CITY OF FRESNO
MITIGATED NEGATIVE DECLARATION
FOR
DEVELOPMENT PERMIT APPLICATION NO. P21-02699 & TENTATIVE PARCEL MAP NO. P21-05930

State Clearinghouse Number: XXXXXXXXXX

City of Fresno
Planning and Development Department
2600 Fresno Street
Fresno, CA 93721

Prepared by:

LSA
2565 Alluvial Avenue, Suite 172
Clovis, California, 93611

Attachments:

Notice of Intent to Adopt a Mitigated Negative Declaration
Appendix G/Initial Study for a Mitigated Negative Declaration
Project Specific Mitigation Monitoring Checklist dated March 2022

CITY OF FRESNO

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

Filed with the
FRESNO COUNTY CLERK
2220 Tulare Street, Fresno, CA 93721

DEVELOPMENT PERMIT APPLICATION NO. P21-02699 & TENTATIVE PARCEL MAP NO. P21-05930

APPLICANT:

Jake Kurth
Scannell Properties
8801 River Crossing Boulevard, Suite 300
Indianapolis, IN 46240

PROJECT LOCATION:

2740 West Nielsen Avenue: Located on the north side of West Nielsen Avenue between North Marks and North Hughes Avenues in the City and County of Fresno, California (See Exhibit A – Vicinity Map)

APNs: 458-020-71 & 458-020-72

Site Latitude: 36° 44' 39.408" N & Site Longitude: 119° 50' 23.964" W
Mount Diablo Base & Meridian, Township 14S, Range 20E, Section 06

The full Initial Study and the Fresno General Plan Program Environmental Impact Report (PEIR) are on file in the Planning and Development Department, Fresno City Hall, 3rd Floor, Room 3043, 2600 Fresno Street, Fresno, CA 93721.

PROJECT DESCRIPTION:

Development Permit Application No. P21-02699 and Tentative Parcel Map No. P21 05930 was filed by Jake Kurth of Scannell Properties and pertains to two parcels totaling ±48.03 acres of property. The applicant proposes the construction of four concrete tilt-up office/warehouse buildings with a total gross floor area of approximately 901,438 square feet.

An Initial Study of the above-described project was prepared by a third-party consultant for the City of Fresno and the city intends to adopt a Mitigated Negative Declaration. The environmental analysis contained in the Initial Study is tiered from the PEIR State Clearinghouse No. 2019050005 prepared for the Fresno General Plan pursuant to CEQA Guidelines § 15152 and incorporates the PEIR by reference pursuant to CEQA Guidelines § 15150.
Pursuant to the California Public Resources Code (PRC) §§ 21093 and 21094 and California

Environmental Quality Act (CEQA) Guidelines §§ 15070 to 15075, 15150, and 15152, this project has been evaluated with respect to each item on the attached Appendix G/Initial Study Checklist to determine whether this project may cause any additional significant effect on the environment, which was not previously examined in the PEIR. After conducting a review of the adequacy of the PEIR pursuant to PRC § 21157.6(b)(1) and CEQA Guidelines §§ 15151 and 15179(b), the Planning and Development Department, as lead agency, finds that no substantial changes have occurred with respect to the circumstances under which the PEIR was certified and that no new information, which was not known and could not have been known at the time that the PEIR was certified as complete, has become available.

The completed Appendix G/Initial Study Checklist, its associated narrative, technical studies and mitigation measures reflect applicable comments of responsible and trustee agencies and research and analyses conducted to examine the interrelationship between the proposed project and the physical environment. The information contained in the project application and its related environmental assessment application, responses to requests for comment, checklist, Initial Study narrative, and any attachments thereto, combine to form a record indicating that an Initial Study has been completed in compliance with the State CEQA Guidelines and the CEQA.

All new development activity and many non-physical projects contribute directly or indirectly toward cumulative impacts on the physical environment. It has been determined that the incremental effect contributed by this project toward cumulative impacts is not considered substantial or significant in itself and/or that cumulative impacts accruing from this project may be mitigated to less than significant with application of feasible mitigation measures.

With mitigation imposed under the PEIR and project specific mitigation, there is no substantial evidence in the record that this project may have additional significant, direct, indirect or cumulative effects on the environment that are significant and that were not identified and analyzed in the PEIR. The Planning and Development Department, as lead agency, finds that no substantial changes have occurred with respect to the circumstances under which the PEIR was certified and that no new information, which was not known and could not have been known at the time that the PEIR was certified as complete has become available.

Based upon the evaluation guided by the Appendix G/Initial Study Checklist, it was determined that there are project specific foreseeable impacts which require project level mitigation measures.

The Initial Study has concluded that the proposed project will not result in any adverse effects, which fall within the "Mandatory Findings of Significance" contained in § 15065 of the State CEQA Guidelines. The finding is, therefore, made that the proposed project will not have a significant adverse effect on the environment.

Public notice has been provided regarding staff's finding in the manner prescribed by § 15072 of the CEQA Guidelines and by § 21092 of the PRC Code (CEQA provisions).

Additional information on the proposed project, including the PEIR, proposed environmental finding of a Mitigated Negative Declaration and the Initial Study may be obtained from the Planning and Development Department, Fresno City Hall, 2600 Fresno Street, 3rd Floor, Room 3043, Fresno, California 93721 3604. Please contact Steven Martinez at (559) 621-8047 or via email at Steven.Martinez@fresno.gov for more information.

ANY INTERESTED PERSON may comment on the proposed environmental finding. Comments must be in writing and must state (1) the commentor's name and address; (2) the commentor's interest in, or relationship to, the project; (3) the environmental determination being commented upon; and (4) the specific reason(s) why the proposed environmental determination should or should not be made. Any comments may be submitted at any time between the publication date of this notice and close of business on **Monday, June 13, 2022**. Please direct comments to Steven Martinez - Planner, City of Fresno Planning and Development Department, City Hall, 2600 Fresno Street, Room 3043, Fresno, California, 93721-3604; or by email to Steven.Martinez@fresno.gov.

INITIAL STUDY PREPARED BY:
LSA
2565 Alluvial Avenue, Suite 172
Clovis, California, 93611

DATE:
May 13, 2022

Attachments:
Exhibit A – Vicinity Map

SUBMITTED BY:
Ralph Kachadourian

Ralph Kachadourian
Supervising Planner

CITY OF FRESNO
PLANING AND DEVELOPMENT
DEPARTMENT

Exhibit A - Vicinity Map

LSA

FIGURE 2

🟥 Project Site

▭ Proposed Parcels

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2740 West Nielsen Office/Warehouse Project

Aerial Photograph of Project Site and Surrounding Land Uses

SOURCES: Google Earth, 9/9/2019; LSA 2021

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APPENDIX G/INITIAL STUDY FOR A MITIGATED NEGATIVE DECLARATION

Environmental Checklist Form for:
Development Permit Application No. P21-02699 and Tentative Parcel Map No. P21-05930

1.	**Project title:** Development Permit Application No. P21-02699 and Tentative Parcel Map No. P21-05930
2.	**Lead agency name and address:** City of Fresno Planning and Development Department 2600 Fresno Street Fresno, CA 93721
3.	**Contact person and phone number:** McKencie Perez, MPA, Supervising Planner City of Fresno Planning and Development Department (559) 621-8066
4.	**Project location:** 2740 West Nielsen Avenue: Northeast of intersection of North Marks Avenue and West Nielsen Avenue (Assessor’s Parcel Numbers [APNs]: 458-020-71 and 458-020-72) Figure 1 shows the site’s regional and local context. Figure 2 depicts an aerial photograph of the project site and surrounding land uses.
5.	**Project sponsor's name and address:** Jake Kurth Scannell Properties 8801 River Crossing Boulevard, Suite 300 Indianapolis, IN 46240
6.	**General & Community plan land use designation:** Heavy Industrial
7.	**Zoning:** Heavy Industrial (IH)
8.	**Description of project:** Development Permit Application No. P21-02699 and Tentative Parcel Map No. P21-05930 was filed by Scannell Properties. The applicant proposes to construct four office/warehouse buildings with a total area of 901,438 square feet, as well as associated circulation, parking, and infrastructure improvements.

Figure 1: Regional Project Location

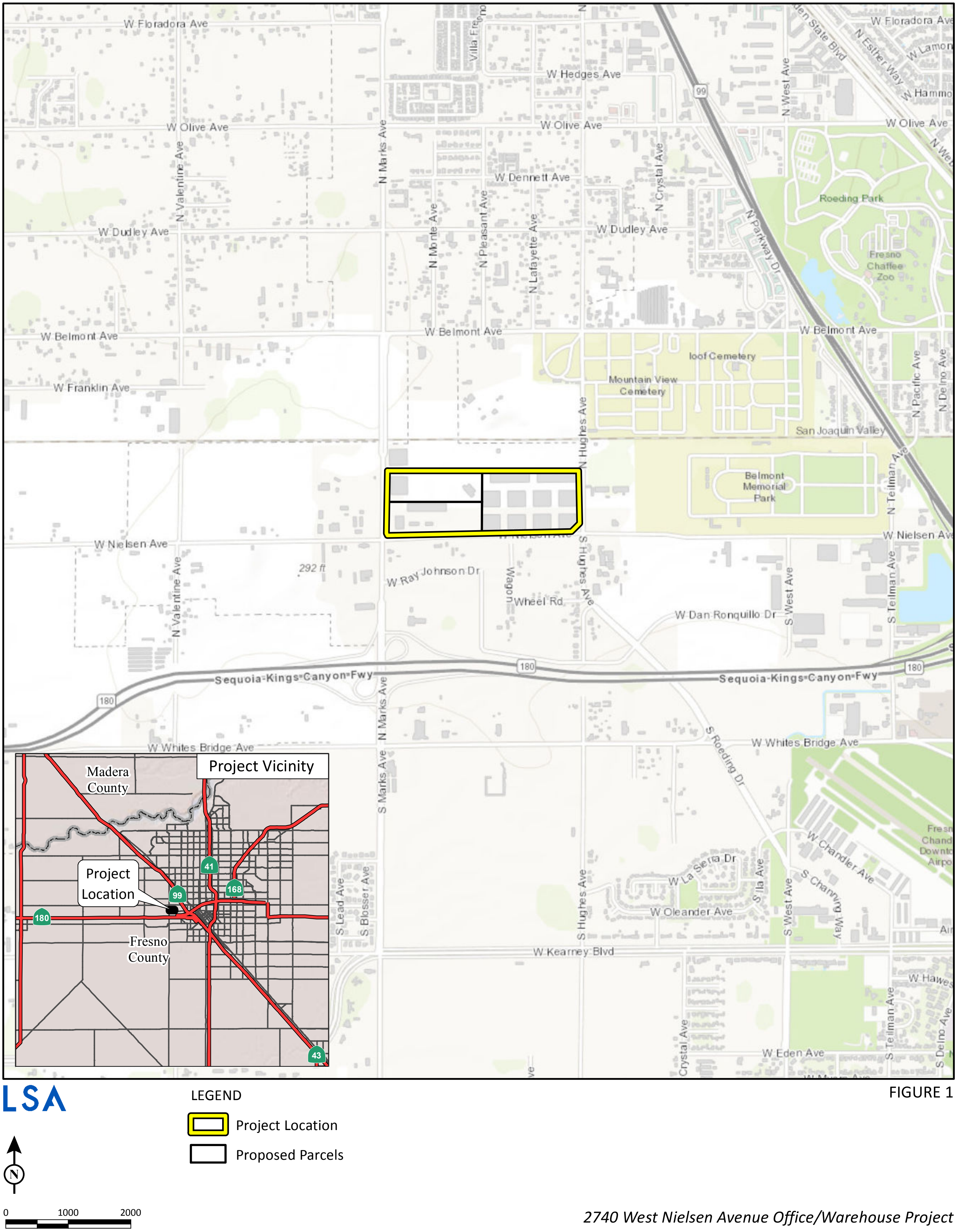

FIGURE 1

2740 West Nielsen Avenue Office/Warehouse Project

Regional Project Location

SOURCE: Esri Topographic Map (2021)

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LSA

FIGURE 2

🟥 Project Site

▭ Proposed Parcels

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FEET

2740 West Nielsen Office/Warehouse Project

Aerial Photograph of Project Site and Surrounding Land Uses

SOURCES: Google Earth, 9/9/2019; LSA 2021

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Project Site

The 48.03-acre project site is currently vacant but formerly consisted of a former industrial warehouse that has previously been demolished. The project site is bounded to the north by vacant, undeveloped land, to the east by North Hughes Avenue, to the south by West Nielsen Avenue, and to the west by North Marks Avenue. Regional access to the site is provided by State Route 180 (SR-180), which is located approximately 0.3 mile south of the project site, and State Route 99 (SR-99), which is located approximately 0.8 miles east of the project site.

Project Characteristics

The project would result in the construction of four office/warehouse buildings that would be configured for heavy industrial uses by tenants that have not been identified. The proposed buildings would result in a total gross floor area of approximately 901,438 square feet. The buildings' exterior would be up to 44 feet high with an interior height of up to 36 feet and designed with a total of 201 loading dock doors on the north and south sides of the buildings. The four buildings would be comprised of the following: Building 1 would be 468,812 square feet and would provide 122 loading dock doors; Building 2 would be 248,786 square feet and would provide 46 loading dock doors; Building 3 would be 93,074 square feet and would provide 18 loading dock doors; and Building 4 would be 90,766 square feet and would provide 15 loading dock doors. Figure 3 shows the project site plan.

As identified above, future tenants have not been identified. Therefore, this analysis assumes that the proposed project would be operational 24 hours per day, 7 days per week; however, it is possible that future tenants may operate less hours than covered in this analysis.

The proposed project would comply with the latest California Green Building Standards Code (CALGreen) building measures and Title 24 standards.

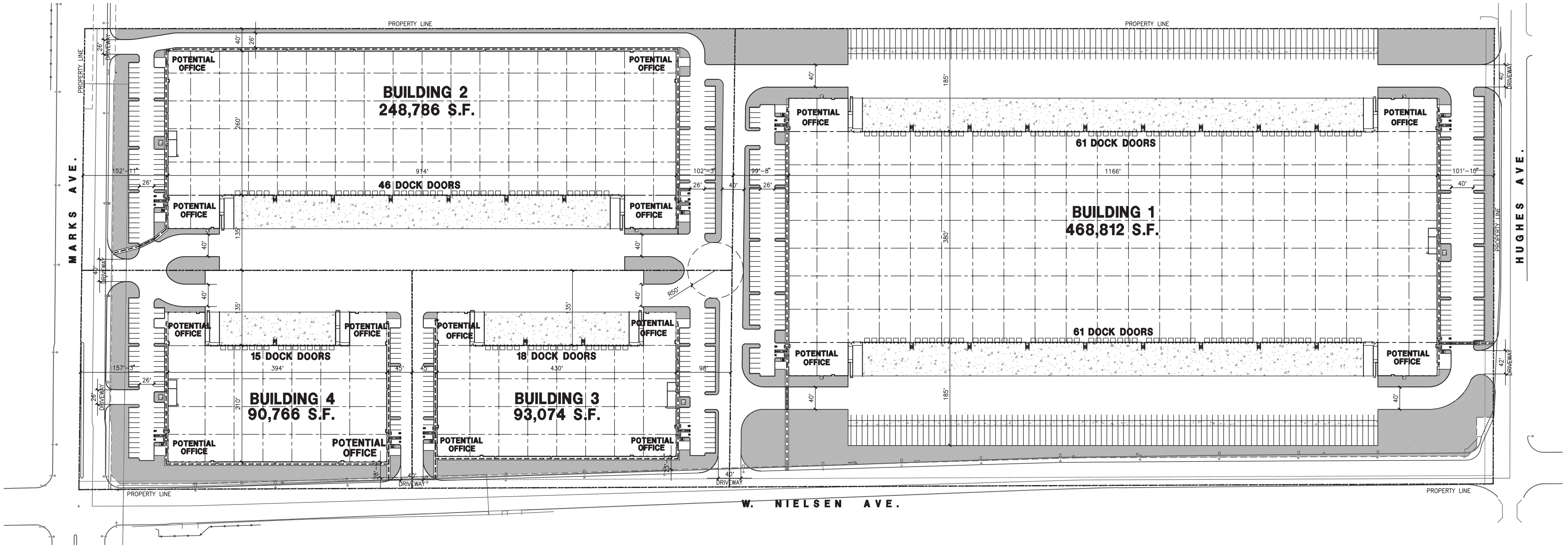
Access, Circulation, and Parking

As shown in Figure 3, vehicular access to the site would be provided by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue.

A total of 594 on-site parking spaces would be provided for vehicles and trucks. Of the 594 parking spaces, 385 spaces would be dedicated for standard vehicles, 11 spaces would be dedicated for accessible standard vehicles, and 10 spaces would be dedicated for accessible vans. The remaining 188 spaces would be dedicated for trailers and would be located along the eastern and western edges of the project site and would be located behind two 8-foot-tall gates, which would be installed to separate the general parking area from the truck storage and dock loading area.

Open Space and Landscaping

Consistent with City of Fresno (City) requirements, landscaping would be provided throughout the project site.



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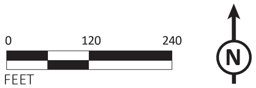

FIGURE 3

2740 West Nielsen Office/Warehouse Project

Site Plan

SOURCE: HPA Architecture, Inc., 2021

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Utilities and Infrastructure

The project site is located in an urban area and is currently served by existing utilities, including: water, sanitary sewer, storm drainage, electricity, and natural gas infrastructure. Proposed utility connections are discussed below.

Water

Water service to the project site would be provided by the City. New water within the project site would connect to the existing 14-inch main located on North Marks Avenue and the 16-inch main on North Hughes Avenue. The project would also include an on-site 12-inch main.

Wastewater

The City would provide wastewater collection and treatment for the proposed project, and maintains an existing 12- to 18-inch line located in West Nielsen Avenue. The proposed project includes the installation of a new on-site 8-inch wastewater line that would connect to the City's existing line.

Stormwater

The proposed project would include construction of a new curb and gutter along North Marks Avenue, West Nielsen Avenue, and North Hughes Avenue that would connect to the existing Fresno Metropolitan Flood Control District (FMFCD) stormwater system.

Electricity and Natural Gas

Electricity and natural gas services to the site are provided by Pacific Gas and Electric Company (PG&E). Existing underground utility connections and gas mains provide electricity and gas to the project site. New underground electrical lines would be installed.

Grading and Construction

Construction of the proposed project is anticipated to occur in two phases occurring over a total 24-month period starting in the first quarter of 2022 and ending in 2024. The first phase would include the construction of Buildings 2, 3, and 4 and would occur for 12 months. The second phase would include the construction of Building 1 and would occur for 12 months. The proposed project would comply with City standards, including the City's current building code, landscape standards, and lighting standards. In addition, the proposed project would be graded similar to other developments throughout the City.

APPROVALS/PERMITS

The following approvals are required by the City of Fresno:

- Adoption of the Initial Study/Mitigated Negative Declaration (IS/MND)
- Design review
- Tentative parcel map
- Water connection(s)
- Sanitary sewer connection(s)

9. **Surrounding Land Uses and Setting:**

	Planned Land Use	Existing Zoning	Existing Land Use
North	Heavy Industrial/ Cemetery	Heavy Industrial (IH)	Heavy Industrial/ Cemetery
East	Light Industrial/ Cemetery	Light Industrial (IH)/ Public and Institutional (PI)	Light Industrial/ Cemetery
South	Highway & Auto/ Business Park	Commercial Highway & Auto (CH)/ Business Park (BP)	Highway & Auto/ Business Park
West	Light Industrial	Light Industrial (IH)	Light Industrial

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

- Pacific Gas & Electric (PG&E), electrical and natural gas connection
- Central Valley Regional Water Quality Control Board (RWQCB) Storm Water Pollution Prevention Plan
- San Joaquin Valley Air Pollution Control District (SJVAPCD) (e.g., Dust Control Plan Approval letter and compliance with Rule 9510 – Indirect Source Review)

11. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code (PRC) Section 21080.3.1? If so, has consultation begun?**

The State requires lead agencies to consider the potential effects of proposed projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the California Environmental Quality Act (CEQA) Guidelines. Pursuant to PRC Section 21080.3.1, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Register of Historical Resources (California Register) or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)). According to the most recent census data, California is home to 109 currently recognized Indian tribes. Tribes in California currently have nearly 100 separate reservations or Rancherias. Fresno County has a number of Rancherias such as Table Mountain Rancheria, Millerton Rancheria, Big Sandy Rancheria, Cold Springs Rancheria, and Squaw Valley Rancheria. These Rancherias are not located within the city limits.

Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See PRC Section 21083.3.2.) Information may also be available from the California Native American Heritage Commission's (NAHC) Sacred Lands File per PRC Section 5097.96 and the California Historical Resources Information System administered by the California

	Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality. Currently, the Table Mountain Rancheria Tribe and the Dumna Wo Wah Tribe have requested to be notified pursuant to Assembly Bill (AB) 52. A certified letter was mailed to the above-mentioned tribes on December 17, 2021. The 30-day comment period ended on January 17, 2022. Neither tribe requested consultation.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

___	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
___	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
___	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT (EIR) is required.

___	I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An EIR is required, but it must analyze only the effects that remain to be addressed.
___	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

____

Planner Name, Title Date

EVALUATION OF ADDITIONAL ENVIRONMENTAL IMPACTS:

1. For purposes of this Initial Study, the following answers have the corresponding meanings:
   a. “No Impact” means the subsequent project will not cause any additional significant effect related to the threshold under consideration.
   b. “Less Than Significant Impact” means there is an impact related to the threshold under consideration, but that impact is less than significant;
   c. “Less Than Significant with Mitigation Incorporation” means there is a potentially significant impact related to the threshold under consideration, however, with the mitigation incorporated into the project, the impact is less than significant.
   d. “Potentially Significant Impact” means there is an additional potentially significant effect related to the threshold under consideration.

2. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

3. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

4. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

5. "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from, "Earlier Analyses," as described in (6) below, may be cross-referenced).

6. Earlier analyses may be used where, pursuant to the tiering, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

   a. Earlier Analysis Used. Identify and state where they are available for review.

   b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c. Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

7. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

8. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

9. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

10. The explanation of each issue should identify:

    a. The significance criteria or threshold, if any, used to evaluate each question; and
    b. The mitigation measure identified, if any, to reduce the impact to less than significant.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS – Except as provided in PRC Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock out-croppings, and historic buildings within a state scenic highway?				X
c) In non-urbanized areas, substantially degrade the existing visual character or quality public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?		X		

DISCUSSION

a) Would the project have a substantial adverse effect on a scenic vista?

A scenic vista is generally defined as a public vantage point with an expansive view of a significant landscape feature. An impact on scenic vistas is considered significant if it substantially diminishes, blocks, or impedes an expansive view of a significant landscape feature from a public vantage point.

The proposed project site is located in a partially developed area of the city and is not located in an area with expansive or far field views. The proposed project would include the construction of four office/warehouse buildings that would be configured for heavy industrial uses. The proposed buildings would result in a total gross floor area of approximately 901,438 square feet. The buildings' exterior would be up to 44 feet high with an interior height of up to 36 feet and designed with a total of 201 loading dock doors on the north and south sides of the buildings. Adjacent parcels consist mostly of residential, light and heavy industrial, a cemetery, and vacant, undeveloped uses. There are no significant trees, rock outcroppings, and/or historic buildings located on the subject property that have been identified as important scenic resources or would otherwise constitute significant landscape features. Therefore, the proposed project would not substantially diminish any scenic vistas within or near the project area and would likewise not substantially block or impede surrounding views. Therefore, the proposed project would result in a less-than-significant impact related to a substantial adverse effect on a scenic vista, and no mitigation is required.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

There are no trees, rock outcroppings, and/or historic buildings located on the subject property that have been identified as important scenic resources or would otherwise constitute significant landscape features. Additionally, there are no officially-designated State Scenic Highways in the immediate vicinity of the project site. According to the California Department of Transportation (Caltrans) mapping of State Scenic Highways,[1] the County of Fresno has one officially designated State Scenic Highways located along State Route (SR-) 180, east of the City of Fresno. Three eligible State Scenic Highways are also located within the County of Fresno, the nearest of which is located along SR-168 east of the City of Clovis. None of these are in the immediate vicinity of the project site. Since there are no eligible or officially designated State Scenic Highways within the immediate vicinity of the project site, the project would not impact a designated State Scenic Highway. Furthermore, the eligibility of the three State Scenic Highways, scenic resources located within the highway segments or its viewshed would not be impacted by the proposed project. Therefore, no impact on scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State Scenic Highway would occur as a result of the proposed project.

c) In non-urbanized areas, would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The project site is primarily flat and previously disturbed with no existing structures. The site was previously developed with a former industrial warehouse site that has been demolished. Nearby parcels consist mostly of low residential, light and heavy industrial, cemetery, and vacant, undeveloped uses. The proposed project would include four office/warehouse buildings that would be configured for heavy industrial uses. Although the proposed project would change the visual characteristics of the project site by

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[1] California Department of Transportation (Caltrans). Mapping of State Scenic Highways. Website: https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed June 2021).

developing the site, the design of the project would be consistent with the visual character within the project area. Although the character of the project site would change from vacant to urban, the project would not substantially degrade the visual character or quality of the site and its surroundings. In addition, the proposed project is consistent with the existing and historic zoning of the site and would not conflict with any applicable zoning or other regulations governing scenic quality. Therefore, any impacts would be less than significant, and no mitigation is required.

d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The project site is located in an urbanized area, which is subject to preexisting exterior lighting from surrounding development and existing street lighting. The proposed project would introduce new sources of light and glare to the area in the form of new windows and exterior safety and security lighting. While compliance with California Building Code (Title 24, California Code of Regulations [CCR]) standards would minimize the proposed project's light and glare impacts, the proposed project's lighting systems could constitute substantial new sources of light relative to baseline conditions if the project's lighting systems are significantly more intense than existing lighting sources or if they are not appropriately shielded to prevent light diffusion. Additionally, the proposed project could create a substantial new source of glare if highly reflective building materials are used.

Mitigation measure AES-4 would ensure that the proposed project's lighting systems do not create a substantial new source of light by imposing a cap on the intensity of lighting systems based on the average intensity of the surrounding streets. Mitigation measures AES-1 through AES-3 would ensure that the proposed project's lighting systems do not create a substantial new source of light by requiring shielding mechanisms to direct light away from nearby uses. As a result, any new sources of light resulting from the proposed project would not be substantial in the context of existing lighting sources.

Additionally, while the project does not propose use of highly reflective glass elements or building materials, mitigation measure AES-5 requires materials used on building facades to be non-reflective. Therefore, any new source of glare would not be substantial.

Accordingly, with the incorporation of Mitigation Measures AES-1 through AES-5, the project's potential impacts would be less than significant.

MITIGATION MEASURES

Mitigation Measure AES-1: Lighting systems for street and parking areas shall include shields to direct light to the roadway surfaces and parking areas. Vertical shields on the light fixtures shall also be used to direct light away from adjacent light sensitive land uses such as residences.

Mitigation Measure AES-2: Lighting systems for public facilities such as active play areas shall provide adequate illumination for the activity; however, low intensity light fixtures and shields shall be used to minimize spillover light onto adjacent properties.

Mitigation Measure AES-3: Lighting systems for non-residential uses, not including public facilities, shall provide shields on the light fixtures and orient the lighting system away from adjacent properties. Low intensity light fixtures shall also be used if excessive spillover light onto adjacent properties will occur.

Mitigation Measure AES-4: Lighting systems for freestanding signs shall not exceed 100 foot Lamberts (FT-L) when adjacent to streets which have an average light intensity of less than 2.0 horizontal footcandles and shall not exceed 500 FT-L when adjacent to streets which have an average light intensity of 2.0 horizontal footcandles or greater.

Mitigation Measure AES-5: Materials used on building facades shall be non-reflective.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
II. AGRICULTURE AND FORESTRY RESOURCES – In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farm-land), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X

DISCUSSION

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project site is located within an urbanized area of Fresno. There are no agricultural uses located within or adjacent to the project site. Additionally, the site is classified as "Urban and Built-Up Land" by the State Department of Conservation.[2] Therefore, development of the proposed project would not convert agricultural land to a non-agricultural use. The proposed project would result in no impact to the conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use and no mitigation is required.

b) Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

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[2] Department of Conservation, Farmland Mapping & Monitoring Program. Website: https://www.conservation.ca.gov/dlrp/fmmp (accessed June 2021).

The project site is designated Heavy Industrial in the General Plan and is located in the Heavy Industrial (IH) zoning district. The project site is not subject to a Williamson Act contract. Therefore, development of the proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract. Therefore, the proposed project would have no impact on existing zoning for agricultural use or a Williamson Act contract and no mitigation is required.

c) **Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?**

The project site is located within an existing urban area and is zoned within a Heavy Industrial (IH) district within the City of Fresno. The proposed project would not conflict with the existing zoning for, or cause rezoning of, forest land or conversion of forest land to non-forest uses. Therefore, the proposed project would have no impact to existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g)), and no mitigation is required.

d) **Would the project result in the loss of forest land or conversion of forest land to non-forest use?**

Please refer to the discussion for c) above. The proposed project would not convert forest land to non-forest use and would result in no impact to the loss or conversion of forest land to a non-forest use, and no mitigation is required.

e) **Would the project involve other changes in the existing environment, which, due to their location or nature, could result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use?**

Please refer to discussions a) and c) of this section. The project site is located within an existing urban environment and would not result in the conversion of farmland to non-agricultural uses or forest land to non-forest uses. Therefore, no impact to changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use would occur, and no mitigation is required.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to agriculture and forestry resources, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan (*e.g.*, by having potential emissions of regulated criterion pollutants which exceed the San Joaquin Valley Air Pollution Control Districts (SJVAPCD) adopted thresholds for these pollutants)?			X	
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
c) Expose sensitive receptors to substantial pollutant concentrations?			X	
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?			X	

DISCUSSION

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

The City of Fresno is part of the San Joaquin Valley Air Basin (SJVAB), which is within the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD is responsible for air quality regulation within the eight-county San Joaquin Valley region.

Both the State and the federal government have established health-based Ambient Air Quality Standards (AAQS) for six criteria air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and suspended particulate matter ($PM_{2.5}$ and PM_{10}). The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards.

CEQA requires that certain proposed projects be analyzed for consistency with the applicable air quality plan. An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a non-attainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the SJVAB into attainment, the SJVAPCD adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.

To assure the SJVAB's continued attainment of the U.S. Environmental Protection Agency (USEPA) PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007. SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions) is designed to reduce PM_{10} emissions generated by human activity. The SJVAPCD adopted the 2018 plan for the 1997, 2006, and 2012 $PM_{2.5}$ standards to address the USEPA federal annual $PM_{2.5}$ standard of 12 $\mu g/m^3$, established in 2012.

For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, construction of the proposed project is anticipated to occur in two phases occurring over a total 24-month period starting in the first quarter of 2022 and ending in 2024 and would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation measures required under SJVAPCD's Regulation VIII would further reduce construction dust impacts. As discussed below, long-term operational emissions associated with the proposed project, including area, energy, and mobile source emissions, would also not exceed SJVAPCD established significance thresholds. Therefore, impacts related to the proposed project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant with mitigation.

Conclusion. The proposed project's potential air quality impacts from construction and operation would not exceed any applicable threshold of significance and would not conflict with or obstruct the applicable clean air plan. Therefore, the proposed project's potential impacts on the applicable air quality plan are less than significant and no mitigation is required.

b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

The SJVAB is designated as non-attainment for O_3 and $PM_{2.5}$ for federal standards and non-attainment for O_3, PM_{10}, and $PM_{2.5}$ for State standards. The SJVAPCD's nonattainment status is attributed to the region's development history. Past, present, and future development projects contribute to the region's adverse air quality impacts on a cumulative basis. By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size to, by itself, result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's contribution to the cumulative impact is considerable, then the project's impact on air quality would be considered significant.

In developing thresholds of significance for air pollutants, the SJVAPCD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The following analysis assesses the potential project-level construction- and operation-related air quality impacts.

Short-Term Construction Emissions. The proposed project's short-term construction emissions would consist of: (1) dust-related PM_{10} emissions and (2) exhaust-related emissions consisting of CO, SO_2, NO_x, ROG, and some soot particulates ($PM_{2.5}$ and PM_{10}) from heavy trucks and construction equipment powered by gasoline and diesel engines.

Emission Sources. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by grading, paving, building, and other activities. Emissions from construction equipment are also anticipated and would include CO, nitrogen oxides (NO_X), reactive organic gases (ROGs), directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and toxic air contaminants (TACs) such as diesel exhaust particulate matter.

Project construction activities would include site preparation, grading, building construction, paving, and architectural coating activities. Construction-related effects on air quality from the proposed project would be greatest during the site preparation phase due to the disturbance of soils. If not properly controlled, these activities would temporarily generate particulate emissions. Sources of fugitive dust would include disturbed soils at the construction site. Unless properly controlled, vehicles leaving the site would deposit dirt and mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions would depend on soil moisture, silt content of soil, wind speed, and the amount of operating equipment. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Water or other soil stabilizers can be used to control dust, resulting in emission reductions of 50 percent or more. The SJVAPCD has implemented Regulation VIII measures for reducing fugitive dust emissions (PM_{10}). Regulation VIII is a series of rules designed to reduce fugitive dust from construction sites, parking and staging areas, open areas, material storage areas, etc. No permits are required by Regulation VIII, but failure to comply can result in fines and penalties. The SJVAPCD provides a synopsis describing requirements and exemptions from Regulation VIII when commenting on proposed projects. Measures generally required by Regulation VIII at all construction sites include the following:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least 6 inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)
- Following the addition of materials to, or the removal of materials from, the surface of out-door storage piles, said piles shall be effectively stabilized of fugitive dust emission utilizing sufficient water or chemical stabilizer/suppressant.

With the implementation of Regulation VIII measures, fugitive dust emissions from construction activities would not result in adverse air quality impacts.

In addition to dust-related PM_{10} emissions, heavy trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_x, ROG, and some soot particulates ($PM_{2.5}$ and PM_{10}) in exhaust emissions. If construction activities were to increase traffic congestion in the area, CO and other emissions from traffic would increase slightly while those vehicles idle in traffic. These emissions would be temporary in nature and limited to the immediate area surrounding the construction site.

Significance Thresholds. The SJVAPCD has established construction emissions thresholds on an annual basis as shown in Table 1 below.

Impact Analysis. Construction emissions for the proposed project were analyzed using the California Emissions Estimator Model (CalEEMod) version 2020.4.0. Construction of the proposed project is anticipated to occur in two phases occurring over a total 24-month period starting in the first quarter of 2022 and ending in 2024. Other precise details of construction activities are unknown at this time; therefore, default assumptions (e.g., construction worker and truck trips and construction fleet activities) from CalEEMod were used. Construction-related emissions are presented in Table 1. CalEEMod output sheets are included in Appendix A.

Table 1: Project Construction Emissions (Tons per Year)

Construction Year	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2022	0.4	3.2	3.1	<0.1	0.7	0.3
2023	0.4	3.0	3.8	<0.1	0.7	0.3
2024	6.3	0.1	0.2	<0.1	<0.1	<0.1
Maximum Annual Construction Emissions	**6.3**	**3.2**	**3.8**	**<0.1**	**0.7**	**0.3**
SJVAPCD Significance Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (September 2021).

CO = carbon monoxide

NO_X = nitrogen oxides

$PM_{2.5}$ = particulate matter less than 2.5 microns in size

PM_{10} = particulate matter less than 10 microns in size

ROG = reactive organic gas

SJVAPCD = San Joaquin Valley Air Pollution Control District

SO_X = sulfur oxides

As shown in Table 1, construction emissions would not exceed the SJVAPCD threshold for annual construction emissions for the proposed project. Therefore, construction of the proposed project would result in a less-than-significant impact related to a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Operational Emissions. Long-term air pollutant emission impacts associated with the proposed project are those related to (1) mobile sources (e.g., vehicle trips), (2) energy sources (e.g., electricity and natural gas), and (3) area sources (e.g., architectural coatings and the use of landscape maintenance equipment).

Emission Sources. PM_{10} emissions result from running exhaust, tire and brake wear, and the entrainment of dust into the atmosphere from vehicles traveling on paved roadways. Entrainment of PM_{10} occurs when vehicle tires pulverize small rocks and pavement and the vehicle wakes generate airborne dust. The contribution of tire and brake wear is small compared to the other particulate matter emission processes. Gasoline-powered engines have small rates of particulate matter emissions compared with diesel-powered vehicles.

Energy source emissions result from activities in buildings for which electricity and natural gas are used. The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Major sources of energy demand include building mechanical systems, such as heating and air conditioning, lighting, and plug-in electronics, such as refrigerators or computers. Greater building or appliance efficiency reduces the amount of energy for a given activity and thus lowers the resultant emissions. The emission factor is determined by the fuel source, with cleaner energy sources, like renewable energy, producing fewer emissions than conventional sources. The proposed project would be consistent with 2019 Title 24 standards.

The proposed project would be consistent with 2019 Title 24 Building Energy Efficiency Standards ("Title 24 Standards"). The Title 24 Standards contain energy and water efficiency requirements (and indoor air quality requirements) for newly constructed buildings, additions to existing buildings, and alterations to existing buildings. The Title 24 Standards establish performance metrics in the form of an "energy budget" based on energy consumption per square foot of floor space. For this reason, the Title 24 Standards include both a prescriptive option, allowing builders to comply by using methods known to be efficient, and a performance option, allowing builders complete freedom in their designs provided the building achieves the same overall efficiency as an equivalent building using the prescriptive option. Reference appendices are adopted along with the Title 24 Standards containing data and various compliance tools to help builders achieve compliance.

Typically, area source emissions consist of direct sources of air emissions located at the project site, including architectural coatings and the use of landscape maintenance equipment. Area source emissions associated with the project would include emissions from the use of landscaping equipment and the use of consumer products.

Significance Thresholds. The SJVAPCD has established emissions thresholds on an annual basis as shown in Table 2 below. If a project's potential emissions exceed any applicable threshold, then the project's emissions are potentially significant.

Impact Analysis. Emission estimates for operation of the proposed project were calculated using CalEEMod. Model results are shown in Table 2. Trip generation rates for the proposed project were based on the project's trip generation estimate, as identified in Section XVII, Transportation. As discussed in Section XVII, Transportation, the proposed project would generate approximately 1,920 average daily trips, including 1,578 vehicle trips and 342 truck trips.

Table 2: Project Operation Emissions (Tons per Year)

	ROG	NO_X	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source Emissions	4.2	<0.1	<0.1	0.0	<0.1	<0.1
Energy Source Emissions	0.1	0.8	0.7	<0.1	0.1	0.1
Mobile Source Emissions	0.6	3.2	6.0	<0.1	2.2	0.6
Total Project Operation Emissions	**4.9**	**4.0**	**6.7**	**<0.1**	**2.3**	**0.7**
SJVAPCD Significance Threshold	10.0	10.0	100.0	27.0	15.0	15.0
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (September 2021).

CO = carbon monoxide

NO_X = nitrogen oxides

$PM_{2.5}$ = particulate matter less than 2.5 microns in size

PM_{10} = particulate matter less than 10 microns in size

ROG = reactive organic gas

SJVAPCD = San Joaquin Valley Air Pollution Control District

SO_X = sulfur oxides

The primary emissions associated with the proposed project are regional in nature, meaning that air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the proposed project; emissions are released in other areas of the SJVAB. The annual emissions associated with project operational trip generation, energy, and area sources are identified in Table 2.

The results shown in Table 2 indicate the proposed project's operational emissions would not exceed the significance criteria for annual ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. Therefore, operation of the proposed project would result in a less-than-significant impact related to a cumulatively considerable net increase of any criteria pollutant for which the proposed project region is in nonattainment under an applicable federal or State AAQS.

Conclusion. The proposed project's potential air quality impacts from construction and operation would not exceed any applicable threshold of significance promulgated by the SJVPACD. As such, the proposed project's potential individual impacts are not cumulatively considerable. Accordingly, no mitigation is required to ensure the proposed project's potential impacts do not cause a cumulatively considerable impact to air quality.

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

This section describes the potential impact on sensitive receptors from construction and operation of the proposed project based on a health risk assessment (HRA) prepared for the project, included in Appendix B.[3] Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter.

Project Construction – Toxic Air Contaminants. Construction of the proposed project may expose surrounding sensitive receptors to airborne particulates, as well as a small quantity of construction equipment pollutants (i.e., usually diesel-fueled vehicles and equipment). However, construction contractors would be required to implement measures to reduce or eliminate emissions by following Regulation VIII, Fugitive PM_{10} Prohibitions. Project construction emissions would be below the SJVAPCD significance thresholds. SJVAPCD project-level thresholds are based in part on Section 180(e) of the Clean Air Act. The project-level thresholds are intended to provide a means of consistency in significance determination within the environmental review process. Notwithstanding, SJVAPCD project-level thresholds do not reflect a particular health impact to a nearby individual or the region. The reason for this is that the project-level thresholds are in pounds/day and tons/year emitted into the air, whereas health effects are determined based on the concentration of a pollutant in the air at a particular location. Federal and State AAQS were developed to protect the most susceptible population groups from adverse health effects.

The annual emissions associated with project construction emissions are identified in Table 1 and indicate the project would not exceed the significance criteria for ROG, NO,

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[3] LSA. 2021. *Health Risk Assessment for the 2740 West Nielsen Avenue Office/Warehouse Project*. December 10.

CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions. The increase in emissions associated with the proposed project would be a small fraction of the Air Basin's emissions.

Therefore, the emissions associated with implementation of the proposed project would not be expected to exceed the most stringent applicable federal or State AAQS for NO_x, $PM_{2.5}$, and PM_{10}. It should be noted that the AAQS are developed and represent levels at which the most susceptible persons (children and the elderly) are protected. In other words, the AAQS are purposefully set low to protect children, the elderly, and those with existing respiratory problems.

Therefore, given the temporary nature of short-term construction impacts and the absence of any exceeded threshold of significance related to construction impacts, the proposed project's potential construction-related impacts to sensitive receptors would be less than significant.

Project Operation – Toxic Air Contaminants. To determine the potential health risk to people living and working near the proposed project associated with the exhaust of diesel-powered trucks and equipment, LSA conducted an HRA for the proposed project that is included in Appendix B.

The HRA was prepared in accordance with policies and procedures of the State Office of Environmental Health Hazard Assessment (OEHHA) and the SJVAPCD. It evaluates the project against the significance criteria established by the SJVAPCD and was prepared in compliance with all applicable requirements, including, but not limited to, City of Fresno General Plan Program Environmental Impact Report Mitigation Measure AIR-3.1.

In order to assess the dispersion of emissions associated with the project, air dispersion modeling was performed using AERMOD. The model is approved by the USEPA when estimating the air quality impacts associated with point and fugitive sources in simple and complex terrain. The model was used to calculate the annual average pollutant concentrations associated with each emitting source.

CARB's HARP2 model was used to translate the TAC concentrations from AERMOD into long-term carcinogenic and chronic, and short-term acute health risk levels following the guidance in the SJVAPCD risk assessment guidelines. To estimate chronic noncancer risks at residential receptors, the "OEHHA-Derived Method" risk-calculation option was used. Following the OEHHA guidance, an 8-hour chronic noncancer risk was calculated for residential receptors because the project would operate more than 8 hours per day and 5 days per week.

Discrete variants for daily breathing rates, exposure frequency, and exposure duration were obtained from relevant distribution profiles presented in the OEHHA guidance document entitled *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* and guidance from SJVAPCD.

Emission Sources. The first step of an HRA is to characterize the project-related emissions of TACs.

The proposed project would generate a total of 1,920 daily trips, with up to 342 truck trips per day. The trucks would access the site by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue. As identified in the Project Description, Building 1 would provide 122 loading dock doors; Building 2 would provide 46 loading dock doors; Building 3 would provide 18 loading dock doors; and Building 4 would provide 15 loading dock doors. As such, the proposed project would have a total of 201 loading dock doors. As the project would contain multiple loading docks, offsite queuing of trucks is not anticipated. While the TAC emissions from gasoline-powered vehicles have a small health effect compared to DPM, this HRA includes both gasoline- and diesel-powered vehicle emissions. For the diesel exhaust emissions, it is sufficient to only consider the DPM (PM_{10} and $PM_{2.5}$) portions of the exhaust; all the TACs for the gasoline exhaust emissions are contained in the ROG emissions. Using speciation data from CARB, the emission rates of the TAC components are derived from the total ROG emissions.

Project trucks would operate in two modes: stationary idling and moving on and off the site. The emissions from trucks while idling result in a much higher concentration of TACs at nearby sensitive receptors compared to the emissions from moving trucks. This is due to the dispersion of emissions that occurs with distance and with travel of the vehicle. For this HRA, the truck travel emissions were modeled as a series of volume sources along the on-site driveway and along East Avenue going north and south of the site driveway. LSA assumed vehicles traveling on site would maneuver slowly, averaging approximately 5-15 miles per hour (mph), and that vehicles traveling on roadways would average 5–55 mph.

The idling emissions of trucks operating on the project site were modeled as point sources within the area sources representing the planned loading docks. EMFAC2021 was used to determine the emissions factors of idling and operating diesel trucks to determine the total emissions of DPM. While it is expected that the truck emissions rate will continue to reduce over time, an HRA only allows for a single emission rate to represent the entire 70-year exposure period. The use of emissions factors for the year 2022, was used as a conservative estimate of emissions, although, the project is not expected to be fully operational until 2024.

<u>Significance Thresholds</u>. Both the State and federal governments have established health-based AAQS for seven air pollutants. For other air pollutants without defined significance standards, the definition of substantial pollutant concentrations varies. For TACs, "substantial" is taken to mean that the individual health risk exceeds a threshold considered to be a prudent risk management level.

The following limits for maximum individual cancer risk (MICR) and noncancer acute and chronic Hazard Index (HI) from project emissions of TACs are considered appropriate for use in determining the health risk for projects in the Basin:

- **MICR:** MICR is the estimated probability of a maximum exposed individual (MEI) contracting cancer as a result of exposure to TACs over a period of 70 years for adults and 9 years for children in residential locations, 350 days per year. The SJVAPCD's *Update to the District's Risk Management Policy to Address the OEHHA Revised Risk*

Assessment Guidance Document states that emissions of TACs are considered significant if an HRA shows an increased risk of **greater than 20 in 1 million**.

- **Chronic HI:** Chronic HI is the ratio of the estimated long-term level of exposure to a TAC for a potential MEI to its chronic reference exposure level. The chronic HI calculations include multi-pathway consideration when applicable. The project would be considered significant if the cumulative increase in total chronic HI for any target organ system would **exceed 1.0 at any receptor location**.
- **Acute HI:** Acute HI is the ratio of the estimated maximum 1-hour concentration of a TAC for a potential MEI to its acute reference exposure level. The project would be considered significant if the cumulative increase in total acute HI for any target organ system would **exceed 1.0 at any receptor location**.

Impact Analysis. The carcinogenic and chronic health risks from the proposed project are shown in Table 3. The residential risk incorporates both the risk for a child living in a nearby residence for 9 years (the standard period of time for child risk) and an adult living in a nearby residence for 70 years (considered a conservative period of time for an individual to live in any one residence).

Table 3: Health Risk Levels for Existing Residents near the Project Site

	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index	Acute Inhalation Hazard Index
Maximally Exposed Resident	6.154	0.001	0.001
Maximally Exposed Worker	0.417	0.001	0.001
SJVAPCD Significance Threshold	**20**	**1.00**	**1.0**
Significant?	**No**	**No**	**No**

Source: LSA (August 2021).
SJVAPCD = San Joaquin Valley Air Pollution Control District

For the nearest residential receptor, the maximum cancer risk for the maximally exposed individual (MEI) would be 6.154 in one million, less than the threshold of 20 in one million. The chronic health risks from the project's activity would be 0.001, which would not exceed the threshold of 1.0. In addition, the total acute hazard index would be 0.001, which would also not exceed the threshold of 1.0. See Appendix B for additional details on the modeling.

For the nearest worker receptor, the maximum cancer risk for the MEI would be 0.417 in one million, less than the threshold of 20 in one million. The chronic health risks from the project's activity would be 0.001, which would not exceed the threshold of 1.0. In addition, the total acute hazard index would be 0.001, which would also not exceed the threshold of 1.0.

As demonstrated in the analysis, the health risk levels to nearby residents from project-related emissions of TACs would be well below the SJVAPCD's HRA thresholds.

Therefore, impacts would be less than significant related to the exposure of sensitive receptors to substantial pollutant concentrations during project operation.

Conclusion. The proposed project's potential air quality impacts from construction and operation would not expose sensitive receptors to substantial pollutant concentrations. The proposed project would not result in any individual health risk in excess of the thresholds considered to be prudent risk management levels. Therefore, the proposed project's potential air quality impacts on sensitive receptors are less than significant and no mitigation is required.

d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

During construction, the various diesel-powered vehicles and equipment in use on site would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the project site. Because the project's potential construction-related odor impacts are localized and temporary, they would not adversely affect a substantial number of people. Therefore, the project's potential construction-related odor impacts are less than significant.

Once operational, the proposed project would include truck activity, which could result in diesel odor impacts. The closest sensitive receptors include the single-family residences located approximately 110 feet south of the project site across West Nielsen Avenue. These residences would be located approximately 260 feet south of the loading docks south of Building 1. These odor emissions may be noticeable from time to time near the project site; however, they would be localized and are not likely to adversely affect a substantial number of people by resulting in confirmed odor complaints. In addition, idling of trucks would be limited by the California Air Resources Board's (CARB) In-Use Off-Road Diesel Vehicles regulation, which limits idling to 5 minutes or less. Minimizing idling time reduces odors, as unburned fuel and products of combustion from some engines condense in the exhaust, particularly during warmup or shortly after engine startup, resulting in more intense odors.[4] Therefore, the proposed project would result in a less-than-significant impact related to other emissions (such as those leading to odors) adversely affecting a substantial number of people.

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[4] USEPA, 1971. *Guide to Reduction of Smoke and Odor from Diesel-Powered Vehicles*. September. Website: https://nepis.epa.gov/Exe/ZyPDF.cgi/9100JLQ0.PDF?Dockey=9100JLQ0.PDF (accessed April 2022).

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
IV. BIOLOGICAL RESOURCES – Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?				X
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

DISCUSSION

The following discussion is based on the findings of the Biological Evaluation[5] prepared for the proposed project. The Biological Evaluation is included as Appendix C.

Methods. A reconnaissance-level field survey was conducted on March 18, 2021, which consisted of systematically walking across the project site while identifying principal land uses and biotic habitats, identifying plant and animal species encountered, and assessing the suitability of the habitats within the project site for special-status species.

In addition, an analysis of potential project impacts to biological resources based on the known and potential biotic resources of the project site and vicinity was conducted. Sources of information used in the preparation of this analysis included:

- California Natural Diversity Data Base information (CNDDB), which is administered by the California Department of Fish and Wildlife (CDFW), formerly known as the California Department of Fish and Game (CDFG). This database covers sensitive plant and animal species as well as sensitive natural communities that occur in California. Records from nine United States Geological Survey (USGS) quadrangles surrounding the project site (*Fresno South, Malaga, Conejo, Caruthers, Raisin, Kearney Park, Herndon, Fresno North,* and *Clovis*) were obtained from this database to inform the field survey.

- California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants, which utilizes four specific categories or "lists" of sensitive plant species to assist with the conservation of rare or endangered botanical resources. All of the plants constituting California Rare Plant Ranks (CRPR) 1A, 1B, 2A, and 2B are intended to meet the status definitions of "threatened" or "endangered" in the California Endangered Species Act (CESA) and the California Fish and Game Code, and are considered by CNPS to be eligible for State listing. At the discretion of the CEQA lead agency, impacts to these species may be analyzed as such, pursuant to the *State CEQA Guidelines* Sections 15125(c) and 15380. Plants in Rank 3 (limited

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[5] Live Oak Associates, Inc. 2021. *Biological Evaluation Nielsen Avenue Office/Warehouse Project, Fresno County, California*. April 13.

information; review list), Rank 4 (limited distribution; watch list), or that are considered Locally Unusual and Significant may be analyzed under CEQA if there is sufficient information to assess potential significant impacts. Records from the nine USGS quadrangles surrounding the project site were obtained from this database to inform the field survey.

- Additional manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

a) **Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?**

The Fresno region supports various special-status natural communities, plants, and animals. The Biological Evaluation provides tables that identify those special-status plant and animal species known to occur or that potentially occur in the vicinity of the project site (based on the literature review and experience in the region) and includes detailed information about each species' habitat and distribution, State and federal status designations, and probability of occurrence within the project site. As stated in the methodology section above, the background research included occurrence records from nine USGS topographic quadrangles surrounding the survey area. A nine-USGS quadrangle search covers a large, variable geographic and topographic area containing numerous habitat types not found within or around the project site.

Special-Status Plants. Ten special-status vascular plant species are known to occur in the region. However, no special-status plants exist within the project site or in adjacent parcels. The project site does not contain suitable habitat and is situated outside of the species' known distribution. Therefore, as the project site does not contain any special-status plants, special-status plants would not be impacted by the proposed project.

Special-Status Species. In total, 20 special-status species could potentially occur in the project vicinity; however, 18 are considered absent or unlikely to occur on the project site due to past and ongoing disturbance of the site and surrounding lands, the absence of suitable habitat, and/or the project site being situated outside of the species' known distribution. The 18 species considered absent or unlikely to occur on the project site include vernal pool fairy shrimp, Crotch bumble bee, valley elderberry longhorn beetle, California tiger salamander, giant garter snake, least Bell's vireo, Swainson's hawk, tricolored blackbird, western yellow-billed cuckoo, Fresno kangaroo rat, San Joaquin kit fox, western spadefoot, western pond turtle, coast horned lizard, northern California legless lizard, California glossy snake, burrowing owl, and American badger. As identified in the Biological Evaluation, the proposed project does not have the potential to impact these species through project-related mortality or loss of habitat as there is little or no likelihood that they are present or would be present during construction activity.

The two special-status species that have the potential to forage over the project site from time to time, but would not roost on the site, include western mastiff bat and pallid bat.

These two bat species would not be adversely affected from project-related loss of habitat nor is foraging habitat uniquely important for these species. These species would not be vulnerable to construction-related injury or mortality while foraging because they are highly mobile during foraging and are expected to avoid active construction zones. These bats would be expected to continue to use the project site for foraging after redevelopment. No other special-status species were determined to have a moderate or high probability of occurrence on the project site.

However, the project site does contain suitable nesting habitat for a few urban adapted native avian species. The on-site trees and shrubs have the potential to support nesting birds such as northern mockingbird or mourning dove. In addition, the project site also has the potential to support the ground-nesting and disturbance-tolerant killdeer. Nearly all native birds are protected by the Federal Migratory Bird Treaty Act, the California Migratory Bird Protection Act, and the California Fish and Game Code. Construction activities that occur during the nesting bird season (typically February 1 through August 31 have potential to result in the mortality/disturbance of nesting birds.

If unmitigated or unavoided, these potential impacts on nesting birds could be considered potentially significant. However, avoidance, conducting pre-construction surveys, and establishing buffers would prevent or compensate for impacts on special-status species. Therefore, implementation of Mitigation Measures BIO-1 and BIO-2, which would require avoidance, conducting pre-construction surveys, and establishing buffers, would effectively mitigate any impacts on special-status species to less-than-significant levels.

Critical Habitat. The project would not result in any impacts to critical habitat, and no additional mitigation is required.

Summary. Therefore, the proposed project would have a less-than-significant impact with implementation of Mitigation Measures BIO-1 and BIO-2 related to a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.

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

Habitat values of the urban site have been severely diminished due to the extensive hardscape, scarcity of vegetation, and perimeter chain-link fencing. No riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulation by the CDFW or United States Fish and Wildlife Service’s (USFWS) is present on the site. Designated critical habitat, sensitive natural communities, and other sensitive habitats are absent from the project site and adjacent lands. Therefore, implementation of the proposed project would have no impact related to a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service.

c) Would the project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No aquatic resources occur within the project site, or within the vicinity of the project site. The project site consists entirely of developed areas. As a result, no impact would occur related to a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The project site does not contain any features that would function as wildlife movement corridors for resident or migratory wildlife species. In addition, the perimeter chain-link fence would inhibit the movement of native or migratory wildlife. Therefore, the proposed project would not place any permanent barriers within any known wildlife movement corridors or interfere with habitat connectivity. The proposed project would result in a less-than-significant impact related to the potential to interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The project would not conflict with any local policies or ordinances protecting biological resources. Though the proposed project is subject to provisions of the City's Municipal Code regarding trees on public property (Article 3 of Section 13 of the City of Fresno Municipal Code), the proposed project does not conflict with any of the existing ordinances. As a result, no impact would occur related to local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The City of Fresno Planning Area is not located within the boundaries of any approved or draft Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other adopted local, regional or State HCP. Therefore, development within the Planning Area would not result in any impacts to an adopted HCP or NCCP.

The PG&E San Joaquin Valley Operation and Maintenance (O&M) Habitat Conservation Plan (HCP) was approved in 2007 and covers portions of nine counties, including Fresno

County and the City of Fresno. This HCP covers PG&E activities which occur as a result of ongoing O&M that would have an adverse impact on any of the 65 covered species and provides incidental take coverage from the USFWS and CDFW. The project site is not located within the covered area of any other HCP, Natural Community Conservation Plan, or other approved local, regional, or State HCP.

Therefore, the project would not conflict with the provisions of the PG&E HCP and the proposed project. The proposed project would have no impact to the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

MITIGATION MEASURES

Mitigation Measure BIO-1: If project construction activities occur during nesting season (between February 1 and August 31), a qualified biologist shall conduct pre-construction surveys for active migratory bird nests at the project site within 14 days of the onset of these activities.

Mitigation Measure BIO-2: Should any active nests be discovered in or near proposed construction zones, the biologist shall identify a suitable construction-free buffer around the nest. This buffer shall be identified on the ground with flagging or fencing, and shall be maintained until the biologist has determined that the young have fledged.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
V. CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?		X		
c) Disturb any human remains, including those interred outside of formal cemeteries?		X		

DISCUSSION

A Cultural Resources Survey[6] was prepared for the proposed project by LSA Associate/Senior Archaeologist Kerrie Collison, M.A., Registered Professional Archaeologist (RPA) No. 28731436. Ms. Collison has more than 10 years of experience as a professional archaeologist in California. She earned her B.S. in Social Sciences from California Polytechnic State University, San Luis Obispo, and her M.A. in Anthropology with an emphasis in Public Archaeology from California State University, Northridge. Ms. Collison meets the Secretary of the Interior's Professional Qualifications Standards in Archaeology. The Cultural Resources Survey included: (1) a records search at the California Historical Resources Information System (CHRIS) Southern San Joaquin Valley Information Center (SSJVIC) to identify prior cultural resource studies and previously recorded cultural resources in the project area and surrounding 0.5-mile area; (2) a search of the NAHC's Sacred Lands File; (3) additional background research including a review of aerial photographs and historic-period maps that include the project site; and (4) a pedestrian field survey of the project area to identify potential historical resources within the project area. The analysis in this Cultural Resources section is based on the results of the Cultural Resources Survey. The Cultural Resources Survey is included as Appendix D.

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

A historical resource defined by CEQA includes one or more of the following criteria: (1) the resource is listed, or found eligible for listing in, the California Register of Historical Resources; (2) listed in a local register of historical resources as defined by Public Resources Code (PRC) Section 5020.1(k); (3) identified as significant in a historical resources survey meeting the requirements of PRC Section 5024.1(g); or 4) determined to be a historical resource by the project's lead agency (PRC Section 21084.1; *State CEQA Guidelines* Section 15064.(a)). Under CEQA, historical resources include built-environment resources and archaeological sites.

As discussed in the Cultural Resources Survey, no historical resources were identified within or adjacent to the project site. Although no evidence of archeological deposits has been identified, there is a potential for unknown archaeological resources that qualify as a historical resource under CEQA to be discovered during construction. In addition, the City has determined that impacts to cultural resources could occur as a result of development within the City, and that unknown archaeological materials constituting historical resources have the potential to be present. Mitigation Measure CUL-1 requires that if unknown archaeological resources are discovered during construction, work in the area would halt, and a qualified historical resources specialist would be contacted and consulted regarding how to appropriately address the situation. This would minimize or eliminate any potential for a change to the significance of any discovered resources. Therefore, adherence to the requirements in Mitigation Measure CUL-1 would reduce

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[6] LSA. 2021. *Phase I Cultural Resources Survey for the 2740 West Nielsen Avenue Office/Warehouse Project in Fresno, Fresno County, California (LSA Project No. SNN2102)*. August 3.

potential impacts related to a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5 to less than significant with mitigation.

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

According to the *State CEQA Guidelines*, "When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource" (*State CEQA Guidelines* Section 15064.5(c)(1)). Those archaeological sites that do not qualify as historical resources shall be assessed to determine if these qualify as "unique archaeological resources" (California PRC Section 21083.2). No archaeological resources were identified in the project site. However, there is a potential for unknown archaeological resources to be discovered during construction. Mitigation Measure CUL-2 requires that if unknown archaeological resources are discovered during construction, work in the area would halt and a qualified archaeologist would be contacted and consulted regarding how to appropriately address the situation. This would minimize or eliminate any potential for an adverse change to the significance of any discovered archaeological resources. Therefore, adherence to the requirements in Mitigation Measure CUL-2 would reduce potential impacts to a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 to less than significant with mitigation.

c) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Disturbance of human remains interred outside of formal cemeteries would result in a significant impact. If human remains are identified during project construction, Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98 shall apply, as appropriate. Mitigation Measure CUL-3 requires adherence to Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98. With implementation of Mitigation Measure CUL-3, potential impacts related to the potential to disturb any human remains, including those interred outside of formal cemeteries would be less than significant with mitigation.

MITIGATION MEASURES

Mitigation Measure CUL-1: If previously unknown resources are encountered before or during grading activities, construction shall stop in the immediate vicinity of the find and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the *State CEQA Guidelines* and the City's Historic Preservation Ordinance. If the resources are determined to be unique historical resources as defined under Section 15064.5 of the *State CEQA Guidelines*, measures shall be identified by the monitor and recommended to the lead agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds.

No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

Mitigation Measure CUL-2: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for prehistoric archaeological resources shall be conducted. The following procedures shall be followed.

- If prehistoric resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that buried prehistoric archaeological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archaeologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with CEQA Guidelines Section 15064.5. If the resources are determined to be unique prehistoric archaeological resources as defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the lead agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any prehistoric archaeological artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

- If prehistoric resources are found during the field survey or literature review, the resources shall be inventoried using appropriate State record forms and submit the forms to the Southern San Joaquin Valley Information Center. The resources shall be evaluated for significance. If the resources are found to be significant, measures shall be identified by the qualified archaeologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include an archaeological monitor. The monitoring period shall be determined by the qualified archaeologist. If additional prehistoric archaeological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.

Mitigation Measure CUL-3: In the event that human remains are unearthed during excavation and grading activities of any future development project, all activity shall cease immediately. Pursuant to Health and Safety Code (HSC) Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98(a). If the remains are determined to be of Native American descent, the coroner shall within 24 hours notify the Native American Heritage Commission (NAHC). The NAHC shall then contact the most likely descendent of the deceased Native American, who shall then serve as the consultant on how to proceed with the remains. Pursuant to PRC Section 5097.98(b), upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
VI. ENERGY – Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	

DISCUSSION

a) Would the project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

The proposed project would increase the demand for electricity, natural gas, and gasoline. The discussion and analysis provided below is based on data included in the CalEEMod output, which is included in Appendix A.

Construction-Period Energy Use. The anticipated construction schedule assumes that the proposed project would be built over approximately 24 months. The proposed project would require grading, site preparation, and building activities during construction.

Construction of the proposed project would require energy for the manufacture and transportation of construction materials, preparation of the site for demolition and grading activities, and construction of the residences. Petroleum fuels (e.g., diesel and gasoline) would be the primary sources of energy for these activities. Construction activities are not anticipated to result in an inefficient use of energy as gasoline and diesel fuel would be supplied by construction contractors who would conserve the use of their supplies to minimize their costs on the project. Energy usage on the project site during construction would be temporary in nature and would be relatively small in comparison to the State's available energy sources. Therefore, the proposed project would result in a less-than-significant impact during project construction.

Operational Energy Use. Energy use consumed by the proposed project would be associated with natural gas use, electricity consumption, and fuel used for vehicle and truck trips associated with the project. Energy and natural gas consumption was estimated for the project using default energy intensities by land use type in CalEEMod. In addition, the proposed building would be constructed to 2019 Title 24 standards, which was included in CalEEMod inputs.

The 2019 Title 24 Building Energy Efficiency Standards ("Title 24 Standards") contain energy efficiency requirements for newly constructed buildings, additions to existing buildings, and alterations to existing buildings. The Title 24 Standards establish performance metrics in the form of an "energy budget" based on energy consumption per square foot of floor space. For this reason, the Title 24 Standards include both a prescriptive option, allowing builders to comply by using methods known to be efficient, and a performance option, allowing builders complete freedom in their designs provided the building achieves the same overall efficiency as an equivalent building using the prescriptive option. Reference appendices are adopted along with the Title 24 Standards containing data and various compliance tools to help builders achieve compliance.

Electricity and natural gas usage estimates associated with the proposed project are shown in Table 4.

Table 4: Estimated Annual Energy Use of Proposed Project

Land Use	Electricity Use (kWh per year)	Natural Gas Use (therms per year)	Fuel Consumption (gallons per year)
Warehouse	8,365,340	161,487	252,507
Parking Lot	83,160	0	0
Total	**8,448,500**	**161,487**	**252,507**

Source: LSA (September 2021).
kWh = kilowatt-hours

In addition, the proposed project would result in energy usage associated with gasoline to fuel project-related trips. Based on the CalEEMod analysis, the proposed project would result in approximately 5,605,645 vehicle miles traveled (VMT) per year. The average fuel economy for light-duty vehicles (autos, pickups, vans, and SUVs) in the United States has steadily increased from about 14.9 miles per gallon (mpg) in 1980 to 22.2 mpg in 2019.[7] Therefore, using the average fuel economy estimates for 2019, the proposed project would result in the consumption of approximately 252,507 gallons of fuel (gasoline and diesel) per year. Table 4, above, shows the estimated potential increased electricity and natural gas demand, and fuel consumption associated with the proposed project.

As shown in Table 4, the estimated potential increased electricity demand associated with the proposed project is 8,448,500 kilowatt-hours (kWh) per year. In 2019, California consumed approximately 279,401 gigawatt-hours (GWh) or 279,401,879,875 kWh.[8] Of this total, Fresno County consumed 7,387 GWh or 7,387,264,573 kWh.[9] Therefore, electricity demand associated with the proposed project would only be approximately 0.11percent of Fresno County's total electricity demand.

The estimated potential increased natural gas demand associated with the proposed project is 161,487 therms per year, as shown in Table 4. In 2019, California consumed approximately 13,158 million therms or 13,158,207,489 therms, while Fresno County consumed approximately 352 million therms or approximately 352,192,240 therms.[10] Therefore, natural gas demand associated with the proposed project would only be approximately 0.05 percent of Fresno County's total natural gas demand.

In addition, the proposed project would result in energy usage associated with gasoline and diesel to fuel project-related trips. As shown above in Table 4, vehicle trips associated with the proposed project would consume approximately 252,507 gallons of fuel per year. Based on fuel consumption obtained from EMFAC2021, approximately 157 million gallons of diesel and approximately 375 million gallons of gasoline will be consumed from vehicle trips in Fresno County in 2022. Therefore, gasoline and diesel fuel demand generated by vehicle trips associated with the proposed project would be a minimal fraction of gasoline and diesel fuel consumption in California.

In addition, proposed new development would be constructed using energy efficient modern building materials and construction practices, and the proposed project also would use new modern appliances and equipment, in accordance with the Appliance Efficiency Regulations (Title 20, CCR Sections 1601 through 1608). The expected energy

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[7] U.S. Department of Transportation (DOT). "Table 4-23: Average Fuel Efficiency of U.S. Light Duty Vehicles." Website: https://www.bts.dot.gov/bts/bts/content/average-fuel-efficiency-us-light-duty-vehicles (accessed June 2021).

[8] California Energy Commission (CEC). 2021. Energy Consumption Data Management Service. Electricity Consumption by County. Website: www.ecdms.energy.ca.gov/elecbycounty.aspx (accessed June 2021).

[9] Ibid.

[10] CEC. 2021. Energy Consumption Data Management Service. Gas Consumption by County. Website: www.ecdms.energy.ca.gov/gasbycounty.aspx (accessed June 2021).

consumption during construction and operation of the proposed project would be consistent with typical usage rates for industrial uses; however, energy consumption is largely a function of personal choice and the physical structure and layout of buildings.

PG&E is the private utility that would supply the proposed project's electricity and natural gas services. In 2020, a total of 31 percent of PG&E's delivered electricity came from renewable sources, including solar, wind, geothermal, small hydroelectric and various forms of bioenergy.[11] PG&E reached California's 2020 renewable energy goal in 2017, and is positioned to meet the State's 60 percent by 2030 renewable energy mandate set forth in Senate Bill (SB) 100. In addition, PG&E plans to continue to provide reliable service to their customers and upgrade their distribution systems as necessary to meet future demand.

Therefore, the proposed project would result in a less-than-significant impact during project operation.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

In 2002, the Legislature passed SB 1389, which required the California Energy Commission (CEC) to develop an integrated energy plan every two years for electricity, natural gas, and transportation fuels, for the California Energy Policy Report. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including assistance to public agencies and fleet operators in implementing incentive programs for zero emission (ZE) vehicles and their infrastructure needs, and encouragement of urban designs that reduce VMT and accommodate pedestrian and bicycle access.

The CEC approved the 2020 Integrated Energy Policy Report in March 2021.[12] The 2020 Integrated Energy Policy Report provides the results of the CEC's assessments of a variety of energy issues facing California. Many of these issues will require action if the State is to meet its climate, energy, air quality, and other environmental goals while maintaining energy reliability and controlling costs. The 2020 Integrated Energy Policy Report covers a broad range of topics, including implementation of SB 350, integrated resource planning, distributed energy resources, transportation electrification, solutions to increase resiliency in the electricity sector, energy efficiency, transportation electrification, barriers faced by disadvantaged communities, demand response, transmission and landscape-scale planning, the California Energy Demand Preliminary Forecast, the preliminary transportation energy demand forecast, renewable gas (in response to SB 1383), updates on California electricity reliability, natural gas outlook, and climate adaptation and resiliency.

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[11] PG&E, 2021. *Exploring Clean Energy Solutions*. https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_clean energy (accessed January 2022).

[12] CEC. 2020. *2020 Integrated Energy Policy Report*. Docket No. 20-IEPR-01.

As indicated above, the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation. Because California's energy conservation planning actions are conducted at a regional level, and because the proposed project's total impact to regional energy supplies would be minor, the proposed project would not conflict with California's energy conservation plans as described in the CEC's 2020 Integrated Energy Policy Report.

In addition, the proposed project would comply with the CALGreen Code (CCR Title 24, Part 11) and the California Energy Code (CCR Title 24, Part 6), which includes provisions related to insulation and design aimed at minimizing energy consumption. The California Energy Code includes solar photovoltaic system requirements for all newly constructed low-rise residential buildings; however, it currently does not include solar requirements for nonresidential buildings. The proposed project would also comply with objectives and policies included in the City's General Plan that are aimed at reducing energy consumption. In addition, as discussed in Section VIII, Greenhouse Gas Emissions, the proposed project would be consistent with the applicable strategies from the GHG Reduction Plan.

Thus, as shown above, the proposed project would be consistent with applicable State and local plans related to renewable energy and energy efficiency. Therefore, the project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency and impacts would be less than significant.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to energy, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. GEOLOGY AND SOILS – Would the project:				
a) Directly or Indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?			X	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		

DISCUSSION

a) **Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:**

   i. **Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.**

   Fault rupture is generally expected to occur along active fault traces that have exhibited signs of recent geological movement (i.e., 11,000 years). Alquist-Priolo Earthquake Fault Zones delineate areas around active faults with potential surface fault rupture hazards that would require specific geological investigations prior to approval of certain kinds of development within the delineated area. The project site is not located within an Alquist-Priolo Earthquake Fault Zone. In addition, no known active or potentially active faults or fault traces are located in the project vicinity. As a result, the proposed project would have no impact related to rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault would occur.

   ii. **Strong seismic ground shaking?**

   The City of Fresno is located in an area with historically low to moderate level of seismicity. However, strong ground shaking could occur within the project site during seismic events and occurrences have the possibility to result in significant impacts. Major seismic activity along the nearby Great Valley Fault Zone or the Nunez Fault, or other associated faults, could affect the project site through strong seismic ground shaking. Strong seismic ground shaking could potentially cause structural damage to the proposed project. However, due to the distance to the known faults, hazards due to ground shaking would be minimal. In addition, compliance with the California Building Code (Title 24 CCR) would ensure that geotechnical design of the proposed project would minimize or eliminate potential impacts related to strong seismic ground shaking. Therefore, the project would not directly or indirectly cause substantial adverse effects related to strong seismic ground shaking. As such, the proposed project would have a less-than-significant impact.

   iii. **Seismic-related ground failure, including liquefaction?**

   Soil liquefaction is a phenomenon primarily associated with saturated soil layers located close to the ground surface. During ground shaking, these soils lose strength and acquire “mobility” sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are clean, loose, uniformly graded, saturated, fine-grained sands that lie relatively close to the ground surface. However, loose sands that contain a significant amount of fines (silt and clay) may also liquefy. Based on the predicted seismic accelerations, and soil and groundwater conditions typically encountered in the region, general liquefaction potential is low in the City of Fresno. Additionally, compliance with the Fresno Municipal Code and the California Building Code would ensure potential impacts associated with seismic-related ground failure, including liquefaction, would not directly or indirectly cause substantial adverse effects. Therefore, the proposed project's impacts would be less than significant.

iv. Landslides?

A landslide generally occurs on relatively steep slopes and/or on slopes underlain by weak materials. The project site is located on a relatively flat area and is not located next to any hills. In general, the potential for land sliding or slope failure in Fresno is very low and the project site would not be susceptible to landslides. Therefore, the proposed project would not directly or indirectly cause substantial adverse effects by exposing people or structures to risk as a result of landslides. As such, the proposed project's impacts would be less than significant.

b) Would the project result in substantial soil erosion or the loss of topsoil?

The total project site is 48.03 acres, which would be disturbed/developed during proposed grading and construction activities. Grading and earthmoving during project construction has the potential to result in erosion and loss of topsoil. Exposed soils could be entrained in stormwater runoff and transported off the project sites. However, this impact would not be substantial because the project is required to comply with water quality control measures, which include preparation of a Stormwater Pollution Prevention Plan (SWPPP) (refer to Section X, Hydrology and Water Quality). Although designed primarily to protect stormwater quality, the SWPPP would incorporate Best Management Practices (BMPs) to minimize erosion. Additional details regarding the SWPPP are provided in Section X, Hydrology and Water Quality, of this Initial Study. Impacts related to substantial soil erosion or the loss of topsoil would be less than significant.

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

As described in discussion a) in this section, soils on the project site would not be subject to liquefaction, lateral spreading, or landslides. Additionally, the proposed project would be required to conform with the California Building Code, which would reduce risks related to unstable soils. Therefore, the proposed project would have a less-than-significant impact related to the potential to be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?

Expansive soils are characterized by the potential for shrinking and swelling as the moisture content of the soil decreases and increases, respectively. Shrink-swell potential is influenced by the amount and type of clay minerals present and can be measured by the percent change of the soil volume. Soil on the project site has mostly been paved over. A few areas of exposed soil occur on site; however, the soils have been disturbed through previous industrial and agricultural activity and are unlikely to exhibit native soil characteristics. Compliance with the California Building Code requires that geotechnical design of the proposed project minimize or eliminate potential impacts related to expansive soils. As such, the risk of expansive soil affecting the proposed project is low. Impacts to expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), would not create substantial direct or indirect risks to life or property. Therefore, the proposed project's potential impacts would be less than significant.

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

The project site is currently served by a wastewater conveyance system maintained by the City of Fresno. Wastewater from the City's collection system is treated at the City's wastewater treatment plant. Development of the proposed project would not involve the use of septic tanks or alternative wastewater disposal systems. Therefore, the proposed project would have no impact related to soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

No paleontological resources or unique geological features are known to exist within or near the project site, and the proposed project is not expected to alter or destroy a paleontological resource, site, or unique geologic feature. Furthermore, the proposed project would not require excavation to depths that have not already been disturbed by previous construction. However, should unknown paleontological resource or unique geologic feature be discovered within the project site, Mitigation Measure GEO-1 would be required. Therefore, adherence to the requirements in Mitigation Measure GEO-1 would reduce potential impacts to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature to less than significant with mitigation.

MITIGATION MEASURES

Mitigation Measure GEO-1: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for unique paleontological/geological resources shall be conducted. The following procedures shall be followed:

- If unique paleontological/geological resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that unique paleontological/geological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified paleontologist shall be consulted to determine whether the resource requires further study. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to, excavation of the finds and evaluation of the finds. If the resources are determined to be significant, mitigation measures shall be identified by the monitor and recommended to the lead agency. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any paleontological/geological resources recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.

- If unique paleontological/geological resources are found during the field survey or literature review, the resources shall be inventoried and evaluated for significance. If the resources are found to be significant, mitigation measures shall be identified by the qualified paleontologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include a paleontological monitor. The monitoring period shall be determined by the qualified paleontologist. If additional paleontological/geological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. GREENHOUSE GAS EMISSIONS – Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			X	

DISCUSSION

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

Greenhouse gas emissions (GHGs) are present in the atmosphere naturally, and are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. However, over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global climate change. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons
- Perfluorocarbons
- Sulfur Hexafluoride

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and the length of time that the gas remains in the atmosphere ("atmospheric lifetime").

The GWP of each gas is measured relative to CO_2, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e).

The *State CEQA Guidelines* indicate that a project would normally have a significant adverse green-house gas emission impact if the project would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reduction the emissions of greenhouse gases.

Section 15064.4 of the *State CEQA Guidelines* states that: "A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project." In performing that analysis, the lead agency has discretion to determine whether to use a model or methodology to quantify GHG emissions, or to rely on a qualitative analysis or performance-based standards. In making a determination as to the significance of potential impacts, the lead agency then considers the extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting, whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project, and the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Therefore, consistent with the *State CEQA Guidelines*, Section 15183.5, if a project is consistent with an adopted qualified Greenhouse Gas Reduction Strategy that meets the standards, it can be presumed that the project would not have significant GHG emission impacts.

The City of Fresno's GHG Reduction Plan was adopted in December 2014 to reduce local community GHG emissions to 1990 levels by the year 2020, consistent with the State objectives set forth in AB 32. The City's 2014 GHG Reduction Plan meets the requirements for a Qualified Greenhouse Gas Reduction Strategy and is designed to streamline environmental review of future development projects in the City, consistent with *State CEQA Guidelines* Section 15183.5.

The City of Fresno updated its 2014 GHG Reduction Plan in the year 2021 to conform with existing applicable State climate change policies and regulations to reduce local community GHG emissions to 40 percent below 1990 levels by the year 2030, consistent with the State objectives set by SB 32. The GHG Plan Update outlines strategies that the City will undertake to achieve its proportional share of GHG emission reductions. The GHG Reduction Plan Update includes a Consistency Checklist to help the City provide a streamlined review process for new development projects that are subject to discretionary review pursuant to CEQA. This analysis evaluates the proposed project's consistency with the City's GHG Reduction Plan Update.

The GHG Reduction Plan Update requires an analysis of GHG emissions to ensure that the change in land use designation would not result in a significant increase in GHG emissions compared to the existing land use designation. The proposed project would not require a change the General Plan land use designation or the current zoning and would be consistent with the City's General Plan and Zoning Ordinance. Therefore, an analysis of the proposed project's estimated GHG emissions compared to maximum buildout of the existing designation would not be required.

As stated above, the GHG Reduction Plan Update includes a Consistency Checklist to help the City provide a streamlined review process for new development projects that are subject to discretionary review pursuant to CEQA. The project's Consistency Checklist is included in Appendix E. As shown in the Consistency Checklist, the proposed project would be consistent with the applicable strategies from the GHG Reduction Plan Update. Therefore, the proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant effect on the environment and impacts would be less than significant.

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The SJVAPCD has adopted a Climate Change Action Plan (CCAP), which includes suggested best performance standards (BPS) for proposed development projects. However, the SJVAPCD's CCAP was adopted in 2009 and was prepared based on the State's 2020 GHG targets, which are now superseded by State policies (i.e., the 2019 California Green Building Code) and the 2030 GHG targets, established in SB 32. As discussed above, the proposed project is consistent with the City's GHG Reduction Plan Update. In addition, the proposed project was analyzed for consistency with the goals of AB 32 and the AB 32 Scoping Plan. The following discussion evaluates the proposed project according to the goals of AB 32, the AB 32 Scoping Plan, Executive Order (EO) B-30-15, SB 32, and AB 197.

AB 32 is aimed at reducing GHG emissions to 1990 levels by 2020. AB 32 requires the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The AB 32 Scoping Plan has a range of GHG reduction actions, which includes direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 implementation fee to fund the program.

EO B-30-15 added the immediate target of reducing GHG emissions to 40 percent below 1990 levels by 2030. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan, to reflect the 2030 target set by EO B-30-15 and codified by SB 32. SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in EO B-30-15. SB 32 builds on AB 32 and keeps the State on the path toward achieving the 2050 objective of reducing emissions to 80 percent below 1990 levels. The companion bill to SB 32, AB 197, provides additional direction to the CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 intended to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

As identified above, the AB 32 Scoping Plan contains GHG reduction measures that work towards reducing GHG emissions, consistent with the targets set by AB 32, EO B-30-15 and codified by SB 32 and AB 197. The measures applicable to the proposed project include energy efficiency measures, water conservation and efficiency measures, and transportation and motor vehicle measures, as discussed below.

Energy efficient measures are intended to maximize energy efficiency building and appliance standards, pursue additional efficiency efforts including new technologies and new policy and implementation mechanisms, and pursue comparable investment in energy efficiency from all retail providers of electricity in California. In addition, these measures are designed to expand the use of green building practices to reduce the carbon footprint of California’s new and existing inventory of buildings. The proposed project would be required to comply with the latest Title 24 standards of the CCR, established by the CEC, regarding energy conservation and green building standards. Therefore, the proposed project would comply with applicable energy measures.

Water conservation and efficiency measures are intended to continue efficiency programs and use cleaner energy sources to move and treat water. Increasing the efficiency of water transport and reducing water use would reduce GHG emissions. As noted above, the proposed project would be required to comply with the latest Title 24 standards of the CCR, which includes a variety of different measures, including reduction of wastewater and water use. In addition, the proposed project would be designed to include drought tolerant landscaping. Therefore, the proposed project would not conflict with any of the water conservation and efficiency measures.

The goal of transportation and motor vehicle measures is to develop regional GHG emissions reduction targets for passenger vehicles. The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. Vehicles traveling to the project site would comply with the Pavley II (LEV III) Advanced Clean Cars Program. Therefore, the proposed project would not conflict with the identified transportation and motor vehicle measures.

As such, the proposed project would comply with existing State regulations adopted to achieve the overall GHG emissions reduction goals identified in AB 32 and would be consistent with applicable plans and programs designed to reduce GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs and impacts would be less than significant.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to greenhouse gas emissions, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. HAZARDS AND HAZARDOUS MATERIAL – Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?			X	

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?			X	
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

DISCUSSION

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Applicable laws and regulations ensure that transport, use, and disposal of hazardous materials do not create a significant hazard to the public or the environment. Therefore, a proposed project's routine transport, use, or disposal of hazardous materials is potentially significant if unusual circumstances are present, such as an unusually high frequency of use, use of an unusually large amount of hazardous substances, or use of particularly hazardous materials. Construction activities associated with the proposed project would involve the use of limited amounts of potentially hazardous materials, including but not limited to, solvents, paints, fuels, oils, and transmission fluids. However, all materials used during construction would be contained, stored, and handled in compliance with applicable standards and regulations established by the Department of Toxic Substances Control (DTSC), the USEPA, and the Occupational Safety and Health Administration (OSHA). No uses utilizing large amounts of hazardous materials are anticipated to occur within the project site. Project operation would involve the use of small quantities of commercially-available hazardous materials (e.g., paint, cleaning supplies) that could be potentially hazardous if handled improperly or ingested. However, these products are not considered acutely hazardous and are not generally considered unsafe. All storage, handling, and disposal of hazardous materials during project construction and operation would comply with applicable standards and regulations. The proposed commercial uses would not generate significant amounts of any hazardous materials. The proposed project would comply with all applicable laws and regulations related to the transport, use, or disposal of hazardous materials and no unusual circumstances are present. Therefore, the proposed project would have a less-than-significant impact to the public or the environment through the routine transport, use, or disposal of hazardous materials, and no mitigation is required.

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

See discussion a) above. The proposed project would not result in a significant impact to the public or the environment through a reasonably foreseeable upset or accident condition related to the release of hazardous materials. This impact would be considered less than significant. No mitigation is required.

c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

The closest existing school is Addams Elementary School, located approximately 1.2 miles from the project site. As previously stated, no unusual circumstances are present. The proposed project would not result in the use or emission of substantial quantities of hazardous materials that would pose a human or environmental health risk. In addition, all materials would be handled, stored, and disposed of in accordance with applicable standards and regulations. Therefore, because the proposed project does not involve activities that would result in the emission of hazardous materials or acutely hazardous substances, implementation of the proposed project would result in a less-than-significant impact related to the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

According to the DTSC EnviroStor database,[13] the project site is not located on a federal superfund site, State response site, voluntary cleanup site, school cleanup site, evaluation site, school investigation site, military evaluation site, tiered permit site, or corrective action site. The project site is not included on the list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.[14] As a result, no impacts related to hazardous materials sites pursuant to Government Code Section 65962.5 would occur, and no mitigation is required.

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

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[13] California Department of Toxic Substances Control (DTSC). 2007. EnviroStor. Website: https://www.envirostor.dtsc.ca.gov/public/map/?myaddress=fresno (accessed June 2021).

[14] California Environmental Protection Agency (CalEPA). 2018. Government Code Section 65962.5(a) Hazardous Waste and Substances Site List. Website: https://calepa.ca.gov/sitecleanup/corteselist/section-65962-5a/ (accessed June 2021).

The nearest airports include the Fresno Chandler Executive Airport, located approximately 0.8 mile from the project site, the Sierra Sky Airport, located approximately 6.7 miles from the project site, and the Fresno International Airport, located approximately 7.1 miles from the project site.

Portions of the project site are located in the Traffic Pattern Zone (TPZ) and Outer Approach/Departure Zone (OADZ) for the Fresno Chandler Executive Airport. OADZs have a moderate risk level because approximately 5 percent of crashes occur in this area, while TPZs have a low risk level. Based on this risk level, the Fresno County Airport Land Use Compatibility Plan[15] (ALUCP) proposes certain criteria for projects within TPZs and OADZs.

For TPZs, the ALUCP proposes a maximum non-residential intensity of 300 persons per acre, with 10 percent required open land. Hazards to flight, outdoor stadiums, and similar high intensity uses are prohibited. Airport disclosures are required, as well as project review for objects taller than 100 feet. In addition, new structures cannot penetrate 14 C.F.R. Part 77 surfaces.

OADZs, in turn, have a maximum density of 150 persons per acre and an open land requirement of 20 percent. Certain uses, including hazardous uses (e.g., aboveground bulk fuel storage or gas stations) and hazards to flight are prohibited. Airport disclosure notices are required, as is airspace review for objects over 70 feet in height.

Although the project site is within 2 miles of the Chandler Executive Airport, operations at the local airports are not expected to pose a safety hazard for people working at or visiting the project site nor does any aspect of the project conflict with the requirements in the ALUCP for TPZs and OADZs. The project contemplates densities below those required in TPZs and OADZs and the project would include over 20 percent open land. In addition, the proposed project would not include any structures higher than 70 feet, hazardous uses, hazards to flight, or other land uses prohibited in TPZs or OADZs. In addition, the proposed project would not include any structures that would penetrate 14 C.F.R. Part 77 surfaces.

Therefore, the proposed project would result in a less-than-significant impact related to a safety hazard for people residing or working in the project area.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

The proposed project would not result in any alterations of existing roadways. Therefore, the proposed project would not interfere with the implementation of or physically interfere with any adopted emergency response plans or emergency evacuation plan, and this impact would be less than significant.

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[15] Fresno County Airport Land Use Commission, Fresno County Airport Land Use Compatibility Plan (2018), Website: https://www.fresnocog.org/wp-content/uploads/2019/01/fresno-draft-ALUCP-12-04-17c.pdf, and https://2ave3l244ex63mgdyc1u2mfp-wpengine.netdna-ssl.com/wp-content/uploads/2019/01/fresno-final-alucp-113018-r_part2.pdf.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Wildland fires occur in geographic areas that contain the types and conditions of vegetation, topography, weather, and structure density susceptible to risks associated with uncontrolled fires that can be started by lightning, improperly managed campfires, cigarettes, sparks from automobiles, and other ignition sources. According to the California Department of Forestry and Fire Protection (CAL FIRE) Very High Fire Hazard Severity Zone (VHFHSZ) Map for Fresno County, the project site is not located within a High or Very High Fire Hazard Severity Zone.[16] Therefore, the proposed project would not expose people or structures to a significant loss, injury, or death involving wildland fires, and impacts would be less than significant.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to hazards and hazardous materials, and no mitigation is required.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
X. HYDROLOGY AND WATER QUALITY – Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?			X	
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:				

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[16] CAL FIRE. 2007. *Fresno County Very High Fire Hazard Severity Zones in LRA.* October 2. Website: https://osfm.fire.ca.gov/media/6673/fhszl06_1_map10.pdf (accessed June 2021).

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
i) Result in a substantial erosion or siltation on- or off-site;			X	
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site:			X	
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or			X	
iv) impede or redirect flood flows?				X
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?			X	
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?			X	

DISCUSSION

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

The State Water Resources Control Board and nine Regional Water Quality Control Boards regulate the water quality of surface water and groundwater bodies throughout California. The proposed project is within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB).

Construction. Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed to wind and water erosion, which could result in temporary increases in sediment load in nearby water bodies, including the Houghton Canal, located approximately 140 feet to the west.

Because the project would disturb greater than 1 acre of soil, it is required to comply with the State Water Resources Control Board's National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ, as amended by 2010-0014-DWG and 2012-0006-DWQ, NPDES No. CAS000002) (Construction General Permit). The project is also subject to Article 7, Urban Storm Water Quality Management and Discharge Control, Section 6-714, Requirement to Prevent, Control, and Reduce Storm Water Pollutants of the City's Municipal Code.

The Construction General Permit requires the preparation of a Storm Water Pollution Prevention Plan (SWPPP) and implement Construction Best Management Practices (BMPs). Construction BMPs would include, but not be limited to, erosion and sediment control, designed to minimize erosion and retain sediment on site, and good housekeeping practices to prevent spills, leaks, and discharge of construction debris and waste into receiving waters. Section 6-714 of the City's Municipal Code also requires the implementation of BMPs to the maximum extent technologically and economically feasible to prevent and reduce pollutants from entering stormwater during construction. Therefore, adherence to the required SWPPP and the City's Municipal Code and implementation of construction BMPs, would reduce the potential for the discharge of pollutants into Houghton Canal during construction and impacts associated with the violation of water quality standards or waste discharge requirements would be less than significant.

During construction, it is likely that dewatering would be required. If groundwater is encountered during construction, the project would be required to obtain coverage under the California Regional Water Quality Control Board Central Valley Region National Pollution Discharge Elimination System Waste Discharge Requirements Limited Threat Discharges to Surface Water (Order R5-2022-0006, NPDES No. CAG995002). With adherence to the Waste Discharge Requirements pertaining to Limited Threat Discharges to Surface Water, project construction would not violate groundwater quality standards or waste discharge requirements and impacts would be less than significant.

Operation. Operation of the proposed project could result in surface water pollution associated with chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and waste that may be spilled or leaked and have the potential to be transported via runoff during periods of heavy precipitation into these water bodies.

The City of Fresno operates under the California Regional Water Quality Control Board Central Valley Regional National Pollutant Discharge Elimination System Permit and Waste Discharge Requirements General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4) (Order No. R5-2016-0040-014, NPDES No. CAS0085324). Consistent with the City of Fresno's MS4 Permit, the project would implement storm water quality controls recommended in the Fresno-Clovis Storm Water Quality Management Construction and Post-Construction Guidelines. If applicable, the project would also be subject to the Statewide General Permit for Stormwater Discharges Associated with Industrial Activities (Order 2014-0057-DWQ as amended in 2015 and 2018) (Industrial General Permit) and would be required to develop and implement a storm water pollution prevention plan, eliminate non-stormwater discharges, conduct routine site inspections, train employees in permit compliance, sample storm water runoff and test if for pollutant indicators, and submit an annual report to the State Water Resources Control Board.

Adherence to the City of Fresno's MS4 Permit, including implementation of the Stormwater Management Post-Construction Guidelines, as specified in the Industrial General Permit, would reduce the potential for the discharge of pollutants during project operations and impacts associated with the violation of water quality standards or waste discharge requirements would be less than significant.

Infiltration of stormwater could have the potential to affect groundwater quality. The majority of the project site would be impervious surface; and therefore, it is not expected that stormwater would infiltrate during project operations. Because stormwater would be collected and diverted to the storm drain system, there is not a direct path for pollutants to reach groundwater. Therefore, project operations would not violate groundwater quality standards or waste discharge requirements and impacts would be less than significant.

Conclusion. The proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality. Therefore, the project's impacts would be less than significant.

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

The City of Fresno overlies the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin. Temporary dewatering from excavations could be necessary during construction. Construction-related dewatering would be temporary and limited to the area of excavations on the project site and would not substantially contribute to depletion of groundwater supplies. Operation of the project would not require groundwater extraction. Following project implementation, there would be a minor increase in impervious surface area. An increase in impervious surface area decreases infiltration, which can decrease the amount of water that is able to recharge the aquifer/groundwater. However, the small increase in impervious area would not substantially decrease any infiltration that currently may occur on the site. Therefore, the project would not impede the Central Valley Regional Water Quality Control Board's ability to manage groundwater. Thus, this project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the project would impede sustainable management of the Kings Subbasin. Impacts would be less than significant, and no mitigation is required.

Additionally, as discussed below in Section XIX, Utilities and Service Systems, the City receives its water supply from groundwater and surface water. The City has indicated that groundwater wells, pump stations, recharge facilities, water treatment and distribution systems shall be expanded incrementally to mitigate increased water demands. One of the primary objectives of Fresno's future water supply plans detailed in the City's current Urban Water Management Plan (UWMP) is to balance groundwater operations through a host of strategies. Through careful planning, Fresno has designed a comprehensive plan to accomplish this objective by increasing surface water supplies and surface water treatment facilities, intentional recharge, and conservation, thereby reducing groundwater pumping. The City continually monitors impacts of land use changes and development project proposals on water supply facilities by assigning fixed demand allocations to each parcel by land use as currently zoned or proposed to be rezoned.

The City relies on groundwater and surface water supplies to meet water demands. In 2006, Fresno updated its Metropolitan Water Resources Management Plan designed to ensure the Fresno metro area has a reliable water supply through 2050. The plan implements a conjunctive use program, combining groundwater, treated surface water, artificial recharge, and an enhanced water conservation program.

The General Plan policies require the City to maintain a comprehensive conservation program to help reduce per capita water usage, and includes conservation programs such as landscaping standards for drought tolerance, irrigation control devices, leak detection and retrofits, water audits, public education and implementing U.S. Bureau of Reclamation Best Management Practices for water conservation to maintain surface water entitlements.

Implementation of the Fresno General Plan policies, the Kings Basin Integrated Regional Water Management Plan, the City of Fresno UWMP, the Fresno-Area Regional Groundwater Management Plan, and the City of Fresno Metropolitan Water Resource Management Plan would address the issues of providing an adequate, reliable, and sustainable water supply for the proposed project.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or through the addition of impervious surfaces, in a manner which would:

i. Result in substantial erosion or siltation on- or off-site?

During construction, excavated soil would be exposed and disturbed, drainage patterns would be temporarily altered, and there would be an increased potential for soil erosion and sedimentation compared to existing conditions. Additionally, during a storm event, soil erosion and siltation could occur at an accelerated rate. As discussed previously, the Construction General Permit requires preparation of a SWPPP to identify construction BMPs to be implemented as part of the project to reduce impacts to water quality during construction, including those impacts associated with soil erosion and siltation. With compliance with the requirements in the Construction General Permit and implementation of the construction BMPs, and with compliance with the City’s Municipal Code, construction impacts related to on- or off-site erosion or siltation would be less than significant.

The project would increase the amount of impervious surface, which would increase the volume of runoff during a storm, and which can more effectively transport sediments to receiving waters. At project completion, much of the project site would be impervious surface area and not prone to onsite erosion or siltation because no exposed soil would be present in these areas. The remaining portion of the site would consist of pervious surface area, which would contain landscaping that would minimize onsite erosion and siltation by stabilizing the soil. Additionally, the project applicant would be required to establish and maintain existing drainage patterns. Therefore, the proposed project would not alter the existing drainage pattern of the site or increase the rate or amount of surface runoff in a manner that would result in an impact related to substantial erosion or siltation on- or off-site.

Compliance with existing regulatory requirements would reduce or eliminate the proposed project's potential to substantially alter the existing drainage pattern of the site.

ii. Substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

During construction, soil would be disturbed and compacted, and drainage patterns would be temporarily altered, which can increase the volume and velocity of stormwater runoff and increase the potential for localized flooding compared to existing conditions. As discussed above, the Construction General Permit requires the preparation of a SWPPP and implementation of construction BMPs to control and direct surface runoff onsite. With adherence to the Construction General Permit, construction impacts related to altering the existing drainage pattern of the site or area or increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite would be less than significant.

While the project would permanently increase the impervious surface area, the project would maintain the overall on-site drainage patterns and continue to direct surface water to catch basins that flow into the existing storm drains. Prior to the issuance of building permits, the applicant would be required to provide a stormwater improvement plan to the City to ensure that the stormwater system would be capable of handling a 25-year storm and that the drainage facilities conform to City requirements. Additionally, the applicant would be required to pay for all necessary improvement costs if the City determines that the City's storm drain system or storm drain pumping capacity requires expansion or modification as a result of the project. Therefore, the project would not alter the existing drainage pattern of the site or area or increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site and impacts would be considered less than significant.

iii. Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Construction. The proposed project would result in an increase in impervious surfaces given that the project site would be mostly built out aside from planting areas located in the parking lot and the perimeter of the project site. However, compliance with pre-existing regulatory requirements, including compliance with the Construction General Permit and implementation of a SWPPP, would reduce or eliminate the potential for project construction to cause substantial additional polluted runoff or runoff in excess of existing or planned stormwater drainage systems. Therefore, construction would not result in additional sources of polluted runoff to be discharged to the storm drain system and impacts would be less than significant.

Operations. As discussed above, the proposed project would result in a minimal increase in impervious surfaces and therefore would not substantially increase runoff from the site. However, compliance with existing regulatory requirements, including compliance with the WPCP and compliance with the MS4, as specified in the Industrial General Permit, would reduce or eliminate the potential for project operations to cause substantial additional polluted runoff or runoff in excess of existing or planned stormwater drainage systems. Therefore, project operations would not result in additional sources of polluted runoff to be discharged to the storm drain system and impacts would be less than significant.

iv. Impede or redirect flood flows?

The proposed project is not located within the 100-year flood hazard area as mapped by the Federal Emergency Management Agency (FEMA).[17] Therefore, the proposed project would not impede or redirect potential flood flows, and the proposed project would have no impact.

d) In flood hazard, tsunami, or seiche zones, would the project risk release of pollutants due to project inundation?

The project site is not located in flood hazard, tsunami, or seiche zones. Refer to discussion a) in Section IX, Hazards and Hazardous Materials regarding the use of hazardous materials within the project site. As a result, a less-than-significant impact would occur related to the release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The City is located within the Kings Subbasin, which is part of the larger San Joaquin Valley Groundwater Basin. The planning documents regarding water resources for the City include the City of Fresno UWMP and the City of Fresno Metropolitan Water Resources Management Plan. As noted above, the proposed project would be required

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[17] Federal Emergency Management Agency, 2020. FEMA Flood Map Service Center: Search By Address. Available online at: https://msc.fema.gov/portal/search?AddressQuery#searchresultsanchor (accessed October 2021)

to adhere to NPDES drainage control requirements during construction and operation as well as to FMFCD drainage control requirements. As a result, the proposed project would not include any other waste discharges that could conflict with the Basin Plan. Therefore, the proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan and impacts would be less than significant.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to hydrology and water quality, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. LAND USE AND PLANNING – Would the project:				
a) Physically divide an established community?				X
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				X

DISCUSSION

a) Would the project physically divide an established community?

The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a means of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas. For instance, the construction of an interstate highway through an existing community may constrain travel from one side of the community to another; similarly, such construction may also impair travel to areas outside of the community.

The project site consists of a former industrial warehouse site that has previously been demolished. Nearby parcels consist mostly of low residential, light and heavy industrial, cemetery, and vacant, undeveloped uses. The proposed project would include four office/warehouse buildings that would be configured for heavy industrial uses. These improvements would not affect connectivity, and would not divide an established community. Therefore, the proposed project would have no impact related to physically dividing an established community.

b) Would the project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The project site is designated Heavy Industrial in the General Plan. This land use is intended to accommodate the broadest range of industrial uses including manufacturing, assembly, wholesaling, distribution, and storage activities that are essential to the development of a balanced economic base. Small-scale commercial services and ancillary office uses are also permitted. The maximum floor area ratio (FAR) is 1.5.

The project site is located in a Heavy Industrial (IH) zoning district which allows for manufacturing, assembly, wholesaling, distribution, and storage activities that are essential to the development of a balanced economic base. Small-scale commercial services and ancillary office uses are also permitted. The Heavy Industrial (IH) zoning districts are accommodate the broadest range of industrial uses on sites identified in the General Plan.

The project would not require a change the General Plan land use designation or the current zoning and would be consistent with the City's General Plan and Zoning Ordinance. Additionally, the project would not cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect and therefore would result in no impact.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to land use and planning, and no mitigation is required.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XII. MINERAL RESOURCES – Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

DISCUSSION

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The project site is located within an urban area on a previously developed site. There are no known mineral resources within or in the vicinity of the project site. The principal area for mineral resources in the City is along the San Joaquin River Corridor. The City's Resource Conservation and Resilience Element of the City's General Plan includes several policies to conserve aggregate mineral resources. However, the project is located approximately 8 miles from the San Joaquin River Corridor. As a result, the proposed project would not result in the loss of availability of a known mineral resource of value to the region or residents of the State and the proposed project would have no impact.

b) Would the project result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Please refer to discussion a) above. The proposed project would not result in the loss of availability of any known locally-important mineral resource recovery sites. Therefore, the proposed project would have no impact.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to mineral resources, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII. NOISE – Would the project result in:				

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Generation of excessive groundborne vibration or groundborne noise levels?			X	
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X	

DISCUSSION

a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?

Noise is usually defined as unwanted sound. Noise consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. Several noise measurement scales exist that are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative intensity of a sound. Sound levels in dB are calculated on a logarithmic basis. An increase of 10 dB represents a 10-fold increase in acoustic energy, while 20 dB is 100 times more intense and 30 dB is 1,000 times more intense. Each 10 dB increase in sound level is perceived as approximately a doubling of loudness; and similarly, each 10 dB decrease in sound level is perceived as half as loud. Sound intensity is normally measured through the A-weighted sound level (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. The A-weighted sound level is the basis for 24-hour sound measurements that better represent human sensitivity to sound at night.

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern.

There are many ways to rate noise for various time periods, but an appropriate rating of ambient noise affecting humans also accounts for the annoying effects of sound. Equivalent continuous sound level (L_{eq}) is the total sound energy of time-varying noise over a sample period. However, the predominant rating scales for human communities in the State of California are the L_{eq}, the community noise equivalent level (CNEL), and the day-night average level (L_{dn}) based on dBA. CNEL is the time varying noise over a 24-hour period, with a 5 dBA weighting factor applied to the hourly L_{eq} for noises occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and 10 dBA weighting factor applied to noise occurring from 10:00 p.m. to 7:00 a.m. (defined as sleeping hours). L_{dn} is similar to the CNEL scale, but without the adjustment for events occurring during the evening relaxation hours. CNEL and L_{dn} are within one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

A project would have a significant noise effect if it would substantially increase the ambient noise levels for adjoining areas or conflict with adopted environmental plans and goals of applicable regulatory agencies, including, as appropriate, the City of Fresno.

The City of Fresno addresses noise in the Noise Element of the General Plan and in Chapter 10, Article 1 (Noise Regulations), of the Fresno Municipal Code. Listed below are objectives and policies related to noise that are presented in the Noise Element of the General Plan. In addition, the Noise Element sets noise standards for transportation and stationary noise sources as shown in Table 5 and Table 6, below.

Table 5: Transportation (Non-Aircraft) Noise Sources

Noise-Sensitive Land Use[1]	Outdoor Activity Areas[2]	Interior Spaces	
	L_{dn}/CNEL, dB	L_{dn}/CNEL, dB	L_{eq} dB[2]
Residential	65	45	-
Transient Lodging	65	45	-
Hospitals, Nursing Homes	65	45	-
Theaters, Auditoriums, Music Halls	-	-	35
Churches, Meeting Halls	65	-	45
Office Buildings	-	-	45
Schools, Libraries, Museums	-	-	45

Source: City of Fresno General Plan (2014).

[1] Where the location of outdoor activity areas is unknown or is not applicable, the exterior noise level standard shall be applied to the property line of the receiving land use.

[2] As determined for a typical worst-case hour during periods of use.

CNEL = community noise equivalent level

L_{dn} = day-night average noise level

dB = decibel(s)

L_{eq} = equivalent continuous sound level

Table 6: Stationary Noise Sources

	Daytime (7:00 a.m. to 10:00 p.m.)	Nighttime (10:00 p.m. to 7:00 a.m.)
Hourly Equivalent Sound Level (L_{eq}), dBA	50	45
Maximum Sound Level (L_{max}), dBA	70	60

Source: City of Fresno General Plan (2014).

[1] The Planning and Development Director, on a case-by-case basis, may designate land uses other than those shown in this table to be noise-sensitive, and may require appropriate noise mitigation measures.

[2] As determined at outdoor activity areas. Where the location of outdoor activity areas is unknown or not applicable, the noise exposure standard shall be applied at the property line of the receiving land use. When ambient noise levels exceed or equal the levels in this table, mitigation shall only be required to limit noise to the ambient plus five dB.

dB = decibel(s)

L_{eq} = equivalent continuous sound level

dBA = A-weighted decibel(s)

L_{max} = maximum A-weighted sound level

L_{dn} = day-night average noise level

- **Policy NS-1-a: Desirable and Generally Acceptable Exterior Noise Environment.** Establish 65 dBA L_{dn} or CNEL as the standard for the desirable maximum average exterior noise levels for defined usable exterior areas of residential and noise-sensitive uses for noise, but designate 60 dBA L_{dn} or CNEL (measured at the property line) for noise generated by stationary sources impinging upon residential and noise-sensitive uses. Maintain 65 dBA L_{dn} or CNEL as the maximum average exterior noise levels for non-sensitive commercial land uses, and maintain 70 dBA L_{dn} or CNEL as maximum average exterior noise level for industrial land uses, both to be measured at the property line of parcels where noise is generated which may impinge on neighboring properties.

- **Policy NS-1-c: Generally Unacceptable Exterior Noise Exposure Range.** Establish the exterior noise exposure of greater than 65 dB L_{dn} or CNEL to be generally unacceptable for residential and other noise sensitive uses for noise generated by sources in Policy NS-1-a, and study alternative less noise-sensitive uses for these areas if otherwise appropriate. Require appropriate noise reducing mitigation measures as determined by a site specific acoustical analysis to comply with the generally desirable or generally acceptable exterior noise level and the required 45 dB interior noise level standards set in Table 5 as conditions of permit approval.

- **Policy NS-1-g:** Noise mitigation measures which help achieve the noise level targets of this plan include, but are not limited to, the following:
  - Façades with substantial weight and insulation;
  - Installation of sound-rated windows for primary sleeping and activity areas;
  - Installation of sound-rated doors for all exterior entries at primary sleeping and activity areas;
  - Greater building setbacks and exterior barriers;
  - Acoustic baffling of vents for chimneys, attic and gable ends;
  - Installation of mechanical ventilation systems that provide fresh air under closed window conditions.

- **NS-1-i Mitigation by New Development.** Require an acoustical analysis where new development of industrial, commercial or other noise generating land uses (including transportation facilities such as roadways, railroads, and airports) may result in noise levels that exceed the noise level exposure criteria established by Tables 5 and 6 to determine impacts, and require developers to mitigate these impacts in conformance with Tables 5 and 6 as a condition of permit approval through appropriate means.

  Noise mitigation measures may include:

  - The screening of noise sources such as parking and loading facilities, outdoor activities, and mechanical equipment;
  - Providing increased setbacks for noise sources from adjacent dwellings;
  - Installation of walls and landscaping that serve as noise buffers;
  - Installation of soundproofing materials and double-glazed windows; and
  - Regulating operations, such as hours of operation, including deliveries and trash pickup.

  Alternative acoustical designs that achieve the prescribed noise level reduction may be approved by the City, provided a qualified Acoustical Consultant submits information demonstrating that the alternative designs will achieve and maintain the specific targets for outdoor activity areas and interior spaces. As a last resort, developers may propose to construct noise walls along roadways when compatible with aesthetic concerns and neighborhood character. This would be a developer responsibility, with no City funding.

- **Policy NS-1-j: Significance Threshold.** Establish, as a threshold of significance for the City's environmental review process, that a significant increase in ambient noise levels is assumed if the project would increase noise levels in the immediate vicinity by 3 dB Ldn or CNEL or more above the ambient noise limits established in this General Plan Update.

Chapter 10, Article 1 (Noise Regulations), of the Fresno Municipal Code establishes excessive noise guidelines and exemptions. Section 10-109 states that construction noise is exempted from City noise regulations provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.

Certain land uses are considered more sensitive to noise than others. Examples of these land uses include residential areas, educational facilities, hospitals, childcare facilities, and senior housing. Adjacent parcels consist mostly of residential, light and heavy industrial, cemetery, and vacant, undeveloped uses. The closest sensitive receptors to the proposed project include the single-family residences located approximately 110 feet south of the project site across West Nielsen Avenue.

The following section describes how the short-term construction and long-term operational noise impacts of the proposed project would be less than significant with mitigation.

Short-Term (Construction) Noise Impacts. Project construction would result in short-term noise impacts on the nearby sensitive receptors. Maximum construction noise would be short-term, generally intermittent depending on the construction phase, and variable depending on receiver distance from the active construction zone. The duration of noise impacts generally would be from one day to several days depending on the phase of construction. The level and types of noise impacts that would occur during construction are described below.

Short-term noise impacts would occur during grading and site preparation activities. Table 7 lists typical construction equipment noise levels (L_{max}) recommended for noise impact assessments, based on a distance of 50 feet between the equipment and a noise receptor, obtained from the Federal Highway Administration (FHWA) Roadway Construction Noise Model. Construction-related short-term noise levels would be higher than existing ambient noise levels currently in the project area but would no longer occur once construction of the proposed project is completed.

Table 7: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Maximum Noise Level (L_{max}) at 50 Feet[1]
Backhoes	40	80
Compactor (ground)	20	80
Compressor	40	80
Cranes	16	85
Dozers	40	85
Dump Trucks	40	84
Excavators	40	85
Flat Bed Trucks	40	84
Forklift	20	85
Front-end Loaders	40	80
Graders	40	85
Impact Pile Drivers	20	95

Table 7: Typical Construction Equipment Noise Levels

Equipment Description	Acoustical Usage Factor (%)	Maximum Noise Level (L_{max}) at 50 Feet[1]
Jackhammers	20	85
Pick-up Truck	40	55
Pneumatic Tools	50	85
Pumps	50	77
Rock Drills	20	85
Rollers	20	85
Scrapers	40	85
Tractors	40	84
Welder	40	73

Source: Roadway Construction Noise Model (FHWA 2006).

Note: Noise levels reported in this table are rounded to the nearest whole number.

[1] Maximum noise levels were developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

L_{max} = maximum instantaneous sound level

Two types of short-term noise impacts could occur during construction of the proposed project. The first type involves construction crew commutes and the transport of construction equipment and materials to the site, which would incrementally increase noise levels on roads leading to the site. As shown in Table 7, there would be a relatively high single-event noise exposure potential at a maximum level of 84 dBA L_{max} with trucks passing at 50 feet.

The second type of short-term noise impact is related to noise generated during grading and construction on the project site. Construction is performed in discrete steps, or phases, each with its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on site. Therefore, the noise levels vary as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase.

Table 7 lists maximum noise levels recommended for noise impact assessments for typical construction equipment, based on a distance of 50 feet between the equipment and a noise receptor. Typical noise levels range up to 88 dBA L_{max} at 50 feet during the noisiest construction phases. The site preparation phase, which includes excavation and grading of the project site, tends to generate the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, draglines, and front loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full-power operation followed by 3 or 4 minutes at lower power settings.

Construction details (e.g., construction fleet activities) are not yet known; therefore, this analysis assumes that scrapers, bulldozers, and water trucks/pickup trucks would be operating simultaneously during construction of the proposed project. As discussed above, noise levels associated with this equipment operating simultaneously would be approximately 88 dBA L_{max} at 50 feet.

Consistent with the applicable noise provisions of the Fresno Municipal Code, construction work would only take place between the hours of 7:00 a.m. and 10:00 p.m. Monday through Saturday. No construction work would occur on Sundays.

As noted above, the closest sensitive receptors to the proposed project include the single-family residences located approximately 110 feet south of the project site across West Nielsen Avenue. Based on a reduction in noise of 6 dBA per doubling of distance, there would be a decrease of approximately 7 dBA from the active construction area to the nearest residences. Therefore, the closest off-site sensitive receptors may be subject to short-term construction noise reaching 81 dBA L_{max} when construction is occurring.

However, construction equipment would operate at various locations within the 48.03-acre project site and would only generate maximum noise levels when operations occur closest to the receptor. Nevertheless, to ensure that the project's potential construction-related noise impacts are less than significant, Mitigation Measure NOI-1 requires the project to equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards, which would reduce the potential impacts associated with construction equipment. Additionally, Mitigation Measure NOI-1 requires the project to designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem. These measures would ensure that the project's potential construction-related noise impacts are mitigated to less-than-significant levels.

With implementation of Mitigation Measure NOI-1, the proposed project would result in a less-than-significant impact associated with the generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, State, or federal standards.

Operational Noise Impacts. The following section addresses possible noise level increases in the project vicinity resulting from implementation of the proposed project, including mobile and stationary noise sources. Mobile noise sources include traffic noise. Stationary noise sources include heating, ventilation, and air conditioning (HVAC) equipment, parking lot activities, and truck delivery and truck unloading activities. The City considers a 3 dBA increase to be a significant increase in ambient noise.

Traffic Noise. Motor vehicles with their distinctive noise characteristics are the dominant noise source in the project vicinity. The amount of noise varies according to many factors, such as volume of traffic, vehicle mix (percentage of cars and trucks), average traffic speed, and distance from the observer. Implementation of the proposed project would result in new daily trips on local roadways in the project site vicinity. A characteristic of sound is that a doubling of a noise source is required in order to result in a perceptible (3 dBA or greater) increase in the resulting noise level.

The proposed project would generate a total of 1,920 daily trips. The adjacent Marks Avenue carries approximately 10,190 average daily trips and the adjacent West Nielsen Street carries approximately 1,614 average daily trips.[18] Based on the trip distribution, the proposed project would generate 1,038 daily trips along Marks Avenue and 616 trips along West Nielsen Street.[19] Project trips would represent a small increase in noise level, up to approximately 0.4 dBA CNEL along Marks Avenue and up to approximately 1.4 dBA CNEL along West Nielsen Street based on the following equation:

$$Change\ in\ (dBA) = 10 * \log_{10}\left(\frac{Current\ Volume}{\text{Future Volume}}\right)$$

In general, noise level changes of less than 5 dBA are not perceptible in an outdoor environment. Therefore, project daily trips would not result in a perceptible noise increase along any roadway segment in the project vicinity and would not result in a perceptible increase in traffic noise levels at receptors in the project vicinity. Additionally, the increased ambient noise of up to approximately 0.4 dBA CNEL along Marks Avenue and up to approximately 1.4 dBA CNEL along West Nielsen Street are both less than the 3 dBA CNEL significance threshold established by City of Fresno's Policy NS-1-j. Therefore, the proposed project would result in a less-than-significant impact associated with the generation of a substantial permanent increase in ambient traffic noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, State, or federal standards.

Stationary Source Noise. Noise impacts associated with the long-term operation of the project must comply with the noise standards specified in the City's General Plan and Municipal Code, as described above. Stationary noise generated by the proposed project includes HVAC equipment, parking lot activities, and truck delivery and truck unloading activities.

Of the on-site stationary noise sources during operation of the project, noise generated by delivery truck activity would generate the highest maximum noise levels. Typical parking lot activities, such as people conversing or doors slamming, would generate noise levels of approximately 60 dBA to 70 dBA L_{max} at 50 feet, while delivery truck loading and unloading activities would result in maximum noise levels that would generate a noise level of 75 dBA L_{max} at 50 feet based on measurements previously conducted by LSA.

The proposed project could include loading activities, which could generate potential noise sources that could affect noise-sensitive receptors in the project site vicinity. As shown in Figure 3, the proposed project would include 61 loading dock doors north of Building 1, 61 loading dock doors south of Building 1, 46 loading dock doors south of Building 2, 18 loading dock doors north of Building 3, and 15 loading dock doors would be located north of Building 4. The closest sensitive receptors include the single-family residences located approximately 110 feet south of the project site across West Nielsen

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[18] LSA, 2021. *Traffic Impact Study 2740 West Nielsen Avenue Warehouse Project, City of Fresno, Fresno County, California.* November.

[19] Ibid.

Avenue. These residences would be located approximately 260 feet south of the loading docks south of Building 1.

At 260 feet, there would be a decrease of 14 dBA due to the increased distance from the baseline noise level of 75 dBA L_{max} at 50 feet. Therefore, maximum noise levels generated by loading and unloading activities would be approximately 61 dBA L_{max} at the closest sensitive receptors. This noise level would not exceed the City's daytime (7:00 a.m. to 10:00 p.m.) noise level standard of 70 dBA L_{max}, but would have the potential to exceed the City's nighttime (10:00 p.m. to 7:00 a.m.) noise level standard of 60 dBA L_{max}. However, implementation of Mitigation Measure NOI-2 would reduce potential impacts related to loading dock and delivery noise by prohibiting loading dock activities at the loading dock doors south of Building 1 during the nighttime hours. Loading dock activities at all other loading dock locations would be shielded by the proposed buildings and would not exceed the City's nighttime noise standard.

In addition, peak noise levels from loading and unloading would be intermittent and when averaged over one hour, these sources would not exceed the City's daytime (7:00 a.m. to 10:00 p.m.) noise level standard of 50 dBA L_{eq} or nighttime (10:00 p.m. to 7:00 a.m.) noise level standard of 45 dBA L_{eq}. Additionally, when averaged over the 24-hour period, noise would not cause an increase in noise levels of more than 3 dBA. With implementation of Mitigation Measure NOI-2, the proposed project would result in a less-than-significant impact associated with the generation of a substantial permanent increase in ambient stationary source noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, State, or federal standards.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

Vibration refers to groundborne noise and perceptible motion. Groundborne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors. Vibration energy propagates from a source, through intervening soil and rock layers, to the foundations of nearby buildings. The vibration then propagates from the foundation throughout the remainder of the structure. Building vibration may be perceived by the occupants as the motion of building surfaces, rattling of items on shelves or hanging on walls, or as a low-frequency rumbling noise. The rumbling noise is caused by the vibrating walls, floors, and ceilings radiating sound waves. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by 10 dB or less. This is an order of magnitude below the damage threshold for normal buildings.

Typical sources of groundborne vibration are construction activities (e.g., pavement breaking and operating heavy-duty earthmoving equipment), and occasional traffic on rough roads. In general, groundborne vibration from standard construction practices is only a potential issue when within 25 feet of sensitive uses. As noted above, the closest sensitive receptors to the proposed project include the single-family residences approximately 110 feet south of the project site across West Nielsen Avenue. At this distance, construction activities associated with implementation of the proposed project are not expected to result in excessive groundborne vibration or groundborne noise levels. In addition, no other existing buildings are located within 25 feet of the project site. Once operational, no permanent groundborne vibration or noise sources would be located within the project site that would expose persons to excessive groundborne vibration or noise levels. Therefore, implementation of the proposed project would not result in the generation of excessive groundborne vibration or groundborne noise levels, and impacts would be less than significant.

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

The nearest airports include the Fresno Chandler Executive Airport, located approximately 0.8 mile from the project site, the Sierra Sky Airport, located approximately 6.7 miles from the project site, and the Fresno International Airport, located approximately 7.1 miles from the project site. Each of these airports has an Airport Land Use Compatibility Plan (ALUCP) that guides approximate compatible land uses. The City of Fresno General Plan, other City land use plans, and all City land use decisions must be compatible with the adopted ALUCP. Each ALUCP includes CNEL noise contours based on projected airport and aircraft operations. The project site is not located in an ALUCP; therefore project implementation would not expose people residing or working in the project area to excessive noise levels, and impacts would be less than significant.

MITIGATION MEASURES

Mitigation Measure NOI-1: The project contractor shall implement the following measures during construction of the project:

- Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards.
- Designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.

Mitigation Measure NOI-2: All loading dock activities shall be prohibited at the loading dock doors on the south end of Building 1 during the nighttime hours (10:00 p.m. to 7:00 a.m.) or once operational, provide documentation to the City of Fresno Planning and Development Department that demonstrates that nighttime loading dock activities would comply with the noise level specifications of the City's Municipal Code.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. POPULATION AND HOUSING – Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			X	
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X

DISCUSSION

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

The proposed project would include four office/warehouse buildings that would be configured for heavy industrial uses. The proposed project would not result in direct population growth as the use proposed is not residential and would not contribute to permanent residency on site. Further, the site is designated Heavy Industrial by the General Plan and would not generate growth beyond that anticipated in the General Plan. Therefore, the proposed project would not induce substantial unplanned population growth in an area, either directly or indirectly, and this impact would be considered less than significant.

b) Would the project displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No housing is currently present on the project site, and therefore, there are no people living on the project site that would be displaced by the proposed project. Therefore, there would be no impacts related to the displacement of substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere, and no mitigation is required.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to population and housing, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. PUBLIC SERVICES – Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?			X	
Police protection?			X	
Schools?				X
Parks?			X	
Other public facilities?			X	

DISCUSSION

a) **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:**

i. **Fire protection?**

The City of Fresno Fire Department (FFD) would provide fire protection services to the proposed project. There are 23 FFD fire stations in Fresno, with the closest fire station, Fire Station 3, located approximately 3 miles from the project site. Planned growth under the General Plan would increase calls for fire protection service in the City. The project is consistent with the site’s General Plan designation and does not represent unplanned growth given that the project site would be developed consistent with its land use and zoning designations. The project could result in an incremental increase in the demand for fire protection services as a result of additional employees to the project site. However, the proposed project would be required to comply with all applicable codes for fire safety and emergency access. In addition, the project applicant would be required to submit plans to the FFD for review and approval prior to the issuance of building permits to ensure the project would conform to applicable building codes.

The FFD would continue providing services to the project site and would not require additional firefighters to serve the proposed project. The construction of a new or expanded fire station would not be required. The proposed project would not result in a significant impact on the physical environment due to the incremental increase in demand for fire protection and life safety services. The incremental increase in demand for services is not expected to adversely affect existing responses times to the site or within the City. Therefore, construction and operation of the proposed project would have a less-than-significant impact on fire protection.

ii. Police protection?

The City of Fresno Police Department (FPD) provides police protection to the project site. The FPD headquarters are located at 2323 Mariposa Street, approximately 3.5 miles from the project site. Planned growth under the General Plan would increase calls for police protection service in the City. The project is consistent with the site’s General Plan designation and does not represent unplanned growth. The project could result in an incremental increase in the demand for police protection services. The FPD would continue to provide services to the project site and would not require additional officers to serve the project site. The construction of new or expanded police facilities would not be required. Therefore, the proposed project would not result in a substantial adverse impact associated with the provision of additional police facilities or services, and impacts to police protection would represent a less-than-significant impact.

iii. Schools?

The proposed project would not generate student demand or otherwise impact school services given that there is no housing or a residential component. As such, there would be no impact related to schools.

iv. Parks?

Demand for parks generated by the project is within planned services levels of the City of Fresno Parks and Community Services Department and the applicant would be required to pay any required impact fees at the time building permits are obtained or receive credits for construction as may be memorialized within a subdivision or development agreement. Maintenance would be afforded through annexation into a Community Facilities District (CFD). Therefore, impacts to parks would be less than significant.

v. **Other public facilities?**

Development of the proposed project could also increase demand for other public services, including libraries, community centers, and public health care facilities. However, due to the minimal increase in population, the proposed project would not result in a substantial increase in the use of these facilities, such that new facilities would be needed to maintain service standards, as these facilities are not currently overused and have capacity to serve new demand. Therefore, impacts to other public facilities would be less than significant.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to public services, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. RECREATION - Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

DISCUSSION

a) **Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

The proposed project would include four office/warehouse buildings that would be configured for heavy industrial uses and would not generate population growth that would result in an increase in the use of existing neighborhood and regional parks or other recreational facilities. Therefore, there would be no impact related to the increase in the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.

b) Would the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

The proposed project would include four office/warehouse buildings that would be configured for heavy industrial uses. The proposed project does not include or require the construction or expansion of existing public recreational facilities; therefore, development of the proposed project and associated recreational opportunities for use by users of the project site would not result in additional environmental effects beyond those described in this document. As a result, no impact would occur to recreational facilities and the proposed project would not require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to recreation, and no mitigation is required.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XVII. TRANSPORTATION – Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?			X	
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

The following discussion is based on the Traffic Impact Study (TIS)[20] prepared for the proposed project. The TIS is included as Appendix F.

DISCUSSION

a) Would the project conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

While Levels of Service (LOS) analysis is no longer a criteria of significance for traffic impacts under CEQA, the City of Fresno General Plan includes policies that utilize LOS to determine project conditions of approval. As such, this analysis includes LOS impacts while VMT impacts are discussed in Response b) below.

Based on the City of Fresno General Plan Circulation Element, the City uses Traffic Impact Zone (TIZ) boundaries within the City to identify acceptable LOS for each TIZ. The majority of the study area is within TIZ III, or along the border of TIZ II and TIZ III. TIZ II has a LOS standard of E, while TIZ III has an LOS standard of D. Therefore, as a conservative estimate, LOS D was considered as the minimum level of service criterion for all intersections. As such, an operational deficiency occurs when the project causes an unsatisfactory condition (deterioration from LOS A through D to LOS E or F) for intersections or when the project contributes to an existing or forecasted deficiency. The project needs to identify improvements to improve the intersection LOS to an acceptable level.

For intersections under the jurisdiction of Caltrans, Caltrans considers an acceptable LOS to be between LOS C and D at all intersections (delay of 45 seconds at signalized intersections and delay of 30 seconds at unsignalized intersections).

Caltrans does not have any operational deficiency criteria for study intersections. Therefore, an operational deficiency occurs when the project causes an unsatisfactory condition (deterioration from LOS A through D to LOS E or F) for intersections or when the project contributes to an existing or forecasted deficiency. The project needs to identify improvements to improve the intersection LOS to an acceptable level.

The TIS examined traffic operations in the vicinity of the proposed project under the following five scenarios:

- Existing Conditions;
- Existing plus Project Conditions;
- Existing plus Project and Near-term approved and pending projects Conditions;
- Cumulative Year (2035) No Project Conditions; and
- Cumulative Year (2035) Plus Project Conditions.

Traffic conditions were examined for the weekday daily, AM, and PM peak hour conditions. The AM peak hour is defined as the one hour of highest traffic volumes

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[20] LSA. 2021, op. cit.

occurring between 7:00 a.m. and 9:00 a.m. The PM peak hour is the one hour of highest traffic volumes occurring between 4:00 p.m. and 6:00 p.m. Roadway segments were analyzed using daily volume counts and comparisons were made to the daily service volume standards provided in the City Guidelines. The study area for the TIS included the following study intersections and roadway segments.

Intersections
1. Marks Avenue/Belmont Avenue (City of Fresno, County of Fresno);
2. Marks Avenue/Nielsen Avenue (City of Fresno);
3. Marks Avenue/Ray Johnson Drive (City of Fresno);
4. Marks Avenue/SR-180 Westbound Ramps (Caltrans);
5. Marks Avenue/SR-180 Eastbound Ramps (Caltrans);
6. Hughes Avenue/Belmont Avenue (City of Fresno, County of Fresno); and
7. Hughes Avenue/Nielsen Avenue (City of Fresno).

Roadway Segments
1. Marks Avenue, between Belmont Avenue and Nielsen Avenue;
2. Marks Avenue, between Nielsen Avenue and Ray Johnson Drive;
3. Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps;
4. Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps;
5. Belmont Avenue, between Marks Avenue and Hughes Avenue;
6. Nielsen Avenue, between Marks Avenue and Hughes Avenue; and
7. Hughes Avenue, between Belmont Avenue and Nielsen Avenue.

In addition, Caltrans recommended evaluating the project under a worst-case scenario with 60 percent of project traffic using Caltrans' facilities (ramps and freeway segments). This evaluation included intersections 3, 4, and 5 as listed above, as well as the following freeway basic and merge/diverge areas for the SR-180 and Marks Avenue interchange:

SR-180 Eastbound
1. West of Marks Avenue Off-Ramp (Basic);
2. Marks Avenue Off-Ramp (Diverge);
3. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
4. Marks Avenue Loop-On Ramp (Merge);
5. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
6. Marks Avenue Slip-On Ramp (Merge); and
7. East of Marks Avenue (Basic).

SR-180 Westbound
1. East of Marks Avenue (Basic);
2. Marks Avenue Off-Ramp (Diverge);
3. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
4. Marks Avenue Loop-On Ramp (Merge);
5. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
6. Marks Avenue Slip-On Ramp (Merge); and
7. West of Marks Avenue (Basic).

Project Trip Generation. To assess potential impacts that the project may have on the surrounding roadway network, the first step was to determine project trip generation. Project trip generation is identified in Table 8 based on the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) High-Cube Warehouse Trip Generation Study. The study provides separate trip generation rates for passenger vehicles, 2–4 axle trucks, and 5+ axle trucks. The truck trips were converted to Passenger Car Equivalent (PCE) trips using a PCE factor of 2.0 for 2–4 axle trucks. To be conservative, a PCE factor of 3.0 was used for 5+ axle trucks.

Table 8: Project Trip Generation

Trip Generation[1]	Average Daily Trips	Weekday AM Peak Hour[2]			Weekday PM Peak Hour[2]		
		In	Out	Total	In	Out	Total
Trip Generation							
Trip Generation (Cars)	1,578	75	18	93	105	24	129
Trip Generation (2–4 Axle Trucks)	146	5	2	7	8	2	10
Trip Generation (5+ Axle Trucks)	196	8	2	10	7	2	9
Trip Generation (Total Trucks)	342	13	4	17	15	4	19
Trip Generation (Total)	**1,920**	**88**	**22**	**110**	**120**	**28**	**148**
PCE Trip Generation							
Trip Generation (Cars)	1,578	75	18	93	105	24	129
PCE Trip Generation (2–4 Axle Trucks)[3]	292	10	4	14	16	4	20
PCE Trip Generation (5+ Axle Trucks)[3]	588	24	6	30	21	6	27
PCE Trip Generation (Total Trucks)	880	34	10	44	37	10	47
PCE Trip Generation (Total)	**2,458**	**109**	**28**	**137**	**142**	**34**	**176**

Source: LSA (2021).

[1] Rates from the Western Riverside Council of Governments (WRCOG) *TUMF High-Cube Warehouse Trip Generation Study*, January 2019, prepared by WSP.

[2] The WRCOG study does not provide in/out splits for the peak hour trip generation. Therefore, in/out splits from Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) supplement Land Use 155 - "High-Cube Fulfilment Center Warehouse" have been used for obtaining in/out traffic.

[3] A Passenger Car Equivalent (PCE) factor 2.0 has been taken for 2-4 axle trucks based on Highway Capacity Manual (HCM) recommendations. Further, as a conservative approach, a PCE factor of 3.0 is taken, for 5+ axle trucks, consistent with latest practices in numerous California jurisdictions.

Intersection Capacity Analysis. For all study area intersections, the Highway Capacity Manual 6th Edition (HCM 6) analysis methodologies were used to determine intersection LOS. Intersection LOS was calculated using the Synchro 10 software, which uses the HCM 6 methodologies. LOS can be determined for both signalized and unsignalized intersections.

Based on the results of the LOS analysis, an operational deficiency currently exists at the intersection of Marks Avenue/Belmont Avenue. This intersection meets several signal warrants under Existing, Near-Term Approved and Pending, and Cumulative Year (2035) scenarios. The City of Fresno Traffic Signal Mitigation Impact (TSMI) fees are charged to all new developments throughout the City to mitigate the traffic operational deficiencies through the funding of traffic signal improvements to serve new developments. Based on the City of Fresno City-Wide Traffic Signal Mitigation Impact Fee nexus Analysis for Proposed Fee Update, dated September 2016, signalization of the intersection of Marks Avenue/Belmont Avenue is included in the Traffic Signal Capital Improvements, where the entire funding is expected to be generated from the TSMI fees. Therefore, since the improvement is covered under the TSMI Fee program, the project would be paying into the fee program for this improvement. Therefore, the intersection is forecast to operate at a satisfactory LOS with the implementation of the proposed improvement and impacts to intersection LOS would be less than significant. No mitigation is required.

Roadway Segment Analysis. According to the HCM, LOS is categorized by two parameters of traffic: uninterrupted and interrupted flow. Uninterrupted flow facilities do not have fixed elements such as traffic signals that cause interruptions in traffic flow. Interrupted flow facilities do have fixed elements that cause an interruption in the flow of traffic, such as stop signs and signalized intersections along arterial roads. A roadway segment is defined as a stretch of roadway generally located between signalized or controlled intersections.

Roadway segment LOS was calculated based on the Florida LOS tables, consistent with the City Guidelines. As shown in Table 7-B of Appendix F, the seven existing roadway segments analyzed have an LOS of C without the proposed project and an LOS of C with the proposed project. Thus, the proposed project would not cause any deterioration of LOS at the roadway segments analyzed. Therefore, impacts to roadway segment LOS would be less than significant. No mitigation is required.

Summary. As described above, the addition of project traffic is not anticipated to exceed the City's level of significance threshold of LOS (LOS D or better). In addition, the project-related traffic would not result in a deficiency to existing transit, roadway, bicycle, and pedestrian facilities. Therefore, the proposed project would not conflict with any plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system or congestion management program. Impacts would be less than significant, and no mitigation is required.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Senate Bill (SB) 743 requires that relevant CEQA analysis of transportation impacts be conducted using a metric known as vehicle miles traveled (VMT) instead of Level of Service (LOS). VMT measures how much actual auto travel (additional miles driven) a proposed project would create on California roads. If the project adds excessive car travel onto our roads, the project may cause a significant transportation impact. Heavy-duty trucks are addressed in other CEQA sections (air quality, greenhouse gases, noise and health risk assessment analysis) and are subject to regulation in a separate collection of rules under CARB jurisdiction.

The State CEQA Guidelines were amended to implement SB 743, by adding Section 15064.3. Among its provisions, Section 15064.3 confirms that, except with respect to transportation projects, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS measures of impacts on traffic facilities is no longer a relevant CEQA criteria for transportation impacts.

CEQA Guidelines Section 15064.3(b)(4) states that “[a] lead agency has discretion to evaluate a project’s vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project’s vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revision to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.”

On June 25, 2020, the City of Fresno adopted CEQA Guidelines for Vehicle Miles Traveled Thresholds, pursuant to Senate Bill 743 to be effective of July 1, 2020. The thresholds described therein are referred to herein as the City of Fresno VMT Thresholds. The City of Fresno VMT Thresholds document was prepared and adopted consistent with the requirements of CEQA Guidelines Sections 15064.3 and 15064.7. The December 2018 Technical Advisory on Evaluating Transportation Impacts in CEQA (Technical Advisory) published by the Governor’s Office of Planning and Research (OPR), was utilized as a reference and guidance document in the preparation of the Fresno VMT Thresholds.

The City of Fresno VMT Thresholds adopted a screening standard and criteria that can be used to screen out qualified projects that meet the adopted criteria from needing to prepare a detailed VMT analysis.

For projects that are not screened out, a quantitative analysis of VMT impacts must be prepared and compared against the adopted VMT thresholds of significance. The Fresno VMT Thresholds document includes thresholds of significance for development projects, transportation projects, and land use plans. These thresholds of significance were developed using the County of Fresno as the applicable region, and the required reduction of VMT (as adopted in the Fresno VMT Thresholds) corresponds to Fresno County’s contribution to the statewide GHG emission reduction target. In order to reach the statewide GHG reduction target of 15%, Fresno County must reduce its GHG emissions by 13%. The method of reducing GHG by 13% is to reduce VMT by 13% as well.

The City’s adopted thresholds for development projects correspond to the regional thresholds set by the Fresno Council of Governments (COG). For residential and office development projects, the adopted threshold of significance is 13% less than the regional average. Therefore, the project would have a less than significant environmental impact if the project generated VMT per capita or per employee is less than 13% of the regional average VMT per capita or per employee. For retail projects, the adopted threshold is any net increase in total VMT compared to existing total VMT for the region. For all other non-residential projects that are consistent with City’s General Plan, the adopted threshold is that a project would not have a significant environmental impact if the project’s VMT per employee is less than the existing regional average VMT per employee. If the project requires a General Plan amendment, the project would have a less than significant environmental impact if the project generated VMT per employee is less than 13% of the existing regional average VMT per employee.

As recommended in the City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds, projects that could not be screened out from a quantitative VMT assessment, the VMT analysis should be conducted using the Fresno COG Activity Based Model (ABM), which is a tour-based model. Therefore, the Fresno COG ABM was used for the project VMT analysis. The model database was updated with the project land uses to calculate project VMT.

The project is non-residential in nature, but would not be classified as an office or retail project. Additionally, the project does not require a General Plan Amendment. Therefore, the project's VMT per employee was compared to the existing regional average VMT per employee. The existing regional average is 25.6 VMT per employee, as established in the City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds. Based on the Fresno COG ABM model output, the project's VMT was calculated to be 19.8 VMT per employee. As such, the project's VMT per employee rate is 22.66 percent lower than the existing regional average VMT per employee, or the City's threshold. In conclusion, the project would result in a less-than-significant VMT impact concerning consistency with CEQA Guidelines Section 15064.3(b).

c) Would the project substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Vehicular access to the project site would be provided via seven driveways located on Marks Avenue, Nielsen Avenue, and Hughes Avenue. All project driveways would be stop controlled at the driveway approach. Therefore, vehicles exiting the project site from project driveways must stop before they continue to merge on the neighboring circulation network.

The majority of the observed traffic flow within the study area utilizes Marks Avenue. Of the three driveways on Marks Avenue, two are right-in-right-out only. For the other driveway, left-turn egress movement will be restricted. Additionally, a two-way left-turn lane (TWLTL) is present at this location on Marks Avenue. Therefore, project trips using a left-turn ingress movement can also wait in the TWLTL for the clearance of northbound traffic on Marks Avenue. Since there is a traffic signal at the intersection of Marks Avenue/Nielsen Avenue, these project trips would have the opportunity to utilize gaps in northbound traffic created by the signal to complete the turn into the project driveway. Additionally, there are no major obstructions to vision present along Marks Avenue. Therefore, sight distance is not expected to be an issue for these driveways.

For project driveways located along Nielsen Avenue and Hughes Avenue, there needs to be adequate corner sight distance for vehicles to make an egress movement. There is no provision for on-street parking along the project frontage on Nielsen Avenue or Hughes Avenue. Additionally, there are no trees or large stationary objects that might obstruct the sight triangle for drivers. As such, there should be adequate sight distance at the project driveways along Nielsen Avenue or Hughes Avenue. Therefore, it can be concluded that a clear sight triangle would be available for drivers exiting the driveway to safely make turns onto Nielsen Avenue or Hughes Avenue.

In addition, the proposed project would not include any sharp curves or other roadway design elements that would create dangerous conditions. In addition, the project design features would be required to comply with standards set by the City's General Plan and City Engineer. In addition, the proposed project would also be required to submit plans to the FFD for review and approval prior to the issuance of building permits to ensure there are no substantial hazards associated with the project design. Therefore, the proposed project would result in a less-than-significant impact related to hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), and no mitigation is required.

d) Would the project result in inadequate emergency access?

Emergency vehicles would have access to the project site via seven driveways located on Marks Avenue, Nielsen Avenue, and Hughes Avenue. Further, the proposed project's site plan would be subject to review and approval by the FFD to ensure the project includes adequate emergency access. In addition, as discussed in Section IX, Hazards and Hazardous Material, project implementation would not physically interfere with emergency evacuation or the FFD access to and from the project site. Therefore, the proposed project would result in less-than-significant impacts related to inadequate emergency access, and no mitigation is required.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to transportation, and no mitigation is required.

ENVIRONMENTAL ISSUES	**Potentially Significant Impact**	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
XVII. TRIBAL CULTURAL RESOURCES – Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in PRC section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in PRC section 5020.1(k), or,		X		
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC section 5024.1. In applying the criteria set forth in subdivision (c) of PRC section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		

DISCUSSION

a) **Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:**

   i. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or**

   ii. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

The State requires lead agencies to consider the potential effects of proposed projects and consult with California Native American tribes during the local planning process for the purpose of protecting Traditional Tribal Cultural Resources through the *State CEQA Guidelines*. Pursuant to PRC Section 21080.3.1, the lead agency shall begin consultation with the California Native American tribe that is traditionally and culturally affiliated with the geographical area of the proposed project. Such significant cultural resources are either sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a tribe which is either on or eligible for inclusion in the California Register or local historic register, or, the lead agency, at its discretion, and support by substantial evidence, choose to treat the resources as a Tribal Cultural Resources (PRC Section 21074(a)(1-2)).

Additional information may also be available from the California NAHC's Sacred Lands File per PRC Section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that PRC Section 21082.3(c) contains provisions specific to confidentiality.

AB 52, which became law January 1, 2015, requires that, as part of the CEQA review process, public agencies provide early notice of a project to California Native American Tribes to allow for consultation between the tribe and the public agency. The purpose of AB 52 is to provide the opportunity for public agencies and tribes to consult and consider potential impacts to Tribal Cultural Resources (TCRs), as defined by PRC Section 2107(a). Under AB 52, public agencies shall reach out to California Native American Tribes who have requested to be notified of projects in areas within or which may have been affiliated with their tribal geographic range. Pursuant to AB 52, the Table Mountain Rancheria Tribe and the Dumna Wo Wah Tribe were invited to consult under AB 52. A certified letter was mailed to the above-mentioned tribes on December 17, 2021. The 30-day comment period ended on January 17, 2022. Neither tribe requested consultation.

The site is currently vacant. While there is no evidence to suggest the presence of TCRs, if any artifacts are inadvertently discovered during ground-disturbing activities, existing federal, State, and local laws and regulations would require construction activities to cease until such artifacts are properly examined and determined not to be of significance by a qualified cultural resources professional. In addition, Mitigation Measure CUL-1 included above in Section V, Cultural Resources, requires that if unknown archaeological resources are discovered during construction, work in the area would halt and a qualified archaeologist would be contacted. Therefore, adherence to the requirements in Mitigation Measure CUL-1 would reduce potential impacts related to the substantial adverse change in the significance of a tribal cultural resource to less than significant with mitigation.

MITIGATION MEASURES

Mitigation Measure TRIBE-1: Implement Mitigation Measure CUL-1.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. UTILITIES AND SERVICE SYSTEMS – Would the project:				

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effect?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	
c) Result in a determination by the waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			X	

DISCUSSION

a) **Would the project require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?**

The City of Fresno Department of Public Utilities has determined that adequate sanitary sewer and water services would be available to serve the proposed project subject to the payment of any applicable connection charges and/or fees and extension of services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies.

Impacts to storm drainage facilities have been previously discussed in Section X, Hydrology and Water Quality. As noted in Section X, the proposed project would result in the construction of new stormwater drainage facilities or the expansion of existing facilities. Specifically, the proposed project would include construction of a new curb and gutter along North Marks Avenue, West Nielsen Avenue, and North Hughes Avenue to connect to the City's existing stormwater system. However, the construction of such minor facilities would be constructed in conformance with City standards; therefore, its construction would not cause significant environmental effects.

Electric power, natural gas, and telecommunication facilities would require connections to the project site. However, because the project site is located within an urbanized area with existing facilities in close proximity, connection to these facilities would not cause significant environmental effects. As a result, the project would result in a less-than-significant impact related to the relocation or construction or new or expanded utilities.

b) **Would the project have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?**

Refer to discussion b) of Section X, Hydrology and Water Quality. As discussed above, sufficient water supply would be available to serve the project site. As a result, the project would result in a less-than-significant impact related to water supply and there are sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

c) **Would the project result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

Refer to discussion a) above. The City of Fresno Department of Public Utilities has determined that adequate sanitary sewer and water services would be available to serve the proposed project subject to the payment of any applicable connection charges and/or fees and extension of services in a manner that is compliant with the Department of Public Utilities standards, specifications, and policies. In addition, the proposed project is not expected to exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. As such, impacts would be less than significant.

d) Would the project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Garbage disposed in the City of Fresno is taken to the Cedar Avenue Recycling and Transfer Station. Once trash has been off-loaded at the transfer station, it is sorted, and non-recyclable solid waste is loaded onto large trucks and taken to the American Avenue Landfill located approximately 6 miles southwest of Kerman.

The American Avenue Landfill (i.e., American Avenue Disposal Site 10-AA-0009) has a maximum permitted capacity of 32,700,000 cubic yards and a remaining capacity of 29,358,535 cubic yards, with an estimated closure date of August 31, 2031. The maximum permitted throughput is 2,200 tons per day.[21]

Other landfills within the County of Fresno include the Clovis Landfill (City of Clovis Landfill 10-AA-0004) with a maximum remaining permitted capacity of 7,740,000 cubic yards, a maximum permitted throughput of 2,000 tons per day, and an estimated closure date of 2047.[22]

Based on CalEEMod, operation of the proposed project would generate approximately 847 tons of solid waste per year or approximately 2 tons of solid waste per day. Given the available capacity at the landfills, the additional solid waste generated by the proposed project is not anticipated to cause the facility to exceed its daily permitted capacity. As such, the project would be served by a landfill with sufficient capacity to accommodate the project's waste disposal needs. The proposed project would not generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and impacts would be less than significant.

e) Would the project comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The proposed project would comply with all federal, State, and local solid waste statutes and/or regulations related to solid waste. Also refer to discussion d) in this section. Therefore, the proposed project would have a less-than-significant impact related to solid waste.

MITIGATION MEASURES

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[21] CalRecycle. Website: https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/352 (accessed July 2021).

[22] CalRecycle. Website: https://www2.calrecycle.ca.gov/SolidWaste/Site/Summary/347 (accessed July 2021).

The proposed project would not result in any potentially significant impacts related to utilities and service systems, and no mitigation is required.

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				X
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?				X
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				X
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?				X

DISCUSSION

As discussed above in discussion g) in Section IX, Hazards and Hazardous Materials, there are no very high fire hazard severity zones located within the City of Fresno.[23] Therefore, the proposed project would not expose people or structures to a significant loss, injury, or death involving wildland fires, and there would be no impact.

MITIGATION MEASURES

The proposed project would not result in any potentially significant impacts related to wildfire, and no mitigation is required.

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[23] Cal Fire. *Fire Hazard Severity Zone Viewer.* Website: https://egis.fire.ca.gov/FHSZ/ (accessed August 2021).

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?		X		
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

DISCUSSION

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

As discussed in Section IV. Biological Resources and Section V, Cultural Resources, with the incorporation of Mitigation Measures BIO-1 and BIO-2 and CUL-1 through CUL-3, development of the proposed project would not: (1) degrade the quality of the environment; (2) substantially reduce the habitat of a fish or wildlife species; (3) cause a fish or wildlife species population to drop below self-sustaining levels; (4) threaten to eliminate a plant or animal community; (5) reduce the number or restrict the range of a rare or endangered plant or animal; or (6) eliminate important examples of the major periods of California history. Therefore, this impact would be less than significant with mitigation incorporated.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

The proposed project's impacts would be individually limited and not cumulatively considerable due to the site-specific nature of the potential impacts. The potentially significant impacts that can be reduced to less-than-significant levels with implementation of recommended mitigation measures include the topics of Aesthetics, Biological Resources, Cultural Resources, Geology and Soils, Noise, and Tribal Cultural Resources. These impacts would primarily be related to construction-period activities, would be temporary in nature, and would not substantially contribute to any potential cumulative impacts associated with these topics.

Implementation of recommended mitigation measures AES-1 through AES-4, BIO-1 and BIO-2, CUL-1 through CUL-3, GEO-1, NOI-1 and NOI-2, and TRIBE-1 would ensure that the impacts of the project would be below established thresholds of significance and that these impacts would not combine with the impacts of other cumulative projects to result in a cumulatively considerable impact on the environment as a result of project development and this impact would be less than significant with mitigation incorporated.

For the topics of Agriculture and Forestry Resources, Air Quality, Energy, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation, Utilities and Service Systems, and Wildlife, the project would have no impacts or less-than-significant impacts, and therefore, the project would not substantially contribute to any potential cumulative impacts for these topics.

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

The proposed project's potential to result in environmental effects that could directly or indirectly impact human beings has been evaluated in this Initial Study. With implementation of the recommended mitigation measures, all environmental effects that could adversely affect human beings, either directly or indirectly, would be less than significant.

APPENDIX A

CALEEMOD OUTPUT SHEETS

APPENDIX A

CALEEMOD OUTPUT SHEETS

2740 West Nielsen Office/Warehouse Project

Fresno County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Unrefrigerated Warehouse-No Rail	901.44	1000sqft	38.03	901,438.00	0
Parking Lot	594.00	Space	10.00	237,600.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2024
Utility Company	Pacific Gas and Electric Company				
CO2 Intensity (lb/MWhr)	203.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Total project site is 48.03 acres.

Construction Phase - Construction of the proposed project is anticipated to occur in two phases occurring over a total 24-month period starting in the first quarter of 2022 and ending in 2024.

Grading -

Vehicle Trips - Based on trip generation prepared for the proposed project.

Construction Off-road Equipment Mitigation - Assuming compliance with SJVAPCD Regulation VIII (Fugitive PM10 Prohibitions) and use of Tier 2 construction equipment.

Fleet Mix - Based on the trip generation prepared for the proposed project.

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	55.00	30.00
tblConstructionPhase	NumDays	740.00	385.00
tblConstructionPhase	NumDays	75.00	40.00
tblConstructionPhase	NumDays	55.00	30.00
tblConstructionPhase	NumDays	30.00	40.00
tblFleetMix	HHD	0.02	0.10
tblFleetMix	LDA	0.52	0.40
tblFleetMix	LDT1	0.05	0.20
tblFleetMix	LDT2	0.18	0.20
tblFleetMix	LHD1	0.03	0.00
tblFleetMix	LHD2	6.8290e-003	0.08
tblFleetMix	MCY	0.02	0.00
tblFleetMix	MDV	0.16	0.00
tblFleetMix	MH	2.9750e-003	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	7.0700e-004	0.00

tblFleetMix	SBUS	1.4960e-003	0.00
tblFleetMix	UBUS	2.8900e-004	0.00
tblLandUse	LotAcreage	20.69	38.03
tblLandUse	LotAcreage	5.35	10.00
tblVehicleTrips	ST_TR	1.74	2.13
tblVehicleTrips	SU_TR	1.74	2.13
tblVehicleTrips	WD_TR	1.74	2.13

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3882	3.2490	3.1257	8.7900e-003	0.9249	0.1282	1.0532	0.3695	0.1194	0.4889	0.0000	800.2819	800.2819	0.1033	0.0445	816.1364
2023	0.4165	2.9962	3.8257	0.0123	0.6333	0.0989	0.7322	0.1719	0.0931	0.2650	0.0000	1,130.1803	1,130.1803	0.0861	0.0786	1,155.7470
2024	6.3427	0.1163	0.2081	3.8000e-004	0.0127	5.6600e-003	0.0184	3.3800e-003	5.2800e-003	8.6600e-003	0.0000	33.7231	33.7231	6.9700e-003	2.7000e-004	33.9771
Maximum	**6.3427**	**3.2490**	**3.8257**	**0.0123**	**0.9249**	**0.1282**	**1.0532**	**0.3695**	**0.1194**	**0.4889**	**0.0000**	**1,130.1803**	**1,130.1803**	**0.1033**	**0.0786**	**1,155.7470**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	0.3882	3.2490	3.1257	8.7900e-003	0.6075	0.1282	0.7357	0.2182	0.1194	0.3376	0.0000	800.2815	800.2815	0.1033	0.0445	816.1360
2023	0.4165	2.9962	3.8257	0.0123	0.6333	0.0989	0.7322	0.1719	0.0931	0.2650	0.0000	1,130.1799	1,130.1799	0.0861	0.0786	1,155.7466
2024	6.3427	0.1163	0.2081	3.8000e-004	0.0127	5.6600e-003	0.0184	3.3800e-003	5.2800e-003	8.6600e-003	0.0000	33.7231	33.7231	6.9700e-003	2.7000e-004	33.9771
Maximum	**6.3427**	**3.2490**	**3.8257**	**0.0123**	**0.6333**	**0.1282**	**0.7357**	**0.2182**	**0.1194**	**0.3376**	**0.0000**	**1,130.1799**	**1,130.1799**	**0.1033**	**0.0786**	**1,155.7466**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**20.21**	**0.00**	**17.60**	**27.78**	**0.00**	**19.85**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**3-7-2022**	**6-6-2022**	1.2488	1.2488
2	**6-7-2022**	**9-6-2022**	1.0517	1.0517
3	**9-7-2022**	**12-6-2022**	0.9974	0.9974
4	**12-7-2022**	**3-6-2023**	0.9053	0.9053
5	**3-7-2023**	**6-6-2023**	0.8796	0.8796
6	**6-7-2023**	**9-6-2023**	0.8752	0.8752
7	**9-7-2023**	**12-6-2023**	0.8776	0.8776
8	**12-7-2023**	**3-6-2024**	5.9951	5.9951
9	**3-7-2024**	**6-6-2024**	0.3021	0.3021
		Highest	5.9951	5.9951

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.1689	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285
Energy	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	1,643.2331	1,643.2331	0.1430	0.0311	1,656.0823
Mobile	0.5673	3.1789	5.9665	0.0260	2.1254	0.0340	2.1594	0.5701	0.0323	0.6023	0.0000	2,460.5352	2,460.5352	0.0536	0.2025	2,522.2291
Waste						0.0000	0.0000		0.0000	0.0000	172.0044	0.0000	172.0044	10.1652	0.0000	426.1336
Water						0.0000	0.0000		0.0000	0.0000	66.1341	104.3637	170.4978	6.8095	0.1624	389.1406
Total	**4.8232**	**3.9705**	**6.6450**	**0.0308**	**2.1254**	**0.0942**	**2.2196**	**0.5701**	**0.0925**	**0.6625**	**238.1385**	**4,208.1587**	**4,446.2972**	**17.1713**	**0.3961**	**4,993.6142**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	4.1689	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285
Energy	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	1,643.2331	1,643.2331	0.1430	0.0311	1,656.0823
Mobile	0.5673	3.1789	5.9665	0.0260	2.1254	0.0340	2.1594	0.5701	0.0323	0.6023	0.0000	2,460.5352	2,460.5352	0.0536	0.2025	2,522.2291
Waste						0.0000	0.0000		0.0000	0.0000	172.0044	0.0000	172.0044	10.1652	0.0000	426.1336
Water						0.0000	0.0000		0.0000	0.0000	66.1341	104.3637	170.4978	6.8095	0.1624	389.1406
Total	**4.8232**	**3.9705**	**6.6450**	**0.0308**	**2.1254**	**0.0942**	**2.2196**	**0.5701**	**0.0925**	**0.6625**	**238.1385**	**4,208.1587**	**4,446.2972**	**17.1713**	**0.3961**	**4,993.6142**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/7/2022	4/29/2022	5	40	
2	Grading	Grading	5/2/2022	6/24/2022	5	40	
3	Building Construction	Building Construction	6/27/2022	12/15/2023	5	385	

4	Paving	Paving	12/18/2023	1/26/2024	5	30	
5	Architectural Coating	Architectural Coating	1/29/2024	3/8/2024	5	30	

Acres of Grading (Site Preparation Phase): 60

Acres of Grading (Grading Phase): 120

Acres of Paving: 10

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 1,352,157; Non-Residential Outdoor: 450,719; Striped Parking Area: 14,256 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Applied

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	478.00	187.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	96.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3931	0.0000	0.3931	0.2021	0.0000	0.2021	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6617	0.3940	7.6000e-004		0.0323	0.0323		0.0297	0.0297	0.0000	66.8788	66.8788	0.0216	0.0000	67.4195
Total	**0.0634**	**0.6617**	**0.3940**	**7.6000e-004**	**0.3931**	**0.0323**	**0.4254**	**0.2021**	**0.0297**	**0.2317**	**0.0000**	**66.8788**	**66.8788**	**0.0216**	**0.0000**	**67.4195**

3.2 Site Preparation - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	8.3000e-004	9.3100e-003	3.0000e-005	2.8800e-003	1.0000e-005	2.8900e-003	7.6000e-004	1.0000e-005	7.8000e-004	0.0000	2.3531	2.3531	8.0000e-005	7.0000e-005	2.3763
Total	**1.2100e-003**	**8.3000e-004**	**9.3100e-003**	**3.0000e-005**	**2.8800e-003**	**1.0000e-005**	**2.8900e-003**	**7.6000e-004**	**1.0000e-005**	**7.8000e-004**	**0.0000**	**2.3531**	**2.3531**	**8.0000e-005**	**7.0000e-005**	**2.3763**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1769	0.0000	0.1769	0.0909	0.0000	0.0909	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0634	0.6617	0.3940	7.6000e-004		0.0323	0.0323		0.0297	0.0297	0.0000	66.8787	66.8787	0.0216	0.0000	67.4195
Total	**0.0634**	**0.6617**	**0.3940**	**7.6000e-004**	**0.1769**	**0.0323**	**0.2092**	**0.0909**	**0.0297**	**0.1206**	**0.0000**	**66.8787**	**66.8787**	**0.0216**	**0.0000**	**67.4195**

3.2 Site Preparation - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.2100e-003	8.3000e-004	9.3100e-003	3.0000e-005	2.8800e-003	1.0000e-005	2.8900e-003	7.6000e-004	1.0000e-005	7.8000e-004	0.0000	2.3531	2.3531	8.0000e-005	7.0000e-005	2.3763
Total	**1.2100e-003**	**8.3000e-004**	**9.3100e-003**	**3.0000e-005**	**2.8800e-003**	**1.0000e-005**	**2.8900e-003**	**7.6000e-004**	**1.0000e-005**	**7.8000e-004**	**0.0000**	**2.3531**	**2.3531**	**8.0000e-005**	**7.0000e-005**	**2.3763**

3.3 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1841	0.0000	0.1841	0.0731	0.0000	0.0731	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0725	0.7769	0.5808	1.2400e-003		0.0327	0.0327		0.0301	0.0301	0.0000	109.0692	109.0692	0.0353	0.0000	109.9511
Total	**0.0725**	**0.7769**	**0.5808**	**1.2400e-003**	**0.1841**	**0.0327**	**0.2168**	**0.0731**	**0.0301**	**0.1032**	**0.0000**	**109.0692**	**109.0692**	**0.0353**	**0.0000**	**109.9511**

3.3 Grading - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3500e-003	9.2000e-004	0.0103	3.0000e-005	3.2000e-003	2.0000e-005	3.2100e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.6145	2.6145	9.0000e-005	8.0000e-005	2.6403
Total	**1.3500e-003**	**9.2000e-004**	**0.0103**	**3.0000e-005**	**3.2000e-003**	**2.0000e-005**	**3.2100e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.6145**	**2.6145**	**9.0000e-005**	**8.0000e-005**	**2.6403**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0828	0.0000	0.0828	0.0329	0.0000	0.0329	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0725	0.7769	0.5808	1.2400e-003		0.0327	0.0327		0.0301	0.0301	0.0000	109.0691	109.0691	0.0353	0.0000	109.9510
Total	**0.0725**	**0.7769**	**0.5808**	**1.2400e-003**	**0.0828**	**0.0327**	**0.1155**	**0.0329**	**0.0301**	**0.0630**	**0.0000**	**109.0691**	**109.0691**	**0.0353**	**0.0000**	**109.9510**

3.3 Grading - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3500e-003	9.2000e-004	0.0103	3.0000e-005	3.2000e-003	2.0000e-005	3.2100e-003	8.5000e-004	2.0000e-005	8.7000e-004	0.0000	2.6145	2.6145	9.0000e-005	8.0000e-005	2.6403
Total	**1.3500e-003**	**9.2000e-004**	**0.0103**	**3.0000e-005**	**3.2000e-003**	**2.0000e-005**	**3.2100e-003**	**8.5000e-004**	**2.0000e-005**	**8.7000e-004**	**0.0000**	**2.6145**	**2.6145**	**9.0000e-005**	**8.0000e-005**	**2.6403**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1152	1.0541	1.1045	1.8200e-003		0.0546	0.0546		0.0514	0.0514	0.0000	156.4145	156.4145	0.0375	0.0000	157.3514
Total	**0.1152**	**1.0541**	**1.1045**	**1.8200e-003**		**0.0546**	**0.0546**		**0.0514**	**0.0514**	**0.0000**	**156.4145**	**156.4145**	**0.0375**	**0.0000**	**157.3514**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0260	0.6807	0.1928	2.6300e-003	0.0837	7.3300e-003	0.0910	0.0242	7.0100e-003	0.0312	0.0000	252.0573	252.0573	1.9000e-003	0.0380	263.4231
Worker	0.1085	0.0740	0.8340	2.2900e-003	0.2580	1.3200e-003	0.2593	0.0686	1.2200e-003	0.0698	0.0000	210.8944	210.8944	6.8800e-003	6.4000e-003	212.9748
Total	**0.1345**	**0.7547**	**1.0268**	**4.9200e-003**	**0.3416**	**8.6500e-003**	**0.3503**	**0.0927**	**8.2300e-003**	**0.1010**	**0.0000**	**462.9518**	**462.9518**	**8.7800e-003**	**0.0444**	**476.3979**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1152	1.0541	1.1045	1.8200e-003		0.0546	0.0546		0.0514	0.0514	0.0000	156.4144	156.4144	0.0375	0.0000	157.3512
Total	**0.1152**	**1.0541**	**1.1045**	**1.8200e-003**		**0.0546**	**0.0546**		**0.0514**	**0.0514**	**0.0000**	**156.4144**	**156.4144**	**0.0375**	**0.0000**	**157.3512**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0260	0.6807	0.1928	2.6300e-003	0.0837	7.3300e-003	0.0910	0.0242	7.0100e-003	0.0312	0.0000	252.0573	252.0573	1.9000e-003	0.0380	263.4231
Worker	0.1085	0.0740	0.8340	2.2900e-003	0.2580	1.3200e-003	0.2593	0.0686	1.2200e-003	0.0698	0.0000	210.8944	210.8944	6.8800e-003	6.4000e-003	212.9748
Total	**0.1345**	**0.7547**	**1.0268**	**4.9200e-003**	**0.3416**	**8.6500e-003**	**0.3503**	**0.0927**	**8.2300e-003**	**0.1010**	**0.0000**	**462.9518**	**462.9518**	**8.7800e-003**	**0.0444**	**476.3979**

3.4 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1966	1.7981	2.0305	3.3700e-003		0.0875	0.0875		0.0823	0.0823	0.0000	289.7559	289.7559	0.0689	0.0000	291.4791
Total	**0.1966**	**1.7981**	**2.0305**	**3.3700e-003**		**0.0875**	**0.0875**		**0.0823**	**0.0823**	**0.0000**	**289.7559**	**289.7559**	**0.0689**	**0.0000**	**291.4791**

3.4 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0251	1.0271	0.3078	4.6900e-003	0.1550	6.5800e-003	0.1616	0.0448	6.2900e-003	0.0511	0.0000	449.5619	449.5619	2.4400e-003	0.0677	469.7878
Worker	0.1850	0.1199	1.4128	4.1000e-003	0.4777	2.3100e-003	0.4800	0.1270	2.1300e-003	0.1291	0.0000	380.3715	380.3715	0.0114	0.0109	383.9037
Total	**0.2102**	**1.1470**	**1.7206**	**8.7900e-003**	**0.6327**	**8.8900e-003**	**0.6416**	**0.1717**	**8.4200e-003**	**0.1802**	**0.0000**	**829.9335**	**829.9335**	**0.0139**	**0.0786**	**853.6915**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1966	1.7981	2.0305	3.3700e-003		0.0875	0.0875		0.0823	0.0823	0.0000	289.7556	289.7556	0.0689	0.0000	291.4788
Total	**0.1966**	**1.7981**	**2.0305**	**3.3700e-003**		**0.0875**	**0.0875**		**0.0823**	**0.0823**	**0.0000**	**289.7556**	**289.7556**	**0.0689**	**0.0000**	**291.4788**

3.4 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0251	1.0271	0.3078	4.6900e-003	0.1550	6.5800e-003	0.1616	0.0448	6.2900e-003	0.0511	0.0000	449.5619	449.5619	2.4400e-003	0.0677	469.7878
Worker	0.1850	0.1199	1.4128	4.1000e-003	0.4777	2.3100e-003	0.4800	0.1270	2.1300e-003	0.1291	0.0000	380.3715	380.3715	0.0114	0.0109	383.9037
Total	**0.2102**	**1.1470**	**1.7206**	**8.7900e-003**	**0.6327**	**8.8900e-003**	**0.6416**	**0.1717**	**8.4200e-003**	**0.1802**	**0.0000**	**829.9335**	**829.9335**	**0.0139**	**0.0786**	**853.6915**

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.1600e-003	0.0510	0.0729	1.1000e-004		2.5500e-003	2.5500e-003		2.3500e-003	2.3500e-003	0.0000	10.0134	10.0134	3.2400e-003	0.0000	10.0944
Paving	4.3700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.5300e-003**	**0.0510**	**0.0729**	**1.1000e-004**		**2.5500e-003**	**2.5500e-003**		**2.3500e-003**	**2.3500e-003**	**0.0000**	**10.0134**	**10.0134**	**3.2400e-003**	**0.0000**	**10.0944**

3.5 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.7700e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4775	0.4775	1.0000e-005	1.0000e-005	0.4819
Total	**2.3000e-004**	**1.5000e-004**	**1.7700e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4775**	**0.4775**	**1.0000e-005**	**1.0000e-005**	**0.4819**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	5.1600e-003	0.0510	0.0729	1.1000e-004		2.5500e-003	2.5500e-003		2.3500e-003	2.3500e-003	0.0000	10.0134	10.0134	3.2400e-003	0.0000	10.0944
Paving	4.3700e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**9.5300e-003**	**0.0510**	**0.0729**	**1.1000e-004**		**2.5500e-003**	**2.5500e-003**		**2.3500e-003**	**2.3500e-003**	**0.0000**	**10.0134**	**10.0134**	**3.2400e-003**	**0.0000**	**10.0944**

3.5 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.5000e-004	1.7700e-003	1.0000e-005	6.0000e-004	0.0000	6.0000e-004	1.6000e-004	0.0000	1.6000e-004	0.0000	0.4775	0.4775	1.0000e-005	1.0000e-005	0.4819
Total	**2.3000e-004**	**1.5000e-004**	**1.7700e-003**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**6.0000e-004**	**1.6000e-004**	**0.0000**	**1.6000e-004**	**0.0000**	**0.4775**	**0.4775**	**1.0000e-005**	**1.0000e-005**	**0.4819**

3.5 Paving - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8800e-003	0.0953	0.1463	2.3000e-004		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	20.0265	20.0265	6.4800e-003	0.0000	20.1885
Paving	8.7300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0186**	**0.0953**	**0.1463**	**2.3000e-004**		**4.6900e-003**	**4.6900e-003**		**4.3100e-003**	**4.3100e-003**	**0.0000**	**20.0265**	**20.0265**	**6.4800e-003**	**0.0000**	**20.1885**

3.5 Paving - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.7000e-004	3.2800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9308	0.9308	3.0000e-005	3.0000e-005	0.9390
Total	**4.3000e-004**	**2.7000e-004**	**3.2800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9308**	**0.9308**	**3.0000e-005**	**3.0000e-005**	**0.9390**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.8800e-003	0.0953	0.1463	2.3000e-004		4.6900e-003	4.6900e-003		4.3100e-003	4.3100e-003	0.0000	20.0265	20.0265	6.4800e-003	0.0000	20.1884
Paving	8.7300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0186**	**0.0953**	**0.1463**	**2.3000e-004**		**4.6900e-003**	**4.6900e-003**		**4.3100e-003**	**4.3100e-003**	**0.0000**	**20.0265**	**20.0265**	**6.4800e-003**	**0.0000**	**20.1884**

3.5 Paving - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.3000e-004	2.7000e-004	3.2800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.9308	0.9308	3.0000e-005	3.0000e-005	0.9390
Total	**4.3000e-004**	**2.7000e-004**	**3.2800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.9308**	**0.9308**	**3.0000e-005**	**3.0000e-005**	**0.9390**

3.6 Architectural Coating - 2024

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.3168					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7100e-003	0.0183	0.0272	4.0000e-005		9.1000e-004	9.1000e-004		9.1000e-004	9.1000e-004	0.0000	3.8299	3.8299	2.2000e-004	0.0000	3.8353
Total	**6.3195**	**0.0183**	**0.0272**	**4.0000e-005**		**9.1000e-004**	**9.1000e-004**		**9.1000e-004**	**9.1000e-004**	**0.0000**	**3.8299**	**3.8299**	**2.2000e-004**	**0.0000**	**3.8353**

3.6 Architectural Coating - 2024

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1200e-003	2.5500e-003	0.0314	1.0000e-004	0.0115	5.0000e-005	0.0116	3.0600e-003	5.0000e-005	3.1100e-003	0.0000	8.9359	8.9359	2.5000e-004	2.4000e-004	9.0144
Total	**4.1200e-003**	**2.5500e-003**	**0.0314**	**1.0000e-004**	**0.0115**	**5.0000e-005**	**0.0116**	**3.0600e-003**	**5.0000e-005**	**3.1100e-003**	**0.0000**	**8.9359**	**8.9359**	**2.5000e-004**	**2.4000e-004**	**9.0144**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.3168					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7100e-003	0.0183	0.0272	4.0000e-005		9.1000e-004	9.1000e-004		9.1000e-004	9.1000e-004	0.0000	3.8299	3.8299	2.2000e-004	0.0000	3.8353
Total	**6.3195**	**0.0183**	**0.0272**	**4.0000e-005**		**9.1000e-004**	**9.1000e-004**		**9.1000e-004**	**9.1000e-004**	**0.0000**	**3.8299**	**3.8299**	**2.2000e-004**	**0.0000**	**3.8353**

3.6 Architectural Coating - 2024

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1200e-003	2.5500e-003	0.0314	1.0000e-004	0.0115	5.0000e-005	0.0116	3.0600e-003	5.0000e-005	3.1100e-003	0.0000	8.9359	8.9359	2.5000e-004	2.4000e-004	9.0144
Total	**4.1200e-003**	**2.5500e-003**	**0.0314**	**1.0000e-004**	**0.0115**	**5.0000e-005**	**0.0116**	**3.0600e-003**	**5.0000e-005**	**3.1100e-003**	**0.0000**	**8.9359**	**8.9359**	**2.5000e-004**	**2.4000e-004**	**9.0144**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5673	3.1789	5.9665	0.0260	2.1254	0.0340	2.1594	0.5701	0.0323	0.6023	0.0000	2,460.5352	2,460.5352	0.0536	0.2025	2,522.2291
Unmitigated	0.5673	3.1789	5.9665	0.0260	2.1254	0.0340	2.1594	0.5701	0.0323	0.6023	0.0000	2,460.5352	2,460.5352	0.0536	0.2025	2,522.2291

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
Unrefrigerated Warehouse-No Rail	1,920.06	1,920.06	1920.06	5,605,645	5,605,645
Total	1,920.06	1,920.06	1,920.06	5,605,645	5,605,645

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Unrefrigerated Warehouse-No	9.50	7.30	7.30	59.00	0.00	41.00	92	5	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.515888	0.053153	0.175761	0.156529	0.025865	0.006829	0.014141	0.022504	0.000707	0.000289	0.023863	0.001496	0.002975
Unrefrigerated Warehouse-No Rail	0.400521	0.200260	0.200260	0.000000	0.000000	0.076042	0.000000	0.102083	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	781.6875	781.6875	0.1265	0.0153	789.4170
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	781.6875	781.6875	0.1265	0.0153	789.4170
NaturalGas Mitigated	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	861.5456	861.5456	0.0165	0.0158	866.6653
NaturalGas Unmitigated	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	861.5456	861.5456	0.0165	0.0158	866.6653

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	1.61448e+007	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	861.5456	861.5456	0.0165	0.0158	866.6653
Total		**0.0871**	**0.7914**	**0.6648**	**4.7500e-003**		**0.0602**	**0.0602**		**0.0602**	**0.0602**	**0.0000**	**861.5456**	**861.5456**	**0.0165**	**0.0158**	**866.6653**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	1.61448e+007	0.0871	0.7914	0.6648	4.7500e-003		0.0602	0.0602		0.0602	0.0602	0.0000	861.5456	861.5456	0.0165	0.0158	866.6653
Total		**0.0871**	**0.7914**	**0.6648**	**4.7500e-003**		**0.0602**	**0.0602**		**0.0602**	**0.0602**	**0.0000**	**861.5456**	**861.5456**	**0.0165**	**0.0158**	**866.6653**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	83160	7.6943	1.2400e-003	1.5000e-004	7.7704
Unrefrigerated Warehouse-No Rail	8.36534e+006	773.9932	0.1252	0.0152	781.6467
Total		**781.6875**	**0.1265**	**0.0153**	**789.4170**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	83160	7.6943	1.2400e-003	1.5000e-004	7.7704
Unrefrigerated Warehouse-No Rail	8.36534e+006	773.9932	0.1252	0.0152	781.6467
Total		**781.6875**	**0.1265**	**0.0153**	**789.4170**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	4.1689	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285
Unmitigated	4.1689	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6317					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.5359					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2700e-003	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285
Total	**4.1689**	**1.2000e-004**	**0.0137**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0267**	**0.0267**	**7.0000e-005**	**0.0000**	**0.0285**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6317					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	3.5359					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.2700e-003	1.2000e-004	0.0137	0.0000		5.0000e-005	5.0000e-005		5.0000e-005	5.0000e-005	0.0000	0.0267	0.0267	7.0000e-005	0.0000	0.0285
Total	**4.1689**	**1.2000e-004**	**0.0137**	**0.0000**		**5.0000e-005**	**5.0000e-005**		**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0267**	**0.0267**	**7.0000e-005**	**0.0000**	**0.0285**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	170.4978	6.8095	0.1624	389.1406
Unmitigated	170.4978	6.8095	0.1624	389.1406

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	208.458 / 0	170.4978	6.8095	0.1624	389.1406
Total		**170.4978**	**6.8095**	**0.1624**	**389.1406**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	208.458 / 0	170.4978	6.8095	0.1624	389.1406
Total		**170.4978**	**6.8095**	**0.1624**	**389.1406**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	172.0044	10.1652	0.0000	426.1336
Unmitigated	172.0044	10.1652	0.0000	426.1336

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	847.35	172.0044	10.1652	0.0000	426.1336
Total		**172.0044**	**10.1652**	**0.0000**	**426.1336**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Unrefrigerated Warehouse-No Rail	847.35	172.0044	10.1652	0.0000	426.1336
Total		**172.0044**	**10.1652**	**0.0000**	**426.1336**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

HEALTH RISK ASSESSMENT

APPENDIX B

HEALTH RISK ASSESSMENT

LSA

CARLSBAD
CLOVIS
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

MEMORANDUM

DATE: December 10, 2021

TO: Paul Starn, Scannell Properties
Jake Kurth, Scannell Properties

FROM: Amy Fischer, Principal
Cara Carlucci, Senior Planner

SUBJECT: Health Risk Assessment for the 2740 West Nielsen Avenue Office/Warehouse Project

LSA has prepared a health risk assessment (HRA) for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project) in the City of Fresno (City), Fresno County, California. An HRA is a process used to estimate the increased health risk levels for people living and/or working near a project that emits toxic air contaminants (TACs). An HRA combines the results of studies on the health effects of various animal and human exposure to TACs with the results of studies that estimate exposure levels at different distances from pollutant sources. The purpose of this HRA is to determine the increased cancer and noncancer health risks from project-related emissions of TACs in the exhaust of diesel-powered trucks and equipment on existing nearby sensitive receptors.

This HRA has been prepared in accordance with policies and procedures of the State Office of Environmental Health Hazard Assessment (OEHHA) and the San Joaquin Valley Air Pollution Control District (SJVAPCD). This HRA evaluates the project against the significance criteria established by the SJVAPCD and is in compliance with all other applicable requirements.

PROJECT DESCRIPTION

The currently vacant 48.03-acre project site is located at 2740 West Nielsen (Assessor's Parcel Numbers 458-020-71 and 458-020-72) in the City of Fresno (City), in Fresno County (County), California. The project site is bounded to the north by vacant, undeveloped land, to the east by North Hughes Avenue, to the south by West Nielsen Avenue, and to the east by North Marks Avenue.

The project would result in the construction of a four office/warehouse buildings that would be configured for heavy industrial uses by tenants that have not been identified. The proposed buildings would result in a total gross floor area of approximately 901,438 square feet. The buildings' exterior would be up to 44 feet high with an interior height of up to 36 feet and designed with a total of 201 loading dock doors on the north and south sides of the buildings. The four buildings would be comprised of the following: Building 1 would be 468,812 square feet and would provide 122 loading dock doors; Building 2 would be 248,786 square feet and would provide 46 loading dock doors; Building 3 would be 93,074 square feet and would provide 18 loading dock doors; and Building 4 would be 90,766 square feet and would provide 15 loading dock doors.

As identified above, future tenants that have not been identified. Therefore, this analysis assumes that the proposed project would be operational 24-hours per day, 7 days per week; however, it is likely that future tenants may operate on a typical 9:00 a.m. to 5:00 p.m. schedule.

Vehicular access to the site would be provided by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue.

A total of 594 on-site parking spaces would be provided for vehicles and trucks. Of the 594 parking spaces, 385 spaces would be dedicated for standard vehicles, 11 spaces would be dedicated for accessible standard vehicles, and 10 spaces would be dedicated for accessible vans. The remaining 188 spaces would be dedicated for trailers and would be located along the eastern and western edges of the project site and would be located behind two 8-foot tall gates, which would be installed to separate the general parking area from the truck storage and dock loading area.

Construction of the proposed project is anticipated to occur in two phases occurring over a total 24-month period starting in the first quarter of 2022 and ending in 2024. The first phase would include the construction of Buildings 2, 3, and 4 and would occur for 12 months. The second phase would include the construction of Building 1 and would occur for 12 months. The proposed project would comply with City standards, including the City's current building code, landscape standards, and lighting standards. In addition, the proposed project would be graded similar to other developments throughout the City.

BACKGROUND

This section provides a discussion of the regulatory guidance from the California Air Resources Board (CARB), the California Air Pollution Control Officers Association (CAPCOA), and the SJVAPCD.

California Air Resources Board Handbook and Technical Advisory

CARB has developed an *Air Quality and Land Use Handbook* (CARB Handbook;)[1] and a supplement, *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory*[2], which are intended to serve as general reference guides for evaluating and reducing air pollution impacts associated with new projects that are part of the land use decision-making process. According to the CARB Handbook, recent air pollution studies have shown an association between both respiratory and other noncancer health effects and proximity to high-traffic roadways and other land uses associated with high volume truck traffic. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall

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[1] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April. Website: www.arb.ca.gov/ch/handbook.pdf (accessed July 2021).

[2] California Air Resources Board, 2017. *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory*. April. Website: www.arb.ca.gov/ch/rd_technical_analysis_fact_sheet.pdf (accessed July 2021).

cancer risk from airborne toxics in California. The CARB Handbook recommends that planning agencies recognize that the configuration of industrial operations can reduce population exposure and risk. For example, locating the main entry and exit points away from sensitive land uses helps to reduce cancer risks and other health impacts.

California Air Pollution Control Officers Association

In 2009, CAPCOA published guidance[1] on assessing the health risk impacts for land use projects. The guidance focused on the acute, chronic, and cancer impacts of sources affected by the California Environmental Quality Act (CEQA) and recommended procedures to identify when a project should undergo further risk evaluation, how to conduct the HRA, how to engage the public, what to do with the results from the HRA, and what mitigation measures may be appropriate for various land use projects.

San Joaquin Valley Air Pollution Control District

Toxic air emissions are regulated under the SJVAPCD's Integrated Air Toxic Program. This program integrates the State and federal requirements and is aimed at protecting public health. These guidelines incorporate the OEHHA guidance and the options to be selected when using the CARB's Hotspots Analysis and Reporting Program Version 2 (HARP2) program for risk assessment calculations.

City of Fresno

This HRA is intended to meet the requirements of the City of Fresno General Plan Program Environmental Impact Report (PEIR), which requires the implementation of the following air quality mitigation measure applicable to the project:

> **GP PEIR Mitigation Measure AIR-3.1:** Prior to future discretionary approval for projects that require environmental evaluation under CEQA, the City of Fresno shall evaluate new development proposals for new industrial or warehousing land uses that: (1) have the potential to generate 100 or more truck trips per day or have 40 or more trucks with operating diesel-powered transport refrigeration units, and (2) are within 1,000 feet of a sensitive land use (e.g., residential, schools, hospitals, or nursing homes), as measured from the property line of the project to the property line of the nearest sensitive use. Such projects shall submit a Health Risk Assessment (HRA) to the City Planning and Development Department. The HRA shall be prepared in accordance with policies and procedures of the most current State Office of Environmental Health Hazard Assessment (OEHHA) and the SJVAPCD. If the HRA shows that the incremental health risks exceed their respective thresholds, as established by the SJVAPCD at the time a project is considered, the Applicant will be required to identify and demonstrate that best available control technologies for

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[1] California Air Pollution Control Officers Association, 2009. *Health Risk Assessments for Proposed Land Use Projects*. July. Website: www.capcoa.org/wp-content/uploads/2012/03/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf (accessed July 2021).

toxics (T-BACTs), including appropriate enforcement mechanisms to reduce risks to an acceptable level. T-BACTs may include, but are not limited to:

- Restricting idling on site or electrifying warehousing docks to reduce diesel particulate matter;
- Requiring use of newer equipment and/or vehicles;
- Provide charging infrastructure for: electric forklifts, electric yard trucks, local drayage trucks, last mile delivery trucks, electric and fuel-cell heavy duty trucks; and/or
- Install solar panels, zero-emission backup electricity generators, and energy storage to minimize emissions associated with electricity generation at the project site.
- T-BACTs identified in the HRA shall be identified as mitigation measures in the environmental document and/or incorporated into the site plan.

The City will, in addition to noticing procedures in the Development Code, notice all residents within 1,000 feet of a proposed warehouse project before any discretionary project approval, and consider "Warehouse Projects: Best Practices and Mitigation Measure to comply with the California Environmental Quality Act" published in March 2021 by Xavier Becerra, Attorney General State of California before any discretionary approval of a specific warehouse project where applicable.

SETTING

Regional Air Quality

The project site is located in the City of Fresno, California, which is part of the San Joaquin Valley Air Basin (Basin) and is under the jurisdiction of the SJVAPCD.

Climate/Meteorology

Air quality in the project area is not only affected by various emission sources (e.g., mobile and industrial) but also by atmospheric conditions (e.g., wind speed, wind direction, temperature, and rainfall). The nearest representative meteorological station that provides the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) ready meteorological data is the Fresno Meteorological Station, which is about 6.75 miles from the project site. Figure 1 shows the wind rose[1] from data measured at this station and the wind patterns for the project area.

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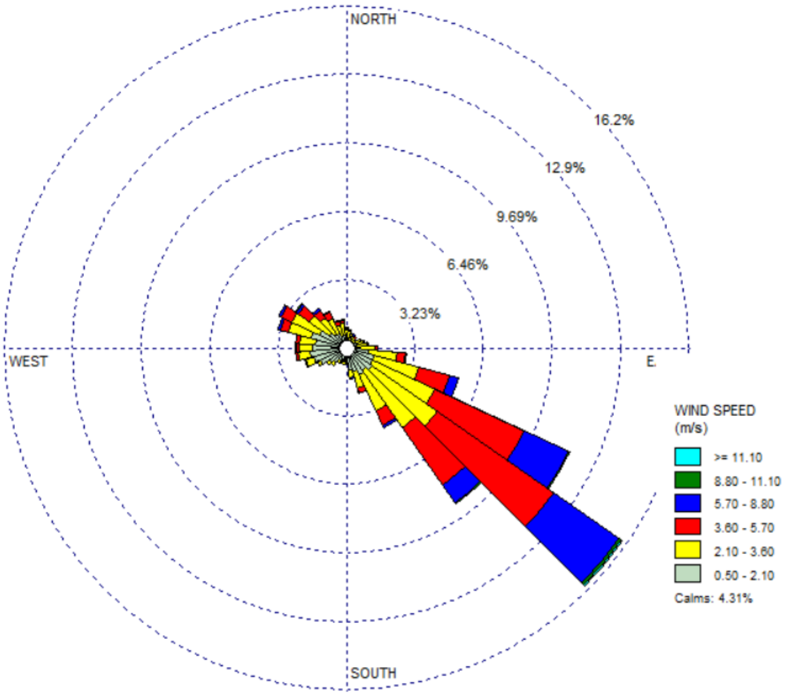
[1] A wind rose provides a succinct view of how wind speed and direction are typically distributed at a particular location. Presented in a circular format, the wind rose shows the frequency of winds blowing from particular directions.



Source: SJVAPCD Meteorological Data for AERMOD.

Figure 1: Project Area Wind Patterns

Toxic Air Contaminants

The public's exposure to TACs is a significant environmental health issue in the State of California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health. Health and Safety Code §39655 defines a TAC as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health." A substance that is listed as a hazardous air pollutant pursuant to Subsection (b) of United States Code [USC] Title 42, Section 7412, is a TAC. Under State law, the California Environmental Protection Agency (CalEPA), acting through CARB, is authorized to identify a substance as a TAC if it determines the substance is an air pollutant that may cause or contribute to an increase in mortality or an increase in serious illness, or that may pose a present or potential hazard to human health.

California regulates TACs primarily through Assembly Bill (AB) 1807 (the Tanner Air Toxics Act), AB 2588 (the Air Toxics "Hot Spot" Information and Assessment Act of 1987), and Senate Bill (SB) 25 (the Children's Environmental Health Protection Act). The Tanner Air Toxics Act sets forth a formal procedure for CARB to designate substances as TACs. Once TACs are identified, CARB adopts an "airborne toxics control measure" for sources that emit designated TACs. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure to below that threshold. If there is no safe threshold, the measure must incorporate toxics best available control technology (T-BACT) to minimize emissions.

Air toxics from stationary sources are also regulated in California under the Air Toxics "Hot Spot" Information and Assessment Act of 1987 (AB 2588). Under AB 2588, TAC emissions from individual facilities are quantified and prioritized by the designated air quality management district or air pollution control district. High-priority facilities are required to perform an HRA and, if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

To date, CARB has designated nearly 200 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM).

THRESHOLDS OF SIGNIFICANCE

Both the State and federal governments have established health-based ambient air quality standards (AAQS) for seven air pollutants. For other air pollutants without defined significance standards, the definition of substantial pollutant concentrations varies. For TACs, "substantial" is taken to mean that the individual health risk exceeds a threshold considered to be a prudent risk management level.

The following limits for maximum individual cancer risk (MICR) and noncancer acute and chronic Hazard Index (HI) from project emissions of TACs are considered appropriate for use in determining the health risk for projects in the Basin:

- **MICR:** MICR is the estimated probability of a maximum exposed individual (MEI) contracting cancer as a result of exposure to TACs over a period of 70 years for adults and 9 years for children in residential locations, 350 days per year. As a conservative measure, the SJVAPCD does not recognize indoor adjustments for residents. However, the typical person spends the majority of their time indoors versus remaining outdoors 24 hours per day, 350 days per year. The MICR calculations include multi-pathway consideration, when applicable.

  The SJVAPCD's *Update to the District's Risk Management Policy to Address the OEHHA Revised Risk Assessment Guidance Document*[1] states that emissions of TACs are considered significant if an HRA shows an increased risk of greater than 20 in 1 million. Thus, the cumulative increase in MICR that is the sum of the calculated MICR values for all TACs would be considered significant if it would result in an increased MICR greater than 20 in 1 million (2.0×10^{-5}) at any receptor location.

- **Chronic HI:** Chronic HI is the ratio of the estimated long-term level of exposure to a TAC for a potential MEI to its chronic reference exposure level. The chronic HI calculations include multi-pathway consideration when applicable. The project would be considered significant if the

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[1] San Joaquin Valley Air Pollution Control District, 2015. *Update to District's Risk Management Policy to Address OEHHA's Revised Risk Assessment Guidance Document*. Website: www.valleyair.org/busind/pto/staff-report-5-28-15.pdf (accessed July 2021).

cumulative increase in total chronic HI for any target organ system would exceed 1.0 at any receptor location.

- **Acute HI:** Acute HI is the ratio of the estimated maximum 1-hour concentration of a TAC for a potential MEI to its acute reference exposure level. The project would be considered significant if the cumulative increase in total acute HI for any target organ system would exceed 1.0 at any receptor location.

The SJVAPCD Governing Board first adopted thresholds for land use projects in 1995 in the *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI).[1] The GAMAQI was revised in 2002 and 2015 but retained the original health risk thresholds. The previous project TAC threshold of 10 in 1 million was revised to 20 in 1 million, with the update to the SJVAPCD Risk Management Policy effective July 1, 2015.

IMPACT ANALYSIS

For the purposes of an HRA, short-term emissions are of concern for analyzing acute health impacts, and long-term emissions are of concern for analyzing chronic and carcinogenic health impacts. A screening-level multi-pathway assessment has been conducted. This technique was chosen as recommended in the OEHHA *Air Toxic Hot Spots Program Risk Assessment Guidelines*.[2] The analysis herein has been conducted in accordance with the guidelines in the SJVAPCD GAMAQI and the SJVAPCD *Guidance for Air Dispersion Modeling*[3].

This HRA has been conducted using three models: (1) CARB's California Emissions Factor Model, Version 2021 (EMFAC2021) for on-road vehicle emissions factors and percentages of fuel type within the overall vehicle fleet; (2) the United States Environmental Protection Agency's (USEPA) AERMOD air dispersion model to determine how the TACs would move through the atmosphere after release from sources both on site and on surrounding roadways; and (3) CARB's HARP2 model to translate the pollutant concentrations from AERMOD into individual health risks at any sensitive receptor locations surrounding the project site.

The OEHHA has determined that long-term exposure to diesel exhaust particulates poses the highest cancer risk of any TAC it has evaluated. Exposure to diesel exhaust can also have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. In studies with human volunteers, DPM made people with allergies more susceptible to the materials to which they were allergic, such as dust and pollen. Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory

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[1] San Joaquin Valley Air Pollution Control District, 2015. *Guidance for Assessing and Mitigating Air Quality Impacts.* Website: www.valleyair.org/transportation/GAMAQI_3-19-15.pdf (accessed July 2021).

[2] California Environmental Protection Agency Office of Environmental Health Hazard Assessment, 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. March. Website: https://oehha.ca.gov/air/air-toxics-hot-spots (accessed July 2021).

[3] San Joaquin Valley Air Pollution Control District, 2006. *Guidance for Air Dispersion Modeling*. Website: www.valleyair.org/busind/pto/Tox_Resources/Modeling%20Guidance.pdf (accessed July 2021).

symptoms and increase the frequency or intensity of asthma attacks. For risk assessment procedures, the OEHHA specifies that the surrogate for whole diesel exhaust is DPM.

The conservative nature of this analysis is due primarily to the following three factors:

- The CARB-adopted diesel exhaust unit risk factor (URF) of 300 in 1 million per microgram per cubic meter (µg/m^3) is based on the upper 95th percentile of estimated risk for each of the epidemiological studies used to develop the URF. Therefore, the risk factor is already representative of the conservative risk posed by DPM.

- The risk estimates assume sensitive receptors would be subject to DPM 24 hours per day, 350 days per year. As a conservative measure, SJVAPCD does not recognize indoor adjustments for residents. However, typical people spend the majority of their time indoors versus remaining outdoors 24 hours per day, 350 days per year.

- The exposure to DPM is assumed to be constant for the given period analyzed (i.e., 70 years). However, emissions from DPM are expected to substantially decrease in the future with the implementation of standard regulatory requirements and technological advancement to reduce DPM.

- The emissions derived assume that every truck accessing the project site will idle for 15 minutes.

Improvements over the last 40 years to diesel fuel and diesel engines have resulted in lower emissions of some of these contaminants. These improvements have resulted in a 75 percent reduction in particle emissions from diesel-powered trucks and other equipment result in an 85 percent reduction as compared to 2000 levels.[1] These improvements are anticipated to continue into the foreseeable future.

Emission Sources

The first step of an HRA is to characterize the project-related emissions of TACs. The proposed project would generate a total of 1,920 daily trips, with up to 342 truck trips per day.[2] The trucks would access the site by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue. As identified in the Project Description, Building 1 would provide 122 loading dock doors; Building 2 would provide 46 loading dock doors; Building 3 would provide 18 loading dock doors; and Building 4 would provide 15 loading dock doors. As such, the proposed project would have a total of 201 loading dock doors. As the project would contain multiple loading docks, offsite queuing of trucks is not anticipated. While the TAC emissions from gasoline-powered vehicles have a small health effect compared to DPM, this HRA includes both gasoline- and diesel-powered vehicle emissions. For the diesel exhaust emissions, it is sufficient to only consider the DPM (particulate matter less than 10

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[1] California Environmental Protection Agency Office of Environmental Health Hazard Assessment, and the American Lung Association of California, 2001. *Health Effects of Diesel Exhaust*. May 21. Website: https://oehha.ca.gov/air/health-effects-diesel-exhaust (accessed July 2021).

[2] LSA, 2021. *Traffic Impact Study 2740 West Nielsen Avenue Warehouse Project, City of Fresno, Fresno County, California.* November.

microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]) portions of the exhaust; all the TACs for the gasoline exhaust emissions are contained in the reactive organic gas (ROG) emissions. Using speciation data from CARB, the emission rates of the TAC components are derived from the total ROG emissions. This data is attached.

Project trucks would operate in two modes: stationary idling and moving on and off the site. The emissions from trucks while idling result in a much higher concentration of TACs at nearby sensitive receptors compared to the emissions from moving trucks. This is due to the dispersion of emissions that occurs with distance and with travel of the vehicle. For this HRA, the truck travel emissions were modeled as a series of volume sources along the on-site driveway and along East Avenue going north and south of the site driveway. LSA assumed vehicles traveling on site would maneuver slowly, averaging approximately 5-15 miles per hour (mph), and that vehicles traveling on roadways would average 5-55 mph.

The idling emissions of trucks operating on the project site were modeled as point sources within the area sources representing the planned loading docks. EMFAC2021 was used to determine the emissions factors of idling and operating diesel trucks to determine the total emissions of DPM. While it is expected that the truck emissions rate will continue to reduce over time, an HRA only allows for a single emission rate to represent the entire 70-year exposure period. The use of emissions factors for the year 2022, was used as a conservative estimate of emissions, although, the project is not expected to be fully operational until 2024.

The tables in the attachment show the development of the exhaust emission rates for the trucks while operating both on the project site and on North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue. The tables show the average daily traffic for the project on each stretch of road by vehicle category. The PM_{10}, emissions factors for trucks at the average vehicle speed of 5-15 mph on site and 5-55 mph on roadways are also shown. Because the AERMOD dispersion model cannot use emissions in grams per mile, emissions are converted to grams per second.

American Meteorological Society/Environmental Protection Agency Regulatory Model Dispersion Modeling

In order to assess the dispersion of emissions associated with the project, air dispersion modeling was performed using AERMOD. The model is approved by the USEPA when estimating the air quality impacts associated with point and fugitive sources in simple and complex terrain. The model was used to calculate the annual average pollutant concentrations associated with each emitting source. Inputs for each emitting source were based on the characterizations described above. Details of these inputs are attached.

For the volume sources used to represent on-road mobile source activity, vertical (sigma z) dispersion parameters were developed as described in the SJVAPCD's modeling guidance for trucks. For the truck unloading locations, individual point sources represent the trucks idling at each loading dock. For all the idling sources, the release parameters were set to the SJVAPCD default parameters.

The model requires additional input parameters, including local meteorology. Due to the model's sensitivity to individual parameters (e.g., wind speed, temperature, and direction), the USEPA recommends meteorological data used as input into dispersion models be selected on the basis of relative spatial and temporal conditions that exist in the area of concern. As such, 5 years of meteorological data from SJVAPCD's Fresno Monitoring Station[1] (the nearest available station) was used to represent local weather conditions and prevailing winds. Figure 2 shows the graphical representation of the wind patterns.

Receptors were placed at the nearest sensitive receptor locations, as shown on Figure 2.

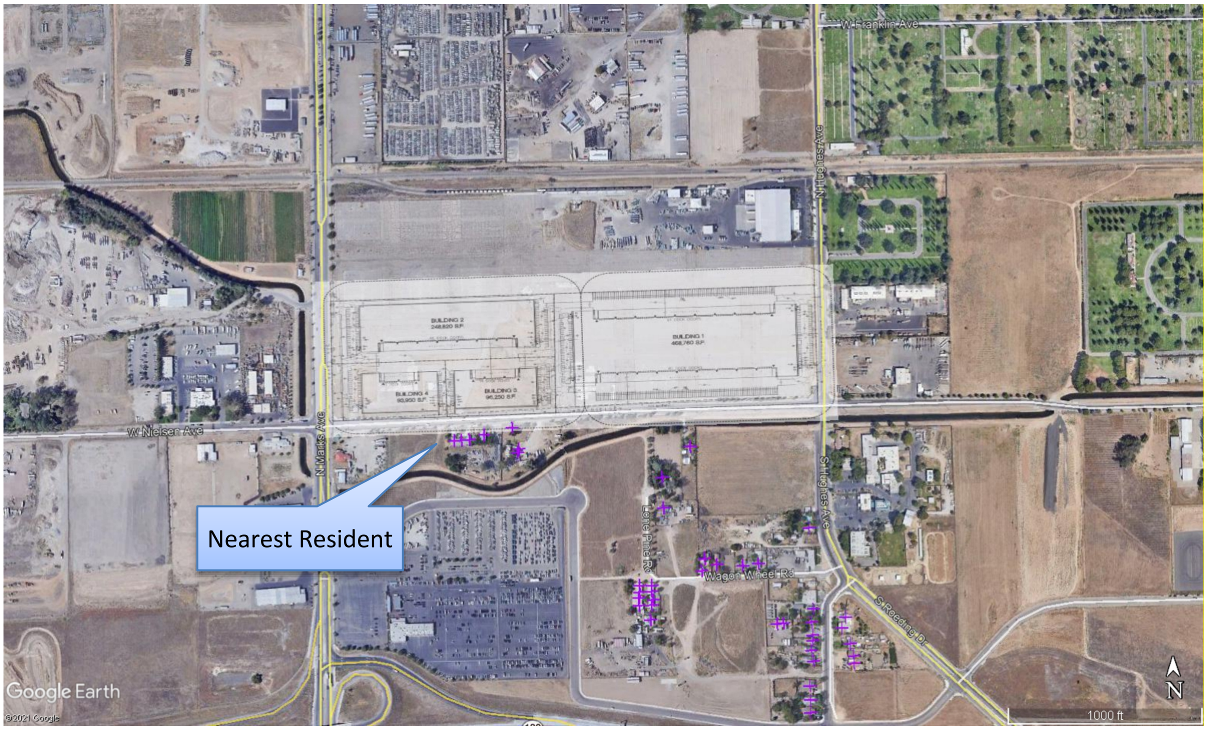

Figure 2: Model Receptor Locations

HOTSPOTS ANALYSIS AND REPORTING PROGRAM MODELING

CARB's HARP2 model is a tool that assists with the programmatic requirements of the Air Toxics "Hot Spots" Program (AB 2588). HARP2 was used to translate the TAC concentrations from AERMOD into long-term carcinogenic and chronic, and short-term acute health risk levels following the guidance in the SJVAPCD risk assessment guidelines. These guidelines specify a minimum set of TAC pathways and HARP2 modeling options for the carcinogenic assessment. To estimate chronic noncancer risks at residential receptors, the "OEHHA-Derived Method" risk-calculation option was used. Following the OEHHA guidance, an 8-hour chronic noncancer risk was calculated for residential receptors because the project would operate more than 8 hours per day and 5 days per week.

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[1] San Joaquin Valley Air Pollution Control District (SJVAPCD). Meteorological Data for AERMOD. Website: http://www.valleyair.org/busind/pto/Tox_Resources/AirQualityMonitoring.htm (accessed July 2021).

The dose-response relationship for a specific pollutant describes the association between exposure and the observed response (health effect). In other words, the relationship estimates how different levels of exposure to a pollutant change the likelihood and severity of health effects. The dose-response relationship (the response occurring with increasing doses) varies with each pollutant, individual sensitivity, and type of health effect. Combining the results of the emission characterization and dispersion modeling described above with the dose-response assessment gives an estimate of the increased health risk for an individual exposed to the maximum predicted long-term concentrations of TACs.

Discrete variants for daily breathing rates, exposure frequency, and exposure duration were obtained from relevant distribution profiles presented in the OEHHA guidance document entitled *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*[1] and guidance from SJVAPCD. The risk calculation outputs are attached.

Carcinogenic and Chronic Project-Related Emission Impact Results

The carcinogenic and chronic health risks from the proposed project are also shown in Table A. The residential risk incorporates both the risk for a child living in a nearby residence for 9 years (the standard period of time for child risk) and an adult living in a nearby residence for 70 years (considered a conservative period of time for an individual to live in any one residence).

For the nearest residential receptor, the maximum cancer risk for the MEI would be 6.154 in 1 million, which is less than the threshold of 20 in 1 million. The chronic health risks from the project's activity would be 0.001, which would not exceed the threshold of 1.0. In addition, the total acute hazard index would be 0.001, which would also not exceed the threshold of 1.0.

For the nearest worker receptor, the maximum cancer risk for the MEI would be 0.417 in 1 million, less than the threshold of 20 in 1 million. The chronic health risks from the project's activity would be 0.001, which would not exceed the threshold of 1.0. In addition, the total acute hazard index would be 0.001, which would also not exceed the threshold of 1.0.

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[1] California Environmental Protection Agency (CalEPA) Office of Environmental Health Hazard Assessment, 2015. op. cit.

Table A: Health Risk Levels for Existing Residents near the Project Site

	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index	Acute Inhalation Hazard Index
Maximally Exposed Resident	6.154	0.001	0.001
Maximally Exposed Worker	0.417	0.001	0.001
SJVAPCD Significance Threshold	**20**	**1.00**	**1.0**
Significant?	**No**	**No**	**No**

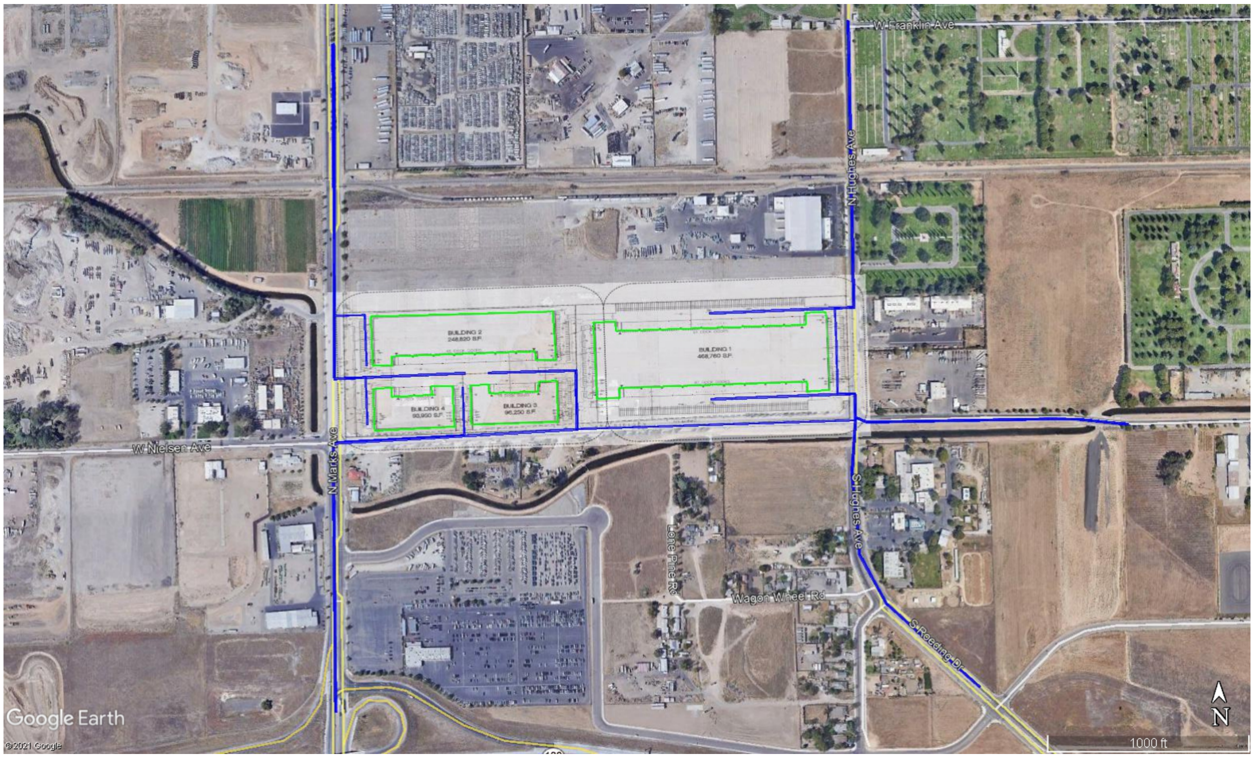
Source: LSA (August 2021).
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SJVAPCD = San Joaquin Valley Air Pollution Control District
µg/m^3 = micrograms per cubic meter

As these results show, all health risk levels to nearby residents from project-related emissions of TACs would be well below the SJVAPCD's HRA thresholds. No significant health risk would occur from project-related emissions, and no mitigation is necessary. The HARP modeling reports and AERMOD information are attached.

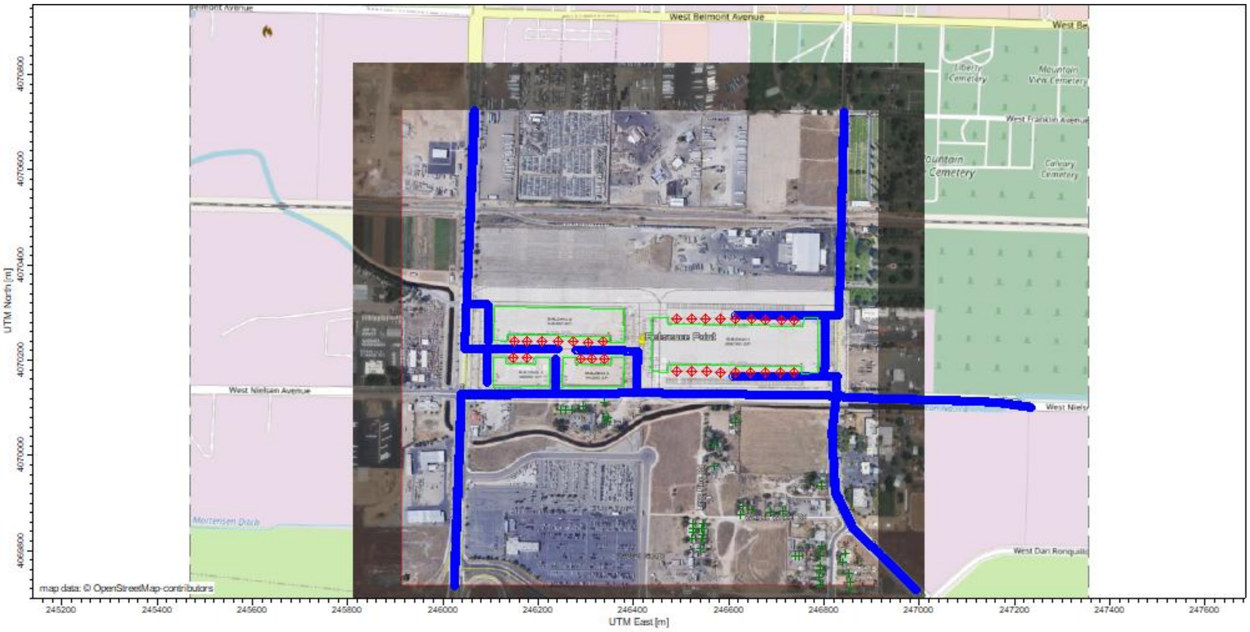
Attachment: HRA Model Output

Project Location

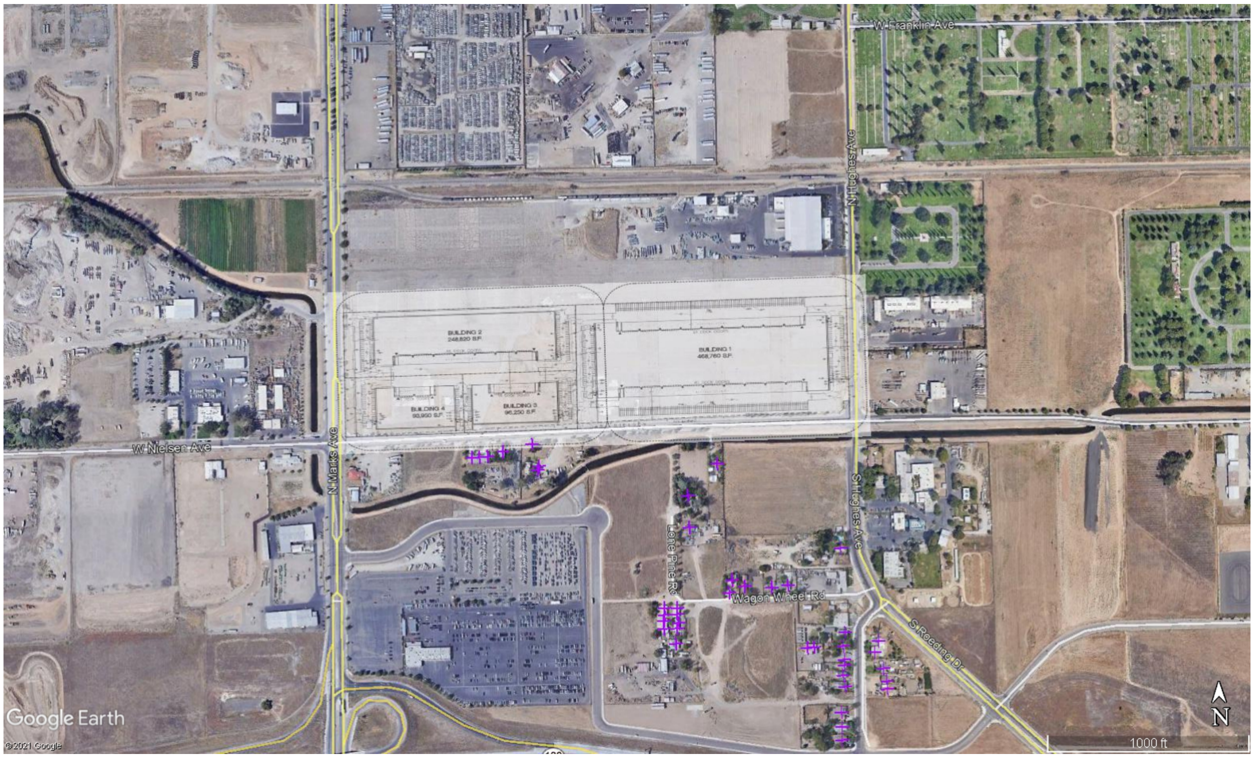
Project Emission Sources



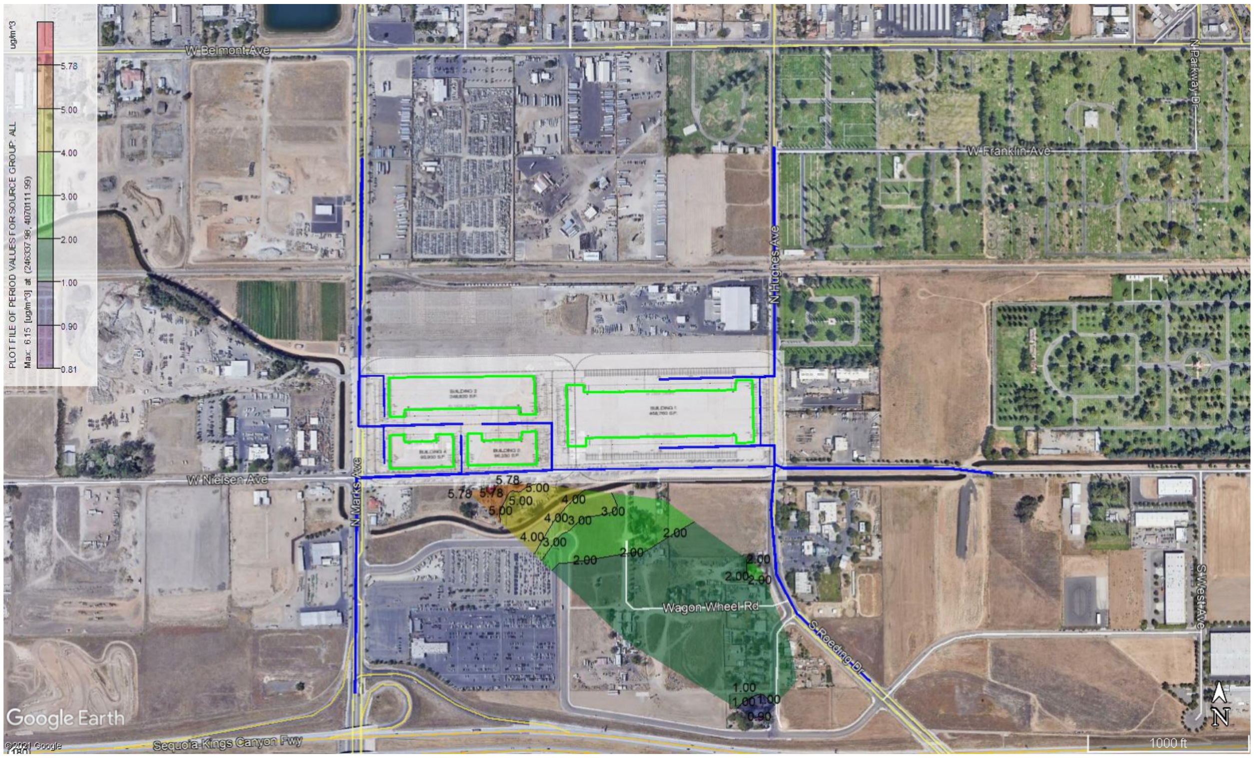
Project Source Locations



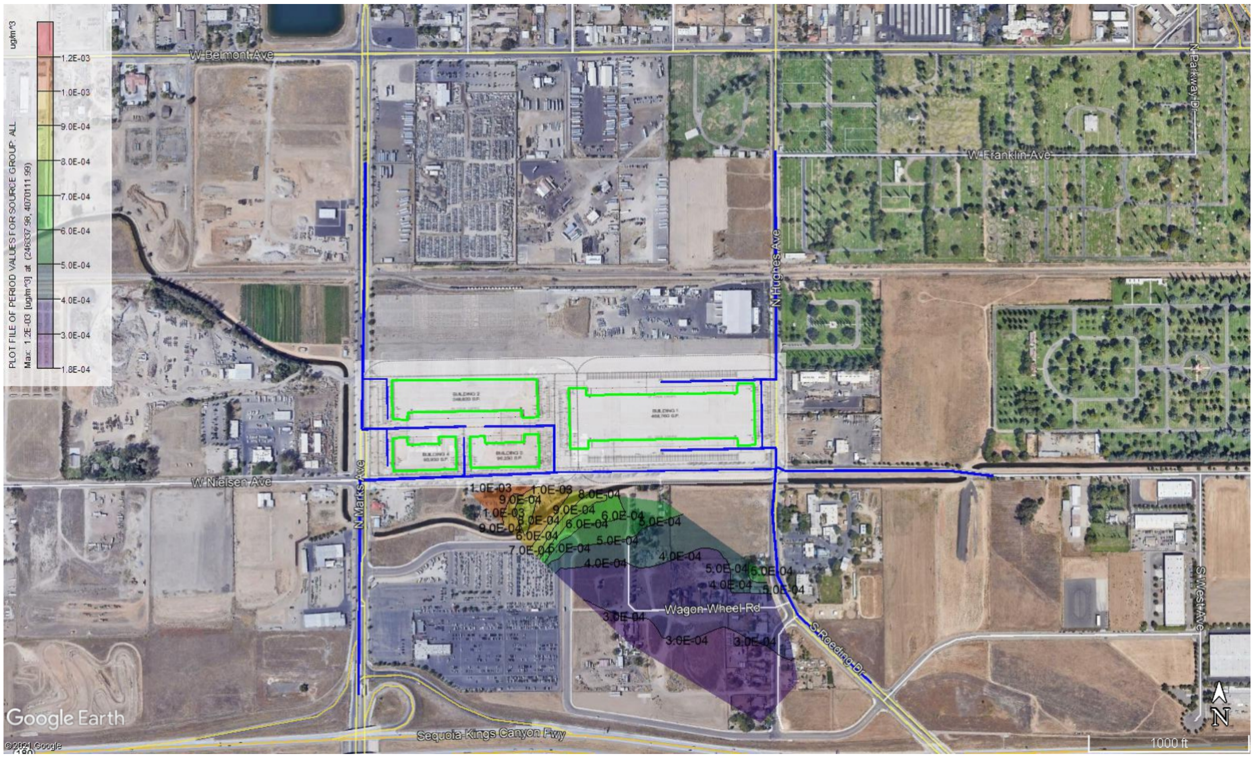
Residential Receptors



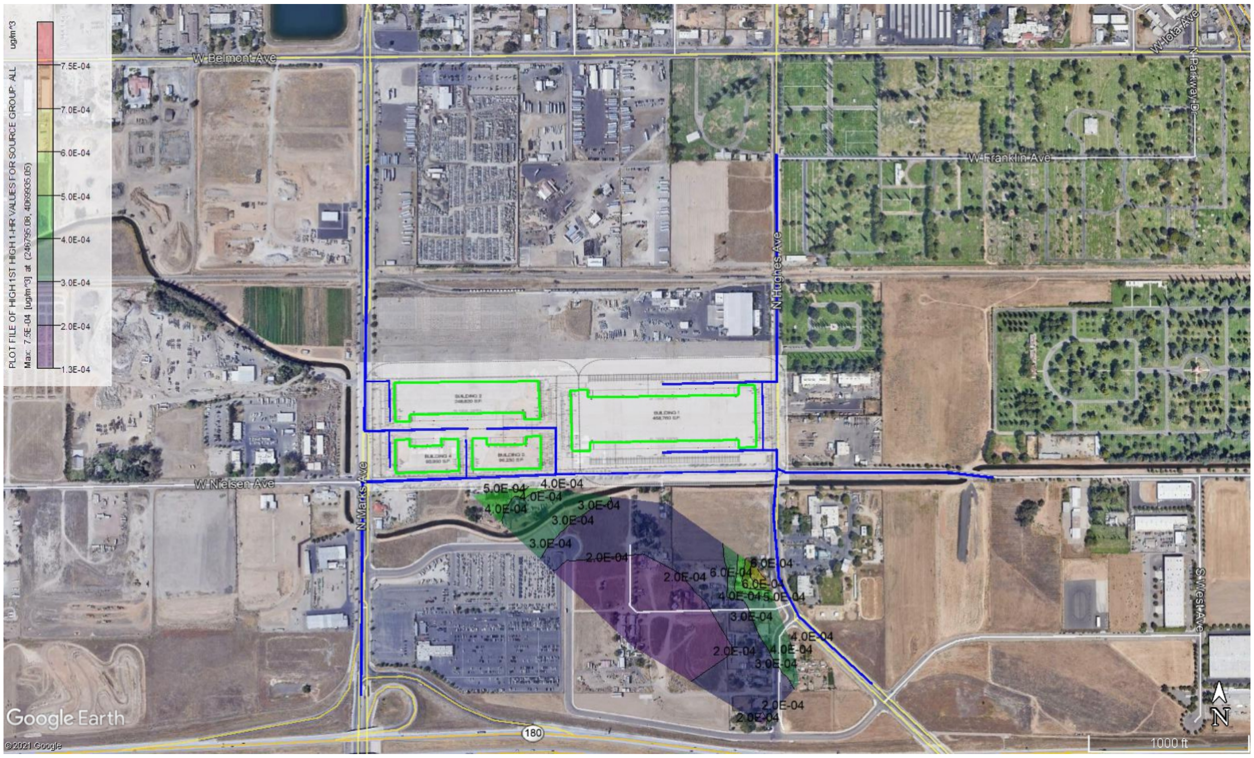
Residential Cancer Risk



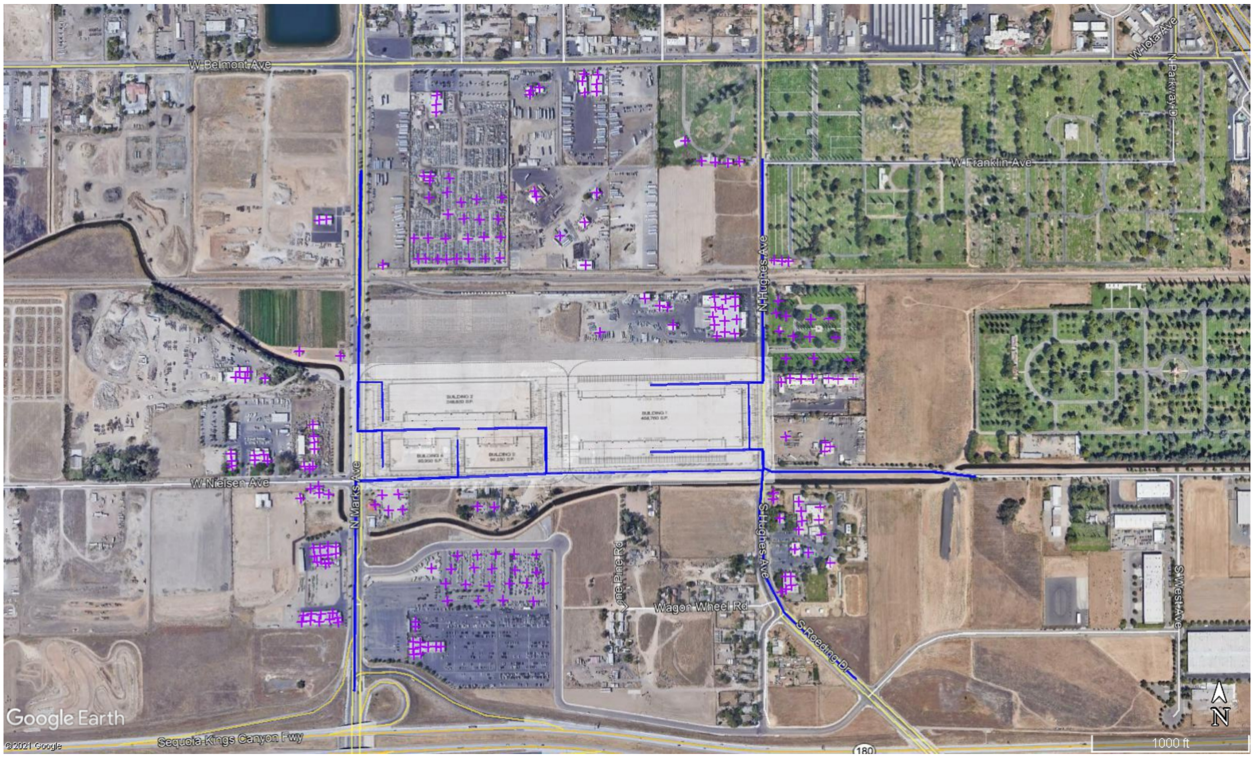
Residential Chronic Hazard Index



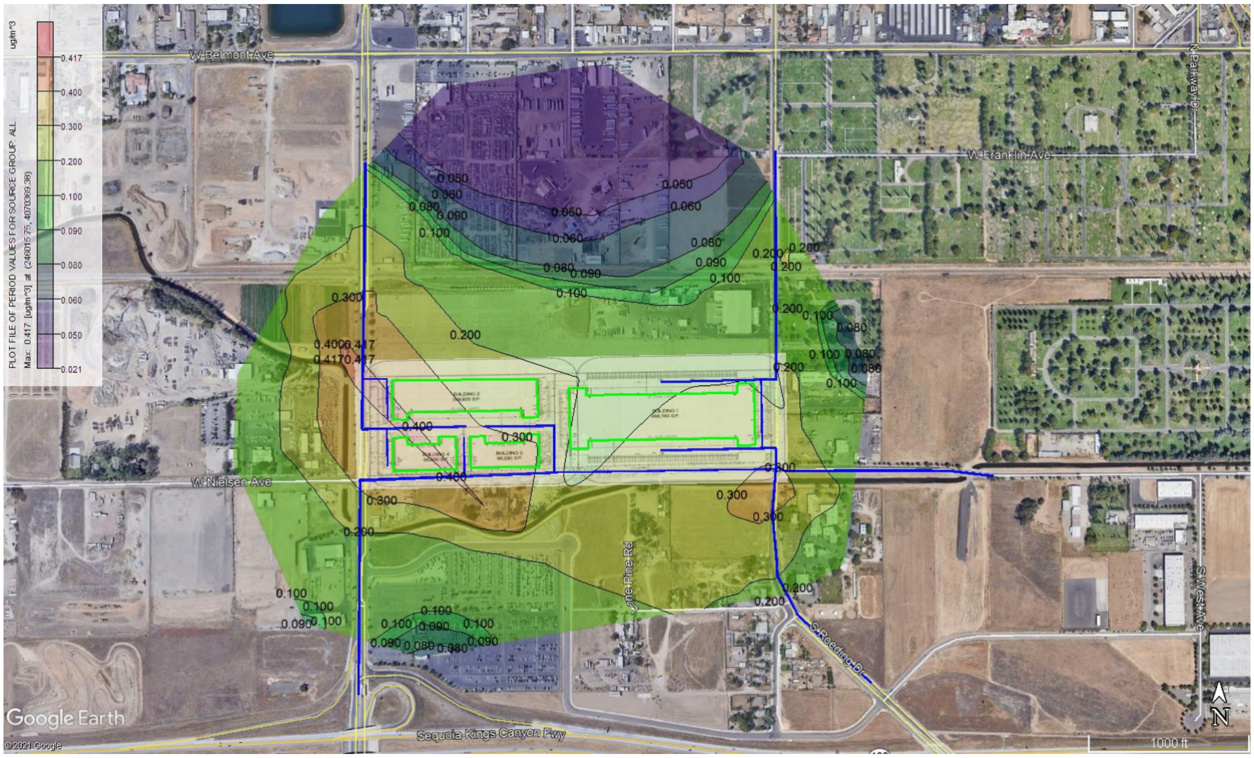
Residential Acute Hazard Index



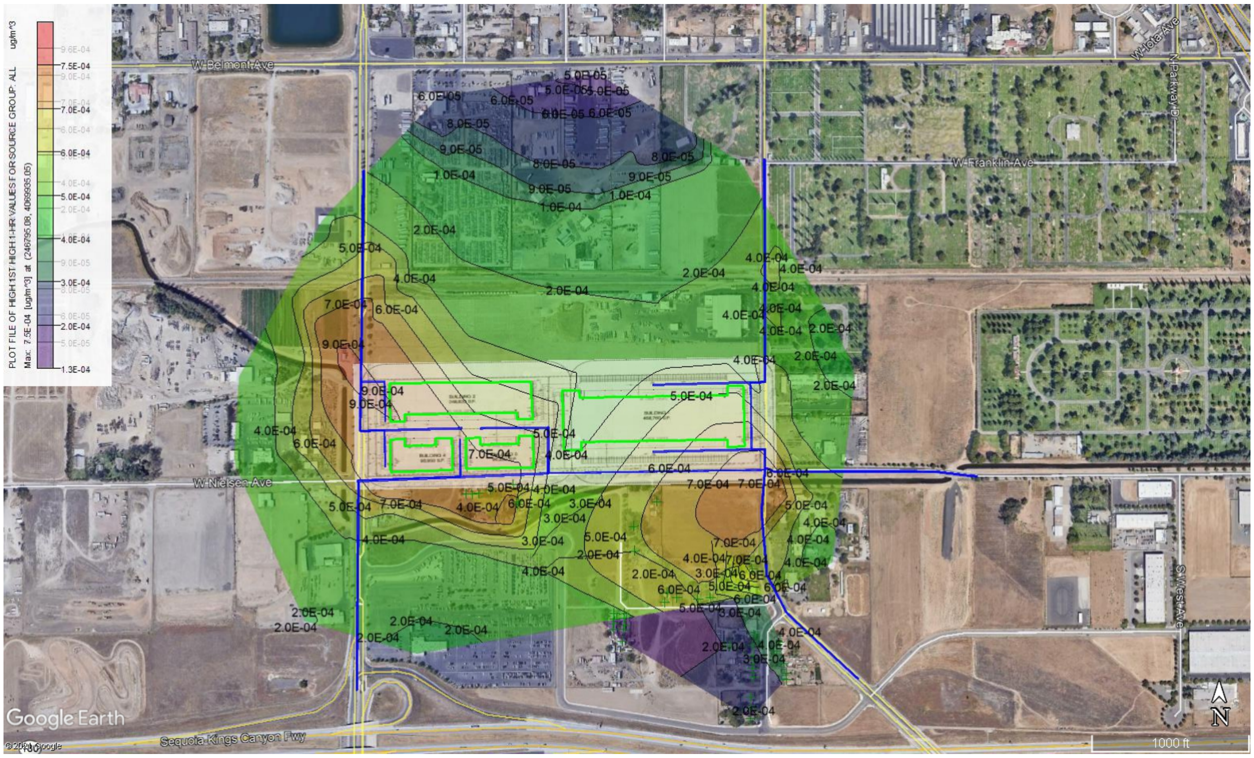
Worker Receptors



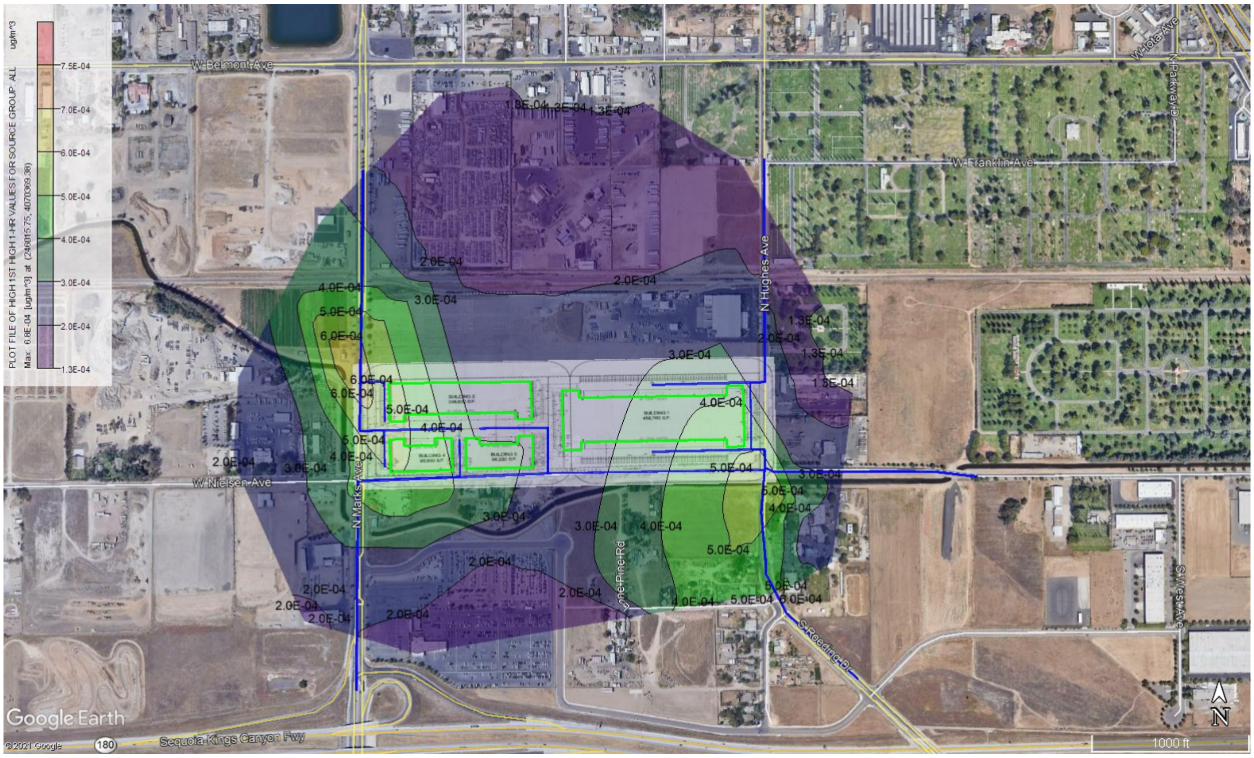
Worker Cancer Risk



Worker Chronic Hazard Index



Worker Acute Hazard Index



Worker Impact

Cancer Risk	0.41693	In a million
Chronic Hi	0.000955	
Acute HI	0.00068	
Resident Impact		
Cancer Risk	6.1537	In a million
Chronic Hi	0.0012373	
Acute HI	0.0007478	

AERMOD Modeling Sources

Volume Sources	3252	Onsite / Offsite Travel
Points	30	Onsite idling Pionts
Total Sources	3282	

Truck Emissions Est.

						g/mile	
Trucks	Daily	AM Peak	PM Peak	Annual	% Contribution	Avg PM10_5-15	Avg PM10_5-55
2-4 Axle Trucks	147	7	10	53655	43%	0.0681	0.0382
5+ Axle Trucks	197	10	9	71905	57%	0.0596	0.0272
Totals	344	17	19	125560	100%		

Location	Driveways	HUGHES1	HUGHES2	NIELSEN	HUGHES3	MARKS1	NIELSEN2	MARKS2
DW2	48%					100%		
DW5	11%						100%	100%
DW6	25%	100%		69%	31%			
DW7	16%		100%					
Total	100%	100%	100%	100%		100%	100%	100%

Truck Idling Emissions Est.

	Annual Truck Trips	
Location	2-4 Axle Trucks	5+ Axle Trucks
DW2	25754	34514
DW5	5902	7910
DW6	13414	17976
DW7	8585	11505
Total	53655	71905

Vehicle Category	PM10_IDLEX g/veh/day
HHDT	0.037
MHDT	0.015
Average	0.026
LHDT1	0.028
LHDT2	0.028
Average	0.028

Location	2-4 Axle Trucks	5+ Axle Trucks	lbs/yr	# Pts	lbs/Yr/Pt		
DW2	1.58	2.01	3.59	6	0.60	1-4	8-9
DW5	0.36	0.46	0.82	6	0.14	10-12	5-7
DW6	0.82	1.05	1.87	9	0.21	13-21	
DW7	0.53	0.67	1.20	9	0.13	22-30	
Total	3.29	4.18	7.47	30	0.25		

Truck Travel Emissions Est.

Emissions Estimation				Onsite Travel Emissions (lbs/Yr)			Offsite Travel Emissions (lbs/Yr)			
Description	Model Name	Dist (m)	Dist (mi)	2-4 Axle Trucks	5+ Axle Trucks	Total	2-4 Axle Trucks	5+ Axle Trucks	Total	
Truck Driveway 6	DW6	218.6	0.14	0.27	0.32	0.59				0.59
Truck North Hughes Ave	HUGHES1	426.9	0.27				0.30	0.29	0.59	0.59
Truck Driveway 7	DW7	218.1	0.14	0.17	0.20	0.38				0.38
Truck Hughes ave South intersection	HUGHES2	36.3	0.02				0.02	0.02	0.03	0.03
Truck Nielsen Ave East	NIELSEN	410.4	0.26				0.20	0.19	0.39	0.39
Truck Hughes ave south 2	HUGHES3	474.2	0.29				0.10	0.10	0.20	0.20
Truck Driveway 5	DW5	220.8	0.14	0.12	0.14	0.26				0.26
Truck Driveway 2	DW2	197.1	0.12	0.47	0.56	1.03				1.03
Truck Marks Ave North	MARKS1	499.2	0.31				0.67	0.64	1.31	1.31
Truck Nielsen ave West	NIELSEN2	369.8	0.23				0.11	0.11	0.22	0.22
Truck Marks South	MARKS2	401.1	0.25				0.12	0.12	0.24	0.24

Passenger Car Emissions Est.

						g/mile			
Cars	Daily	AM Peak	PM Peak	Max Hourly	Annual	Avg PM10 5-55	Avg ROG 5-55	Sum Of VMT	% of Travel
Diesel	3	0.2	0.3	0.3	1129	0.15		25796.31	0.19%
Electricity	48	3	4	4	17415			397932.21	3.00%
Gasoline	1504	88	124	124	549114		0.82	12547048.28	94.68%
Plug-in Hybrid	34	2	3	3	12327		0.00	281660.30	2.13%
Totals	1589	93	131		579985			13252437.11	100.00%

Location	% Traffic Contribution
DW6_CAR	15%
DW7CAR	5%
DW5CAR	31%
DW1CAR	29%
DW4CAR	10%
DW3CAR	10%
Total	100%

Emissions Estimation (lbs/yr)				PM10 5-55	ROG 5-55		
Description	Model Name	Dist (m)	Dist (mi)	Diesel	Gasoline	Plug-in Hybrid	Total ROG
Passenger Veh	DW6_CAR	516.3	0.32	0.02	2.59	0.01	2.61
Passenger Veh	DW7CAR	543.5	0.34	0.01	0.30	0.00	0.30
Passenger Veh	DW5CAR	981.9	0.61	0.07	21.05	0.25	21.30
Passenger Veh	DW1CAR	528.5	0.33	0.03	9.92	0.11	10.03
Passenger Veh	DW4CAR	672.2	0.42	0.02	1.50	0.01	1.51
Passenger Veh	DW3CAR	618.8	0.38	0.01	1.38	0.01	1.39

CARB			TOG Running Exhaust (lbs /Yr)					
CAS#	**Chemical Name**	**Fraction**	DW6_CAR	DW7CAR	DW5CAR	DW1CAR	DW4CAR	DW3CAR
75070	Acetaldehyde	2.80E-03	7.30E-03	8.50E-04	5.96E-02	2.81E-02	4.22E-03	3.88E-03
107028	Acrolein	1.30E-03	3.39E-03	3.95E-04	2.77E-02	1.30E-02	1.96E-03	1.80E-03
71432	Benzene	2.47E-02	6.44E-02	7.50E-03	5.26E-01	2.48E-01	3.72E-02	3.42E-02
106990	1,3-Butadiene	5.50E-03	1.43E-02	1.67E-03	1.17E-01	5.51E-02	8.28E-03	7.62E-03
100414	Ethylbenzene	1.05E-02	2.74E-02	3.19E-03	2.24E-01	1.05E-01	1.58E-02	1.46E-02
50000	Formaldehyde	1.58E-02	4.12E-02	4.80E-03	3.37E-01	1.58E-01	2.38E-02	2.19E-02
110543	Hexane	1.60E-02	4.17E-02	4.86E-03	3.41E-01	1.60E-01	2.41E-02	2.22E-02
67561	Methanol	1.20E-03	3.13E-03	3.64E-04	2.56E-02	1.20E-02	1.81E-03	1.66E-03
78933	Methyl Ethyl Ketone	2.00E-04	5.21E-04	6.07E-05	4.26E-03	2.01E-03	3.01E-04	2.77E-04
91203	Naphthalene	5.00E-04	1.30E-03	1.52E-04	1.06E-02	5.01E-03	7.53E-04	6.93E-04
115071	Propylene	3.06E-02	7.98E-02	9.29E-03	6.52E-01	3.07E-01	4.61E-02	4.24E-02
100425	Styrene	1.20E-03	3.13E-03	3.64E-04	2.56E-02	1.20E-02	1.81E-03	1.66E-03
108883	Toluene	5.76E-02	1.50E-01	1.75E-02	1.23E+00	5.77E-01	8.67E-02	7.98E-02
1330207	Xylenes	4.80E-02	1.25E-01	1.46E-02	1.02E+00	4.81E-01	7.23E-02	6.65E-02

Emissions Estimation (lbs/Hr)				PM10 5-55	ROG 5-55		
Description	Model Name	Dist (m)	Dist (mi)	Diesel	Gasoline	Plug-in Hybrid	Total ROG
Passenger Veh	DW6_CAR	516.3	0.32	3.93E-06	5.85E-04	3.32E-06	5.89E-04
Passenger Veh	DW7CAR	543.5	0.34	1.38E-06	6.85E-05	1.30E-07	6.86E-05
Passenger Veh	DW5CAR	981.9	0.61	1.54E-05	4.76E-03	5.58E-05	4.81E-03
Passenger Veh	DW1CAR	528.5	0.33	7.77E-06	2.24E-03	2.46E-05	2.26E-03
Passenger Veh	DW4CAR	672.2	0.42	3.41E-06	3.39E-04	1.28E-06	3.40E-04
Passenger Veh	DW3CAR	618.8	0.38	3.14E-06	3.12E-04	1.18E-06	3.13E-04

CARB			TOG Running Exhaust (lbs /Hr)					
CAS#	**Chemical Name**	**Fraction**	DW6_CAR	DW7CAR	DW5CAR	DW1CAR	DW4CAR	DW3CAR
75070	Acetaldehyde	2.80E-03	1.65E-06	1.92E-07	1.35E-05	6.34E-06	9.52E-07	8.76E-07
107028	Acrolein	1.30E-03	7.65E-07	8.92E-08	6.25E-06	2.94E-06	4.42E-07	4.07E-07
71432	Benzene	2.47E-02	1.45E-05	1.69E-06	1.19E-04	5.59E-05	8.40E-06	7.73E-06
106990	1,3-Butadiene	5.50E-03	3.24E-06	3.77E-07	2.65E-05	1.25E-05	1.87E-06	1.72E-06
100414	Ethylbenzene	1.05E-02	6.18E-06	7.20E-07	5.05E-05	2.38E-05	3.57E-06	3.29E-06
50000	Formaldehyde	1.58E-02	9.30E-06	1.08E-06	7.60E-05	3.58E-05	5.37E-06	4.95E-06
110543	Hexane	1.60E-02	9.42E-06	1.10E-06	7.70E-05	3.62E-05	5.44E-06	5.01E-06
67561	Methanol	1.20E-03	7.06E-07	8.23E-08	5.77E-06	2.72E-06	4.08E-07	3.76E-07
78933	Methyl Ethyl Ketone	2.00E-04	1.18E-07	1.37E-08	9.62E-07	4.53E-07	6.80E-08	6.26E-08
91203	Naphthalene	5.00E-04	2.94E-07	3.43E-08	2.41E-06	1.13E-06	1.70E-07	1.57E-07
115071	Propylene	3.06E-02	1.80E-05	2.10E-06	1.47E-04	6.93E-05	1.04E-05	9.58E-06
100425	Styrene	1.20E-03	7.06E-07	8.23E-08	5.77E-06	2.72E-06	4.08E-07	3.76E-07
108883	Toluene	5.76E-02	3.39E-05	3.95E-06	2.77E-04	1.30E-04	1.96E-05	1.80E-05

1330207	Xylenes	4.80E-02	2.83E-05	3.29E-06	2.31E-04	1.09E-04	1.63E-05	1.50E-05

Source: EMFAC2021 (v1.0.1) Emission Rates
Region Type: County
Region: Fresno
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, g/mile for RUNEX, PMBW and PMTW, mph for Speed

Region	Calendar Y	Vehicle Cat	Model Yea	Speed	Fuel	Total VMT	CVMT	EVMT	NOx_RUNEX	PM2.5_RUNEX	PM10_RUNEX	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	ROG_RUNEX	TOG_RUNEX	CO_RUNEX	SOx_RUNEX	NH3_RUNEX	PM10_PMBW	PM2.5_PMBW	Fuel Consumption	Energy Consumption
Fresno	2022	HHDT	Aggregate	5	Gasoline	3.205037631	3.205037631	0	8.591839237	0.025672367	0.027921041	5693.711382	1.684502263	0.245566408	10.58983867	15.45266773	442.2181919	0.056288134	0.032079248	0.164294525	0.057503084	600.3947512	0
Fresno	2022	HHDT	Aggregate	5	Diesel	852.5886091	852.5886091	0	20.72265906	0.128514756	0.134325623	3531.391987	0.029414085	0.556372246	0.633277184	0.720937868	1.409413264	0.03344017	0.130439164	0.158666437	0.055533253	315.4578473	0
Fresno	2022	HHDT	Aggregate	5	Natural Gas	69.43054795	69.43054795	0	2.745882371	0.007388685	0.00803587	4088.835078	8.537500354	0.833535779	0.121984034	8.713145315	23.66402645	0	1.06	0.14571373	0.050999806	472.6069722	0
Fresno	2022	HHDT	Aggregate	10	Gasoline	4.621040869	4.621040869	0	8.284671523	0.017591994	0.019132898	4553.626456	1.14812649	0.230763473	7.243076101	10.56907964	319.5462751	0.045017233	0.032079248	0.164294525	0.057503084	480.1742201	0
Fresno	2022	HHDT	Aggregate	10	Diesel	13418.61648	13418.61648	0	9.841586121	0.024137187	0.025228563	3151.123719	0.010194075	0.496460825	0.219475649	0.249856319	1.022865716	0.029839257	0.191120681	0.146840188	0.051394066	281.4886336	0
Fresno	2022	HHDT	Aggregate	10	Natural Gas	678.677293	678.677293	0	7.866227148	0.00850809	0.009253324	3947.62232	13.42047764	0.804748634	0.826430385	14.41968667	55.39274546	0	0.730661496	0.189049195	0.066167218	456.2849312	0
Fresno	2022	HHDT	Aggregate	15	Gasoline	2.256278694	2.256278694	0	8.144393705	0.012645352	0.013752974	3690.257456	0.817342596	0.221554737	5.171344645	7.546013967	242.1700921	0.036481952	0.032079248	0.162113075	0.056739576	389.1330379	0
Fresno	2022	HHDT	Aggregate	15	Diesel	30609.15619	30609.15619	0	6.34229482	0.013413296	0.014019785	2535.724709	0.005619243	0.39950446	0.120980751	0.137727376	0.610722344	0.024011797	0.198067503	0.143012836	0.050054492	226.5152837	0
Fresno	2022	HHDT	Aggregate	15	Natural Gas	1237.093274	1237.093274	0	5.762291031	0.007601953	0.008267818	2894.194931	8.306191006	0.59000057	0.478104551	8.886579637	35.7239039	0	0.692953999	0.193547283	0.067741549	334.5247918	0
Fresno	2022	HHDT	Aggregate	20	Gasoline	2.390320188	2.390320188	0	8.068046029	0.009531424	0.010366293	3053.513968	0.613545227	0.214959685	3.892036007	5.679249805	193.6390487	0.030187094	0.032079248	0.158594607	0.055508112	321.9892326	0
Fresno	2022	HHDT	Aggregate	20	Diesel	54878.46681	54878.46681	0	4.265183734	0.009037133	0.009445752	2152.399467	0.003281374	0.339111413	0.070647076	0.080426318	0.386799954	0.020381936	0.204174771	0.093287774	0.032650721	192.2729918	0
Fresno	2022	HHDT	Aggregate	20	Natural Gas	1295.912353	1295.912353	0	4.33342846	0.00661074	0.007189783	2314.853125	5.487983742	0.471897953	0.251139536	5.797682241	25.64363855	0	0.691306514	0.193009753	0.067553413	267.5617152	0
Fresno	2022	HHDT	Aggregate	25	Gasoline	2.924001513	2.924001513	0	8.055858476	0.007531342	0.008191022	2604.333515	0.483879297	0.210807738	3.076436972	4.489129607	162.6536958	0.025746488	0.032079248	0.155076139	0.054276649	274.6237151	0
Fresno	2022	HHDT	Aggregate	25	Diesel	36515.70616	36515.70616	0	3.989041913	0.010259994	0.010723905	1968.322085	0.002986226	0.310109946	0.064292623	0.073192257	0.333504027	0.018638833	0.199193121	0.136115013	0.047640255	175.8294321	0
Fresno	2022	HHDT	Aggregate	25	Natural Gas	1195.167372	1195.167372	0	3.286428767	0.00565216	0.00614724	1951.09225	4.046624523	0.397742919	0.178381677	4.267238046	19.2480873	0	0.731150234	0.186037368	0.065113079	225.5165061	0
Fresno	2022	HHDT	Aggregate	30	Gasoline	3.760439397	3.760439397	0	8.11310823	0.006236907	0.006783205	2308.117717	0.399905275	0.209079845	2.547402094	3.717163155	143.0770589	0.022818093	0.032079248	0.152894689	0.053513141	243.3881293	0
Fresno	2022	HHDT	Aggregate	30	Diesel	39819.45636	39819.45636	0	3.340474242	0.010761215	0.011247789	1820.373017	0.002319959	0.28680051	0.049948089	0.056862097	0.259079629	0.017237844	0.19775336	0.134634716	0.047122151	162.6132005	0
Fresno	2022	HHDT	Aggregate	30	Natural Gas	1378.357034	1378.357034	0	2.694679222	0.005067525	0.005511396	1715.407291	3.241787851	0.349696998	0.14395279	3.419719194	15.40051039	0	0.754130468	0.18178043	0.063623151	198.2749195	0
Fresno	2022	HHDT	Aggregate	35	Gasoline	4.580111942	4.580111942	0	8.226896203	0.005412058	0.005886107	2137.521516	0.346404609	0.209331811	2.210148134	3.225042969	131.7389262	0.021131576	0.032079248	0.129375358	0.045281375	225.3989731	0
Fresno	2022	HHDT	Aggregate	35	Diesel	45292.20406	45292.20406	0	2.765101208	0.011474191	0.011993003	1697.967082	0.001795159	0.267515405	0.038649288	0.043999272	0.19814593	0.016078733	0.197993503	0.115222948	0.040328032	151.6787268	0
Fresno	2022	HHDT	Aggregate	35	Natural Gas	1519.661208	1519.661208	0	2.329250639	0.004788831	0.005208291	1546.15876	2.725802805	0.315194578	0.121344415	2.875759888	12.81821516	0	0.763670222	0.172455311	0.060359359	178.7123707	0
Fresno	2022	HHDT	Aggregate	40	Gasoline	4.694236954	4.694236954	0	8.393744442	0.004920195	0.005351161	2067.628967	0.314216446	0.211386553	2.007430624	2.929238054	126.8979343	0.020440617	0.032079248	0.112332365	0.039316328	218.0288912	0
Fresno	2022	HHDT	Aggregate	40	Diesel	54996.30334	54996.30334	0	2.253057435	0.012811165	0.013390429	1599.242318	0.001370854	0.251961278	0.029514103	0.033599559	0.147943467	0.015143868	0.199976243	0.100382933	0.035134026	142.8596827	0
Fresno	2022	HHDT	Aggregate	40	Natural Gas	1606.954482	1606.954482	0	2.080916439	0.004778744	0.00519732	1416.902311	2.360174632	0.288844805	0.104849385	2.489768271	10.93898183	0	0.767539987	0.165915038	0.058070263	163.7722966	0
Fresno	2022	HHDT	Aggregate	45	Gasoline	4.751768429	4.751768429	0	8.618004153	0.004685674	0.005096098	2075.345761	0.298189982	0.215286645	1.907050166	2.782763125	127.8926847	0.020516906	0.032079248	0.095289372	0.03335128	218.8426174	0
Fresno	2022	HHDT	Aggregate	45	Diesel	60301.78434	60301.78434	0	1.974193963	0.015307181	0.015999304	1540.197341	0.001133172	0.242658718	0.024396879	0.027773989	0.113145388	0.014584748	0.200380571	0.085863868	0.030052354	137.5852184	0
Fresno	2022	HHDT	Aggregate	45	Natural Gas	1637.803718	1637.803718	0	1.851414402	0.004884048	0.005311848	1313.026511	2.045173825	0.267669044	0.089430409	2.155847423	9.443088219	0	0.779468347	0.156987487	0.054945621	151.7658384	0
Fresno	2022	HHDT	Aggregate	50	Gasoline	5.189386878	5.189386878	0	8.850301488	0.004673974	0.005083373	2142.133156	0.297299713	0.219799257	1.903010008	2.776867737	135.4810428	0.021177167	0.032079248	0.083018417	0.029056446	225.8852647	0
Fresno	2022	HHDT	Aggregate	50	Diesel	71194.85061	71194.85061	0	1.714905913	0.018288839	0.019115779	1506.201351	0.000945634	0.237302636	0.020359251	0.023177457	0.085276819	0.014262826	0.202904125	0.074736465	0.026157763	134.54837	0
Fresno	2022	HHDT	Aggregate	50	Natural Gas	1631.07375	1631.07375	0	1.729885118	0.005317546	0.005783316	1230.960795	1.829457501	0.250939411	0.079732266	1.928155337	8.431902435	0	0.781343372	0.151870894	0.053154813	142.2802934	0
Fresno	2022	HHDT	Aggregate	55	Gasoline	8.654297159	8.654297159	0	9.11395658	0.004883043	0.005310755	2245.741996	0.310652454	0.225481521	1.989806284	2.903520658	150.8422931	0.022201446	0.032079248	0.083018417	0.029056446	236.8106875	0
Fresno	2022	HHDT	Aggregate	55	Diesel	114585.2245	114585.2245	0	1.644771147	0.022458781	0.023474267	1493.327809	0.000865563	0.235274404	0.018635326	0.0212149	0.069297105	0.014140921	0.205096598	0.072882543	0.02550889	133.3983816	0
Fresno	2022	HHDT	Aggregate	55	Natural Gas	1921.745356	1921.745356	0	1.365700353	0.00494488	0.005378009	1157.885857	1.471215605	0.236042607	0.059372171	1.545178152	7.361972701	0	0.842475234	0.133954756	0.046884165	133.833945	0
Fresno	2022	HHDT	Aggregate	60	Gasoline	18.58288343	18.58288343	0	9.440364842	0.00534267	0.005810641	2368.127025	0.339062102	0.233090974	2.172710458	3.170414001	176.39531	0.023411347	0.032079248	0.083018417	0.029056446	249.7160358	0
Fresno	2022	HHDT	Aggregate	60	Diesel	302529.7874	302529.7874	0	1.697673693	0.028147172	0.029419862	1515.911193	0.000851507	0.238832426	0.01833272	0.020870406	0.061997778	0.014354772	0.20870636	0.07106649	0.024873272	135.4157464	0
Fresno	2022	HHDT	Aggregate	60	Natural Gas	2829.091597	2829.091597	0	0.943895725	0.003582386	0.003896171	1150.594227	1.187528748	0.23455616	0.03897595	1.237035036	6.91058842	0	0.93103467	0.10796924	0.037789234	132.9911438	0
Fresno	2022	HHDT	Aggregate	65	Gasoline	17.75847063	17.75847063	0	9.766802528	0.006121726	0.006657936	2499.158829	0.389075289	0.241151139	2.493930273	3.6391372	218.0668775	0.024706729	0.032079248	0.083018417	0.029056446	263.5331759	0
Fresno	2022	HHDT	Aggregate	65	Diesel	507553.9082	507553.9082	0	1.996547039	0.03474584	0.036316893	1593.688899	0.000919177	0.251086335	0.019789635	0.022528993	0.064123905	0.015091281	0.210732581	0.070680933	0.024738327	142.3635981	0
Fresno	2022	HHDT	Aggregate	65	Natural Gas	3684.526963	3684.526963	0	0.925149392	0.003502198	0.00380896	1151.189461	1.174336942	0.234677502	0.03808074	1.22276664	6.914879526	0	0.935175937	0.106638005	0.037323302	133.0599437	0
Fresno	2022	HHDT	Aggregate	70	Gasoline	1.129727638	1.129727638	0	10.02725467	0.006667166	0.007251151	2564.71322	0.421886168	0.247709824	2.704277909	3.946075977	246.3851333	0.025354801	0.032079248	0.083018417	0.029056446	270.4458045	0
Fresno	2022	HHDT	Aggregate	70	Diesel	556102.2268	556102.2268	0	1.926830564	0.036030091	0.037659212	1585.97366	0.000875952	0.249870796	0.018859001	0.021469538	0.061231128	0.015018222	0.212904972	0.070079275	0.024527746	141.6743988	0
Fresno	2022	HHDT	Aggregate	70	Natural Gas	1505.313859	1505.313859	0	0.769695693	0.002888305	0.003141295	1149.111336	1.072492334	0.234253863	0.031056391	1.112481628	6.755692167	0	0.967810249	0.097302043	0.034055715	132.8197442	0
Fresno	2022	HHDT	Aggregate	75	Gasoline	0.377280518	0.377280518	0	10.13941071	0.006667166	0.007251151	2562.208648	0.418564299	0.250412489	2.68270712	3.914599932	244.8652871	0.025330041	0.032079248	0.083018417	0.029056446	270.1817005	0
Fresno	2022	HHDT	Aggregate	75	Diesel	97367.3921	97367.3921	0	1.909294124	0.035881076	0.037503459	1584.982801	0.00086971	0.249714686	0.018724614	0.021316548	0.061191992	0.015008839	0.21322059	0.069916555	0.024470794	141.5858858	0
Fresno	2022	HHDT	Aggregate	75	Natural Gas	255.0571013	255.0571013	0	0.367897251	0.001330874	0.001447446	1141.444196	0.813379433	0.232690866	0.013112678	0.831812208	6.224009537	0	1.051262512	0.07289963	0.025514871	131.9335398	0
Fresno	2022	HHDT	Aggregate	80	Diesel	6565.463618	6565.463618	0	1.744909998	0.030692679	0.032080466	1612.69483	0.000823925	0.254080727	0.017738888	0.020194374	0.059664351	0.015271256	0.213107619	0.069925359	0.024473875	144.0613903	0
Fresno	2022	HHDT	Aggregate	80	Natural Gas	87.62472055	87.62472055	0	0.325415203	0.001187977	0.001292034	1141.648867	0.789126294	0.23273259	0.011394209	0.805497015	6.104528528	0	1.0593018	0.070340272	0.024619095	131.9571966	0
Fresno	2022	HHDT	Aggregate	85	Diesel	643.4627222	643.4627222	0	1.736053652	0.031818547	0.03325724	1609.627025	0.000808334	0.253597393	0.017403217	0.019812238	0.058810085	0.015242205	0.214005505	0.069855789	0.024449526	143.7873445	0
Fresno	2022	HHDT	Aggregate	85	Natural Gas	6.940589239	6.940589239	0	0.339739385	0.001247814	0.001357111	1142.009613	0.798949345	0.23280613	0.012062406	0.816123546	6.103410906	0	1.056208734	0.071267862	0.024943752	131.9988933	0
Fresno	2022	HHDT	Aggregate	90	Diesel	0.537434188	0.537434188	0	1.855074178	0.036877696	0.038545142	1582.462245	0.000843641	0.249317571	0.018163359	0.020677602	0.06054083	0.014984971	0.214684312	0.069756572	0.0244148	141.3607255	0
Fresno	2022	LDA	Aggregate	5	Gasoline	275.5393984	275.5393984	0	0.092336661	0.009089105	0.00988513	721.9237138	0.020352495	0.00956606	0.079251016	0.115609968	1.865226655	0.007136951	0.032708965	0.00595458	0.002084103	76.12595359	0
Fresno	2022	LDA	Aggregate	5	Diesel	0.5584213	0.5584213	0	0.312974149	0.088117231	0.092101501	612.5172953	0.013983451	0.096502349	0.301055465	0.342731632	4.16248566	0.005803913	0.0031	0.006027715	0.0021097	54.71592735	0
Fresno	2022	LDA	Aggregate	5	Electricity	9898.23463	0	9898.235	0	0	0	0	0	0	0	0	0	0	0	0.00132448	0.000463568	0	630004.1988
Fresno	2022	LDA	Aggregate	5	Plug-in Hybrid	1997.565272	3.708837041	1993.856	4.71851E-05	1.83741E-05	1.99835E-05	1.594642941	1.61805E-05	8.79701E-06	5.04314E-05	7.35894E-05	0.004346685	1.57647E-05	7.00336E-05	0.001327083	0.000464479	0.168153106	471892.2658
Fresno	2022	LDA	Aggregate	10	Gasoline	1377.841218	1377.841218	0	0.082162809	0.005730425	0.00623229	577.6845928	0.012717738	0.008525404	0.04960797	0.072364917	1.604286657	0.005711	0.032708965	0.007364236	0.002577483	60.91611851	0
Fresno	2022	LDA	Aggregate	10	Diesel	2.792398795	2.792398795	0	0.302098228	0.063183062	0.066039919	510.2847233	0.010185049	0.080395566	0.219278119	0.24963356	3.093054929	0.004835207	0.0031	0.007454684	0.002609139	45.58353219	0
Fresno	2022	LDA	Aggregate	10	Electricity	15835.3428	0	15835.34	0	0	0	0	0	0	0	0	0	0	0	0.002343567	0.000820248	0	425185.0569
Fresno	2022	LDA	Aggregate	10	Plug-in Hybrid	7990.772569	18.54612652	7972.226	3.87656E-05	1.44518E-05	1.57176E-05	1.380394026	9.5655E-06	7.2273E-06	2.98137E-05	4.35041E-05	0.003117391	1.36466E-05	8.75455E-05	0.002348172	0.00082186	0.145560825	334504.7891
Fresno	2022	LDA	Aggregate	15	Gasoline	2286.744586	2286.744586	0	0.07089135	0.003811137	0.004144909	478.5988345	0.008568374	0.007363544	0.033475316	0.048830384	1.527451851	0.004731437	0.032708965	0.00876579	0.003068027	50.4676491	0
Fresno	2022	LDA	Aggregate	15	Diesel	4.634425755	4.634425755	0	0.277012047	0.047047251	0.049174519	419.7077328	0.005874897	0.066125124	0.126483072	0.143992568	1.620697634	0.003976944	0.0031	0.008873453	0.003105708	37.49232551	0
Fresno	2022	LDA	Aggregate	15	Electricity	35266.6637	0	35266.66	0	0	0	0	0	0	0	0	0	0	0	0.003362653	0.001176929	0	357684.5769
Fresno	2022	LDA	Aggregate	15	Plug-in Hybrid	19542.68263	30.78021898	19511.9	1.98401E-05	6.50976E-06	7.07996E-06	0.771712125	4.26146E-06	3.69892E-06	1.32821E-05	1.93812E-05	0.001644281	7.62916E-06	5.94096E-05	0.003369259	0.001179241	0.081376079	289717.994
Fresno	2022	LDA	Aggregate	20	Gasoline	593909.1812	593909.1812	0	0.06397179	0.002673567	0.00290771	394.5042894	0.005984169	0.006648434	0.023412746	0.034151275	1.348993543	0.003900077	0.032708965	0.010175446	0.003561406	41.5999844	0
Fresno	2022	LDA	Aggregate	20	Diesel	1203.644702	1203.644702	0	0.263388558	0.036428426	0.038075558	344.2966185	0.003305568	0.054244072	0.071166926	0.081018814	0.756962779	0.003262385	0.0031	0.010300422	0.003605148	30.75588055	0
Fresno	2022	LDA	Aggregate	20	Electricity	51791.46242	0	51791.46	0	0	0	0	0	0	0	0	0	0	0	0.004385059	0.001534771	0	334944.5347
Fresno	2022	LDA	Aggregate	20	Plug-in Hybrid	36378.73979	7994.182982	28384.56	0.002315954	0.000636006	0.000691715	92.19912737	0.00043488	0.000431777	0.001355431	0.001977841	0.180076772	0.000911482	0.008288881	0.004394089	0.001537931	9.722282781	212175.6651
Fresno	2022	LDA	Aggregate	25	Gasoline	81052.86531	81052.86531	0	0.058262555	0.00197816	0.002151399	337.6145142	0.004440558	0.006056094	0.017395784	0.025373876	1.240767148	0.003337663	0.032708965	0.011333956	0.003966885	35.60102868	0
Fresno	2022	LDA	Aggregate	25	Diesel	164.2656066	164.2656066	0	0.262687489	0.029374328	0.030702505	288.6037677	0.002395847	0.045469641	0.051581182	0.058721747	0.511810213	0.002734667	0.0031	0.011473161	0.004015606	25.78086025	0
Fresno	2022	LDA	Aggregate	25	Electricity	56566.82992	0	56566.83	0	0	0	0	0	0	0	0	0	0	0	0.004989208	0.001746223	0	331465.6743
Fresno	2022	LDA	Aggregate	25	Plug-in Hybrid	29506.2163	1090.99414	28415.22	0.000337314	7.90562E-05	8.59808E-05	13.86083028	5.77608E-05	6.28875E-05	0.000180028	0.000262697	0.025837394	0.000137028	0.001394692	0.004999086	0.00174968	1.461607234	251409.857
Fresno	2022	LDA	Aggregate	30	Gasoline	245686.616	245686.616	0	0.053858046	0.001543598	0.001678778	299.929371	0.003473881	0.005597326	0.013622829	0.019870067	1.145068647	0.002965107	0.032708965	0.012257524	0.004290133	31.62717742	0
Fresno	2022	LDA	Aggregate	30	Diesel	497.9202261	497.9202261	0	0.267349815	0.024753167	0.025872395	249.9838199	0.001941789	0.039385053	0.041805569	0.047592861	0.411171866	0.002368724	0.0031	0.012408072	0.004342825	22.3309556	0
Fresno	2022	LDA	Aggregate	30	Electricity	56711.42565	0	56711.43	0	0	0	0	0	0	0	0	0	0	0	0.00517842	0.001812447	0	331846.1361
Fresno	2022	LDA	Aggregate	30	Plug-in Hybrid	26009.17554	3307.010276	22702.17	0.00102895	0.000211866	0.000230423	43.48535015	0.000163765	0.000191833	0.000510421	0.000744805	0.07805096	0.000429897	0.004795992	0.005188875	0.001816106	4.58547584	224097.5294
Fresno	2022	LDA	Aggregate	35	Gasoline	492233.0388	492233.0388	0	0.050740593	0.001270244	0.001381484	278.2614298	0.002864092	0.005270904	0.01124014	0.016394306	1.060325341	0.002750898	0.032708965	0.01317299	0.004610546	29.3423201	0
Fresno	2022	LDA	Aggregate	35	Diesel	997.5829776	997.5829776	0	0.274174589	0.021745987	0.022729244	225.9803378	0.001652829	0.035603294	0.035584437	0.040510515	0.349604082	0.002141279	0.0031	0.013334782	0.004667174	20.18673405	0
Fresno	2022	LDA	Aggregate	35	Electricity	53299.82978	0	53299.83	0	0	0	0	0	0	0	0	0	0	0	0.005370951	0.001879833	0	333403.3612
Fresno	2022	LDA	Aggregate	35	Plug-in Hybrid	22918.39605	6625.59379	16292.8	0.002118324	0.000396053	0.000430744	91.49584563	0.000316286	0.000394932	0.000985797	0.001438473	0.159146442	0.00090453	0.010904607	0.005382172	0.00188376	9.6481226	180500.2118
Fresno	2022	LDA	Aggregate	40	Gasoline	1295346.528	1295346.528	0	0.048744311	0.001102309	0.001198842	268.4885624	0.002480975	0.005059816	0.009740823	0.014207176	0.970535348	0.002654283	0.032708965	0.012038784	0.004213574	28.31178343	0
Fresno	2022	LDA	Aggregate	40	Diesel	2625.211119	2625.211119	0	0.282301277	0.019890083	0.020789424	211.4670289	0.001471351	0.033316717	0.031677312	0.036062514	0.312325619	0.002003758	0.0031	0.012186646	0.004265326	18.89026592	0
Fresno	2022	LDA	Aggregate	40	Electricity	46413.31796	0	46413.32	0	0	0	0	0	0	0	0	0	0	0	0.004959333	0.001735766	0	337996.5411
Fresno	2022	LDA	Aggregate	40	Plug-in Hybrid	28433.82675	17435.72502	10998.1	0.004134779	0.00072864	0.000792463	180.7946783	0.000580728	0.000770872	0.001810011	0.002641163	0.302938651	0.001787339	0.023129921	0.004970392	0.001739637	19.06457293	102766.707
Fresno	2022	LDA	Aggregate	45	Gasoline	1040517.544	1040517.544	0	0.047460805	0.001008731	0.001097068	269.3005305	0.002270149	0.004921779	0.008914169	0.013001232	0.901164958	0.00266231	0.032708965	0.008854906	0.003099217	28.39740446	0
Fresno	2022	LDA	Aggregate	45	Diesel	2108.762533	2108.762533	0	0.291173296	0.018928932	0.019784815	204.2609048	0.001367543	0.032181389	0.029442401	0.033518216	0.29252126	0.001935476	0.0031	0.008963663	0.003137282	18.24654571	0
Fresno	2022	LDA	Aggregate	45	Electricity	34309.11663	0	34309.12	0	0	0	0	0	0	0	0	0	0	0	0.003940246	0.001379086	0	344877.5501
Fresno	2022	LDA	Aggregate	45	Plug-in Hybrid	20588.87047	14005.65592	6583.215	0.004250881	0.000739621	0.000804406	188.8883136	0.000568384	0.000792518	0.001771536	0.002585021	0.308322444	0.001867353	0.025659039	0.003949148	0.001382202	19.91803666	86661.68142
Fresno	2022	LDA	Aggregate	50	Gasoline	2236309.305	2236309.305	0	0.047052729	0.000973434	0.001058679	276.9136121	0.002188305	0.00487346	0.008591202	0.01252997	0.838206117	0.002737573	0.032708965	0.005662927	0.001982025	29.2001944	0
Fresno	2022	LDA	Aggregate	50	Diesel	4532.211207	4532.211207	0	0.300646893	0.018744567	0.019592114	204.7808674	0.001326852	0.032263309	0.028566343	0.032520882	0.287502983	0.001940403	0.0031	0.00573248	0.002006368	18.29299376	0
Fresno	2022	LDA	Aggregate	50	Electricity	19591.54912	0	19591.55	0	0	0	0	0	0	0	0	0	0	0	0.002924479	0.001023568	0	355019.4389
Fresno	2022	LDA	Aggregate	50	Plug-in Hybrid	33265.58891	30101.34605	3164.243	0.005290216	0.000949718	0.001032904	238.0178734	0.000675644	0.000986287	0.002105844	0.003072843	0.379089381	0.002353049	0.034131875	0.002931371	0.00102598	25.09868735	26455.79597
Fresno	2022	LDA	Aggregate	55	Gasoline	2172436.752	2172436.752	0	0.047309817	0.000990622	0.001077372	288.2928892	0.002225137	0.004892725	0.008731493	0.012734408	0.785364236	0.002850069	0.032708965	0.003645661	0.001275981	30.40012495	0
Fresno	2022	LDA	Aggregate	55	Diesel	4402.764042	4402.764042	0	0.310418572	0.019328657	0.020202614	214.2870524	0.001344926	0.033761012	0.028955465	0.032963872	0.297430006	0.002030479	0.0031	0.003690438	0.001291653	19.1421775	0
Fresno	2022	LDA	Aggregate	55	Electricity	7752.289503	0	7752.29	0	0	0	0	0	0	0	0	0	0	0	0.002157675	0.000755186	0	368986.6923
Fresno	2022	LDA	Aggregate	55	Plug-in Hybrid	30314.85921	29241.60371	1073.256	0.005296732	0.001030978	0.001121283	241.8378493	0.000651102	0.000987502	0.002029352	0.002961225	0.37760961	0.002390813	0.036384389	0.002162816	0.000756986	25.50149904	10735.13312
Fresno	2022	LDA	Aggregate	60	Gasoline	1234170.391	1234170.391	0	0.048345082	0.001063163	0.001156265	300.11413	0.00238563	0.004990648	0.009354145	0.013642376	0.739669681	0.002966934	0.032708965	0.002795007	0.000978252	31.64666003	0
Fresno	2022	LDA	Aggregate	60	Diesel	2501.228638	2501.228638	0	0.320964925	0.020850492	0.021793258	232.3128971	0.001438275	0.036600992	0.03096522	0.035251844	0.330288959	0.002201283	0.0031	0.002829336	0.000990267	20.75241907	0
Fresno	2022	LDA	Aggregate	60	Electricity	1985.099507	0	1985.1	0	0	0	0	0	0	0	0	0	0	0	0.001639833	0.000573942	0	386630.2541
Fresno	2022	LDA	Aggregate	60	Plug-in Hybrid	16819.80237	16612.27717	207.5252	0.005118334	0.001134087	0.001233423	237.0991703	0.000608193	0.000954242	0.001895611	0.002766071	0.363914733	0.002343967	0.037254414	0.001643756	0.000575315	25.00181126	3936.660946
Fresno	2022	LDA	Aggregate	65	Gasoline	1430655.132	1430655.132	0	0.050374821	0.001203397	0.001308779	308.885917	0.002692541	0.005188501	0.010547168	0.015382219	0.695057778	0.003053652	0.032708965	0.001944353	0.000680523	32.571634	0
Fresno	2022	LDA	Aggregate	65	Diesel	2899.433996	2899.433996	0	0.332150209	0.023528093	0.024591929	261.1667136	0.00161751	0.041146922	0.034824039	0.039644853	0.391285664	0.002474687	0.0031	0.001968233	0.000688882	23.32991907	0
Fresno	2022	LDA	Aggregate	65	Electricity	289.7629383	0	289.7629	0	0	0	0	0	0	0	0	0	0	0	0.00112531	0.000393859	0	404777.6705
Fresno	2022	LDA	Aggregate	65	Plug-in Hybrid	19279.25473	19257.01652	22.23822	0.004919508	0.001299889	0.001413748	229.9966446	0.000564476	0.000917174	0.001759357	0.00256725	0.345913139	0.002273751	0.037676297	0.001128008	0.000394803	24.25285879	404.1451724
Fresno	2022	LDA	Aggregate	70	Gasoline	1090839.161	1090839.161	0	0.05167503	0.001306146	0.001420526	312.1758652	0.002922695	0.005315461	0.011442491	0.01668793	0.68049749	0.003086176	0.032708965	0.001944353	0.000680523	32.91855493	0
Fresno	2022	LDA	Aggregate	70	Diesel	2210.746724	2210.746724	0	0.337687449	0.025394967	0.026543215	282.0187522	0.001742476	0.044432169	0.037514482	0.042707743	0.433980082	0.002672271	0.0031	0.001968233	0.000688882	25.19262342	0
Fresno	2022	LDA	Aggregate	70	Electricity	46.99705403	0	46.99705	0	0	0	0	0	0	0	0	0	0	0	0.00112531	0.000393859	0	449707.4317
Fresno	2022	LDA	Aggregate	70	Plug-in Hybrid	14684.33602	14682.9989	1.337115	0.004689551	0.001413403	0.001537204	222.0683449	0.00052291	0.000874302	0.001629803	0.002378204	0.329995935	0.002195372	0.037716371	0.001128009	0.000394803	23.4168295	31.83079255
Fresno	2022	LDT1	Aggregate	5	Gasoline	23.83848359	23.83848359	0	0.415726617	0.015369455	0.016714836	864.2416076	0.071025792	0.027666042	0.32177663	0.469330487	5.175396705	0.008543908	0.03740487	0.00862254	0.003017889	91.13319768	0
Fresno	2022	LDT1	Aggregate	5	Diesel	0.006619168	0.006619168	0	1.055915172	0.959926667	1.003330291	1039.551347	0.054208209	0.163781738	1.167070831	1.328632549	5.020259718	0.009850277	0.0031	0.009765241	0.003417834	92.86271006	0
Fresno	2022	LDT1	Aggregate	5	Electricity	15.71092425	0	15.71092	0	0	0	0	0	0	0	0	0	0	0	0.001327687	0.00046469	0	630004.1988
Fresno	2022	LDT1	Aggregate	5	Plug-in Hybrid	3.97653661	0.006266491	3.97027	4.00486E-05	1.00434E-05	1.09231E-05	1.353462172	1.37414E-05	7.47495E-06	4.28039E-05	6.24594E-05	0.003689274	1.33804E-05	6.61864E-05	0.001320994	0.000462348	0.142720895	472025.0254
Fresno	2022	LDT1	Aggregate	10	Gasoline	119.2048957	119.2048957	0	0.360933446	0.009863231	0.010726573	692.4763982	0.045439251	0.024157539	0.206355394	0.300970063	4.356164932	0.006845834	0.03740487	0.010727921	0.003754772	73.02077096	0
Fresno	2022	LDT1	Aggregate	10	Diesel	0.033099307	0.033099307	0	1.113219517	0.668251682	0.698467058	875.0595265	0.037739495	0.137865985	0.812509105	0.924987596	3.565978178	0.008291634	0.0031	0.012149637	0.004252373	78.16872086	0
Fresno	2022	LDT1	Aggregate	10	Electricity	25.13457	0	25.13457	0	0	0	0	0	0	0	0	0	0	0	0.00234924	0.000822234	0	425185.0569
Fresno	2022	LDT1	Aggregate	10	Plug-in Hybrid	15.90604561	0.031335735	15.87471	3.29048E-05	7.90001E-06	8.59198E-06	1.171699626	8.12413E-06	6.14157E-06	2.53063E-05	3.69269E-05	0.002646089	1.15834E-05	8.27422E-05	0.002337398	0.000818089	0.123554262	334622.4369
Fresno	2022	LDT1	Aggregate	15	Gasoline	197.8393057	197.8393057	0	0.305641527	0.006669522	0.007253283	573.3055459	0.031280135	0.020545454	0.14235308	0.207616632	4.061654099	0.005667709	0.03740487	0.012843881	0.004495358	60.45435349	0
Fresno	2022	LDT1	Aggregate	15	Diesel	0.054933514	0.054933514	0	1.167667748	0.4868107	0.50882212	725.5685646	0.027482159	0.114313623	0.591674704	0.673582313	2.66551135	0.006875131	0.0031	0.014546015	0.005091105	64.81475246	0
Fresno	2022	LDT1	Aggregate	15	Electricity	55.97683855	0	55.97684	0	0	0	0	0	0	0	0	0	0	0	0.003370794	0.001179778	0	357684.5769
Fresno	2022	LDT1	Aggregate	15	Plug-in Hybrid	38.90511645	0.05200659	38.85311	1.68387E-05	3.55814E-06	3.8698E-06	0.654967058	3.61892E-06	3.14289E-06	1.12728E-05	1.64492E-05	0.001395533	6.47502E-06	5.61437E-05	0.003353801	0.00117383	0.069065458	289787.1342
Fresno	2022	LDT1	Aggregate	20	Gasoline	51382.46781	51382.46781	0	0.272131863	0.004748512	0.005164112	473.0377869	0.022262749	0.018347234	0.101501099	0.148031491	3.541294959	0.00467646	0.03740487	0.014949262	0.005232242	49.88124358	0
Fresno	2022	LDT1	Aggregate	20	Diesel	14.26723326	14.26723326	0	1.225789062	0.3711023	0.387881899	596.1099694	0.020942126	0.093917368	0.450871633	0.513287379	2.098321949	0.005648445	0.0031	0.016930411	0.005925644	53.25026743	0
Fresno	2022	LDT1	Aggregate	20	Electricity	82.20574405	0	82.20574	0	0	0	0	0	0	0	0	0	0	0	0.004395675	0.001538486	0	334944.5347
Fresno	2022	LDT1	Aggregate	20	Plug-in Hybrid	70.02785628	13.5070578	56.5208	0.002032794	0.000359516	0.000391007	80.92641524	0.000381934	0.000379414	0.001189709	0.001736021	0.158059713	0.00080004	0.008101011	0.004373658	0.00153078	8.533589372	219481.8245
Fresno	2022	LDT1	Aggregate	25	Gasoline	7012.345279	7012.345279	0	0.245691164	0.003557156	0.003868469	404.9040559	0.016782381	0.016594061	0.076634817	0.111762472	3.224028496	0.004002889	0.03740487	0.015816806	0.005535882	42.69662678	0
Fresno	2022	LDT1	Aggregate	25	Diesel	1.947099275	1.947099275	0	1.284441944	0.296035886	0.309421315	499.8167208	0.01670429	0.078746328	0.359633535	0.40941887	1.740345541	0.004736017	0.0031	0.017912926	0.006269524	44.64842968	0
Fresno	2022	LDT1	Aggregate	25	Electricity	89.78542265	0	89.78542	0	0	0	0	0	0	0	0	0	0	0	0.005001287	0.00175045	0	331465.6743
Fresno	2022	LDT1	Aggregate	25	Plug-in Hybrid	58.42521637	1.843355469	56.58186	0.000287829	4.34439E-05	4.72493E-05	11.82739529	4.93161E-05	5.37223E-05	0.000153618	0.000224158	0.022046953	0.000116926	0.001325129	0.004976099	0.001741635	1.247184055	252825.9596
Fresno	2022	LDT1	Aggregate	30	Gasoline	21255.74926	21255.74926	0	0.226119697	0.002802041	0.003047256	359.717003	0.013284906	0.01528246	0.060737341	0.08857536	2.95544155	0.003556169	0.03740487	0.015435933	0.005402577	37.93170851	0
Fresno	2022	LDT1	Aggregate	30	Diesel	5.9020274	5.9020274	0	1.343912914	0.247122254	0.258296026	432.2000159	0.01394382	0.068093289	0.300202225	0.341760275	1.520260302	0.004095315	0.0031	0.017481578	0.006118552	38.60825621	0
Fresno	2022	LDT1	Aggregate	30	Electricity	90.0149315	0	90.01493	0	0	0	0	0	0	0	0	0	0	0	0.005190956	0.001816835	0	331846.1361
Fresno	2022	LDT1	Aggregate	30	Plug-in Hybrid	50.79328658	5.587560236	45.20573	0.000890228	0.000118049	0.000128389	37.62269624	0.00014177	0.000166158	0.000441607	0.000644391	0.067528203	0.000371939	0.004620247	0.005164883	0.001807709	3.96726631	228498.5826
Fresno	2022	LDT1	Aggregate	35	Gasoline	42585.88531	42585.88531	0	0.21296101	0.002319951	0.002522968	333.6660145	0.011035852	0.014387951	0.050498579	0.073641522	2.727470452	0.003298628	0.03740487	0.01505506	0.005269271	35.18466433	0
Fresno	2022	LDT1	Aggregate	35	Diesel	11.82470958	11.82470958	0	1.404591004	0.215871499	0.225632251	390.0771251	0.012180185	0.06145681	0.262232216	0.298533943	1.39855631	0.003696179	0.0031	0.01705023	0.00596758	34.84543506	0
Fresno	2022	LDT1	Aggregate	35	Electricity	84.59989273	0	84.59989	0	0	0	0	0	0	0	0	0	0	0	0.005383953	0.001884384	0	333403.3612
Fresno	2022	LDT1	Aggregate	35	Plug-in Hybrid	43.63774578	11.19467474	32.44307	0.001879754	0.000226337	0.000246162	81.19138713	0.00028083	0.00035085	0.000874775	0.001276469	0.141223028	0.00080266	0.010774533	0.005357045	0.001874966	8.561530327	188766.8805
Fresno	2022	LDT1	Aggregate	40	Gasoline	112067.81	112067.81	0	0.205329843	0.002018343	0.002194958	321.9051756	0.009587156	0.013853665	0.043890009	0.064002447	2.497283262	0.00318236	0.03740487	0.013288233	0.004650882	33.94449856	0
Fresno	2022	LDT1	Aggregate	40	Diesel	31.11757093	31.11757093	0	1.466284238	0.197330853	0.206253279	364.0669884	0.011133796	0.057358902	0.239704081	0.272887159	1.354932661	0.00344972	0.0031	0.015049254	0.005267239	32.52195986	0
Fresno	2022	LDT1	Aggregate	40	Electricity	73.66931072	0	73.66931	0	0	0	0	0	0	0	0	0	0	0	0.004971339	0.001739969	0	337996.5411
Fresno	2022	LDT1	Aggregate	40	Plug-in Hybrid	51.35957842	29.45958909	21.89999	0.0038677	0.000438942	0.00047739	169.1165768	0.000543538	0.000721893	0.001693096	0.002470562	0.283370883	0.00167189	0.024090983	0.00494676	0.001731366	17.83313172	113290.2341
Fresno	2022	LDT1	Aggregate	45	Gasoline	90021.10237	90021.10237	0	0.201452881	0.001844941	0.002006376	322.7214958	0.00875712	0.013560897	0.040094001	0.05846519	2.326289374	0.003190431	0.03740487	0.010135452	0.003547408	34.0305785	0
Fresno	2022	LDT1	Aggregate	45	Diesel	24.99592022	24.99592022	0	1.528260452	0.188760287	0.19729519	351.0223405	0.010649988	0.055303713	0.229287982	0.261029123	1.382389778	0.003326115	0.0031	0.011478651	0.004017528	31.35668663	0
Fresno	2022	LDT1	Aggregate	45	Electricity	54.45697666	0	54.45698	0	0	0	0	0	0	0	0	0	0	0	0.003949785	0.001382425	0	344877.5501
Fresno	2022	LDT1	Aggregate	45	Plug-in Hybrid	36.77294483	23.66410734	13.10884	0.00402133	0.000450603	0.000490072	178.6882	0.000538008	0.000750568	0.001675871	0.002445428	0.291672796	0.001766515	0.027027819	0.003930304	0.001375606	18.84244743	96617.85533
Fresno	2022	LDT1	Aggregate	50	Gasoline	193475.8621	193475.8621	0	0.202090584	0.001772083	0.001927136	331.6812416	0.008388608	0.013559468	0.038396518	0.055988216	2.178751463	0.003279007	0.03740487	0.00698267	0.002443935	34.9753725	0
Fresno	2022	LDT1	Aggregate	50	Diesel	53.72192838	53.72192838	0	1.590973669	0.188947803	0.197491185	351.6054678	0.010660341	0.055395585	0.229510859	0.261282854	1.485318105	0.00333164	0.0031	0.007908048	0.002767817	31.40877716	0

Fresno	2022	LDT1	Aggregate	50	Electricity	31.09659001	0	31.09659	0	0	0	0	0	0	0	0	0	0	0	0.002931559	0.001026046	0	355019.4389
Fresno	2022	LDT1	Aggregate	50	Plug-in Hybrid	57.16036314	50.85955901	6.300804	0.00520188	0.000601416	0.000654095	234.0434446	0.000664754	0.000970914	0.002070681	0.003021533	0.372759336	0.002313758	0.037370327	0.002917223	0.001021028	24.6795888	30658.24147
Fresno	2022	LDT1	Aggregate	55	Gasoline	187949.8836	187949.8836	0	0.206534155	0.001789041	0.001945572	345.1310613	0.008440145	0.013798564	0.038607734	0.056294597	2.063653122	0.003411972	0.03740487	0.00485613	0.001699645	36.39363918	0
Fresno	2022	LDT1	Aggregate	55	Diesel	52.18754461	52.18754461	0	1.653553126	0.19791988	0.206868938	367.6321601	0.01116632	0.057920597	0.240404287	0.273684297	1.68067185	0.003483502	0.0031	0.005499688	0.001924891	32.84043523	0
Fresno	2022	LDT1	Aggregate	55	Electricity	12.30478339	0	12.30478	0	0	0	0	0	0	0	0	0	0	0	0.002162898	0.000757014	0	368986.6923
Fresno	2022	LDT1	Aggregate	55	Plug-in Hybrid	51.54405098	49.40692907	2.137122	0.005263465	0.000659791	0.000717583	240.3189144	0.000647394	0.000982408	0.002016606	0.002942626	0.37523792	0.002375797	0.040258594	0.002152346	0.000753321	25.34132925	12572.18065
Fresno	2022	LDT1	Aggregate	60	Gasoline	106775.1137	106775.1137	0	0.215603407	0.001899249	0.002065417	359.1278678	0.008919752	0.01432754	0.040761625	0.05943362	1.974450469	0.003550345	0.03740487	0.00375583	0.001314541	37.86958494	0
Fresno	2022	LDT1	Aggregate	60	Diesel	29.64796202	29.64796202	0	1.716236475	0.216946972	0.226756351	398.2208867	0.012239643	0.062739863	0.26351231	0.299991245	2.002762325	0.003773345	0.0031	0.004253571	0.00148875	35.57291407	0
Fresno	2022	LDT1	Aggregate	60	Electricity	3.150839432	0	3.150839	0	0	0	0	0	0	0	0	0	0	0	0.001643803	0.000575331	0	386630.2541
Fresno	2022	LDT1	Aggregate	60	Plug-in Hybrid	28.48151764	28.06828272	0.413235	0.005107085	0.00072876	0.000792593	236.5780619	0.000607214	0.00095322	0.001891445	0.002759992	0.363114903	0.002338815	0.041390627	0.001635791	0.000572527	24.94686103	4629.263955
Fresno	2022	LDT1	Aggregate	65	Gasoline	123774.1284	123774.1284	0	0.230819587	0.002121384	0.002306982	369.5781943	0.009891832	0.015238435	0.0451456	0.065824154	1.897641378	0.003653657	0.03740487	0.002655531	0.000929436	38.97155882	0
Fresno	2022	LDT1	Aggregate	65	Diesel	34.36803325	34.36803325	0	1.779290023	0.248849472	0.260101341	447.2916729	0.014039391	0.070470985	0.302259819	0.344102709	2.513341227	0.004238316	0.0031	0.003007454	0.001052609	39.95638795	0
Fresno	2022	LDT1	Aggregate	65	Electricity	0.459924799	0	0.459925	0	0	0	0	0	0	0	0	0	0	0	0.001128035	0.000394812	0	404777.6705
Fresno	2022	LDT1	Aggregate	65	Plug-in Hybrid	32.58114473	32.53686284	0.044282	0.004918495	0.000836971	0.000910282	229.9492918	0.000564693	0.000918021	0.001758995	0.002566721	0.345841921	0.002273283	0.041942917	0.001122539	0.000392889	24.2478655	476.1978923
Fresno	2022	LDT1	Aggregate	70	Gasoline	94374.71224	94374.71224	0	0.240582256	0.00228563	0.002485595	373.4573708	0.010633645	0.015823331	0.048495753	0.070707903	1.883864024	0.003692006	0.03740487	0.002655531	0.000929436	39.38061313	0
Fresno	2022	LDT1	Aggregate	70	Diesel	26.2047755	26.2047755	0	1.810516581	0.271092503	0.283350103	482.5849529	0.015294209	0.076031456	0.329275321	0.374858062	2.870719045	0.004572738	0.0031	0.003007454	0.001052609	43.10912267	0
Fresno	2022	LDT1	Aggregate	70	Electricity	0.074595843	0	0.074596	0	0	0	0	0	0	0	0	0	0	0	0.001128035	0.000394812	0	449707.4317
Fresno	2022	LDT1	Aggregate	70	Plug-in Hybrid	24.81121587	24.80855334	0.002663	0.004689475	0.000910233	0.000989961	222.064735	0.00052321	0.000875275	0.001629776	0.002378166	0.329990571	0.002195336	0.041995493	0.001122539	0.000392889	23.41644884	37.51283523
Fresno	2022	LDT2	Aggregate	5	Gasoline	122.216587	122.216587	0	0.188839133	0.00937527	0.010196347	905.8031672	0.02757619	0.014364457	0.111638289	0.162874518	2.3974023	0.008954786	0.034143466	0.008248567	0.002886998	95.51581221	0
Fresno	2022	LDT2	Aggregate	5	Diesel	0.305872985	0.305872985	0	0.192247958	0.037423153	0.039115262	810.077234	0.013327535	0.127627998	0.286933982	0.326655262	2.483803797	0.007675893	0.0031	0.00794898	0.002782143	72.36387841	0
Fresno	2022	LDT2	Aggregate	5	Electricity	252.4452273	0	252.4452	0	0	0	0	0	0	0	0	0	0	0	0.001320691	0.000462242	0	630004.1988
Fresno	2022	LDT2	Aggregate	5	Plug-in Hybrid	195.9236013	0.331054159	195.5925	4.29418E-05	1.39006E-05	1.51182E-05	1.451239116	1.47441E-05	8.02521E-06	4.58962E-05	6.69716E-05	0.003955795	1.4347E-05	7.07433E-05	0.001322821	0.000462987	0.153031351	471971.2034
Fresno	2022	LDT2	Aggregate	10	Gasoline	611.1469066	611.1469066	0	0.166544959	0.005921031	0.006439581	726.6882035	0.017355376	0.012725267	0.070460955	0.102797049	2.055259854	0.007184053	0.034143466	0.010262634	0.003591922	76.62836308	0
Fresno	2022	LDT2	Aggregate	10	Diesel	1.529525026	1.529525026	0	0.170923029	0.027955404	0.029219423	681.8958992	0.009876883	0.107432977	0.21264348	0.242080464	1.852961613	0.00646131	0.0031	0.009889897	0.003461464	60.91349055	0
Fresno	2022	LDT2	Aggregate	10	Electricity	403.8656247	0	403.8656	0	0	0	0	0	0	0	0	0	0	0	0.002336862	0.000817902	0	425185.0569
Fresno	2022	LDT2	Aggregate	10	Plug-in Hybrid	783.7117893	1.65544408	782.0563	3.52809E-05	1.09337E-05	1.18914E-05	1.25630983	8.71667E-06	6.59349E-06	2.71337E-05	3.95935E-05	0.002837168	1.24199E-05	8.84364E-05	0.002340631	0.000819221	0.132476302	334574.7394
Fresno	2022	LDT2	Aggregate	15	Gasoline	1014.29458	1014.29458	0	0.142715849	0.003944311	0.00428974	600.715402	0.011771759	0.010941046	0.047916475	0.069905421	1.950037045	0.005938683	0.034143466	0.012286822	0.004300388	63.34468857	0
Fresno	2022	LDT2	Aggregate	15	Diesel	2.538487764	2.538487764	0	0.133845063	0.021419336	0.022387824	565.4040826	0.005141541	0.089079643	0.110694346	0.126018154	0.935540644	0.005357491	0.0031	0.011840566	0.004144198	50.50732273	0
Fresno	2022	LDT2	Aggregate	15	Electricity	899.4433115	0	899.4433	0	0	0	0	0	0	0	0	0	0	0	0.003353033	0.001173562	0	357684.5769
Fresno	2022	LDT2	Aggregate	15	Plug-in Hybrid	1916.818426	2.747470273	1914.071	1.80555E-05	4.92473E-06	5.35609E-06	0.702295401	3.88304E-06	3.37431E-06	1.20873E-05	1.76378E-05	0.001496375	6.94291E-06	6.00102E-05	0.003358441	0.001175454	0.074056173	289759.1049
Fresno	2022	LDT2	Aggregate	20	Gasoline	263430.7598	263430.7598	0	0.128124343	0.002771008	0.00301368	495.9211171	0.008270453	0.009845467	0.033742145	0.049225794	1.718458313	0.004902685	0.034143466	0.014300889	0.005005311	52.29426216	0
Fresno	2022	LDT2	Aggregate	20	Diesel	659.2914655	659.2914655	0	0.109260954	0.016911207	0.017675857	464.5226196	0.002360131	0.073185728	0.050812235	0.057846352	0.399078784	0.004401588	0.0031	0.013781483	0.004823519	41.4956216	0
Fresno	2022	LDT2	Aggregate	20	Electricity	1320.892865	0	1320.893	0	0	0	0	0	0	0	0	0	0	0	0.004372514	0.00153038	0	334944.5347
Fresno	2022	LDT2	Aggregate	20	Plug-in Hybrid	3498.025156	713.5680259	2784.457	0.002149888	0.000490795	0.000533785	85.58799046	0.000404208	0.000401783	0.00125824	0.00183602	0.16716437	0.000846124	0.008540538	0.004379812	0.001532934	9.025146655	216460.5275
Fresno	2022	LDT2	Aggregate	25	Gasoline	35951.3181	35951.3181	0	0.116270051	0.002052719	0.002232484	424.3375383	0.006167169	0.008947826	0.025210313	0.036778307	1.577678764	0.004195009	0.034143466	0.015130807	0.005295782	44.74586321	0
Fresno	2022	LDT2	Aggregate	25	Diesel	89.97581456	89.97581456	0	0.099324051	0.013815807	0.014440497	389.4854715	0.001562245	0.061363595	0.03363421	0.038290312	0.255558624	0.003690573	0.0031	0.014581258	0.00510344	34.79258288	0
Fresno	2022	LDT2	Aggregate	25	Electricity	1442.684152	0	1442.684	0	0	0	0	0	0	0	0	0	0	0	0.004974935	0.001741227	0	331465.6743
Fresno	2022	LDT2	Aggregate	25	Plug-in Hybrid	2884.848454	97.3831268	2787.465	0.000307954	5.99985E-05	6.52538E-05	12.6543855	5.28E-05	5.75521E-05	0.000164359	0.000239832	0.023588511	0.000125101	0.001413297	0.004983003	0.001744051	1.33438914	252250.0361
Fresno	2022	LDT2	Aggregate	30	Gasoline	108975.2676	108975.2676	0	0.107245288	0.001603196	0.001743592	376.9031565	0.004842055	0.008259112	0.019823	0.02891857	1.454129698	0.003726071	0.034143466	0.014766453	0.005168258	39.74396692	0
Fresno	2022	LDT2	Aggregate	30	Diesel	272.7337685	272.7337685	0	0.095373324	0.011773308	0.012305645	336.7947089	0.001226755	0.053062144	0.026411323	0.030067535	0.199887464	0.003191301	0.0031	0.014230137	0.004980548	30.08573793	0
Fresno	2022	LDT2	Aggregate	30	Electricity	1446.371931	0	1446.372	0	0	0	0	0	0	0	0	0	0	0	0.005163605	0.001807262	0	331846.1361
Fresno	2022	LDT2	Aggregate	30	Plug-in Hybrid	2522.214848	295.1867376	2227.028	0.000947109	0.000162114	0.000176313	40.0266069	0.00015093	0.000177001	0.000469823	0.000685565	0.071842933	0.000395704	0.004899904	0.005172098	0.001810234	4.220755685	226693.9837
Fresno	2022	LDT2	Aggregate	35	Gasoline	218331.9058	218331.9058	0	0.100952825	0.001319971	0.001435563	349.6179899	0.00400064	0.007774319	0.016394608	0.023916757	1.34549871	0.00345633	0.034143466	0.014402099	0.005040735	36.8667802	0
Fresno	2022	LDT2	Aggregate	35	Diesel	546.4219982	546.4219982	0	0.09369947	0.010411754	0.010882527	303.9701688	0.001013922	0.047890624	0.021829153	0.024851039	0.165255147	0.002880272	0.0031	0.013879017	0.004857656	27.15353477	0
Fresno	2022	LDT2	Aggregate	35	Electricity	1359.362365	0	1359.362	0	0	0	0	0	0	0	0	0	0	0	0.005355585	0.001874455	0	333403.3612
Fresno	2022	LDT2	Aggregate	35	Plug-in Hybrid	2189.691444	591.4065129	1598.285	0.001979042	0.000307588	0.000334529	85.47989322	0.000295864	0.000369854	0.00092098	0.001343892	0.148682388	0.000845056	0.011307744	0.005364623	0.001877618	9.013747936	185326.4611
Fresno	2022	LDT2	Aggregate	40	Gasoline	574556.0617	574556.0617	0	0.097029596	0.0011456	0.001245921	337.5125577	0.003467467	0.007466694	0.01421584	0.020738065	1.231362318	0.003336655	0.034143466	0.012711902	0.004449166	35.5902775	0
Fresno	2022	LDT2	Aggregate	40	Diesel	1437.94866	1437.94866	0	0.093351488	0.009529722	0.009960614	283.7015985	0.000874299	0.044697302	0.018823139	0.021428892	0.142951318	0.002688217	0.0031	0.012250207	0.004287573	25.34295141	0
Fresno	2022	LDT2	Aggregate	40	Electricity	1183.728315	0	1183.728	0	0	0	0	0	0	0	0	0	0	0	0.004945145	0.001730801	0	337996.5411
Fresno	2022	LDT2	Aggregate	40	Plug-in Hybrid	2635.216108	1556.328635	1078.887	0.003982288	0.000583373	0.000634471	174.1269593	0.000560019	0.000744232	0.001743257	0.002543757	0.291766254	0.001721422	0.024726228	0.004953931	0.001733876	18.36147029	108775.2112
Fresno	2022	LDT2	Aggregate	45	Gasoline	461525.6605	461525.6605	0	0.094654797	0.001048048	0.001139825	338.535768	0.003169541	0.007273421	0.012992922	0.018953843	1.143650817	0.003346771	0.034143466	0.009695861	0.003393551	35.69817375	0
Fresno	2022	LDT2	Aggregate	45	Diesel	1155.066057	1155.066057	0	0.093809008	0.00901522	0.009422848	273.5364707	0.000783275	0.043095782	0.016863457	0.019197925	0.12885511	0.002591897	0.0031	0.009343709	0.003270298	24.43490457	0
Fresno	2022	LDT2	Aggregate	45	Electricity	875.0219678	0	875.022	0	0	0	0	0	0	0	0	0	0	0	0.003928974	0.001375141	0	344877.5501
Fresno	2022	LDT2	Aggregate	45	Plug-in Hybrid	1895.955155	1250.157555	645.7976	0.00412045	0.000595975	0.000648177	183.0926231	0.000551642	0.000770052	0.001717179	0.002505704	0.298862137	0.001810057	0.027606381	0.00393603	0.00137761	19.30688833	92318.76577
Fresno	2022	LDT2	Aggregate	50	Gasoline	991923.8125	991923.8125	0	0.094161632	0.001010691	0.001099197	348.1396115	0.003047389	0.007219629	0.012484035	0.018211277	1.064568167	0.003441714	0.034143466	0.006679821	0.002337937	36.71088704	0
Fresno	2022	LDT2	Aggregate	50	Diesel	2482.500163	2482.500163	0	0.094837435	0.008814056	0.009212589	273.9908765	0.000728146	0.043167374	0.015676563	0.017846724	0.121023802	0.002596203	0.0031	0.006437211	0.002253024	24.47549646	0
Fresno	2022	LDT2	Aggregate	50	Electricity	499.6641578	0	499.6642	0	0	0	0	0	0	0	0	0	0	0	0.002916113	0.001020639	0	355019.4389
Fresno	2022	LDT2	Aggregate	50	Plug-in Hybrid	2997.278115	2686.873459	310.4047	0.005240864	0.000782126	0.000850633	235.7974158	0.000670189	0.000979441	0.002086199	0.003044177	0.375552874	0.002331098	0.037531245	0.002921542	0.00102254	24.86454287	28803.64332
Fresno	2022	LDT2	Aggregate	55	Gasoline	963592.8899	963592.8899	0	0.095159529	0.001027478	0.001117453	362.4143483	0.003086308	0.00727411	0.012628689	0.018422112	0.998688337	0.003582835	0.034143466	0.004645512	0.001625929	38.21614021	0
Fresno	2022	LDT2	Aggregate	55	Diesel	2411.596007	2411.596007	0	0.096226479	0.008916134	0.009319282	286.479782	0.000702982	0.045135006	0.015134794	0.017229957	0.118808454	0.002714542	0.0031	0.004476787	0.001566876	25.59112544	0
Fresno	2022	LDT2	Aggregate	55	Electricity	197.7149015	0	197.7149	0	0	0	0	0	0	0	0	0	0	0	0.002151502	0.000753026	0	368986.6923
Fresno	2022	LDT2	Aggregate	55	Plug-in Hybrid	2715.415875	2610.132077	105.2838	0.005278233	0.000854049	0.000928856	240.9931908	0.000649649	0.000986425	0.002022264	0.002950882	0.376290746	0.002382463	0.040243795	0.002155547	0.000754441	25.41243085	11756.68969
Fresno	2022	LDT2	Aggregate	60	Gasoline	547421.1445	547421.1445	0	0.09792608	0.001101254	0.001197689	377.2199975	0.003291664	0.007455969	0.01344708	0.019615779	0.94219904	0.003729204	0.034143466	0.003592934	0.001257527	39.77737742	0
Fresno	2022	LDT2	Aggregate	60	Diesel	1370.037762	1370.037762	0	0.098482373	0.009425451	0.009851629	310.3162487	0.000722768	0.048890451	0.015560777	0.017714911	0.12587947	0.002940404	0.0031	0.003462439	0.001211854	27.72042757	0
Fresno	2022	LDT2	Aggregate	60	Electricity	50.62810844	0	50.62811	0	0	0	0	0	0	0	0	0	0	0	0.001635142	0.0005723	0	386630.2541
Fresno	2022	LDT2	Aggregate	60	Plug-in Hybrid	1503.184658	1482.826932	20.35773	0.00511209	0.000941605	0.001024082	236.8099168	0.00060822	0.000955375	0.001893298	0.002762696	0.363470768	0.002341107	0.041300083	0.001638227	0.000573379	24.97130984	4321.106637
Fresno	2022	LDT2	Aggregate	65	Gasoline	634572.7267	634572.7267	0	0.102984975	0.001244572	0.001353557	388.3136943	0.003692155	0.007801499	0.015052873	0.021958068	0.887397277	0.003838876	0.034143466	0.002540356	0.000889125	40.94719388	0
Fresno	2022	LDT2	Aggregate	65	Diesel	1588.153119	1588.153119	0	0.101408898	0.010409686	0.010880366	348.554982	0.000786147	0.054914979	0.016925292	0.01926832	0.142881187	0.003302736	0.0031	0.002448091	0.000856832	31.13627847	0
Fresno	2022	LDT2	Aggregate	65	Electricity	7.390133043	0	7.390133	0	0	0	0	0	0	0	0	0	0	0	0.001122091	0.000392732	0	404777.6705
Fresno	2022	LDT2	Aggregate	65	Plug-in Hybrid	1721.080282	1718.898766	2.181516	0.004918946	0.001080462	0.001175101	229.9703836	0.000565127	0.000919279	0.001759156	0.002566956	0.345873642	0.002273491	0.041814024	0.001124212	0.000393474	24.25008961	444.1042468
Fresno	2022	LDT2	Aggregate	70	Gasoline	483846.0123	483846.0123	0	0.106235146	0.001349702	0.001467892	392.3436641	0.003994219	0.008023536	0.016266314	0.023728074	0.869862445	0.003878717	0.034143466	0.002540356	0.000889125	41.37214915	0
Fresno	2022	LDT2	Aggregate	70	Diesel	1210.927482	1210.927482	0	0.10285578	0.011095914	0.011597622	376.0575028	0.000830337	0.059248013	0.017876658	0.020351386	0.154781476	0.003563336	0.0031	0.002448091	0.000856832	33.59306776	0
Fresno	2022	LDT2	Aggregate	70	Electricity	1.198615958	0	1.198616	0	0	0	0	0	0	0	0	0	0	0	0.001122091	0.000392732	0	449707.4317
Fresno	2022	LDT2	Aggregate	70	Plug-in Hybrid	1310.748971	1310.617804	0.131168	0.004689509	0.001174937	0.001277852	222.0663431	0.000523567	0.000876401	0.001629788	0.002378183	0.329992961	0.002195352	0.041862902	0.001124213	0.000393474	23.41661841	34.98167967
Fresno	2022	LHDT1	Aggregate	5	Gasoline	12595.3495	12595.3495	0	0.367314402	0.004856924	0.005282348	1683.584729	0.039687346	0.020579166	0.200479002	0.29253849	3.138481608	0.016643949	0.044806962	0.078000022	0.027300008	177.5319061	0
Fresno	2022	LHDT1	Aggregate	5	Diesel	7298.710481	7298.710481	0	2.812824445	0.111581516	0.116626737	1218.659985	0.023410496	0.192000377	0.504014189	0.573786645	1.614762269	0.011547423	0.148075826	0.078000022	0.027300008	108.8624137	0
Fresno	2022	LHDT1	Aggregate	10	Gasoline	32843.39251	32843.39251	0	0.327106551	0.003321576	0.003612517	1411.229939	0.02650422	0.018224464	0.134110619	0.195693901	2.435541781	0.013951445	0.044806962	0.078000022	0.027300008	148.8124338	0
Fresno	2022	LHDT1	Aggregate	10	Diesel	24271.53893	24271.53893	0	2.62805453	0.090261736	0.094342971	1054.432637	0.018946143	0.166126291	0.4078993	0.464366234	1.27543551	0.009991285	0.148075826	0.078000022	0.027300008	94.19204976	0
Fresno	2022	LHDT1	Aggregate	15	Gasoline	74788.83333	74788.83333	0	0.296258716	0.002392102	0.002601629	1185.40684	0.018607747	0.016407108	0.094402647	0.137752121	1.949131336	0.011718953	0.044806962	0.078000022	0.027300008	124.9996701	0
Fresno	2022	LHDT1	Aggregate	15	Diesel	52565.20006	52565.20006	0	2.473508681	0.073700233	0.077032631	877.5954668	0.015561594	0.138265523	0.335031967	0.38141162	1.018616828	0.008315663	0.148075826	0.078000022	0.027300008	78.3952554	0
Fresno	2022	LHDT1	Aggregate	20	Gasoline	86417.91617	86417.91617	0	0.274357032	0.001804412	0.001962463	1002.207625	0.013600423	0.01510066	0.069280093	0.101093349	1.593916384	0.009907843	0.044806962	0.078000022	0.027300008	105.6815418	0
Fresno	2022	LHDT1	Aggregate	20	Diesel	57628.43775	57628.43775	0	2.341203355	0.060480115	0.063214758	758.4261926	0.012897728	0.119490355	0.277680497	0.316120784	0.81766612	0.007186474	0.148075826	0.078000022	0.027300008	67.74991135	0
Fresno	2022	LHDT1	Aggregate	25	Gasoline	66568.43774	66568.43774	0	0.260419399	0.001420774	0.001545221	858.1986326	0.010327235	0.014247358	0.052923763	0.07722623	1.331904063	0.008484167	0.044806962	0.078000022	0.027300008	90.49597352	0
Fresno	2022	LHDT1	Aggregate	25	Diesel	61677.80269	61677.80269	0	2.243015082	0.049802531	0.05205438	659.5311201	0.010752069	0.103909397	0.231485721	0.263531103	0.657764132	0.006249393	0.148075826	0.078000022	0.027300008	58.9156537	0
Fresno	2022	LHDT1	Aggregate	30	Gasoline	58868.34598	58868.34598	0	0.247780197	0.001166929	0.001269141	749.2609225	0.008252575	0.013483312	0.042650323	0.062235251	1.153615337	0.007407207	0.044806962	0.078000022	0.027300008	79.0086281	0
Fresno	2022	LHDT1	Aggregate	30	Diesel	52063.87959	52063.87959	0	2.161431787	0.041206164	0.043069323	578.1730412	0.009007693	0.091091398	0.193930327	0.220776784	0.530535168	0.005478483	0.148075826	0.078000022	0.027300008	51.64796874	0
Fresno	2022	LHDT1	Aggregate	35	Gasoline	21996.96249	21996.96249	0	0.243985286	0.001001732	0.001089475	671.606974	0.006814339	0.013214669	0.035546615	0.051869537	1.024603275	0.006639519	0.044806962	0.078000022	0.027300008	70.82011625	0
Fresno	2022	LHDT1	Aggregate	35	Diesel	27476.13043	27476.13043	0	2.116404619	0.034420728	0.035977081	519.138553	0.007596094	0.08179049	0.163539424	0.186178761	0.431292343	0.004919102	0.148075826	0.078000022	0.027300008	46.37444129	0
Fresno	2022	LHDT1	Aggregate	40	Gasoline	6493.001718	6493.001718	0	0.244454793	0.000902029	0.000981039	621.5216578	0.00590636	0.013192585	0.031097189	0.045376945	0.949522339	0.006144374	0.044806962	0.078000022	0.027300008	65.53868224	0
Fresno	2022	LHDT1	Aggregate	40	Diesel	15083.4975	15083.4975	0	2.095169302	0.029288545	0.030612844	472.4956009	0.006477306	0.074441874	0.139452591	0.158757503	0.357615666	0.004477136	0.148075826	0.078000022	0.027300008	42.20784486	0
Fresno	2022	LHDT1	Aggregate	45	Gasoline	7993.456516	7993.456516	0	0.239110775	0.000854953	0.00092984	595.3052627	0.005521593	0.01287867	0.029312184	0.04277227	0.941315143	0.005885199	0.044806962	0.078000022	0.027300008	62.77419613	0
Fresno	2022	LHDT1	Aggregate	45	Diesel	16280.05443	16280.05443	0	2.090197084	0.025722383	0.026885435	440.6271545	0.005629221	0.069420988	0.121193815	0.137971101	0.308671258	0.004175166	0.148075826	0.078000022	0.027300008	39.36104917	0
Fresno	2022	LHDT1	Aggregate	50	Gasoline	59022.56886	59022.56886	0	0.233475855	0.000854006	0.000928809	589.5934867	0.005520531	0.012569674	0.029460785	0.042989108	0.991859526	0.005828732	0.044806962	0.078000022	0.027300008	62.1718965	0
Fresno	2022	LHDT1	Aggregate	50	Diesel	62862.44868	62862.44868	0	2.111278748	0.023683656	0.024754525	428.6566857	0.005042058	0.067535035	0.108552546	0.123579857	0.284984248	0.00406174	0.148075826	0.078000022	0.027300008	38.29173193	0
Fresno	2022	LHDT1	Aggregate	55	Gasoline	16233.9937	16233.9937	0	0.248377997	0.000897191	0.000975777	600.2161042	0.0055627	0.013373142	0.029671381	0.04329641	1.057146023	0.005933747	0.044806962	0.078000022	0.027300008	63.29203823	0
Fresno	2022	LHDT1	Aggregate	55	Diesel	37856.3377	37856.3377	0	2.169905265	0.023173208	0.024220997	431.1026945	0.004716032	0.067920405	0.101533392	0.115589017	0.288579327	0.004084917	0.148075826	0.078000022	0.027300008	38.51023292	0
Fresno	2022	LHDT2	Aggregate	5	Gasoline	2103.173892	2103.173892	0	0.326504829	0.003887123	0.004227601	1890.849635	0.025549015	0.019227915	0.1182116	0.17249409	1.876441278	0.018692974	0.044974059	0.091000026	0.031850009	199.3877314	0
Fresno	2022	LHDT2	Aggregate	5	Diesel	2659.928371	2659.928371	0	2.591312405	0.09916926	0.103653254	1450.428377	0.020940532	0.228515582	0.450837318	0.513248312	1.426117655	0.013743546	0.160218508	0.091000026	0.031850009	129.5661924	0
Fresno	2022	LHDT2	Aggregate	10	Gasoline	5484.196024	5484.196024	0	0.286129155	0.002664327	0.002897699	1587.98121	0.016824474	0.016845244	0.077593675	0.113224508	1.529069549	0.015698811	0.044974059	0.091000026	0.031850009	167.4506345	0
Fresno	2022	LHDT2	Aggregate	10	Diesel	8845.474166	8845.474166	0	2.378701643	0.081214929	0.084887107	1265.079089	0.017236794	0.199313726	0.371098025	0.422470429	1.139721464	0.011987267	0.160218508	0.091000026	0.031850009	113.0090139	0
Fresno	2022	LHDT2	Aggregate	15	Gasoline	12488.25383	12488.25383	0	0.254745029	0.001923694	0.002092193	1335.8581	0.011628845	0.01498763	0.053546688	0.078135201	1.260290144	0.013206317	0.044974059	0.091000026	0.031850009	140.8645675	0
Fresno	2022	LHDT2	Aggregate	15	Diesel	19156.76301	19156.76301	0	2.197597151	0.066924186	0.069950201	1069.620407	0.01435349	0.168519131	0.309022188	0.351801216	0.916506893	0.010135197	0.160218508	0.091000026	0.031850009	95.54876723	0
Fresno	2022	LHDT2	Aggregate	20	Gasoline	14430.08033	14430.08033	0	0.231759952	0.001454038	0.001581399	1130.442714	0.008348959	0.013624435	0.038486664	0.05615965	1.044726986	0.011175577	0.044974059	0.091000026	0.031850009	119.2037717	0
Fresno	2022	LHDT2	Aggregate	20	Diesel	21001.99987	21001.99987	0	2.040859216	0.055290712	0.057790712	925.102607	0.012029076	0.145750292	0.258978928	0.294830292	0.737431314	0.008765817	0.160218508	0.091000026	0.031850009	82.63904942	0
Fresno	2022	LHDT2	Aggregate	25	Gasoline	11115.61059	11115.61059	0	0.216123756	0.001146064	0.001246449	968.1369824	0.006203533	0.012696895	0.028729176	0.041921545	0.873535278	0.00957102	0.044974059	0.091000026	0.031850009	102.0888351	0
Fresno	2022	LHDT2	Aggregate	25	Diesel	22477.74284	22477.74284	0	1.918861297	0.045747138	0.04781562	804.077478	0.010116093	0.126682734	0.217793525	0.247943448	0.59190177	0.007619043	0.160218508	0.091000026	0.031850009	71.82792259	0
Fresno	2022	LHDT2	Aggregate	30	Gasoline	9829.847781	9829.847781	0	0.202308547	0.000941279	0.001023727	844.5757352	0.004818405	0.011883049	0.022505244	0.032839599	0.748929414	0.008349491	0.044974059	0.091000026	0.031850009	89.05945601	0
Fresno	2022	LHDT2	Aggregate	30	Diesel	18974.06272	18974.06272	0	1.816536491	0.037965822	0.039682468	703.2603075	0.008529386	0.110798948	0.183632658	0.209053572	0.473931226	0.006663749	0.160218508	0.091000026	0.031850009	62.82196468	0
Fresno	2022	LHDT2	Aggregate	35	Gasoline	3673.057044	3673.057044	0	0.196228057	0.000807484	0.000878213	755.7622111	0.003861573	0.011531453	0.018240657	0.026616724	0.654916529	0.007471479	0.044974059	0.091000026	0.031850009	79.69418086	0
Fresno	2022	LHDT2	Aggregate	35	Diesel	10013.34949	10013.34949	0	1.750815048	0.031754801	0.033190612	627.7939478	0.007219063	0.098909192	0.155422184	0.176937824	0.380169447	0.005948667	0.160218508	0.091000026	0.031850009	56.08058467	0
Fresno	2022	LHDT2	Aggregate	40	Gasoline	1084.202681	1084.202681	0	0.194137852	0.000726636	0.000790283	697.7378535	0.00324755	0.011424294	0.015529908	0.022661205	0.596402124	0.006897849	0.044974059	0.091000026	0.031850009	73.57558484	0
Fresno	2022	LHDT2	Aggregate	40	Diesel	5497.001564	5497.001564	0	1.710929137	0.027002085	0.028223	568.5895869	0.006156019	0.089581521	0.132535473	0.150882824	0.308886597	0.005387675	0.160218508	0.091000026	0.031850009	50.79188256	0
Fresno	2022	LHDT2	Aggregate	45	Gasoline	1334.748913	1334.748913	0	0.188288961	0.000688703	0.000749028	666.5496439	0.002946892	0.011107045	0.014244637	0.020785741	0.581029079	0.006589522	0.044974059	0.091000026	0.031850009	70.28682712	0
Fresno	2022	LHDT2	Aggregate	45	Diesel	5933.072528	5933.072528	0	1.690916468	0.02364572	0.024714874	527.879946	0.005324152	0.0831677	0.11462585	0.130493909	0.259486611	0.005001931	0.160218508	0.091000026	0.031850009	47.15530647	0
Fresno	2022	LHDT2	Aggregate	50	Gasoline	9855.599946	9855.599946	0	0.183023682	0.000688542	0.000748853	658.6190839	0.002882138	0.010833519	0.014017264	0.020453958	0.60326278	0.00651112	0.044974059	0.091000026	0.031850009	69.45055947	0
Fresno	2022	LHDT2	Aggregate	50	Diesel	22909.473	22909.473	0	1.698847989	0.0216583	0.022637592	510.1831755	0.004716338	0.080379567	0.101539975	0.115596511	0.232344856	0.004834245	0.160218508	0.091000026	0.031850009	45.57446097	0
Fresno	2022	LHDT2	Aggregate	55	Gasoline	2710.755402	2710.755402	0	0.193973819	0.000724393	0.000787843	669.5417863	0.002908241	0.011528473	0.014129593	0.020617868	0.637743351	0.006619102	0.044974059	0.091000026	0.031850009	70.60234479	0
Fresno	2022	LHDT2	Aggregate	55	Diesel	13796.29277	13796.29277	0	1.74392791	0.021040426	0.021991781	511.0035023	0.004332734	0.08050881	0.093281204	0.106194449	0.228908604	0.004842018	0.160218508	0.091000026	0.031850009	45.64774044	0
Fresno	2022	MCY	Aggregate	5	Gasoline	2.008417731	2.008417731	0	0.910218487	0.010502505	0.011215266	481.434955	1.165537238	0.06295824	7.729126747	9.215190511	38.44299222	0.004759475	0.008517287	0.012000003	0.004200001	50.76671447	0
Fresno	2022	MCY	Aggregate	10	Gasoline	10.04313992	10.04313992	0	0.843422416	0.00677631	0.007233621	385.4959819	0.764080284	0.057740144	5.110698101	6.074333299	30.49017283	0.00381102	0.008517287	0.012000003	0.004200001	40.65006963	0
Fresno	2022	MCY	Aggregate	15	Gasoline	16.66817304	16.66817304	0	0.769708618	0.004611096	0.004920598	312.710671	0.52197842	0.052193847	3.504278447	4.15954457	24.84825596	0.003091463	0.008517287	0.012000003	0.004200001	32.97494953	0
Fresno	2022	MCY	Aggregate	20	Gasoline	4329.027851	4329.027851	0	0.729227716	0.003307998	0.003528886	259.3065387	0.378162454	0.048965245	2.554013184	3.025083636	21.07162779	0.002563509	0.008517287	0.012000003	0.004200001	27.34355051	0
Fresno	2022	MCY	Aggregate	25	Gasoline	590.7975873	590.7975873	0	0.696704923	0.002501024	0.002667214	221.5378644	0.288163732	0.046357336	1.955489277	2.312226328	18.460267	0.002190127	0.008517287	0.012000003	0.004200001	23.360891	0
Fresno	2022	MCY	Aggregate	30	Gasoline	1790.819602	1790.819602	0	0.674122186	0.00199208	0.002123856	196.3340966	0.231012907	0.044482571	1.57416213	1.85859672	16.59017482	0.001940962	0.008517287	0.012000003	0.004200001	20.70318518	0
Fresno	2022	MCY	Aggregate	35	Gasoline	3587.90637	3587.90637	0	0.661304945	0.001671044	0.001781133	181.4306551	0.19505281	0.043314245	1.334242522	1.573177701	15.30179763	0.001793627	0.008517287	0.012000003	0.004200001	19.13163588	0
Fresno	2022	MCY	Aggregate	40	Gasoline	9441.832818	9441.832818	0	0.657763581	0.001475798	0.001572674	174.6948854	0.173387501	0.04280637	1.190355986	1.401718288	14.44976449	0.001727037	0.008517287	0.012000003	0.004200001	18.42135739	0
Fresno	2022	MCY	Aggregate	45	Gasoline	7584.374126	7584.374126	0	0.659168809	0.001371839	0.00146161	174.2514974	0.161948589	0.042676291	1.114967822	1.311634569	14.0102749	0.001722653	0.008517287	0.012000003	0.004200001	18.37460268	0
Fresno	2022	MCY	Aggregate	50	Gasoline	16300.54825	16300.54825	0	0.667345078	0.001341875	0.001429458	178.5265767	0.159119873	0.043034945	1.098155631	1.290749947	14.00144021	0.001764917	0.008517287	0.012000003	0.004200001	18.82540445	0
Fresno	2022	MCY	Aggregate	55	Gasoline	15834.97865	15834.97865	0	0.680156363	0.001380913	0.001470861	185.6748729	0.164190962	0.043745609	1.135077973	1.333350893	14.47764832	0.001835585	0.008517287	0.012000003	0.004200001	19.57918335	0
Fresno	2022	MCY	Aggregate	60	Gasoline	8995.917496	8995.917496	0	0.698534551	0.001494846	0.001592074	194.2403589	0.178017156	0.04486828	1.232048709	1.446687205	15.60455267	0.001920264	0.008517287	0.012000003	0.004200001	20.48240315	0
Fresno	2022	MCY	Aggregate	65	Gasoline	10428.10266	10428.10266	0	0.724469725	0.00170198	0.001812584	203.1953778	0.202999105	0.046531293	1.406123575	1.650601484	17.6844487	0.002008793	0.008517287	0.012000003	0.004200001	21.4266987	0
Fresno	2022	MCY	Aggregate	70	Gasoline	7951.170412	7951.170412	0	0.738870102	0.001850735	0.00197098	207.6590399	0.220746626	0.047480188	1.529181929	1.795004728	19.23930161	0.002052921	0.008517287	0.012000003	0.004200001	21.89738629	0
Fresno	2022	MDV	Aggregate	5	Gasoline	107.5692692	107.5692692	0	0.28070733	0.009619252	0.010461305	1104.728667	0.038951597	0.019313809	0.167596829	0.244377192	2.923652628	0.010921368	0.033127996	0.008542925	0.002990024	116.4922576	0
Fresno	2022	MDV	Aggregate	5	Diesel	1.665841806	1.665841806	0	0.198526728	0.026687327	0.02789401	1012.819745	0.010655882	0.159570163	0.229414861	0.261173566	4.083535268	0.009596982	0.0031	0.008284189	0.002899466	90.47478661	0
Fresno	2022	MDV	Aggregate	5	Electricity	264.5873396	0	264.5873	0	0	0	0	0	0	0	0	0	0	0	0.001320581	0.000462203	0	630004.1988
Fresno	2022	MDV	Aggregate	5	Plug-in Hybrid	158.7259405	0.293635593	158.4323	4.70142E-05	2.04276E-05	2.22169E-05	1.588866727	1.61356E-05	8.7793E-06	5.02487E-05	7.33228E-05	0.004330941	1.57076E-05	7.7698E-05	0.001326975	0.000464441	0.167544011	471895.4453
Fresno	2022	MDV	Aggregate	10	Gasoline	537.9026509	537.9026509	0	0.247813052	0.006081868	0.006614232	887.7383599	0.024505379	0.017095157	0.105677315	0.154078643	2.496511499	0.008776197	0.033127996	0.010628866	0.003720103	93.61090084	0
Fresno	2022	MDV	Aggregate	10	Diesel	8.330080983	8.330080983	0	0.178702442	0.020575502	0.021505835	860.1305017	0.00790969	0.135513911	0.170290967	0.193864944	3.050127645	0.008150174	0.0031	0.010306954	0.003607434	76.835117	0
Fresno	2022	MDV	Aggregate	10	Electricity	423.2907563	0	423.2908	0	0	0	0	0	0	0	0	0	0	0	0.002336667	0.000817834	0	425185.0569
Fresno	2022	MDV	Aggregate	10	Plug-in Hybrid	634.9433344	1.468331662	633.475	3.86252E-05	1.6067E-05	1.74743E-05	1.375396194	9.53893E-06	7.21276E-06	2.97057E-05	4.33465E-05	0.003106104	1.35972E-05	9.71267E-05	0.002347981	0.000821793	0.14503381	334507.6066
Fresno	2022	MDV	Aggregate	15	Gasoline	892.7341981	892.7341981	0	0.212568665	0.004055909	0.004410913	732.7595447	0.016612694	0.014690636	0.071783405	0.104654606	2.357938051	0.007244074	0.033127996	0.01272529	0.004453851	77.26857843	0
Fresno	2022	MDV	Aggregate	15	Diesel	13.82508183	13.82508183	0	0.143664489	0.016095169	0.016822921	729.4484258	0.004076474	0.114924897	0.087764089	0.09991358	1.521934214	0.006911895	0.0031	0.012339884	0.00431896	65.16133892	0
Fresno	2022	MDV	Aggregate	15	Electricity	942.7047422	0	942.7047	0	0	0	0	0	0	0	0	0	0	0	0.003352754	0.001173464	0	357684.5769
Fresno	2022	MDV	Aggregate	15	Plug-in Hybrid	1552.857318	2.436927736	1550.42	1.97682E-05	7.23731E-06	7.87124E-06	0.768915996	4.24961E-06	3.69147E-06	1.3234E-05	1.9311E-05	0.001638323	7.60152E-06	6.59114E-05	0.003368985	0.001179145	0.081081231	289719.65
Fresno	2022	MDV	Aggregate	20	Gasoline	231859.3165	231859.3165	0	0.191046368	0.002852442	0.003102094	605.5255996	0.011667256	0.013217388	0.050505282	0.073628342	2.074557107	0.005986237	0.033127996	0.014811231	0.005183931	63.85191789	0
Fresno	2022	MDV	Aggregate	20	Diesel	3590.625329	3590.625329	0	0.12071035	0.012881262	0.013463695	605.8040296	0.001827645	0.095444672	0.03934813	0.04479523	0.629170838	0.005740301	0.0031	0.01436265	0.005026927	54.11623399	0
Fresno	2022	MDV	Aggregate	20	Electricity	1384.425179	0	1384.425	0	0	0	0	0	0	0	0	0	0	0	0.004372149	0.001530252	0	334944.5347
Fresno	2022	MDV	Aggregate	20	Plug-in Hybrid	2888.35809	632.9144782	2255.444	0.002309391	0.000707648	0.000769632	91.93785605	0.000434014	0.000431249	0.00135159	0.001972237	0.179566476	0.000908899	0.009203294	0.004393753	0.001537814	9.694732047	212345.0023
Fresno	2022	MDV	Aggregate	25	Gasoline	31642.65269	31642.65269	0	0.173561211	0.002115166	0.002300279	518.0585471	0.008699518	0.012013369	0.037720195	0.054986193	1.902148583	0.005121536	0.033127996	0.015670765	0.005484768	54.62862649	0
Fresno	2022	MDV	Aggregate	25	Diesel	490.0252099	490.0252099	0	0.111875154	0.010617078	0.011097136	512.2696433	0.001194899	0.080708291	0.025725482	0.02928675	0.394630382	0.004854015	0.0031	0.015196151	0.005318653	45.76084431	0
Fresno	2022	MDV	Aggregate	25	Electricity	1512.074385	0	1512.074	0	0	0	0	0	0	0	0	0	0	0	0.00497452	0.001741082	0	331465.6743
Fresno	2022	MDV	Aggregate	25	Plug-in Hybrid	2344.256343	86.37605475	2257.88	0.000336135	8.7903E-05	9.56025E-05	13.81238304	5.76076E-05	6.27689E-05	0.000179399	0.000261779	0.025747086	0.000136549	0.001547525	0.004998684	0.001749539	1.456498533	251443.5961
Fresno	2022	MDV	Aggregate	30	Gasoline	95914.88509	95914.88509	0	0.160262016	0.00165349	0.00179819	460.0889433	0.006831162	0.011092141	0.029658416	0.043231591	1.752126051	0.004548448	0.033127996	0.015293408	0.005352693	48.5158042	0

Fresno	2022	MDV	Aggregate	30	Diesel	1485.359403	1485.359403	0	0.108817809	0.009114946	0.009527084	442.441441	0.000933969	0.069706829	0.020107812	0.022891407	0.305346771	0.004192358	0.0031	0.014830223	0.005190578	39.52311866	0
Fresno	2022	MDV	Aggregate	30	Electricity	1515.939538	0	1515.94	0	0	0	0	0	0	0	0	0	0	0	0.005163174	0.001807111	0	331846.1361
Fresno	2022	MDV	Aggregate	30	Plug-in Hybrid	2065.741646	261.8222134	1803.919	0.001025689	0.000235652	0.000256293	43.34754416	0.000163384	0.000191534	0.000508804	0.000742445	0.077803615	0.000428535	0.005323286	0.005188468	0.001815964	4.57094437	224200.9794
Fresno	2022	MDV	Aggregate	35	Gasoline	192165.4346	192165.4346	0	0.151011837	0.001362494	0.001481722	426.7366791	0.005646587	0.01044626	0.024540689	0.035769516	1.621284411	0.004218727	0.033127996	0.014916052	0.005220618	44.99884962	0
Fresno	2022	MDV	Aggregate	35	Diesel	2975.91698	2975.91698	0	0.107969383	0.00809584	0.008461897	401.4544247	0.000768501	0.063249308	0.016545383	0.018835818	0.249487385	0.003803985	0.0031	0.014464296	0.005062504	35.86176473	0
Fresno	2022	MDV	Aggregate	35	Electricity	1424.744986	0	1424.745	0	0	0	0	0	0	0	0	0	0	0	0.005355138	0.001874298	0	333403.3612
Fresno	2022	MDV	Aggregate	35	Plug-in Hybrid	1819.190631	524.5607018	1294.63	0.002112854	0.000440777	0.000479385	91.25955157	0.000315736	0.000394548	0.000983252	0.001434758	0.158735436	0.000902194	0.012110633	0.00538177	0.001883619	9.623205687	180689.7768
Fresno	2022	MDV	Aggregate	40	Gasoline	505697.1169	505697.1169	0	0.145276616	0.00118333	0.001286875	412.1033285	0.004897304	0.010039593	0.021297936	0.031041288	1.485002472	0.004074061	0.033127996	0.013165539	0.004607939	43.45578108	0
Fresno	2022	MDV	Aggregate	40	Diesel	7831.338867	7831.338867	0	0.108411191	0.007413317	0.007748515	375.5053939	0.000659371	0.059161028	0.01419588	0.016161065	0.212788054	0.003558104	0.0031	0.0127668	0.00446838	33.54374809	0
Fresno	2022	MDV	Aggregate	40	Electricity	1240.663288	0	1240.663	0	0	0	0	0	0	0	0	0	0	0	0.004944732	0.001730656	0	337996.5411
Fresno	2022	MDV	Aggregate	40	Plug-in Hybrid	2254.330861	1380.419091	873.9118	0.004128962	0.000811877	0.00088299	180.5403355	0.000580402	0.00077103	0.001807464	0.002637448	0.302512475	0.001784825	0.02571832	0.004970059	0.001739521	19.0377528	102995.9039
Fresno	2022	MDV	Aggregate	45	Gasoline	406213.0947	406213.0947	0	0.141827214	0.001083174	0.001177951	413.3598324	0.004480763	0.009787534	0.019492143	0.028407883	1.381134176	0.004086483	0.033127996	0.010041868	0.003514654	43.58827784	0
Fresno	2022	MDV	Aggregate	45	Diesel	6290.707007	6290.707007	0	0.109632647	0.006985776	0.007301642	361.3697168	0.000587189	0.056933946	0.012641838	0.014391892	0.188446071	0.003424162	0.0031	0.009737734	0.003408207	32.28101365	0
Fresno	2022	MDV	Aggregate	45	Electricity	917.1087806	0	917.1088	0	0	0	0	0	0	0	0	0	0	0	0.003928646	0.001375026	0	344877.5501
Fresno	2022	MDV	Aggregate	45	Plug-in Hybrid	1631.957867	1108.854079	523.1038	0.004245936	0.000824314	0.000896516	188.6685944	0.000568203	0.000792874	0.001769475	0.002582014	0.307963797	0.001865181	0.028537423	0.003948889	0.001382111	19.89486755	86876.14595
Fresno	2022	MDV	Aggregate	50	Gasoline	873044.5045	873044.5045	0	0.141166479	0.001045002	0.001136435	425.1201948	0.004313302	0.009724211	0.018762643	0.027343347	1.28865747	0.004202746	0.033127996	0.006918197	0.002421369	44.82839337	0
Fresno	2022	MDV	Aggregate	50	Diesel	13520.16282	13520.16282	0	0.111413442	0.006772238	0.007078449	363.1805305	0.000541884	0.05721924	0.011666434	0.013281459	0.173094014	0.00344132	0.0031	0.006708669	0.002348034	32.44277292	0
Fresno	2022	MDV	Aggregate	50	Electricity	523.697008	0	523.697	0	0	0	0	0	0	0	0	0	0	0	0.00291587	0.001020554	0	355019.4389
Fresno	2022	MDV	Aggregate	50	Plug-in Hybrid	2634.611579	2383.180091	251.4315	0.005288384	0.001059333	0.001152121	237.9354413	0.000675982	0.000987538	0.002105115	0.003071779	0.378958092	0.002352234	0.037991773	0.002931196	0.001025919	25.08999499	26542.95733
Fresno	2022	MDV	Aggregate	55	Gasoline	848108.9641	848108.9641	0	0.142707268	0.001062645	0.001155618	442.5349157	0.004374457	0.009808047	0.019020705	0.027718263	1.213238672	0.004374908	0.033127996	0.004811292	0.001683952	46.66475393	0
Fresno	2022	MDV	Aggregate	55	Diesel	13134.00546	13134.00546	0	0.113539998	0.006761761	0.007067498	383.2823326	0.00051858	0.060386288	0.011164714	0.012710285	0.165284015	0.003631795	0.0031	0.004665574	0.001632951	34.23845895	0
Fresno	2022	MDV	Aggregate	55	Electricity	207.2245943	0	207.2246	0	0	0	0	0	0	0	0	0	0	0	0.002151323	0.000752963	0	368986.6923
Fresno	2022	MDV	Aggregate	55	Plug-in Hybrid	2400.393812	2315.112675	85.28114	0.00529605	0.001150223	0.001250972	241.8066692	0.000651569	0.000988969	0.00202909	0.002960843	0.377560925	0.002390505	0.040507825	0.00216269	0.000756941	25.49821113	10772.84342
Fresno	2022	MDV	Aggregate	60	Gasoline	481814.2441	481814.2441	0	0.146863933	0.001139078	0.001238737	460.5809537	0.004672701	0.010065601	0.020302483	0.029585119	1.150924729	0.004553312	0.033127996	0.003721151	0.001302403	48.56768609	0
Fresno	2022	MDV	Aggregate	60	Diesel	7461.483346	7461.483346	0	0.116503054	0.00704682	0.007365446	415.01764	0.000529202	0.065386198	0.011393418	0.012970649	0.170489567	0.003932503	0.0031	0.003608451	0.001262958	37.07336138	0
Fresno	2022	MDV	Aggregate	60	Electricity	53.06321956	0	53.06322	0	0	0	0	0	0	0	0	0	0	0	0.001635005	0.000572252	0	386630.2541
Fresno	2022	MDV	Aggregate	60	Plug-in Hybrid	1331.71518	1315.225178	16.49	0.005118104	0.001265363	0.001376198	237.0885161	0.00060868	0.00095574	0.001895526	0.002765947	0.36389838	0.002343861	0.041479934	0.001643661	0.000575281	25.00068779	3950.821482
Fresno	2022	MDV	Aggregate	65	Gasoline	558520.9517	558520.9517	0	0.154418875	0.001287278	0.0013999	474.1962329	0.005249788	0.010547235	0.022786677	0.03320421	1.093549446	0.004687913	0.033127996	0.002631011	0.000920854	50.00340026	0
Fresno	2022	MDV	Aggregate	65	Diesel	8649.380608	8649.380608	0	0.120116909	0.007661464	0.008007882	466.0066398	0.000571805	0.073419536	0.012310632	0.014014837	0.188509227	0.00441565	0.0031	0.002551327	0.000892964	41.62818853	0
Fresno	2022	MDV	Aggregate	65	Electricity	7.745583714	0	7.745584	0	0	0	0	0	0	0	0	0	0	0	0.001121997	0.000392699	0	404777.6705
Fresno	2022	MDV	Aggregate	65	Plug-in Hybrid	1526.381212	1524.614158	1.767054	0.004919487	0.001450417	0.001577461	229.9956783	0.000564952	0.000918651	0.00175935	0.002567239	0.345911685	0.002273741	0.041951378	0.001127943	0.00039478	24.2527569	405.6154428
Fresno	2022	MDV	Aggregate	70	Gasoline	425858.4145	425858.4145	0	0.15925788	0.001395915	0.001518042	479.0428989	0.005684204	0.010856216	0.024658088	0.035930715	1.078255322	0.004735827	0.033127996	0.002631011	0.000920854	50.51447514	0
Fresno	2022	MDV	Aggregate	70	Diesel	6594.938831	6594.938831	0	0.121904274	0.008090006	0.0084558	501.6639175	0.000601509	0.079037355	0.012950132	0.014742864	0.201122021	0.004753521	0.0031	0.002551327	0.000892964	44.81343903	0
Fresno	2022	MDV	Aggregate	70	Electricity	1.256266997	0	1.256267	0	0	0	0	0	0	0	0	0	0	0	0.001121997	0.000392699	0	449707.4317
Fresno	2022	MDV	Aggregate	70	Plug-in Hybrid	1162.586842	1162.480595	0.106247	0.00468955	0.001577082	0.00171522	222.0682713	0.000523352	0.000875713	0.001629802	0.002378203	0.329995826	0.002195371	0.041996162	0.001127944	0.00039478	23.41682174	31.94671583
Fresno	2022	MH	Aggregate	5	Gasoline	387.9157604	387.9157604	0	0.806133125	0.008916375	0.009697372	4219.103168	0.093474852	0.04845278	0.416397389	0.607606092	5.405393932	0.04171013	0.044632355	0.061495877	0.021523557	444.8991574	0
Fresno	2022	MH	Aggregate	5	Diesel	174.324328	174.324328	0	15.07158735	0.310603015	0.324647105	2148.755686	0.050853351	0.338537333	1.094842697	1.24640562	2.453019843	0.020360552	0.119635239	0.061495877	0.021523557	191.9474943	0
Fresno	2022	MH	Aggregate	10	Gasoline	688.3325274	688.3325274	0	0.714885145	0.005680232	0.006177771	3424.397755	0.060533988	0.042629543	0.27174215	0.396525508	4.198203573	0.033853658	0.044632355	0.061495877	0.021523557	361.0984646	0
Fresno	2022	MH	Aggregate	10	Diesel	262.766674	262.766674	0	12.52688036	0.264047377	0.275986428	1951.079399	0.038360861	0.307393354	0.825886754	0.940217161	1.966481574	0.018487469	0.119635239	0.061495877	0.021523557	174.2891498	0
Fresno	2022	MH	Aggregate	15	Gasoline	516.4889549	516.4889549	0	0.645194514	0.003817548	0.004151932	2800.229923	0.041328294	0.038153742	0.186884235	0.272701037	3.408764481	0.027683124	0.044632355	0.061495877	0.021523557	295.2807466	0
Fresno	2022	MH	Aggregate	15	Diesel	225.49813	225.49813	0	8.642530683	0.187671081	0.196156735	1602.005316	0.019402804	0.25239659	0.417730947	0.475558911	1.204633203	0.015179815	0.119635239	0.061495877	0.021523557	143.1065002	0
Fresno	2022	MH	Aggregate	20	Gasoline	540.8126357	540.8126357	0	0.591946113	0.002706202	0.002943241	2327.593322	0.029767288	0.034707304	0.135536621	0.19777472	2.877187223	0.02301063	0.044632355	0.060630201	0.02122057	245.4418075	0
Fresno	2022	MH	Aggregate	20	Diesel	238.2722002	238.2722002	0	6.321247037	0.13360809	0.139649255	1314.635887	0.008480643	0.207121419	0.182583244	0.207858885	0.724422392	0.012456843	0.119635239	0.060630201	0.02122057	117.435903	0
Fresno	2022	MH	Aggregate	25	Gasoline	640.5209406	640.5209406	0	0.551694375	0.002023045	0.002200246	1989.502504	0.022597666	0.032074459	0.103550612	0.15110081	2.509498083	0.019668258	0.044632355	0.049809241	0.017433234	209.7905532	0
Fresno	2022	MH	Aggregate	25	Diesel	274.7830115	274.7830115	0	5.48984205	0.110958531	0.115975583	1179.174959	0.005851189	0.185779495	0.125972654	0.143411491	0.558793848	0.011173282	0.119635239	0.049809241	0.017433234	105.335232	0
Fresno	2022	MH	Aggregate	30	Gasoline	762.2771605	762.2771605	0	0.522979451	0.001594526	0.001734192	1765.332623	0.018044409	0.030157463	0.083159716	0.121346463	2.250101436	0.01745211	0.044632355	0.044398761	0.015539566	186.1521194	0
Fresno	2022	MH	Aggregate	30	Diesel	321.0680449	321.0680449	0	5.039597476	0.098899351	0.103371141	1106.834006	0.004703788	0.174382148	0.101269796	0.11528893	0.47167529	0.010487815	0.119635239	0.044398761	0.015539566	98.87304332	0
Fresno	2022	MH	Aggregate	35	Gasoline	843.7014174	843.7014174	0	0.503149555	0.001324811	0.001440853	1636.385439	0.015172889	0.02879496	0.070284314	0.102558706	2.072879233	0.016177336	0.044632355	0.041585311	0.014554859	172.5548	0
Fresno	2022	MH	Aggregate	35	Diesel	359.8112025	359.8112025	0	4.717633453	0.091837684	0.095990176	1046.799983	0.003857283	0.164923764	0.083045034	0.094541249	0.404469189	0.009918962	0.119635239	0.041585311	0.014554859	93.51022784	0
Fresno	2022	MH	Aggregate	40	Gasoline	891.2168148	891.2168148	0	0.490929384	0.001160084	0.001261698	1583.985419	0.0134292	0.027907069	0.06248604	0.091179483	1.961560023	0.015659308	0.044632355	0.041585311	0.014554859	167.0292833	0
Fresno	2022	MH	Aggregate	40	Diesel	383.0372115	383.0372115	0	4.485909663	0.089678924	0.093733807	999.0728919	0.00325317	0.157404341	0.07003883	0.079734552	0.353619882	0.009466723	0.119635239	0.041585311	0.014554859	89.24678567	0
Fresno	2022	MH	Aggregate	45	Gasoline	836.4517216	836.4517216	0	0.484459152	0.001070439	0.001164201	1589.479555	0.012515066	0.027384268	0.058456631	0.085299779	1.910995804	0.015713624	0.044632355	0.041585311	0.014554859	167.6086331	0
Fresno	2022	MH	Aggregate	45	Diesel	361.6348631	361.6348631	0	4.323065603	0.092369645	0.09654619	963.6527321	0.002863139	0.15182388	0.061641703	0.07017498	0.317406795	0.009131099	0.119635239	0.041585311	0.014554859	86.08271683	0
Fresno	2022	MH	Aggregate	50	Gasoline	899.1677343	899.1677343	0	0.486272255	0.001040648	0.0011318	1636.08253	0.012233874	0.02736333	0.057313719	0.083632044	1.917254897	0.016174341	0.044632355	0.041585311	0.014554859	172.5228586	0
Fresno	2022	MH	Aggregate	50	Diesel	420.2665435	420.2665435	0	4.225768628	0.099877161	0.104393163	940.5395023	0.002671981	0.148182382	0.057526174	0.065489725	0.294905463	0.00891209	0.119635239	0.041585311	0.014554859	84.01802117	0
Fresno	2022	MH	Aggregate	55	Gasoline	1477.28841	1477.28841	0	0.492997317	0.001065754	0.001159104	1703.321769	0.012599417	0.027656966	0.059168449	0.086338462	1.999280603	0.01683907	0.044632355	0.041585311	0.014554859	179.6131523	0
Fresno	2022	MH	Aggregate	55	Diesel	741.9096948	741.9096948	0	4.184334635	0.112180236	0.117252529	929.7332027	0.002670858	0.146479845	0.057502006	0.065462211	0.285578843	0.008809695	0.119635239	0.041585311	0.014554859	83.0526987	0
Fresno	2022	MH	Aggregate	60	Gasoline	2832.076998	2832.076998	0	0.504522993	0.001149671	0.001250372	1772.595089	0.013657648	0.028259696	0.064251194	0.093755191	2.179770271	0.017523907	0.044632355	0.041585311	0.014554859	186.9179373	0
Fresno	2022	MH	Aggregate	60	Diesel	1334.685478	1334.685478	0	4.21248338	0.129404957	0.135256075	931.2338345	0.002878179	0.14671627	0.06196549	0.070543591	0.290545665	0.008823914	0.119635239	0.041585311	0.014554859	83.18674955	0
Fresno	2022	MH	Aggregate	65	Gasoline	2796.895173	2796.895173	0	0.520966996	0.001306236	0.001420651	1827.20536	0.015596633	0.029181876	0.073460659	0.107193621	2.505528917	0.018063785	0.044632355	0.041585311	0.014554859	192.6765222	0
Fresno	2022	MH	Aggregate	65	Diesel	1261.658925	1261.658925	0	4.304802352	0.151513703	0.158364481	945.0413978	0.003283661	0.148891657	0.070695281	0.080481877	0.309181071	0.008954748	0.119635239	0.041585311	0.014554859	84.42017371	0
Fresno	2022	MH	Aggregate	70	Gasoline	125.0683204	125.0683204	0	0.534733813	0.001419668	0.001544018	1844.375852	0.016938194	0.029967647	0.079794673	0.116436199	2.737388346	0.018233533	0.044632355	0.041585311	0.014554859	194.4871291	0
Fresno	2022	MH	Aggregate	70	Diesel	42.74426997	42.74426997	0	4.440338578	0.178355308	0.186419744	971.1558912	0.003860696	0.153006006	0.083118507	0.094624895	0.339867847	0.009202196	0.119635239	0.041585311	0.014554859	86.75297106	0
Fresno	2022	MH	Aggregate	75	Gasoline	37.10902945	37.10902945	0	0.54211987	0.001419668	0.001544018	1844.338553	0.016798601	0.030372479	0.079097539	0.115418944	2.715776836	0.018233164	0.044632355	0.041585311	0.014554859	194.483196	0
Fresno	2022	MH	Aggregate	75	Diesel	13.54196105	13.54196105	0	4.446028772	0.178355308	0.186419744	971.1558912	0.003860696	0.153006006	0.083118507	0.094624895	0.339867847	0.009202196	0.119635239	0.041585311	0.014554859	86.75297106	0
Fresno	2022	MHDT	Aggregate	5	Gasoline	1473.580065	1473.580065	0	1.108412838	0.007182961	0.007812126	3997.553906	0.117515421	0.051353852	0.601445387	0.877627696	5.607636393	0.03951989	0.044779043	0.061495877	0.021523557	421.5370646	0
Fresno	2022	MHDT	Aggregate	5	Diesel	918.1579427	918.1579427	0	11.60731307	0.086544494	0.090457652	2409.489584	0.018824957	0.379616065	0.405296156	0.461398822	0.628726793	0.022816426	0.13483826	0.061495877	0.021523557	215.2387501	0
Fresno	2022	MHDT	Aggregate	5	Natural Gas	80.81747924	80.81747924	0	0.484004223	0.003938701	0.004283697	2571.589746	3.777324668	0.524235392	0.053970516	3.855036881	8.095840474	0	1.06	0.061495877	0.021523557	297.2365528	0
Fresno	2022	MHDT	Aggregate	10	Gasoline	2614.776697	2614.776697	0	0.973022957	0.004557643	0.004956853	3244.922371	0.07524421	0.044953146	0.386411933	0.563851385	4.694777625	0.032079361	0.044779043	0.061495877	0.021523557	342.1730096	0
Fresno	2022	MHDT	Aggregate	10	Diesel	9268.677612	9268.677612	0	4.588331143	0.054905037	0.057387599	2025.987802	0.012065427	0.319195203	0.259765326	0.29572305	0.551469653	0.019184893	0.190028262	0.061495877	0.021523557	180.9806878	0
Fresno	2022	MHDT	Aggregate	10	Natural Gas	193.8993758	193.8993758	0	0.292553519	0.003711982	0.00403712	2071.236264	2.542880329	0.422235062	0.036332742	2.595195889	7.623732085	0	1.06	0.061495877	0.021523557	239.4033216	0
Fresno	2022	MHDT	Aggregate	15	Gasoline	1961.992539	1961.992539	0	0.868788311	0.003050917	0.003318151	2653.741309	0.050812449	0.040015445	0.261808386	0.382030182	4.044927824	0.026234935	0.044779043	0.061495877	0.021523557	279.8337053	0
Fresno	2022	MHDT	Aggregate	15	Diesel	16164.76126	16164.76126	0	2.83318093	0.03463225	0.036198167	1599.17853	0.00643459	0.251951229	0.138534968	0.157711515	0.369496978	0.015143264	0.196973761	0.061495877	0.021523557	142.8539846	0
Fresno	2022	MHDT	Aggregate	15	Natural Gas	200.9133876	200.9133876	0	0.167559377	0.003119138	0.003392348	1575.209394	1.563089131	0.32111674	0.022333459	1.595247107	6.558957248	0	1.06	0.061495877	0.021523557	182.0701809	0
Fresno	2022	MHDT	Aggregate	20	Gasoline	2054.391185	2054.391185	0	0.788369135	0.002154354	0.002343057	2206.036181	0.036214812	0.036196628	0.18719281	0.273151309	3.565495323	0.021808914	0.044779043	0.060630201	0.02122057	232.6237589	0
Fresno	2022	MHDT	Aggregate	20	Diesel	21401.75532	21401.75532	0	2.136591607	0.022121985	0.023122243	1362.512835	0.003411043	0.214664452	0.073438825	0.083604512	0.266863484	0.012902182	0.199440282	0.060630201	0.02122057	121.7127318	0
Fresno	2022	MHDT	Aggregate	20	Natural Gas	199.5564677	199.5564677	0	0.115598295	0.002564077	0.002788668	1317.089694	1.141978499	0.26849735	0.016316619	1.165472819	5.544186943	0	1.06	0.060630201	0.02122057	152.2354804	0
Fresno	2022	MHDT	Aggregate	25	Gasoline	2433.154271	2433.154271	0	0.726771735	0.001604499	0.001745039	1885.735953	0.027220551	0.033262076	0.141129374	0.205935651	3.19928261	0.01864242	0.044779043	0.049809241	0.017433234	198.8485001	0
Fresno	2022	MHDT	Aggregate	25	Diesel	29091.94645	29091.94645	0	1.834579278	0.017409117	0.01819628	1226.600175	0.002457939	0.193251357	0.052918749	0.060243967	0.210613677	0.01161517	0.199237734	0.049809241	0.017433234	109.5717078	0
Fresno	2022	MHDT	Aggregate	25	Natural Gas	278.1419445	278.1419445	0	0.095991519	0.002016714	0.002193361	1148.449158	0.901537028	0.234118874	0.012881185	0.920084662	4.55873663	0	1.06	0.049809241	0.017433234	132.7432066	0
Fresno	2022	MHDT	Aggregate	30	Gasoline	2895.671026	2895.671026	0	0.681688352	0.001260184	0.001370565	1673.315117	0.021540894	0.031101163	0.111993439	0.163420564	2.910384443	0.016542423	0.044779043	0.044398761	0.015539566	176.4489883	0
Fresno	2022	MHDT	Aggregate	30	Diesel	40217.8599	40217.8599	0	1.581374656	0.014675319	0.015338872	1126.676682	0.001908903	0.17750837	0.041098156	0.046787122	0.169514593	0.010668954	0.199260689	0.044398761	0.015539566	100.6455817	0
Fresno	2022	MHDT	Aggregate	30	Natural Gas	387.1409919	387.1409919	0	0.082642628	0.001567945	0.001705283	1029.593627	0.746762928	0.209889396	0.010669769	0.762126341	3.685656729	0	1.06	0.044398761	0.015539566	119.0053199	0
Fresno	2022	MHDT	Aggregate	35	Gasoline	3204.978288	3204.978288	0	0.649421514	0.001043618	0.00113503	1551.070187	0.017965463	0.029541776	0.093641779	0.136641864	2.683732283	0.015333908	0.044779043	0.041585311	0.014554859	163.5584131	0
Fresno	2022	MHDT	Aggregate	35	Diesel	49222.92485	49222.92485	0	1.39072646	0.012864552	0.01344623	1051.750079	0.001495574	0.165703653	0.03219929	0.036656441	0.135941448	0.009959444	0.199221507	0.041585311	0.014554859	93.95241789	0
Fresno	2022	MHDT	Aggregate	35	Natural Gas	483.8811358	483.8811358	0	0.073530368	0.001211907	0.001318059	939.7534583	0.638065336	0.19157489	0.009116695	0.651192476	2.921663599	0	1.06	0.041585311	0.014554859	108.6211667	0
Fresno	2022	MHDT	Aggregate	40	Gasoline	3385.475575	3385.475575	0	0.628122753	0.000911176	0.000990987	1501.31471	0.015786012	0.028497057	0.082468023	0.120337146	2.50808927	0.014842024	0.044779043	0.041585311	0.014554859	158.3117603	0
Fresno	2022	MHDT	Aggregate	40	Diesel	39536.59724	39536.59724	0	1.32248027	0.012143513	0.012692589	1002.597849	0.001214784	0.157959699	0.026153962	0.029774295	0.109640783	0.009494002	0.197803315	0.041585311	0.014554859	89.56166871	0
Fresno	2022	MHDT	Aggregate	40	Natural Gas	461.2733176	461.2733176	0	0.06968137	0.000937133	0.001019217	866.7161106	0.554360549	0.176685749	0.007920718	0.565765601	2.277034023	0	1.06	0.041585311	0.014554859	100.1791633	0
Fresno	2022	MHDT	Aggregate	45	Gasoline	3177.438785	3177.438785	0	0.615305414	0.00083861	0.000912064	1506.380942	0.014619043	0.027852611	0.076522139	0.111660926	2.379504351	0.014892109	0.044779043	0.041585311	0.014554859	158.8459882	0
Fresno	2022	MHDT	Aggregate	45	Diesel	22093.71682	22093.71682	0	1.387325893	0.012433247	0.012995423	978.529664	0.0010452	0.154167747	0.022502868	0.025617803	0.089575976	0.009266091	0.194855513	0.041585311	0.014554859	87.41166726	0
Fresno	2022	MHDT	Aggregate	45	Natural Gas	346.4998078	346.4998078	0	0.067604969	0.000758122	0.000824527	806.1452616	0.488102697	0.164337985	0.006974024	0.498144604	1.768975036	0	1.06	0.041585311	0.014554859	93.17809693	0
Fresno	2022	MHDT	Aggregate	50	Gasoline	3415.678824	3415.678824	0	0.613978623	0.000813514	0.000884771	1550.365269	0.01422102	0.027742192	0.074554978	0.108790449	2.291377729	0.015326939	0.044779043	0.041585311	0.014554859	163.4840805	0
Fresno	2022	MHDT	Aggregate	50	Diesel	14130.44587	14130.44587	0	1.387058793	0.013131036	0.013724763	975.2315936	0.0009519	0.153648135	0.020494139	0.023331017	0.074938402	0.00923486	0.19441055	0.041585311	0.014554859	87.11705193	0
Fresno	2022	MHDT	Aggregate	50	Natural Gas	236.7325755	236.7325755	0	0.063272901	0.000687712	0.000747949	757.7533474	0.438007577	0.154472977	0.006258264	0.447018859	1.369094838	0	1.06	0.041585311	0.014554859	87.58472972	0
Fresno	2022	MHDT	Aggregate	55	Gasoline	5611.79249	5611.79249	0	0.619981534	0.000831715	0.000904566	1613.870653	0.014587514	0.027978583	0.076573275	0.111735543	2.257132687	0.015954754	0.044779043	0.041585311	0.014554859	170.1806439	0
Fresno	2022	MHDT	Aggregate	55	Diesel	16982.78583	16982.78583	0	1.39219094	0.014631751	0.015293334	995.8957558	0.000954546	0.156903782	0.020551118	0.023395883	0.066945661	0.009430537	0.194994699	0.041585311	0.014554859	88.96297336	0
Fresno	2022	MHDT	Aggregate	55	Natural Gas	277.5693007	277.5693007	0	0.058869847	0.000712488	0.000774896	717.4040635	0.398160323	0.146247511	0.005688925	0.406351813	1.072197372	0	1.06	0.041585311	0.014554859	82.92096791	0
Fresno	2022	MHDT	Aggregate	60	Gasoline	10758.2435	10758.2435	0	0.633193464	0.000896092	0.000974582	1679.262651	0.015766016	0.028556679	0.082836637	0.120875026	2.287794322	0.016601221	0.044779043	0.041585311	0.014554859	177.0761484	0
Fresno	2022	MHDT	Aggregate	60	Diesel	27460.18125	27460.18125	0	1.289565312	0.015378979	0.016074348	1038.18227	0.000943294	0.163566039	0.020308866	0.023120098	0.062112702	0.009830965	0.198848508	0.041585311	0.014554859	92.74041093	0
Fresno	2022	MHDT	Aggregate	60	Natural Gas	342.3902824	342.3902824	0	0.05749834	0.000720174	0.000783254	718.5367915	0.399995089	0.146478425	0.005715141	0.408224327	1.050556792	0	1.06	0.041585311	0.014554859	83.05189399	0
Fresno	2022	MHDT	Aggregate	65	Gasoline	10624.5979	10624.5979	0	0.653878347	0.001017363	0.001106475	1730.699705	0.017967308	0.02948989	0.094461407	0.137837863	2.409439588	0.017109729	0.044779043	0.041585311	0.014554859	182.5001215	0
Fresno	2022	MHDT	Aggregate	65	Diesel	36629.14058	36629.14058	0	1.154585392	0.015758052	0.016470561	1106.539414	0.000922991	0.174335735	0.019871753	0.022622479	0.060832682	0.010478267	0.204435357	0.041585311	0.014554859	98.84672751	0
Fresno	2022	MHDT	Aggregate	65	Natural Gas	235.1216286	235.1216286	0	0.051103855	0.000755663	0.000821852	724.4093484	0.408484894	0.147675585	0.005836443	0.416888796	0.949711648	0	1.06	0.041585311	0.014554859	83.730672	0
Fresno	2022	MHDT	Aggregate	70	Gasoline	475.0984686	475.0984686	0	0.671575092	0.001105504	0.001202337	1746.782418	0.01950694	0.030294156	0.102566851	0.149665308	2.510264252	0.017268723	0.044779043	0.041585311	0.014554859	184.1960234	0
Fresno	2022	MHDT	Aggregate	70	Diesel	34046.3945	34046.3945	0	1.014286307	0.014288095	0.014934139	1103.143704	0.000815859	0.17380074	0.017565229	0.019996676	0.055341532	0.010446111	0.206996816	0.041585311	0.014554859	98.54339006	0
Fresno	2022	MHDT	Aggregate	70	Natural Gas	143.1223253	143.1223253	0	0.048048411	0.000772621	0.000840296	727.3041495	0.412544731	0.148265709	0.00589445	0.421032157	0.901368963	0	1.06	0.041585311	0.014554859	84.06526685	0
Fresno	2022	MHDT	Aggregate	75	Gasoline	140.9664974	140.9664974	0	0.680530722	0.001105504	0.001202337	1746.752036	0.019365635	0.030694829	0.101800778	0.148547456	2.493199675	0.017268422	0.044779043	0.041585311	0.014554859	184.1928197	0
Fresno	2022	MHDT	Aggregate	75	Diesel	4769.092682	4769.092682	0	0.979143097	0.013282998	0.013883597	1100.172025	0.000738433	0.173332551	0.015898263	0.018098962	0.051466543	0.010417971	0.207363551	0.041585311	0.014554859	98.27793115	0
Fresno	2022	MHDT	Aggregate	75	Natural Gas	21.12311471	21.12311471	0	0.052700323	0.00074742	0.000812887	722.9813261	0.406511553	0.147384473	0.005808248	0.414874857	0.973210401	0	1.06	0.041585311	0.014554859	83.5656144	0
Fresno	2022	MHDT	Aggregate	80	Diesel	174.8193815	174.8193815	0	0.846267085	0.012242704	0.012796265	1098.154185	0.000666246	0.173014639	0.014344094	0.016329659	0.047917022	0.010398863	0.209966403	0.041585311	0.014554859	98.09767832	0
Fresno	2022	MHDT	Aggregate	80	Natural Gas	0.325057493	0.325057493	0	0.041090181	0.000811416	0.000882489	733.9353161	0.421832166	0.149617515	0.006027149	0.430510666	0.790772684	0	1.06	0.041585311	0.014554859	84.83172857	0
Fresno	2022	MHDT	Aggregate	85	Diesel	13.83003451	13.83003451	0	0.647233819	0.009143925	0.009557372	1089.974247	0.00043253	0.171725886	0.009312262	0.010601302	0.035934791	0.010321404	0.2131091	0.041585311	0.014554859	97.36696771	0
Fresno	2022	MHDT	Aggregate	90	Diesel	0.017372606	0.017372606	0	0.64313863	0.009143925	0.009557372	1089.974247	0.000434471	0.171725886	0.009354046	0.01064887	0.036372794	0.010321404	0.2131091	0.041585311	0.014554859	97.36696771	0
Fresno	2022	OBUS	Aggregate	5	Gasoline	179.7514732	179.7514732	0	1.207784586	0.005001239	0.005439304	4088.935998	0.118386933	0.055935145	0.589299663	0.859904685	5.233531375	0.040423295	0.044780196	0.061495877	0.021523557	431.1731919	0
Fresno	2022	OBUS	Aggregate	5	Diesel	85.24739203	85.24739203	0	7.510708912	0.218819469	0.228713514	2420.874003	0.056580395	0.381409685	1.218160389	1.386782875	1.950284524	0.022924229	0.18942247	0.061495877	0.021523557	216.2557157	0
Fresno	2022	OBUS	Aggregate	5	Natural Gas	0.99106666	0.99106666	0	0.63183088	0.00369148	0.004014821	2632.68857	3.79973364	0.536690787	0.054290696	3.87790688	7.875947208	0	1.06	0.061495877	0.021523557	304.298645	0
Fresno	2022	OBUS	Aggregate	10	Gasoline	596.8722354	596.8722354	0	1.062395385	0.003177384	0.003455695	3319.172367	0.075619665	0.04896587	0.377596332	0.550987681	4.430984276	0.032813398	0.044780196	0.061495877	0.021523557	350.0025789	0
Fresno	2022	OBUS	Aggregate	10	Diesel	288.1246534	288.1246534	0	6.295363809	0.165104738	0.172570042	2145.986332	0.03921756	0.33810102	0.844343316	0.961220593	1.491900828	0.020321207	0.19166931	0.069649222	0.024377228	191.7001089	0
Fresno	2022	OBUS	Aggregate	10	Natural Gas	2.996105892	2.996105892	0	0.420966112	0.003348481	0.003641779	2108.610444	2.547280882	0.429854033	0.036395618	2.599686977	7.291771623	0	1.06	0.061495877	0.021523557	243.7232069	0
Fresno	2022	OBUS	Aggregate	15	Gasoline	709.6036795	709.6036795	0	0.947170325	0.002129672	0.002316212	2714.511894	0.051059867	0.043432325	0.255760361	0.373204918	3.857586081	0.026835714	0.044780196	0.061495877	0.021523557	286.2418875	0
Fresno	2022	OBUS	Aggregate	15	Diesel	376.8484851	376.8484851	0	4.705016243	0.100036706	0.104559922	1823.37297	0.019222343	0.287273154	0.413851773	0.471138741	0.969603865	0.017266252	0.194151176	0.078246177	0.027386162	162.8811851	0
Fresno	2022	OBUS	Aggregate	15	Natural Gas	3.407900189	3.407900189	0	0.254918155	0.002723262	0.002961796	1594.223378	1.542418153	0.324992865	0.022038112	1.574150857	6.201688236	0	1.06	0.061495877	0.021523557	184.2679074	0
Fresno	2022	OBUS	Aggregate	20	Gasoline	807.0056952	807.0056952	0	0.86225297	0.001505709	0.001637596	2256.562663	0.036278442	0.039328094	0.182259115	0.265952072	3.417527281	0.022308419	0.044780196	0.060630201	0.02122057	237.9517133	0
Fresno	2022	OBUS	Aggregate	20	Diesel	444.5688706	444.5688706	0	3.777851593	0.0679889	0.071063056	1577.71284	0.009696712	0.2485693	0.20876754	0.237665953	0.695810213	0.014939997	0.19440788	0.077796639	0.027228824	140.936463	0
Fresno	2022	OBUS	Aggregate	20	Natural Gas	3.957977441	3.957977441	0	0.184457387	0.002179079	0.002369947	1326.04375	1.109793417	0.270322693	0.015856758	1.132625582	5.215961891	0	1.06	0.060630201	0.02122057	153.2704327	0
Fresno	2022	OBUS	Aggregate	25	Gasoline	879.3688203	879.3688203	0	0.797891852	0.001122755	0.001221099	1928.925829	0.027176627	0.036197455	0.13691712	0.19978914	3.074759315	0.019069396	0.044780196	0.049809241	0.017433234	203.4028185	0
Fresno	2022	OBUS	Aggregate	25	Diesel	508.493211	508.493211	0	3.154200029	0.058554252	0.061201816	1378.894294	0.007287133	0.217245358	0.156889984	0.178607305	0.570665264	0.013057304	0.193374296	0.064873963	0.022705887	123.1760811	0
Fresno	2022	OBUS	Aggregate	25	Natural Gas	4.814136994	4.814136994	0	0.145484994	0.001715933	0.001866234	1155.616035	0.868442211	0.235579888	0.012408326	0.886308974	4.334592591	0	1.06	0.049809241	0.017433234	133.5715882	0
Fresno	2022	OBUS	Aggregate	30	Gasoline	1064.025751	1064.025751	0	0.750599149	0.000882823	0.00096015	1711.640968	0.02144911	0.033873756	0.108343431	0.158094481	2.80119173	0.016921314	0.044780196	0.044398761	0.015539566	180.4904014	0
Fresno	2022	OBUS	Aggregate	30	Diesel	659.3242306	659.3242306	0	2.673987414	0.053335259	0.055746843	1229.551169	0.006089192	0.193716287	0.131098628	0.149245808	0.48181751	0.011643114	0.192478962	0.056562739	0.019796959	109.8353189	0
Fresno	2022	OBUS	Aggregate	30	Natural Gas	6.564527657	6.564527657	0	0.120690202	0.001333825	0.001450656	1035.404136	0.714278625	0.211073907	0.010205632	0.728973728	3.557580334	0	1.06	0.044398761	0.015539566	119.6769262	0
Fresno	2022	OBUS	Aggregate	35	Gasoline	1664.661971	1664.661971	0	0.715900507	0.000731877	0.000795983	1586.601821	0.017860102	0.032149411	0.090432731	0.131959228	2.584671528	0.015685174	0.044780196	0.041585311	0.014554859	167.3051796	0
Fresno	2022	OBUS	Aggregate	35	Diesel	1146.002411	1146.002411	0	2.329804338	0.050314712	0.05258972	1106.065901	0.005183229	0.174261133	0.111593488	0.127040692	0.411337741	0.010473783	0.191417089	0.047927641	0.016774674	98.8044288	0
Fresno	2022	OBUS	Aggregate	35	Natural Gas	12.07473608	12.07473608	0	0.103414417	0.001032753	0.001123213	944.9274048	0.607187814	0.192629633	0.008675516	0.6196797	2.88492512	0	1.06	0.041585311	0.014554859	109.219196	0
Fresno	2022	OBUS	Aggregate	40	Gasoline	1982.310593	1982.310593	0	0.693869928	0.000639604	0.000695628	1535.709476	0.015657039	0.031022268	0.079446661	0.115928382	2.411236192	0.015182052	0.044780196	0.041585311	0.014554859	161.9386454	0
Fresno	2022	OBUS	Aggregate	40	Diesel	1381.49527	1381.49527	0	2.089585748	0.046824933	0.048942149	1055.789037	0.004320181	0.166339993	0.093012313	0.105887438	0.342766508	0.009997691	0.191682901	0.047245958	0.016536085	94.31321645	0
Fresno	2022	OBUS	Aggregate	40	Natural Gas	14.35542407	14.35542407	0	0.090756977	0.000812717	0.000883904	873.7388915	0.528411438	0.178117389	0.007549957	0.53928263	2.316626951	0	1.06	0.041585311	0.014554859	100.9908896	0
Fresno	2022	OBUS	Aggregate	45	Gasoline	1428.943271	1428.943271	0	0.680279616	0.000589157	0.000640762	1540.896272	0.014480874	0.030300806	0.073617509	0.107422496	2.281258336	0.015233328	0.044780196	0.041585311	0.014554859	162.4855866	0
Fresno	2022	OBUS	Aggregate	45	Diesel	942.9882556	942.9882556	0	1.920034928	0.044202865	0.046201522	1065.751238	0.003612738	0.167909542	0.077781261	0.088548045	0.280967043	0.010092027	0.19304209	0.048204684	0.016871639	95.20313588	0
Fresno	2022	OBUS	Aggregate	45	Natural Gas	9.098791988	9.098791988	0	0.081050998	0.000673719	0.000732731	815.8857551	0.467999124	0.166323649	0.006686784	0.477627433	1.852685824	0	1.06	0.041585311	0.014554859	94.30394942	0
Fresno	2022	OBUS	Aggregate	50	Gasoline	949.515488	949.515488	0	0.680841943	0.000571926	0.000622022	1585.884027	0.014052998	0.030234665	0.071545884	0.104399586	2.183657547	0.015678078	0.044780196	0.041585311	0.014554859	167.2294891	0
Fresno	2022	OBUS	Aggregate	50	Diesel	428.8010286	428.8010286	0	1.706973153	0.036427258	0.038074337	1251.298847	0.002518759	0.197142643	0.054228201	0.061734679	0.191696688	0.011849052	0.199238951	0.054762938	0.019167028	111.7780303	0
Fresno	2022	OBUS	Aggregate	50	Natural Gas	2.686196683	2.686196683	0	0.073390959	0.000615757	0.000669692	767.6980736	0.420179328	0.156500274	0.006003534	0.428823824	1.493101741	0	1.06	0.041585311	0.014554859	88.73418839	0
Fresno	2022	OBUS	Aggregate	55	Gasoline	1246.71194	1246.71194	0	0.691353689	0.000585048	0.000636293	1650.824006	0.014360355	0.030636994	0.073192056	0.106801676	2.129854451	0.016320076	0.044780196	0.041585311	0.014554859	174.0773288	0
Fresno	2022	OBUS	Aggregate	55	Diesel	371.7016518	371.7016518	0	1.5524289	0.027395304	0.028633999	1526.460137	0.00131232	0.240494416	0.028253895	0.032164909	0.100876825	0.014454665	0.207433074	0.065762716	0.02301695	136.3580793	0
Fresno	2022	OBUS	Aggregate	55	Natural Gas	0.665034484	0.665034484	0	0.067259157	0.000638833	0.000694789	726.775686	0.381372807	0.148157978	0.005449065	0.389218923	1.237874702	0	1.06	0.041585311	0.014554859	84.00418453	0
Fresno	2022	OBUS	Aggregate	60	Gasoline	2341.302241	2341.302241	0	0.70528311	0.000630587	0.000685821	1717.688134	0.015524006	0.031221849	0.079196516	0.11556337	2.13862006	0.016981096	0.044780196	0.041585311	0.014554859	181.1280676	0
Fresno	2022	OBUS	Aggregate	60	Diesel	1005.153683	1005.153683	0	1.718441374	0.027222255	0.028453125	1682.553829	0.000878727	0.265087041	0.018918745	0.021537551	0.068941575	0.015932779	0.210619994	0.070040832	0.024514291	150.301867	0
Fresno	2022	OBUS	Aggregate	60	Natural Gas	0.048855422	0.048855422	0	0.06723327	0.000638833	0.000694789	726.775686	0.381372807	0.148157978	0.005449065	0.389218923	1.237874702	0	1.06	0.041585311	0.014554859	84.00418453	0
Fresno	2022	OBUS	Aggregate	65	Gasoline	2834.420395	2834.420395	0	0.726095899	0.000716101	0.000778825	1770.250967	0.017714715	0.032144221	0.090433371	0.131960163	2.22592635	0.017500733	0.044780196	0.041585311	0.014554859	186.6707526	0
Fresno	2022	OBUS	Aggregate	65	Diesel	1913.597247	1913.597247	0	2.144290584	0.033086787	0.034582825	1778.33672	0.000986865	0.280177674	0.021246935	0.024188018	0.076014802	0.016839785	0.210708966	0.070160268	0.024556094	158.8581148	0
Fresno	2022	OBUS	Aggregate	65	Natural Gas	2.32631E-05	2.32631E-05	0	0.067232457	0.000638833	0.000694789	726.775686	0.381372807	0.148157978	0.005449065	0.389218923	1.237874702	0	1.06	0.041585311	0.014554859	84.00418453	0

Fresno	2022	OBUS	Aggregate	70	Gasoline	32.16899916	32.16899916	0	0.732230438	0.000778189	0.000846351	1786.700212	0.019438643	0.032432952	0.099281626	0.144871515	2.324556212	0.017663351	0.044780196	0.041585311	0.014554859	188.4053049	0
Fresno	2022	OBUS	Aggregate	70	Diesel	2556.703043	2556.703043	0	2.143532922	0.033086754	0.03458279	1778.337452	0.000989622	0.28017779	0.021306284	0.024255582	0.07657415	0.016839792	0.210708989	0.070160298	0.024556104	158.8581801	0
Fresno	2022	OBUS	Aggregate	75	Gasoline	0.012040914	0.012040914	0	0.731577991	0.000778189	0.000846351	1786.702186	0.019448275	0.032404305	0.099332509	0.144945763	2.325661847	0.01766337	0.044780196	0.041585311	0.014554859	188.4055131	0
Fresno	2022	OBUS	Aggregate	75	Diesel	446.0185775	446.0185775	0	2.144633939	0.033086754	0.03458279	1778.337452	0.000993062	0.28017779	0.021380352	0.024339903	0.077340727	0.016839792	0.210708989	0.070160298	0.024556104	158.8581801	0
Fresno	2022	OBUS	Aggregate	80	Diesel	18.90048338	18.90048338	0	2.144417648	0.033086754	0.03458279	1778.337452	0.000997183	0.28017779	0.021469066	0.024440897	0.07831433	0.016839792	0.210708989	0.070160298	0.024556104	158.8581801	0
Fresno	2022	OBUS	Aggregate	85	Diesel	2.225856708	2.225856708	0	2.143812855	0.033086754	0.03458279	1778.337452	0.001001983	0.28017779	0.021572425	0.024558564	0.079494958	0.016839792	0.210708989	0.070160298	0.024556104	158.8581801	0
Fresno	2022	OBUS	Aggregate	90	Diesel	0.002796011	0.002796011	0	2.130248485	0.033086754	0.03458279	1778.337452	0.001007464	0.28017779	0.02169043	0.024692903	0.080882611	0.016839792	0.210708989	0.070160298	0.024556104	158.8581801	0
Fresno	2022	SBUS	Aggregate	5	Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno	2022	SBUS	Aggregate	10	Gasoline	314.7301751	314.7301751	0	0.674918364	0.004279434	0.004654274	1542.083314	0.040465243	0.038133156	0.193846449	0.282860283	1.937678609	0.015245064	0.045	0.061495877	0.021523557	162.6107587	0
Fresno	2022	SBUS	Aggregate	10	Diesel	330.2572518	330.2572518	0	10.00678977	0.073545547	0.07687095	2075.909041	0.018687693	0.327060315	0.402340903	0.458034491	0.751374516	0.019657617	0.142701611	0.061495877	0.021523557	185.4401323	0
Fresno	2022	SBUS	Aggregate	10	Natural Gas	65.105652	65.105652	0	3.252973814	0.01022027	0.011115476	5695.818288	15.79429432	1.161129819	0.225669302	16.11923583	55.82312856	0	1.06	0.061495877	0.021523557	658.3497216	0
Fresno	2022	SBUS	Aggregate	15	Gasoline	751.0849666	751.0849666	0	0.59565129	0.002840586	0.003089396	1261.257762	0.026865588	0.033654535	0.128698074	0.187795927	1.769792461	0.012468817	0.045	0.061495877	0.021523557	132.9980551	0
Fresno	2022	SBUS	Aggregate	15	Diesel	788.1394176	788.1394176	0	7.028641892	0.048989169	0.051204242	1668.370371	0.010130364	0.262852431	0.218103952	0.248294747	0.501730378	0.01579847	0.142701611	0.061495877	0.021523557	149.0348644	0
Fresno	2022	SBUS	Aggregate	15	Natural Gas	155.3707916	155.3707916	0	1.490569516	0.008311964	0.009040019	3232.570811	8.551409299	0.658980707	0.122182766	8.727340414	29.07160101	0	1.06	0.061495877	0.021523557	373.6358827	0
Fresno	2022	SBUS	Aggregate	20	Gasoline	1190.831261	1190.831261	0	0.53485938	0.001989139	0.002163371	1048.546891	0.018805573	0.030219768	0.090087028	0.131454779	1.619887217	0.010365954	0.045	0.060630201	0.02122057	110.5679595	0
Fresno	2022	SBUS	Aggregate	20	Diesel	1249.580405	1249.580405	0	5.499377541	0.032254374	0.033712774	1409.719507	0.005255381	0.222101882	0.113146919	0.128809155	0.35367635	0.013349201	0.142701611	0.060630201	0.02122057	125.9296851	0
Fresno	2022	SBUS	Aggregate	20	Natural Gas	246.3375037	246.3375037	0	0.891648318	0.006650998	0.007233567	2225.905223	5.708517148	0.453765341	0.081563446	5.825960455	18.91621416	0	1.06	0.060630201	0.02122057	257.2806943	0
Fresno	2022	SBUS	Aggregate	25	Gasoline	1530.659336	1530.659336	0	0.487799962	0.001469458	0.001598169	896.3471862	0.013889856	0.027560892	0.066538566	0.097092919	1.486966186	0.008861304	0.045	0.049809241	0.017433234	94.51869082	0
Fresno	2022	SBUS	Aggregate	25	Diesel	1606.17375	1606.17375	0	5.002303851	0.02555586	0.026711383	1263.728802	0.003797222	0.199100987	0.081753155	0.093069744	0.278434388	0.011966756	0.142701611	0.049809241	0.017433234	112.8883933	0
Fresno	2022	SBUS	Aggregate	25	Natural Gas	316.6349524	316.6349524	0	0.607424357	0.005237371	0.005696118	1684.520757	4.22114128	0.343400576	0.06031178	4.307984286	13.72255267	0	1.06	0.049809241	0.017433234	194.7049072	0
Fresno	2022	SBUS	Aggregate	30	Gasoline	1969.78792	1969.78792	0	0.451684474	0.001145202	0.001245512	795.3983166	0.010827284	0.025520353	0.051867488	0.075684917	1.369187565	0.007863322	0.045	0.044398761	0.015539566	83.87375865	0
Fresno	2022	SBUS	Aggregate	30	Diesel	2066.966552	2066.966552	0	4.675330402	0.021846694	0.022834505	1164.23504	0.002985024	0.183425705	0.064266746	0.073162798	0.227190201	0.01102461	0.142701611	0.044398761	0.015539566	104.0006549	0
Fresno	2022	SBUS	Aggregate	30	Natural Gas	407.4738838	407.4738838	0	0.447030975	0.004071083	0.004427674	1348.452137	3.317063699	0.274890789	0.047394295	3.385306803	10.62005343	0	1.06	0.044398761	0.015539566	155.8605005	0
Fresno	2022	SBUS	Aggregate	35	Gasoline	2398.919811	2398.919811	0	0.425040915	0.000941549	0.00102402	737.2899981	0.008903207	0.024014981	0.042650305	0.062235225	1.264061554	0.007288862	0.045	0.041585311	0.014554859	77.74630908	0
Fresno	2022	SBUS	Aggregate	35	Diesel	2517.26948	2517.26948	0	4.428083123	0.019456166	0.020335887	1087.436581	0.002371185	0.171326076	0.05105097	0.058117644	0.186351535	0.010297374	0.142701611	0.041585311	0.014554859	97.14027899	0
Fresno	2022	SBUS	Aggregate	35	Natural Gas	496.2448814	496.2448814	0	0.346329926	0.003152135	0.003428235	1120.428382	2.714021009	0.228406655	0.038778005	2.769857506	8.579559491	0	1.06	0.041585311	0.014554859	129.5044322	0
Fresno	2022	SBUS	Aggregate	40	Gasoline	2611.373798	2611.373798	0	0.406670496	0.000816655	0.000888187	713.6195989	0.00772081	0.022977045	0.036986101	0.053970032	1.169778836	0.007054856	0.045	0.041585311	0.014554859	75.25029506	0
Fresno	2022	SBUS	Aggregate	40	Diesel	2740.204792	2740.204792	0	4.258635171	0.018377018	0.019207945	1032.56779	0.001936726	0.162681476	0.041697182	0.047469068	0.15489827	0.0097778	0.142701611	0.041585311	0.014554859	92.23887167	0
Fresno	2022	SBUS	Aggregate	40	Natural Gas	540.1934965	540.1934965	0	0.278333631	0.002480527	0.002697799	956.0228841	2.285427006	0.194891519	0.032654242	2.33244589	7.146438861	0	1.06	0.041585311	0.014554859	110.5016642	0
Fresno	2022	SBUS	Aggregate	45	Gasoline	2372.89587	2372.89587	0	0.39594642	0.000747255	0.000812708	715.9883661	0.00705831	0.02237113	0.033812433	0.049339023	1.084693645	0.007078274	0.045	0.041585311	0.014554859	75.5000786	0
Fresno	2022	SBUS	Aggregate	45	Diesel	2489.961658	2489.961658	0	4.166306638	0.018607314	0.019448654	999.1797913	0.001667349	0.157421183	0.035897557	0.040866637	0.13208689	0.009461635	0.142701611	0.041585311	0.014554859	89.25633495	0
Fresno	2022	SBUS	Aggregate	45	Natural Gas	490.8615218	490.8615218	0	0.229953045	0.002056258	0.002236368	832.1298021	1.966429432	0.169635104	0.028096397	2.006885468	6.090656073	0	1.06	0.041585311	0.014554859	96.18151349	0
Fresno	2022	SBUS	Aggregate	50	Gasoline	1662.349555	1662.349555	0	0.391151018	0.00072133	0.000784512	736.8424444	0.006812279	0.022100188	0.032633834	0.047619215	1.009236848	0.007284438	0.045	0.041585311	0.014554859	77.6991151	0
Fresno	2022	SBUS	Aggregate	50	Diesel	1744.360849	1744.360849	0	4.148513467	0.020148978	0.021060026	986.9905829	0.001552127	0.155500768	0.033416859	0.03804255	0.117379762	0.009346211	0.142701611	0.041585311	0.014554859	88.16747779	0
Fresno	2022	SBUS	Aggregate	50	Natural Gas	343.8766289	343.8766289	0	0.194029914	0.001879329	0.002043941	735.5734026	1.720519568	0.14995145	0.02458283	1.755916415	5.284079455	0	1.06	0.041585311	0.014554859	85.02106639	0
Fresno	2022	SBUS	Aggregate	55	Gasoline	1228.288596	1228.288596	0	0.393011224	0.000734571	0.000798913	766.9465417	0.006933136	0.022205291	0.033212792	0.048464028	0.941167433	0.007582047	0.045	0.041585311	0.014554859	80.87355454	0
Fresno	2022	SBUS	Aggregate	55	Diesel	1288.885682	1288.885682	0	4.20637551	0.023007083	0.024047362	995.8145652	0.001582539	0.15689099	0.034071625	0.038787952	0.11039301	0.009429768	0.142701611	0.041585311	0.014554859	88.95572063	0
Fresno	2022	SBUS	Aggregate	55	Natural Gas	254.0859957	254.0859957	0	0.166557099	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	60	Gasoline	1518.943958	1518.943958	0	0.400757266	0.000789166	0.00085829	797.9095276	0.00744702	0.022642945	0.035674526	0.052056184	0.880412784	0.007888148	0.045	0.041585311	0.014554859	84.13856272	0
Fresno	2022	SBUS	Aggregate	60	Diesel	1593.880399	1593.880399	0	4.303924354	0.025503155	0.026656294	1026.184221	0.00167332	0.161675742	0.036026116	0.041012991	0.110459595	0.009717351	0.142701611	0.041585311	0.014554859	91.66862995	0
Fresno	2022	SBUS	Aggregate	60	Natural Gas	314.2114882	314.2114882	0	0.166536632	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	65	Gasoline	818.1254301	818.1254301	0	0.415059903	0.000894412	0.000972755	822.1796454	0.008442785	0.02345105	0.040444679	0.059016781	0.826220389	0.008128083	0.045	0.041585311	0.014554859	86.69781632	0
Fresno	2022	SBUS	Aggregate	65	Diesel	858.4872932	858.4872932	0	4.420821989	0.026812909	0.028025269	1074.606646	0.001728594	0.169304715	0.037216148	0.042367752	0.113726911	0.010175882	0.142701611	0.041585311	0.014554859	95.99418603	0
Fresno	2022	SBUS	Aggregate	65	Natural Gas	169.2389029	169.2389029	0	0.166534719	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	70	Gasoline	220.8624108	220.8624108	0	0.425364752	0.000971484	0.001056577	829.7066246	0.009166633	0.024033278	0.043912236	0.064076632	0.800764938	0.008202495	0.045	0.041585311	0.014554859	87.49152687	0
Fresno	2022	SBUS	Aggregate	70	Diesel	231.7585621	231.7585621	0	4.421211292	0.026812909	0.028025269	1074.606646	0.001729223	0.169304715	0.037229698	0.042383178	0.113840652	0.010175882	0.142701611	0.041585311	0.014554859	95.99418603	0
Fresno	2022	SBUS	Aggregate	70	Natural Gas	45.68799688	45.68799688	0	0.166549385	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	75	Gasoline	28.58801746	28.58801746	0	0.42169923	0.000971484	0.001056577	829.7127519	0.009205967	0.023826174	0.04410066	0.064351579	0.804114114	0.008202555	0.045	0.041585311	0.014554859	87.49217299	0
Fresno	2022	SBUS	Aggregate	75	Diesel	29.99839489	29.99839489	0	4.415398057	0.026812909	0.028025269	1074.606646	0.001730008	0.169304715	0.037246588	0.042402405	0.113996476	0.010175882	0.142701611	0.041585311	0.014554859	95.99418603	0
Fresno	2022	SBUS	Aggregate	75	Natural Gas	5.913768882	5.913768882	0	0.166330397	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	80	Gasoline	0.032000795	0.032000795	0	0.424206986	0.000971484	0.001056577	829.7068676	0.009168805	0.023967864	0.043922639	0.064091812	0.800889766	0.008202497	0.045	0.041585311	0.014554859	87.49155249	0
Fresno	2022	SBUS	Aggregate	80	Diesel	0.03357954	0.03357954	0	4.416070329	0.026812909	0.028025269	1074.606646	0.001730947	0.169304715	0.037266818	0.042425435	0.114194381	0.010175882	0.142701611	0.041585311	0.014554859	95.99418603	0
Fresno	2022	SBUS	Aggregate	80	Natural Gas	0.006619742	0.006619742	0	0.166355722	0.001949739	0.002120519	658.3046287	1.525643178	0.134199705	0.021798431	1.557030765	4.650021436	0	1.06	0.041585311	0.014554859	76.08997462	0
Fresno	2022	SBUS	Aggregate	85	Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno	2022	SBUS	Aggregate	90	Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno	2022	UBUS	Aggregate	5	Gasoline	5.991241952	5.991241952	0	0.044986842	0.001248152	0.001357479	1704.41287	0.004966278	0.004284401	0.017483832	0.025512367	1.354365905	0.016849856	0.045	0.091000026	0.031850009	179.7282075	0
Fresno	2022	UBUS	Aggregate	5	Diesel	0.01334726	0.01334726	0	0.415649308	0.015336272	0.01602971	1151.282712	0.006269042	0.18138506	0.134968778	0.15365298	0.268001651	0.010908989	0.22	0.091000026	0.031850009	102.8436286	0
Fresno	2022	UBUS	Aggregate	5	Natural Gas	2.34061287	2.34061287	0	1.520004536	0.034525713	0.036086812	1631.444381	0.00740464	0.33258061	0.15941754	0.18148627	0.566011645	0	0.97	0.091000026	0.031850009	188.5700877	0
Fresno	2022	UBUS	Aggregate	10	Gasoline	76.78587153	76.78587153	0	0.309892534	0.002676651	0.002911103	3017.531815	0.011819289	0.026552415	0.039949405	0.058294078	0.589654193	0.029831374	0.045	0.106088525	0.037130984	318.1949595	0
Fresno	2022	UBUS	Aggregate	10	Diesel	22.59434663	22.59434663	0	1.239836764	0.004491429	0.004694512	1965.077204	0.006510891	0.309598714	0.14017769	0.159581632	0.20330607	0.018620105	0.22	0.109970417	0.038489646	175.5395682	0
Fresno	2022	UBUS	Aggregate	10	Electricity	0.76137264	0	0.761373	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	2539112.571
Fresno	2022	UBUS	Aggregate	10	Natural Gas	284.1353014	284.1353014	0	2.058925421	0.001112903	0.001163223	6677.396302	4.400168517	1.361230918	0.066015221	4.494128821	67.52728177	0	0.97	0.109587067	0.038355473	771.805169	0
Fresno	2022	UBUS	Aggregate	15	Gasoline	207.7250946	207.7250946	0	0.284115964	0.001856118	0.002018698	2532.016299	0.008143258	0.02433126	0.027520165	0.040157359	0.494326727	0.025031559	0.045	0.10672578	0.037354023	266.997955	0
Fresno	2022	UBUS	Aggregate	15	Diesel	63.68535905	63.68535905	0	0.790272336	0.003875587	0.004050823	1567.294196	0.004658303	0.246927839	0.10029199	0.114174798	0.129351897	0.014850909	0.22	0.109976239	0.038491684	140.0057697	0
Fresno	2022	UBUS	Aggregate	15	Electricity	2.146694996	0	2.146695	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	2116551.356
Fresno	2022	UBUS	Aggregate	15	Natural Gas	797.6938565	797.6938565	0	1.04427588	0.000832661	0.00087031	3587.017394	2.957195652	0.731236961	0.04454561	3.020538589	45.57407271	0	0.97	0.109666929	0.038383425	414.6045016	0
Fresno	2022	UBUS	Aggregate	20	Gasoline	320.9661851	320.9661851	0	0.267972962	0.001355752	0.001474504	2170.482394	0.005930053	0.022931883	0.020025429	0.02922106	0.417887172	0.021457428	0.045	0.107648057	0.03767682	228.8746565	0
Fresno	2022	UBUS	Aggregate	20	Diesel	104.1325417	104.1325417	0	0.587460148	0.003565268	0.003726473	1350.418473	0.003735805	0.21275898	0.080430851	0.091564403	0.096003173	0.012795901	0.22	0.109983881	0.038494358	120.6323472	0
Fresno	2022	UBUS	Aggregate	20	Electricity	3.511495151	0	3.511495	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1879250.754
Fresno	2022	UBUS	Aggregate	20	Natural Gas	1297.488172	1297.488172	0	0.667118031	0.000571386	0.000597221	2385.574409	2.342673131	0.486314949	0.034878404	2.392405014	35.93278855	0	0.97	0.109772731	0.038420456	275.7360169	0
Fresno	2022	UBUS	Aggregate	25	Gasoline	473.1030142	473.1030142	0	0.25762543	0.001034655	0.001125282	1912.542298	0.004540896	0.02202867	0.015318509	0.022352733	0.363757206	0.018907428	0.045	0.108677277	0.038037047	201.6751957	0
Fresno	2022	UBUS	Aggregate	25	Diesel	162.9150058	162.9150058	0	0.447548422	0.003561484	0.003722518	1214.320162	0.003167715	0.191316636	0.06820003	0.077640543	0.076822201	0.011506301	0.22	0.109991474	0.038497016	108.4747391	0
Fresno	2022	UBUS	Aggregate	25	Electricity	5.495919431	0	5.495919	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1723528.244
Fresno	2022	UBUS	Aggregate	25	Natural Gas	2019.301182	2019.301182	0	0.476154021	0.00036237	0.000378755	1759.090313	2.001069833	0.358602068	0.02926019	2.042968758	30.46701157	0	0.97	0.109878959	0.038457636	203.3240106	0
Fresno	2022	UBUS	Aggregate	30	Gasoline	683.42753	683.42753	0	0.244533485	0.000816929	0.000888485	1719.409065	0.003590544	0.02090178	0.012106279	0.017665453	0.328492096	0.016998109	0.045	0.109155245	0.038204336	181.3095376	0
Fresno	2022	UBUS	Aggregate	30	Diesel	241.6632519	241.6632519	0	0.328551523	0.003865179	0.004039945	1107.275361	0.00277681	0.174451684	0.059783966	0.068059495	0.064301344	0.010491997	0.22	0.109994709	0.038498148	98.91246937	0
Fresno	2022	UBUS	Aggregate	30	Electricity	8.153871446	0	8.153871	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1382100.339
Fresno	2022	UBUS	Aggregate	30	Natural Gas	2988.662106	2988.662106	0	0.363722636	0.000252209	0.000263613	1377.249559	1.777720208	0.280761332	0.025769717	1.814697378	26.84908143	0	0.97	0.109924561	0.038473596	159.1890432	0
Fresno	2022	UBUS	Aggregate	35	Gasoline	783.5732806	783.5732806	0	0.236983824	0.000678673	0.000738119	1620.845809	0.003012181	0.020247219	0.0101511	0.014812462	0.301578057	0.016023711	0.045	0.109746348	0.038411222	170.9161654	0
Fresno	2022	UBUS	Aggregate	35	Diesel	286.039543	286.039543	0	0.234349962	0.004474873	0.004677207	1023.282289	0.002488384	0.161218541	0.053574228	0.060990181	0.055449347	0.00969612	0.22	0.109998483	0.038499469	91.40940154	0
Fresno	2022	UBUS	Aggregate	35	Electricity	9.653073315	0	9.653073	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1405896.108
Fresno	2022	UBUS	Aggregate	35	Natural Gas	3528.202135	3528.202135	0	0.290439763	0.000160923	0.0001682	1123.523235	1.622870278	0.229037561	0.023282381	1.656361614	24.31467205	0	0.97	0.109978021	0.038492307	129.86215	0
Fresno	2022	UBUS	Aggregate	40	Gasoline	627.6314397	627.6314397	0	0.228924657	0.000590179	0.000641873	1577.733484	0.002629803	0.019555732	0.008861388	0.012930517	0.279139982	0.015597502	0.045	0.109933851	0.038476848	166.3700245	0
Fresno	2022	UBUS	Aggregate	40	Diesel	231.3913837	231.3913837	0	0.164939044	0.005390807	0.005634555	962.2600501	0.002265343	0.151604463	0.04877222	0.055523459	0.048845745	0.009117903	0.22	0.109999632	0.038499871	85.95830909	0
Fresno	2022	UBUS	Aggregate	40	Electricity	7.809315347	0	7.809315	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1489082.383
Fresno	2022	UBUS	Aggregate	40	Natural Gas	2851.855363	2851.855363	0	0.239757036	0.000117333	0.000122639	943.0489547	1.505783157	0.192246699	0.021536002	1.536785446	22.38802232	0	0.97	0.109994341	0.03849802	109.0020758	0
Fresno	2022	UBUS	Aggregate	45	Gasoline	357.4677946	357.4677946	0	0.221389363	0.000539655	0.000586924	1576.236679	0.002390716	0.018914308	0.008055968	0.01175525	0.258981174	0.015582704	0.045	0.109806826	0.038432389	166.2121884	0
Fresno	2022	UBUS	Aggregate	45	Diesel	130.9102624	130.9102624	0	0.12034325	0.006612337	0.006911318	924.2329122	0.002086758	0.145613272	0.044927323	0.051146338	0.043718459	0.008757577	0.22	0.109998856	0.0384996	82.56135993	0
Fresno	2022	UBUS	Aggregate	45	Electricity	4.417959655	0	4.41796	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1581084.759
Fresno	2022	UBUS	Aggregate	45	Natural Gas	1614.315472	1614.315472	0	0.202946506	0.000103834	0.000108529	808.8191623	1.413439763	0.164883077	0.020249212	1.442577846	20.86377282	0	0.97	0.109983318	0.038494161	93.48715907	0
Fresno	2022	UBUS	Aggregate	50	Gasoline	200.4204659	200.4204659	0	0.198874659	0.000517194	0.000562495	1505.566897	0.002083723	0.017027879	0.007024777	0.010250538	0.24751739	0.014884062	0.045	0.107796028	0.03772861	158.7601481	0
Fresno	2022	UBUS	Aggregate	50	Diesel	65.59730824	65.59730824	0	0.100567093	0.008136718	0.008504624	908.909662	0.001939968	0.143199087	0.041766983	0.047548531	0.039606992	0.008612381	0.22	0.10998503	0.03849476	81.19254006	0
Fresno	2022	UBUS	Aggregate	50	Electricity	2.212166932	0	2.212167	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1582715.644
Fresno	2022	UBUS	Aggregate	50	Natural Gas	816.6938976	816.6938976	0	0.204410387	0.00020449	0.000213737	806.4785216	1.398975607	0.164405922	0.020567892	1.428389662	20.65049288	0	0.97	0.109788728	0.038426055	93.2166167	0
Fresno	2022	UBUS	Aggregate	55	Gasoline	106.3971043	106.3971043	0	0.211996208	0.000530747	0.000577236	1640.672891	0.002264168	0.018128371	0.007631019	0.011135165	0.232708604	0.016219722	0.045	0.109034564	0.038162098	173.0069064	0
Fresno	2022	UBUS	Aggregate	55	Diesel	37.37401983	37.37401983	0	0.105619201	0.009970503	0.010421324	917.2254614	0.001816558	0.144509245	0.039110006	0.044523765	0.036249795	0.008691177	0.22	0.109993908	0.038497868	81.93538713	0
Fresno	2022	UBUS	Aggregate	55	Electricity	1.260969981	0	1.26097	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1627272.893
Fresno	2022	UBUS	Aggregate	55	Natural Gas	462.4632749	462.4632749	0	0.203541209	0.000136561	0.000142735	807.9571312	1.408229845	0.164707347	0.020319599	1.437418859	20.78690116	0	0.97	0.109913255	0.038469639	93.38752142	0
Fresno	2022	UBUS	Aggregate	60	Gasoline	86.5555654	86.5555654	0	0.226237428	0.000570685	0.000620672	1769.229917	0.00254519	0.019325066	0.008576042	0.01251414	0.210304996	0.017490639	0.045	0.110000032	0.038500011	186.5630841	0
Fresno	2022	UBUS	Aggregate	60	Diesel	32.02165071	32.02165071	0	0.135493409	0.012110667	0.012658258	948.5212065	0.001711338	0.149439902	0.036844645	0.041944824	0.033447346	0.00898772	0.22	0.110000032	0.038500011	84.73102364	0
Fresno	2022	UBUS	Aggregate	60	Electricity	1.080733551	0	1.080734	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1624380.749
Fresno	2022	UBUS	Aggregate	60	Natural Gas	394.5509452	394.5509452	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	65	Gasoline	92.92495433	92.92495433	0	0.235575487	0.000646794	0.000703448	1823.267029	0.002877604	0.020122717	0.009696116	0.014148549	0.196832107	0.018024851	0.045	0.110000032	0.038500011	192.26123	0
Fresno	2022	UBUS	Aggregate	65	Diesel	34.378037	34.378037	0	0.190188245	0.014554512	0.015212602	1002.699937	0.001620232	0.157975783	0.034883143	0.039711803	0.031065589	0.009501091	0.22	0.110000032	0.038500011	89.57078817	0
Fresno	2022	UBUS	Aggregate	65	Electricity	1.160261797	0	1.160262	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1712542.525
Fresno	2022	UBUS	Aggregate	65	Natural Gas	423.5848775	423.5848775	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	70	Gasoline	83.74172845	83.74172845	0	0.241120938	0.000702528	0.000764064	1840.036537	0.003126803	0.020596406	0.010535793	0.015373804	0.190915574	0.018190634	0.045	0.110000032	0.038500011	194.0295538	0
Fresno	2022	UBUS	Aggregate	70	Diesel	30.98065809	30.98065809	0	0.190188245	0.014554512	0.015212602	1002.699937	0.001620232	0.157975783	0.034883143	0.039711803	0.031065589	0.009501091	0.22	0.110000032	0.038500011	89.57078817	0
Fresno	2022	UBUS	Aggregate	70	Electricity	1.045599958	0	1.0456	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1637653.768
Fresno	2022	UBUS	Aggregate	70	Natural Gas	381.7244791	381.7244791	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	75	Gasoline	28.31062436	28.31062436	0	0.240430473	0.000702528	0.000764064	1840.037082	0.003131803	0.020537427	0.01055264	0.015398387	0.191213067	0.01819064	0.045	0.110000032	0.038500011	194.0296112	0
Fresno	2022	UBUS	Aggregate	75	Diesel	10.47365262	10.47365262	0	0.190188245	0.014554512	0.015212602	1002.699937	0.001620232	0.157975783	0.034883143	0.039711803	0.031065589	0.009501091	0.22	0.110000032	0.038500011	89.57078817	0
Fresno	2022	UBUS	Aggregate	75	Electricity	0.353486705	0	0.353487	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1637653.768
Fresno	2022	UBUS	Aggregate	75	Natural Gas	129.0498601	129.0498601	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	80	Gasoline	0.876779066	0.876779066	0	0.234537815	0.000702528	0.000764064	1840.041439	0.003171608	0.02003408	0.010686762	0.015594098	0.193594257	0.018190683	0.045	0.110000032	0.038500011	194.0300707	0
Fresno	2022	UBUS	Aggregate	80	Diesel	0.324368663	0.324368663	0	0.190188245	0.014554512	0.015212602	1002.699937	0.001620232	0.157975783	0.034883143	0.039711803	0.031065589	0.009501091	0.22	0.110000032	0.038500011	89.57078817	0
Fresno	2022	UBUS	Aggregate	80	Electricity	0.010947471	0	0.010947	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1637653.768
Fresno	2022	UBUS	Aggregate	80	Natural Gas	3.996669743	3.996669743	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	85	Gasoline	0.078967268	0.078967268	0	0.23364733	0.000702528	0.000764064	1840.04214	0.00317801	0.019958015	0.010708337	0.01562558	0.193977375	0.01819069	0.045	0.110000032	0.038500011	194.0301446	0
Fresno	2022	UBUS	Aggregate	85	Diesel	0.029214323	0.029214323	0	0.190188245	0.014554512	0.015212602	1002.699937	0.001620232	0.157975783	0.034883143	0.039711803	0.031065589	0.009501091	0.22	0.110000032	0.038500011	89.57078817	0
Fresno	2022	UBUS	Aggregate	85	Electricity	0.000985986	0	0.000986	0	0	0	0	0	0	0	0	0	0	0	0.055000016	0.019250006	0	1637653.768
Fresno	2022	UBUS	Aggregate	85	Natural Gas	0.359960797	0.359960797	0	0.202806128	9.41791E-05	9.84374E-05	808.9970045	1.414681727	0.164919332	0.020213011	1.443786465	20.88207021	0	0.97	0.110000032	0.038500011	93.50771491	0
Fresno	2022	UBUS	Aggregate	90	Gasoline	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno	2022	UBUS	Aggregate	90	Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fresno	2022	UBUS	Aggregate	90	Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: FRESNO
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HTSK and RUNLS, g/vehicle/day for IDLEX, RESTL and DIURN. Note 'day' in the unit is operation day.

Region	Calendar Ye	Vehicle Cat	Model Year	Speed	Fuel	Population	VMT	Trips	NOx_RUNE	NOx_IDLEX	NOx_STREX	PM2.5_RU	PM2.5_IDL	PM2.5_STR	PM2.5_PM	PM2.5_PM	PM10_RUN	PM10_IDLE	PM10_STR	PM10_PM	PM10_PM	CO2_RUNE	CO2_IDLEX	CO2_STREX	CH4_RUNE	CH4_IDLEX	CH4_STREX	N2O_RUNE	N2O_IDLEX	N2O_STRE	ROG_RUNE	ROG_IDLEX	ROG_STRE	ROG_HOTS	ROG_RUNL	ROG_RESTL	ROG_DIUR	TOG_RUNE	TOG_IDLEX	TOG_STREX	TOG_HOTS	TOG_RUNL	TOG_RESTL	TOG_DIUR	CO_RUNEX	CO_IDLEX	CO_STREX	SOx_RUNE	SOx_IDLEX	SOx_STREX
FRESNO	2022	HHDT	Aggregated	Aggregated	DSL	16686.85	2302316	192966.5	3.015235	75.63203	2.072195	0.032777	0.035827	0	0.008941	0.026287	0.034259	0.037447	0	0.035764	0.061335	1403.737	14690.23	0	0.00273	0.273417	0	0.220648	2.309099	0	0.058783	5.886584	0	0	0	0	0	0.06692	6.701428	0	0	0	0	0	0.289022	82.01959	0	0.013262	0.138786	0
FRESNO	2022	LHDT1	Aggregated	Aggregated	DSL	10563	361877.2	132869.2	2.480866	2.32483	0	0.029456	0.026649	0	0.003	0.03276	0.030787	0.027854	0	0.012	0.07644	565.9064	137.8972	0	0.008391	0.005098	0	0.088953	0.021676	0	0.180652	0.10976	0	0	0	0	0	0.20566	0.124954	0	0	0	0	0	0.842791	0.909745	0	0.00535	0.001304	0
FRESNO	2022	LHDT2	Aggregated	Aggregated	DSL	3640.727	126379.6	45795.76	2.055033	2.296398	0	0.027333	0.026567	0	0.003	0.03822	0.028568	0.027768	0	0.012	0.08918	632.5731	220.5499	0	0.007861	0.005098	0	0.099432	0.034667	0	0.169253	0.10976	0	0	0	0	0	0.192684	0.124954	0	0	0	0	0	0.781622	0.909745	0	0.00598	0.002085	0
FRESNO	2022	MDV	Aggregated	Aggregated	DSL	2257.042	90386.49	10845.06	0.058641	0	0	0.005147	0	0	0.002	0.01575	0.00538	0	0	0.008	0.03675	366.7976	0	0	0.000483	0	0	0.057655	0	0	0.010403	0	0	0	0	0	0	0.011843	0	0	0	0	0	0	0.17317	0	0	0.003468	0	0
FRESNO	2022	MHDT	Aggregated	Aggregated	DSL	9785.05	670211.9	89846.78	2.265639	6.439362	1.736045	0.037316	0.014669	0	0.003	0.05586	0.039004	0.015332	0	0.012	0.13034	1058.691	796.9348	0	0.004529	0.004242	0	0.166411	0.125267	0	0.097513	0.091327	0	0	0	0	0	0.111011	0.103969	0	0	0	0	0	0.321809	2.294769	0	0.010002	0.007529	0

APPENDIX C

BIOLOGICAL EVALUATION

APPENDIX C

BIOLOGICAL EVALUATION

LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

BIOLOGICAL EVALUATION
NIELSEN AVENUE OFFICE/WAREHOUSE PROJECT
FRESNO COUNTY, CALIFORNIA

Prepared by:

Live Oak Associates, Inc.

Austin Pearson (Director of Ecological Services)
Jeff Gurule (Senior Project Manager)

Prepared for:

Jake Kurth
Scannell Properties
294 Grove Lane East, Suite 140
Wayzata, Minnesota 55391

April 13, 2021 File No. 2557-01

EXECUTIVE SUMMARY

Pursuant to the California Environmental Quality Act (CEQA), Live Oak Associates, Inc. (LOA) investigated potential impacts to biological resources associated with the proposed development of the Nielsen Avenue Office/Warehouse Project ("project") on an approximately 48-acre property ("project site") in the City of Fresno. Current zoning of the site is for heavy industrial uses. The proposed project entails the construction of three office/warehouse buildings that will function as an industrial warehouse and distribution business center. The entire project site was once utilized for similar industrial purposes, but the previous facility was decommissioned and demolished.

On March 18, 2021, LOA ecologist Jeff Gurule surveyed the project site for its biotic habitats, the plants and animals occurring in those habitats, and significant habitat values that may be protected by state and federal law. At the time of the field survey, the project site was entirely ruderal in nature, consisting primarily of hardscape with herbaceous weedy vegetation growing in hardscape cracks. A small portion of the site contained open ground supporting similar herbaceous weeds. A few small trees and shrubs occurred on the site. Lands within the vicinity of the project site are utilized primarily for industrial, commercial, and residential purposes.

The disturbed nature of the site, predominance of hardscape, and proximity to urban development has created habitat conditions that are unsuitable for most native plants and wildlife. However, the project has the potential to result in construction-related mortality or disturbance of urban-adapted, native nesting birds that are protected under the Federal Migratory Bird Treaty Act, California Migratory Bird Protection Act, and California Fish and Game Code. This potential impact would be considered significant under CEQA. Project construction outside the nesting season and avoidance of active nests identified during preconstruction surveys will reduce the magnitude of potential impacts to nesting birds to a less than significant level.

No other biological resources would be significantly affected by the project as defined by CEQA. The project will have no effect on all locally occurring special status plant species, an insignificant effect, or no effect, on 22 locally occurring special status animal species, and no effect on designated critical habitat, sensitive habitats, wildlife movement corridors, and waters of the U.S. or California. The project also appears to be consistent with local plans and ordinances. No Habitat Conservation Plans or Natural Community Conservation Plans are known to apply to the project.

TABLE OF CONTENTS

1.0 INTRODUCTION

This report, prepared by Live Oak Associates, Inc. (LOA) in compliance with the California Environmental Quality Act (CEQA), describes the biotic resources associated with the proposed Nielsen Avenue Office/Warehouse Project ("project") and assesses potential project-related impacts to those resources. The project site occupies an approximately 48-acre property ("project site") at 2740 W. Nielsen Avenue in the City of Fresno, California (Figure 1). The project site is within a portion of the city zoned for heavy industrial uses. The site can be found primarily in the Fresno South 7.5" U.S. Geological Survey (USGS) 7.5-minute quadrangle; Section 6 of Township 14 South, Range 20 East, Mount Diablo Base and Meridian (Figure 2).

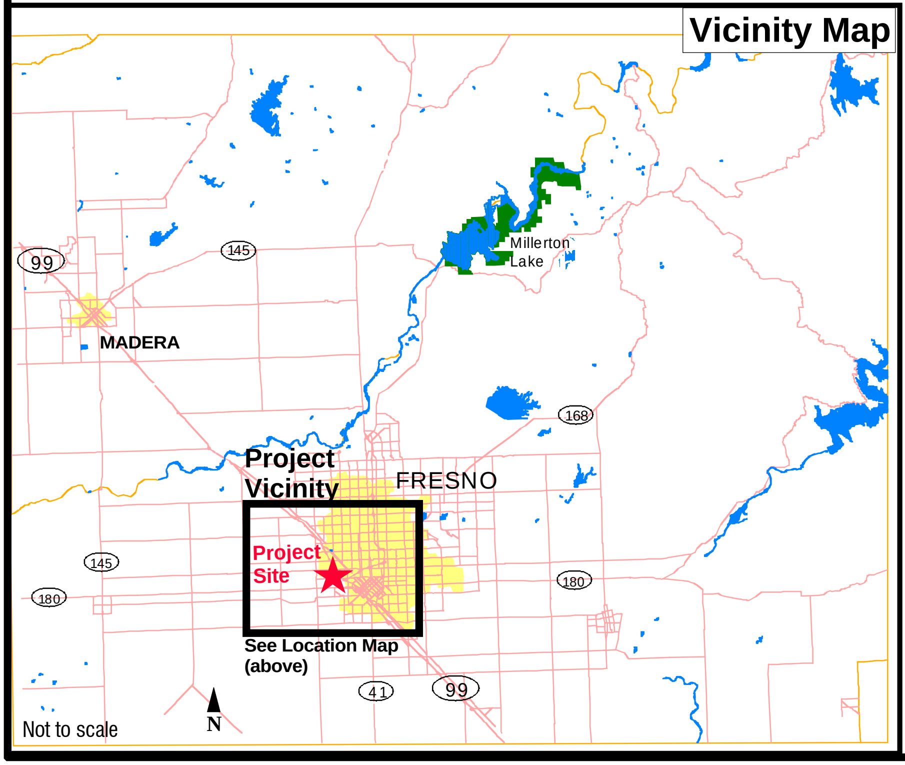
1.1 PROJECT DESCRIPTION

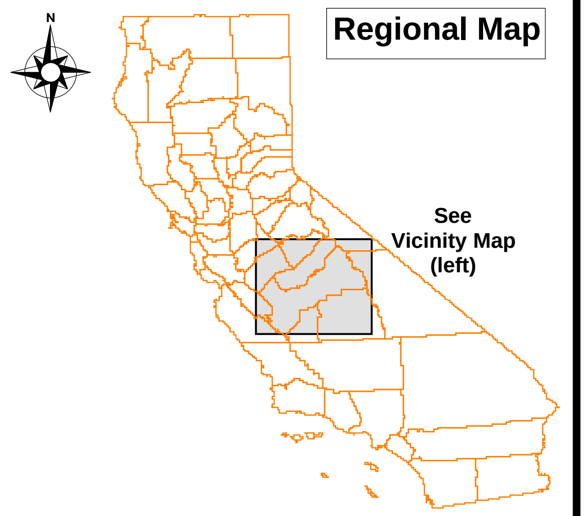
The project is the construction of three office/warehouse buildings that will function as an industrial warehouse and distribution business center. One building will encompass approximately 407,680 square feet and the other two buildings 225,576 square feet each. The proposed hours of operations of the facilities are 24 hours a day, 7 days a week.

1.2 REPORT OBJECTIVES

This report addresses issues related to: 1) sensitive biotic resources occurring on the project site; 2) the federal, state, and local laws regulating such resources; and 3) mitigation measures that may be required to reduce the magnitude of anticipated project-related impacts and/or comply with permit requirements of state and federal resource agencies. As such, the objectives of this report are to:

- Summarize all site-specific information related to existing biological resources;
- Make reasonable inferences about the biological resources that could occur on site based on habitat suitability and the proximity of the site to a species' known range;
- Summarize all state and federal natural resource protection laws that may be relevant to future site development;
- Identify and discuss project impacts to biological resources likely to occur on the site within the context of CEQA and state or federal laws;

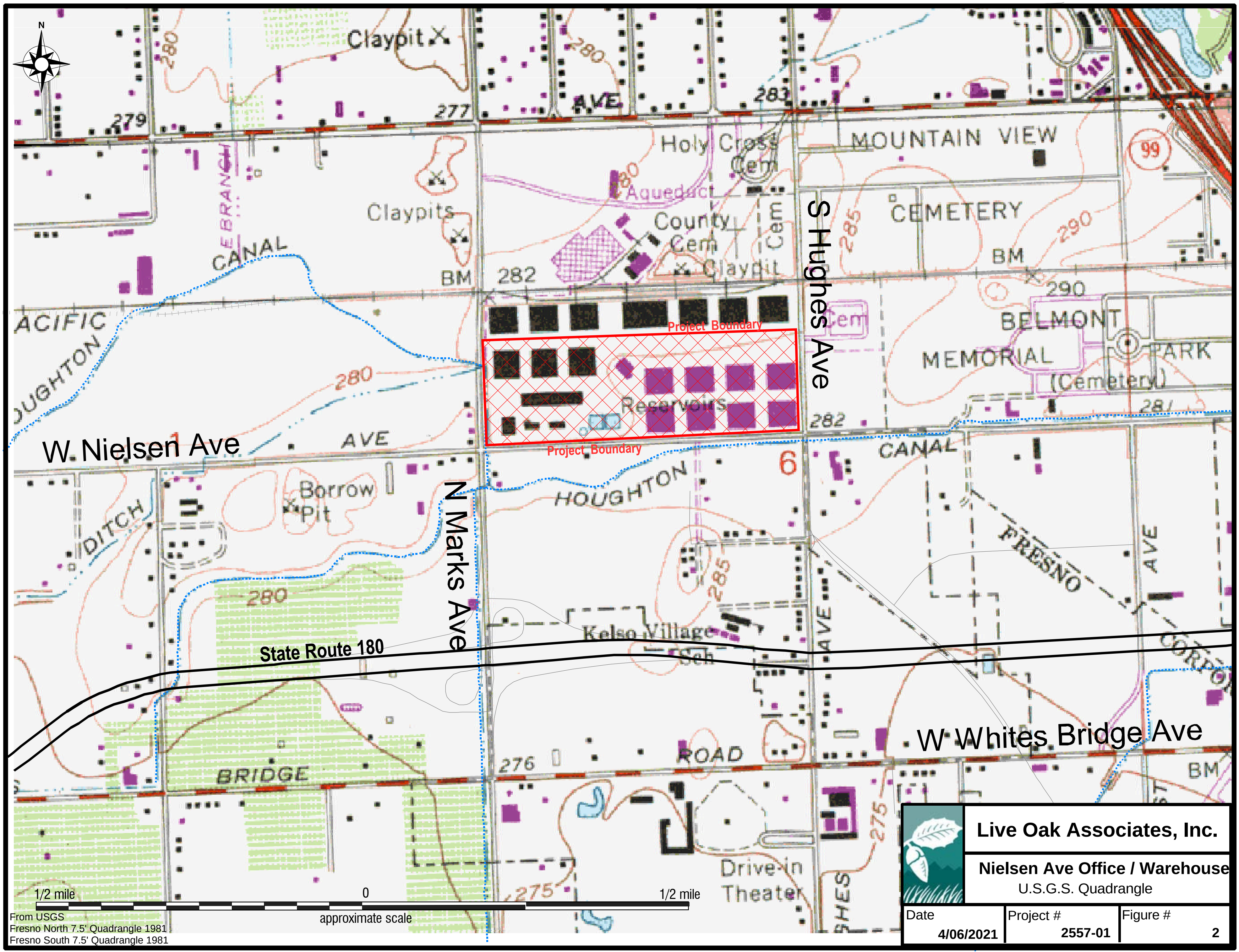




Live Oak Associates, Inc.

Nielsen Ave Office / Warehouse
Site / Vicinity Map

Date	Project #	Figure #
4/06/2021	2557-01	1



From USGS
Fresno North 7.5' Quadrangle 1981
Fresno South 7.5' Quadrangle 1981

Live Oak Associates, Inc.

Nielsen Ave Office / Warehouse
U.S.G.S. Quadrangle

Date	Project #	Figure #
4/06/2021	2557-01	2

- Identify avoidance, minimization, and/or mitigation measures that would reduce the magnitude of project impacts in a manner consistent with the requirements of CEQA and that are generally consistent with the requirements of the resource agencies regulating affected biological resources

1.3 STUDY METHODOLOGY

A reconnaissance-level field survey was conducted on March 18, 2021 by LOA biologist Jeff Gurule. The survey consisted of systematically walking across the project site while identifying principal land uses and biotic habitats, identifying plant and animal species encountered, and assessing the suitability of the habitats within the project site for special status species.

LOA conducted an analysis of potential project impacts to biological resources based on the known and potential biotic resources of the project site and vicinity. Sources of information used in the preparation of this analysis included: (1) the *California Natural Diversity Data Base* (CDFW 2021), (2) the *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2021), and (3) manuals, reports, and references related to plants and animals of the San Joaquin Valley region.

LOA's field investigation did not include focused surveys for special status species. The field survey was sufficient to assess the possible biological impacts associated with development of the site.

2.0 EXISTING CONDITIONS

The geographical and biological setting of the project provides the context for analyzing potential impacts to biological resources from future site development. The project site is located within a region of Fresno that was historically utilized for agricultural uses. This region of the city is currently zoned for heavy industrial uses and is increasingly utilized for commercial and industrial purposes. Some agricultural rural residential uses remain in the area surrounding the project site.

Like most of California, the project vicinity experiences a Mediterranean climate. Warm dry summers are followed by cool moist winters. Summer temperatures commonly exceed 90 degrees Fahrenheit, and the relative humidity is generally very low. Winter temperatures rarely rise much above 70 degrees Fahrenheit, with daytime highs often below 60 degrees Fahrenheit. Annual precipitation within the project site is about 11 inches, almost 85% of which falls between the months of October and March. Nearly all precipitation falls in the form of rain. Stormwater runoff appears to collect in a cement ditch along the southern edge of the site. This ditch leads to an underground pipe that heads south toward Nielsen Avenue, likely to a stormwater drainage piping system beneath Nielsen Avenue.

Natural drainages are absent from the project vicinity. The nearby Houghton Canal appears to source water from Redbank Slough and the Kings River and distribute water to farmland to the west of the project site.

The site itself consists of a former industrial warehouse site that has been demolished. The site's topography is relatively flat, with a median elevation of approximately 288 feet National Geodetic Vertical Datum (NGVD).

Soils of the site have been mostly paved over. A few areas of exposed soils occur on the site; however, the soils here have been significantly disturbed through decades of industrial and agricultural activity and are unlikely to exhibit their native soil characteristics.

2.1 BIOTIC HABITATS/LAND USES

At the time of LOA's field survey, the site consisted of a vacant urban lot surrounded by chain link fencing and supported a single biotic habitat/land use type characterized as ruderal (Figure 3). Lists of the vascular plant species observed within the project site and the terrestrial vertebrates using, or potentially using, the site are provided in Appendices A and B, respectively. Representative photos of the site are presented in Appendix C.

The site was mostly barren of vegetation at the time of the survey. However, vegetation did occur in pavement cracks and in unpaved areas. Where vegetation was present, it consisted of non-native herbaceous weed species such as red brome (*Bromus madritensis ssp. rubens*), telegraphweed (*Heterotheca grandiflora*), red-stemmed filaree (*Erodium cicutarium*), prickly lettuce (*Lactuca serriola*), and common and small-flowered fiddleneck (*Amsinckia intermedia* and *menziesii*), among others. A few non-native trees and shrubs occurred on the site including Mexican fan palm (*Washingtonia robusta*), oleander (*Nerium oleander*), and red gum (*Eucalyptus camaldulensis*), among others.

Due to the site's extensive hardscape, paucity of vegetation, and perimeter fencing, it provides limited habitat value for native wildlife species. Amphibians are expected to be absent from the site due to the absence of aquatic habitats on the site. A limited number of reptile species would be expected to forage on the site. Two lizard species were observed during the field survey of the site: the western fence lizard (*Sceloporus occidentalis*) and common side-blotched lizard (*Uta stansburiana*). Few, if any, other reptile species are expected to occur on the site.

The few shrubs and trees on the site, as well as the ground, provide possible nesting habitat for a few urban adapted avian species. Birds potentially nesting on the site include mourning doves (*Zenaida macroura*), killdeer (*Charadrius vociferus*), and northern mockingbird (*Mimus polyglottos*). The likelihood of nesting is diminished by the limited foraging opportunity on the site, however. At the time of the field survey, the only bird species actually observed utilizing the site was the killdeer.

Although small mammal burrows were scarce on the site at the time of the field survey, a few small mammal species would be expected to occasionally occur in earthen areas of the site.

Aerial photograph courtesy of Google Earth
Photo Date 5/2020

Live Oak Associates, Inc.

Nielsen Ave Office / Warehouse
Project Site

Date **4/06/2021**	Project # **2557-01**	Figure # **3**

These include California ground squirrels (*Otospermophilus beecheyi*), deer mice (*Peromyscus maniculatus*), house mice (*Mus musculus*), and Botta's pocket gophers (*Thomomys bottae*).

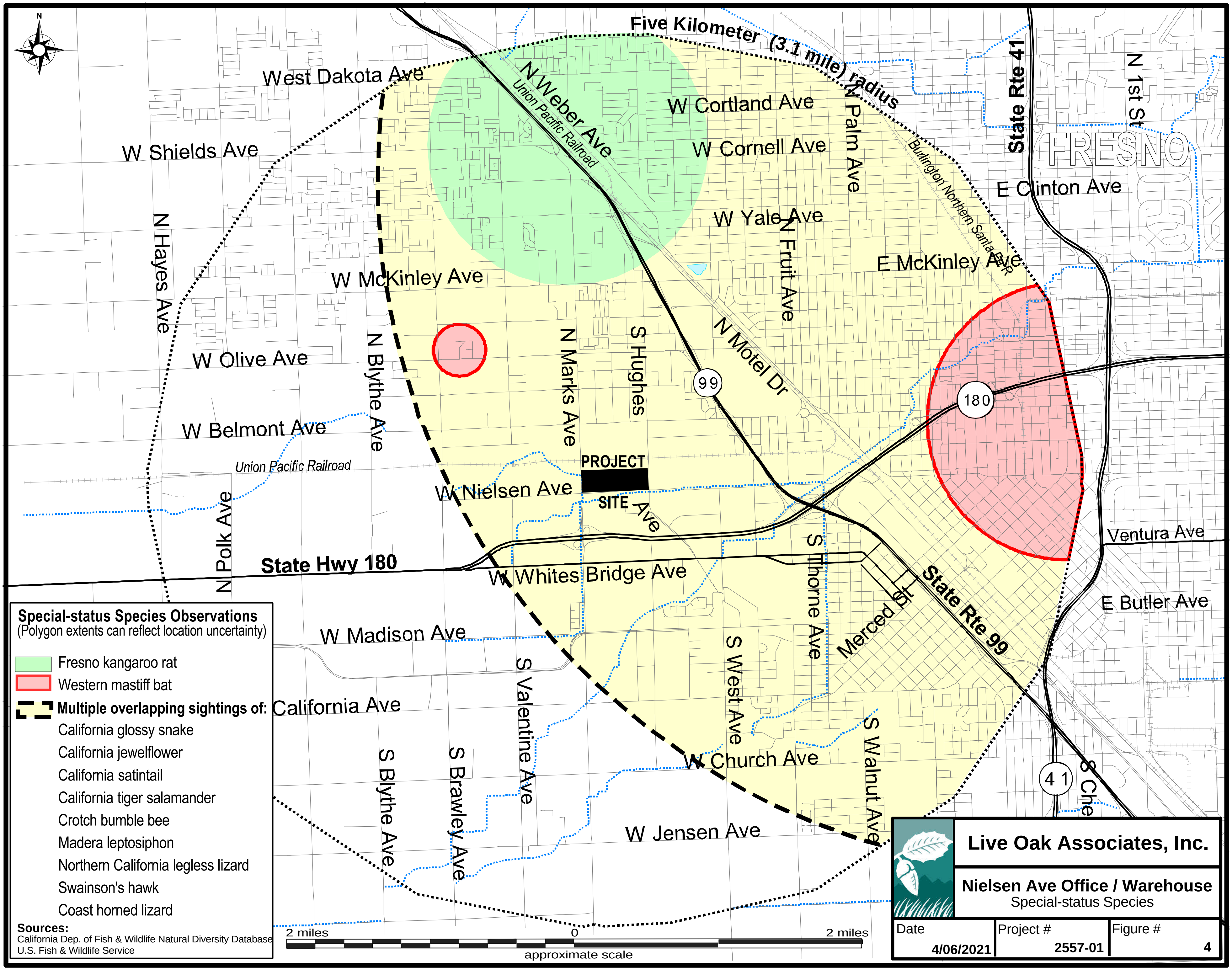
Mammalian predators potentially occurring on the site would be limited by the surrounding fence. Possible species that may occasionally occur on the site include the raccoon (*Procyon lotor*) and feral cat (*Felis catus*).

2.2 SPECIAL STATUS PLANTS AND ANIMALS

A number of species of plants and animals within the state of California have low populations and/or limited distributions. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.1, state and federal laws have provided the CDFW and the USFWS with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been formally designated as "threatened" or "endangered" under state and federal endangered species legislation. Others have been designated as candidates for such listing. Still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists (i.e., California Rare Plant Ranks, or CRPR) of native plants considered rare, threatened, or endangered (CNPS 2021). Collectively, these plants and animals are referred to as "special status species."

The California Natural Diversity Data Base (CNDDB) was queried for special status species occurrences in the nine U.S.G.S. 7.5-minute quadrangles containing and surrounding the project site. These quads included Fresno South, Malaga, Conejo, Caruthers, Raisin, Kearney Park, Herndon, Fresno North, and Clovis. These species, and their potential to occur on the project site, are listed in Table 1 on the following pages. Other sources of information for this table included *California's Wildlife, Volumes I, II, and III* (Zeiner et. al 1988-1990), *The Jepson Manual: Vascular Plants of California, second edition* (Baldwin et al 2012), the *California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2021), *Calflora.org,* and *eBird.org*.

Special status species occurrences within 3.1 miles of the project site are depicted in Figure 4.



Special-status Species Observations
(Polygon extents can reflect location uncertainty)

- 🟩 Fresno kangaroo rat
- 🟥 Western mastiff bat
- **Multiple overlapping sightings of:**
  - California glossy snake
  - California jewelflower
  - California satintail
  - California tiger salamander
  - Crotch bumble bee
  - Madera leptosiphon
  - Northern California legless lizard
  - Swainson's hawk
  - Coast horned lizard

Sources:
California Dep. of Fish & Wildlife Natural Diversity Database
U.S. Fish & Wildlife Service

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Special-status Species

Date	Project #	Figure #
4/06/2021	2557-01	4

TABLE 1. LIST OF SPECIAL STATUS SPECIES POTENTIALLY OCCURRING WITHIN HABITATS OF THE PROJECT SITE

PLANTS: Adapted from the California Natural Diversity Base (CDFW 2021) and the Inventory of Rare and Endangered Vascular Plant Species of California (CNPS 2021)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat/Range	*Occurrence within the Project Site
Succulent Owl's Clover (*Castilleja campestris* ssp. *succulenta*)	FT, CE CRPR 1B	Occurs in vernal pools and swales in valley foothills and grasslands of the San Joaquin and Sacramento Valleys from Fresno Co. on the south to Solano County on the north; blooms April to May.	**Absent**. Vernal pool habitat required by this species is absent from the project site.
California Jewel-flower (*Caulanthus californicus)*	FT, CT, CRPR 1B	Chenopod scrub, pinyon juniper woodland, valley and foothill scrub. Blooms February-May.	**Absent.** Suitable habitat for this species is absent from the project site.
San Joaquin Valley Orcutt Grass (*Orcuttia ineaqualis*)	FT, CE CRPR 1B	Occurs in deep vernal pools of California's San Joaquin Valley; blooms April to September.	**Absent**. Vernal pool habitat required by this species is absent from the project site.
Hairy Orcutt Grass (*Orcuttia pilosa*)	FE, CE CRPR 1B	Occurs in vernal pools of California's Central Valley. Requires deep pools with prolonged periods of inundation; blooms May to September.	**Absent**. Vernal pool habitat required by this species is absent from the project site.
Greene's Tuctoria (*Tuctoria greenei*)	FE CRPR 1B	Occurs in vernal pools of California's Central Valley from Shasta Co. on the north to Tulare Co. on the south; blooms May to September.	**Absent**. Vernal pool habitat required by this species is absent from the project site.

CNPS-listed Species

Lesser Saltscale (*Atriplex minuscula*)	CRPR 1B	Occurs in sandy, alkaline soils of alkali sinks and grasslands. Blooms May to October.	**Absent.** Habitat and soils required by this species are absent from the project site. No Atriplex species were observed during the field survey.
California Satintail (*Imperata brevifolia*)	CRPR 2B	This perennial grass is found in scrubland and chaparral habitats where water is available. Blooms September-May.	**Absent.** Suitable habitat for this species is absent from the project site.
Alkali-Sink Goldfields (*Lasthenia chrysantha*)	CRPR 1B	Occurs in alkaline vernal pools. Blooms February to June.	**Absent**. Suitable habitat in the form of vernal pools is absent from the project site.
Madera Leptosiphon (*Leptosiphon serrulatus*)	CRPR 1B	Occurs in cismontane woodland, lower montane coniferous forests, and annual grasslands of the Sierra foothills from Madera Co. on the north to Kern Co. on the south. This species prefers dry slopes, often on decomposed granite in woodland. Blooms April to May.	**Absent.** Suitable habitat for this species is absent from the project site.
Sanford's Arrowhead (*Sagittaria sanfordii*)	CRPR 1B	Occurs in freshwater marshes, pond margins, sloughs, canals of California's Central Valley and low Sierra Foothills. Blooms May to October.	**Absent.** Suitable habitat for this species is absent from the project site.

TABLE 1. LIST OF SPECIAL STATUS SPECIES POTENTIALLY OCCURRING WITHIN HABITATS OF THE PROJECT SITE

ANIMALS (adapted from CDFW 2021)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act

Species	Status	Habitat	*Occurrence within the Project Site
Vernal Pool Fairy Shrimp (*Branchinecta lynchi*)	FT	Primarily found in vernal pools of California's Central Valley.	**Absent**. Vernal pool habitat required by this species is absent from the project site.
Crotch Bumble Bee (*Bombus crotchii*)	CCE	Inhabits open grassland and scrub habitats of the southern 2/3 of California. Historically in, but largely extirpated from the Central Valley. Flight period for queens is late February to late October peaking in April and July; flight period for males and workers is March through September peaking in early July. Constructs nests underground in animal burrows. Overwintering sites are likely in soft soils or in debris or leaf litter. Food plant genera include *Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.*	**Absent.** Suitable habitat for this species is absent from the project site.
Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*)	FT	Lives in mature elderberry shrubs of California's Central Valley and Sierra foothills.	**Absent.** Blue elderberry shrubs required by this species are absent from the project site. Furthermore, the current opinion of the USFWS is that Fresno County is outside the range of this subspecies.
California Tiger Salamander (*Ambystoma californiense*)	FT, CT	Found primarily in annual grasslands; requires vernal pools for breeding and rodent burrows for refuge.	**Absent.** Suitable breeding habitat in the form of large vernal pools within grassland habitat is absent from the project site and surrounding lands.
Giant Garter Snake (*Thamnophis gigas)*	FT, CT	Requires permanent or summer water with vegetative cover and a dense prey population at higher elevation uplands not prone to flooding.	**Absent.** Suitable habitat for this species is absent from the project site and surrounding lands.
Least Bell's Vireo (*Vireo bellii pusillus*)	FE, CE	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms. Typically nests in willow, *Baccharis*, or mesquite shrubs.	**Absent.** The project site provides no breeding or foraging habitat for this species. Moreover, this species has been extirpated from the project vicinity.
Swainson's Hawk *(Buteo swainsoni*)	CT	Summer migrant in the Central Valley. Forages in grasslands and fields close to riparian areas.	**Unlikely.** Suitable nesting habitat is absent from the project site. Foraging habitat is absent to extremely marginal on the site due to the predominance of paved surfaces on the site. At most, this species may occasionally pass over the site during migration.
Tricolored Blackbird (*Agelaius tricolor*)	CT	Breeds colonially near fresh water in dense bulrush, cattails, or thickets of willows or shrubs. Occasionally nests in wheat fields. Forages in a wide variety of habitats.	**Unlikely.** This species is unlikely to occur in the urban environment in which the project is situated. Furthermore, suitable nesting habitat is absent from the project site and surrounding lands.
Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)	CE	Frequents valley foothill and desert riparian habitats in scattered locations in California	**Absent.** The project site provides no breeding or foraging habitat for this species. Furthermore, this species has been extirpated from the project vicinity.

TABLE 1. LIST OF SPECIAL STATUS SPECIES POTENTIALLY OCCURRING WITHIN HABITATS OF THE PROJECT SITE

ANIMALS (adapted from CDFW 2021)

Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Act (cont.)

Species	Status	Habitat	*Occurrence within the Project Site
Fresno Kangaroo Rat (*Dipodomys nitratoides exilis*)	FE, CE	Inhabits grassland on gentle slopes of generally less than 10°, with friable, sandy-loam soils.	**Absent.** Suitable habitat for this species is absent from the project site and surrounding lands. Furthermore, this species is currently only known to occur in Kings County (ESRP 2020).
San Joaquin Kit Fox (*Vulpes macrotis mutica*)	FE, CT	Occurs in desert alkali scrub and annual grasslands of California's San Joaquin Valley and Tulare Basin, extending west into San Luis Obispo County. This species may forage in adjacent agricultural habitats.	**Absent.** Suitable habitat for this species is absent to extremely marginal. While this species has adapted to urban environments in the Bakersfield area, no urban adapted populations of San Joaquin kit fox are known to occur in the Fresno metropolitan area.

State Species of Special Concern

Western Spadefoot (*Spea hammondii*)	CSC	Primarily occurs in grasslands, but also occurs in valley and foothill hardwood woodlands. Requires vernal pools or other temporary wetlands for breeding.	**Absent.** Suitable breeding habitat in the form of vernal pools is absent from the project site and surrounding lands.
Western Pond Turtle (*Emys marmorata*)	CSC	Occurs in ponds and slow-moving rivers and streams of the Sierra foothills and Central Valley.	**Absent.** Suitable aquatic habitat required by this species is absent from the project site and surrounding lands.
Coast Horned Lizard (*Phrynosoma blainvillii*)	CSC	Occurs in a wide variety of natural habitats. Most common in lowlands along sandy washes with scattered low bushes where there are open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	**Absent.** Suitable habitat for this species is absent from the project site and surrounding lands.
Northern California Legless Lizard (*Anniella pulchra*)	CSC	Moist sandy or loose loamy soils under sparse vegetation.	**Absent.** Suitably loose and moist soils are absent from the project site. Furthermore, the only documented occurrence in the region is an 1880s specimen collection.
California Glossy Snake (*Arizona elegans occidentalis*)	CSC	Occurs in arid scrub, rocky washes, grasslands, and chaparral from the eastern San Francisco Bay Area south to northwestern Baja, excluding coastal areas in Central California. Known from up to 7,200 ft. in elevation.	**Absent.** Ruderal habitat found on the project site provides unsuitable habitat for this species.
Burrowing Owl (*Athene cunicularia hypugaea*)	CSC	Found in open, dry grasslands, deserts, and ruderal areas; requires ground squirrel burrows for cover and nesting.	**Unlikely.** The site's urban setting and preponderance of paved surfaces are generally incompatible with burrowing owl ecology. No evidence of burrowing owl occupation such as cough pellets, whitewash, or feathers was observed during the field survey. The nearest documented occurrence is approx. 6.5 miles to the northeast at the Fresno International Airport (CDFW 2021).

TABLE 1. LIST OF SPECIAL STATUS SPECIES POTENTIALLY OCCURRING WITHIN HABITATS OF THE PROJECT SITE

ANIMALS (adapted from CDFW 2021)

State Species of Special Concern (cont.)

Species	Status	Habitat	*Occurrence within the Project Site
Western Mastiff Bat (*Eumops perotis* ssp. *californicus*)	CSC	Frequents open, semi-arid to arid habitats, including conifer, and deciduous woodlands, coastal scrub, grasslands, palm oasis, chaparral and urban. Roosts in cliff faces, high buildings, and tunnels.	**Possible.** The project site provides possible foraging habitat for this species. Roosting and breeding habitat is absent from the site.
Pallid Bat (*Antrozous pallidus*)	CSC	Grasslands, chaparral, woodlands, and forests of California; most common in dry rocky open areas providing roosting opportunities.	**Possible.** The site could be used for foraging; roosting and breeding habitat is absent.
American Badger (*Taxidea taxus*)	CSC	This species inhabits open and dry sections of grasslands, shrub, and forest habitats with friable soil.	**Absent.** The site provides unsuitable habitat conditions for this species based on its urban setting and predominance of paved surfaces.

* Explanation of Occurrence, Designations, and Status Codes

Present: Species observed on the Site at time of field surveys or during recent past.
Likely: Species not observed on the Site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the Site, but it could occur there from time to time.
Unlikely: Species not observed on the Site, and would not be expected to occur there except, perhaps, as a transient
Absent: Species not observed on the Site and precluded from occurring there because habitat requirements not met.

STATUS CODES

FE	Federally Endangered	CE	California Endangered
FT	Federally Threatened	CT	California Threatened
FPT	Federally Proposed Threatened	CSC	California Species of Special Concern
FC	Federal Candidate	CNPS	California Native Plant Society Listing
FPD	Federally (Proposed) Delisted	CFP	California Fully Protected
		CCE	California Candidate Endangered

2.3 JURISDICTIONAL WATERS

As will be discussed in greater detail in Section 3.1.8, the U.S. Army Corps of Engineers (USACE) has regulatory authority over certain rivers, creeks, lakes, ponds, reservoirs, wetlands, and in some cases irrigation canals (“waters of the U.S.”). The CDFW asserts jurisdiction over waters in California that have a defined bed and bank, including engineered channels that replace, and/or connect to, natural drainages. The State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCBs) assert jurisdiction over California’s oceans, lakes, and rivers, and some, but not all, of California’s wetland features.

Hydrologic features under the jurisdiction of the USCAE, CDFW, or RWQCB are absent from the site.

2.4 SENSITIVE NATURAL COMMUNITIES

Sensitive Natural Communities are those that are of limited distribution, distinguished by significant biological diversity, home to special status plant and animal species, of importance in maintaining water quality or sustaining flows, etc. Examples of sensitive natural communities include various types of wetlands, riparian habitat, and valley scrub habitats. CDFW has assigned State Ranks to California’s natural communities that reflect the condition and imperilment of that community throughout its range within the state. State Ranks are represented with a letter and number score. Older ranks, which need to be updated in the CNDDB, may still contain a decimal "threat" rank of .1, .2, or .3, where .1 indicates very threatened status, .2 indicates moderate threat, and .3 indicates few or no current known threats.

The project site supports no sensitive natural communities.

2.5 WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are routes that animals regularly and predictably follow during seasonal migration, dispersal from native ranges, daily travel within home ranges, and inter-population movements. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines.

The project site does not contain features that would function as a wildlife movement corridor and the perimeter fencing would greatly inhibit wildlife movement on or off the site.

2.6 DESIGNATED CRITICAL HABITAT

The USFWS often designates areas of “critical habitat” when it lists species as threatened or endangered. Critical habitat is a specific geographic area(s) that contains features essential for the conservation of a threatened or endangered species and that may require special management and protection. Designated critical habitat is absent from the project site and immediately surrounding lands.

3.0 IMPACTS AND MITIGATIONS

In California, any project carried out or approved by a public agency that will result in a direct or reasonably foreseeable indirect physical change in the environment must comply with CEQA. The purpose of CEQA is to ensure that a project's potential impacts on the environment are evaluated, and methods for avoiding or reducing these impacts are considered, before the project is allowed to move forward. A secondary aim of CEQA is to provide justification to the public for the approval of any projects involving significant impacts on the environment.

According to Section 15382 of the CEQA Guidelines, a significant effect on the environment means a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest." Although the lead agency may set its own CEQA significance thresholds, project impacts to biological resources are generally considered to be significant if they would meet any of the following criteria established in Appendix G of the CEQA Guidelines:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.

- Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065(a) requires the lead agency to make "mandatory findings of significance" if there is substantial evidence that a project may:

- Substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of an endangered, rare or threatened species.

- Achieve short-term environmental goals to the detriment of long-term environmental goals.

- Produce environmental effects that are individually limited but cumulatively considerable, meaning that the incremental effects of the project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects.

3.1 RELEVANT GOALS, POLICIES, AND LAWS

3.1.1 City of Fresno General Plan Policies

In compliance with CEQA, the lead agency must consider project conformance with applicable goals and policies of the relevant general plan policies. The City of Fresno General Plan includes goals and policies designed to protect significant biotic resources of the Planning Area. Resource elements addressed by this plan include a number of policy goals pertaining to the preservation and enhancement of natural resources such as wetland and riparian areas, fish and wildlife habitat, vegetation, and open space. Public and private development projects within the city must be consistent with these general plan policies.

3.1.2 Habitat Conservation Plans and Natural Community Conservation Plans

Section 10 of the federal Endangered Species Act establishes a process by which non-federal projects can obtain authorization to incidentally take listed species, provided take is minimized and thoroughly mitigated. A Habitat Conservation Plan (HCP) developed by the project applicant in collaboration with the USFWS and/or NMFS, ensures that such minimization and mitigation will occur, and is a prerequisite to the issuance of a federal incidental take permit. Similarly, a Natural Community Conservation Plan (NCCP) developed by the project applicant in collaboration with CDFW, provides for the conservation of biodiversity within a project area, and permits limited incidental take of state-listed species.

3.1.3 Threatened and Endangered Species

In California, imperiled plants and animals may be afforded special legal protections under the California Endangered Species Act (CESA) and/or Federal Endangered Species Act (FESA). Species may be listed as "threatened" or "endangered" under one or both Acts, and/or as "rare" under CESA. Under both Acts, "endangered" means a species is in danger of extinction throughout all or a significant portion of its range, and "threatened" means a species is likely to become endangered within the foreseeable future. Under CESA, "rare" means a species may become endangered if their present environment worsens. Both Acts prohibit "take" of listed species, defined under CESA as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86), and more broadly defined under FESA to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3).

When state and federally listed species have the potential to be impacted by a project, the USFWS and CDFW must be included in the CEQA process. These agencies review the environmental document to determine the adequacy of its treatment of endangered species issues and to make project-specific recommendations for the protection of listed species. Projects that may result in the "take" of listed species must generally enter into consultation with the USFWS and/or CDFW pursuant to FESA and CESA, respectively. In some cases, incidental take authorization(s) from these agencies may be required before the project can be implemented.

3.1.4 California Fully Protected Species

The classification of certain animal species as “fully protected” was the State of California’s initial effort in the 1960s, prior to the passage of the California Endangered Species Act, to identify and provide additional protection to those species that were rare or faced possible extinction. Following CESA enactment in 1970, many fully protected species were also listed as California threatened or endangered. The list of fully protected species are identified, and their protections stipulated, in California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and fish (5515). Fully protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take, except in conjunction with necessary scientific research and protection of livestock.

3.1.5 Migratory Birds

The Federal Migratory Bird Treaty Act (FMBTA: 16 USC 703-712) prohibits killing, possessing, or trading in any bird species covered in one of four international conventions to which the United States is a party, except in accordance with regulations prescribed by the Secretary of the Interior. The name of the act is misleading, as it actually covers almost all birds native to the United States, even those that are non-migratory. The FMBTA encompasses whole birds, parts of birds, and bird nests and eggs.

Native birds are also protected under California state law. The California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the FMBTA (Section 3513), as well as any other native non-game bird (Section 3800), even if incidental to lawful activities. Moreover, the California Migratory Bird Protection Act, enacted in September 2019, clarifies native bird protection and increases protections where California law previously deferred to federal law.

3.1.6 Birds of Prey

Birds of prey are protected in California under provisions of the Fish and Game Code (Section 3503.5), which states that it is unlawful to take, possess, or destroy any birds in the order Falconiformes (hawks and eagles) or Strigiformes (owls), as well as their nests and eggs. The bald eagle and golden eagle are afforded additional protection under the federal Bald and Golden Eagle Protection Act (16 USC 668), which makes it unlawful to kill birds or their eggs.

3.1.7 Nesting Birds

In California, protection is afforded to the nests and eggs of all birds. California Fish and Game Code (Section 3503) states that it is “unlawful to take, possess, or needlessly destroy the nest or eggs of any bird except as otherwise provided by this code or any regulation adopted pursuant thereto.” Breeding-season disturbance that causes nest abandonment and/or loss of reproductive effort is considered a form of “take” by the CDFW.

3.1.8 Wetlands and Other Jurisdictional Waters

The USACE regulates the filling or grading of waters of the U.S. under the authority of Section 404 of the Clean Water Act (CWA). Drainage channels and adjacent wetlands may be considered “waters of the United States” or “jurisdictional waters” subject to the jurisdiction of the USACE.

Waters of the U.S. are defined by the Navigable Waters Protection Rule. The new rule was published in the Federal Register on April 21, 2020, and took effect on June 22, 2020.

The Navigable Waters Protection Rule (33 CFR Part 328) identifies four categories of Waters of the U.S.: (1) territorial seas and traditional navigable waters, (2) tributaries, (3) lakes, ponds, and impoundments of jurisdictional waters, and (4) adjacent wetlands. These categories are defined as follows:

Territorial Seas and Traditional Navigable Waters (TNWs)

- The territorial seas and traditional navigable waters include large rivers and lakes and tidally-influenced waterbodies used in interstate or foreign commerce.

Tributaries

- Tributaries include perennial and intermittent rivers and streams that contribute surface flow to traditional navigable waters in a typical year. These naturally occurring surface water channels must flow more often than just after a single precipitation event—that is, tributaries must be perennial or intermittent.

- Tributaries can connect to a traditional navigable water or territorial sea in a typical year either directly or through other “waters of the United States,” through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).

- Ditches are to be considered tributaries only where they satisfy the flow conditions of the perennial and intermittent tributary definition and either were constructed in or relocate a tributary or were constructed in an adjacent wetland and contribute perennial or intermittent flow to a traditional navigable water in a typical year.

Lakes, Ponds, and Impoundments of Jurisdictional Waters

- Lakes, ponds, and impoundments of jurisdictional waters are jurisdictional where they contribute surface water flow to a traditional navigable water or territorial sea in a typical year either directly or through other “waters of the United States,” through channelized non-jurisdictional surface waters, through artificial features (including culverts and spillways), or through natural features (including debris piles and boulder fields).
- Lakes, ponds, and impoundments of jurisdictional waters are also jurisdictional where they are flooded by a “water of the United States” in a typical year, such as certain oxbow lakes that lie along the Mississippi River.

Adjacent Wetlands

- Wetlands that physically touch other jurisdictional waters are “adjacent wetlands,”
- Wetlands separated from a “water of the United States” by only a natural berm, bank or dune are also “adjacent.”
- Wetlands inundated by flooding from a “water of the United States” in a typical year are “adjacent.”
- Wetlands that are physically separated from a jurisdictional water by an artificial dike, barrier, or similar artificial structure are “adjacent” so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature.

- An adjacent wetland is jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

The final rule also outlines what are not "waters of the United States." The following waters/features are not jurisdictional under the rule:

- Waterbodies that are not included in the four categories of "waters of the United States" listed above.

- Groundwater, including groundwater drained through subsurface drainage systems, such as drains in agricultural lands.

- Ephemeral features, including ephemeral streams, swales, gullies, rills, and pools.

- Diffuse stormwater run-off and directional sheet flow over upland.

- Many farm and roadside ditches.

- Prior converted cropland retains its longstanding exclusion, but is defined for the first time in the final rule. The agencies are clarifying that this exclusion will cease to apply when cropland is abandoned (i.e., not used for, or in support of, agricultural purposes in the immediately preceding five years) and has reverted to wetlands.

- Artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease.

- Artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters.

- Water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel.

- Stormwater control features excavated or constructed in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off.

- Groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention and infiltration basins and ponds, that are constructed in upland or in non-jurisdictional waters.

- Waste treatment systems have been excluded from the definition of "waters of the United States" since 1979 and will continue to be excluded under the final rule. Waste treatment systems include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater or stormwater prior to discharge (or eliminating any such discharge).

All activities that involve the discharge of dredge or fill material into waters of the U.S. are subject to the permit requirements of the USACE. Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the RWQCB issues a Section 401 Water Quality Certification (or waiver of such certification) verifying that the proposed activity will meet state water quality standards.

Under the Porter-Cologne Water Quality Control Act of 1969, the State Water Resources Control Board has regulatory authority to protect the water quality of all surface water and groundwater in the State of California ("Waters of the State"). Nine RWQCBs oversee water quality at the local and regional level. The RWQCB for a given region regulates discharges of fill or pollutants into waters of the State through the issuance of various permits and orders. Discharges into waters of the State that are also waters of the U.S. require a Section 401 Water Quality Certification from the RWQCB as a prerequisite to obtaining certain federal permits, such as a Section 404 Clean Water Act permit. Discharges into all Waters of the State, even those that are not also waters of the U.S., require Waste Discharge Requirements (WDRs), or waivers of WDRs, from the RWQCB. The RWQCB also administers the Construction Storm Water Program and the federal National Pollution Discharge Elimination System (NPDES) program. Projects that disturb one or more acres of soil must obtain a Construction General

Permit under the Construction Storm Water Program. A prerequisite for this permit is the development of a Storm Water Pollution Prevention Plan (SWPPP) by a certified Qualified SWPPP Developer. Projects that discharge wastewater, storm water, or other pollutants into a water of the U.S. may require a NPDES permit.

CDFW has jurisdiction over the bed and bank of natural drainages and lakes according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that may substantially modify such waters through the diversion or obstruction of their natural flow, change or use of any material from their bed or bank, or the deposition of debris require a Notification of Lake or Streambed Alteration. If CDFW determines that the activity may adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared. Such an agreement typically stipulates that certain measures will be implemented to protect the habitat values of the lake or drainage in question.

4.0 IMPACT ANALYSIS

The following analysis is based upon project elements described in Section 1.1. It is assumed that ground disturbance will occur across the entire site.

4.1 POTENTIALLY SIGNIFICANT PROJECT IMPACTS/MITIGATION

4.1.1 Project-Related Mortality/Disturbance of Other Nesting Birds

Potential Impacts. The project site has the potential to be used for nesting by a few urban adapted native avian species. Onsite trees and shrubs have the potential to support nesting birds such as the northern mockingbird and mourning dove. The site also has the potential to support the disturbance-tolerant, ground-nesting killdeer. Nearly all native birds are protected by the Federal Migratory Bird Treaty Act, California Migratory Bird Protection Act, and California Fish and Game Code. If construction occurs during the nesting season, birds nesting on the site could be injured or killed by construction activities. Project activities that adversely affect the nesting success or result in mortality of nesting birds would violate federal and state laws (see Sections 3.1.5, 3.1.6, and 3.1.7) and would be considered a significant impact under CEQA.

Mitigation. The applicant will implement the following measures to avoid and minimize the potential for project-related mortality/disturbance of nesting birds, as necessary.

> ***Mitigation 4.1.1a* (*Avoidance*).** If feasible, the project will be constructed outside the avian nesting season, typically defined as February 1-August 31.
>
> ***Mitigation 4.1.1b* (*Pre-construction Surveys*).** If the project must be constructed between February 1 and August 31, a qualified biologist will conduct pre-construction surveys for active migratory bird nests at the project site within 14 days of the onset of these activities.
>
> ***Mitigation 4.1.1c* (*Establish Buffers*).** Should any active nests be discovered in or near proposed construction zones, the biologist will identify a suitable construction-free buffer around the nest. This buffer will be identified on the ground with flagging or fencing, and will be maintained until the biologist has determined that the young have fledged.

Compliance with the above mitigation measures would reduce impacts to nesting birds to a less than significant level under CEQA and ensure compliance with state and federal laws protecting these species.

4.2 LESS THAN SIGNIFICANT PROJECT IMPACTS

4.2.1 Special Status Plants

Potential Impacts. Ten special status vascular plant species are known to occur in the region (see Table 1). Due to the absence of suitable habitat and/or the site being situated outside of the species' known distribution, none of these species are expected to occur on site. Therefore, the project would not adversely affect any of these 10 plant species and impacts would be less than significant as defined by CEQA.

Mitigation. Mitigation is not warranted.

4.2.2 Special Status Animal Species Absent from or Unlikely to Occur on the Project Site

Potential Impacts. Of the 20 special status animal species that potentially occur in the project vicinity, 18 are considered absent or unlikely to occur on site due to past and ongoing disturbance of the site and surrounding lands, the absence of suitable habitat, and/or the sitebeing situated outside of the species' known distribution. These comprise the vernal pool fairy shrimp, Crotch bumble bee, valley elderberry longhorn beetle, California tiger salamander, giant garter snake, least Bell's vireo, Swainson's hawk, tricolored blackbird, western yellow-billed cuckoo, Fresno kangaroo rat, San Joaquin kit fox, western spadefoot, western pond turtle, coast horned lizard, northern California legless lizard, California glossy snake, burrowing owl, and American badger.

The project does not have the potential to impact these species through project-related mortality or loss of habitat because there is little or no likelihood that they are present or would be present during construction activity.

Mitigation. Mitigation is not warranted.

4.2.3 Special Status Animal Species that May Occur within the Project Site as Occasional or Regular Foragers but Breed or Roost Elsewhere

Potential Impacts. Two special status animals, the western mastiff bat and pallid bat, have the potential to forage over the project site from time to time but would not roost on the site (see Table 1). These species would not be vulnerable to construction-related injury or mortality while foraging because they are highly mobile during foraging and would be expected to simply avoid active construction zones.

These species also would not be adversely affected from project-related loss of habitat. Potential foraging habitat on the project site is not uniquely important for these species and similar or higher quality foraging habitat is abundant in the region.

Mitigation. Mitigation is not warranted.

4.2.4 Wildlife Movement Corridors

Potential Impacts. The project site does not contain features that would function as a wildlife movement corridor. Furthermore, the perimeter fence would inhibit the movements of native wildlife land movements. As a result, project impacts to wildlife movement and wildlife movement corridors are considered less than significant under CEQA.

Mitigation. No mitigation is warranted.

4.2.5 Waters of the United States and California.

Potential Impacts. Waters of the U.S. and California are absent from the project site. As a result, the project will have no effect on such waters.

Mitigation. Mitigations are not warranted.

4.2.6 Designated Critical Habitat and Sensitive Natural Communities

Potential Impacts. Designated critical habitat, sensitive natural communities, and other sensitive habitats are absent from the project site and adjacent lands. The project will have no impact on such habitats.

Mitigation. No mitigation is warranted.

4.2.7 Local Policies or Habitat Conservation Plans

Potential Impacts. The project appears to be consistent with the goals and policies of the City of Fresno General Plan pertaining to biological resources and would not conflict with any other local policies or ordinances protecting biological resources. The project is not subject to any Habitat Conservation Plans or Natural Community Conservation Plans.

Mitigation. No mitigation is warranted.

5.0 LITERATURE REFERENCED

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APPENDIX A: VASCULAR PLANT LIST

APPENDIX A
VASCULAR PLANTS OF THE SITE

The plants species listed below were observed on the Nielsen Avenue Office/Warehouse Project site during a field survey conducted by Live Oak Associates, Inc. on March 18, 2021. The U.S. Fish and Wildlife Service wetland indicator status of each plant has been shown following its common name.

OBL - Obligate
FACW - Facultative Wetland
FAC - Facultative
FACU - Facultative Upland
UPL - Upland

APOCYNACEAE – Dogbane Family		
Nerium oleander	Oleander	UPL
ARECACEAE—Palm Family		
Washingtonia robusta	Mexican Fan Palm	FACW
ASTERACEAE – Sunflower Family		
Ambrosia acanthicarpa	Annual Bursage	UPL
Heterotheca grandiflora	Telegraphweed	UPL
Erigeron canadensis	Canada Horseweed	FACU
Lactuca serriola	Prickly Lettuce	FACU
BORAGINACEAE – Borage Family		
Amsinckia intermedia	Common Fiddleneck	UPL
Amsinckia menziesii	Small Flowered Fiddleneck	UPL
BRASSICACEAE – Mustard Family		
Hirschfeldia incana	Mustard	UPL
Sisymbrium orientale	Indian Hedge Mustard	UPL
CHENOPODIACEAE – Goosefoot Family		
Salsola tragus	Russian Thistle	FACU
FABACEAE - Legume Family		
Medicago lupulina	Black Medic	FAC
Medicago polymorpha	Burclover	FACU
GERANIACEAE - Geranium Family		
Erodium cicutarium	Red-stem Filaree	UPL
MYRTACEAE – Bottlebrush Family		
Eucalyptus camaldulensis	Red Gum	FAC
POACEAE - Grass Family		
Avena sp.	Wild Oats	UPL
Bromus madritensis ssp. *rubens*	Red Brome	FACU
Festuca myuros	Rattail Fescue	FACU

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR WITHIN THE PROJECT SITE

APPENDIX B: TERRESTRIAL VERTEBRATE SPECIES THAT POTENTIALLY OCCUR WITHIN THE PROJECT SITE

The species listed below are those that may reasonably be expected to use the project site routinely or from time to time. The list was not intended to include birds that are vagrants or occasional transients. Terrestrial vertebrate species observed on the project site during a survey conducted by Live Oak Associates, Inc. on March 18, 2021 have been noted with an asterisk.

CLASS: REPTILIA
ORDER: SQUAMATA (Lizards and Snakes)
SUBORDER: SAURIA (Lizards)
FAMILY: PHRYNOSOMATIDAE
*Western Fence Lizard (*Sceloporus occidentalis*)
*Side Blotched Lizard (*Uta stansburiana*)
SUBORDER: SERPENTES (Snakes)
FAMILY: COLUBRIDAE (Colubrids)
Gopher Snake *(Pituophis melanoleucus)*

CLASS: AVES
ORDER: FALCONIFORMES (Vultures, Hawks, and Falcons)
FAMILY: ACCIPITRIDAE (Hawks, Old World Vultures, and Harriers)
Red-tailed Hawk *(Buteo jamaicensis)*
FAMILY: FALCONIDAE (Caracaras and Falcons)
American Kestrel (*Falco sparverius*)
ORDER: CHARADRIIFORMES (Shorebirds, Gulls, and relatives)
FAMILY: CHARADRIIDAE (Plovers and relatives)
*Killdeer (*Charadrius vociferus*)
ORDER: COLUMBIFORMES (Pigeons and Doves)
FAMILY: COLUMBIDAE (Pigeons and Doves)
Rock Pigeon (*Columba livia*)
Mourning Dove (*Zenaida macroura*)
Eurasian Collared-dove (*Streptopelia decaocto*)
ORDER: APODIFORMES (Swifts and Hummingbirds)
FAMILY: TROCHILIDAE (Hummingbirds)
Anna's Hummingbird (*Calypte anna*)
ORDER: PASSERIFORMES (Perching Birds)
FAMILY: TYRANNIDAE (Tyrant Flycatchers)
Black Phoebe (*Sayornis nigricans*)
Western Kingbird (*Tyrannus verticalis*)
FAMILY: CORVIDAE (Jays, Magpies, and Crows)
American Crow (*Corvus brachyrhynchos*)
Common Raven (*Corvus corax*)
FAMILY: ALAUDIDAE (Larks)
Horned Lark (*Eremophila alpestris*)
FAMILY: HIRUNDINIDAE (Swallows)
Cliff Swallow (*Petrochelidon pyrrhonota*)
Barn Swallow (*Hirundo rustica*)

- **FAMILY: TURDIDAE (Thrushes)**
  - American Robin (*Turdus migratorius*)
- **FAMILY: MIMIDAE (Mockingbirds and Thrashers)**
  - *Northern Mockingbird (*Mimus polyglottos*)
- **FAMILY: STURNIDAE (Starlings and Allies)**
  - *European Starling (*Sturnus vulgaris*)
- **FAMILY: PARULIDAE (Wood Warblers and Relatives)**
  - Yellow-rumped Warbler (*Dendroica coronata*)
- **FAMILY: EMBERIZIDAE (Emberizines)**
  - Savannah Sparrow (*Passerculus sandwichensis*)
  - *White-crowned Sparrow (*Zonotrichia leucophrys*)
- **FAMILY: ICTERIDAE (Blackbirds, Orioles and Allies)**
  - Brewer's Blackbird (*Euphagus cyanocephalus*)
- **FAMILY: FRINGILLIDAE (Finches)**
  - *House Finch (*Carpodacus mexicanus*)
  - Lesser Goldfinch (*Carduelis psaltria*)
- **FAMILY: PASSERIDAE (Old World Sparrows)**
  - House Sparrow (*Passer domesticus*)

CLASS: MAMMALIA

- **ORDER: CHIROPTERA (Bats)**
  - **FAMILY: VESPERTILIONIDAE (Vespertilionid Bats)**
    - Little Brown Myotis *(Myotis lucifugus)*
    - Yuma Myotis *(Myotis yumanensis)*
    - California Myotis *(Myotis californicus)*
    - Small-footed Myotis *(Myolis leibii)*
    - Western Pipistrelle *(Pipislrellus ffesperus)*
    - Big Brown Bat *(Eptesicus fuscus)*
    - Pallid Bat (*Antrozous pallidus*)
  - **FAMILY: MOLOSSIDAE (Free-tailed Bat)**
    - Brazilian Free-tailed Bat *(Tadarida brasiliensis)*
    - Western Mastiff Bat *(Eumops perolis)*
- **ORDER: RODENTIA (Rodents)**
  - **FAMILY: GEOMYIDAE (Pocket Gophers)**
    - Botta’s Pocket Gopher (*Thomomys bottae*)
  - **FAMILY: MURIDAE (Mice, Rats and Voles)**
    - Western Harvest Mouse (*Reithrodontomys megalotis*)
    - Norway Rat (*Rattus norvegicus*)
    - Deer Mouse (*Peromyscus maniculatus*)
    - House Mouse (*Mus musculus*)
- **ORDER: CARNIVORA (Carnivores)**
  - **FAMILY: PROCYONIDAE (Raccoons and Relatives)**
    - Raccoon (*Procyon lotor*)
  - **FAMILY: FELIDAE (Cats)**
    - Feral Cat (*Felis cattus*)

APPENDIX C: PHOTOS

Photo 1: Overview of southwest end of project site.

Photo 2: Northeast end of project site. Adjacent industrial site in upper left.

Photo 3: Onsite oleander shrubs at east end of site.

Photo 4: Open ground on site in foreground; onsite eucalyptus trees in background.

Photo 5: Open ground on site in foreground; onsite palm trees in background.

Photo 6: Example of the few California ground squirrel burrows (in lower right) that were found in areas of open ground on the site.

Photo 7: Onsite drainage ditch along southern side of site leading to drain inlet in foreground.

APPENDIX D

PHASE I CULTURAL RESOURCES SURVEY

APPENDIX D

PHASE I CULTURAL RESOURCES SURVEY

LSA

CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

August 3, 2021

Jake Kurth
Scannell Properties
8801 River Crossing Boulevard, Suite 300
Indianapolis, IN 46420

Subject: Phase I Cultural Resources Survey for the 2740 West Nielsen Avenue Office/Warehouse Project in Fresno, Fresno County, California (LSA Project No. SNN2102)

Dear Mr. Kurth:

LSA conducted a Phase I Cultural Resources Survey (study) for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project) in Fresno, Fresno County, California. The proposed project includes the development of four office/warehouse buildings on a currently vacant parcel. All cultural resources study work was completed per the requirements of the California Environmental Quality Act of 1970 (CEQA).

This study has the following purposes: (1) identify archaeological deposits that may meet the CEQA definition of a historical resource (California Public Resources Code [PRC] §21084.1) or a unique archaeological resource (PRC §21083.2) and that may be impacted by the proposed project; (2) assess the potential for human remains; and (3) recommend procedures for avoiding or mitigating impacts to such deposits, if warranted. The study consisted of background research and a field survey and was conducted by LSA Associate/Senior Archaeologist Kerrie Collison, M.A., Registered Professional Archaeologist (RPA) No. 28731436.

PROJECT LOCATION AND CHARACTERISTICS

The project site, which is also the Phase I study site, is depicted on the United States Geological Survey (USGS) *Fresno South, California* 7.5-minute topographic quadrangle map in Section 06 of Township 14 South, Range 20 East, Mount Diablo Baseline and Meridian (USGS 1981; Figure 1; all references are in Attachment A, and all figures are in Attachment B). The project site is located on the north side of West Nielsen Avenue between North Marks Avenue and North Hughes Avenue (Figure 2).

The project site is relatively flat and is at an elevation of 290 feet (ft). The nearest current water source is a man-made ditch, and the nearest natural freshwater source (the San Joaquin River) is 7.5 miles (mi) north of the project site. Subsurface sediments of the project site consist of Quaternary marine and nonmarine alluvium, lake, playa, and terrace deposits that date to the Pleistocene and Holocene (ranging from 2.58 million years ago to the present).[1]

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[1] California Geological Survey. 2015. Geologic Map of California. Website: https://maps.conservation.ca.gov/cgs/gmc/ (accessed July 30, 2021).

BACKGROUND RESEARCH

Southern San Joaquin Valley Information Center

A record search of the project site and a 0.5 mi search radius was conducted on May 10, 2021, by staff members at the Southern San Joaquin Valley Information Center (SSJVIC) of the California Historical Resources Information System (CHRIS) at California State University, Bakersfield (SSJVIC Records Search File No. 21-161). The SSJVIC, an affiliate of the California Office of Historic Preservation (OHP), is the official repository of cultural resources records and reports for Fresno County. Background research also included a review of the following State and federal inventories:

- Built Environment Resources Directory (BERD)[1]
- California Historical Landmarks (OHP 1996)
- California Points of Historical Interest (OHP 1992)
- *Five Views: An Ethnic Historic Site Survey for California* (OHP 1988)
- California Inventory of Historic Resources (OHP 1976)

The record search results (Attachment C) indicate that no previous cultural resources studies have included the project site and that four previous studies have included a portion of the area within a 0.5 mi radius of the project site. All four previous studies were field surveys. No cultural resources have been previously recorded in the project site, and one cultural resource (P-10-003930, the historic-period Southern Pacific Railroad) has been recorded within 0.5 mi of the project site. No resources listed in the BERD are within the project site.

Native American Heritage Commission

LSA submitted a request to the Native American Heritage Commission (NAHC) to request a review of the Sacred Lands File (SLF) for the presence of Native American cultural resources that might be impacted by the proposed project. The NAHC maintains the SLF database and is the official State repository of Native American sacred-site location records in California.

Nancy Gonzalez-Lopez, NAHC Cultural Resources Analyst, responded to the SLF search request on May 18, 2021, stating that the results were negative and that no Native American cultural resources were known in the area (Attachment D). The NAHC also provided a suggested list of Native American individuals to contact for information regarding the project site.

Aerial Photographs and Historic Maps

Additional background research included a review of aerial photographs and historic-period maps that include the project site.[2] The purpose of this review was to assess the potential for historic-period archaeological deposits in the project site. The oldest available aerial photograph that

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[1] California Office of Historic Preservation. Built Environment Resources Directory (BERD). n.d. Website: https://ohp.parks.ca.gov/?page_id=30338 (accessed July 31, 2021).

[2] National Environmental Title Research. n.d. Historic Aerials. Website: http://www.historicaerials.com (accessed July 31, 2021).

includes the project site dates to 1962, at which time the project site was already disturbed with buildings on the western portion and cleared land on the eastern portion. By 1972, the square buildings on the eastern portion of the project site were constructed. The rectangular buildings on the eastern portion of the project site were constructed by 1998. All buildings were demolished by 2014.

The earliest available topographic quadrangle reviewed by LSA dates to 1923 and depicts the roads along the borders of the project site but depicts no buildings on the project site itself. Buildings in the southwestern corner of the project site are depicted on a 1947 map, and the remainder of the buildings on the western portion of the project site are depicted on a 1964 map along with two reservoirs just west of the center of the southern edge of the project site. The map dating to 1974 depicts the square buildings on the eastern portion of the project site (which were visible on the 1972 aerial photograph).

FIELD SURVEY

On June 11, 2021, LSA Archaeologist Kerrie Collison, RPA, conducted a pedestrian survey of the project site by spot-checking areas of exposed sediment (Attachment E). Areas not surveyed were covered with concrete or asphalt. In surveyed areas, Ms. Collison walked transects spaced less than 5 meters (16.4 ft) apart. A trowel was used to periodically expose native soil to obtain a better view of the ground surface. Rodent burrowing holes and backdirt piles were examined for indications of archaeological deposits and/or human remains.

Field Survey Results

The field survey did not identify any cultural resources in the project site. Observed sediments consisted of a light-brown loam and were recently disturbed by mechanical equipment. Much of the project site was covered by concrete (building foundations) or asphalt (driving areas).

SUMMARY AND RECOMMENDATIONS

This study, consisting of background research and a field survey, did not identify surficial archaeological deposits or human remains in the project site. The remaining building foundations within the project site are not 50 years old and as such do not meet the age threshold for evaluation per CEQA. Based on the examined aerial photographs and maps, the buildings that previously stood within the project site served a business purpose and were not occupied for residential purposes. While subsurface sediments of the project site date to a time period that includes human occupation of the region, the project site is 7.5 mi south of what would have been a reliable freshwater source during precontact occupation of the area.

For the above reasons, it is unlikely that ground-disturbing work associated with project implementation will impact subsurface cultural resources, and no additional cultural resources studies are recommended for this proposed project. However, there is always the potential that construction activities could uncover unanticipated subsurface cultural resources. A qualified professional archaeologist should be contacted in the event that construction personnel encounter any archaeological deposits and/or human remains during construction activities. If any such resources are discovered, contractors should stop work in the immediate area of the find and contact the archaeologist to assess the nature of the find. Upon completion of any monitoring activities, the archaeologist should prepare a report to document the methods and results of monitoring activities. This report should be submitted to the SSJVIC.

If human remains are encountered during project work, the regulatory process outlined in Health and Safety Code Section 7050.5 must be followed, which involves coordination with the NAHC and a Native American Most Likely Descendant.

Please contact me at kerrie.collison@lsa.net if you have any questions regarding this study. Thank you for using the services of LSA.

Sincerely,

LSA Associates, Inc.

Kerrie N Collison

Kerrie Collison, RPA
Associate/Senior Archaeologist

Attachments: A—References
B—Figures 1 and 2
C—Record Search Results
D—Sacred Lands File Search Results
E—Survey Photographs

ATTACHMENT A

REFERENCES

PUBLISHED RESOURCES

California Office of Historic Preservation (OHP)

1976 California Inventory of Historic Resources. California Department of Parks and Recreation, Sacramento.

1988 *Five Views: An Ethnic Historic Site Survey for California.* California Department of Parks and Recreation, Sacramento.

1992 California Points of Historical Interest. California Department of Parks and Recreation, Sacramento.

1996 California Historical Landmarks. California Department of Parks and Recreation, Sacramento.

United States Geological Survey (USGS)

1981 *Fresno South, California* 7.5-minute topographic quadrangle. Published 1963, photorevised 1981. USGS, Denver, Colorado.

ONLINE RESOURCES

California Geological Survey

2015 Geologic Map of California. Website: https://maps.conservation.ca.gov/cgs/gmc/ (accessed July 30, 2021).

California Office of Historic Preservation

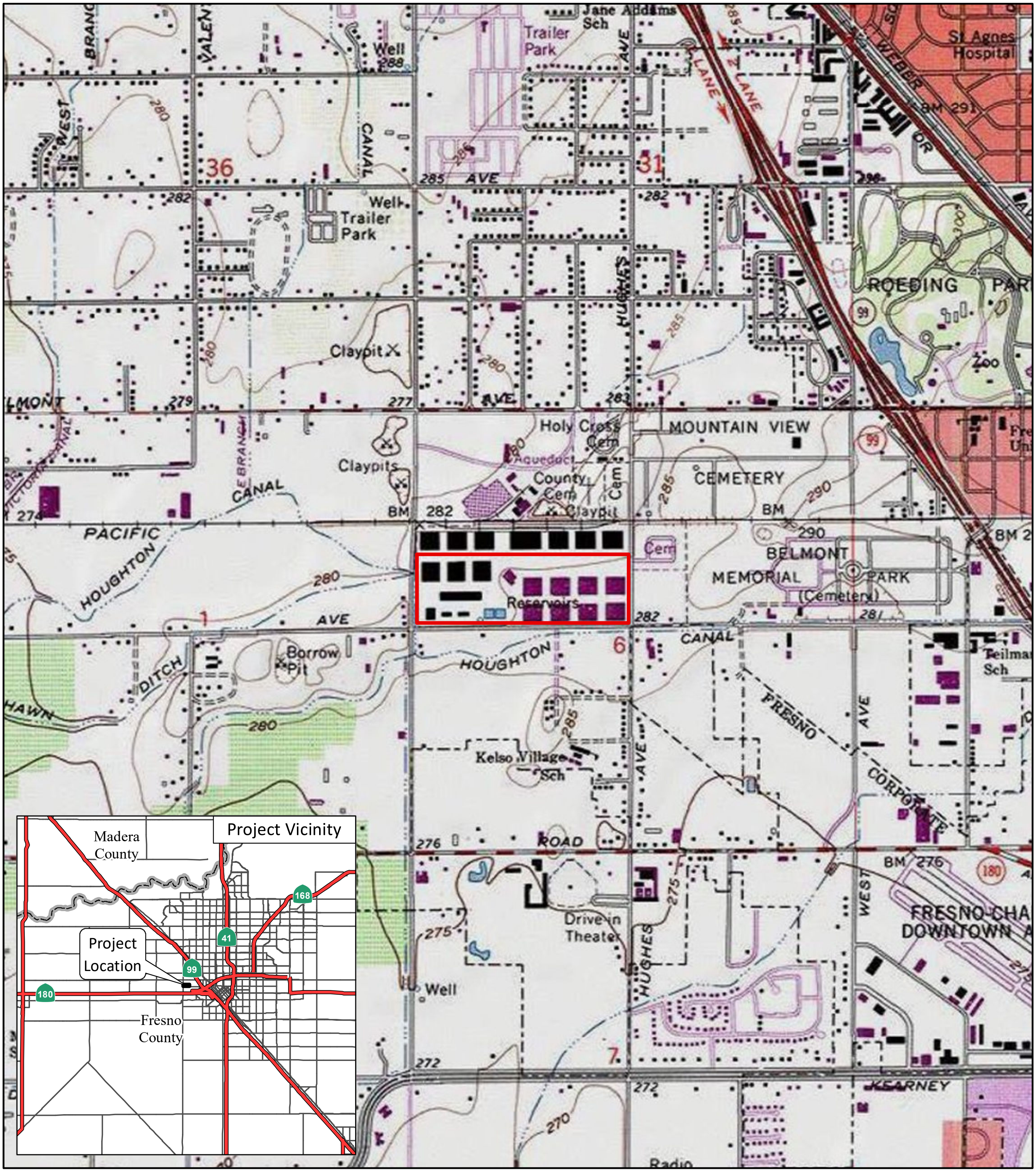
n.d. Built Environment Resources Directory (BERD). Website: https://ohp.parks.ca.gov/?page_id=30338 (accessed July 31, 2021).

National Environmental Title Research (NETR)

n.d. Historic Aerials. Website: http://www.historicaerials.com (accessed July 31, 2021).

ATTACHMENT B

FIGURES 1 AND 2



LSA

FIGURE 1

LEGEND

🟥 Project Site

N

0 1000 2000

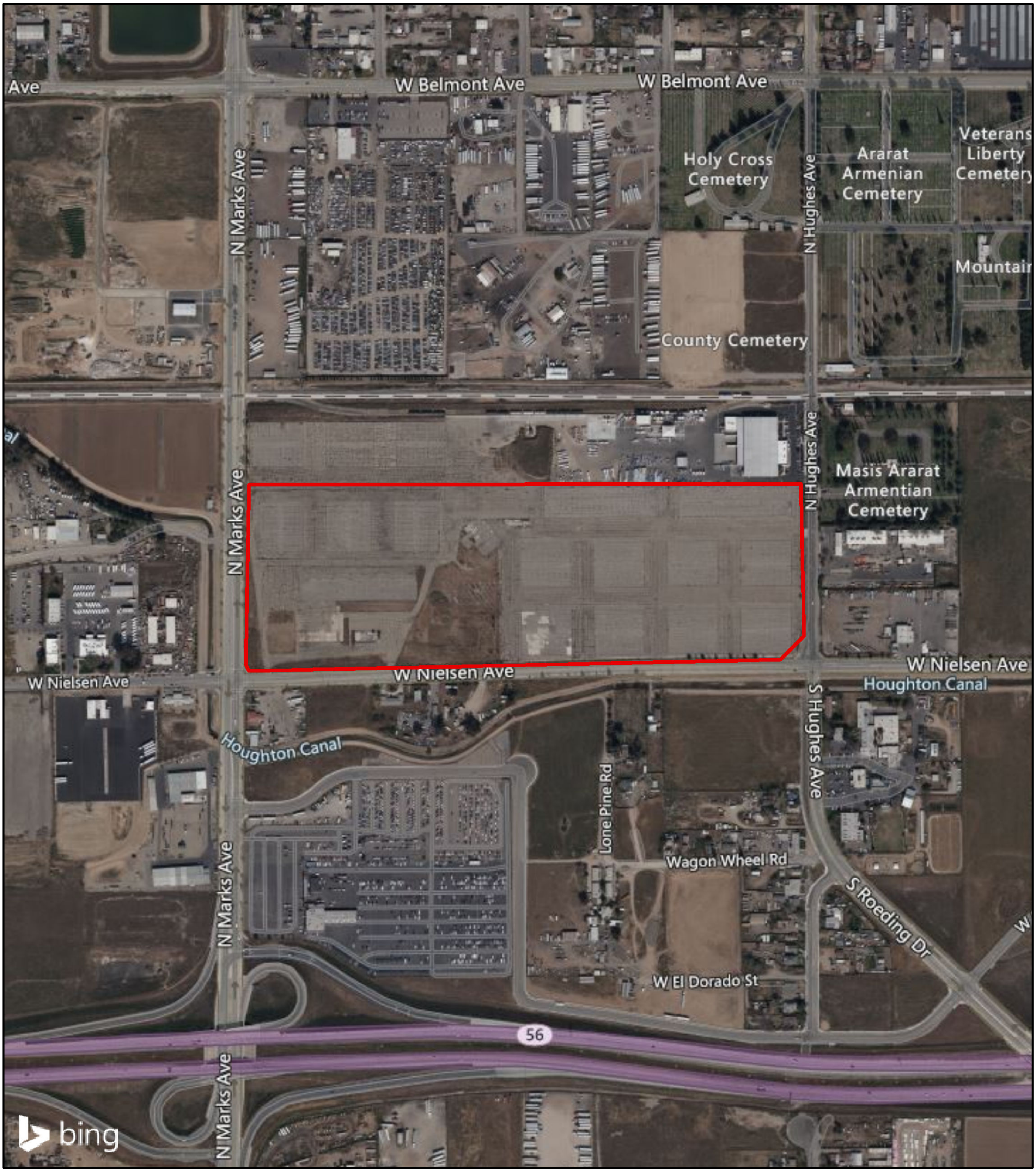
FEET

SOURCE: USGS 7.5' Quad.- *Fresno South, CA* (1981)

2740 West Nielsen Avenue Office/Warehouse Project

Project Location and Vicinity

I:\SNN2102\GIS\MXD\Figure 1_ProjectVicnity.mxd (4/22/2021)



LSA

LEGEND

🟥 Project Site

FIGURE 2

N

0 375 750

FEET

SOURCE: Bing Maps, 2021

2740 West Nielsen Avenue Office/Warehouse Project

Project Site

I:\SNN2102\GIS\MXD\Figure 2_ProjectSite.mxd (4/22/2021)

ATTACHMENT C

RECORD SEARCH RESULTS

California
Historical
Resources
Information
System

Fresno
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
E-mail: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

5/10/2021

Kerrie Collison
LSA Associates, Inc.
285 South Street, Suite P
San Luis Obispo, CA 93401

Re: 2740 W. Nielsen Ave. (SNN2102)
Records Search File No.: 21-161

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Fresno South USGS 7.5' quad. The following reflects the results of the records search for the project area and the 0.5 mile radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☐ GIS data

Resources within project area:	None
Archaeological resources within 0.5 mile radius:	P-10-003930
Reports within project area:	None
Reports within 0.5 mile radius:	FR-00249, 00250, 02232, 02722

Resource Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Resource Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Report Database Printout (list): ☒ enclosed ☐ not requested ☐ nothing listed

Report Database Printout (details): ☒ enclosed ☐ not requested ☐ nothing listed

Report Digital Database Records: ☐ enclosed ☒ not requested ☐ nothing listed

Resource Record Copies: ☒ enclosed ☐ not requested ☐ nothing listed

Report Copies: ☐ enclosed ☒ not requested ☐ nothing listed

OHP Built Environment Resources Directory: ☐ enclosed ☒ not requested ☐ nothing listed

Archaeological Determinations of Eligibility: ☒ enclosed ☐ not requested ☐ nothing listed

CA Inventory of Historic Resources (1976): ☐ enclosed ☐ not requested ☒ nothing listed

Caltrans Bridge Survey: Not available at SSJVIC; please see
https://dot.ca.gov/programs/environmental-analysis/cultural-studies/california-historical-bridges-tunnels

Ethnographic Information: Not available at SSJVIC

Historical Literature: Not available at SSJVIC

Historical Maps: Not available at SSJVIC; please see
http://historicalmaps.arcgis.com/usgs/

Local Inventories: Not available at SSJVIC

GLO and/or Rancho Plat Maps: Not available at SSJVIC; please see
http://www.glorecords.blm.gov/search/default.aspx#searchTabIndex=0&searchByTypeIndex=1 and/or
http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items

Shipwreck Inventory: Not available at SSJVIC; please see
https://www.slc.ca.gov/shipwrecks/

Soil Survey Maps: Not available at SSJVIC; please see
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Digitally signed by Celeste M.
Thomson
Date: 2021.05.10 11:45:38 -07'00'

Celeste M. Thomson
Coordinator

ATTACHMENT D

SACRED LANDS FILE SEARCH RESULTS

STATE OF CALIFORNIA **Gavin Newsom, *Governor***

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

May 18, 2021

Kerrie Collison

LSA

Via Email to: kerrie.collison@lsa.net

Re: 2740 West Nielsen Avenue Office/Warehouse Project, Fresno County

Dear Ms. Collison:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Nancy.Gonzalez-Lopez@nahc.ca.gov.

Sincerely,

Nancy Gonzalez Lopez

Nancy Gonzalez-Lopez
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contacts List
May 18, 2021

Big Sandy Rancheria of Western Mono Indians
Elizabeth D. Kipp, Chairperson
PO. Box 337
Western Mono
Auberry ,CA 93602
lkipp@bsrnation.com
(559) 374-0066
(559) 374-0055

Chicken Ranch Rancheria of Me-Wuk Indians
Lloyd Mathiesen, Chairperson
P.O. Box 1159
Miwok - Me-wuk
Jamestown ›CA 95327
lmathiesen@crtribal.com
(209) 984-9066
(209) 984-9269

Cold Springs Rancheria
Carol Bill, Chairperson
P.O. Box 209
Mono
Tollhouse ›CA 93667
coldsprgstribe@netptc.net
(559) 855-5043
(559) 855-4445 Fax

Dumna Wo-Wah Tribal Goverment
Robert Ledger Sr., Chairperson
2191 West Pico Ave.
Dumna/Foothill Yokuts
Mono
Fresno ›CA 93705
ledgerrobert@ymail.com
(559) 540-6346

Dunlap Band of Mono Indians
Benjamin Charley Jr., Tribal Chair
P.O. Box 14
Mono
Dunlap ›CA 93621
ben.charley@yahoo.com
(760) 258-5244

Dunlap Band of Mono Indians
Dirk Charley, Tribal Secretary
5509 E. McKenzie Avenue
Mono
Fresno ›CA 93727
dcharley2016@gmail.com
(559) 554-5433

Kings River Choinumni Farm Tribe
Stan Alec
3515 East Fedora Avenue
Foothill Yokuts
Choinumni
Fresno ›CA 93726
(559) 647-3227 Cell

Nashville Enterprise Miwok-Maidu-Nishinam Tribe
Cosme A. Valdez, Chairperson
P.O. Box 580986
Miwok
Elk Grove ›CA 95758-001
valdezcome@comcast.net
(916) 429-8047 Voice/Fax
(916) 396-1173 Cell

North Fork Mono Tribe
Ron Goode, Chairperson
13396 Tollhouse Road
Mono
Clovis ›CA 93619
rwgoode911@hotmail.com
(559) 299-3729 Home
(559) 355-1774 - cell

North Valley Yokuts Tribe
Katherine Erolinda Perez, Chairperson
P.O. Box 717
Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok
Linden ›CA 95236
canutes@verizon.net
(209) 887-3415
(209) 649-8972 (cell)

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.

**This list is only applicable for contacting local Native Americans Tribes for the proposed:
2740 West Nielsen Avenue Office/Warehouse Project, Fresno County.**

Native American Heritage Commission
Native American Contacts List
May 18, 2021

North Valley Yokuts Tribe
Timothy Perez, MLD Contact
P.O. Box 717
Linden ›CA 95236
huskanam@gmail.com
(209) 662-2788
Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

Picayune Rancheria of Chukchansi Indians
Claudia Gonzales, Chairwoman
P.O. Box 2226
Oakhurst ›CA 93644
cgonzales@chukchansitribe.net
(559) 412-5590
Chukchansi / Yokut

Santa Rosa Rancheria Tachi Yokut Tribe
Leo Sisco, Chairperson
P.O. Box 8
Lemoore ›CA 93245
(559) 924-1278
(559) 924-3583 Fax
Tache
Tachi
Yokut

Table Mountain Rancheria
Brenda D. Lavell, Chairperson
P.O. Box 410
Friant ›CA 93626
rpennell@tmr.org
(559) 822-2587
(559) 822-2693 Fax
Yokuts

Table Mountain Rancheria
Bob Pennell, Cultural Resources Director
P.O. Box 410
Friant ›CA 93626
rpennell@tmr.org
(559) 325-0351
(559) 325-0394 Fax
Yokuts

Traditional Choinumni Tribe
David Alvarez, Chairperson
2415 E. Houston Avenue
Fresno ›CA 93720
davealvarez@sbcglobal.net
(559) 217-0396 Cell
Choinumni

Traditional Choinumni Tribe
Rick Osborne, Cultural Resources
2415 E. Houston Avenue
Fresno ›CA 93720
(559) 324-8764
lemek@att.net
Choinumni

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589
Porterville ›CA 93258
neil.peyron@tulerivertribe-nsn.gov
(559) 781-4271
(559) 781-4610 Fax
Yokuts

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct.
Salinas ›CA 93906
kwood8934@aol.com
(831) 443-9702
Foothill Yokuts
Mono
Wuksache

Xolon-Salinan Tribe
Karen White, Chairperson
P.O. Box 7045
Spreckels ›CA 93962
xolon.salinan.heritage@gmail.com
831-238-1488
Salinan

This list is current as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code,Section 5097.94 of the Public Resources Code, or Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans Tribes for the proposed:
2740 West Nielsen Avenue Office/Warehouse Project, Fresno County.

ATTACHMENT E

SURVEY PHOTOGRAPHS

Survey Photographs: 2740 West Nielsen Avenue Office/Warehouse Project
Fresno, Fresno County, California

Example of concrete and asphalt that covers most of project site.
View to north. June 11, 2021.

Combination of asphalt and sandy loam sediment in middle of project site.
View to west. June 11, 2021.

APPENDIX E

GHG REDUCTION PLAN UPDATE CHECKLIST

APPENDIX E

GHG REDUCTION PLAN UPDATE CHECKLIST

Fresno Greenhouse Gas (GHG) Reduction Plan Update – CEQA Project Consistency Checklist

INTRODUCTION

The City of Fresno updated its 2014 Greenhouse Gas (GHG) Reduction Plan (the Plan) in the year 2021 to conform with existing applicable State climate change policies and regulations. The GHG Plan Update outlines strategies that the City will undertake to achieve its proportional share of GHG emission reductions. The purpose of this GHG Reduction Plan Update Consistency Checklist (Checklist) is to help the City provide a streamlined review process for new development projects that are subject to discretionary review pursuant to the California Environmental Quality Act (CEQA) Guidelines Section 15183.5.

This Checklist has been developed as part of the GHG Plan Update implementation and monitoring process and will support the achievement of individual GHG reduction strategies as well as the City's overall GHG reduction goals. In addition, this Checklist will further the City's sustainability goals and policies that encourage sustainable development and aim to conserve and reduce the consumption of resources, such as energy and water. Projects that meet the requirements of this Checklist will be deemed to be consistent with the Fresno GHG Reduction Plan Update and will be found to have a less than significant contribution to cumulative GHG (i.e., the project's incremental contribution to cumulative GHG effects is not cumulatively considerable), pursuant to CEQA Guidelines Sections 15064(h)(3), 15130(d), and 15183(b). Projects that do not meet the requirements in this Checklist will be deemed to be inconsistent with the Fresno GHG Reduction Plan Update and must prepare a project-specific analysis of GHG emissions, including quantification of existing and projected GHG emissions and incorporation of the measures in this Checklist to the extent feasible. This GHG Checklist can be updated to reflect adoption of new GHG reduction strategies or to comply with any changes and updates in the Plan or local, State or federal regulations. Note that not all the measures in the checklist are applicable to all projects. The projects should comply with applicable measures from the checklist.

1. Project Information

Contact Information

Project No./Name:	2740 West Nielsen Office/Warehouse Project
Address:	2740 West Nielsen
Applicant Name/Co:	Scannell Properties
Contact Information:	8801 River Crossing Boulevard, Suite 300
	Indianapolis, Indiana, 46240

Project Information

1. What is the Site acreage of the Project?	48.03
2. Identify all Applicable Proposed Land uses:	Warehouse/Office
a. Residential (Indicate number of single-family units)	
b. Residential (Indicate number of multi-family units)	
c. Commercial (total square footage)	
d. Industrial (total square footage)	901,438 square feet
e. Other (describe)	201 loading dock doors and 594 parking spaces
3. Is the project or a portion of the project located in a transit priority area? (Y/N)	No
4. Provide a brief description of the project proposed:	The project would result in the construction of a four office/warehouse buildings that would be configured for heavy industrial uses by tenants that have not been identified. The proposed buildings would result in a total gross floor area of approximately 901,438 square feet. The four buildings would be comprised of the following: Building 1 would be 468,812 square feet and would provide 122 loading dock doors; Building 2 would be 248,786 square feet and would provide 46 loading dock doors; Building 3 would be 93,074 square feet and would provide 18 loading dock doors; and Building 4 would be 90,766 square feet and would provide 15 loading dock doors. Vehicular access to the site would be provided by North Hughes Avenue, West Nielsen Avenue, and North Marks Avenue. A total of 594 on-site parking spaces would be provided for vehicles and trucks.

2. Determining Land Use Consistency		
Checklist Item		
As the first step in determining the consistency with the GHG Reduction Plan for discretionary development projects, this section allows the City to determine the project's consistency with the land use assumptions used in the GHG Reduction Plan.		
	Yes	**No**
1. Is the proposed project consistent with the approved General Plan, Specific Plan, and Community Plan planned land use and zoning designations? If the answer is **Yes**, then proceed to the GHG Plan Update Consistency Checklist. If the answer is **No**, then proceed to question 2.	X	
2. If the proposed project is not consistent with the approved planned land use and zoning designation(s), then provide estimated GHG project emissions under both existing and proposed designation(s) for comparison. Compare the maximum buildout of the existing designation with the maximum buildout of the proposed designation. If the estimated project emissions at maximum buildout of the proposed designation(s) **is equivalent to or less than** the estimated project emissions at maximum buildout of the existing designation(s), then in accordance with the City's Significance Determination Thresholds, the project's GHG impact is less than significant. If there is a proposed development project associated with this plan amendment and or rezone then complete the GHG Plan Update Consistency Checklist and incorporate applicable measures, otherwise there is no further step required. If the estimated project emission at maximum buildout of the proposed designation(s) is **greater than** the estimated project emissions at maximum buildout of the existing designation(s), then in accordance with the City's Significance Determination Thresholds, the project's GHG impact is significant. The project must either show consistency with applicable GP objectives and policies (provide applicable GP objectives and policies here) or provide analysis and measures to incorporate into the project to bring the GHG emissions to a level that is less than or equal to the estimated project emission at maximum buildout of the existing designation(s) unless the decision-maker finds that a measure is infeasible in accordance with CEQA Guidelines Section 15091. If there is a proposed development project associated with this plan amendment and or rezone then complete the GHG Plan Update Consistency Checklist and incorporate applicable measures, otherwise there is no further step required.		

3. Greenhouse Gas (GHG) Reduction Plan Update - CEQA Project Consistency Checklist

GHG Reduction Plan Update consistency review involves the evaluation of project consistency with the applicable strategies of the GHG Reduction Plan Update. The GHG reduction strategies identified in the GHG Reduction Plan Update relies upon the General Plan and additional local measures as the basis of the development related strategies to reduce GHG emissions. This checklist is developed based on the key local GHG reduction strategies and actions identified in the GHG Reduction Plan Update that are applicable to proposed development projects. Note that not all strategies listed below will apply to all projects. For example, not all projects will meet mixed-use related policies of the General Plan, because not all projects are required to be mixed use.

Checklist Item (Check the appropriate box and provide an explanation for your answer)	Relevant General Plan Policy	Yes	No	Not Applicable (NA)	Explanation
1: Land Use and Transportation Demand Strategies					
a. Does the project include mixed-use, development? For GHG Reduction Plan consistency, mixed-use development is defined as pedestrian-friendly development that blends two or more residential, commercial, cultural, or institutional, uses, one of which must be residential	Policy UF-1-c, LU-3-b, Objective-UF 12, UF-12-a, UF-12-b, UF-12-d, Policy RC-2-a			X	The proposed project does not include mixed-use development and does not include residential uses.
b. Is the project high density? For GHG Reduction Plan consistency, is the project developed at 12 units per acre or higher?	LU-5-f			X	The proposed project does not include residential uses.
c. Is the project infill development, pursuant to the General Plan definition of location within the City limits as of December 31, 2012?	LU-2-a, Objective-12, UF-12-a, UF-12-b, UF-12-d	X			The project site consists of a former industrial warehouse site and is in a heavy industrial district.
d. Does the project implement pedestrian bicycle, and transit linkages with surrounding land uses and neighborhoods? For GHG Reduction Plan consistency, the project must include all sidewalks, paths, trails, and facilities required by the General Plan and Active Transportation Plan, as implemented through the Fresno Municipal Code and project conditions of approval.	Policy UF-1-c, UF-12-e, Policy RC-2-a, Objective MT-4,5,6, Policy MT-4-c, Policy MT-6-a, Policy POSS-7-h Objective MT 8, Policies MT-8-a, MT-8-b	X			The project would provide complete streets for all roadway improvements.
e. If the project includes mixed-use or high density development, is it located within ½ mile of a High Quality Transit Area as defined in the City's CEQA Guidelines for Vehicle Miles Traveled? Or, is the project located within 500 feet of an existing or planned transit stop?	Policy UF-12-a, UF-12-b, LU-3-b, Objective MT 8, Policies MT-8-a, MT-8-b			X	The proposed project does not include mixed-use or high density development.
f. Will the project accommodate a large employer (over 100 employees) and will it implement trip reduction programs such as increasing transit use, carpooling, vanpooling, bicycling, or other measures to reduce vehicle miles traveled pursuant to San Joaquin Valley Air Pollution Control District Rule 9410? See the SJVAPCD website for details: https://www.valleyair.org/rules/currntrules/r9410.pdf	Policy MT-8-b, Objective MT-9, Policy MT-10-c, San Joaquin Valley Air Pollution Control District Rule 9410	X			The project would have over 100 employees and would be required to comply with SJVAPCD Rule 9410.

Checklist Item (Check the appropriate box and provide an explanation for your answer)	**Relevant General Plan Policy**	**Yes**	**No**	**Not Applicable (NA)**	**Explanation**
g. If the project includes modifications to the transportation network, do those improvements meet the requirements of the City of Fresno's Complete Streets Policy, adopted in October 2019? According to the policy, a complete street is a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users - including bicyclists, pedestrians, transit vehicles, trucks, and motorists - appropriate to the function and context of the facility while connecting to a larger transportation network. See City of Fresno website for details: https://www.fresno.gov/publicworks/wp-content/uploads/sites/17/2019/10/Complete-Streets-091119.pdf	MT-1-g, MT-1-h	X			The project would provide complete streets for all roadway improvements.
h. Does the project have a less than significant VMT impact, either through satisfying screening criteria or mitigating VMT impacts, pursuant to the City's adopted VMT thresholds? See City of Fresno website for details: https://www.fresno.gov/darm/wp-content/uploads/sites/10/2021/01/CEQA-Guidelines-for-Vehicle-Miles-Traveled-Final-Adopted-Version.pdf	MT-2-b, MT-2-c	X			The proposed project has a less than significant VMT impact.
2: Electric Vehicle Strategies					
a. For new multi-family dwelling units with parking, does the project provide EV charging spaces capable of supporting future EV supply equipment (EV capable) at 10% of the parking spaces per 2019 California Green Building Standards Code (CALGREEN, Title 24, Part 11), Section 4.106.4	Policy RC-8-j			X	The proposed project would not include multi-family residential uses.
b. For new commercial buildings, does project provide EV charging spaces capable of supporting EV capable spaces at 4% to 10% of the parking spaces per 2019 California Green Building Standards Code (CALGREEN, Title 24, Part 11), Section 5.106.5.3	Policy RC-8-j			X	The proposed project would not include commercial uses.
3: Energy Conservation Strategies					
a. Does the project meet or exceed mandatory state building energy codes? If yes, does the project follow any other GreenPoint ratings such as LEED, Energy Star or others? If yes, indicate level of certification-Silver, gold, platinum if applicable?	Policy RC-5-c, Objective RC-8, Policy RC 8-a	X			The project would meet the latest CalGreen standards, but would not follow any other GreenPoint ratings.
b. For commercial projects, does the project achieve net zero emissions electricity? Mark NA if project will be permitted before 2030. Mark Yes if voluntary. Add source and capacity in explanation.	Additional Recommended GHG Plan Measure, supports Objective RC-8			X	The project does not include commercial uses and would be permitted before 2030.

Checklist Item (Check the appropriate box and provide an explanation for your answer)	Relevant General Plan Policy	Yes	No	Not Applicable (NA)	Explanation
4: Water Conservation Strategies					
a. Does the project meet or exceed the mandatory outdoor water use measures of the 2019 California Green Building Standards Code (CALGREEN, Title 24, Part 11), Section 4.304? If the project exceeds CalGreen Code mandatory measures provide methods in excess of requirements in the explanation. Examples include outdoor water conservation measures such as; drought tolerant landscaping plants, compliant irrigation systems, xeriscape, replacing turf etc. Provide the conservation measure that the project will include in the explanation.	Objective RC-7, Policy RC-7-a, RC-7-h	X			The project would meet the latest CalGreen standards.
b. Does the project meet or exceed the mandatory indoor water use measures of the 2019 California Green Building Standards Code (CALGREEN, Title 24, Part 11), Section 4.303? If the project exceeds CalGreen Code, mandatory measures provide methods in excess of requirements in the explanation. Examples may include water conserving devices and systems such as water leak detection system, hot water pipe insulation, pressure reducing valves, energy efficient appliances such as Energy Star Certified dishwashers, washing machines, dual flush toilets, point of use and/or tankless water heaters.	Objective RC-7, Policy RC-7-a, RC-7-e	X			The project would meet the latest CalGreen standards.
5: Waste Diversion and Recycling Strategies					
a. Does the project implement techniques of solid waste segregation, disposal and reduction, such as recycling, composting, waste to energy technology, and/or waste separation, to reduce the volume of solid wastes that must be sent to landfill facilities?	Policy PU-9-a, RC-11-a	X			The proposed project would be consistent with the CalRecycle Waste Diversion and Recycling Mandate.
b. During construction will the project recycle construction and demolition waste?	Policy RC-11-a	X			The proposed project would recycle construction waste.
c. Does the project provide recycling canisters in public areas where trashcans are also provided?	Policy RC-11-a	X			The proposed project would provide recycling canisters.

Note: The GHG reduction strategies included in this checklist are based on the GHG reduction strategies identified in the Chapter 5 of the GHG Reduction Plan Update.

APPENDIX F

TRAFFIC IMPACT STUDY

APPENDIX F

TRAFFIC IMPACT STUDY

TRAFFIC IMPACT STUDY

2740 WEST NIELSEN AVENUE WAREHOUSE PROJECT
CITY OF FRESNO
FRESNO COUNTY, CALIFORNIA

This Traffic Impact Study has been prepared under the supervision of
Ambarish Mukherjee, P.E.

AMBARISH MUKHERJEE
C 88084
A. Mukherjee
CIVIL

LSA

December 2021

TRAFFIC IMPACT STUDY

2740 WEST NIELSEN AVENUE WAREHOUSE PROJECT

CITY OF FRESNO

FRESNO COUNTY, CALIFORNIA

Prepared for:

Jill Gormley, City Traffic Engineer
City of Fresno
Room 4016
Fresno, California 93721

Prepared by:

LSA Associates, Inc.
1500 Iowa Avenue, Suite 200
Riverside, California 92507
(951) 781-9310

Project No. SNN2101

December 2021

TABLE OF CONTENTS

APPENDICES

FIGURES AND TABLES

FIGURES

TABLES

1.0 INTRODUCTION

The Traffic Impact Study (TIS) has been prepared for the proposed 2740 West Nielsen Avenue Warehouse project (project) to be located at the northeast corner of the intersection of Marks Avenue and Nielsen Avenue in the City of Fresno. Figure 1-1 illustrates the regional and project location. (Figures and tables are located at the end of each chapter.)

This report is intended to satisfy the requirements established by the City of Fresno *Traffic Impact Study Report Guidelines* (updated February 2, 2009), the *City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds* (adopted on June 25, 2020), the California Department of Transportation (Caltrans), as well as the requirements for the disclosure of potential impacts and mitigation measures pursuant to the California Environmental Quality Act (CEQA). The scope of work for this TIS, including trip generation, trip distribution, study area, and analysis methodologies, has been approved by City staff via the Scoping Agreement process. A copy of the Scoping Agreement is included in Appendix A.

This study examines traffic operations in the vicinity of the proposed project under the following five scenarios:

- Existing Conditions;
- Existing plus Project Conditions;
- Existing plus Project and Near-term approved and pending projects Conditions;
- Cumulative Year (2035) no Project Conditions; and
- Cumulative Year (2035) plus Project Conditions.

Traffic conditions were examined for the weekday daily, a.m., and p.m. peak hour conditions. The a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. The p.m. peak hour is the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m. Roadway segments were analyzed using daily volume counts and comparisons were made to the daily service volume standards provided in the City's TIS Guidelines.

1.1 PROJECT DESCRIPTION

The proposed project consists of four buildings with a total area of 901,438 sf, all of which will be High Cube Fulfilment Center warehouses. The project site designation in the City of Fresno Official Zoning Map is IH – Heavy Industrial. As such, the proposed project is consistent with the designated zoning. The project is anticipated to be completed by the year 2023. Figure 1-2 illustrates the conceptual site plan for the proposed project.

As illustrated in Figure 1-2, access to the project will be provided via the following seven driveways:

Driveways on Marks Avenue

- Driveway 1: This full access driveway near the northwest corner of the site will be used by passenger vehicles only.
- Driveway 2: This driveway will be used by trucks only. This driveway will allow all movements except for left-turn egress from the project site.
- Driveway 3: This right-in-right-out driveway near the southwest corner of the site will be used by passenger vehicles only.

Driveways on Nielsen Avenue

- Driveway 4: This right-in-right-out driveway will be used by passenger vehicles only.
- Driveway 5: This full access driveway will be used by both passenger vehicles and trucks.

Driveways on Hughes Avenue

- Driveway 6: This full access driveway near the northeast corner of the site will be used by both passenger vehicles and trucks.
- Driveway 7: This full access driveway will be used by both passenger vehicles and trucks.

Additionally, as part of project design feature, the project will also construct sidewalks along the project frontages on Marks Avenue, Nielsen Avenue and Hughes Avenue.

1.2 STUDY AREA

Based on the City's TIS Guidelines, the study intersections for the TIS will be identified on a case-by-case basis for each project. Study intersections and roadway segments considered for the analysis were finalized during the TIS scoping agreement process and based on discussion with City staff.

1.2.1 Study Intersections

Per the Scoping Agreement (Appendix A), intersections analyzed in this study and their jurisdictions are as follows:

1. Marks Avenue/Belmont Avenue (City of Fresno, County of Fresno);
2. Marks Avenue/Nielsen Avenue (City of Fresno);
3. Marks Avenue/Ray Johnson Drive (City of Fresno);
4. Marks Avenue/SR-180 Westbound Ramps (Caltrans);
5. Marks Avenue/SR-180 Eastbound Ramps (Caltrans);
6. Hughes Avenue/Belmont Avenue (City of Fresno, County of Fresno); and
7. Hughes Avenue/Nielsen Avenue (City of Fresno).

It should be noted that based upon recommendation by City staff during the scoping agreement process, a LOS analysis was not required at the project driveway intersections. As such, the project driveway intersections have been included for project trip distribution, and trip assignment purposes only.

Figure 1-3 illustrates the locations of all study intersections.

1.2.2 Roadway Segments

Per the Scoping Agreement (Appendix A), roadway segments analyzed in this study are as follows:

1. Marks Avenue, between Belmont Avenue and Nielsen Avenue;
2. Marks Avenue, between Nielsen Avenue and Ray Johnson Drive;
3. Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps;
4. Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps;
5. Belmont Avenue, between Marks Avenue and Hughes Avenue;
6. Nielsen Avenue, between Marks Avenue and Hughes Avenue; and
7. Hughes Avenue, between Belmont Avenue and Nielsen Avenue.

For each roadway segment, the highest volume on any part of the segment will be considered as the analysis volume for the entire segment.

1.2.3 Worst Case Scenario Study Area

During the Scoping Agreement process, California Department of Transportation (Caltrans) recommended to evaluate the project under a worst case scenario with 60% of project traffic using Caltrans facilities (ramps and freeway segments). This evaluation included intersections 3, 4, and 5 as listed above, as well as the following freeway basic and merge/diverge areas for the SR-180 and Marks Avenue interchange:

SR-180 Eastbound

1. West of Marks Avenue Off-Ramp (Basic);
2. Marks Avenue Off-Ramp (Diverge);
3. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
4. Marks Avenue Loop-On Ramp (Merge);
5. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
6. Marks Avenue Slip-On Ramp(Merge); and
7. East of Marks Avenue (Basic).

SR-180 Westbound

8. East of Marks Avenue (Basic);
9. Marks Avenue Off-Ramp (Diverge);
10. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
11. Marks Avenue Loop-On Ramp(Merge);
12. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);

13. Marks Avenue Slip-On Ramp(Merge); and
14. West of Marks Avenue (Basic).

1.3 LIST OF CHAPTER 1.0 FIGURES

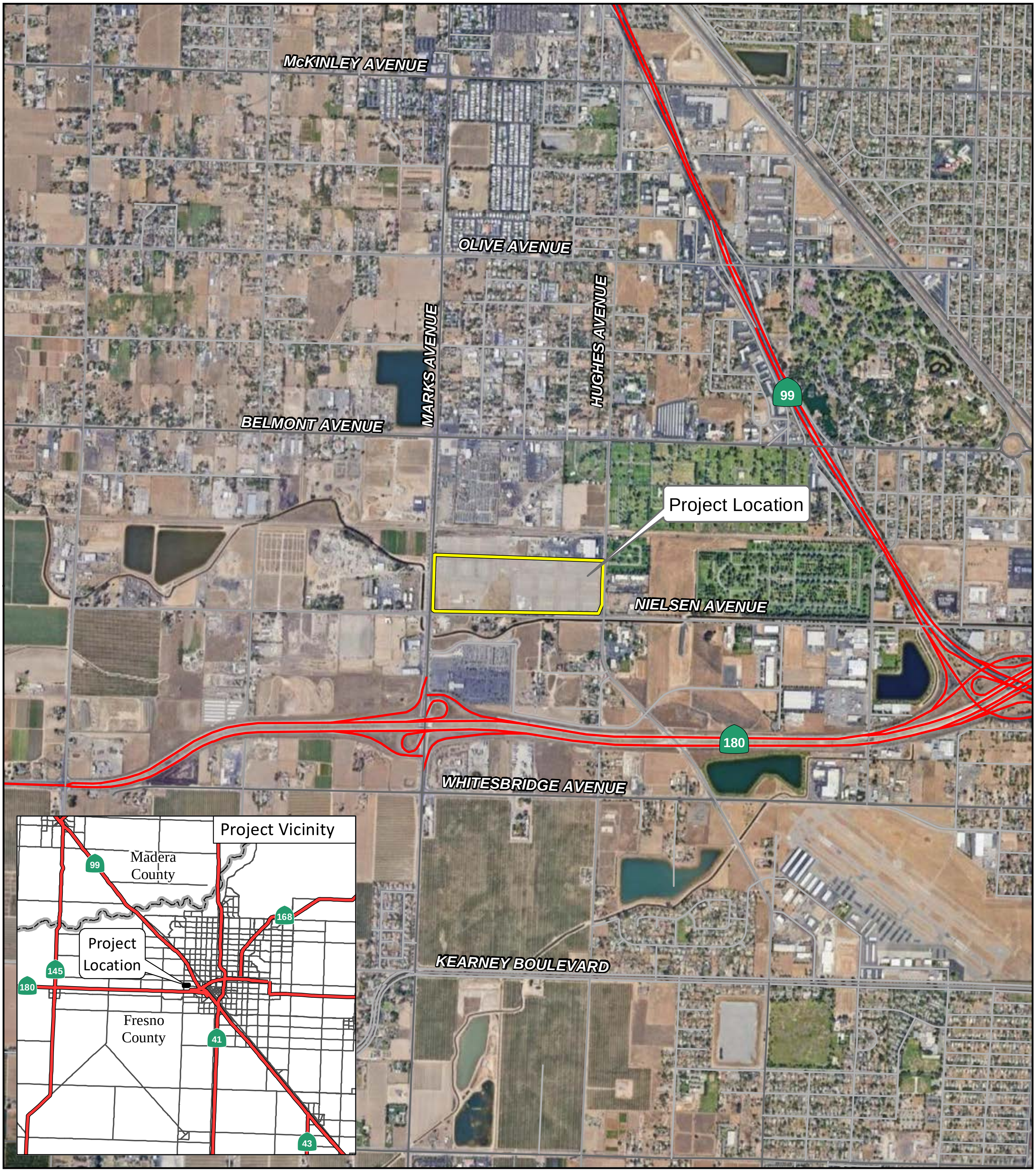


FIGURE 1-1

2740 West Nielsen Warehouse Project
Traffic Impact Study

Regional and Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

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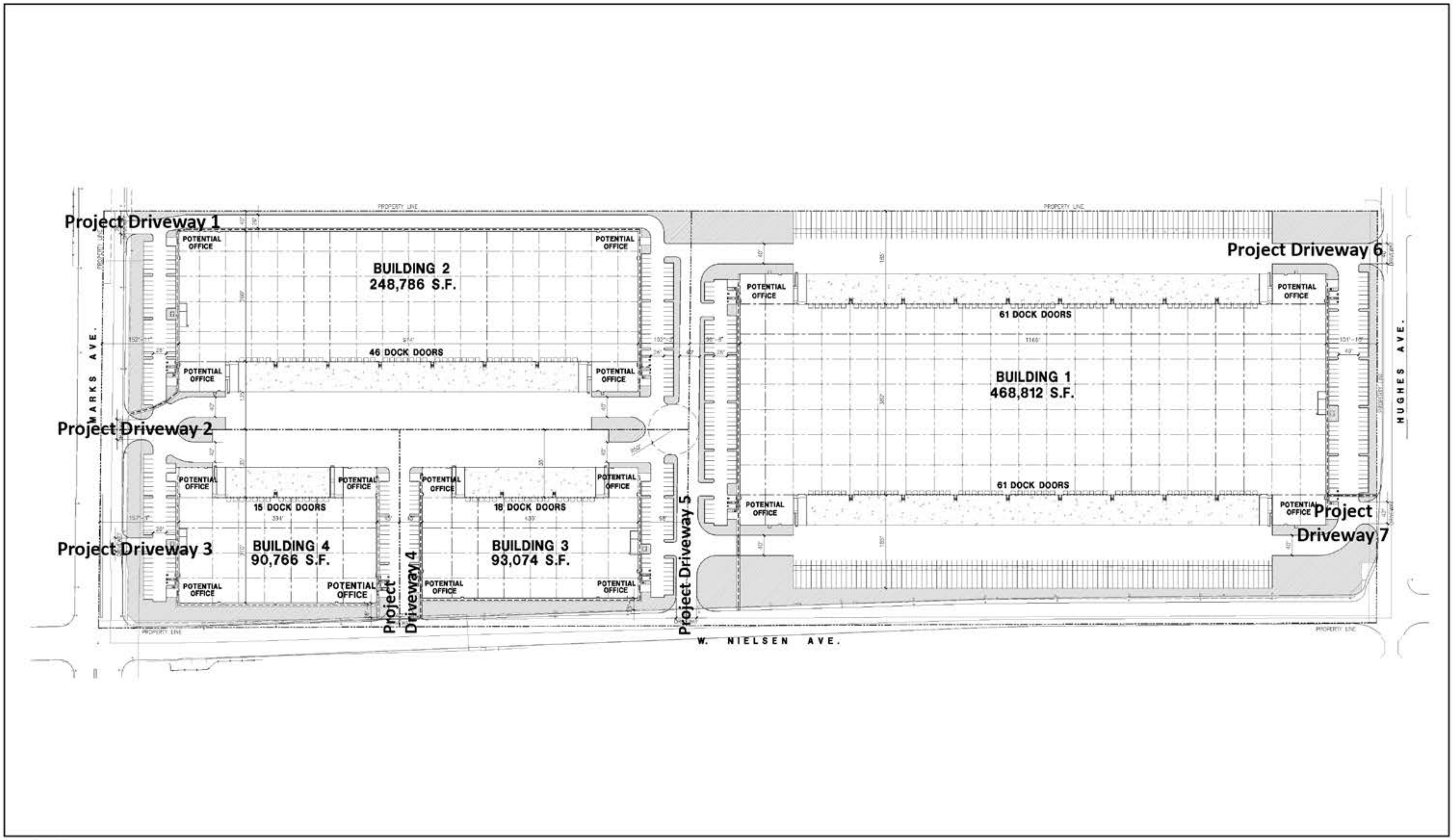

LSA

FIGURE 1-2

2740 West Nielsen Warehouse Project
Traffic Impact Study

Conceptual Site Plan

SOURCE: HPA architecture; April 2021

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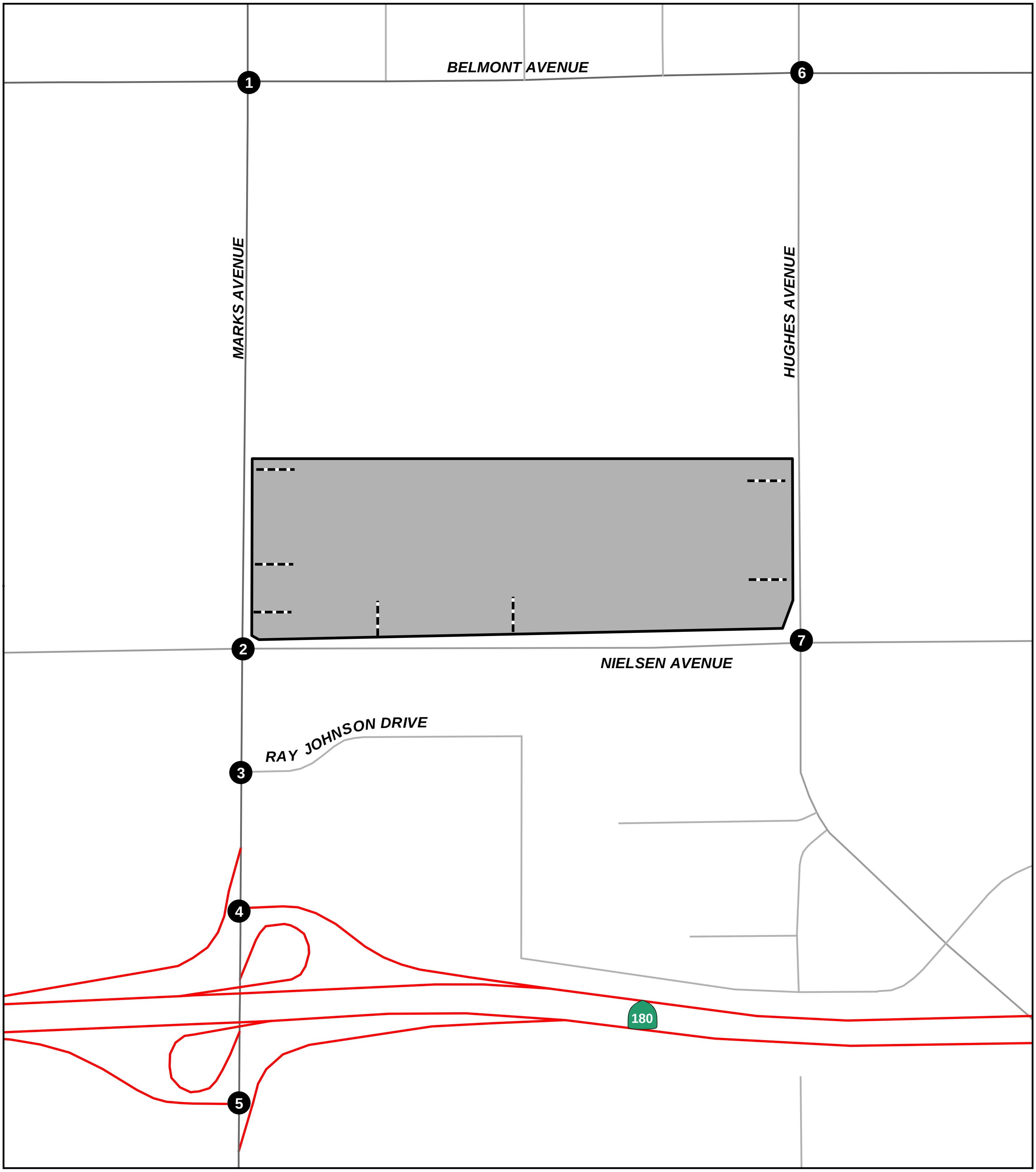

LSA

FIGURE 1-3

LEGEND

▨ Project Site

● Study Intersection

---- Project Driveway

2740 West Nielsen Warehouse Project
Traffic Impact Study

Study Area Intersections

SOURCE: County of Fresno Streets Data, 2021.

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2.0 ANALYSIS METHODOLOGY AND THRESHOLDS

2.1 LEVEL OF SERVICE DEFINITIONS

LOS can be characterized for the whole intersection, each intersection approach, and by each lane group. Control delay alone is used to characterize LOS for the entire intersection. Control delay quantifies the increase in travel time due to the traffic signal control, and is a surrogate measure of driver discomfort and fuel consumption.

A complete description of the meaning of LOS can be found in the Transportation Research Board Special Report 209, *Highway Capacity Manual* (HCM). The HCM establishes LOS A through F for intersections. A description of LOS for signalized and unsignalized intersections is summarized in Table 2-A. A description of LOS for roadway segments is summarized in Table 2-B.

Table 2-C shows the LOS criteria for unsignalized and signalized intersections. The TIS Guidelines recommend using Florida LOS tables to be used for roadway segment analysis. Table 2-D summarizes the LOS criteria used to evaluate roadway segments based on the Florida LOS Tables for urbanized areas, which was adapted from Table 1 of the *2020 Quality/Level of Service Handbook*, dated June 2020. The daily traffic volumes represent the total vehicles (both directions) traveling on a roadway segment within 24 hours.

Basic freeway segments have uniform traffic conditions and roadway characteristics. The measure used to provide an estimate of LOS is density, where density is calculated from the average vehicle flow rate per lane and the average speed. Table 2-E shows the correlation between LOS and flow density. LOS A represents a freeway segment with density less than or equal to 11 passenger cars per mile per lane (pc/mi/ln). LOS F represents a freeway segment with density greater than 45 pc/mi/ln.

Based on the HCM, the LOS for freeway ramps is determined by traffic flow density. Table 2-F shows the correlation between LOS and traffic flow density defined in the HCM. LOS A represents traffic flow density less than or equal to 10 pc/mi/ln. LOS F represents overflow conditions with high density and congestion.

For all study area intersections, the *Highway Capacity Manual 6th Edition* (HCM 6) analysis methodologies were used to determine intersection LOS. Intersection LOS was calculated using the Synchro 10 software, which uses the HCM 6 methodologies. Roadway segment LOS was calculated based on the Florida LOS tables as described above. For basic freeway segments and ramp merge/diverge segments, the Highway Capacity 7 Software (HCS 7) was used. The software calculates LOS using the HCM 6 methodologies.

2.2 LEVEL OF SERVICE PROCEDURES AND THRESHOLDS

Study intersections and roadway segments analyzed in this report are under the jurisdiction of the City of Fresno or on the border of both the City and County of Fresno. However, intersections located at freeway on-ramps and off-ramps are under the jurisdiction of Caltrans. Based on the City of Fresno General Plan Circulation Element, the City uses Traffic Impact Zone (TIZ) boundaries within the City to identify acceptable LOS for each TIZ. The majority of the study area is within TIZ III, or along the border of TIZ II and TIZ III. TIZ II has a LOS standard of E, while within TIZ III has a LOS standard of D. Therefore, as a conservative estimate, LOS D was considered as the minimum level of service criterion for all intersections. As such, an operational deficiency occurs when the project causes an unsatisfactory condition (deteriorate from LOS A through D to E or F) for intersections or when the project contributes to an existing or forecast deficiency. The project needs to identify improvements to improve the intersection LOS to an acceptable level.

For intersections under the jurisdictions of Caltrans, Caltrans considers an acceptable LOS to be between LOS C and D at all intersections under its jurisdiction (delay of 45 seconds at signalized intersections and delay of 30 seconds at unsignalized intersections).

Caltrans does not have any operational deficiency criteria for study intersections. Therefore, an operational deficiency occurs when the project causes an unsatisfactory condition (deteriorate from LOS A through D to E or F) for intersections or when the project contributes to an existing or forecast deficiency. The project needs to identify improvements to improve the intersection LOS to an acceptable level.

2.3 LIST OF CHAPTER 2.0 TABLES

Table 2-A: Intersection Level of Service Definitions

LOS	Description
A	Traffic operations with a control delay of 10 seconds per vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If LOS A is the result of favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.
B	Traffic operations with control delay between 10 seconds per vehicle and 20 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.
C	Traffic operations with control delay between 20 and 35 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of the insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.
D	Traffic operations with control delay between 35 and 55 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.
E	Traffic operations with control delay between 55 and 80 seconds per vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.
F	Traffic operations with control delay exceeding 80 seconds per vehicle or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Source: *Highway Capacity Manual* (6th Edition)

Table 2-B: Roadway Segment Level of Service Definitions

LOS	Description
A	Describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control Delay at the boundary intersection is minimal. The travel speed exceeds 80% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
B	Describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted, and control delay at the boundary is not significant. The travel speed is between 67% and 80% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
C	Describes stable operation. The ability to maneuver and change lanes at mid-segment locations may be more restricted than at LOS B. Longer queues at the boundary intersection may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
D	Indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volume, or inappropriate signal timing at the boundary intersections. The travel speed is between 40% and 50% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
E	Characterized by unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30% and 40% of the base free-flow speed, and the volume-to-capacity ratio is no greater than 1.0.
F	Characterized by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is between 30% or less of the base free-flow speed, and the volume-to-capacity ratio is greater than 1.0.

Source: *Highway Capacity Manual* (6th Edition)

Table 2-C: Level of Service Criteria for Unsignalized and Signalized Intersections

Level of Service	Unsignalized Intersection Average Delay per Vehicle (sec.)	Signalized Intersection Average Delay per Vehicle (sec.)
A	≤ 10	≤ 10
B	> 10 and ≤ 15	> 10 and ≤ 20
C	> 15 and ≤ 25	> 20 and ≤ 35
D	> 25 and ≤ 35	> 35 and ≤ 55
E	> 35 and ≤ 50	> 55 and ≤ 80
F	> 50	> 80

Source: *Highway Capacity Manual* (6th Edition)

Table 2-D: Roadway Segment Capacity and Levels of Service

Class I (40 MPH or Higher Posted Speed Limit)					
		Level of Service			
Lanes	Median	B	C	D	E
2	Undivided	*	15,120	15,930	*
4	Divided	*	34,110	35,820	*
6	Divided	*	52,560	53,910	*
8	Divided	*	70,920	72,090	*
Class II (35 MPH or Slower Posted Speed Limit)					
2	Undivided	*	6,570	13,320	14,040
4	Divided	*	13,050	29,160	30,420
6	Divided	*	20,970	45,000	45,810
8	Divided	*	28,800	60,570	61,290

[1] The Florida LOS Tables includes the LOS capacities for State Signalized Arterials, and recommends a 10% adjustment for non-state signalized roadway system. Therefore, the roadway capacities have been calculated using a 10% adjustment to the values provided within the Florida LOS Table for urbanized area for State Signalized arterials.

Source: State of Florida *2020 Quality/level of Service Handbook, June 2020*.

Table 2-E: Level of Service Criteria for Freeway Segments

LOS	Density (v/c)
A	≤ 0.30
B	> 0.30–0.50
C	> 0.50–0.71
D	> 0.71–0.89
E	> 0.89–1.00
F	> 1.00

Table 2-F: Level Of Service Criteria for Ramps and Ramp Junctions

LOS	Density (pc/mi/ln)
A	≤ 10
B	> 10–20
C	> 20–28
D	> 28–35
E	> 35
F	Demand exceeds capacity

3.0 CIRCULATION NETWORK SETTING

3.1 EXISTING ROADWAY NETWORK

This section provides a description of the circulation network within the study area. Within the City of Fresno, all major roadways are classified based on the Major Street Circulation Diagram provided in the Mobility and Transportation Element of the City of Fresno *General Plan*. Following is a brief description of major roadways within the study area:

- **Marks Avenue**: Marks Avenue is designated as an Arterial in the City's General Plan. Within the study area, Marks Avenue is a 4-lane divided roadway. There is no provision for continuous sidewalks within the study area. Class II bike lanes are present on both sides of Marks Avenue within the study area. There is no provision for on-street parking within the study area.
- **Belmont Avenue**: Belmont Avenue is designated as a collector street in the City's General Plan. Between Marks Avenue and Hughes Avenue, Belmont Avenue is a 4-lane undivided roadway. There is no provision for continuous sidewalks within the study area. There are no bike facilities along either direction of this segment. There is no provision for on-street parking within the study area.
- **Nielsen Avenue**: Nielsen Avenue is designated as a collector street in the City's General Plan. Between Marks Avenue and Hughes Avenue, Nielsen Avenue is a 2-lane undivided roadway with a two-way left-turn lane (TWLTL). There is no provision for sidewalks within the study area. Class II bike lanes are present on both sides of Nielsen Avenue within the study area. There is no provision for on-street parking within the study area.
- **Hughes Avenue**: Hughes Avenue is designated as a collector street in the City's General Plan. Between Belmont Avenue and Nielsen Avenue, Hughes Avenue is a 2-lane undivided roadway. There is no provision for continuous sidewalks within the study area. There are no bike facilities along either direction of this segment. There is no provision for on-street parking within the study area.

Figure 3-1 illustrates existing study intersection geometrics and traffic control. Figure 3-2 illustrates the Major Street Circulation Diagram for the City.

3.2 EXISTING BICYCLE, PEDESTRIAN, AND TRANSIT FACILITIES

3.2.1 Bicycle Facilities

The City of Fresno is committed to improving non-motorized travel. Bicycling can be a viable alternative to local work commutes and offers children a healthy way to get to school. To facilitate and encourage bicycle trips among other non-motorized mods of travel, the City has adopted its Active Transportation Plan in 2016 that includes a network of proposed facilities and implementation plan for the future. The *City of Fresno Active Transportation Plan* (adopted December 2016) provides an inventory of all existing bicycle infrastructure improvements to be implemented in the future.

According to the *City of Fresno Active Transportation Plan,* the bikeway network within the City is classified into four categories: Class I – Bike Paths, Class II – Bike Lanes, and Class III – Bike Routes, and Class IV – Separated Bikeways. Class I bikeways provide bicycle travel on a paved right-of-way completely separated from any street or highway. Class II bikeways provide a striped and stenciled lane for one-way travel on a street or highway. Class III bikeways provide for shared use with motor vehicle traffic and are identified only by signing. Class IV bikeways are physically separated bikeway facilities distinct from the sidewalks and designated for exclusive use of the bikers.

Currently, Class II bike lanes exists along Marks Avenue and Nielsen Avenue within the study area. Proposed future Class II bike lanes will be added along the Belmont Avenue and Hughes Avenue within the study area. Figure 3-3 illustrates the existing and proposed bike lanes within the project vicinity.

3.2.2 Pedestrian Facilities

The implementation of enhanced pedestrian linkage with a comprehensive trails system links residential areas, schools, parks, and commercial centers so that residents can travel within the community without driving. Safe and attractive sidewalks and walkways improve the walkability of the City. Sidewalks are generally provided on both sides of the streets throughout the City. Additionally, standard paved trails and non-standard unpaved trails are frequently used by bicyclists and pedestrians in the City. The existence of trails and sidewalks provides accessible facilities, provides safety features, and improves walkability in the City.

Paved sidewalks are present intermittently on both sides of Belmont Avenue and Marks Avenue. Sidewalks are proposed on Marks Avenue, Nielsen Avenue, Belmont Avenue and Hughes Avenue within the study area. Additionally, as previously mentioned, the project will be constructing sidewalks along the project frontage on Marks Avenue, Nielsen Avenue and Hughes Avenue. Figure 3-4 illustrates the existing and planned sidewalks within the City.

3.2.3 Transit Facilities

Fresno Area Express (FAX) is the Transportation Service Agency within the City and is responsible for coordinating transit services within its service area. FAX provides services via Route 1/Q (Bus Rapid Transit) as well as 17 other routes throughout the City, and four routes for Clovis Transit. There are currently no transit routes present within the study area.

3.3 LIST OF CHAPTER 3.0 FIGURES

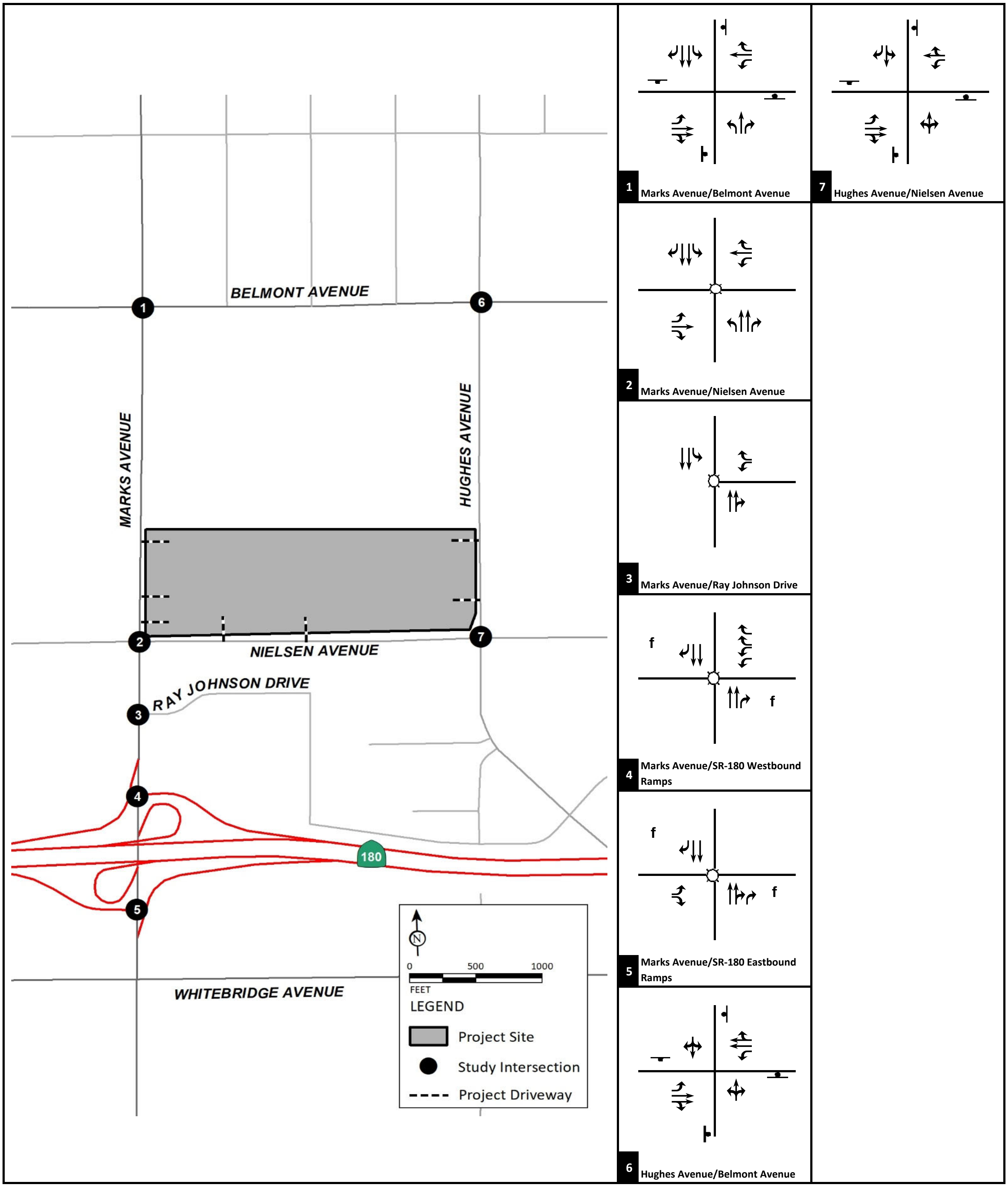


FIGURE 3-1

LSA

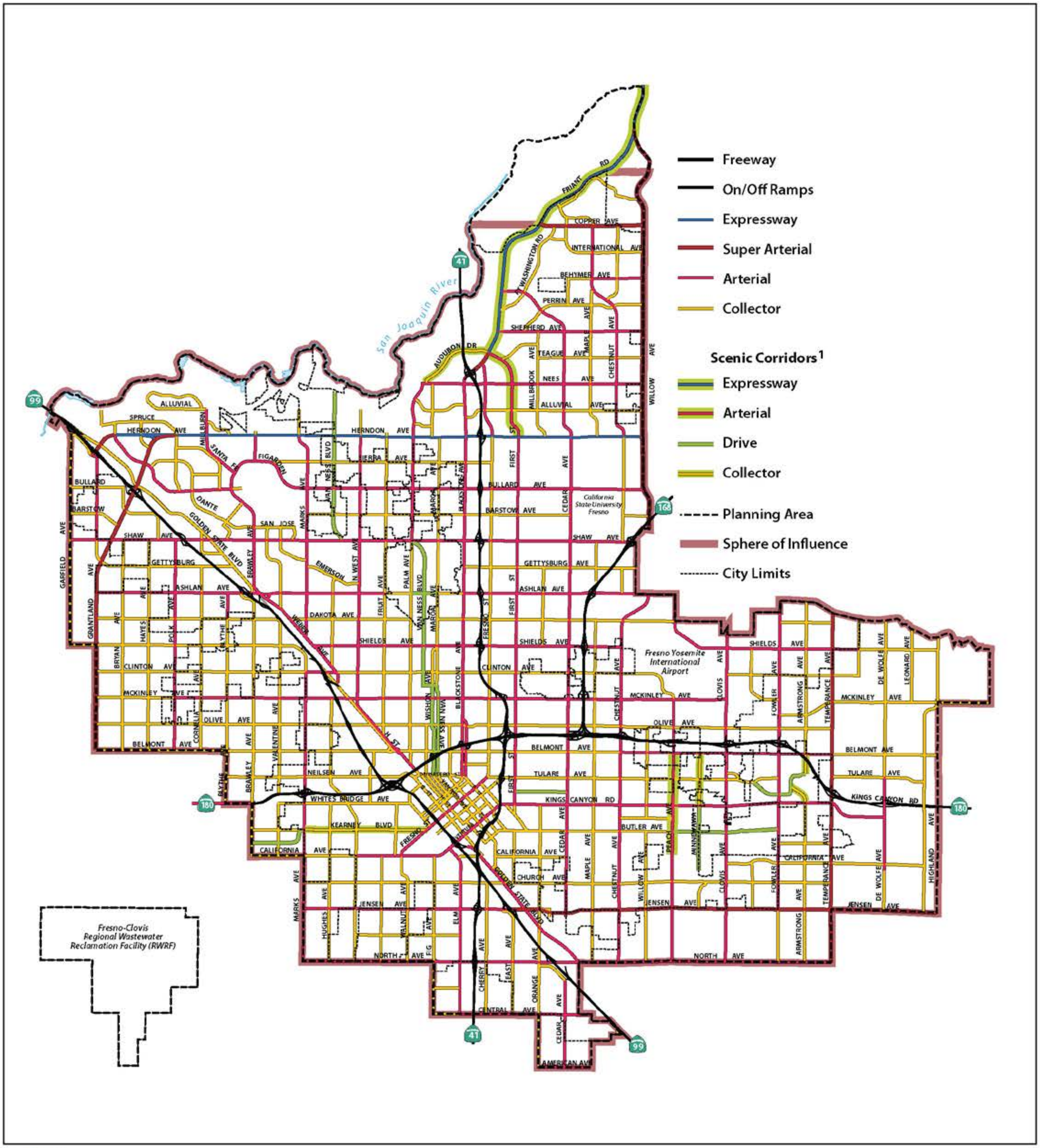
Legend

Signal
f Free Right Turn
Stop Sign

2740 West Nielsen Warehouse Project

Traffic Impact Study

Existing Study Intersection Geometrics and Traffic Control



LSA

FIGURE 3-2

2740 West Nielsen Warehouse Project
Traffic Impact Study

City of Fresno Roadway Classification

SOURCE: City of Fresno General Plan, 2014

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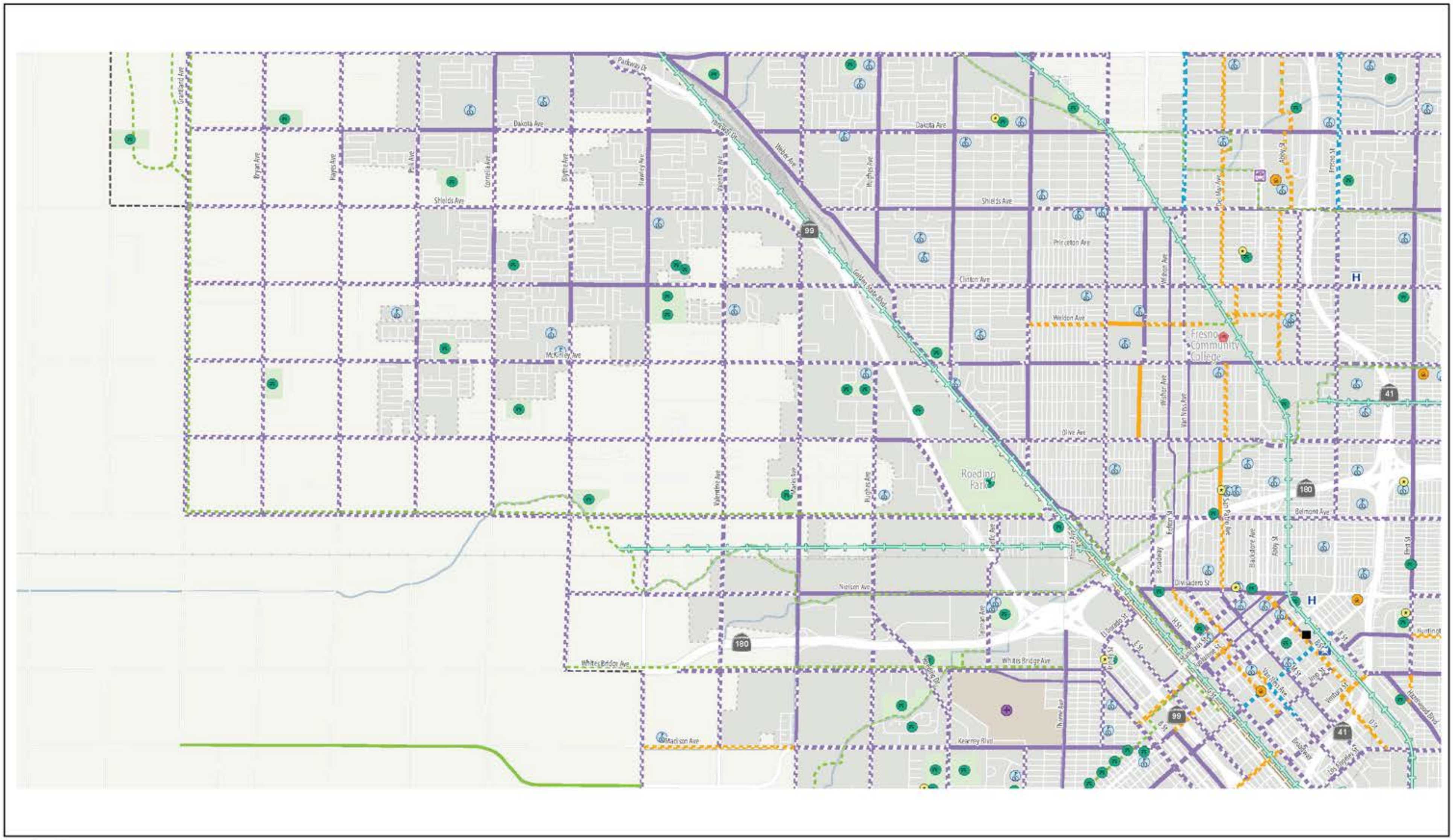

LSA

Legend

Existing Bicycle Facilities	Planned Bicycle Facilities
━ Class I Bike Path	- - - Class I Bike Path
━ Class II Bike Lane	- - - Class II Bike Lane
━ Class III Bike Route	- - - Class III Bike Route
	- - - Class IV Separated Bikeways

N

0 2,500 5,000

FEET

FIGURE 3-3

2740 West Nielsen Warehouse Project
Traffic Impact Study

City of Fresno Existing and Proposed Bikeway Network

SOURCE: Fresno Active Transportation Plan, December 2016

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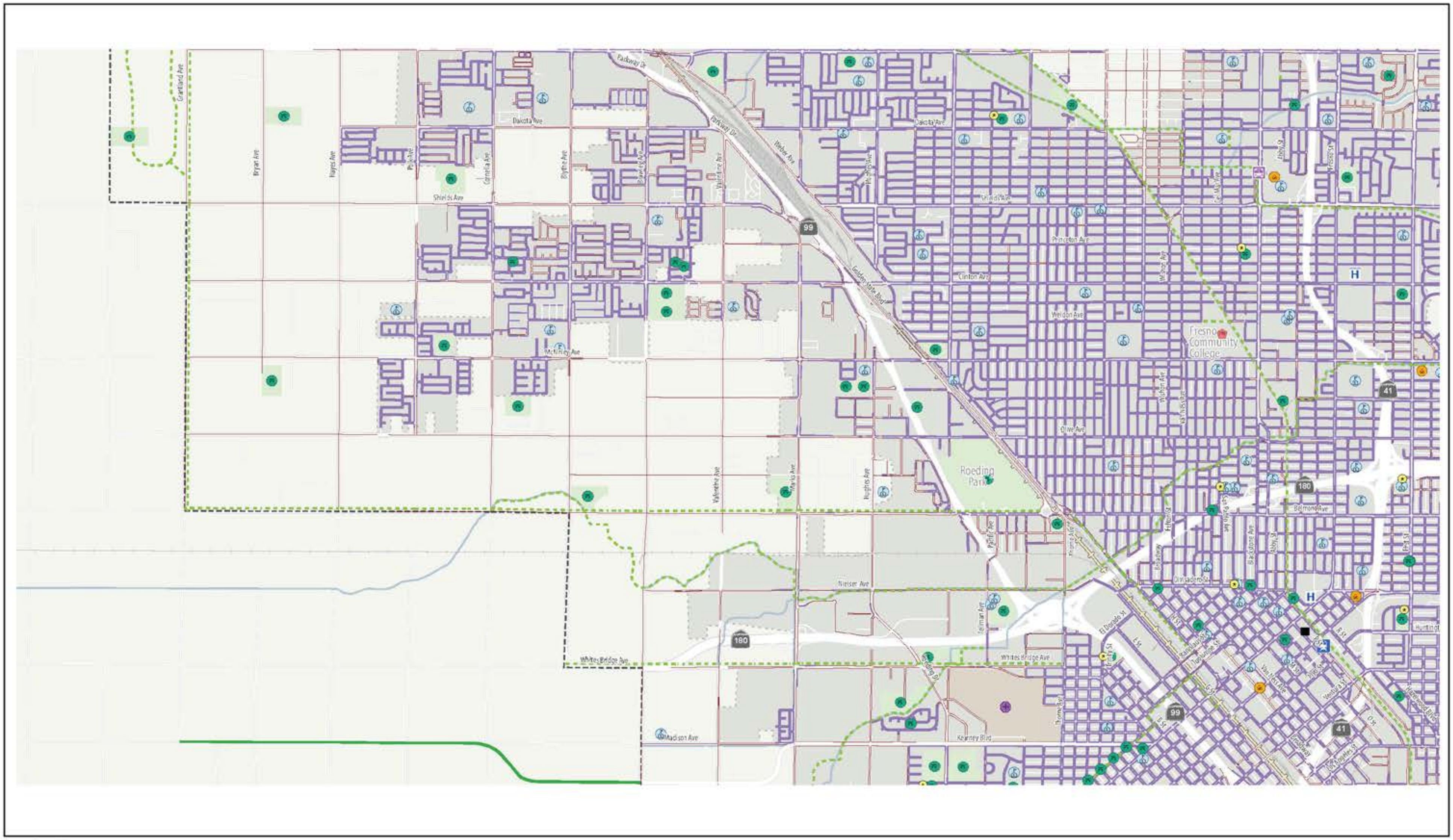

LSA

FIGURE 3-4

Legend

- Class I Bike Path
- Class I Bike Path
- Existing Sidewalk
- Planned Sidewalks

N

0 2,500 5,000
FEET

2740 West Nielsen Warehouse Project
Traffic Impact Study

City of Fresno Existing and Proposed Sidewalks

SOURCE: Fresno Active Transportation Plan, December 2016

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4.0 TRAFFIC VOLUMES FOR WITHOUT PROJECT SCENARIOS

4.1 EXISTING TRAFFIC VOLUMES

Traffic volumes for existing year traffic conditions are typically developed using existing count data collected at study intersections and roadway segments. Due to the current statewide school and office closures/restrictions for the COVID-19 pandemic, new traffic counts will not reflect realistic traffic conditions at the study intersections. Traffic counts were collected in August 2021. However, LSA consulted traffic counters to obtain historic traffic counts at study intersections wherever available to identify the differences between COVID time and historical traffic counts. Existing counts were adjusted accordingly based on the difference between these two counts. Following is a brief description of the development of existing traffic volumes from historic and COVID counts.

Step 1: For the intersection of Marks Avenue/Belmont Avenue, historic counts were available for the year 2016. To develop the existing 2021 traffic counts, a 2 percent per annum growth was applied to these counts and compared to the 2021 counts by turning movements. The higher of the turning movements was taken as the adjusted 2021 volumes.

Step 2: All other study intersections did not have any historic counts available. Therefore, to develop existing traffic volumes at these intersections, a percentage growth adjustment was applied to the counts collected in August 2021 to reflect existing conditions. The percentage difference between the COVID counts and the adjusted existing volumes on all four approaches at the intersection of Marks Avenue/Belmont Avenue was developed for the percentage growth adjustment to be used at the remaining study intersections. It was observed that the north-south direction has a higher traffic volume based on the comparison of the adjusted historical counts to the August 2021 counts, while the east-west direction has a higher traffic volumes for the August 2021 counts. Therefore, the percentage growth adjustment was applied for only the north-south direction/approaches along Marks Avenue.

Step 3: For other intersections along Marks Avenue, August 2021 traffic counts were adjusted based on the growth rate developed in Step 2.

Step 4: Vehicle classification counts were collected at the intersections of Marks Avenue/Belmont Avenue, Marks Avenue/Nielsen Avenue, Marks Avenue/SR-180 Westbound Ramps, and Marks Avenue/SR-180 Eastbound Ramps. At these locations, counts were converted to Passenger Car Equivalent (PCE) volumes. The concept of PCEs accounts for the larger impact of trucks on traffic operations. It does so by assigning each type of truck a PCE factor that represents the number of passenger vehicles that could travel through an intersection in the same time that a particular type of truck could. PCE volumes at study intersections were computed using a factor of 2.0, consistent with the HCM 6 methodologies.

Step 5: The percentage of trucks at the remaining study intersections without classification counts was determined based on truck percentages derived from adjacent intersections with classification counts. At these locations, PCE volumes were computed using a PCE factor of 2.0, consistent with the HCM 6 methodologies.

Figure 4-1 illustrates existing peak hour traffic volumes at study intersections. Table 4-A illustrates existing daily traffic volumes at the study roadway segments. Detailed counts are included in Appendix B. Detailed volume development worksheets are included in Appendix C.

4.2 NEAR-TERM APPROVED AND PENDING (2023) WITHOUT PROJECT TRAFFIC VOLUMES

Traffic volumes for Near-term approved and pending (2023) conditions were developed by applying a growth rate of 2 percent per annum to the existing without project traffic volumes and adding trips from approved and pending cumulative projects in the area.

Information concerning cumulative projects in the vicinity of the proposed project was obtained from both the City of Fresno and County of Fresno. Figure 4-2 illustrates the cumulative project locations. The trip generation for cumulative projects was developed using trip generation rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition), and/or using information from approved traffic studies where available.

Table 4-B lists the approved and pending projects included in this analysis, and shows the cumulative projects are estimated to generate 330 new a.m. peak hour trips, 389 new p.m. peak hour trips, and 4,450 daily trips.

Cumulative project trips were assigned to the roadway network based on their locations in relation to surrounding land uses and regional arterials, and/or using information from approved traffic studies where available. Figure 4-3 illustrates the peak hour cumulative project trip assignment at the study area intersections. Figure 4-4 illustrates the peak hour traffic volumes at study intersections under Near-term approved and pending (2023) without project conditions. Table 4-C shows Near-term approved and pending (2023) daily volumes at the study area roadway segments.

It should be noted that the volume development for this scenario was prepared to develop the volumes for Near-term approved and pending (2023) with project scenario. As such, this scenario was not evaluated for operational performances.

4.3 CUMULATIVE YEAR (2035) WITHOUT PROJECT TRAFFIC VOLUMES

Cumulative Year (2035) no Project volume was developed using forecast volumes obtained from the latest version of the Fresno Council of Governments (Fresno COG) Activity Based Model (ABM) and by applying the Fresno COG recommended post-processing methodologies. Figure 4-5 illustrates the peak hour traffic volumes at study intersections under Cumulative Year (2035) without project conditions. Table 4-D shows Cumulative Year (2035) daily volumes at the study area roadway segments.

4.4 LIST OF CHAPTER 4.0 FIGURES AND TABLES

- Figure 4-1: Existing Peak Hour Traffic Volumes
- Figure 4-2: Cumulative Project Locations
- Figure 4-3: Cumulative Projects Trip Assignment

- Figure 4-4: Near-term approved and pending (2023) without Project Peak Hour Traffic Volumes
- Figure 4-5: Cumulative Year (2035) without Project Peak Hour Traffic Volumes
- Table 4-A: Existing Roadway Segment Daily Traffic Volumes
- Table 4-B: Cumulative Projects Trip Generation
- Table 4-C: Near term approved and pending (2023) Roadway Segment Daily Traffic Volumes
- Table 4-D: Cumulative Year (2035) Roadway Segment Daily Traffic Volumes

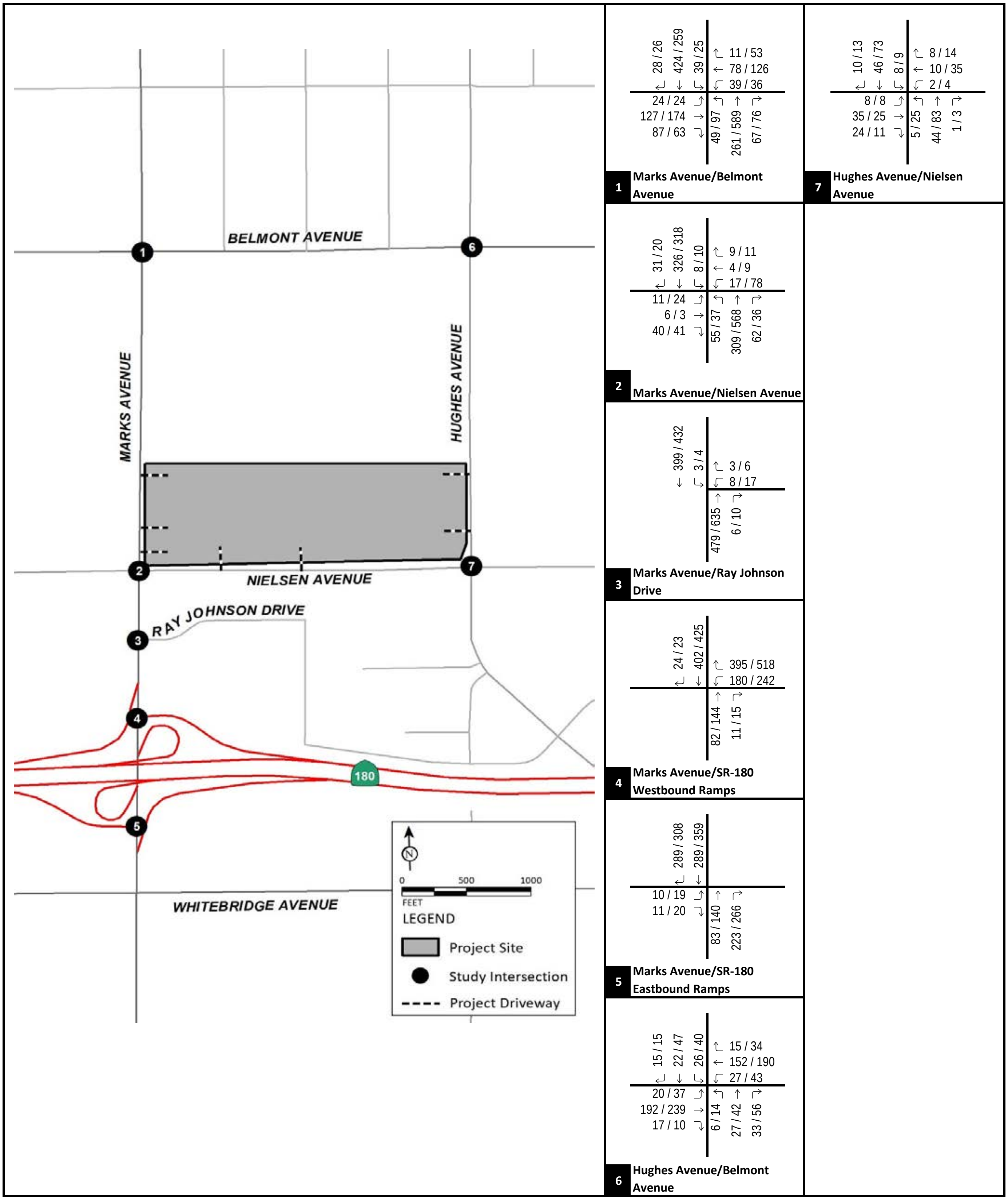

FIGURE 4-1

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Existing Peak Hour Traffic Volumes

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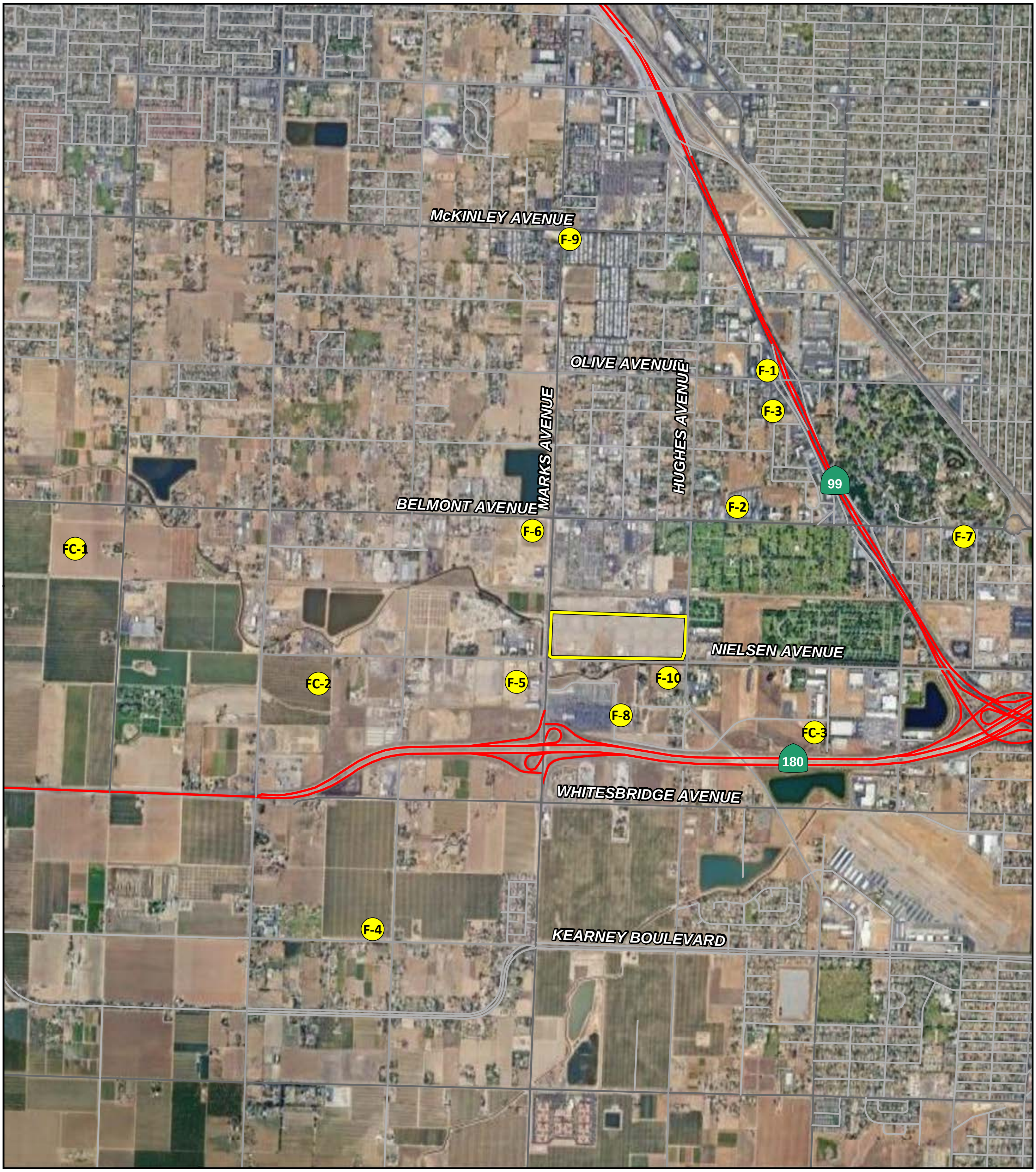

LSA

FIGURE 4-2

LEGEND

▭ Project Location

● Cumulative Project Location

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

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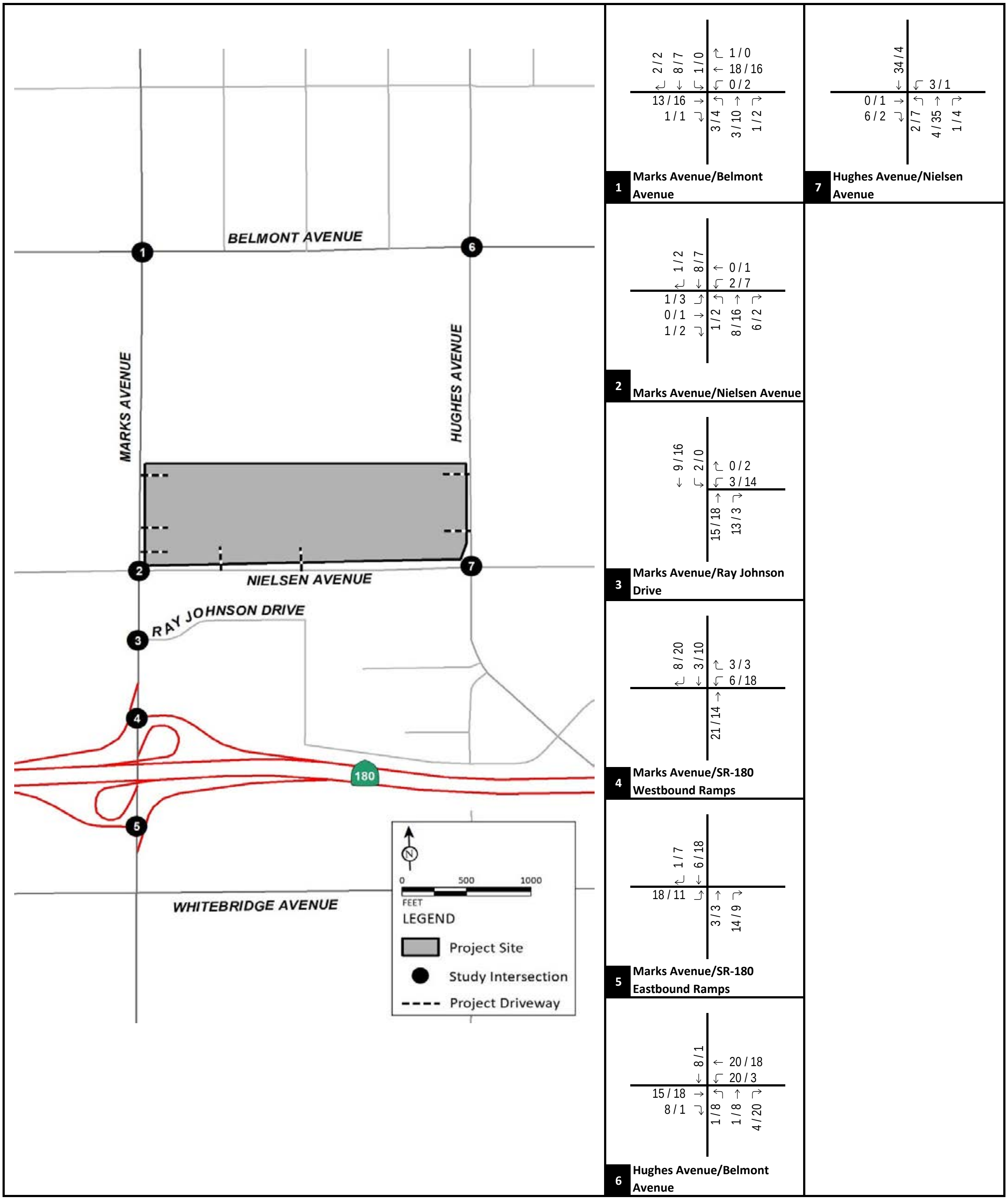


FIGURE 4-3

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Project Trip Assignment

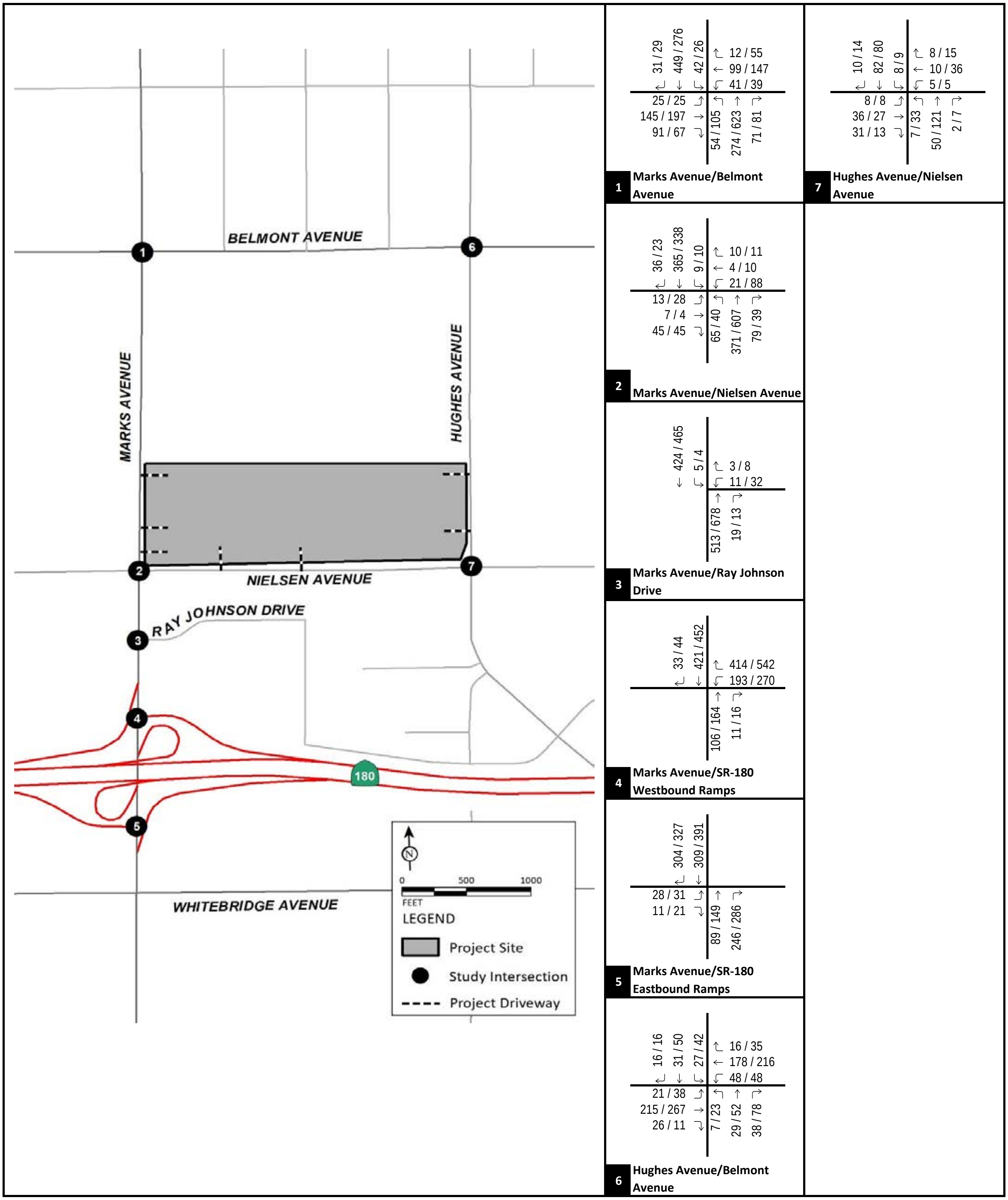
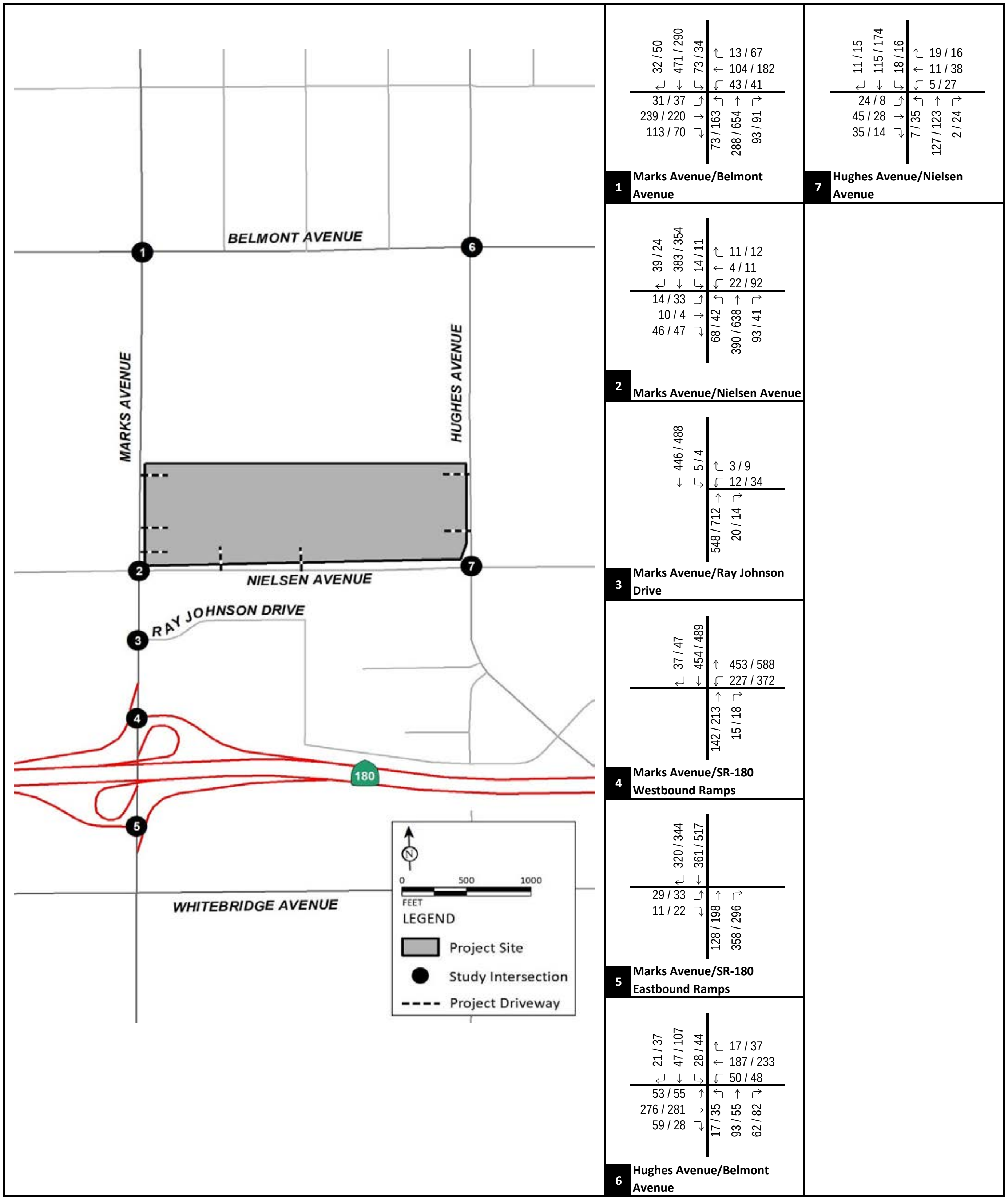


FIGURE 4-4

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Near-term approved and pending (2023) without Project Peak Hour Traffic Volumes



LSA

FIGURE 4-5

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Year (2035) without Project Peak Hour Traffic Volumes

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Table 4-A - Existing Daily Traffic Volumes

Roadway	#	Segment	Existing ADT	Project Trips	Existing With Project ADT
Marks Avenue	**1**	Marks Avenue, between Belmont Avenue and Nielsen Avenue	10,190	1,038	11,228
	2	Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	11,554	592	12,146
	3	Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	12,019	592	12,611
	4	Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	10,651	326	10,977
Belmont Avenue	**5**	Belmont Avenue, between Marks Avenue and Hughes Avenue	7,240	310	7,550
Nielsen Avenue	**6**	Nielsen Avenue, between Marks Avenue and Hughes Avenue	1,614	616	2,230
Hughes Avenue	**7**	Hughes Avenue, between Belmont Avenue and Nielsen Avenue	2,604	456	3,060

Table 4-B - Cumulative Projects Trip Generation

				A.M. Peak Hour			P.M. Peak Hour			Daily
Project No.	**Project Name/Land Use/Builder/Applicant**	**Units**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	
F-1	**P21-02291/Step Up on 99**									
	1240 N Crystal Avenue									
	Proposed Use - Affordable Housing	98	DU							
	Trips/Unit[1]			0.11	0.35	0.46	0.35	0.21	0.56	7.32
	Trip Generation			11	34	45	34	21	55	717
	Proposed Use - Multifamily Housing	63	DU							
	Trips/Unit[1]			0.11	0.35	0.46	0.35	0.21	0.56	7.32
	Trip Generation			7	22	29	22	13	35	461
	Existing Use - Motel	98	RM							
	Trips/Unit[2]			0.14	0.24	0.38	0.21	0.17	0.38	3.35
	Trip Generation			14	24	38	21	17	38	328
	Total Net Trip Generation (Proposed - Existing)			**4**	**32**	**36**	**35**	**17**	**52**	**850**
F-2	**P19-00662/Derrel's Mini Storage West Belmont Expansion**									
	1800 W Belmont Avenue, 1827 W Dudley Avenue									
	Replacement of existing office/residential building with a new office/caretake	105.525	TSF							
	Trips/Unit[3]			0.06	0.04	0.10	0.08	0.09	0.17	1.51
	Trip Generation			**6**	**4**	**10**	**8**	**9**	**17**	**159**
F-3	**P21-02299/Sun Lodge**									
	1101 N Parkway Drive									
	Proposed Use - Affordable Housing	97	DU							
	Trips/Unit[1]			0.11	0.35	0.46	0.35	0.21	0.56	7.32
	Trip Generation			11	34	45	34	20	54	710
	Proposed Use - Multifamily Housing	63	DU							
	Trips/Unit[1]			0.11	0.35	0.46	0.35	0.21	0.56	7.32
	Trip Generation			7	22	29	22	13	35	461
	Existing Use - Motel	97	RM							
	Trips/Unit[2]			0.14	0.24	0.38	0.21	0.17	0.38	3.35
	Trip Generation			14	23	37	20	16	36	325
	Total Net Trip Generation (Proposed - Existing)			**4**	**33**	**37**	**36**	**17**	**53**	**846**
F-4	**P19-04220, P19-04222/The OASIS Project**									
	Northwest and Northeast corners of intersection of Madison Avenue and Valentina Avenue									
	84 Single-Family Lots	84	SFDU							
	Trips/Unit[4]			0.19	0.55	0.74	0.62	0.37	0.99	9.44
	Trip Generation			**16**	**46**	**62**	**52**	**31**	**83**	**793**
F-5	**P19-06300**									
	3075 W Nielsen Avenue									
	Replacing a 7,000 sf fire damaged metal building with a new 4,920 sf metal bu	4.920	TSF							
	Trips/Unit[5]			0.58	0.36	0.94	1.83	1.98	3.81	37.75
	Trip Generation			3	2	5	9	10	19	186
	Pass-by Trips[6]			0	0	0	(3)	(3)	(6)	(63)
	Net Trip Generation			**3**	**2**	**5**	**6**	**7**	**13**	**123**
F-6	**P21-03628**									
	963 N Marks Avenue									
	Subdivide industrial parcel	148	TSF							
	Trips/Unit[7]									
	Trip Generation			**17**	**3**	**20**	**22**	**4**	**26**	**402**

Table 4-B - Cumulative Projects Trip Generation

				A.M. Peak Hour			P.M. Peak Hour			Daily
Project No.	**Project Name/Land Use/Builder/Applicant**	**Units**		**In**	**Out**	**Total**	**In**	**Out**	**Total**	
F-7	**P19-02847/Red Onion Drive Thru**									
	555 W Belmont Avenue									
	Proposed Use - Fast-Food Restaurant w/ Drive-Through	3.500	TSF							
	Trips/Unit[8]			20.50	19.69	40.19	16.99	15.68	32.67	470.95
	Trip Generation			72	69	141	59	55	114	1,648
	Pass-by Trips[9]			(35)	(34)	(69)	(30)	(28)	(58)	(816)
	Net Trip Generation			**37**	**35**	**72**	**29**	**27**	**56**	**832**
	Existing Use - Fast-Food Restaurant	3.500	TSF							
	Trips/Unit[10]			15.06	10.04	25.10	14.17	14.17	28.34	346.23
	Trip Generation			53	35	88	50	50	100	1,212
	Pass-by Trips[11]			(26)	(17)	(43)	(25)	(25)	(50)	(600)
	Net Trip Generation			**27**	**18**	**45**	**25**	**25**	**50**	**612**
	Net Gross Trip Generation (Proposed - Existing)			**19**	**34**	**53**	**9**	**5**	**14**	**436**
	Net Pass-By Trips (Proposed - Existing)			**(9)**	**(17)**	**(26)**	**(5)**	**(3)**	**(8)**	**(216)**
	Net Project Trip Generation (Proposed - Existing)			**10**	**17**	**27**	**4**	**2**	**6**	**220**
F-8	**P20-03068/Truck Wash and Lube Building**									
	125 S Pleasant Avenue									
	8,100 sf metal building containing 2 truck wash bays, 1 truck lube bay	3	Bay							
	Trips/Unit[12]			1.92	0.69	2.62	0.69	2.23	2.92	23.08
	Trip Generation			**6**	**2**	**8**	**2**	**7**	**9**	**69**
F-9 .	**P19-04564/McKinley Ave Retail & Residential Complex**									
	2809 W McKinley Avenue									
	Retail Building	5.480	TSF							
	Trips/Unit[5]			0.58	0.36	0.94	1.83	1.98	3.81	37.75
	Trip Generation			3	2	5	10	11	21	207
	Pass-by Trips[6]			0	0	0	(3)	(4)	(7)	(70)
	Net Trip Generation			**3**	**2**	**5**	**7**	**7**	**14**	**137**
	Multifamily Housing	6	DU							
	Trips/Unit[1]			0.11	0.35	0.46	0.35	0.21	0.56	7.32
	Trip Generation			1	2	3	2	1	3	44
	Project Gross Trip Generation			**4**	**4**	**8**	**12**	**12**	**24**	**251**
	Pass-By Trips			**0**	**0**	**0**	**(3)**	**(4)**	**(7)**	**(70)**
	Net Project Trip Generation			**4**	**4**	**8**	**9**	**8**	**17**	**181**
F-10 .	**P19-02113/Royalty Freight Trucking Service**									
	50 S Hughes Avenue									
	The applicant is proposing to develop a new 26,143 sf truck-service facility for	6	Bay							
	Trips/Unit[12]			1.92	0.69	2.62	0.69	2.23	2.92	23.08
	Trip Generation			**12**	**4**	**16**	**4**	**13**	**17**	**138**
FC-1 .	**AA3752**									
	Rezoning of 0.75 acre to commercial/light manufacturing use									
	South of Belmont between North Brawley and North Valentine Avenu	8.17	TSF							
	Trips/Unit[13]			0.48	0.14	0.62	0.21	0.46	0.67	3.93
	Trip Generation			**4**	**1**	**5**	**2**	**4**	**6**	**32**
FC-2 .	**CUP3066**									
	Kochergen Tranefer Facility									
	East of Brawley Avenue and North of Nieslen Avenue	7.00	Ac							
	Trip Generation[14]			**33**	**26**	**53**	**26**	**33**	**53**	**530**
FC-3 .	**CUP3629**									
	2.67 acre waste transfer station									
	310 S. West Avenue	2.67	Ac							
	Trip Generation[15]			**39**	**4**	**43**	**4**	**39**	**43**	**170**

Table 4-B - Cumulative Projects Trip Generation

Project No.	Project Name/Land Use/Builder/Applicant	Units	A.M. Peak Hour In	A.M. Peak Hour Out	A.M. Peak Hour Total	P.M. Peak Hour In	P.M. Peak Hour Out	P.M. Peak Hour Total	Daily
		Total Gross Trip Generation	167	195	356	218	198	410	4,799
		Total Pass-By Trips	(9)	(17)	(26)	(11)	(10)	(21)	(349)
		Total Net Trip Generation	**158**	**178**	**330**	**207**	**188**	**389**	**4,450**

Notes:

DU = Dwelling Units; VFP = Vehicle Fueling Positions; TSF = Thousand Square Feet.

[1] Rates based on Land Use 220 - "Multifamily Housing (Low-Rise)" from Institute of Transportation Engineers (ITE) *Trip Generation Manual,* 10th Edition. Setting/Location used is General

[2] Rates based on Land Use 320 - "Motel" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[3] Rates based on Land Use 151 - "Mini-Warehouse" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[4] Rates based on Land Use 210 - "Single-Family Detached Housing" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[5] Rates based on Land Use 820 - "Shopping Center" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[6] Pass-by rates obtained from the ITE Trip Generation Handbook (3rd Edition) for Land Use 820. A.m. and p.m. peak period pass-by rates for this land use in the ITE handbook are 0 percent and 34 percent respectively. No daily pass-by rates are provided. Therefore, the daily pass-by rate was obtained as an average of the a.m. and p.m. peak period pass-by rates.

[7] Rates are based on WRCOG TUMF Warehosue facilities Trip generation rates.

[8] Rates based on Land Use 934 - "Fast-Food Restaurant with Drive-Through Window" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[9] Pass-by rates obtained from the ITE Trip Generation Handbook (3rd Edition) for Land Use 934. A.m. and p.m. peak period pass-by rates for this land use in the ITE handbook are 49 percent and 50 percent respectively. No daily pass-by rates are provided. Therefore, the daily pass-by rate was obtained as an average of the a.m. and p.m. peak period pass-by rates.

[10] Rates based on Land Use 933 - "Fast-Food Restaurant without Drive-Through Window" from ITE Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[11] Pass-by rates obtained from the ITE Trip Generation Handbook (3rd Edition) for Land Use 934. A.m. and p.m. peak period pass-by rates for this land use in the ITE handbook are 49 percent and 50 percent respectively. No daily pass-by rates are provided. Therefore, the daily pass-by rate was obtained as an average of the a.m. and p.m. peak period pass-by rates.

[12] Rates are based on Driveway Survey Counts for Truck Maintenance facilities

[13] Rates based on Land Use 150 - "Warehouse" from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Setting/Location used is General Urban/Suburban.

[14] Trip generation and distribution obtained from Proposed Kochergen Transfer facility Traffic Impact Study Prepared by Peter's Engineering Group.

[15] Trip generation Obtained from the Operational Statement for County of Fresno Regional Environmental Complience Center.

Table 4-C - Near-term Approved and Pending (2023) Daily Traffic Volumes

Roadway	#	Segment	Existing (2021) ADT	2021-23 Growth	Cumulative Projects Trips	Near-term (2023) ADT	Project Trips	Near-term (2023) With Project ADT
Marks Avenue	**1**	Marks Avenue, between Belmont Avenue and Nielsen Avenue	10,190	408	340	10,938	1,038	11,976
	2	Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	11,554	462	392	12,408	592	13,000
	3	Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	12,019	481	433	12,933	592	13,525
	4	Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	10,651	426	386	11,463	326	11,789
Belmont Avenue	**5**	Belmont Avenue, between Marks Avenue and Hughes Avenue	7,240	290	375	7,905	310	8,215
Nielsen Avenue	**6**	Nielsen Avenue, between Marks Avenue and Hughes Avenue	1,614	65	88	1,767	616	2,383
Hughes Avenue	**7**	Hughes Avenue, between Belmont Avenue and Nielsen Avenue	2,604	104	88	2,796	456	3,252

Table 4-D - Cumulative Year (2035) Daily Traffic Volumes

Roadway	#	Segment	Cumulative Year (2035) ADT	Project Trips	Cumulative Year (2035) With Project ADT
Marks Avenue	**1**	Marks Avenue, between Belmont Avenue and Nielsen Avenue	11,651	1,038	12,689
	2	Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	13,244	592	13,836
	3	Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	13,706	592	14,298
	4	Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	13,065	326	13,391
Belmont Avenue	**5**	Belmont Avenue, between Marks Avenue and Hughes Avenue	8,846	310	9,156
Nielsen Avenue	**6**	Nielsen Avenue, between Marks Avenue and Hughes Avenue	1,772	616	2,388
Hughes Avenue	**7**	Hughes Avenue, between Belmont Avenue and Nielsen Avenue	3,531	456	3,987

5.0 PROJECT TRAFFIC

5.1 PROJECT TRIP GENERATION

The trip generation rates from Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) Land Use 155 – "High-Cube Fulfillment Center Warehouse" has a small sample size. Recently, Western Riverside Council of Governments (WRCOG) facilitated a Trip Generation Study for such facilities. Therefore, the trip generation for the proposed project was developed using rates from the WRCOG *Transportation Uniform Mitigation Fee (TUMF) High-Cube Warehouse Trip Generation Study* (dated January 29, 2019) prepared by WSP. The study is included within Appendix A. The study provides separate trip generation rates for passenger vehicles, 2-4 axle trucks, and 5+ axle trucks. The truck trips were converted to PCE trips using a PCE factor of 2.0 for 2-4 axle trucks, consistent with HCM recommendations. However, as a conservative approach, a PCE factor of 3.0 was used for 5+ axle trucks, consistent with the practices in several regions within the State. Table 5-A illustrates the project trip generation.

As shown in Table 5-A, the project is estimated to generate 2,458 daily PCE trips, with 137 PCE trips occurring during the a.m. peak hour and 176 PCE trips occurring during the p.m. peak hour.

5.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution patterns were obtained from select zone model runs of the Fresno COG ABM, which take into account the location of the proposed project in relation to surrounding land uses and the regional roadway network. Separate select zone trip distributions for passenger car and truck trips were obtained from the Fresno COG ABM. The select zone distribution plots are included in Appendix C. However, the model does not account for driveway location, driveway access configuration, or the internal site circulation pattern. Therefore, the distribution was manually adjusted to reflect the project driveway locations and access patterns. Figures 5-1 and 5-2 illustrate the trip distributions at study intersections and project driveways for passenger car and truck trips, respectively.

The project trip assignment is the product of the project trip generation and the trip distribution percentages. Figures 5-3 and 5-4 illustrate the trip assignments at study intersections for passenger car and truck PCE trips respectively. Figure 5-5 illustrates the total project PCE trip assignment. It should be noted that these figures also include trip distribution and assignment at all the project driveways. These figures help demonstrate the volume development methodology under plus project conditions with addition of project traffic.

5.3 LIST OF CHAPTER 5.0 FIGURES AND TABLES

- Figure 5-5: Total Project PCE Trip Assignment
- Table 5-A: Project Trip Generation

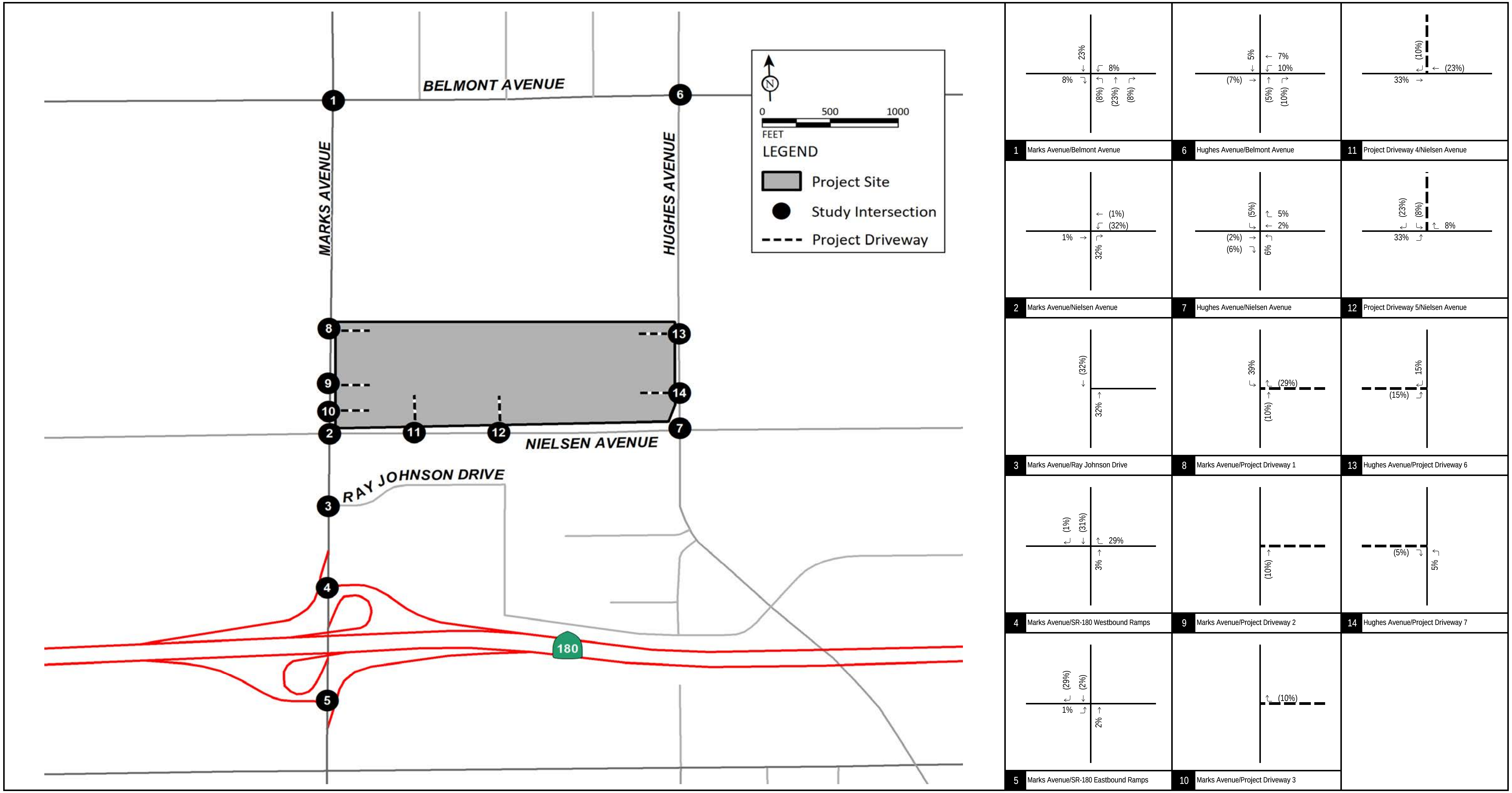

FIGURE 5-1

XX% (YY%)
Inbound (Outbound) Distribution
- - - - Project Driveway

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Distribution - Passenger Vehicles

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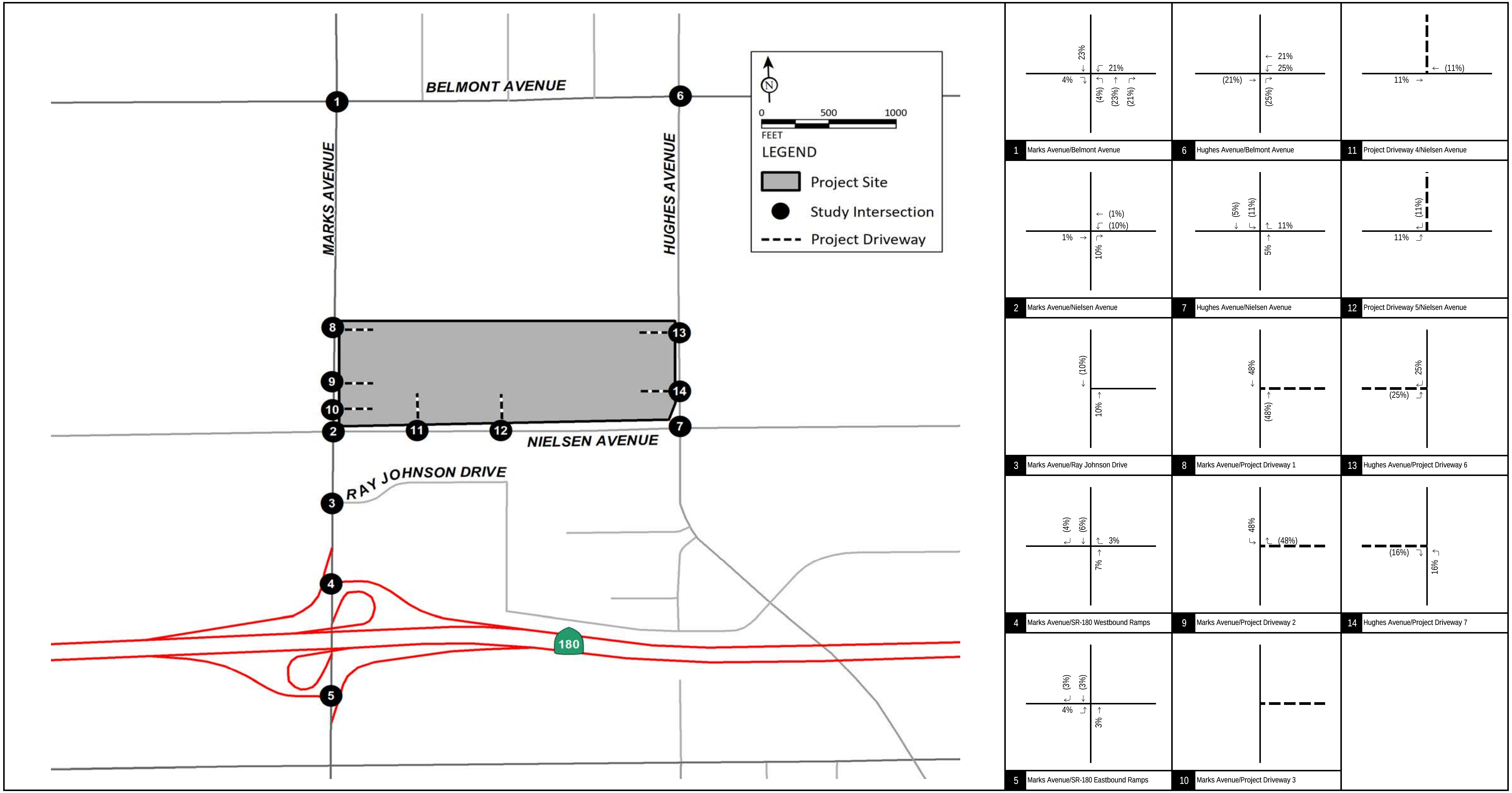

FIGURE 5-2

XX% (YY%)
Inbound (Outbound) Distribution
- - - - Project Driveway

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Distribution - Trucks

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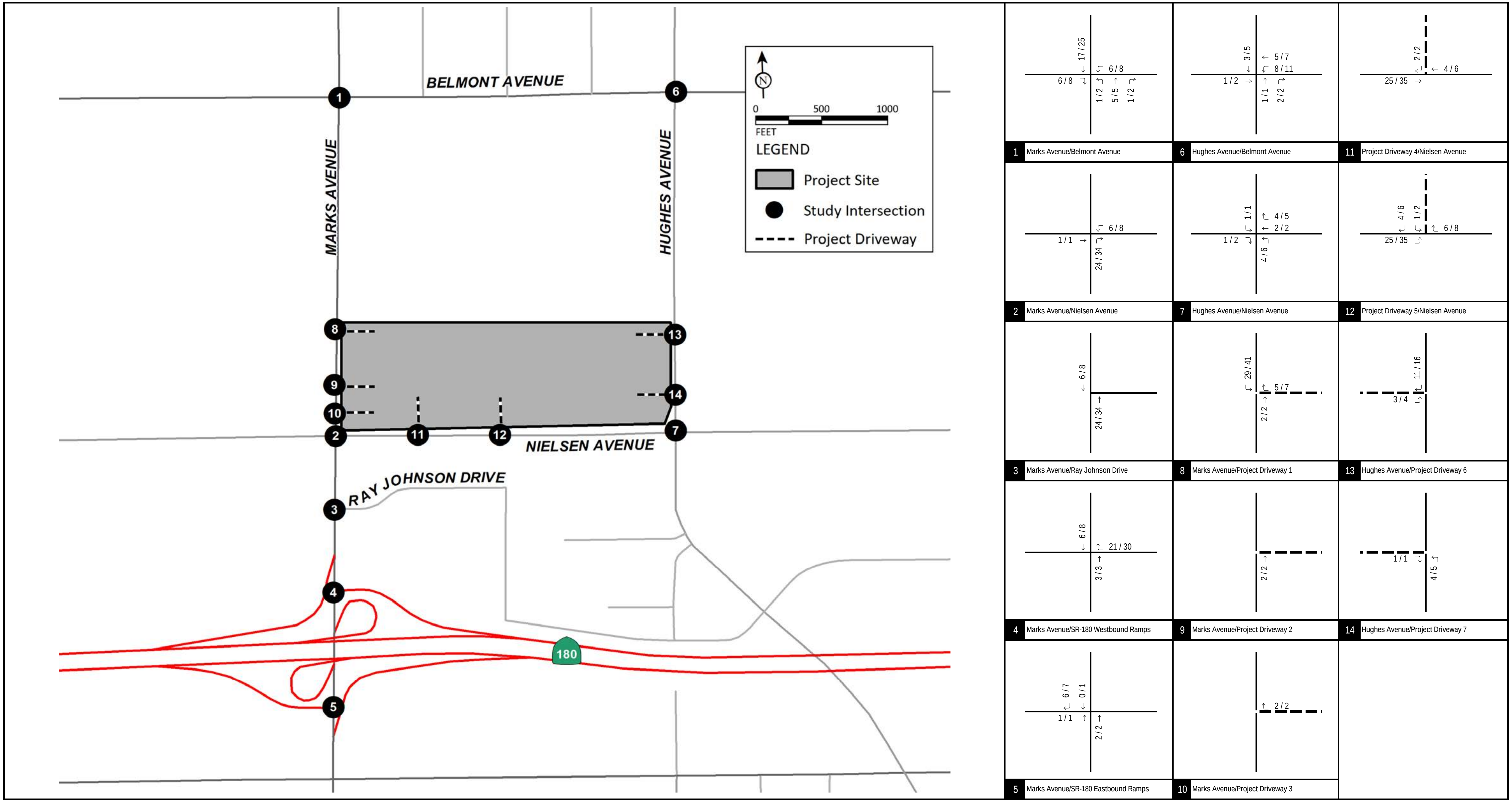

FIGURE 5-3

XX / YY
AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Assignment - Passenger Vehicles

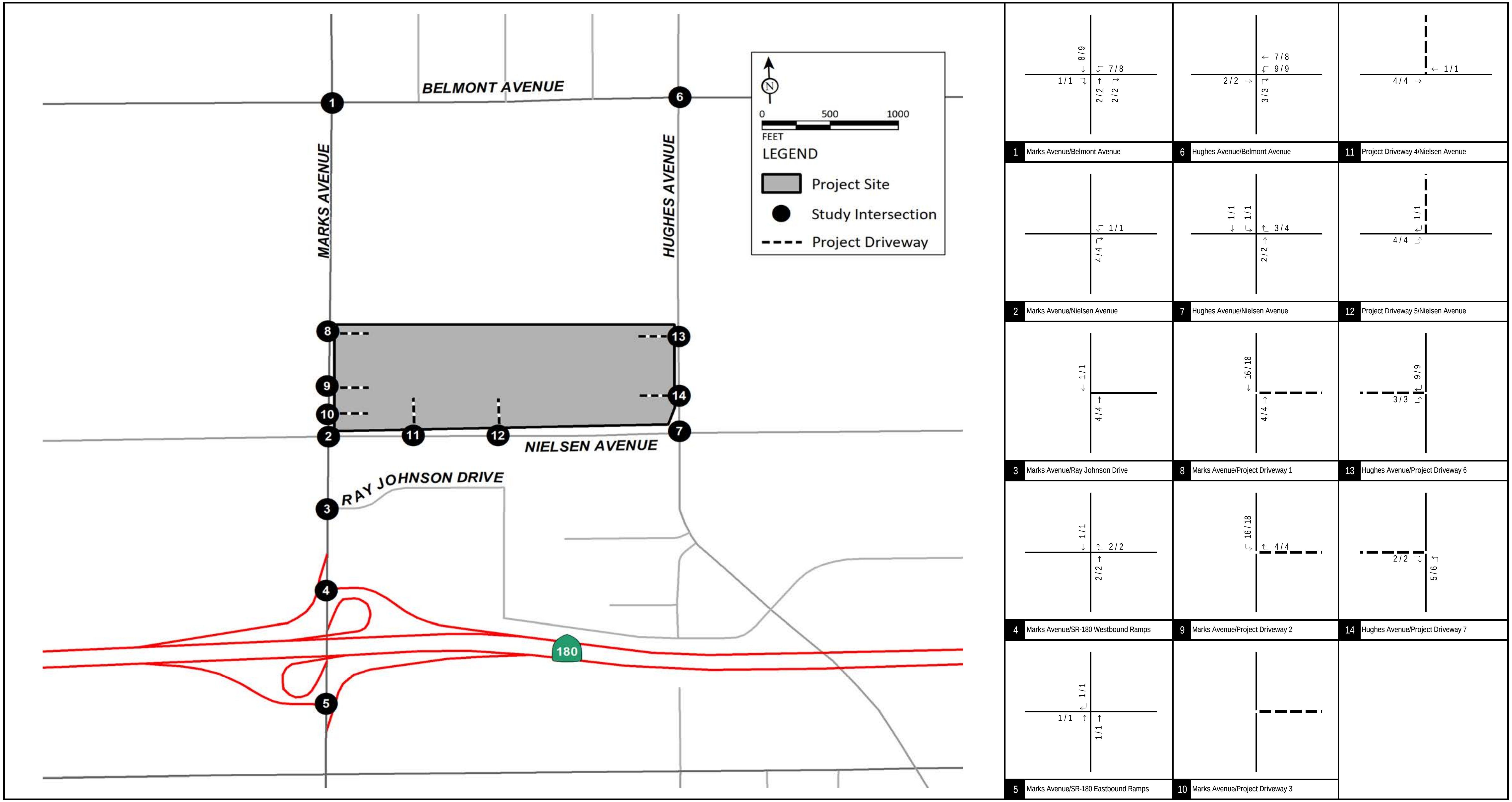

FIGURE 5-4

XX / YY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Assignment - Trucks

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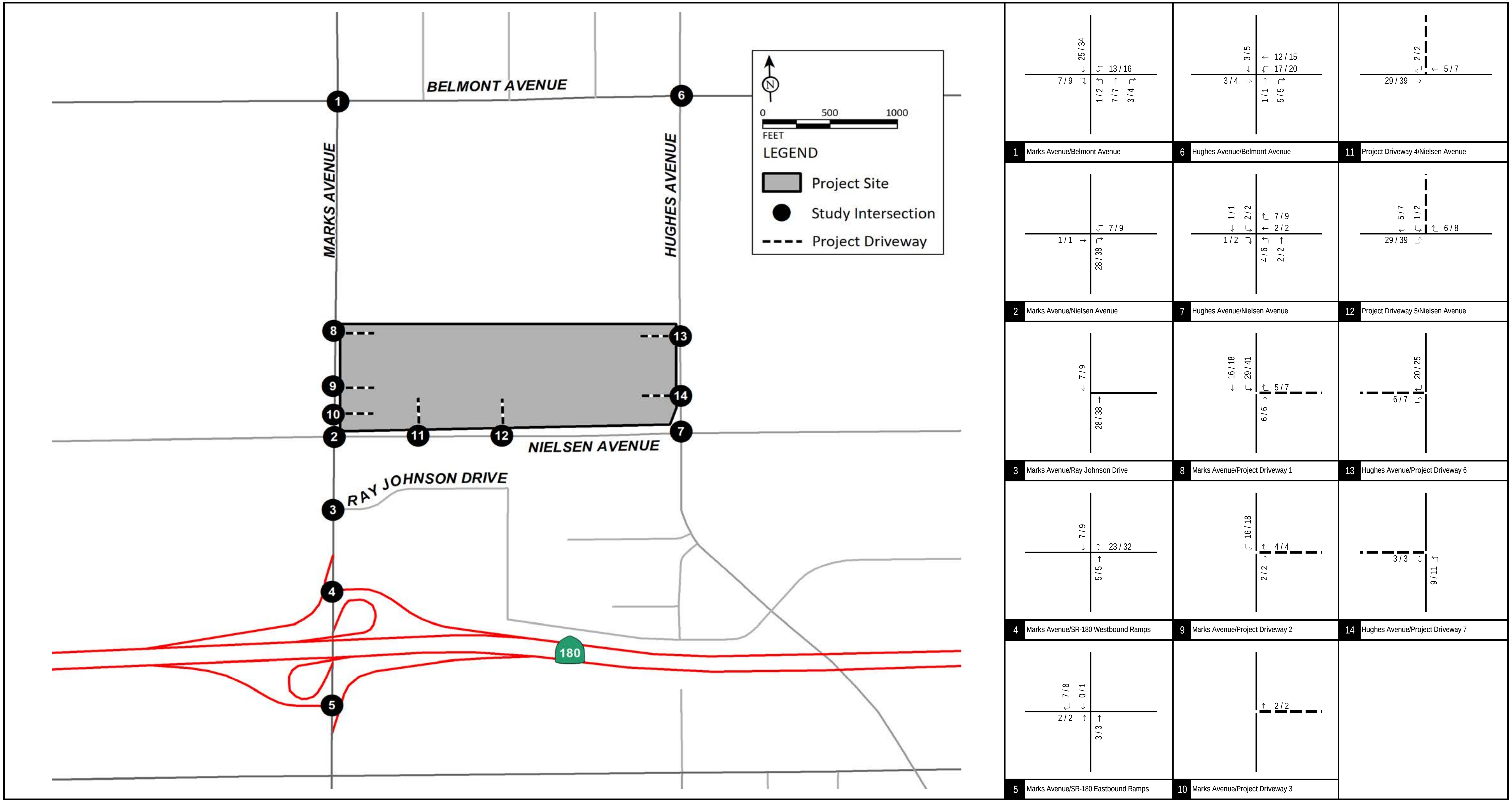

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FIGURE 5-5

XX / YY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study
Total Project PCE Trip Assignment

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Table 5-A - Project Trip Generation

Land Use		Units	A.M. Peak Hour			P.M. Peak Hour			Daily
			In	Out	Total	In	Out	Total	
High-Cube Fulfillment Center[1,2]	901.438	TSF							
Trips/Unit (Cars)			0.083	0.020	0.103	0.117	0.027	0.144	1.750
Trips/Unit (2-4 Axle Trucks)			0.006	0.002	0.008	0.009	0.002	0.011	0.162
Trips/Unit (5+ Axle Trucks)			0.009	0.002	0.011	0.008	0.002	0.010	0.217
Trips/Unit (Total)			0.098	0.024	0.122	0.134	0.031	0.165	2.129
Trip Generation (Cars)			75	18	93	105	24	129	1,578
Trip Generation (2-4 Axle Trucks)			5	2	7	8	2	10	146
Trip Generation (5+ Axle Trucks)			8	2	10	7	2	9	196
Trip Generation (Total Trucks)			13	4	17	15	4	19	342
Trip Generation (Total)			88	22	110	120	28	148	1,920
Trip Generation (Cars)			75	18	93	105	24	129	1,578
PCE Trip Generation (2-4 Axle Trucks)[3]			10	4	14	16	4	20	292
PCE Trip Generation (5+ Axle Trucks)[3]			24	6	30	21	6	27	588
PCE Trip Generation (Total Trucks)			34	10	44	37	10	47	880
PCE Trip Generation (Total)			109	28	137	142	34	176	2,458

Note:

TSF = Thousand Square Feet

[1] Rates from the Western Riverside Council of Governments (WRCOG) *TUMF High-Cube Warehouse Trip Generation Study*, January 2019, prepared by WSP.

[2] The WRCOG study does not provide in/out splits for the peak hour trip generation. Therefore, in/out splits from Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) supplement Land Use 155 - "High-Cube Fulfilment Center Warehouse" have been used for obtaining in/out traffic.

[3] A Passenger Car Equivalent (PCE) factor 2.0 has been taken for 2-4 axle trucks based on Highway Capacity Manual (HCM) recommendations. Further, as a conservative approach, a PCE factor of 3.0 is taken, for 5+ axle trucks, consistent with latest practices in numerous California jurisdictions.

6.0 TRAFFIC VOLUMES FOR WITH PROJECT SCENARIOS

Existing, Near-term approved and pending (2023), and Cumulative year (2035) with project traffic volumes were developed by adding project traffic to the corresponding without project scenarios. Figures 6-1, 6-2, and 6-3 illustrate "with project" peak hour traffic volumes at study intersections under existing, Near-term approved and pending (2023), and Cumulative year (2035) conditions respectively. Previously referenced Tables 4-A, 4-C, and 4-D summarize the "with project" roadway segment daily traffic volumes under existing, Near-term approved and pending (2023), and Cumulative year (2035) conditions.

Detailed volume development worksheets are included in Appendix C.

6.1 LIST OF CHAPTER 6.0 FIGURES

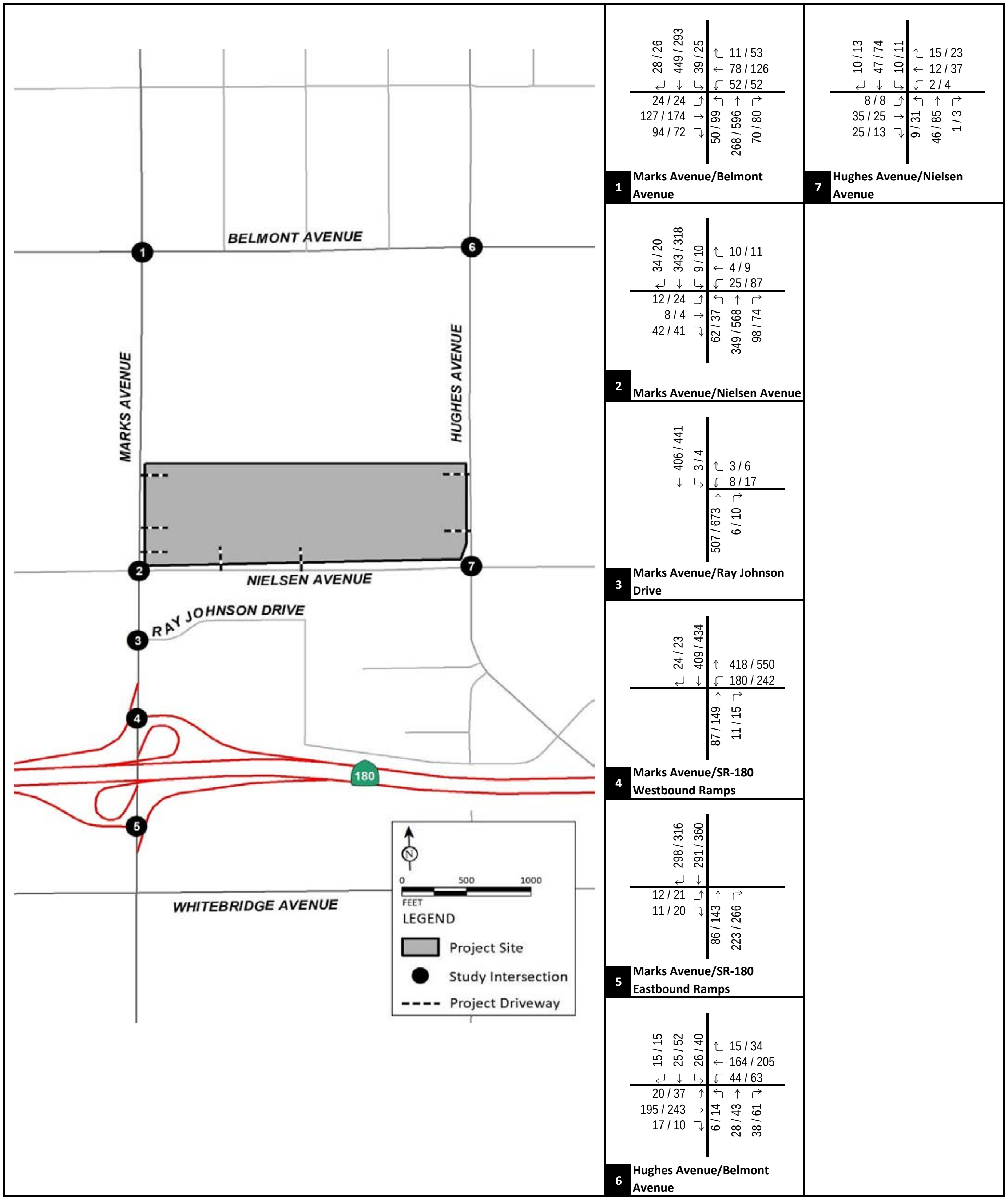

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FIGURE 6-1

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Existing with Project Peak Hour Traffic Volumes

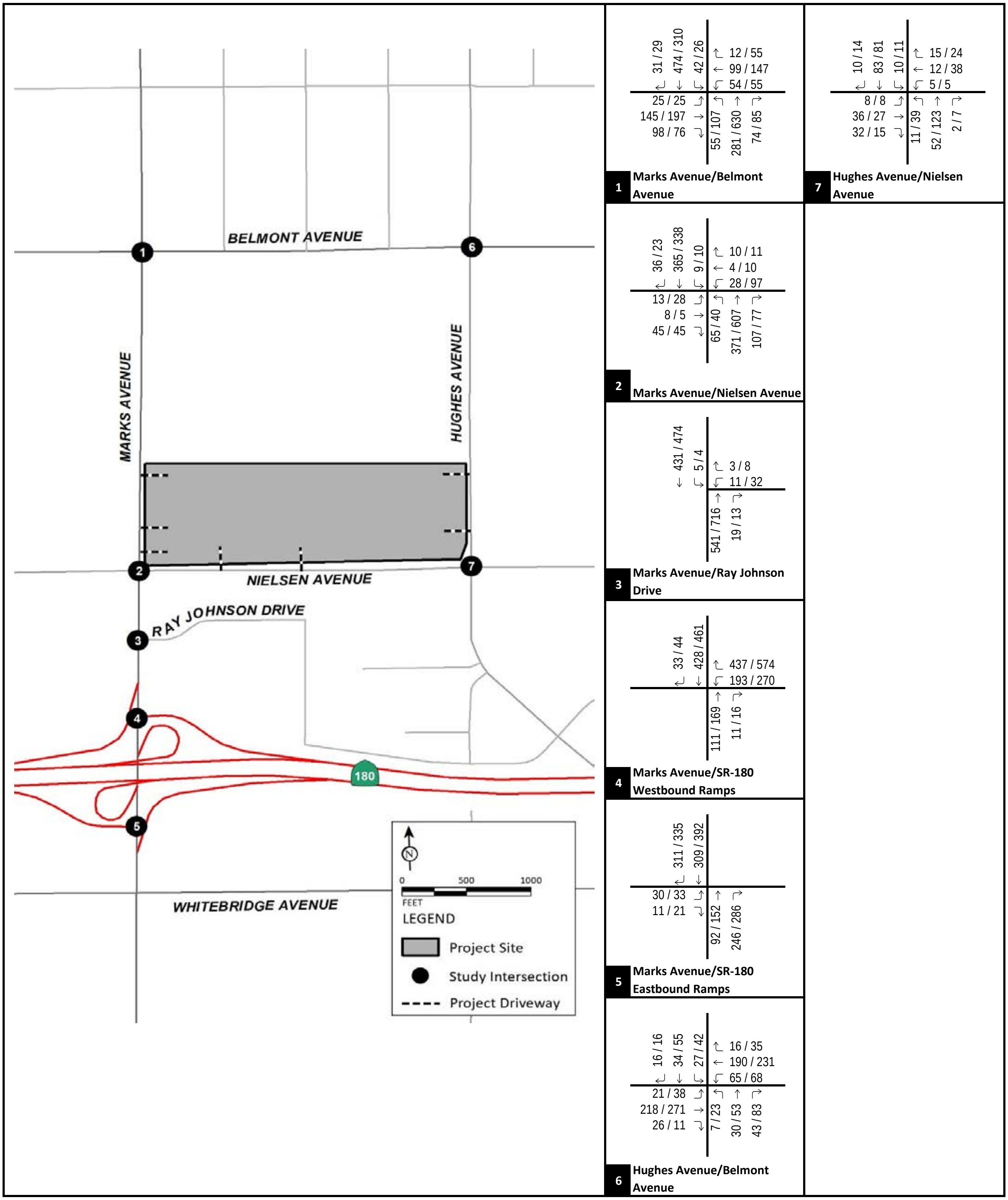

FIGURE 6-2

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Near-term approved and pending (2023) with Project Peak Hour Traffic Volumes

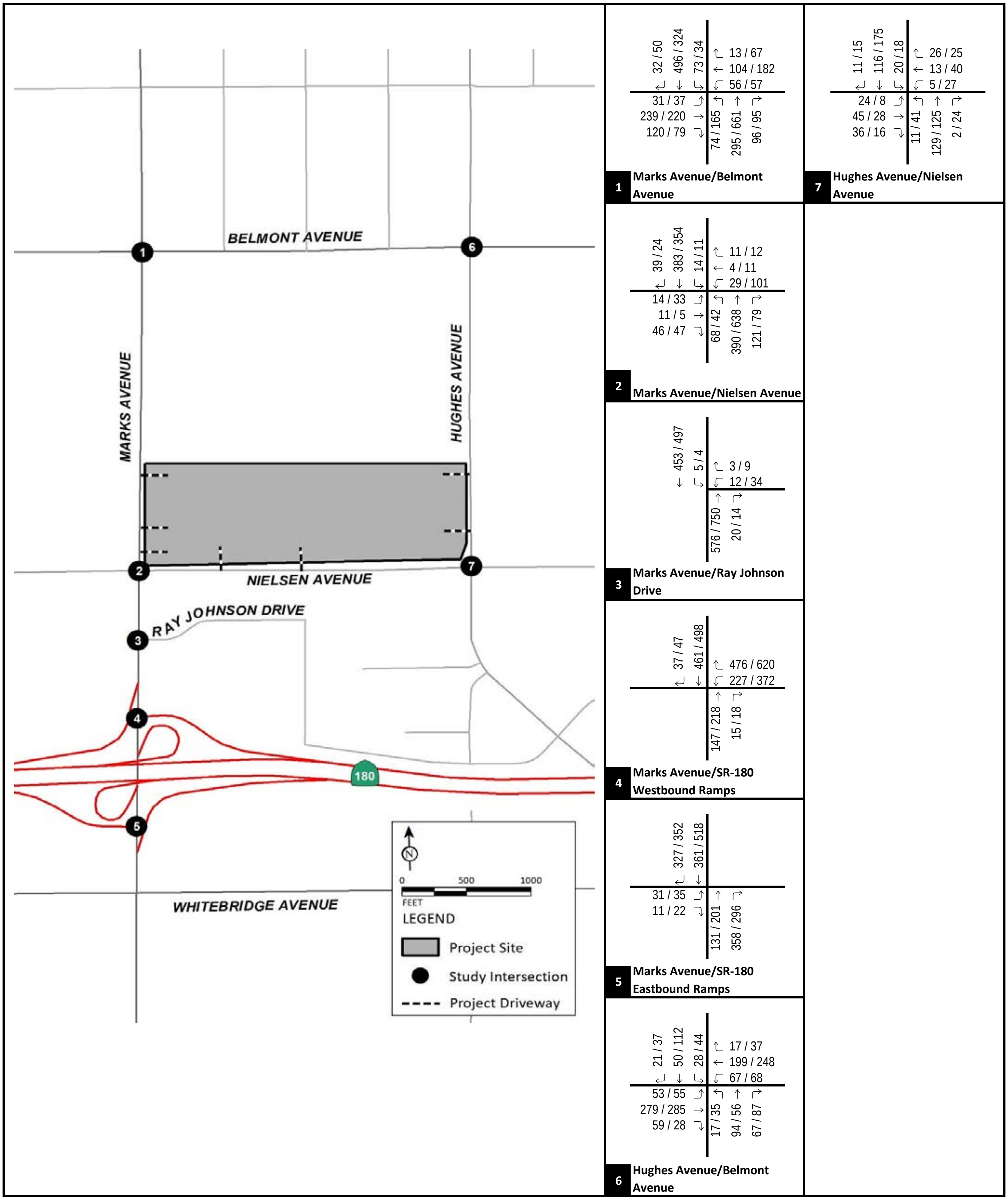

FIGURE 6-3

LSA

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Year (2035) with Project Peak Hour Traffic Volumes

7.0 INTERSECTION AND ROADWAY SEGMENT LEVELS OF SERVICE

7.1 EXISTING LEVELS OF SERVICE

7.1.1 Study Intersections

Previously referenced Figure 3-1 illustrates existing study intersection geometrics and traffic control. An intersection LOS analysis was conducted for existing conditions using the methodologies previously discussed. Table 7-A summarizes the results of this analysis and shows that all intersections are currently operating at a satisfactory LOS except the following:

- Marks Avenue/Belmont Avenue (p.m. peak hour).

Detailed intersection levels of service worksheets are included in Appendix D.

7.1.2 Roadway Segments

A roadway segment LOS analysis was conducted for existing conditions using the methodologies previously discussed. Table 7-B summarizes the results of this analysis and shows that all roadway segments are currently operating at a satisfactory LOS.

7.2 EXISTING WITH PROJECT LEVELS OF SERVICE

Analysis of the existing with project scenario is provided to identify direct project related operational deficiency if the project were to be built and in operation today. This scenario eliminates the effects of ambient growth and other cumulative projects and deals specifically with operational deficiencies only due to the project traffic.

7.2.1 Study Intersections

An intersection LOS analysis was conducted for existing with project conditions using the methodologies previously discussed. Previously referenced Table 7-A summarizes the results of this analysis and shows that the all intersections are forecast to operate at a satisfactory LOS under existing with project conditions except the following:

- Marks Avenue/Belmont Avenue (p.m. peak hour).

It should be noted that this intersection is already operating at a deficient LOS under existing conditions. As such, the project adds to the existing deficiency.

Detailed intersection levels of service worksheets are included in Appendix D.

7.2.2 Roadway Segments

A roadway segment LOS analysis was conducted for existing with project conditions using the methodologies previously discussed. Previously referenced Table 7-B summarizes the results of this analysis and shows that all roadway segments are forecast to operate at a satisfactory LOS under existing with project conditions.

7.3 NEAR-TERM APPROVED AND PENDING (2023) WITH PROJECT LEVELS OF SERVICE

7.3.1 Study Intersections

An intersection LOS analysis was conducted for Near-term approved and pending (2023) with project conditions using the methodologies previously discussed. Table 7-C summarizes the results of this analysis and shows that all intersections are forecast to operate at a satisfactory LOS under Near-term approved and pending (2023) with project conditions with the exception of the following:

- Marks Avenue/Belmont Avenue (p.m. peak hour).

Detailed intersection levels of service worksheets are included in Appendix D.

7.3.2 Roadway Segments

A roadway segment LOS analysis was conducted for Near-term approved and pending (2023) with project conditions using the methodologies previously discussed. Table 7-D summarizes the results of this analysis and shows that all roadway segments are forecast to operate at a satisfactory LOS.

7.4 CUMULATIVE YEAR (2035) WITHOUT PROJECT LEVELS OF SERVICE

7.4.1 Study Intersections

An intersection LOS analysis was conducted under Cumulative Year (2035) without project conditions using the methodologies previously discussed. Table 7-E summarizes the results of this analysis and shows that all of the study intersections are forecast to operate at a satisfactory LOS under Cumulative Year (2035) without project conditions with the exception of the following:

- Marks Avenue/Belmont Avenue (p.m. peak hour).

Detailed intersection levels of service worksheets are included in Appendix D.

7.4.2 Roadway Segments

A roadway segment LOS analysis was conducted for Cumulative Year (2035) without project conditions using the methodologies previously discussed. Table 7-F summarizes the results of this analysis and shows that all roadway segments are forecast to operate at a satisfactory LOS.

7.4 CUMULATIVE YEAR (2035) WITH PROJECT LEVELS OF SERVICE

7.4.1 Study Intersections

An intersection LOS analysis was conducted under Cumulative Year (2035) with project conditions using the methodologies previously discussed. Table 7-E summarizes the results of this analysis and shows that all of the study intersections are forecast to operate at a satisfactory LOS under Cumulative Year (2035) with project conditions with the exception of the following:

- Marks Avenue/Belmont Avenue (p.m. peak hour).

It should be noted that this intersection is forecast to operate at a deficient LOS under Cumulative Year (2035) without project conditions. As such, the project adds to the forecasted deficiency.

Detailed intersection levels of service worksheets are included in Appendix D.

7.4.2 Roadway Segments

A roadway segment LOS analysis was conducted for Cumulative Year (2035) with project conditions using the methodologies previously discussed. Table 7-F summarizes the results of this analysis and shows that all roadway segments are forecast to operate at a satisfactory LOS.

7.5 LIST OF CHAPTER 7.0 TABLES

- Table 7-A: Existing Intersection Levels of Service
- Table 7-B: Existing Roadway Segment Levels of Service
- Table 7-C: Near term approved and pending (2023) with project Intersection Levels of Service
- Table 7-D: Near term approved and pending (2023) with project Roadway Segment Levels of Service
- Table 7-E: Cumulative Year (2035) Intersection Levels of Service
- Table 7-F: Cumulative Year (2035)Roadway Segment Levels of Service

Table 7-A - Existing Intersection Levels of Service

Intersection	Jurisdiction	Control	Without Project				With Project			
			AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
			Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Marks Avenue/Belmont Avenue	City of Fresno	AWSC	18.7	C	95.3	F *	20.9	C	>100	F *
2 . Marks Avenue/Nielsen Avenue	City of Fresno	Signal	12.2	B	12.7	B	12.2	B	12.9	B
3 . Marks Avenue/Ray Johnson Drive	City of Fresno	Signal	2.3	A	3.0	A	2.4	A	3.0	A
4 . Marks Avenue/SR-180 Westbound Ramps	CALTRANS	Signal	19.1	B	19.2	B	19.1	B	19.3	B
5 . Marks Avenue/SR-180 Eastbound Ramps	CALTRANS	Signal	4.1	A	5.1	A	4.2	A	5.2	A
6 . Hughes Avenue/Belmont Avenue	City of Fresno	AWSC	8.8	A	10.4	B	8.9	A	10.8	B
7 . Hughes Avenue/Nielsen Avenue	City of Fresno	AWSC	7.9	A	8.5	A	7.9	A	8.7	A

Notes:

AWSC = All-Way Stop Control

Delay = Average control delay in seconds.

LOS = Level of Service

* Exceeds LOS Standard

Table 7-B - Existing Roadway Segment Levels of Service

Roadway Segment	Functional Classification[1]	Roadway Capacity[2]	Without Project		With Project	
			Daily Volume	LOS	Daily Volume	LOS
Segments on Marks Avenue						
1 . Marks Avenue, between Belmont Avenue and Nielsen Avenue	4 Lane Arterial (Divided)	35,820	10,190	C	11,228	C
2 . Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	4 Lane Arterial (Divided)	35,820	11,554	C	12,146	C
3 . Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	4 Lane Arterial (Divided)	35,820	12,019	C	12,611	C
4 . Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	4 Lane Arterial (Divided)	35,820	10,651	C	10,977	C
Segments on Belmont Avenue						
5 Belmont Avenue, between Marks Avenue and Hughes Avenue	4 Lane Collector (Undivided)	31,860	7,240	C	7,550	C
Segments on Nielsen Avenue						
6 . Nielsen Avenue, between Marks Avenue and Hughes Avenue	2 Lane Collector	15,930	1,614	C	2,230	C
Segments on Hughes Avenue						
7 . Hughes Avenue, between Belmont Avenue and Nielsen Avenue	2 Lane Collector	15,930	2,604	C	3,060	C

Notes:

LOS = Level of Service.

[1] Functional Classification obtained from the Figure MT-1 Major Street Circulayion Diagram, City of Fresno 2014 General Plan.

[2] Roadway Capacity obtained from Table 1, Generalized Annual averge Daily Volues for Florida's Urbanized Areas. Since the facilities ate Non-State, a 10% reduction factor was applied for the roadway capacities.

Table 7-C - Near-Term approved and pending with Project Intersection Levels of Service

			With Project				
			AM Peak Hour		PM Peak Hour		
Intersection	**Jurisdiction**	**Control**	**Delay (sec.)**	**LOS**	**Delay (sec.)**	**LOS**	
1 . Marks Avenue/Belmont Avenue	City of Fresno	AWSC	26.2	D	>100	F	*
2 . Marks Avenue/Nielsen Avenue	City of Fresno	Signal	12.3	B	13.3	B	
3 . Marks Avenue/Ray Johnson Drive	City of Fresno	Signal	2.7	A	3.9	A	
4 . Marks Avenue/SR-180 Westbound Ramps	CALTRANS	Signal	19.0	B	19.2	B	
5 . Marks Avenue/SR-180 Eastbound Ramps	CALTRANS	Signal	5.7	A	5.8	A	
6 . Hughes Avenue/Belmont Avenue	City of Fresno	AWSC	9.3	A	11.9	B	
7 . Hughes Avenue/Nielsen Avenue	City of Fresno	AWSC	8.3	A	9.2	A	

Notes:

AWSC = All-Way Stop Control

Delay = Average control delay in seconds.

LOS = Level of Service

* Exceeds LOS Standard

No delay was reported for Intersection 9 (Project Truck Driveway 1/24th Street) because there are no conflicting movements.

Table 7-D - Near-term Approved and Pending (2023) Roadway Segment Levels of Service

Roadway Segment	Functional Classification[1]	Roadway Capacity[2]	With Project	
			Daily Volume	LOS
Segments on Marks Avenue				
1 . Marks Avenue, between Belmont Avenue and Nielsen Avenue	4 Lane Arterial (Divided)	35,820	11,976	C
2 . Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	4 Lane Arterial (Divided)	35,820	13,000	C
3 . Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	4 Lane Arterial (Divided)	35,820	13,525	C
4 . Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	4 Lane Arterial (Divided)	35,820	11,789	C
Segments on Belmont Avenue				
5 Belmont Avenue, between Marks Avenue and Hughes Avenue	4 Lane Collector (Undivided)	31,860	8,215	C
Segments on Nielsen Avenue				
6 . Nielsen Avenue, between Marks Avenue and Hughes Avenue	2 Lane Collector	15,930	2,383	C
Segments on Hughes Avenue				
7 . Hughes Avenue, between Belmont Avenue and Nielsen Avenue	2 Lane Collector	15,930	3,252	C

Notes:

LOS = Level of Service.

[1] Functional Classification obtained from the Figure MT-1 Major Street Circulayion Diagram, City of Fresno 2014 General Plan.

[2] Roadway Capacity obtained from Table 1, Generalized Annual averge Daily Values for Florida's Urbanized Areas. Since the facilities ate Non-State, a 10% reduction factor was applied for the roadway capacities.

Table 7-E - Cumulative Year (2035) Intersection Levels of Service

Intersection	Jurisdiction	Control	Without Project					With Project				
			AM Peak Hour		PM Peak Hour			AM Peak Hour		PM Peak Hour		
			Delay (sec.)	LOS	Delay (sec.)	LOS		Delay (sec.)	LOS	Delay (sec.)	LOS	
1 . Marks Avenue/Belmont Avenue	City of Fresno	AWSC	21.1	C	>100	F	*	23.6	C	>100	F	*
2 . Marks Avenue/Nielsen Avenue	City of Fresno	Signal	12.2	B	13.4	B		12.3	B	13.5	B	
3 . Marks Avenue/Ray Johnson Drive	City of Fresno	Signal	2.6	A	4.0	A		2.6	A	4.0	A	
4 . Marks Avenue/SR-180 Westbound Ramps	CALTRANS	Signal	18.9	B	19.0	B		18.9	B	19.0	B	
5 . Marks Avenue/SR-180 Eastbound Ramps	CALTRANS	Signal	5.2	A	5.4	A		5.3	A	5.5	A	
6 . Hughes Avenue/Belmont Avenue	City of Fresno	TWSC	10.6	B	12.0	B		10.8	B	12.3	B	
7 . Hughes Avenue/Nielsen Avenue	City of Fresno	AWSC	8.9	A	9.5	A		9.0	A	9.7	A	

Notes:

AWSC = All-Way Stop Control

Delay = Average control delay in seconds.

LOS = Level of Service

* Exceeds LOS Standard

No delay was reported for Intersection 9 (Project Truck Driveway 1/24th Street) because there are no conflicting movements.

Table 7-F - Cumulative Year (2035) Segment Levels of Service

Roadway Segment	Functional Classification[1]	Roadway Capacity[2]	Without Project		With Project	
			Daily Volume	LOS	Daily Volume	LOS
Segments on Marks Avenue						
1 . Marks Avenue, between Belmont Avenue and Nielsen Avenue	4 Lane Arterial (Divided)	35,820	11,651	C	12,689	C
2 . Marks Avenue, between Nielsen Avenue and Ray Johnson Drive	4 Lane Arterial (Divided)	35,820	13,244	C	13,836	C
3 . Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps	4 Lane Arterial (Divided)	35,820	13,706	C	14,298	C
4 . Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps	4 Lane Arterial (Divided)	35,820	13,065	C	13,391	C
Segments on Belmont Avenue						
5 Belmont Avenue, between Marks Avenue and Hughes Avenue	4 Lane Collector (Undivided)	31,860	8,846	C	9,156	C
Segments on Nielsen Avenue						
6 . Nielsen Avenue, between Marks Avenue and Hughes Avenue	2 Lane Collector	15,930	1,772	C	2,388	C
Segments on Hughes Avenue						
7 . Hughes Avenue, between Belmont Avenue and Nielsen Avenue	2 Lane Collector	15,930	3,531	C	3,987	C

Notes:

LOS = Level of Service.

[1] Functional Classification obtained from the Figure MT-1 Major Street Circulayion Diagram, City of Fresno 2014 General Plan.

[2] Roadway Capacity obtained from Table 1, Generalized Annual averge Daily Volues for Florida's Urbanized Areas. Since the facilities ate Non-State, a 10% reduction factor was applied for the roadway capacities.

8.0 QUEUING ANALYSIS

As recommended by the City staff during the scoping agreement process, a queuing analysis was performed at the study intersections for all analysis scenarios.

Table 8-A lists the available turn-pocket storage lengths and summarize the 95th percentile back-of-queue lengths at the study intersections under existing, Near-term approved and pending with project, and Cumulative Year (2035) conditions. The queues for signalized intersections have been reported from Synchro, whereas queues at unsignalized intersections were reported from Simtraffic. As shown in Table 8-A, queues for some of the movements are projected to exceed the existing available turn-pocket storage lengths under existing, Near-term approved and pending with project, and Cumulative Year (2035) for the intersection of Marks Avenue/Belmont Avenue.

Based on the project location, majority of the project traffic will be using the intersections of Marks Avenue/Nielsen Avenue, Hughes Avenue/Belmont Avenue, and Hughes Avenue/Nielsen Avenue. However, as summarized before, the project will not result in creating any inadequacy of turn pocket storage lengths at these intersections.

Detailed queuing analysis worksheets are included in Appendix E.

8.1 LIST OF CHAPTER 8.0 TABLES

- Table 8-A: Intersection Queuing Analysis

Table 8-A - Intersection Queuing Analysis

Intersection	Movement	Storage Length[1] (ft/ln)	Queue Lengths[2]									
			Existing				Near Term		Cumulative (2035)			
			No Project		With Project		With Project		No Project		With Project	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1 . Marks Avenue/Belmont Avenue	**NBL**	230	55	160	50	**335**	60	**470**	65	**480**	65	**475**
	NBR	375	60	90	50	60	50	**450**	60	**590**	55	**1290**
	SBL	135	40	50	40	40	40	40	50	40	55	70
	SBR	50	**55**	**140**	50	**110**	**60**	**75**	**80**	50	**140**	20
	EBL	105	40	45	45	50	40	40	45	35	45	60
	WBL	250	40	80	40	55	55	50	45	60	50	55
	WBR	125	30	45	20	35	30	45	20	50	25	50
2 . Marks Avenue/Nielsen Avenue	**NBL**	240	85	60	85	60	90	65	95	65	95	65
	NBR	215	15	5	15	20	15	20	20	5	20	20
	SBL	245	25	10	25	25	25	25	35	25	35	25
	SBR	215	5	0	5	0	5	0	5	0	5	0
	EBL	55	30	40	30	40	30	45	30	50	30	50
	EBR	55	15	15	15	15	20	15	20	20	20	20
	WBL	215	35	95	45	105	50	115	40	110	50	115
	WBR	210	0	0	0	0	0	0	0	0	0	0
3 . Marks Avenue/Ray Johnson Drive	**SBL**	110	10	15	10	15	15	15	15	15	15	15
	WBL	75	20	30	20	30	20	45	25	45	25	45
	WBR	75	10	15	10	15	10	15	10	15	10	15
4 . Marks Avenue/SR-180 Westbound Ramps	**NBR**	475	0	0	0	0	0	0	0	0	0	0
	WBL	340	85	105	85	105	85	115	105	145	105	145
	WBR	205	10	25	5	25	5	25	40	40	40	40
5 . Marks Avenue/SR-180 Eastbound Ramps	**NBR**	270	0	0	0	0	0	0	0	0	0	0
	SBR	460	0	0	0	0	0	0	0	0	0	0
	EBL	520	20	25	20	25	35	35	35	35	35	35
	EBR	520	0	0	0	0	0	0	0	0	0	0
6 . Hughes Avenue/Belmont Avenue	**EBL**	145	45	45	40	50	45	50	50	50	50	50
	WBL	165	45	55	50	40	50	60	50	45	50	45
7 . Hughes Avenue/Nielsen Avenue	**SBR**	100	30	30	30	40	25	35	40	35	25	35
	EBL	205	30	15	25	20	25	30	45	20	35	15
	WBL	205	0	25	15	15	25	15	20	45	35	45

Notes:

ft/ln = feet per lane

EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound

L = Left; R = Right

Bold = Queue exceeds available storage.

[1] Storage length for all movements obtained from Google Earth measurements.

[2] All queues reported are 95th percentile queues. All queues for signalized intersections have been reported from Synchro. Queues for unsignalized intersections have been reported from Simtraffic.

9.0 CALTRANS SCENARIO ANALYSIS

Based on the comments received from Caltrans during the scoping agreement process, the Marks Avenue/SR-180 interchange using a different project trip distribution compared to what was approved by the City during the scoping agreement process. This revised project trip distribution would result in potentially greater impacts at the interchange and therefore would present a worst case scenario analysis of the interchange. To conduct this analysis, Caltrans staff recommended to distribute 60% of the project traffic through the ramps for this evaluation. Based on Caltrans staff recommendation, this analysis was conducted for the following two scenarios:

- Near-term approved and pending with project Scenario; and
- Cumulative Year (2035) with project Scenario.

9.1 STUDY AREA

9.1.1 Study Intersections

The following intersections were evaluated for both scenarios included above:

3. Marks Avenue/Ray Johnson Drive (City of Fresno);
4. Marks Avenue/SR-180 Westbound Ramps (Caltrans);
5. Marks Avenue/SR-180 Eastbound Ramps (Caltrans);

9.1.2 Freeway Basic and Merge/Diverge Study Area

The following freeway facilities were included for the worst case scenario analysis:

SR-180 Eastbound

1. West of Marks Avenue Off-Ramp (Basic);
2. Marks Avenue Off-Ramp (Diverge);
3. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
4. Marks Avenue Loop-On Ramp (Merge);
5. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
6. Marks Avenue Slip-On Ramp (Merge); and
7. East of Marks Avenue (Basic).

SR-180 Westbound

8. East of Marks Avenue (Basic);
9. Marks Avenue Off-Ramp(Diverge);
10. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);

11. Marks Avenue Loop-On Ramp (Merge);
12. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
13. Marks Avenue Slip-On Ramp (Merge); and
14. West of Marks Avenue (Basic).

9.2 VOLUME DEVELOPMENT AND ANALYSIS METHODOLOGY

9.2.1 Intersections

Figures 9-1 and Figures 9-2 illustrates the alternate project passenger vehicle and truck trip distribution at the study intersections included in this scenario. Figures 9-3 and 9-4 illustrates the corresponding project trip assignment. Figure 9-5 illustrates the total project trip assignment at the study intersections.

For the study intersections, project trips for this alternative distribution were added to the corresponding no project traffic volumes developed as discussed in Chapter 4 to develop this worst case scenario with project traffic volumes at the study intersections. Figures 9-6 illustrates the traffic volumes for Near-term approved and pending with project conditions. Figure 9-7 illustrates the corresponding traffic volume for Cumulative Year (2035) with project conditions.

9.2.2 Freeway Mainline and Merge/Diverge Segments

For freeway segments, existing freeway segment bidirectional volumes was developed using the Annual Average Daily Traffic (AADT) volume data published by Caltrans in 2019. A 2.6 percent per annum growth rate was applied to the volumes to develop volumes for Near-term approved and pending (2023) conditions. This growth rate was obtained from the Fresno COG ABM. Freeway traffic volumes for Cumulative Year (2035) was developed using forecast volumes obtained from the latest version of the Fresno COG ABM and by applying the Fresno COG recommended post-processing methodologies. For ramp influence areas, vehicles entering and exiting a ramp are based on peak hour turning movement counts developed for the study intersections.

Table 9-A summarizes the freeway traffic volumes for the Near-term approved and pending (2023) with project conditions. Table 9-B summarizes the corresponding volumes for Cumulative Year (2035) with project conditions.

9.3 NEAR-TERM APPROVED AND PENDING (2023) WITH PROJECT CONDITIONS LOS ANALYSIS

9.3.1 Study Intersections

An intersection LOS analysis was conducted for Near-term approved and pending (2023) with project conditions using the methodologies previously discussed. Table 9-C summarizes the results of this analysis and shows that all intersections are forecast to operate at a satisfactory LOS under near term approved and pending (2023) with project conditions.

Detailed intersection levels of service worksheets are included in Appendix D.

9.3.2 Freeway Segments

A freeway segment LOS analysis was conducted for Near-term approved and pending (2023) with project conditions using the methodologies previously discussed. Table 9-D summarizes the results of this analysis and shows that all freeway segments are forecast to operate at a satisfactory LOS.

Detailed freeway levels of service worksheets are included in Appendix F.

9.4 CUMULATIVE YEAR (2035) WITH PROJECT CONDITIONS LOS ANALYSIS

9.4.1 Study Intersections

An intersection LOS analysis was conducted for Cumulative Year (2035) with project conditions using the methodologies previously discussed. Table 9-E summarizes the results of this analysis and shows that all intersections are forecast to operate at a satisfactory LOS under Cumulative Year (2035) with project conditions.

Detailed intersection levels of service worksheets are included in Appendix D.

9.4.2 Freeway Segments

A freeway segment LOS analysis was conducted for Cumulative Year (2035) with project conditions using the methodologies previously discussed. Table 9-F summarizes the results of this analysis and shows that all freeway segments are forecast to operate at a satisfactory LOS.

Detailed freeway levels of service worksheets are included in Appendix F.

9.5 LIST OF CHAPTER 9.0 FIGURES AND TABLES

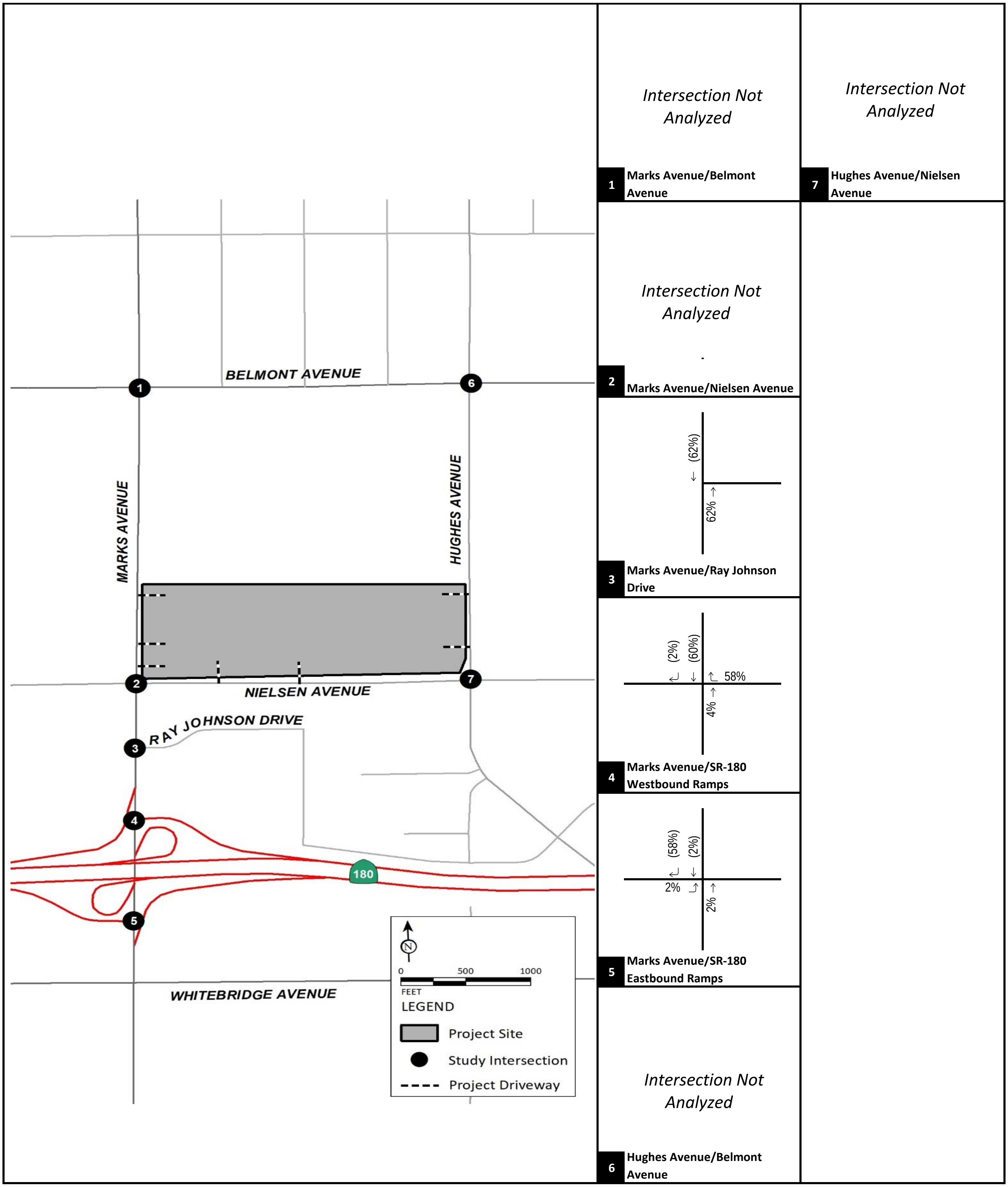

FIGURE 9-1

XX% (YY%)
Inbound (Outbound) Trip Distribution

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Distribution – Passenger Car

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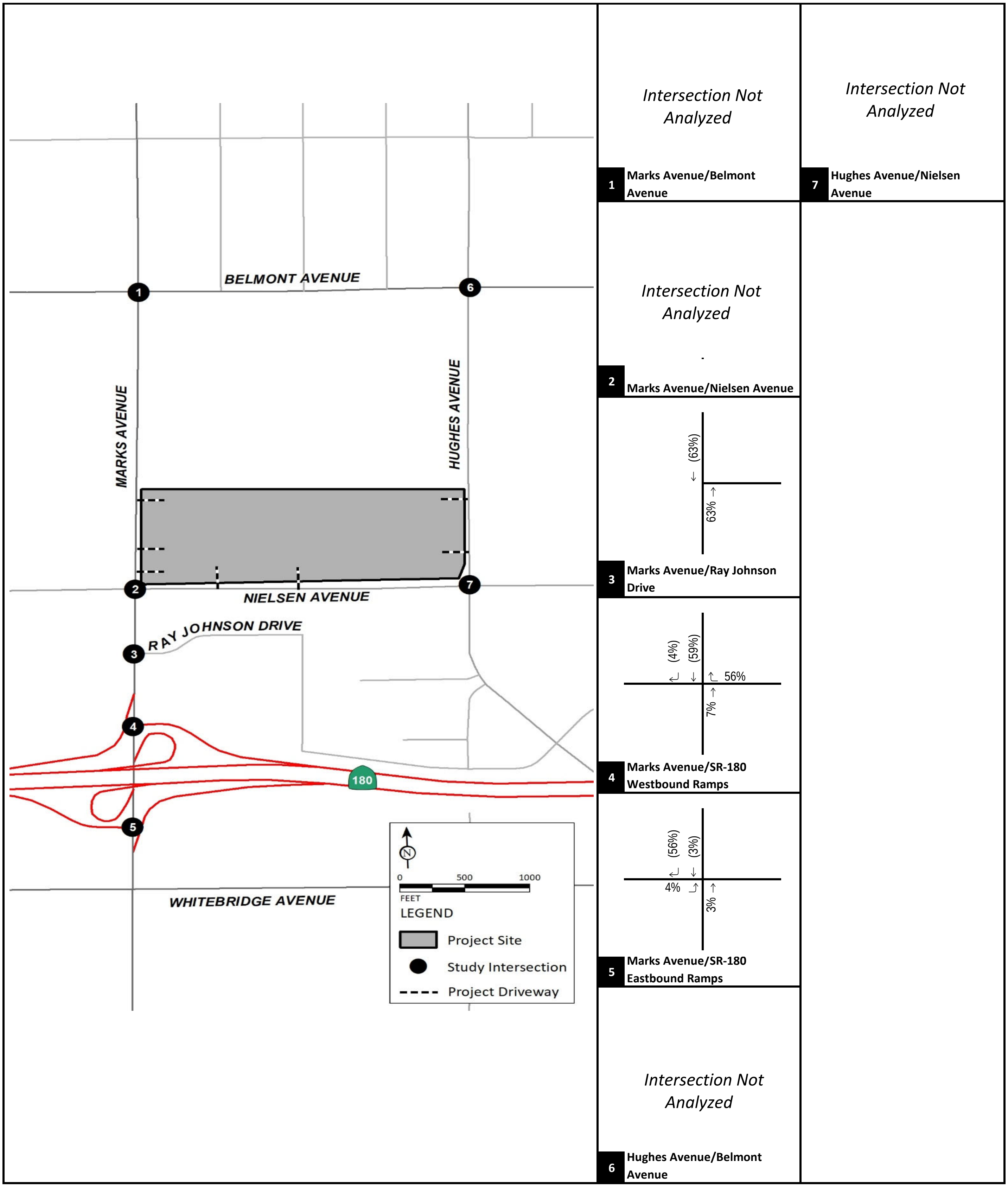

FIGURE 9-2

XX% (YY%)
Inbound (Outbound) Trip Distribution

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Distribution – Truck

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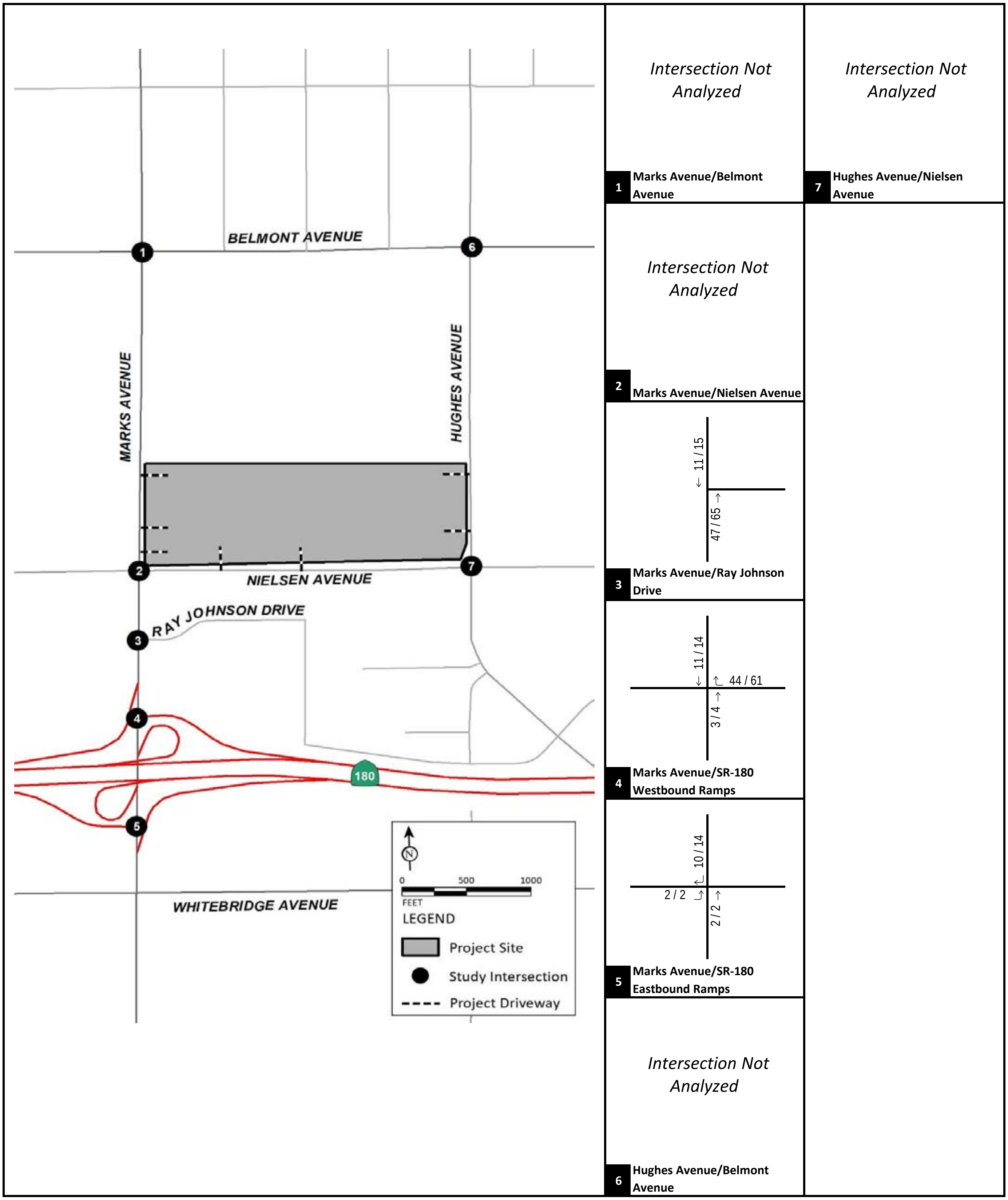

FIGURE 9-3

XX / YY
AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Assignment – Passenger Car

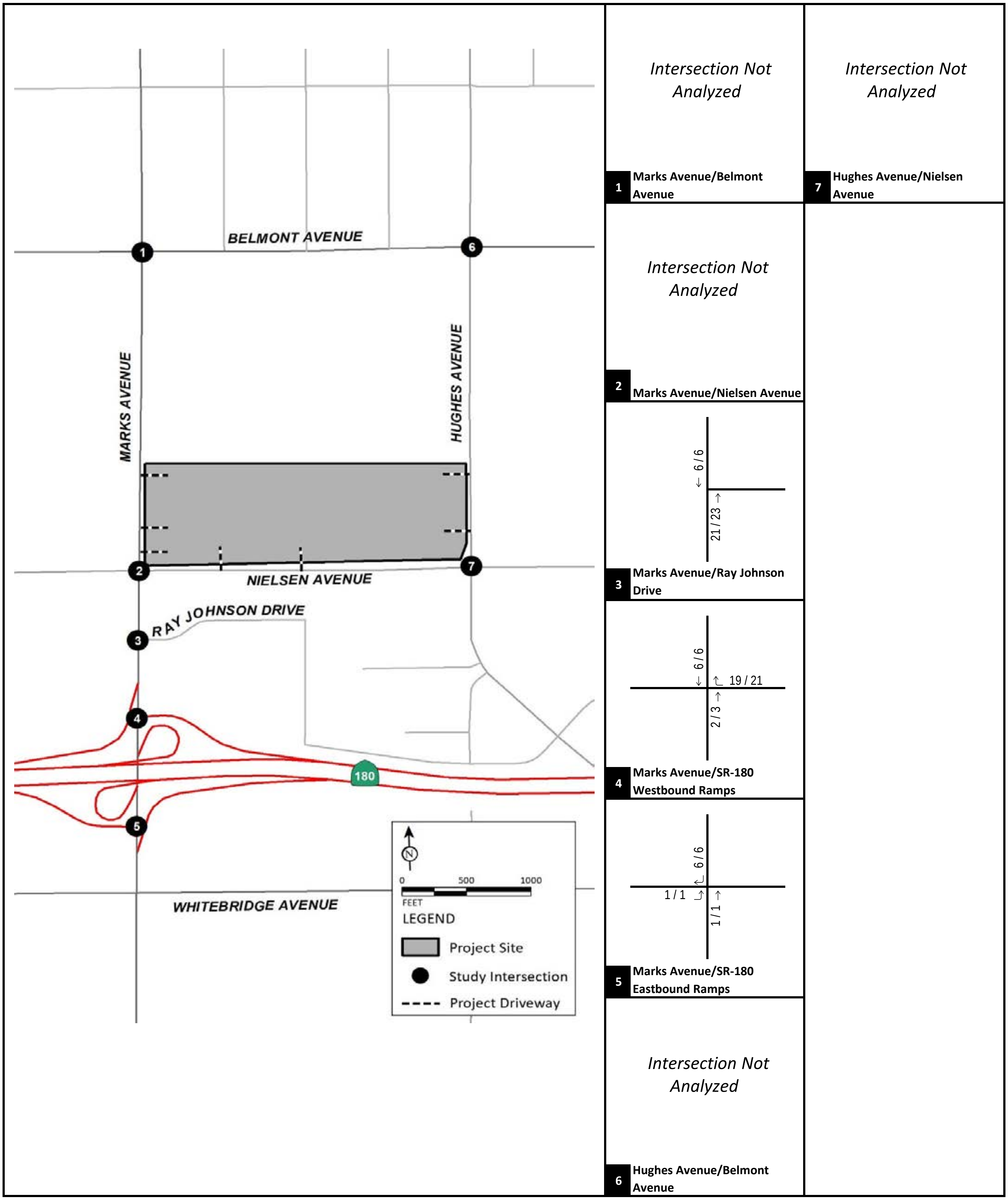

FIGURE 9-4

XX / YY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Assignment – Truck

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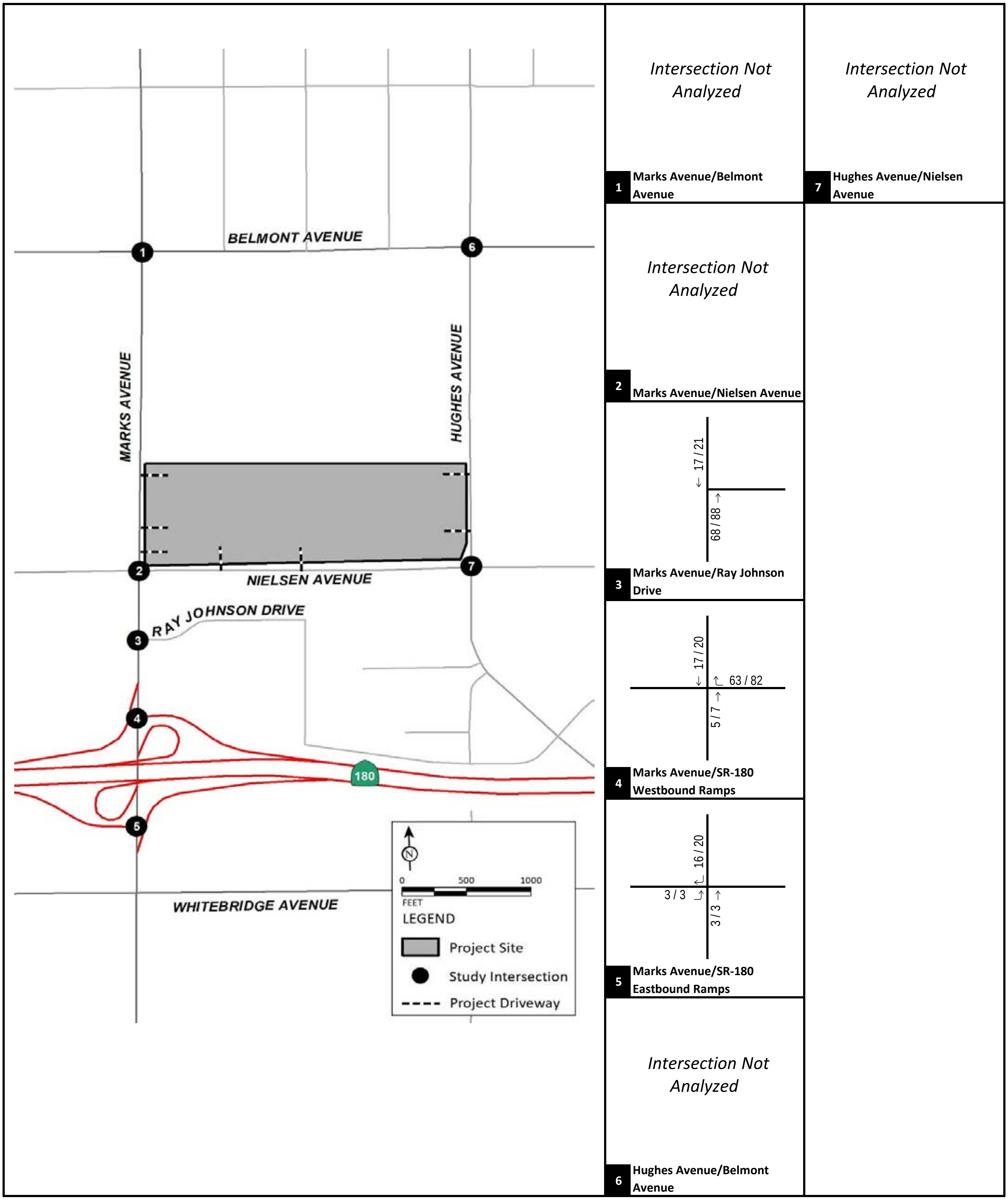

FIGURE 9-5

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Total Project PCE Trip Assignment

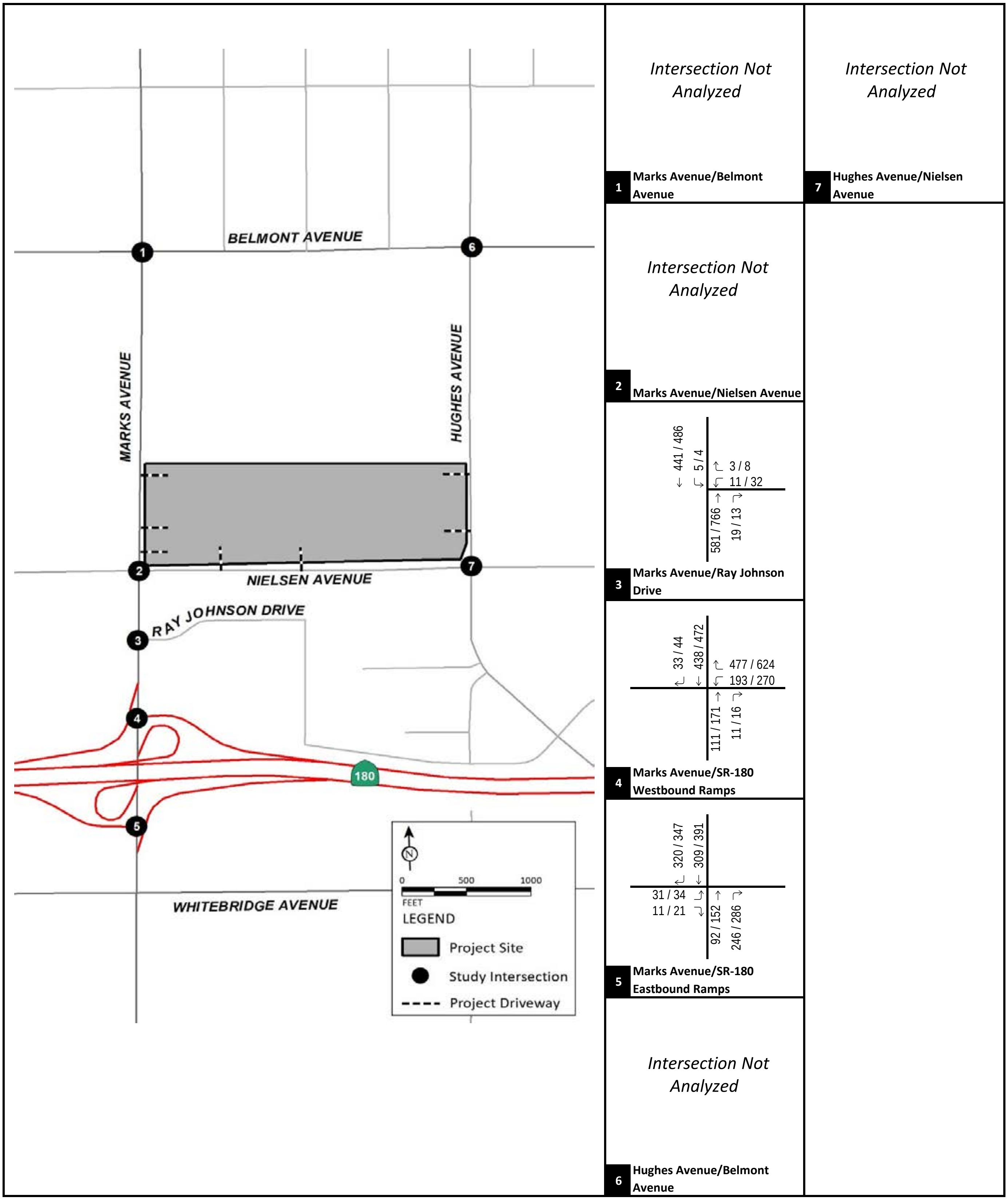

FIGURE 9-6

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Near-term approved and pending (2023) with Project Peak Hour Traffic Volumes

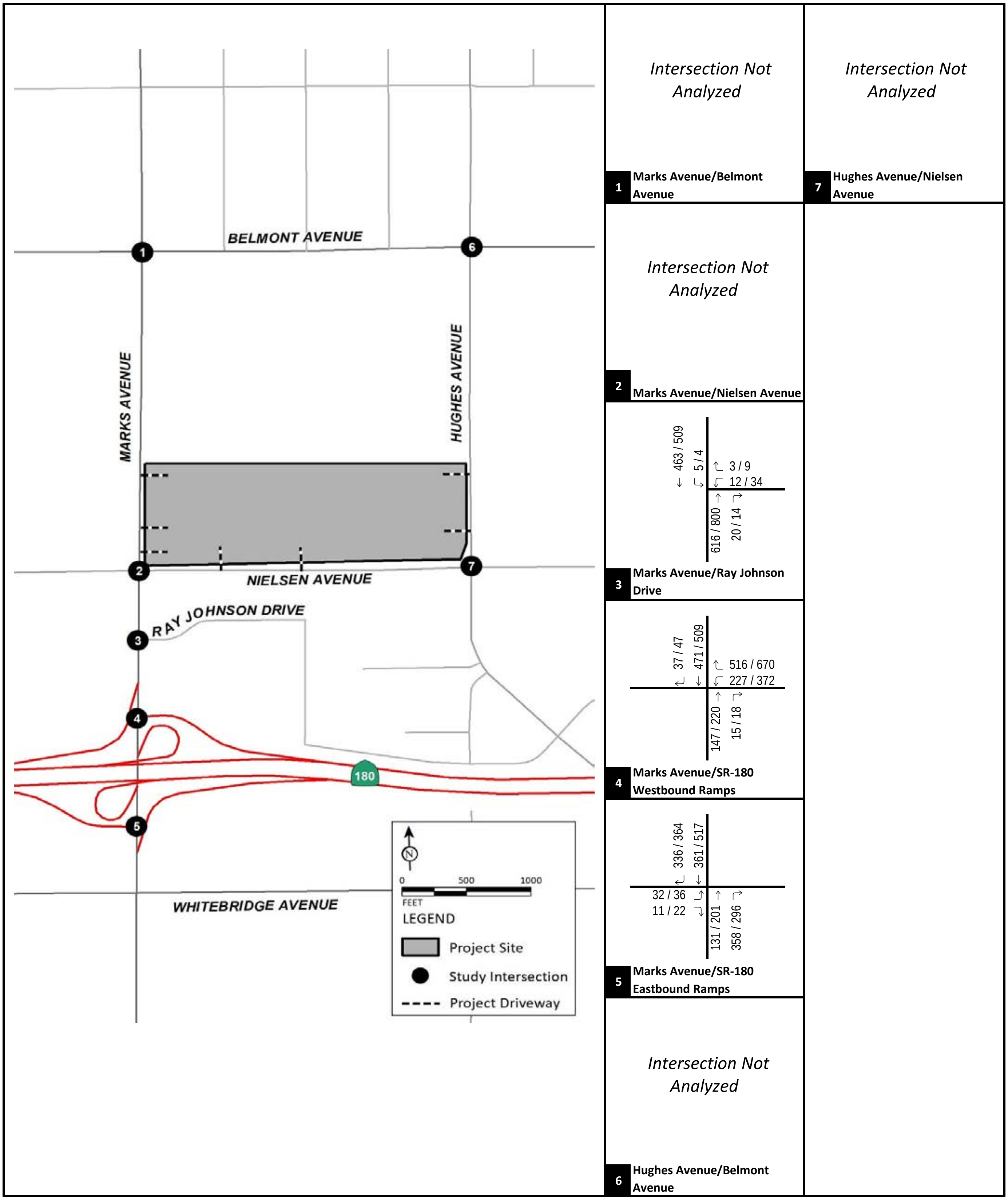

FIGURE 9-7

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Year (2035) with Project Peak Hour Traffic Volumes

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Table 9-A - Near-Term Approved and Pending (2023) with Projects Conditions Freeway Segment and Ramp Traffic Volumes

Eastbound																	
		AM Peak Hour								PM Peak Hour							
SR-180 Eastbound	Type	Mainline Auto	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Total Volumes	Ramp Truck Volumes	Mainline Cars	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Total Volumes	Ramp Truck Volumes
1 . West of Marks Avenue Off-Ramp	Basic	1,830	252	2,082	12.1%					1,314	185	1,499	12.3%				
2 . Marks Avenue Off-Ramp	Ramp (Diverge)					42	0.0%	42	0					55	11.4%	49	6
3 . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	1,788	252	2,040	12.4%					1,271	179	1,450	12.3%				
4 . Marks Avenue Loop-On Ramp	Ramp (Merge)					320	23.0%	260	60					347	5.8%	328	19
5 . Between Marks Avenue Loop-On Ramp and Maks Avenue Slip-On Ramp	Basic	1,988	312	2,300	13.6%					1,580	198	1,778	11.1%				
6 . Marks Avenue Slip-On Ramp	Ramp (Merge)					246	3.7%	237	9					286	0.8%	284	2
7 . East of Marks Avenue	Basic	2,216	321	2,537	12.7%					1,862	200	2,062	9.7%				

Westbound																	
		AM Peak Hour								PM Peak Hour							
SR-180 Westbound	Type	Mainline Cars	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Total Volumes	Ramp Truck Volumes	Mainline Cars	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Total Volumes	Ramp Truck Volumes
8 . East of Marks Avenue	Basic	2,001	257	2,258	11.4%					2,416	345	2,761	12.5%				
9 . Marks Avenue Off-Ramp	Ramp (Diverge)					670	8.8%	616	54		0		0	894	12.8%	793	102
10 . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	1,439	203	1,642	12.3%					1,725	243	1,968	12.3%				
11 . Marks Avenue Loop-On Ramp	Ramp (Merge)					11	0.0%	11	0		0		0	16	0.0%	16	0
12 . Between Marks Avenue Loop-On Ramp and Maks Avenue Slip-On Ramp	Basic	1,450	203	1,653	12.3%					1,741	243	1,984	12.2%				
13 . Marks Avenue Slip-On Ramp	Ramp (Merge)					33	26.3%	26	7		0		0	44	15.0%	38	6
14 . West of Marks Avenue	Basic	1,469	210	1,679	12.5%					1,773	249	2,022	12.3%				

Table 9-B - Cumulative Year (2035) With Project Conditions Freeway Segment and Ramp Traffic Volumes

Eastbound																	
		AM Peak Hour								PM Peak Hour							
SR-180 Eastbound	Type	Mainline Auto	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Non-PCE Volume	Ramp Truck Volumes	Mainline Auto	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Non-PCE Volume	Ramp Truck Volumes
1 . West of Marks Avenue Off-Ramp	Basic	2,332	323	2,655	12.2%					1,619	227	1,846	12.3%				
2 . Marks Avenue Off-Ramp	Ramp (Diverge)					43	0.0%	43	0					58	11.4%	52	6
3 . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	2,289	323	2,612	12.4%					1,573	221	1,794	12.3%				
4 . Marks Avenue Loop-On Ramp	Ramp (Merge)					336	23.0%	273	63					364	5.8%	344	20
5 . Between Marks Avenue Loop-On Ramp and Maks Avenue Slip-On Ramp	Basic	2,499	386	2,885	13.4%					1,897	241	2,138	11.3%				
6 . Marks Avenue Slip-On Ramp	Ramp (Merge)					358	3.7%	345	13					296	0.8%	294	2
7 . East of Marks Avenue	Basic	2,831	399	3,230	12.3%					2,189	243	2,432	10.0%				

Westbound																	
		AM Peak Hour								PM Peak Hour							
SR-180 Westbound	Type	Mainline Auto	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Non-PCE Volume	Ramp Truck Volumes	Mainline Auto	Mainline Trucks	Mainline Total	Mainline Truck%	Ramp PCE Volumes	Ramp Truck%	Ramp Non-PCE Volume	Ramp Truck Volumes
8 . East of Marks Avenue	Basic	2,272	292	2,564	11.4%					3,105	442	3,547	12.5%				
9 . Marks Avenue Off-Ramp	Ramp (Diverge)					743	8.8%	683	60					1,042	12.8%	924	118
10 . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	1,649	232	1,881	12.3%					2,299	324	2,623	12.3%				
11 . Marks Avenue Loop-On Ramp	Ramp (Merge)					15	0.0%	15	0					18	0.0%	18	0
12 . Between Marks Avenue Loop-On Ramp and Maks Avenue Slip-On Ramp	Basic	1,664	232	1,896	12.2%					2,317	324	2,641	12.3%				
13 . Marks Avenue Slip-On Ramp	Ramp (Merge)					37	26.3%	29	8					47	15.0%	41	6
14 . West of Marks Avenue	Basic	1,685	240	1,925	12.5%					2,352	330	2,682	12.3%				

Table 9-C - Near-Term approved and pending with Project Intersection Levels of Service

Intersection	Jurisdiction	Control	With Project			
			AM Peak Hour		PM Peak Hour	
			Delay (sec.)	LOS	Delay (sec.)	LOS
3 . Marks Avenue/Ray Johnson Drive	City of Fresno	Signal	2.7	A	3.9	A
4 . Marks Avenue/SR-180 Westbound Ramps	CALTRANS	Signal	19.2	B	19.5	B
5 . Marks Avenue/SR-180 Eastbound Ramps	CALTRANS	Signal	5.8	A	5.9	A

Notes:

Delay = Average control delay in seconds.

LOS = Level of Service

* Exceeds LOS Standard

Table 9-D -Near Term Approved and Pending (2023) With Project Freeway Segment and Ramp Levels of Service

SR-180 Freeway	Type	Mainline Lanes	With Project					
			AM Peak Hour			PM Peak Hour		
			Speed (mi/hr)	Density (pc/mi/ln)	LOS	Speed (mi/hr)	Density (pc/mi/ln)	LOS
Eastbound								
1 . West of Marks Avenue Off-Ramp	Basic	2	73.2	17.0	B	73.6	12.2	B
2 . Marks Avenue Off-Ramp	Ramp (Diverge)	2	65.3	24.1	C	65.3	18.2	B
3 . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	2	72.9	16.6	B	72.9	11.8	B
4 . Marks Avenue Loop-On Ramp	Ramp (Merge)	2	64.1	21.2	C	65.2	15.9	B
6 . Marks Avenue Slip-On Ramp	Ramp (Merge)	3	74.3	13.4	B	74.4	10.6	A
7 . East of Marks Avenue	Basic	3	73.6	13.7	B	73.6	10.9	A
Westbound								
8a . East of Marks Avenue	Basic	3	73.6	12.1	B	73.6	15.0	B
8b . East of Marks Avenue	Basic	4	73.6	9.1	A	73.6	11.2	B
9 . Marks Avenue Off-Ramp	Ramp (Diverge)	4	72.5	9.2	A	71.8	11.5	A
10a . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	3	73.3	8.9	A	73.1	10.7	A
10b . Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	2	73.5	13.3	B	73.4	16.0	B
11 . Marks Avenue Loop-On Ramp	Ramp (Merge)	2	65.1	15.2	B	64.6	19.0	B
13 . Marks Avenue Slip-On Ramp	Ramp (Merge)	2	66.4	15.1	B	65.9	18.7	B
14 . East of Marks Avenue	Basic	2	73.2	13.6	B	73.2	16.5	B

Notes:

SR-180 = State Route 180

mi/hr : miles per hour

pc/mi/ln: passanger cars per mile per lane

Bold Indicates deficient LOS

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Table 9-E - Cumulative Year (2035) Intersection Levels of Service

Intersection	Jurisdiction	Control	With Project			
			AM Peak Hour		PM Peak Hour	
			Delay (sec.)	LOS	Delay (sec.)	LOS
3 . Marks Avenue/Ray Johnson Drive	City of Fresno	Signal	2.6	A	4.0	A
4 . Marks Avenue/SR-180 Westbound Ramps	CALTRANS	Signal	19.0	B	19.2	B
5 . Marks Avenue/SR-180 Eastbound Ramps	CALTRANS	Signal	5.4	A	5.5	A

Notes:

Delay = Average control delay in seconds.

LOS = Level of Service

* Exceeds LOS Standard

Table 9-F -Cumulative Year (2035) With Project Freeway Segment and Ramp Levels of Service

				With Project					
				AM Peak Hour			PM Peak Hour		
	SR-180 Freeway	Type	Mainline Lanes	Speed (mi/hr)	Density (pc/mi/ln)	LOS	Speed (mi/hr)	Density (pc/mi/ln)	LOS
	Eastbound								
1 .	West of Marks Avenue Off-Ramp	Basic	2	73.2	17.0	B	70.5	22.5	C
2 .	Marks Avenue Off-Ramp	Ramp (Diverge)	2	65.3	24.1	C	65.3	30.0	D
3 .	Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	2	72.9	16.6	B	70.7	22.1	C
4 .	Marks Avenue Loop-On Ramp	Ramp (Merge)	2	64.1	21.2	C	62.0	26.1	C
6 .	Marks Avenue Slip-On Ramp	Ramp (Merge)	3	57.3	35.0	D	74.1	17.3	B
7 .	East of Marks Avenue	Basic	3	54.1	37.6	B	73.0	17.6	B
	Westbound								
8a .	East of Marks Avenue	Basic	3	73.6	13.8	B	72.2	19.6	C
8b .	East of Marks Avenue	Basic	4	73.6	10.3	A	73.4	14.4	B
9 .	Marks Avenue Off-Ramp	Ramp (Diverge)	4	72.5	10.5	A	71.6	7.3	A
10a .	Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	3	73.3	10.2	A	73.0	14.2	B
10b .	Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp	Basic	2	73.5	15.3	B	70.7	22.2	C
11 .	Marks Avenue Loop-On Ramp	Ramp (Merge)	2	64.7	18.2	B	63.0	25.1	C
13 .	Marks Avenue Slip-On Ramp	Ramp (Merge)	2	66.1	17.8	B	64.2	24.9	C
14 .	West of Marks Avenue	Basic	2	73.2	15.7	B	70.2	22.8	C

Notes:

SR-180 = State Route 180

mi/hr : miles per hour

pc/mi/ln: passanger cars per mile per lane

Bold Indicates deficient LOS

10.0 SITE ACCESS ANALYSIS

10.1 EVALUATION OF PROJECT DRIVEWAYS

Previously referenced Figure 1-2 illustrates the project site plan. As shown in Figure 1-2, and as described in Chapter 1, access to the project site will be provided via seven driveways located on Marks Avenue, Nielsen Avenue, and Hughes Avenue.

All project driveways will be stop controlled at the driveway approach. Therefore, vehicles exiting the project site from project driveways must stop before they continue to merge on the neighboring circulation network.

The majority of the observed traffic flow within the study area utilize Marks Avenue. Out of the three driveways on Marks Avenue, two of them are right-in-right-out only. For the other driveway, left-turn egress movement will be restricted. Additionally, a two-way left turn lane (TWLTL) is present at this location on Marks Avenue. Therefore, project trips using a left-turn ingress movement can also wait in the TWLTL for the clearance of northbound traffic on Marks Avenue. Since there is a traffic signal at the intersection of Marks Avenue/Nielsen Avenue, these project trips will have the opportunity to utilize gaps in northbound traffic created by the signal to complete the turn into the project driveway. Additionally, there are no major obstructions to vision present along Marks Avenue. Therefore, sight distance will not be an issue for these driveways.

For project driveways located along Nielsen Avenue and Hughes Avenue, there needs to be adequate corner sight distance for vehicles to make an egress movement. There is no provision for on-street parking along the project frontage on Nielsen Avenue or Hughes Avenue. Additionally, there are no trees or large stationary objects that might obstruct the sight triangle for drivers. As such, there should be adequate sight distance at the project driveways along Nielsen Avenue or Hughes Avenue. Therefore, it can be concluded that a clear sight triangle will be available for drivers exiting the driveway to safely make turns onto Nielsen Avenue or Hughes Avenue.

11.0 SIGNAL WARRANT ANALYSIS

As recommended during the scoping agreement process, signal warrant analysis was conducted at all unsignalized study intersections. Intersection approach volumes for the study intersections was examined to determine whether signalization is warranted per the criteria defined in the California supplement of the *Manual on Uniform Traffic Control Devices* (CA-MUTCD). As recommended by City staff, three separate signal warrant analysis was conducted for the unsignalized study intersections as follows:

1. Warrant 1: 8 hour Vehicular Volume
2. Warrant 2: 4 hour Vehicular Volume
3. Warrant 3: Peak Hour

Specifically, warrant 1 and 2 was conducted for all the unsignalized intersections under existing scenario, and an analysis with signal warrant 3 was conducted for the unsignalized intersections under all scenarios. Following is a brief summary of signal warrant analysis for each intersection:

11.1 MARKS AVENUE/BELMONT AVENUE

Table 11-A shows the Warrant 1 – Eight Hour Vehicular Volume Condition A for the intersection under existing scenario. Additionally, since the posted speed limit on Marks Avenue (Major Street) is 45 mph, the 70% traffic volume condition was used for this analysis. As shown in Table 11-A, the intersection meets the signal warrant. Since Condition A is already met, Condition B was not analyzed for this intersection.

Figure 11-1 illustrates the Warrant 2- 4 hour for the study intersection under existing scenario. As shown in Figure 11-1, the intersection meets the signal warrant.

Figures 11-2, 11-3, and 11-4 illustrate the Warrant 3 (peak hour signal warrant) for this intersection under existing, Near-term approved and pending with project and Cumulative Year (2035) scenario. As shown in these figures, the intersection meets the signal warrant under all scenarios.

11.2 HUGHES AVENUE/BELMONT AVENUE

Based on the traffic volumes for this intersection, a combination of Condition A and Condition B was evaluated for this intersection. Tables 11-B and 11-C shows the Warrant 1 – Eight Hour Vehicular Volume Condition A, and Condition B, respectively for the intersection under existing scenario. As shown in these tables, the intersection does not meet the signal warrant. As such, this intersection does not meet either Condition A or Condition B.

Figure 11-5 illustrates the Warrant 2- 4 hour for the study intersection. As shown in Figure 11-5, the intersection does not meet the signal warrant.

Figures 11-6, 11-7, and 11-8 illustrates the Warrant 3- peak hour signal warrant for this intersection under existing, Near term Approved and pending with project and Cumulative Year (2035) scenario. As shown in these figures, the intersection does not meet the signal warrant under any scenarios.

11.3 HUGHES AVENUE/NIELSEN AVENUE

Based on the traffic volumes for this intersection, a combination of Condition A and Condition B was evaluated for this intersection. Tables 11-D and 11-E shows the Warrant 1 – Eight Hour Vehicular Volume Condition A, and Condition B, respectively for the intersection under existing scenario. As shown in these tables, the intersection does not meet the signal warrant. As such, this intersection does not meet either Condition A or Condition B.

Figure 11-9 illustrates the Warrant 2- 4 hour for the study intersection. As shown in Figure 11-9, the intersection does not meet the signal warrant.

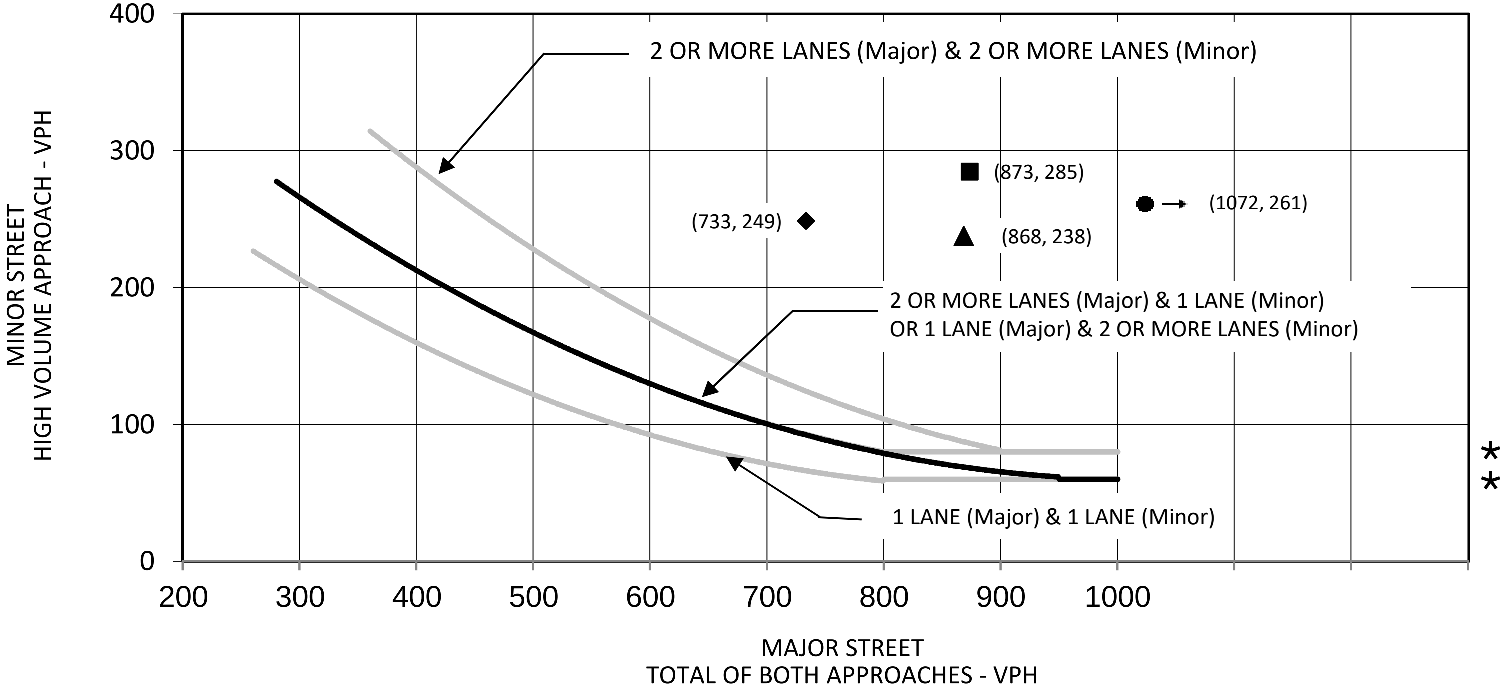
Figures 11-10, 11-11, and 11-12 illustrates the Warrant 3- peak hour signal warrant for this intersection under existing, Near-term Approved and pending with project and Cumulative Year (2035) scenario. As shown in these figures, the intersection does not meet the signal warrant under any scenarios.

11.5 LIST OF CHAPTER 11.0 FIGURES AND TABLES

- Table 11-E : Eight-Hour Warrant Analysis - Condition B (80%) - Hughes Avenue/Nielsen Avenue

WARRANT 2, FOUR-HOUR VEHICULAR VOLUME (70% fACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 mph ON MAJOR STREET)



* 80 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 60 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-1

● Highest Hour Volumes (P.M. Peak Hour)

■ Second Highest Hourly Volumes (15:00-16:00)

▲ Third Highest Hourly Volumes (A.M. Peak Hour)

◆ Fourth Highest Hourly Volumes (14:00-15:00)

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-2

Warrant 2: 4 Hour - Marks Avenue/Belmont Avenue– Existing Conditions

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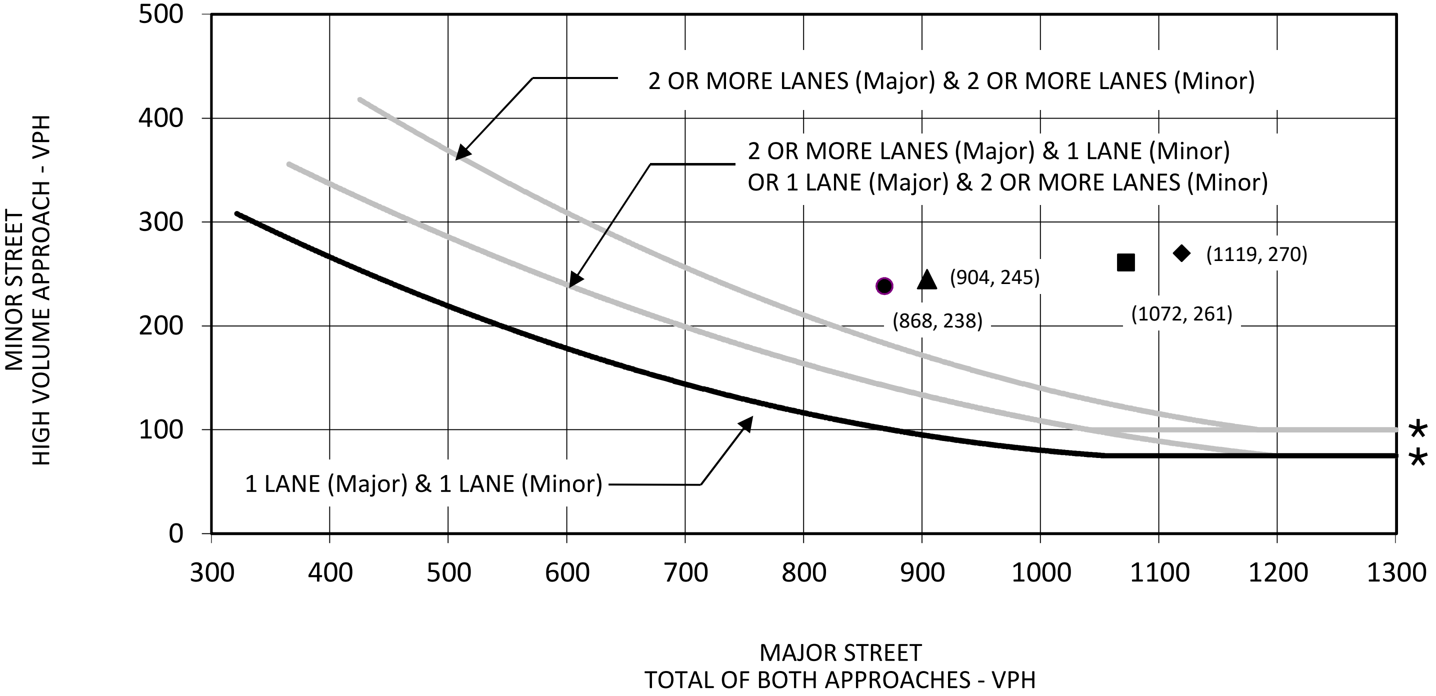
WARRANT 3, PEAK HOUR (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 mph ON MAJOR STREET)



* 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 75 VPH applies as the lower threshold volume for a minor street approaching with one lane.

LSA

FIGURE 11-2

● No Project AM Peak Hour

■ No Project PM Peak Hour

▲ With Project AM Peak Hour

◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project

Warrant 3: Peak Hour - Marks Avenue/Belmont Avenue – Existing Conditions

Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-4

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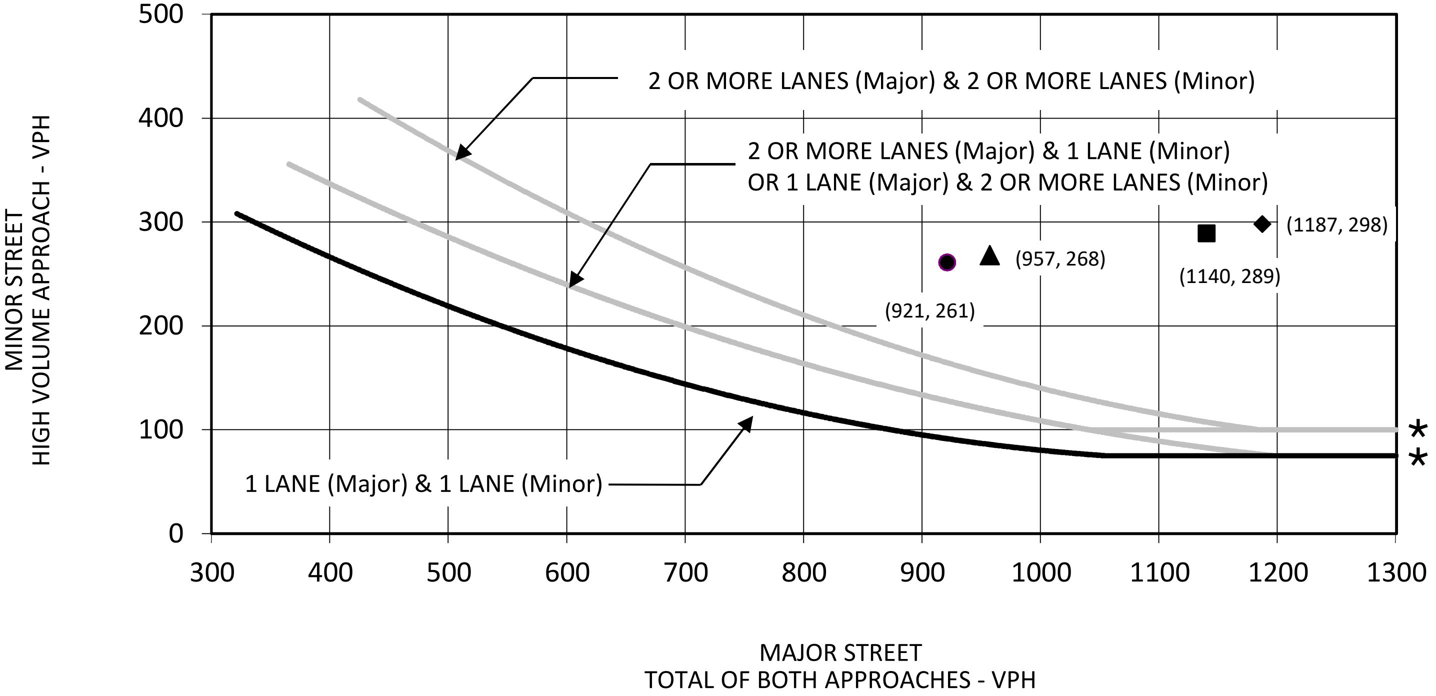
WARRANT 3, PEAK HOUR (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 mph ON MAJOR STREET)



* 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 75 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-3

●	No Project AM Peak Hour	▲	With Project AM Peak Hour
■	No Project PM Peak Hour	◆	With Project PM Peak Hour

2740 West Nielsen Warehouse Project

Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-4 Warrant 3: Peak Hour - Marks Avenue/Belmont Avenue - Near-term Approved and pending with project Conditions

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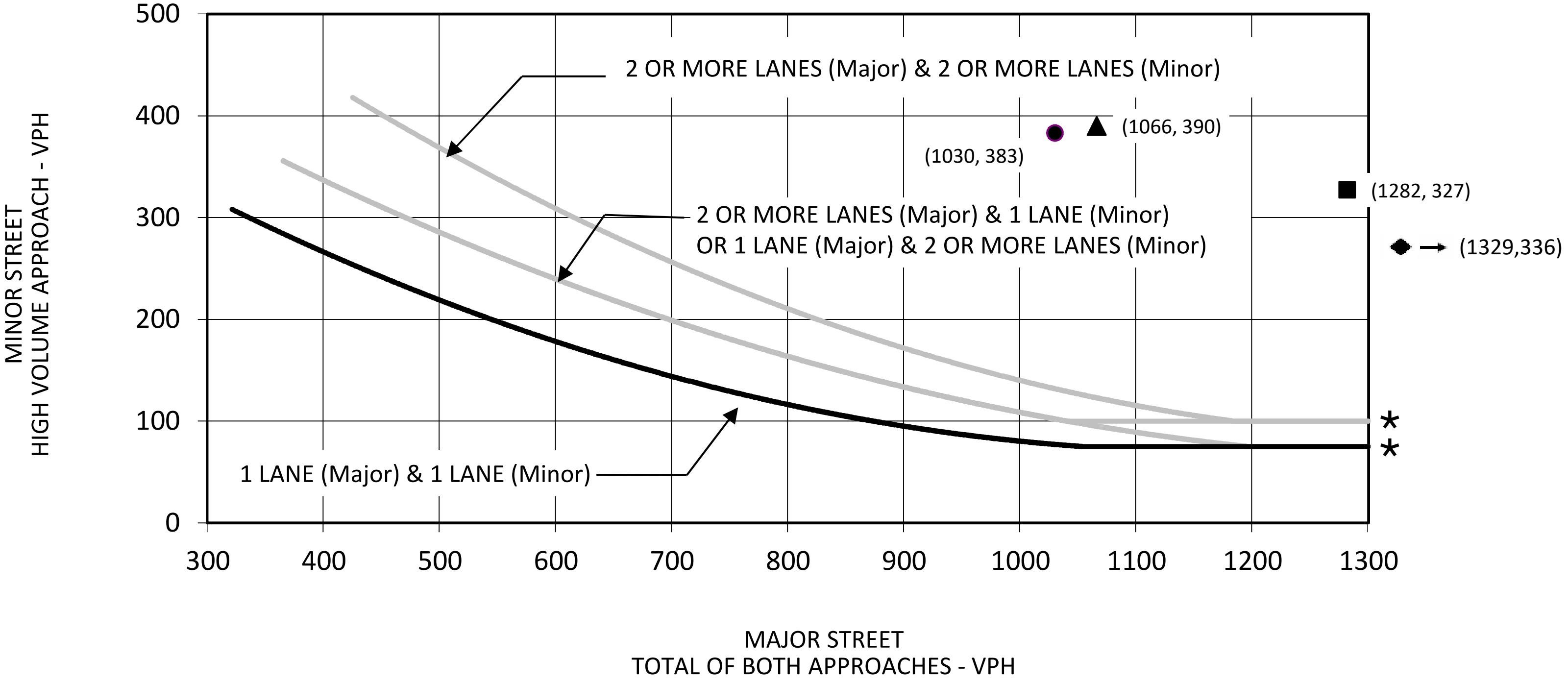
WARRANT 3, PEAK HOUR (70% FACTOR)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 mph ON MAJOR STREET)



* 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 75 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-4

● No Project AM Peak Hour

▲ With Project AM Peak Hour

■ No Project PM Peak Hour

◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project

Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-4

Warrant 3: Peak Hour - Marks Avenue/Belmont Avenue Cumulative Year (2035) Conditions

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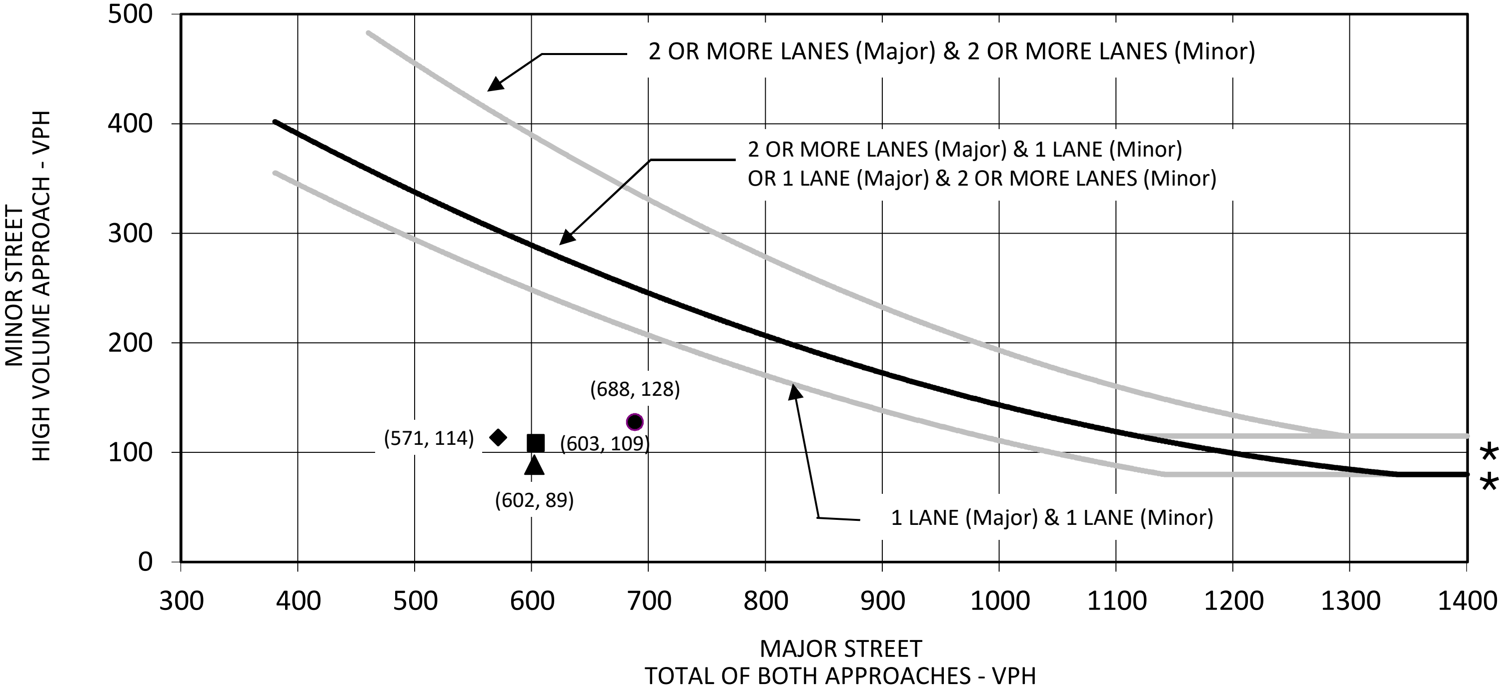
WARRANT 2, FOUR-HOUR VEHICULAR VOLUME



* 115 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 80 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-5

LSA

● Highest Hour Volumes (15:00-16:00)

■ Second Highest Hourly Volumes (14:00-15:00)

▲ Third Highest Hourly Volumes (13:00-14:00)

◆ Fourth Highest Hourly Volumes (12:00-13:00)

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-1

Warrant 2: 4 Hour - Hughes Avenue/Belmont Avenue-Existing Conditions

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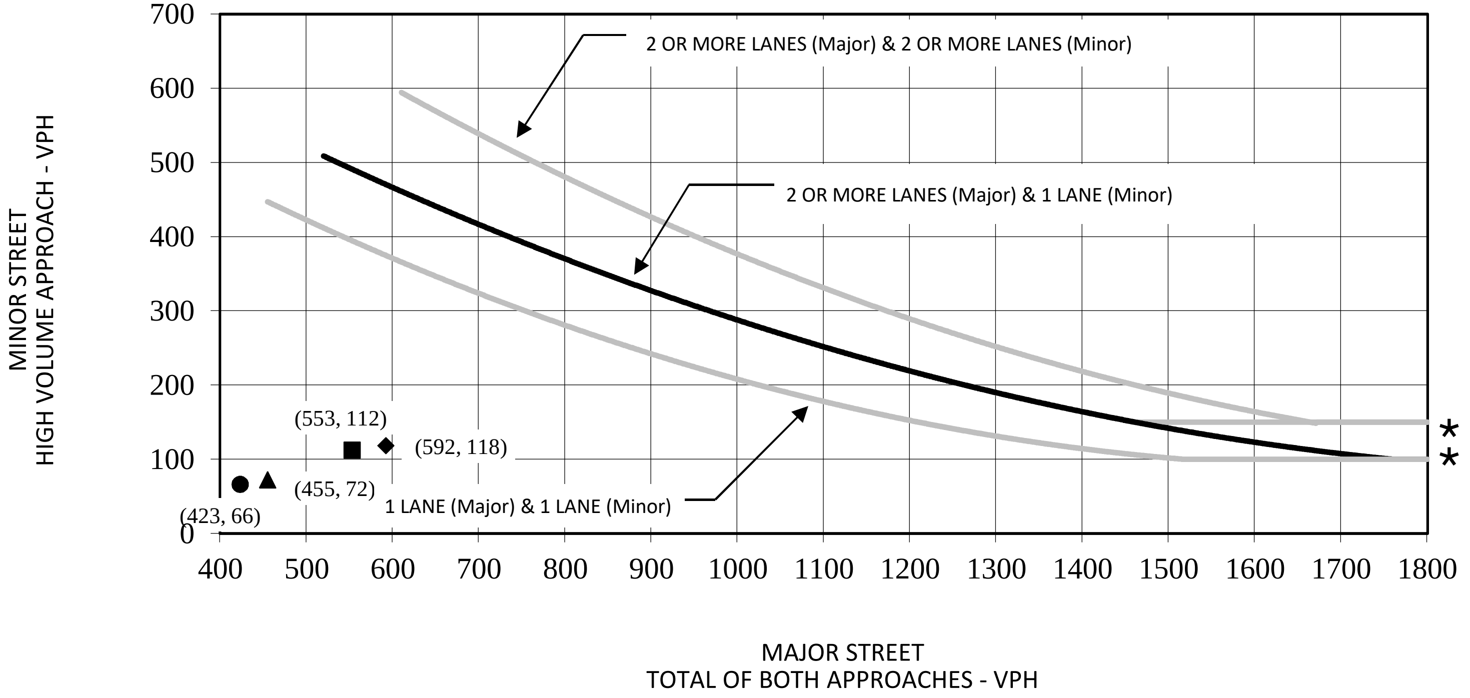
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

LSA

FIGURE 11-6

● No Project AM Peak Hour	▲ With Project AM Peak Hour
■ No Project PM Peak Hour	◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study
Warrant 3: Peak Hour - Hughes Avenue/Belmont Avenue – Existing Conditions

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

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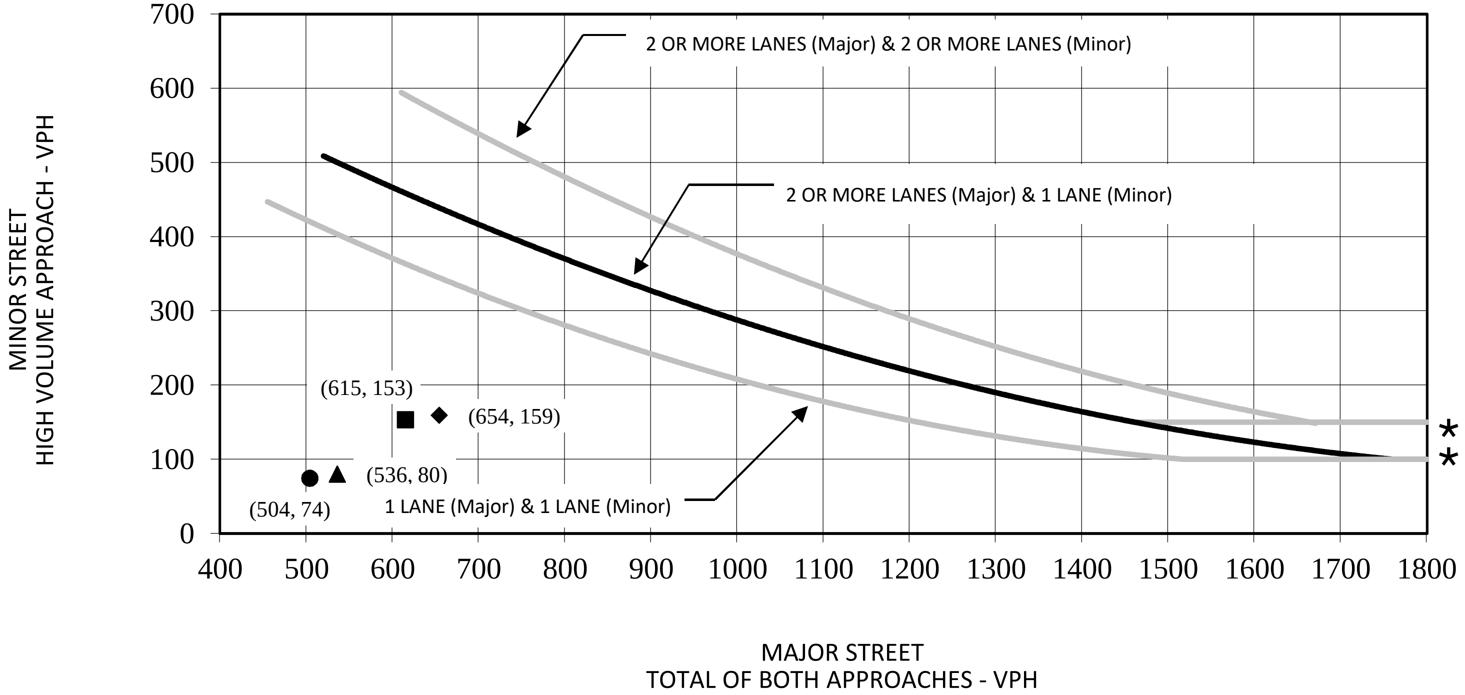
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

LSA

FIGURE 11-7

●	No Project AM Peak Hour	▲	With Project AM Peak Hour
■	No Project PM Peak Hour	◆	With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

Warrant 3: Peak Hour - Hughes Avenue/Belmont Avenue –Near-term approved and pending with project Conditions

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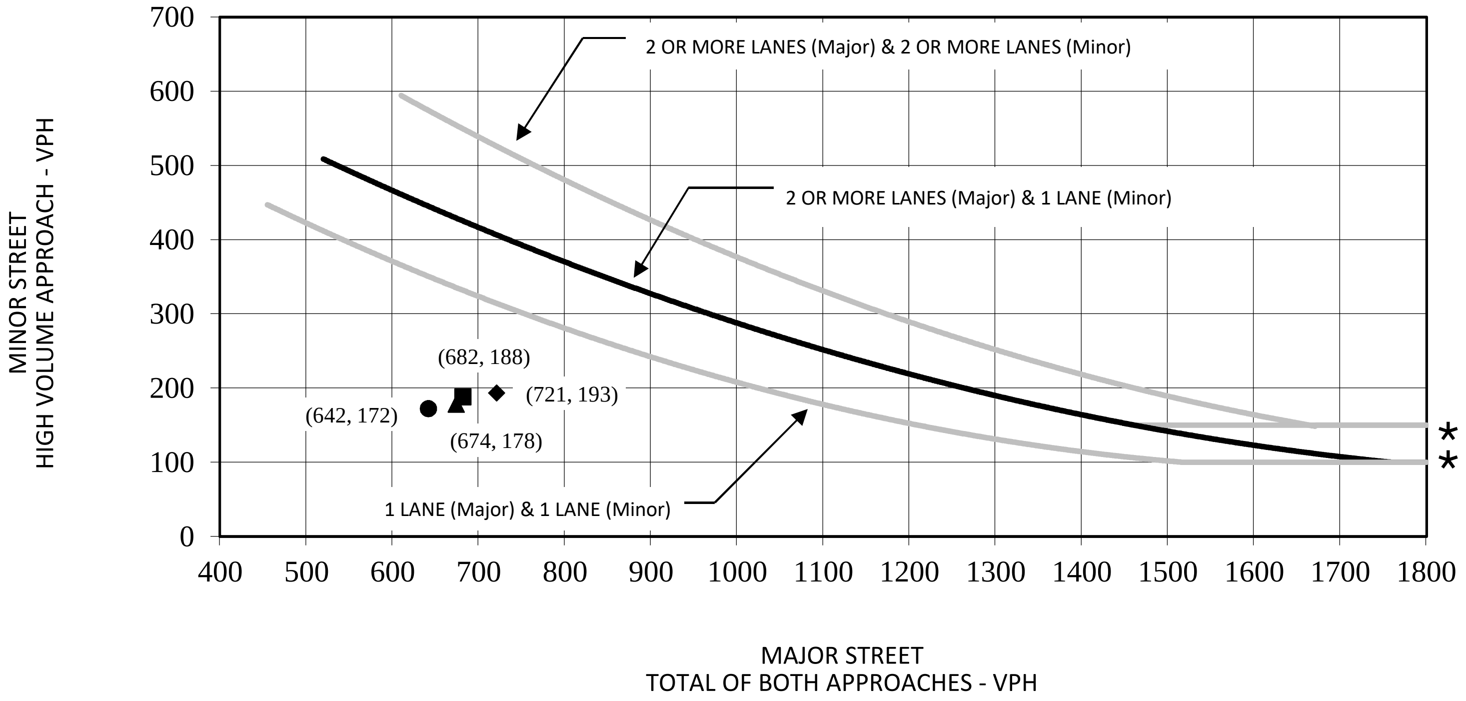
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-8

● No Project AM Peak Hour

■ No Project PM Peak Hour

▲ With Project AM Peak Hour

◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

Warrant 3: Peak Hour - Hughes Avenue/Belmont Avenue Cumulative Year (2035) Conditions

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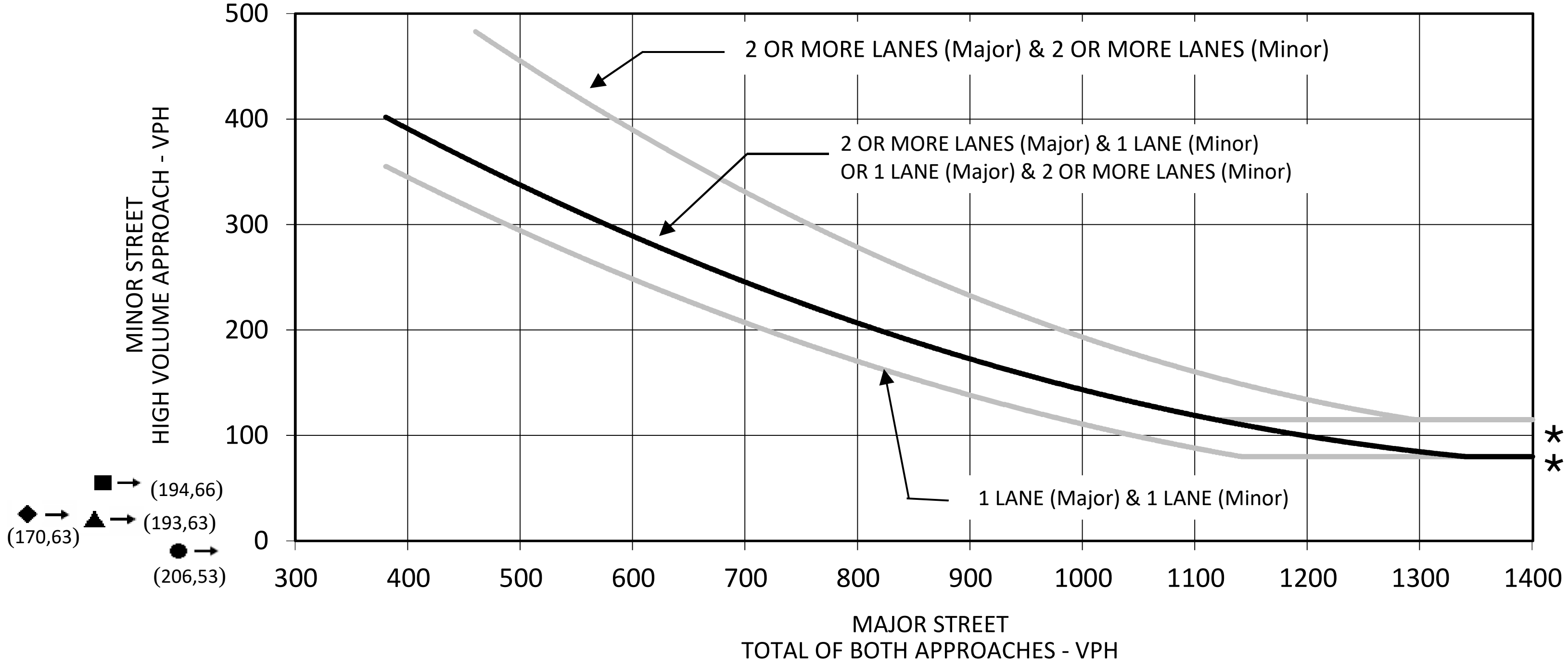
WARRANT 2, FOUR-HOUR VEHICULAR VOLUME



* 115 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 80 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-9

● Highest Hour Volumes (P.M. Peak Hour)

■ Second Highest Hourly Volumes (14:00-15:00)

▲ Third Highest Hourly Volumes (12:00-13:00)

◆ Fourth Highest Hourly Volumes (15:00-16:00)

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-1

Warrant 2: 4 Hour - Hughes Avenue/Nielsen Avenue-Existing Conditions

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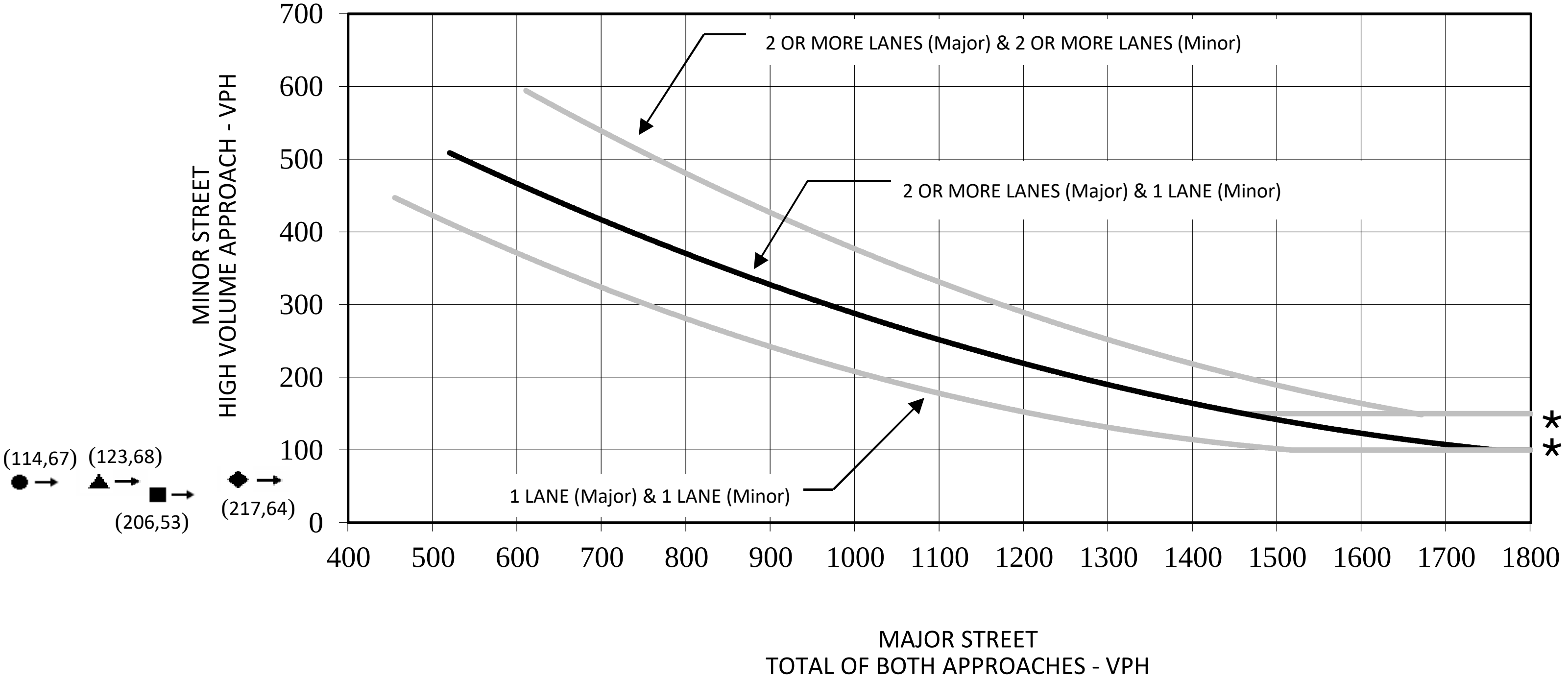
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

LSA

FIGURE 11-10

● No Project AM Peak Hour	▲ With Project AM Peak Hour
■ No Project PM Peak Hour	◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

Warrant 3: Peak Hour - Hughes Avenue/Nielsen Avenue – Existing Conditions

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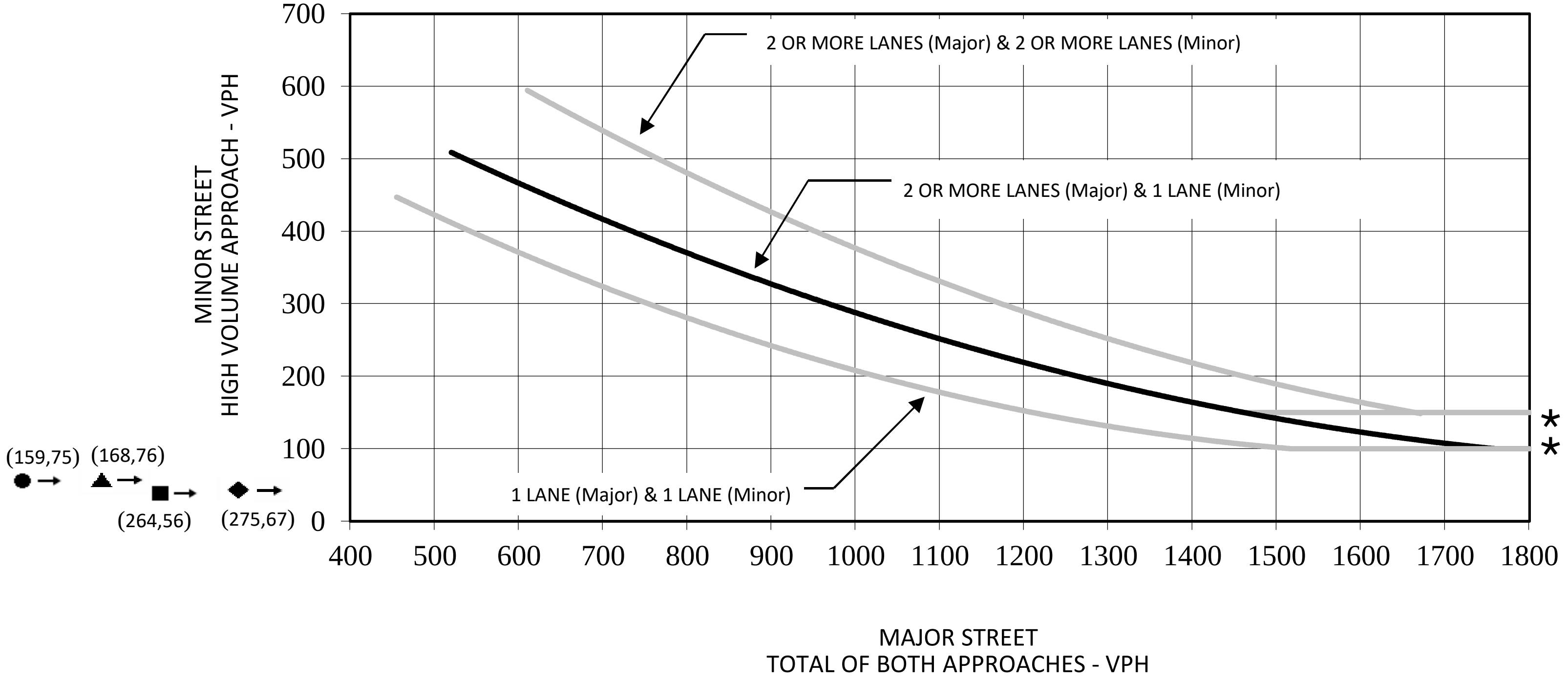
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-11

● No Project AM Peak Hour

▲ With Project AM Peak Hour

■ No Project PM Peak Hour

◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

Warrant 3: Peak Hour - Hughes Avenue/Nielsen Avenue –Near-term approved and pending with project Conditions

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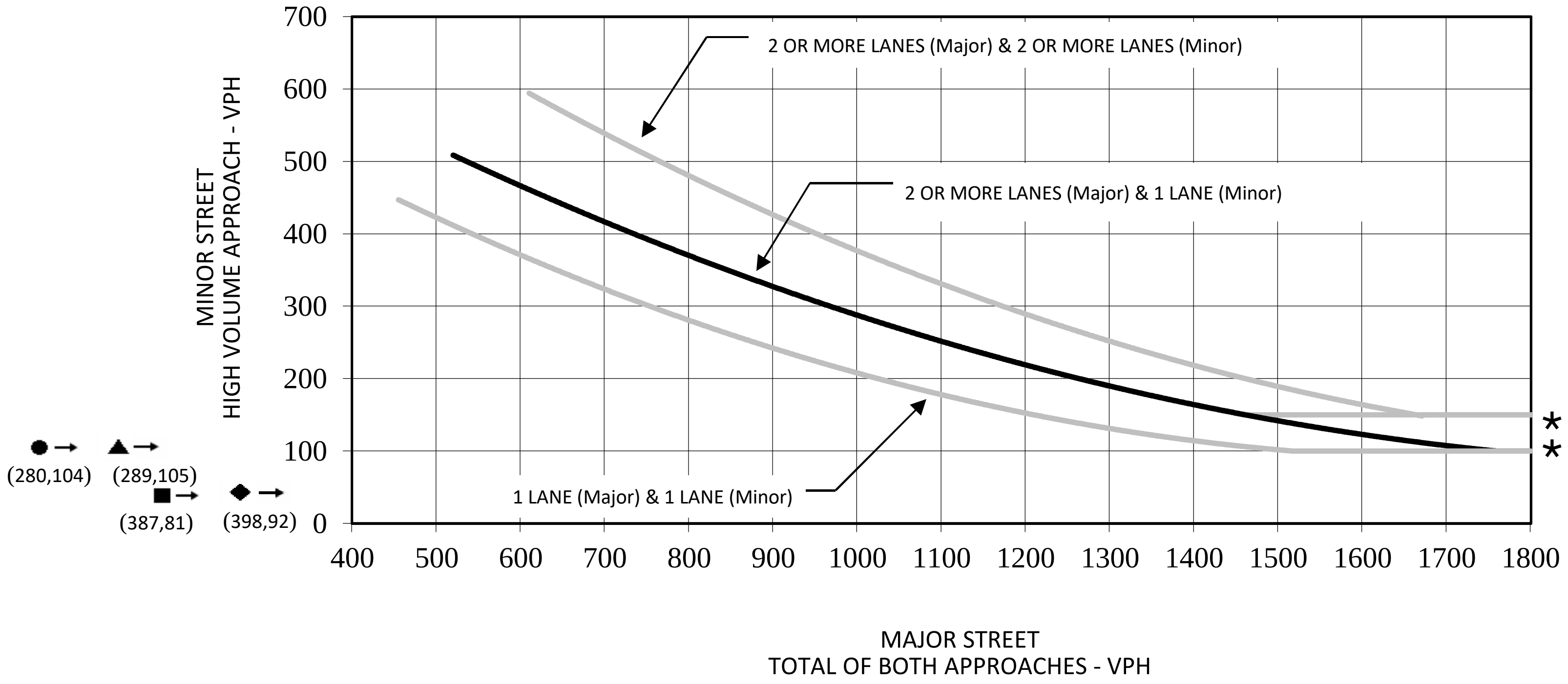
WARRANT 3, PEAK HOUR



* 150 VPH applies as the lower threshold volume for a minor street approach with two or more lanes
and 100 VPH applies as the lower threshold volume for a minor street approaching with one lane.

LSA

FIGURE 11-12

● No Project AM Peak Hour	▲ With Project AM Peak Hour
■ No Project PM Peak Hour	◆ With Project PM Peak Hour

2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-3

Warrant 3: Peak Hour - Hughes Avenue/Nielsen Avenue - Cumulative Year (2035) Conditions

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Table 11-A - Eight-Hour Warrant Analysis - Condition A (70%)

Marks Avenue/Belmont Avenue

	24-Hour Counts (Veh/hr)				Total Major Approaches (≥ 420 Veh/hr)	Higher Minor Approaches (≥ 140 Veh/hr)	Warrant Met
Time	EB	WB	NB	SB			
1 Marks Avenue/Belmont Avenue							
	Minor Approach		Major Approach				
0:00 - 1:00	15	39	26	27	53	39	No
1:00 - 2:00	10	0	19	12	31	10	No
2:00 - 3:00	13	6	22	18	40	13	No
3:00 - 4:00	14	18	22	18	40	18	No
4:00 - 5:00	42	62	52	60	112	62	No
5:00 - 6:00	106	85	115	141	256	106	No
6:00 - 7:00	131	105	164	193	357	131	No
7:00 - 8:00	248	130	230	357	587	248	Yes
8:00 - 9:00	182	162	259	289	548	182	Yes
9:00 - 10:00	145	173	240	196	436	173	Yes
10:00 - 11:00	142	221	262	178	440	221	Yes
11:00 - 12:00	173	239	281	206	487	239	Yes
12:00 - 13:00	168	234	383	196	578	234	Yes
13:00 - 14:00	166	242	400	211	612	242	Yes
14:00 - 15:00	192	249	522	211	733	249	Yes
15:00 - 16:00	241	285	662	211	873	285	Yes
16:00 - 17:00	264	236	530	201	732	264	Yes
17:00 - 18:00	171	191	449	206	655	191	Yes
18:00 - 19:00	122	136	296	134	429	136	No
19:00 - 20:00	96	146	121	104	225	146	No
20:00 - 21:00	53	91	183	94	277	91	No
21:00 - 22:00	33	86	99	53	152	86	No
22:00 -23:00	24	67	55	29	84	67	No
23:00 - 24:00	22	46	39	26	65	46	No
Total	2,773	3,249	5,430	3,371			

Notes:

▨ Meets Approach Volume Criteria

Table 11-B - Eight-Hour Warrant Analysis - Condition A (80%)

Hughes Avenue/Belmont Avenue

	24-Hour Counts (Veh/hr)				Total Major Approaches	Higher Minor Approaches	Warrant Met
Time	**EB**	**WB**	**NB**	**SB**	**(≥ 480 Veh/hr)**	**(≥ 120 Veh/hr)**	
6 Hughes Avenue/Belmont Avenue							
	Major Approach		**Minor Approach**				
0:00 - 1:00	27	27	17	15	54	17	No
1:00 - 2:00	1	4	17	6	5	17	No
2:00 - 3:00	13	30	7	4	43	7	No
3:00 - 4:00	32	25	8	11	57	11	No
4:00 - 5:00	55	83	13	15	138	15	No
5:00 - 6:00	155	128	52	49	283	52	No
6:00 - 7:00	165	138	43	47	303	47	No
7:00 - 8:00	200	163	66	57	363	66	No
8:00 - 9:00	214	185	77	74	399	77	No
9:00 - 10:00	213	215	73	107	428	107	No
10:00 - 11:00	257	257	104	89	514	104	No
11:00 - 12:00	266	291	94	87	557	94	No
12:00 - 13:00	296	275	114	81	571	114	No
13:00 - 14:00	291	311	80	89	602	89	No
14:00 - 15:00	293	310	109	96	603	109	No
15:00 - 16:00	353	335	128	97	688	128	Yes
16:00 - 17:00	299	269	109	102	568	109	No
17:00 - 18:00	216	239	113	77	455	113	No
18:00 - 19:00	181	170	40	62	351	62	No
19:00 - 20:00	157	173	18	52	330	52	No
20:00 - 21:00	110	129	49	49	239	49	No
21:00 - 22:00	79	125	46	40	204	46	No
22:00 -23:00	63	90	30	26	153	30	No
23:00 - 24:00	55	69	14	15	124	15	No
Total	3,991	4,041	1,421	1,347			

Notes:

▨ Meets Approach Volume Criteria

Table 11- C - Eight-Hour Warrant Analysis - Condition B (80%)

Hughes Avenue/Belmont Avenue

	24-Hour Counts (Veh/hr)				Total Major Approaches	Higher Minor Approaches	Warrant Met
Time	EB	WB	NB	SB	(≥ 720 Veh/hr)	(≥ 60 Veh/hr)	
6 Hughes Avenue/Belmont Avenue							
	Major Approach		**Minor Approach**				
0:00 - 1:00	27	27	17	15	54	17	No
1:00 - 2:00	1	4	17	6	5	17	No
2:00 - 3:00	13	30	7	4	43	7	No
3:00 - 4:00	32	25	8	11	57	11	No
4:00 - 5:00	55	83	13	15	138	15	No
5:00 - 6:00	155	128	52	49	283	52	No
6:00 - 7:00	165	138	43	47	303	47	No
7:00 - 8:00	200	163	66	57	363	66	No
8:00 - 9:00	214	185	77	74	399	77	No
9:00 - 10:00	213	215	73	107	428	107	No
10:00 - 11:00	257	257	104	89	514	104	No
11:00 - 12:00	266	291	94	87	557	94	No
12:00 - 13:00	296	275	114	81	571	114	No
13:00 - 14:00	291	311	80	89	602	89	No
14:00 - 15:00	293	310	109	96	603	109	No
15:00 - 16:00	353	335	128	97	688	128	No
16:00 - 17:00	299	269	109	102	568	109	No
17:00 - 18:00	216	239	113	77	455	113	No
18:00 - 19:00	181	170	40	62	351	62	No
19:00 - 20:00	157	173	18	52	330	52	No
20:00 - 21:00	110	129	49	49	239	49	No
21:00 - 22:00	79	125	46	40	204	46	No
22:00 -23:00	63	90	30	26	153	30	No
23:00 - 24:00	55	69	14	15	124	15	No
Total	3,991	4,041	1,421	1,347			

Notes:

▨ Meets Approach Volume Criteria

Table 11-D - Eight-Hour Warrant Analysis - Condition A (80%)

Hughes Avenue/Nielsen Avenue

Time	24-Hour Counts (Veh/hr) EB	WB	NB	SB	Total Major Approaches (≥ 400 Veh/hr)	Higher Minor Approaches (≥ 120 Veh/hr)	Warrant Met
7 Hughes Avenue/Nielsen Avenue							
	Minor Approach		**Major Approach**				
0:00 - 1:00	7	9	21	12	33	9	No
1:00 - 2:00	5	2	18	12	30	5	No
2:00 - 3:00	4	3	6	11	17	4	No
3:00 - 4:00	2	3	6	10	16	3	No
4:00 - 5:00	23	2	11	11	22	23	No
5:00 - 6:00	44	14	19	49	68	44	No
6:00 - 7:00	55	12	30	38	68	55	No
7:00 - 8:00	61	21	38	56	94	61	No
8:00 - 9:00	56	21	61	64	125	56	No
9:00 - 10:00	44	30	52	80	132	44	No
10:00 - 11:00	46	37	67	75	142	46	No
11:00 - 12:00	44	41	73	91	164	44	No
12:00 - 13:00	63	31	105	88	193	63	No
13:00 - 14:00	62	43	66	71	137	62	No
14:00 - 15:00	66	46	96	98	194	66	No
15:00 - 16:00	63	52	92	78	170	63	No
16:00 - 17:00	44	50	102	96	198	50	No
17:00 - 18:00	33	31	77	66	143	33	No
18:00 - 19:00	33	30	56	40	96	33	No
19:00 - 20:00	64	18	51	7	58	64	No
20:00 - 21:00	22	8	48	44	92	22	No
21:00 - 22:00	12	12	38	39	77	12	No
22:00 -23:00	10	5	25	22	47	10	No
23:00 - 24:00	6	5	11	25	36	6	No
Total	869	526	1,169	1,183			

Notes:

▨ Meets Approach Volume Criteria

Table 11-E - Eight-Hour Warrant Analysis - Condition B (80%)

Hughes Avenue/Nielsen Avenue

Time	EB	WB	NB	SB	Total Major Approaches (≥ 600 Veh/hr)	Higher Minor Approaches (≥ 60 Veh/hr)	Warrant Met
	24-Hour Counts (Veh/hr)						
7 Hughes Avenue/Nielsen Avenue							
	Minor Approach		Major Approach				
0:00 - 1:00	7	9	21	12	33	9	No
1:00 - 2:00	5	2	18	12	30	5	No
2:00 - 3:00	4	3	6	11	17	4	No
3:00 - 4:00	2	3	6	10	16	3	No
4:00 - 5:00	23	2	11	11	22	23	No
5:00 - 6:00	44	14	19	49	68	44	No
6:00 - 7:00	55	12	30	38	68	55	No
7:00 - 8:00	61	21	38	56	94	61	No
8:00 - 9:00	56	21	61	64	125	56	No
9:00 - 10:00	44	30	52	80	132	44	No
10:00 - 11:00	46	37	67	75	142	46	No
11:00 - 12:00	44	41	73	91	164	44	No
12:00 - 13:00	63	31	105	88	193	63	No
13:00 - 14:00	62	43	66	71	137	62	No
14:00 - 15:00	66	46	96	98	194	66	No
15:00 - 16:00	63	52	92	78	170	63	No
16:00 - 17:00	44	50	102	96	198	50	No
17:00 - 18:00	33	31	77	66	143	33	No
18:00 - 19:00	33	30	56	40	96	33	No
19:00 - 20:00	64	18	51	7	58	64	No
20:00 - 21:00	22	8	48	44	92	22	No
21:00 - 22:00	12	12	38	39	77	12	No
22:00 -23:00	10	5	25	22	47	10	No
23:00 - 24:00	6	5	11	25	36	6	No
Total	869	526	1,169	1,183			

Notes:

▨ Meets Approach Volume Criteria

12.0 CIRCULATION IMPROVEMENTS AND FUNDING SOURCES

12.1 RECOMMENDED IMPROVEMENTS

Based on the results of the LOS analysis, an operational deficiency currently exists at the intersection of Marks Avenue/Belmont Avenue. As discussed in Chapter 11, this intersection meets several signal warrants under existing, Near-term approved and pending, and Cumulative Year (2035) scenarios. Therefore, the following improvement is being recommended for this intersection:

- Marks Avenue/Belmont Avenue: Install a signal.

Tables 12-A, 12-B, and 12-C illustrate the post-improvement intersection levels of service under existing, Near-term approved and pending conditions, and Cumulative Year (2035) conditions, respectively. As shown in these tables, the intersection is forecast to operate at a satisfactory LOS with the implementation of the proposed improvement.

12.2 FUNDING SOURCES AND MECHANISMS

Where there is a funding mechanism (fee program) for the recommended improvements, payment into the fee program would be considered sufficient project obligation to alleviate project impacts. At study intersections where the project adds to or creates a forecast deficiency and there is no funding mechanism in place, the project is responsible for its fair-share payment toward the implementation of the improvements.

12.2.1 Citywide Traffic Signal Mitigation Impact (TSMI) Program

The City of Fresno traffic Signal Mitigation Impact (TSMI) fees are charged to all new developments throughout the City to mitigate the traffic operational deficiencies through the funding of traffic signal improvements to serve new developments. Based on the City of Fresno *City-Wide Traffic Signal Mitigation Impact Fee nexus Analysis for Proposed Fee Update*, dated September 2016, signalization of intersection of Marks Avenue/Belmont Avenue is included in the Traffic Signal Capital Improvements, where the entire funding is expected to be generated from the TSMI fees. Therefore, since the improvement is covered under the TSMI Fee program, the project will be paying into the fee program for this improvement.

12.3 LIST OF CHAPTER 12.0 TABLES

- Table 12-A: Existing with Project with Improvements Intersection Levels of Service
- Table 12-B: Near-Term Approved and Pending with Project with Improvements Intersection Levels of Service
- Table 12-C: Cumulative (2035) with Project with Improvements Intersection Levels of Service

Table 12-A - Existing with Project with Recommended Improvements Intersection Levels of Service

	With Project Without Improvements					With Project With Improvements				
		A.M. Peak Hour		P.M. Peak Hour			A.M. Peak Hour		P.M. Peak Hour	
Intersection	Control	Delay (sec.)	LOS	Delay (sec.)	LOS	Control	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Marks Avenue/Belmont Avenue	AWSC	20.9	C	>100	F *	Signal	20.6	C	22.3	C

Table 12-B - Near-Term approved and pending with Project with Recommended Improvements Intersection Levels of Service

	With Project Without Improvements					With Project With Improvements				
		A.M. Peak Hour		P.M. Peak Hour			A.M. Peak Hour		P.M. Peak Hour	
Intersection	Control	Delay (sec.)	LOS	Delay (sec.)	LOS	Control	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Marks Avenue/Belmont Avenue	AWSC	26.2	D	>100	F *	Signal	21.3	C	23.3	C

Table 12-C - Cumulative Year (2035) with Project with Recommended Improvements Intersection Levels of Service

	With Project Without Improvements					With Project With Improvements				
		A.M. Peak Hour		P.M. Peak Hour			A.M. Peak Hour		P.M. Peak Hour	
Intersection	Control	Delay (sec.)	LOS	Delay (sec.)	LOS	Control	Delay (sec.)	LOS	Delay (sec.)	LOS
1 . Marks Avenue/Belmont Avenue	AWSC	23.6	C	>100	F *	Signal	23.4	C	24.4	C

Notes:

AWSC = All-Way Stop Control

Delay = Average control delay in seconds (For OWSC intersections, reported delay is for worst-case movement).

LOS = Level of Service

* Exceeds LOS Standard

13.0 VEHICLE MILES TRAVELED ANALYSIS

On December 28, 2018, the California Office of Administrative Law cleared the revised California Environmental Quality Act (CEQA) guidelines for use. Among the changes to the guidelines was removal of vehicle delay and level of service from consideration under CEQA. With the adopted guidelines, transportation impacts are to be evaluated based on a project's effect on vehicle miles traveled (VMT).

The City adopted the City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds (VMT Guidelines) on June 25, 2020, which includes the screening criteria, VMT analysis methodology, VMT impact thresholds, and VMT mitigation measures. Therefore, the City's VMT Guidelines was used in the evaluation of the project's VMT analysis.

13.1 METHODOLOGY

The VMT Guidelines provides multiple screening criteria for land use projects. The project was compared with the screening criteria established in the "Project Screening" section of the VMT Guidelines to check if the project can be screened out. Following is a brief description about the project in relation with the project screening criteria:

- **Transit Priority Area (TPA) Screening:** The project is not located within a TPA. Therefore, this screening criteria does not apply to the project.
- **Low Trip Generator:** The VMT Guidelines identifies that projects generating less than 500 daily trips could also be screened out. As discussed in the project trip generation section, the project is estimated to generate 2,458 daily trips. Therefore, the project does not satisfy this screening criteria.
- **Other Screening Criteria:** The project is not a residential or office projects, and therefore it could not be screened out using low VMT area maps. Additionally, it is neither an affordable housing project nor it could be classified as retail, institutional/government uses or public service uses. Therefore, these criteria do not apply for the project.

As shown above, the project could not be screened out from detailed VMT analysis. As such, pursuant to the VMT Guidelines, a detailed VMT analysis was conducted to assess the project's VMT impact.

13.1.1 Thresholds of Significance

Though the project is non-residential it could not be classified as a retail or office project. Additionally, the project does not require a General Plan Amendment (GPA). Therefore, pursuant to the VMT Guidelines, the project VMT per employee needs to be compared with the existing VMT per employee for the region. The City's VMT Guidelines establishes a numerical value of 25.6 for the regional VMT per employee.

As recommended in the VMT Guidelines, Fresno COG ABM was used for the project VMT analysis. The model database was updated with the project land uses to calculate project VMT. The project VMT was calculated from Fresno COG ABM model run as described below:

13.1.2 Project Traffic Analysis Zone Update

The first step in preparation of this analysis was to update the traffic analysis zone (TAZ) in the model that include the project area. The project land use was converted to employments. SF to employee conversion factor were estimated from Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition. Daily Trip rates per employee were divided by daily trip rates per 1,000 SF to estimate the ratio between land use square footage and number of employees. The socioeconomic data for the project TAZ in the existing year model scenario was updated accordingly.

13.1.3 Model Runs and Project VMT Estimation

Model run was conducted for this updated model upon completion of the socioeconomic data update. The outputs from this updated model run was used to calculate the project VMT per employee.

13.2 PROJECT VMT ANALYSIS

Table 13-A summarizes the regional threshold and project VMT per employee. As shown in Table 13-A, the project VMT per employee is 22.66% lower than the existing regional VMT per employee. Therefore, based on the VMT Guidelines, the project will not have any significant VMT impact.

Detailed VMT calculation for the project is included in Appendix G.

13.3 LIST OF CHAPTER 13.0 TABLES

Table 13-A: Existing (2019) Regional and Project VMT per Employee

Regional*	Project	Difference	Percentage Difference	Significant Impact
25.6	19.8	5.8	22.66%	No

* *Obtained from City's VMT Guidelines.*

14.0 COLLISION ANALYSIS

As recommended by the City staff during the scoping agreement process, a collision analysis was performed in the vicinity of the project area. As such, intersections and roadway segments within the study area where accidents occurred in recent times were evaluated to estimate the accident rates at those locations. For the arterial roadway network system in the vicinity of the project, Statewide Integrated Traffic Records System (SWITRS) collision data between January 2018 and December 2020 were obtained from the Transportation Injury Mapping System (TIMS) database. For the freeway facilities in the vicinity of SR-180 Marks Avenue Interchange, Traffic Accident Surveillance and Analysis System (TASAS) crash data summary was obtained from Caltrans for the same time period. The SWIRTS data summary and Caltrans TASAS data summary is included in Appendix H.

Based on the SWIRTS data summary, within the study area during the same time period, one collision occurred at the intersection of Marks Avenue/SR-180 Westbound Ramps and one fatal collision occurred along the roadway segment of Hughes Avenue, between Belmont Avenue and Nielsen Avenue.

14.1 METHODOLOGY

For the intersections analyzed, rates per million entering vehicle (RMEV) was calculated to develop the accident rate at the intersection of Marks Avenue/SR-180 Westbound Ramps. Similarly, for the roadway segment of Hughes Avenue, between Belmont Avenue and Nielsen Avenue, rates per million vehicle miles (MVM) was calculated to determine the accident rate. For the roadway segment, length of the segment was determined from Google Earth aerial imagery. Additionally, since the accidents occurred at one intersection and within one segment only, only those locations were evaluated. These rates were compared against corresponding countywide and statewide rates to identify their performance. The statewide and countywide rates were obtained or derived from the data published in Caltrans *2018 Crash Data on California State Highways (Caltrans Crash Data).*

14.2 ANALYSIS SUMMARY

14.2.1 Intersections

Table 14-A summarizes the accident ratio for the intersection of Marks Avenue/SR-180 Westbound Ramps. As shown in Table 14-A, the accident rate at this intersection is 0.06 per million entering vehicle, which is substantially lower than the statewide average for such intersections. The accident rate for such intersections (signalized T-intersections under suburban setting) is 0.29 as per the Caltrans Crash Data. Relevant pages from the Caltrans Crash Data summary is included in Appendix H. As such, the intersection currently operates within the safety limits and no safety related improvements would be required at this intersection. Since no accidents occurred at the other intersections within recent years, no improvement is necessary for those intersections as well.

14.2.2 Roadway Segment

Table 14-B summarizes the accident rate for the roadway segment of Hughes Avenue, between Belmont Avenue and Nielsen Avenue. As shown in Table 14-B, the accident rate at this roadway segment is 0.71 per million vehicle miles traveled, which is lower than both countywide and

statewide average for non-freeway facilities. The average accident rate for roadway segments (non-freeway facilities) is 0.96 for the County and 1.02 for the state based on the Caltrans Crash Data. Additionally, as per Caltrans Crash Data, the statewide accident rate for two-lane undivided roadways with a speed limit of less than 45 mph and in a suburban setting is 1.6 which is substantially higher than the accident rate at the analyzed segment. Relevant pages from the Caltrans Crash Data summary is included in Appendix H. Therefore, this segment currently operates within acceptable safety limits.

However, currently, this roadway segment does not have any sidewalks to provide safe access to pedestrians. As previously mentioned, the City recommends installing sidewalks along this roadway segment under its Active Transportation Plan. As such, the project would be constructing a sidewalk along this segment along the project frontage, as well as project frontages along Marks Avenue and Nielsen Avenue as a project design feature. The addition of these sidewalks by the project would enhance pedestrian access and address safety concerns.

Since no accidents happened along other roadway segments within the study area, no improvement have been recommended at those segments.

14.2.3 Freeway Segment

Based on the TASAS data for freeway facilities, 36 collisions occurred in the freeway facilities within one mile on either side of the SR-180 and Marks Avenue interchange. None of these collisions resulted in any fatalities. The Caltrans TASAS data summary is included in Appendix H. As included in the summary, the rate of total fatal and injury related collisions along this facility is lower than the corresponding average rate for similar facilities.

14.3 CONCLUSION

Based on the results of this analysis, no improvement is necessary within the study area with the exception of installation of sidewalk along the project frontage on Hughes Avenue. Though the project will be adding new trips within the study area, it is not estimated that the project traffic will be significantly changing the traffic flow pattern within the neighborhood. As such, it is not expected that the project traffic will result in unsafe environment within the study area from traffic safety perspective. As described in the previous chapter, project traffic are estimated to have adequate time for turn movements and corner sight clearance along the project driveway and the intersections. Therefore, both car and truck trips generated by the project could safely maneuver throughout the study area. As such, the project would not potentially increase traffic collision rate within the study area.

14.4 LIST OF CHAPTER 14.0 TABLES

Table 14-A - Intersection Accident Rate per RMEV

	Intersection	# of Crashes C	Existing Daily Approach V	Years of Data N	Accident Ratio R
4 .	Marks Avenue/SR-180 Westbound Ramps	1	16,474	3	0.06

Notes:

RMEV= Rate per Million Entering Vehicle

Table 14-B - Roadway Segment Accident Rate per MVM

Roadway	#	Segment	# of Crashes	Existing ADT	Years of Data	Length of Segment (ft)[1]	Accident Ratio
			C	V	N	L	R
Hughes Avenue	**7**	Hughes Avenue, between Belmont Avenue and Nielsen Avenue	1	2,604	3	2,587	0.72

Notes:

MVM = Million Vehicle Miles Traveled.

15.0 SUMMARY AND CONCLUSION

The proposed project consists of four buildings with a total area of 901,438 sf, all of which will be High Cube Fulfilment Center warehouses. Access to the project site would be provided via seven driveways located on Marks Avenue, Nielsen Avenue and Hughes Avenue. The project is estimated to generate 2,458 daily PCE trips, with 137 PCE trips occurring during the a.m. peak hour and 176 PCE trips occurring during the p.m. peak hour.

15.1 EXISTING CONDITIONS SUMMARY

All but one study intersections and all roadway segments operate at a satisfactory LOS under existing without and with project conditions.

15.2 NEAR-TERM APPROVED AND PENDING (2023) CONDITIONS SUMMARY

All but one study intersections and all roadway segments are forecast to operate at a satisfactory LOS under Near-term approved and pending (2023) with project conditions.

15.3 CUMULATIVE YEAR (2035) CONDITIONS SUMMARY

All but one study intersections and all roadway segments are forecast to operate at a satisfactory LOS under Cumulative Year (2035) without and with project conditions.

15.4 QUEUING ANALYSIS SUMMARY

Except for some movements for the intersection of Marks Avenue/Belmont Avenue, all other study intersections are forecast to have adequate storage lane lengths to accommodate queues under all scenarios.

15.5 WORST CASE SCENARIO ANALYSIS SUMMARY

All study intersections and freeway segments evaluated under this scenario are forecast to operate at a satisfactory LOS under Near-term approved and pending (2023) with project conditions and Cumulative Year (2035) with project conditions.

15.6 SITE ACCESS ANALYSIS SUMMARY

The project driveways have adequate corner sight distance and will be stop controlled. Based on the locations of the project driveways, the project is not anticipated to create deficiency in the neighborhood traffic flow pattern.

15.7 SIGNAL WARRANT ANALYSIS SUMMARY

The intersection of Marks Avenue/Belmont Avenue meets signal warrant 1 and signal warrant 2 under existing conditions. This intersection also meets peak hour signal warrant for existing and all other analysis scenarios. The intersections of Hughes Avenue/Belmont Avenue and Hughes Avenue/Nielsen Avenue do not meet any signal warrant under any scenario.

15.7 CIRCULATION IMPROVEMENTS SUMMARY

Based on the improvements discussed in Section 12.1 “Recommended Improvements” of this report, the recommended improvements includes installing a signal at the intersection of Marks Avenue/Belmont Avenue. This improvement is included in the City’s TSMI fee program.

15.8 CEQA VMT ANALYSIS SUMMARY

The project could not be screened out and a detailed VMT analysis was performed for the project. Based on the results of this analysis, the project will not have any CEQA VMT impact.

15.9 COLLISION ANALYSIS SUMMARY

Accident ratio within the study area is lower than the corresponding countywide and statewide average and no improvement is necessary to enhance safety within the study area. Within one mile of the SR-180 and Marks Avenue interchange, the accident rates are lower than the average for similar facilities. It is not estimated that the project traffic will significantly change the traffic flow pattern within the study area or increase the current collision frequency.

APPENDIX A:

SCOPING AGREEMENT

LSA

CARLSBAD
FRESNO
IRVINE
LOS ANGELES
PALM SPRINGS
POINT RICHMOND
RIVERSIDE
ROSEVILLE
SAN LUIS OBISPO

July 19, 2021

Ms. Jill Gormley
City Traffic Engineer, City of Fresno
2600 Fresno Street
Room 4016
Fresno, CA 93721

Subject: Scope of Work for the 2740 West Nielsen Warehouse Traffic Impact Study (LSA Project No. SNN2101)

Dear Jill:

LSA will be preparing a traffic impact study (TIS) for the proposed 2740 West Nielsen Warehouse Project (project) to be located at the northeast corner of the intersection of Marks Avenue and Nielsen Avenue in the City of Fresno (City). Figure 1 (all figures and tables attached) illustrates the regional and project location.

The proposed project includes four High Cube Fulfillment Center warehouses totaling an area of 907,780 square feet (sf). Access to the project will be provided via the following seven driveways:

Driveways on Marks Avenue

- Driveway 1: This full access driveway located on Marks Avenue near the Northwest corner of the site will be used by passenger vehicles only.
- Driveway 2: This driveway located on Marks Avenue will be used by trucks only. This driveway will allow all movements except for left-turn egress from the project site.
- Driveway 3: This right-in-right-out driveway located on Marks Avenue near the Southwest corner of the site will be used by passenger vehicles only.

Driveways on Nielsen Avenue

- Driveway 4: This right-in-right-out driveway located on Nielsen Avenue will be used by passenger vehicles only.
- Driveway 5: This full access driveway located on Nielsen Avenue will be used by both passenger vehicles and trucks.

Driveways on Hughes Avenue

- Driveway 6: This full access driveway located on Hughes Avenue near the Northeast corner of the site will be used by both passenger vehicles and trucks.
- Driveway 7: This full access driveway located on Hughes Avenue will be used by both passenger vehicles and trucks.

Figure 2 illustrates the conceptual site plan and the driveway locations.

The project site designation in the City of Fresno Official Zoning Map is IH – Heavy Industrial. The project is consistent with the designated zoning. LSA anticipates that the following scope of work will be required to prepare the TIS for the proposed project.

SCOPE OF WORK: CEQA TRANSPORTATION ASSESSMENT

Senate Bill 743 (SB 743) required changes be made to California Environmental Quality Act (CEQA) regulations introducing vehicle miles traveled (VMT) as the metric for determining project traffic impacts. Thus, a VMT analysis will be conducted for the project to satisfy the CEQA requirements. The City adopted the *City of Fresno CEQA Guidelines for Vehicle Miles Traveled Thresholds* (VMT Guidelines) on June 25, 2020, which includes the screening criteria, VMT analysis methodology, VMT impact thresholds, and VMT mitigation measures. Based on the screening criteria provided in the VMT Guidelines, it is anticipated that the project will not be screened out from a detailed VMT analysis.

LSA will utilize the Fresno Council of Governments (Fresno COG) Activity Based Model (ABM) for the VMT calculations for the project. Recently LSA has been selected as one of the consultants to run the model in-house for VMT analysis and other purposes. Therefore, LSA will run the model in-house and extract the project VMT for the VMT analysis purposes. The CEQA VMT Assessment will involve the following steps:

Project Traffic Analysis Zone Update

The first step in preparation of this analysis will be to update the traffic analysis zones (TAZs) in the model that include the project area. LSA will convert the project land use into model socioeconomic categories using regional conversion factors. The socioeconomic data for the project TAZ in the existing year model scenario will be updated.

Project VMT Analysis

Upon completion of the socioeconomic data update, LSA will conduct model run for the existing scenario. LSA will utilize the outputs from the model runs to calculate the regional (Entire Fresno County) with project VMT per employee. Further, with project regional VMT per employee will be compared to corresponding no project VMT per employee under existing conditions. As per the City’s VMT analysis guidelines, if the with project VMT per employee exceeds the no project VMT per employee, then the project would create a significant VMT impact.

The TIS will include a chapter with the detailed VMT analysis methodology and results, and a discussion on mitigations if a significant VMT impact is found. The VMT methodology and findings will be confirmed with City staff prior to inclusion in the TIS.

Active Transportation and Public Transit Analysis

The TIS will evaluate potential project impacts on public transit, bicycle, and pedestrian facilities in the vicinity of the project. The analysis will determine whether the project conflicts with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decreases the performance or safety of such facilities.

SCOPE OF WORK: LEVEL OF SERVICE ANALYSIS

While Levels of Service (LOS) analysis is not a determinant of CEQA impacts, consistency with the City's General Plan goals and policies is still required. The LOS analysis will be prepared to satisfy the requirements established by the City of Fresno *Traffic Impact Study Report Guidelines* (City Guidelines), updated February 2, 2009.

Study Intersections

LSA proposes to include the following intersections in the study:

1. Marks Avenue/Belmont Avenue (City of Fresno, County of Fresno);
2. Marks Avenue/Nielsen Avenue (City of Fresno);
3. Marks Avenue/Ray Johnson Drive (City of Fresno);
4. Marks Avenue/SR-180 Westbound Ramps (Caltrans);
5. Marks Avenue/SR-180 Eastbound Ramps (Caltrans);
6. Hughes Avenue/Belmont Avenue (City of Fresno, County of Fresno); and
7. Hughes Avenue/Nielsen Avenue (City of Fresno).

Figure 3 illustrates the study area intersections.

It should be noted that based upon the recommendation by the City, a detailed LOS analysis will not be conducted at the project driveway intersections. As such, these intersections will be included for project trip distribution, assignment and volume development purposes only. A detailed LOS analysis will only be conducted for the intersections listed above.

Roadway Segments

LSA recommends evaluating the following roadway segments in the study:

1. Marks Avenue, between Belmont Avenue and Nielsen Avenue;
2. Marks Avenue, between Nielsen Avenue and Ray Johnson Drive;
3. Marks Avenue, between Ray Johnson Drive and SR-180 Westbound Ramps;
4. Marks Avenue, between SR-180 Westbound Ramps and SR-180 Eastbound Ramps;
5. Belmont Avenue, between Marks Avenue and Hughes Avenue;
6. Nielsen Avenue, between Marks Avenue and Hughes Avenue; and
7. Hughes Avenue, between Belmont Avenue and Nielsen Avenue.

For each roadway segment, the highest volume on any part of the segment will be considered as the analysis volume for the entire segment.

Analysis Scenarios

The LOS analysis will satisfy the requirements established by the City and Caltrans. The following scenarios will be included in the TIS:

- Existing Conditions;
- Existing plus Project Conditions;
- Existing plus Project and Near-term approved and pending projects Conditions;
- Cumulative Year (2040) no Project Conditions; and
- Cumulative Year (2040) plus Project Conditions.

Trip Generation

The trip generation rates from Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) Land Use 155 – "High-Cube Fulfillment Center Warehouse" have a small sample size. Recently, Western Riverside Council of Governments (WRCOG) facilitated a Trip Generation Study for such facilities. Therefore, the trip generation for the proposed project was developed using rates from this WRCOG *TUMF High-Cube Warehouse Trip Generation Study* (dated January 29, 2019) prepared by WSP. The study is included in Appendix A. The study provides separate trip generation rates for passenger vehicles, 2-4 axle trucks and 5+ axle trucks. The truck trips were converted to Passenger Car Equivalent (PCE) trips using a PCE factor of 2.0 for 2-4 axle trucks, consistent with Highway Capacity Manual (HCM) recommendations. However, as a conservative approach, a PCE factor of 3.0 was used for 5+ axle trucks, consistent with the practices in several regions within the State.

Table A summarizes the daily, a.m., and p.m. peak hour project trip generation. As shown in Table A, the project is estimated to generate 2,474 daily PCE trips, with 137 PCE trips occurring during the a.m. peak hour and 178 PCE trips occurring during the p.m. peak hour. Trip distribution patterns were obtained from select zone model runs of the Fresno COG ABM, which take into account the location of the proposed project in relation to surrounding land uses and the regional roadway network. Separate select zone trip distributions for passenger car and truck trips were obtained from the Fresno COG ABM. The select zone distribution plots are included in Appendix B. However, the model does not account for driveway location, driveway access configuration or the internal site circulation pattern. Therefore, the distribution was manually adjusted to reflect the project driveway locations and access patterns. Figures 4-A and 4-B illustrate the trip distributions at study intersections for passenger car and truck trips respectively.

The project trip assignment is the product of the project trip generation and the trip distribution percentages. Figures 5-A and 5-B illustrate the trip assignments at study intersections for passenger car and truck PCE trips respectively. Figure 6 illustrates the total project PCE trip assignment. It should be noted that these figures also include trip distribution and assignment at all the project driveways. These figures help demonstrate the volume development methodology under plus project conditions with addition of project traffic.

Volume Development and Analysis Methodology

Traffic volumes for existing year traffic conditions are usually based on current count data collected at study intersections and roadway segments. However, current traffic counts will not reflect the typical traffic conditions due to the statewide COVID-induced closure. LSA proposes to use historical counts available from counters, and apply a growth rate appropriate for the City to develop Existing year (2021) traffic volumes.

Existing plus project volumes will be developed by adding project traffic to the Existing conditions scenario volumes.

Existing plus project and Near-term approved and pending project conditions traffic volumes will be developed by applying a per annum growth factor to the existing traffic volumes and adding traffic from the project, as well as from the approved and pending development projects in the vicinity of the project. LSA contacted the City's Planning and GIS department and obtained a list of approved and pending development projects in the project vicinity. LSA is in the process of obtaining the list of cumulative projects from the County of Fresno because of the project's adjacency to the unincorporated County limits. Table B summarizes the list of Cumulative projects within the City. As noted in Table B, LSA is requesting the City to provide additional details for projects that have missing information.

Cumulative Year (2040) no Project volumes will be developed using forecast volumes obtained from the latest version of the Fresno COG ABM and by applying the FCOG recommended post-processing methodologies. Additionally, the transportation network to be evaluated in this scenario will include all Capital Improvement Projects (CIPs) already identified in an impact fee program such as the Fresno Major Street Impact (FMSI) program or Traffic Signal Mitigation Impact (TSMI) program.

Cumulative Year (2040) plus Project Conditions will be developed by adding project traffic to the Cumulative Year (2040) scenario volumes.

All study intersections will be analyzed during the a.m. and p.m. peak hours. As per the City Guidelines, the a.m. peak hour is defined as the one hour of highest traffic volumes occurring between 7:00 and 9:00 a.m. while the p.m. peak hour is defined as the one hour of highest traffic volumes occurring between 4:00 and 6:00 p.m. Intersection LOS will be calculated using *Highway Capacity Manual 6* (HCM 6) analysis methodologies by using the Synchro 10 software.

Roadway segments will be analyzed for daily traffic using the Florida Tables as recommended in the City Guidelines.

Queuing Analysis

A queuing analysis will be performed at all the study intersections. Queues for signalized intersections will be reported from Synchro, while queues for unsignalized intersections will be reported from SimTraffic.

Site Access and Circulation

A description of project driveways and illustration on the Site plan will be provided in the TIS. Traffic operations at the project driveways will be analyzed for Levels of service (LOS) and queues as part of the LOS and queuing analysis. The TIS will also include a discussion on the distance of the driveways from nearby intersections, along with the anticipated queues and Minimum Required Throat Depth (MRTD) at the driveways. An evaluation of sight distance and other potential unsafe traffic conditions shall be included in the TIS as requested by the City Staff.

Analysis of Traffic Operations and Recommended Circulation Improvements

LOS and delay will be analyzed under the Existing plus Project, Near-Term, and Cumulative plus project analysis scenarios to determine operational deficiencies at study intersections and roadway segments. Determination of operational deficiencies will be made based on the City's LOS standards and significance threshold criteria set forth in the City Guidelines and as per consultation with City staff.

Improvements will be recommended at locations operating at an unsatisfactory LOS or where the project causes an operational deficiency. Improvements may include addition of intersection turn lanes, roadway widening, traffic signal installation and modification, local street striping and channelization improvements, and signage. The LOS with improvements will be calculated and summarized along with a comparison of the LOS without improvements.

Signal Warrant Analysis

As per City staff comments, signal warrant analysis would be conducted at unsignalized study intersections. Peak hour approach volumes for the study intersections will be examined to determine whether signalization may be warranted per the criteria defined in the California supplement of the *Manual on Uniform Traffic Control Devices* (CA-MUTCD). Specifically, warrants 1 and 2 will be included for existing unsignalized intersections under the existing scenario. Warrant 3 will be included for unsignalized study intersections under all study scenarios.

Multimodal Analysis

The existing, pedestrian, bicycle, and transit service will be documented and gaps in the existing sidewalk and bicycle network within the study area as well as current access to transit and current transit service will be identified in the analysis. The analysis will identify connectivity from the project site to the existing bicycle, pedestrian network, and distance to current transit stops. Improvements that will increase connectivity to sidewalks, trails, bicycle facilities and transit facilities will be considered in the TIS.

Collision Analysis

An analysis of the collision data based on the California Highway Patrol (CHP) Statewide Integrated Traffic Records System (SWITRS) will be included in the TIS.

Fair Share

LSA will evaluate whether the improvements identified in the TIS are included in the City's FMSI or the TMSI programs. If it is determined that the improvement is not covered through either of the fee programs, then the project's fair share contribution will be calculated based on the project traffic as a percentage of total growth from existing to cumulative year conditions.

Should you have any questions, please do not hesitate to contact me at (951) 781-9310 or email me at Ambarish.Mukherjee@lsa.net.

Sincerely,

LSA ASSOCIATES, INC.

A. Mukherjee

Ambarish Mukherjee, AICP, PE
Principal

Attachments:

Table A: Project Trip Generation
Table B: Cumulative Projects
Figure 1: Regional and Project Location
Figure 2: Conceptual Site Plan
Figure 3: Study Area Intersections
Figure 4-A: Project Trip Distribution – Passenger Vehicles
Figure 4-B: Project Trip Distribution – Trucks
Figure 5-A: Project Trip Assignment – Passenger Vehicles
Figure 5-B: Project Trip Assignment – Truck PCE
Figure 6: Project Total Trip Assignment
Appendix A: WRCOG TUMF High-Cube Warehouse Trip Generation Study
Appendix B: Fresno COG Travel Model Select Zone Distribution Plots

TABLES

Table A - Project Trip Generation

			A.M. Peak Hour			P.M. Peak Hour			Daily
Land Use		**Units**	**In**	**Out**	**Total**	**In**	**Out**	**Total**	
High-Cube Fulfillment Center[1,2]	907.780	TSF							
Trips/Unit (Cars)			0.083	0.020	0.103	0.117	0.027	0.144	1.750
Trips/Unit (2-4 Axle Trucks)			0.006	0.002	0.008	0.009	0.002	0.011	0.162
Trips/Unit (5+ Axle Trucks)			0.009	0.002	0.011	0.008	0.002	0.010	0.217
Trips/Unit (Total)			0.098	0.024	0.122	0.134	0.031	0.165	2.129
Trip Generation (Cars)			75	18	93	106	25	131	1,589
Trip Generation (2-4 Axle Trucks)			5	2	7	8	2	10	147
Trip Generation (5+ Axle Trucks)			8	2	10	7	2	9	197
Trip Generation (Total Trucks)			13	4	17	15	4	19	344
Trip Generation (Total)			88	22	110	121	29	150	1,933
Trip Generation (Cars)			75	18	93	106	25	131	1,589
PCE Trip Generation (2-4 Axle Trucks)[3]			10	4	14	16	4	20	294
PCE Trip Generation (5+ Axle Trucks)[3]			24	6	30	21	6	27	591
PCE Trip Generation (Total Trucks)			34	10	44	37	10	47	885
PCE Trip Generation (Total)			109	28	137	143	35	178	2,474

Note:

TSF = Thousand Square Feet

[1] Rates from the Western Riverside Council of Governments (WRCOG) *TUMF High-Cube Warehouse Trip Generation Study*, January 2019, prepared by WSP.

[2] The WRCOG study does not provide in/out splits for the peak hour trip generation. Therefore, in/out splits from Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) supplement have been used for obtaining in/out traffic.

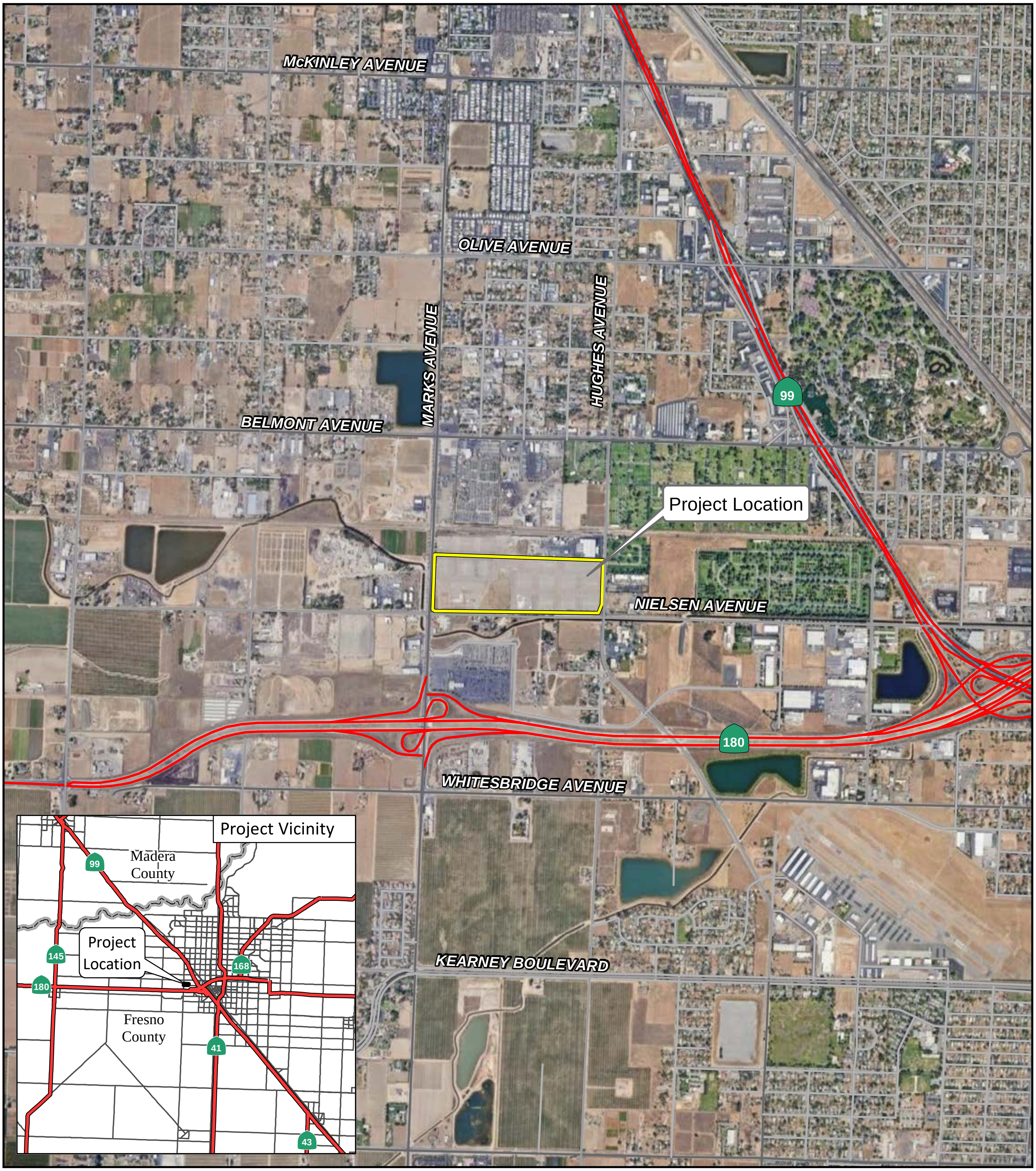
[3] A Passenger Car Equivalent (PCE) factor 2.0 has been taken for 2-4 axle trucks based on Highway Capacity Manual (HCM) recommendations. Further, as a conservative approach, a PCE factor of 3.0 is taken, for 5+ axle trucks, consistent with latest practices in numerous California jurisdictions.

Table B - Cumulative Projects

Project No.	Project Name	Address	Project Description	Required Information
1	Clinton and Marks Commercial Building	3031 W Clinton Avenue, 3015 W Clinton Avenue	8,775 sf restaurant, a 4,669 sf car wash building, a 2,200 sf Starbucks cafe with drive thru	*Please confirm project description.*
2	Derrel's Mini Storage West Belmont Expansion	1800 W Belmont Avenue, 1827 W Dudley Avenue	6.02-acre mini-storage facility	*Please confirm project description.*
3	Soccer, Retail, and Hotel Project	310 S West Street, 1725 W Nielsen Avenue, 1730 W Nielsen Avenue	The applicant proposes to develop these parcels into two indoor soccer fields, seven outdoor soccer fields, a 190 room hotel, restaurants, soccer apparel store, and market with gas station.	*Please confirm project description. Another description for 3100 S West Avenue is to site, build and operate a Permanent Regional Household Hazardous Waste Collection Facility. Another description for 1725 W Nielsen Avenue in the table is that the proposed project pertains to the development of a 16,000 SF industrial shop with office, 7 bays and truck yard with 60 stalls for Dave's Trucking (DISABLED AMERICAN VETERAN ENTERPRISES TRUCKING & SWEEPING, INC.).*
4	Bombay Business Park	145 N Fruit Avenue, 147 N Fruit Avenue, 183 N Fruit Avenue, 227 N Fruit Avenue, 289 N Fruit Avenue, 662 W Nielsen Avenue	The proposed project site is situated in the old industrial area east of State Route 99 and north of State Route 180 West, lying west of and fronting on North Fruit Avenue, south of the Southern Pacific Rail Road tracks and north of the Houghton Canal.	*Please provide number of units for the project (a detailed project description).*
5	ABS Auto Auctions	130 S West Avenue	The applicant is proposing the new use of an auto auction dealership. The proposed use will be through an online bidding system for wholesaling and services made available only to licensed dealers. The site will store between 30 to 60 cars at a time.	*Please provide building square footage.*
6	OASIS Tract 5463	3425 W Whites Bridge Avenue	-	*Please provide detailed project description.*
7	OASIS Tract 5456	3420 W Madison Avenue	-	*Please provide detailed project description.*
8	Tentative Map Tract 6183	3558 W Madison Avenue	The applicant proposes to subdivide the existing property into a 66-lot single-family subdivision.	
9	Tentative Map Tract 6183	3338 W Madison Avenue	The applicant proposes to subdivide the existing property into a 18-lot single-family subdivision.	
10	Truck Wash and Service	294 N Fruit Avenue	-	*Please provide detailed project description.*
11	Replacement of a Commercial Fire Damaged Building	3075 W Nielsen Avenue	Replacing a 7,000 sf fire damaged metal building with a new 4,920 sf metal building.	
12	KFC ASAP REFRESH	1904 W Olive Avenue	-	*Please provide project name and detailed project description.*
13	RNG/CNG Fueling Station	227 N Fruit Avenue, 289 N Fruit Avenue	A Renewable Natural Gas (RNG/CNG) fueling station.	*Please provide detailed project description with number of units.*
14	Fresno Mobile Home Park Expansion	3147 W Olive Avenue	-	*Please provide detailed project description with number of units.*
15	Red Onion Drive Thru	555 W Belmont Avenue	-	*Please provide detailed project description.*
16	Truck Wash and Lube Building	125 S Pleasant Avenue	8,100 sf metal building	*Please provide details about land use.*
17	Mixed-use Project	1824 W Olive Avenue	A 95-space 15 yr truck parking yard, a 5,000 sf convenience store with drive thru restaurant, and 6 multi-purpose dispensers and car wash tunnel.	
18	Renewable Natural Gas (RNG) Fueling Station	2280 W Whites Bridge Avenue	-	*Please provide detailed project description with number of units.*
19	Sandoval Trucking	Please provide exact address.	Proposal to build a new 3,750 sf metal building with 1,000 sf attached roof cover, to be used for truck repair (replace tires, brakes, etc.) and to store tools for trucking company.	*Please provide exact address and confirm project description.*
20	Truck Wash and Repair Facility	-	The proposed development is to construct a 5,000 sf metal building. This metal building will consist of one bay for truck wash and another bay for truck repair, and roughly 60 sf of reception area.	*Please provide exact address.*
21	Commercial Project	2809 W McKinley Avenue	-	*Please provide detailed project description with number of units.*
22	Royalty Freight Trucking Service	50 S Hughes Avenue	The applicant is proposing to develop a new 26,143 sf truck-service facility for truck repair, lube, wash, a tire repair shop with storage for parts, and offices. This project will also include a vestibule and covered patio, oil tank, guard kiosk and loading cross pit.	*Please confirm project description and number of units.*
23	New Metal Office Building	30 E Divisadero Street	3,800 sf general industrial	
24	NKRS Trucking	-	Accela record number P18-01260 pertains to the development permit application for a large diesel truck repair facility that specializes in minor maintenance and repair of large diesel trucks.	*Please provide exact address and detailed project description with number of units.*

Notes:
sf = square feet

FIGURES



LSA

FIGURE 1

N

0 1000 2000

FEET

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

2740 West Nielsen Warehouse
Traffic Impact Study

Regional and Project Location

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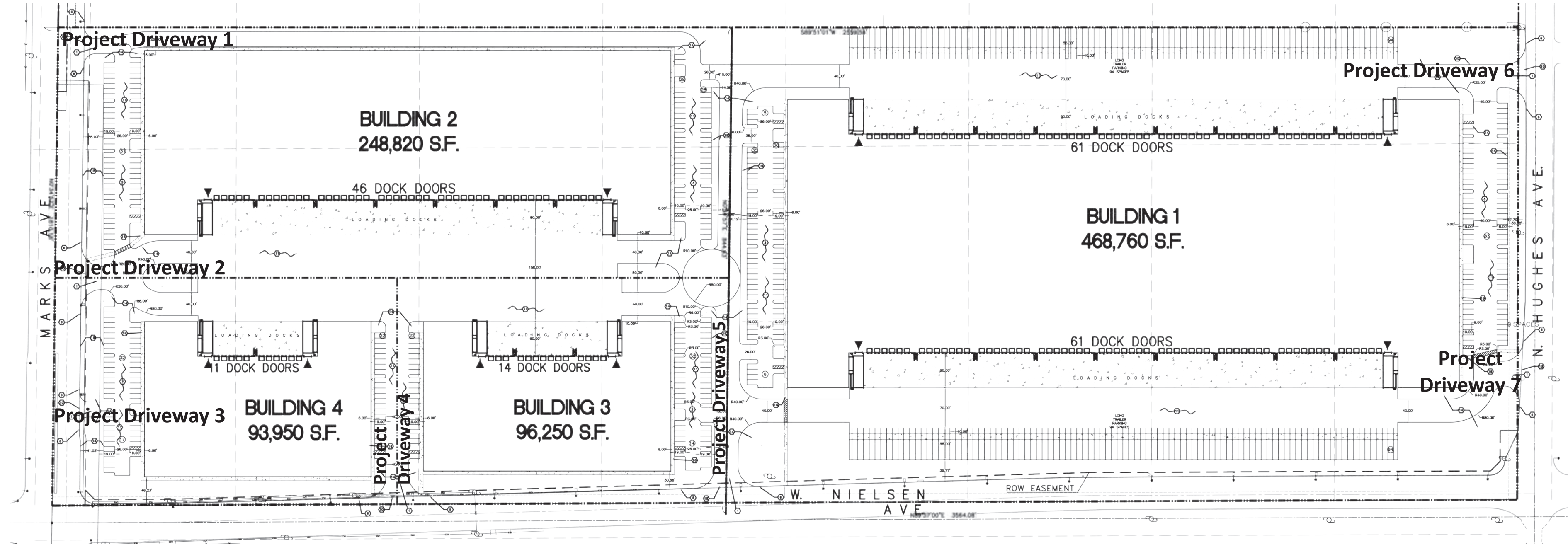
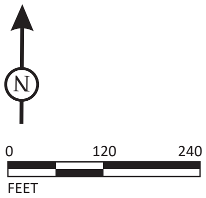


FIGURE 2



2740 West Nielsen Warehouse
Traffic Impact Study

Conceptual Site Plan

SOURCE: Lars Anderson and Associates, Inc.; April 2021

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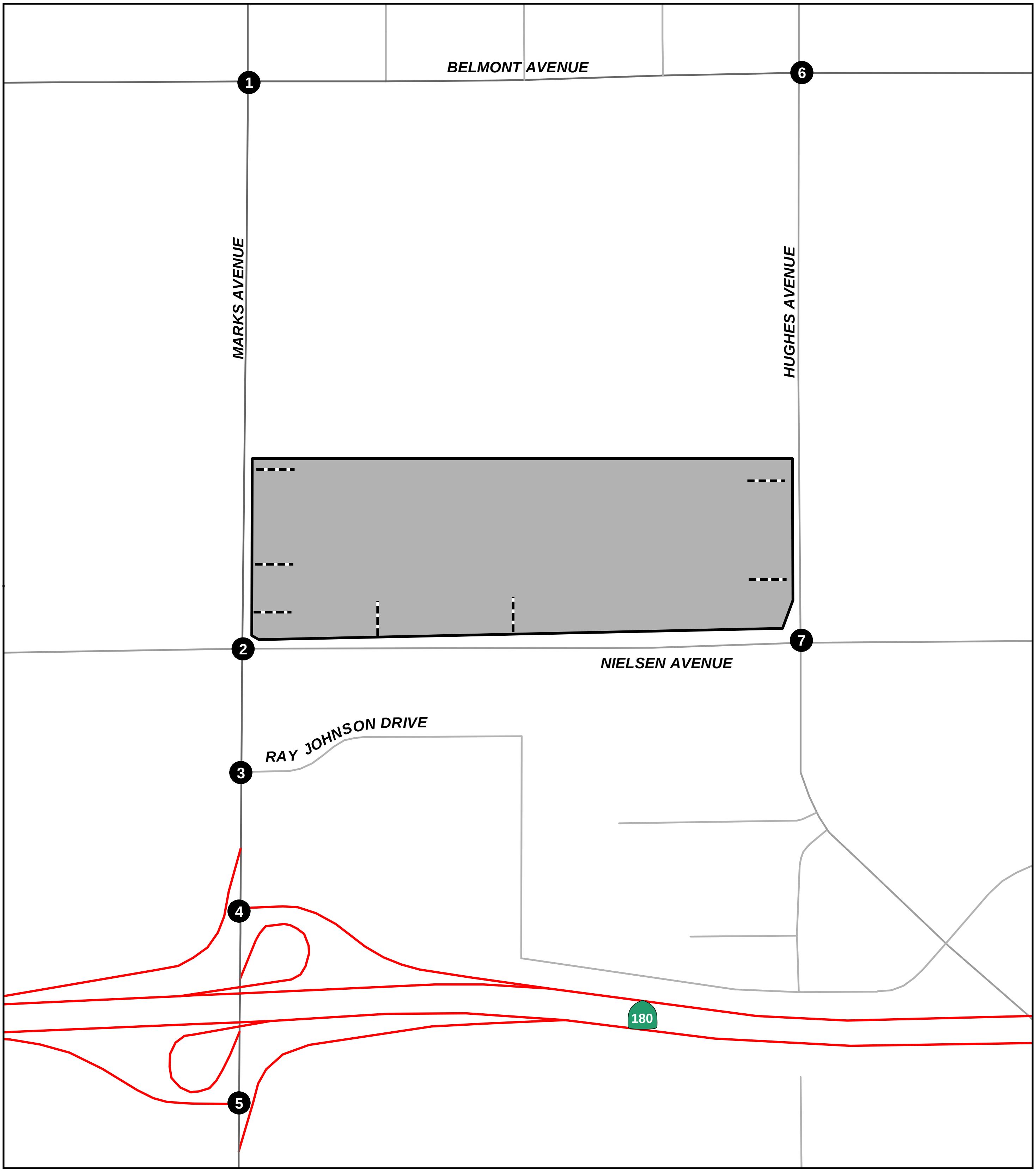

FIGURE 3

LEGEND

▨ Project Site

● Study Intersection

---- Project Driveway

2740 West Nielsen Warehouse
Traffic Impact Study

Study Area Intersections

SOURCE: County of Fresno Streets Data, 2021.

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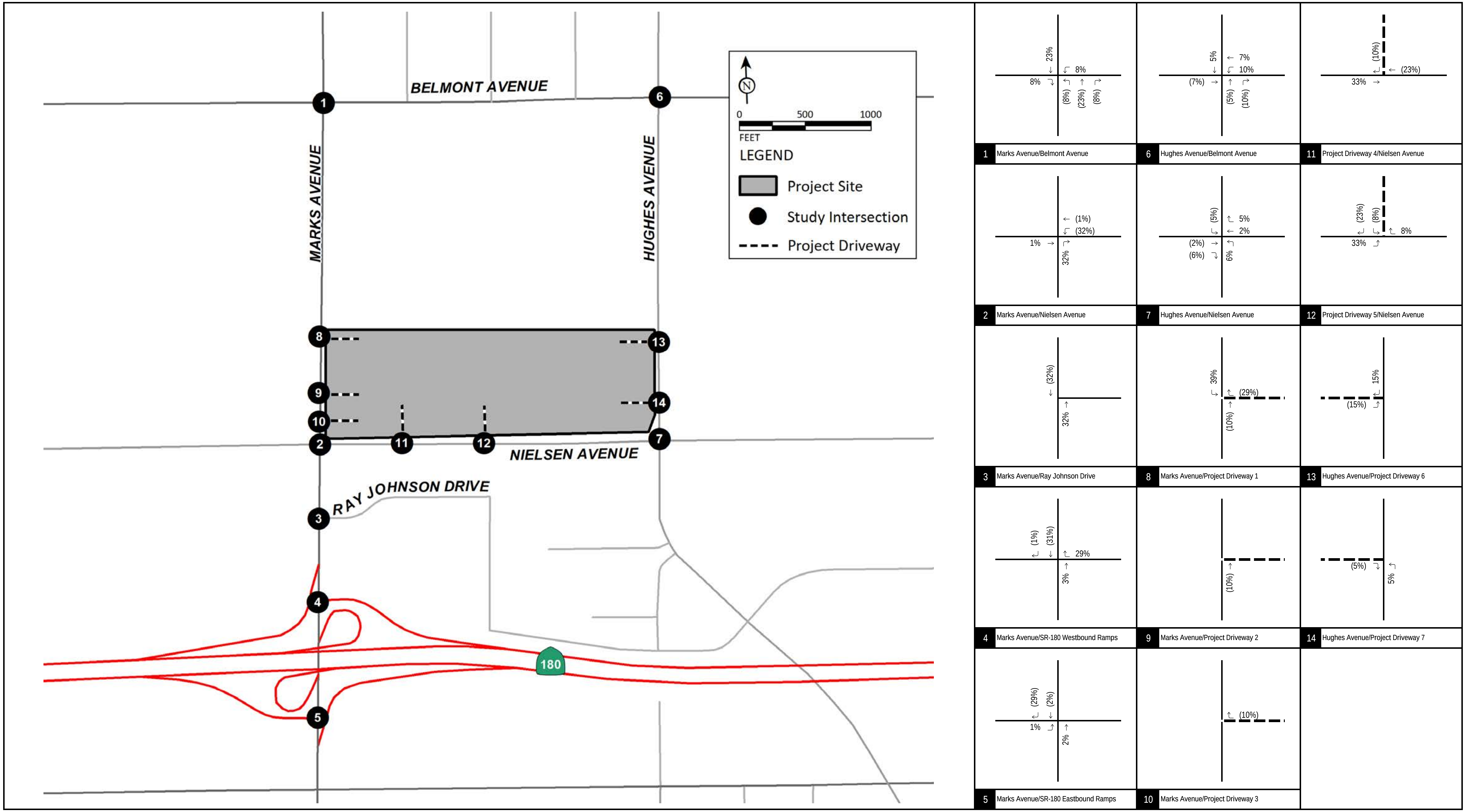

LSA

FIGURE 4-A

XX% (YY%)
Inbound (Outbound) Distribution
– – – – Project Driveway

2740 West Nielsen Warehouse
Traffic Impact Study
Project Trip Distribution - Passenger Vehicles

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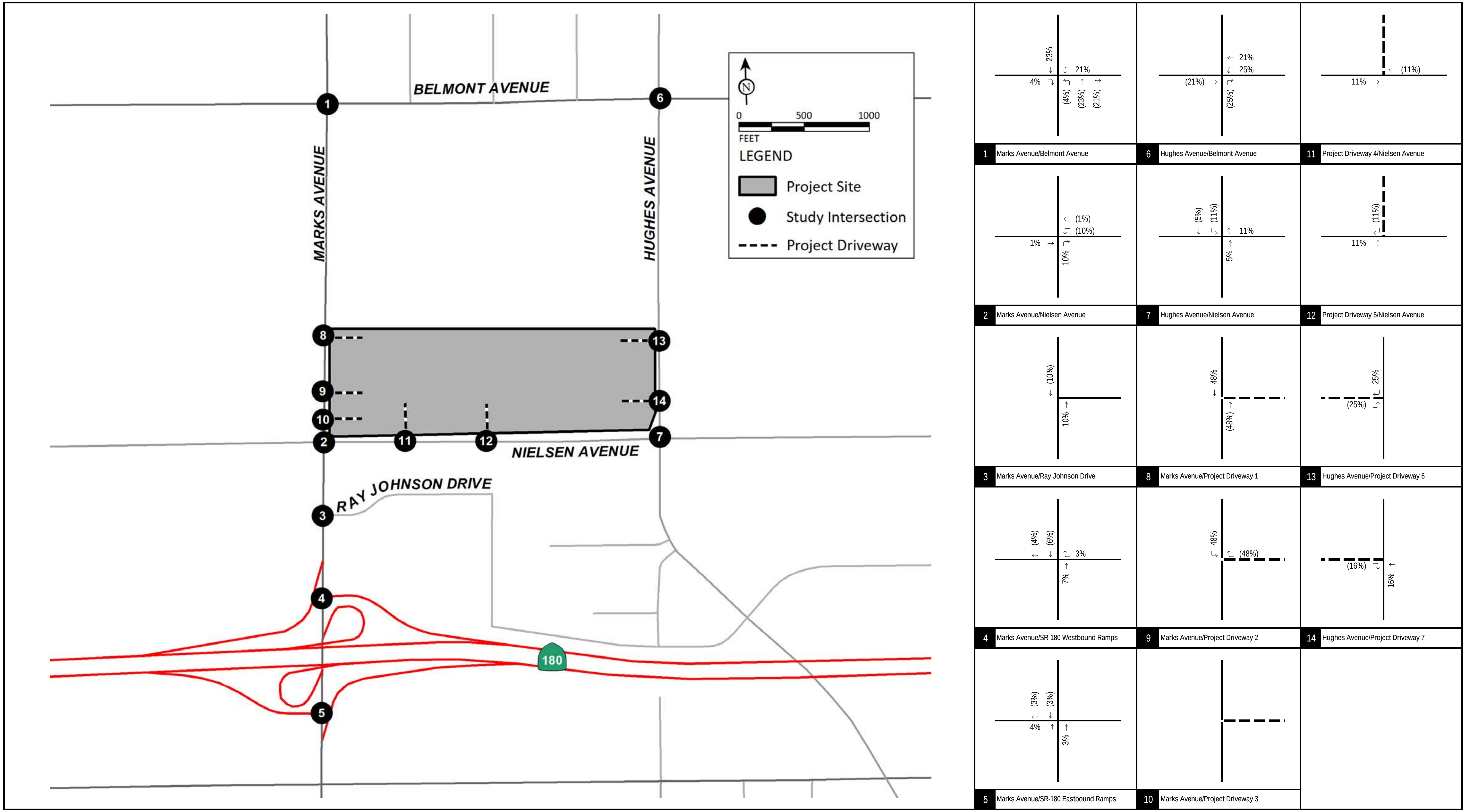

LSA

FIGURE 4-B

XX% (YY%)
Inbound (Outbound) Distribution
- - - - Project Driveway

2740 West Nielsen Warehouse
Traffic Impact Study
Project Trip Distribution - Trucks

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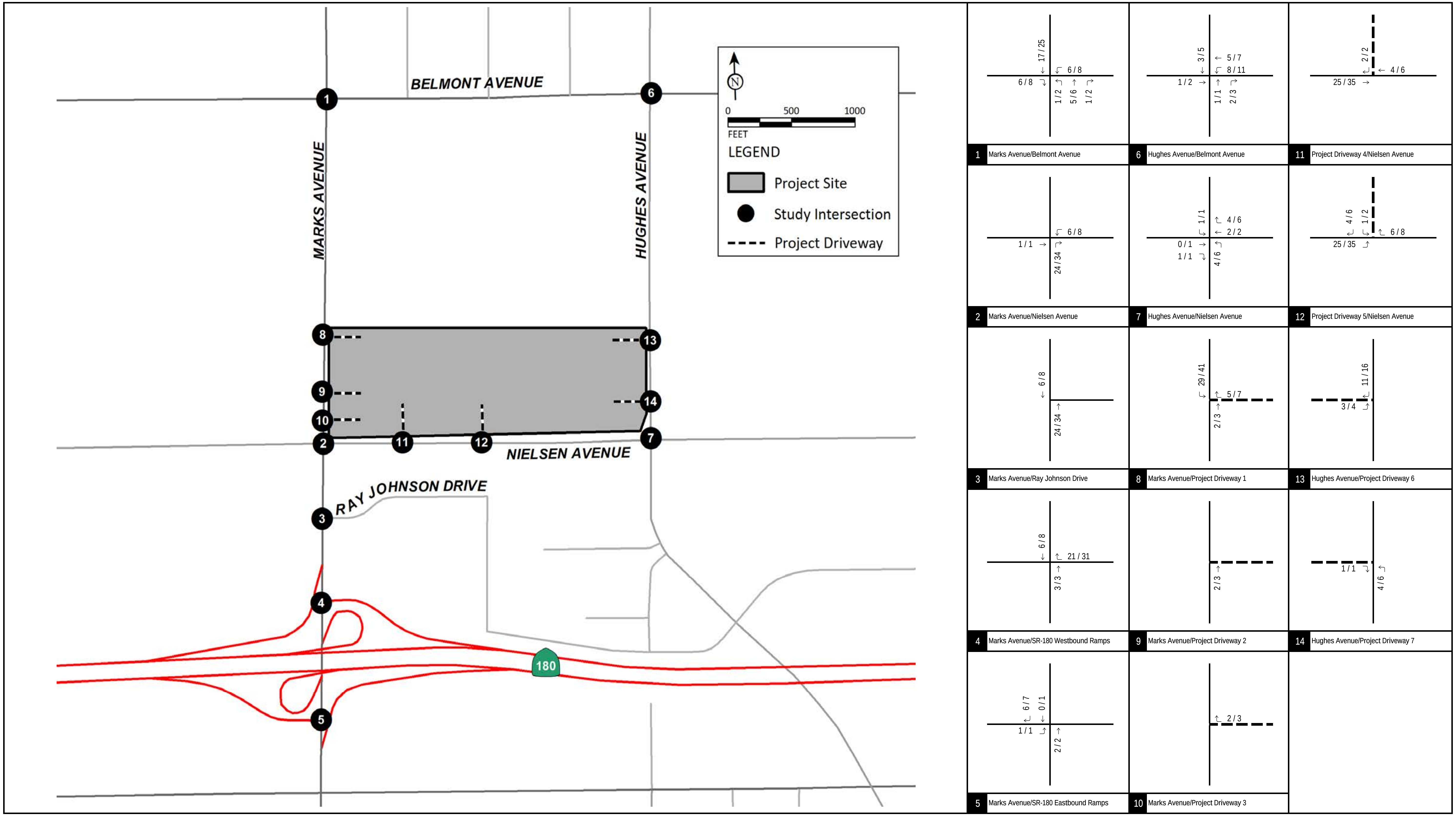

FIGURE 5-A

XX / YY
AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse
Traffic Impact Study
Project Trip Assignment - Passenger Vehicles

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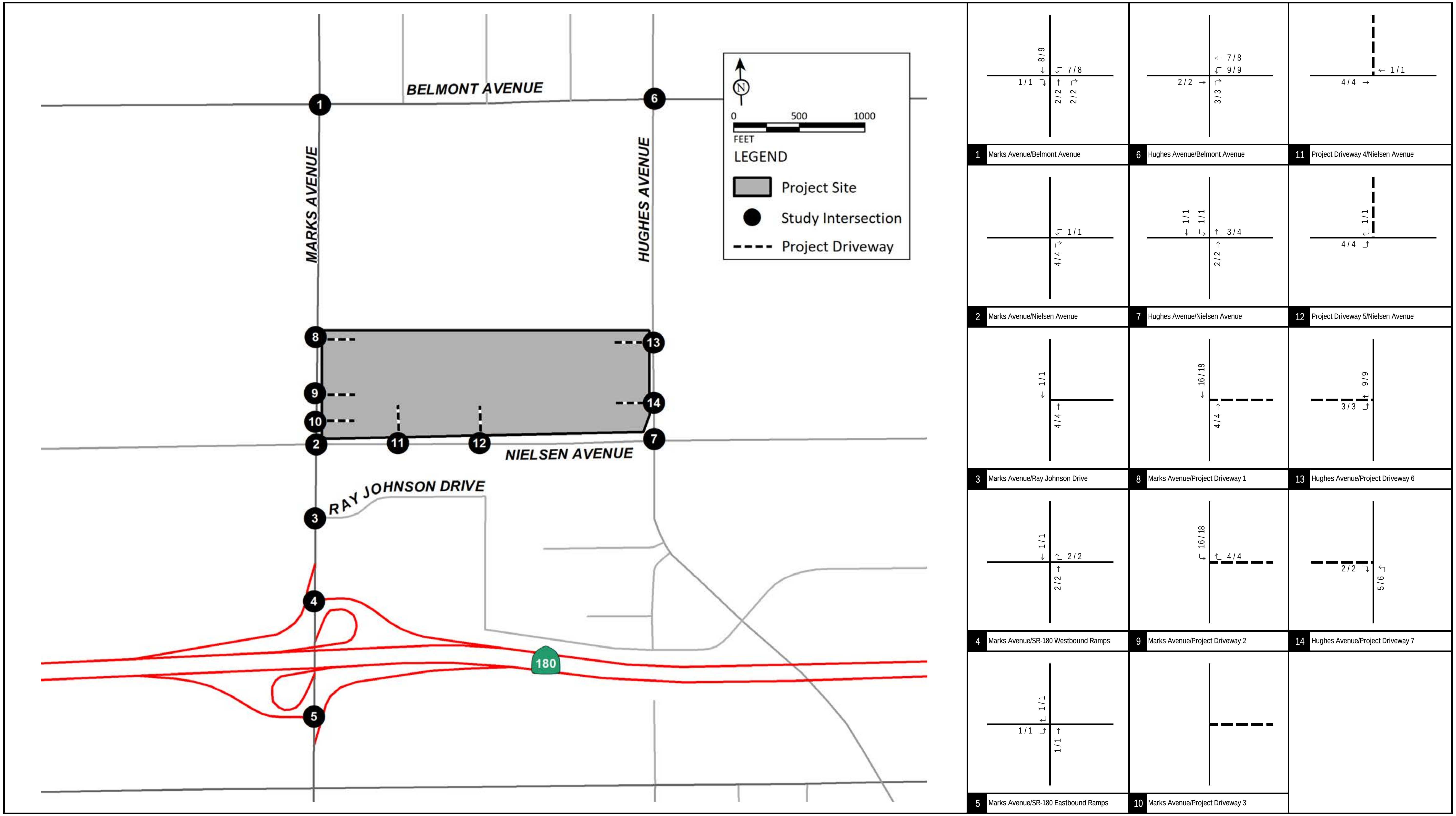

LSA

FIGURE 5-B

XX / YY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse
Traffic Impact Study

Project Trip Assignment - Trucks

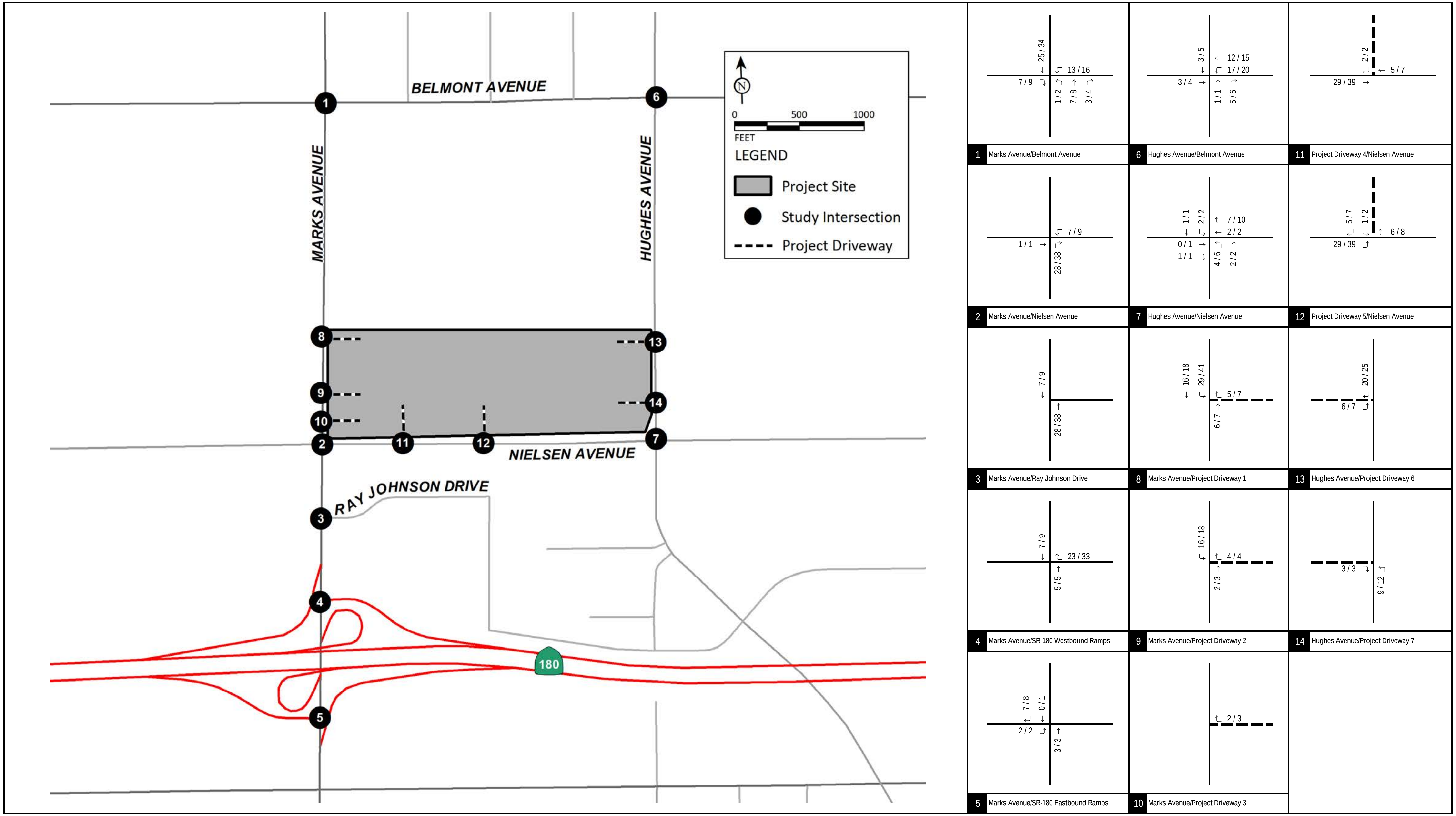

FIGURE 6

XX / YY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse
Traffic Impact Study
Total Project Trip Assignment

APPENDICES

Technical Memorandum

To: Daniel Ramirez-Cornejo, Program Manager, WRCOG

From: Billy Park, Supervising Transportation Planner, WSP

Subject: **TUMF High-Cube Warehouse Trip Generation Study**

Date: January 29, 2019

Background

High-cube warehousing is emerging as an important development type in the Inland Empire. Studies such as Logistics & Distribution: *An Answer to Regional Upward Social Mobility*[1] and *Multi-County Goods Movement Action Plan*[2] suggests that this trend is likely to increase over time due to the Inland Empire's relative abundance of suitable sites compared to coastal counties.

A recurring analytical problem for the analyses of traffic impacts associated with proposed high-cube warehouses is the lack of reliable data regarding the number and vehicle mix of trips generated by this land development type. Specifically:

- The *2003 Fontana Truck Trip Generation Study*, which has been used for years by agencies in the Inland Empire, is based on the older type of high-cube warehouse. Newer warehouses generally are larger (often over 1 million square feet), much more automated, and generate far fewer trips per square foot.
- The use of overly-conservative estimates has produced results that were unreasonable when compared to actual field conditions. For example, the Environmental Impact Report (EIR) for the Skechers high-cube warehouse building in Moreno Valley included traffic forecasts that were substantially higher than the actual post-construction trip generation for both cars and trucks. Overstated forecasts are misleading to decision makers and could result in oversized infrastructure that could itself have environmental consequences, creates an undue burden on development, and could even have adverse legal consequences for the agencies involved.
- In 2011 the Commercial Real Estate Development Association, also known by its former acronym NAIOP, commissioned a trip generation study of high-cube warehouses focused on large highly-automated warehouses in the Inland Empire. NAIOP had hoped that their study, which found trip-gen rates considerably lower than previous studies, would be used in CEQA analyses going forward. However, concerns about potential bias by the sponsoring party have placed into question the validity of the study results. Similarly, a study commissioned by SCAQMD was viewed as possibly having an anti-development bias.
- Finally, in 2015 NAIOP and SCAQMD jointly sponsored a trip-gen study for high-cube warehouses through a respected neutral party, the Institute of Transportation Engineers (ITE). The report for this study, *High-Cube Warehouse Vehicle Trip Generation Analysis*, was completed in 2016.

The joint NAIOP/SCAQMD/ITE study resulted in a consensus on the trip generation rates to be used for the most common type of high-cube warehouse, a category they call "transload and short-term storage". The findings of the joint study generally indicated the trip generation rates for this use as being consistent with the trip generation rates for the broader category of high-cube warehouses as described by ITE in the 9th Edition of the *Trip*

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[1] *Logistics & Distribution: An Answer to Regional Upward Social Mobility*, Dr. John Husing for SCAG, June 2004

[2] *Multi-County Goods Movement Action Plan*, Wilbur Smith Associates, August 2008

Generation Manual. However, the report did not settle the issue of trip generation rates for two other specific types of high-cube warehouses:

> *"The single data points for fulfillment centers and parcel hubs indicate that they have significantly different vehicle trip generation characteristics compared to other HCWs. However, there are insufficient data from which to derive useable trip generation rates."*

The purpose of this technical memorandum is to gather sufficient data to develop reliable trip generation rates for fulfillment centers and parcel hubs for use in traffic impact studies in the Inland Empire.

Methodology

Number of Sites: The study team reviewed ITE's *Trip Generation Handbook 2nd* Edition, Chapter 4 of which describes how to perform a trip generation study that meets ITE's standards (which improves the defensibility of the results if they are used for CEQA analyses). ITE recommends that at least three sites, and preferably five, be surveyed for a given land use category. Based on the review of candidate sites identified by Western Riverside Council of Governments (WRCOG) staff, it was recommended that data be collected at a total of 16 sites for the purposes of this study.

Independent Variables: ITE's Trip Generation Manual measures the size of proposed developments using more than a dozen different independent variables, such as students (for schools), acres (for parks), etc. All High-Cube related categories in both 9th and 10th Editions of the Trip Generation Manual are reported in Square Foot Gross Floor Area (GFA) measured in thousands of square feet (TSF), which is also the independent variable used for the TUMF program. Some other ITE employment categories use employment as the independent variable, as does SCAG in its Sustainable Communities Strategy. WRCOG provided GFA for all sites and employment data for eight fulfillment centers and one parcel hub site.

The ITE *Trip Generation Manual* typically reports trip generation rates two ways; namely as the average rate and using the "best fit" mathematical relationship between the number of trips generated and the independent variable. R-squared, also known as the coefficient of determination, is used to measure how well the best fit equations match the surveyed traffic counts. The *Trip Generation Manual* recommends that the best fit equation only be used when the R^2 is greater than or equal to 0.50 and certain other conditions being met; otherwise the average rate should be used.

Data Collection

WRCOG provided a list of recommended trip generation study sites after reviewing potential sites within the Inland Empire with its member agencies. The list included 11 fulfillment centers and 5 parcel hub sites as follows:

Fulfillment Centers

1. Walmart: 6750 Kimball Ave, Chino, CA 91708
2. Amazon: 24208 San Michele Rd, Moreno Valley, CA 92551
3. Lineage Logistics: 1001 Columbia Ave Riverside, CA 92507
4. P&G: 16110 Cosmos Street, Moreno Valley, CA 92551
5. Big 5: 6125 Sycamore Canyon Blvd, Riverside, CA 92507
6. Nestle USA: 3450 Dulles Drive, Jurupa Valley, CA
7. Home Depot: 11650 Venture Drive, Jurupa Valley, CA
8. ACT Fulfillment Center: 3155 Universe Drive, Jurupa Valley, CA
9. Petco: 4345 Parkhurst Street, Jurupa Valley, CA
10. Komer: 11850 Riverside Drive, Jurupa Valley, CA
11. Ross: 3404 Indian Ave Perris, CA 92571

Parcel Hubs

12. UPS: 15801 Meridian Pkwy, Riverside, CA 92518
13. FedEx: 330 Resource Dr, Bloomington, CA 92316
14. FedEx Freight: 12100 Riverside Drive, Jurupa Valley, CA
15. UPS Chain Logistics: 11811/11991 Landon Drive, Jurupa Valley, CA
16. DHL: 12249 Holly St N, Riverside, CA 92509

Traffic counts were collected at all of these sites. These were 72-hour driveway counts collected using video cameras for three-midweek days starting June 26, 2018. Video collection was determined to be preferable to collection data by means of machine counts, which can be problematic for driveways where vehicles are maneuvering at slow speeds. Video counts provide the ability for human viewers to review the captured footage to classify vehicles into 5 types (car, large 2-axle, 3-axle, 4-axle, and 5+ axle truck). The three-day average was calculated and used for the purposes of this study.

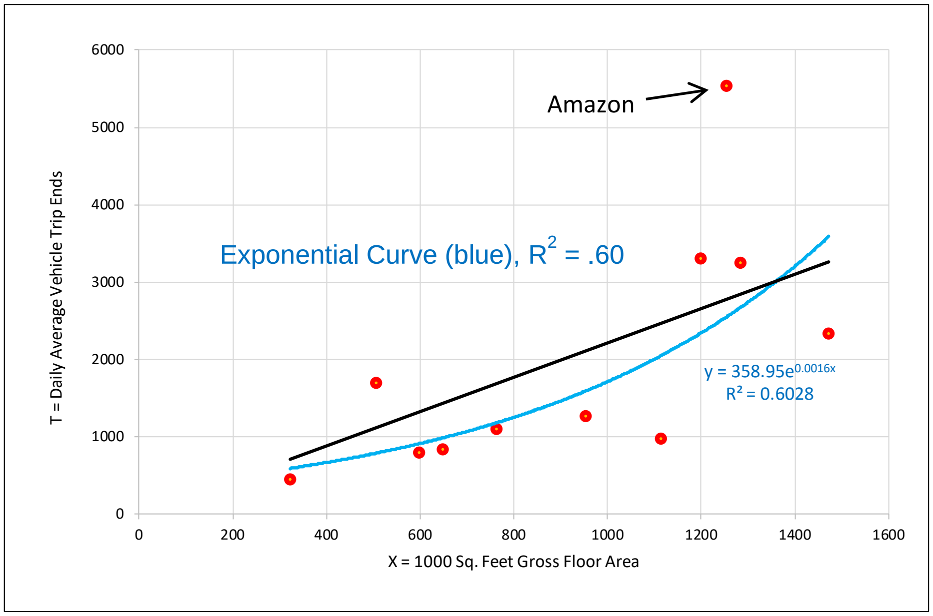
Fulfillment Centers

By Building Size

Exhibit 1 displays a data plot of daily vehicle trips for the 11 fulfillment centers against building size as the independent variable. The average trip generation rate for fulfillments centers (see black line in Exhibit 1) was found to be 2.2 trips/TSF, compared to the 1.4 trips/TSF found for conventional high-cube warehouses in the ITE/SCAQMD/NAIOP study (i.e. about 50% higher).

Exhibit 1 denotes one outlier data point representing the Amazon site in the upper right of the chart. As shown, the average daily trips generated at this facility is over 50% higher than the trips generated at the two sites of similar size (Walmart and Ross), which appears indicative of a greater frequency of same day e-commerce deliveries from Amazon to individual consumers.

Exhibit 1: Data Plot for Daily Total Vehicle Trip Ends against Building Size (Fulfillment Center)



The best fit equation was an exponential relationship with R^2 of 0.60 (i.e. high enough to meet the criteria of acceptability). This is shown as a blue line in Exhibit 1. An exponential relationship, meaning that the larger the building the higher the trip generation rate, is quite unusual. Exhibit 2 takes a deeper look at this by showing the daily vehicle trip generation rates for each of the 11 surveyed fulfillment centers sorted by the smallest to the largest building size from left to right. As shown, small sites tend to generate fewer trips per thousand square feet, but higher percentage of trucks. On the other hand, largest sites tend to generate a higher number of car trips, but fewer truck trips. So not only is the overall trip generation rate affected by building size, the vehicle mix is affected as well.

Exhibit 2: Daily Vehicle Trip Generation Rates by Building Size for Each Fulfillment Center

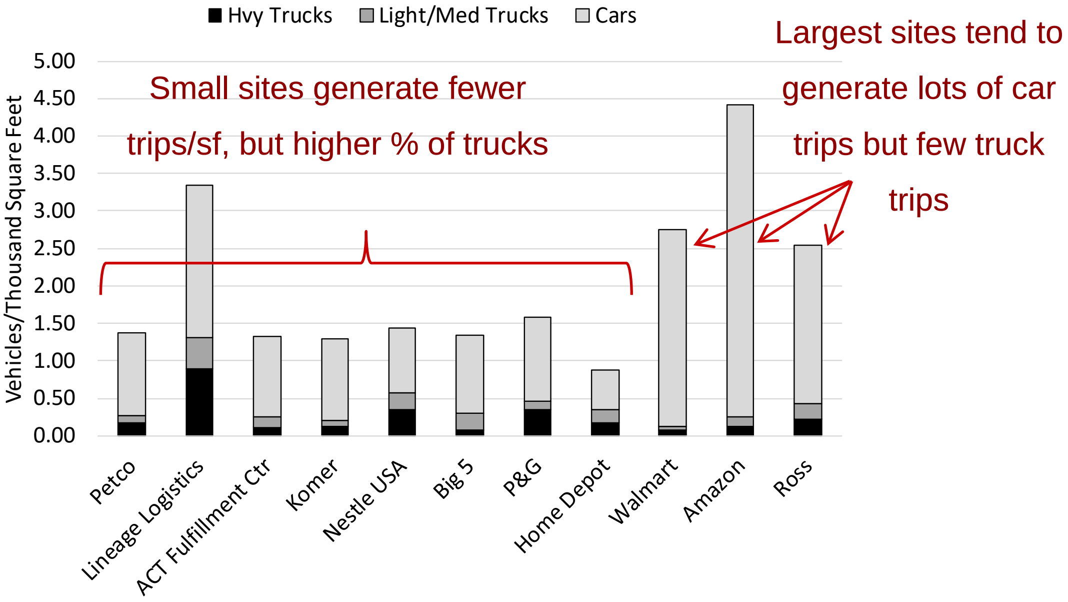


Exhibit 3 and Exhibit 4 show data plots for AM and PM peak hour vehicle trip ends against building size (respectively). The fitted curves had a low R^2, and so we recommend using the average rate.

Exhibit 3: Data Plot for AM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

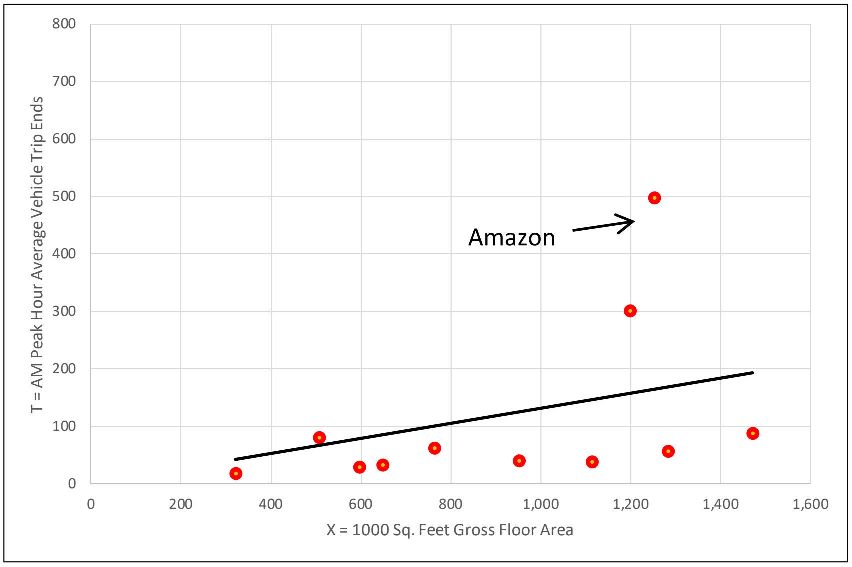


Exhibit 4: Data Plot for PM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

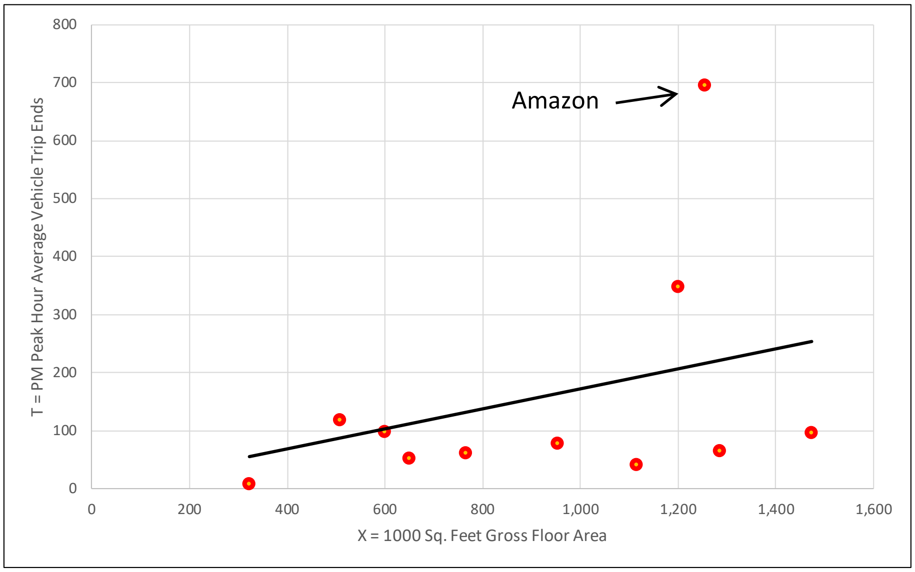
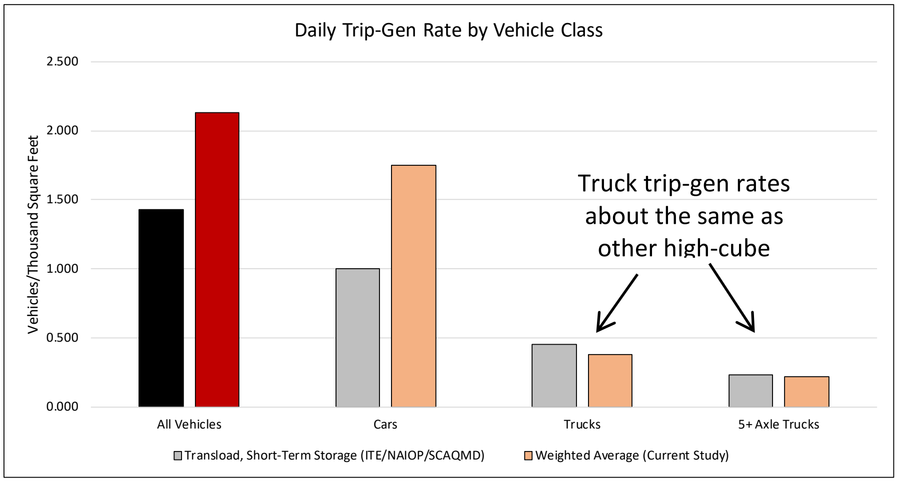


Exhibit 5 compares the average trip generation rates of 11 fulfillment centers with the rates found for conventional transload and short-term storage warehouses in the 2016 high-cube warehouse trip generation study[3] by SCAQMD/NAIOP/ITE. As shown, the fulfillment centers generate more daily vehicle trips than conventional warehouse facilities although trucks are roughly the same. This means that the additional trips by fulfillment centers are entirely due to additional car traffic, which is almost double the rate of car trips generated by conventional warehouses.

Exhibit 5: Conventional Warehouse vs Fulfillment Centers



Visual observation of the fulfillment center sites indicates the higher trip generation rates for cars appears to be mostly due to the use vans and passenger cars as delivery vehicles, particularly for the larger facilities operated by retailers such as Amazon and Walmart.

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[3] *High-Cube Warehouse Vehicle Trip Generation Analysis*, Institute of Transportation Engineers, 2016

Exhibit 6 summarizes the AM and PM peak hour trip rates and the daily rates for fulfillment centers based on the findings of this study, and compares the results to rates for conventional transload and short-term storage warehouses.

Exhibit 6: Summary of Trip Generation Rates per Thousand Square Feet of Gross Floor Area for Fulfillment Centers

Vehicle Class	AM Peak Hour		PM Peak Hour		Daily	
	Conventional Warehouse*	Fulfillment Center	Conventional Warehouse	Fulfillment Center	Conventional Warehouse	Fulfillment Center
Cars	0.057	0.103	0.086	0.144	1.000	1.750
2-4 Axle Trucks	0.009	0.008	0.013	0.011	0.221	0.162
5-Axle Trucks	0.015	0.011	0.010	0.010	0.233	0.217
Total	0.082	0.122	0.108	0.165	1.432	2.129
% Higher than Conventional		49%		52%		49%

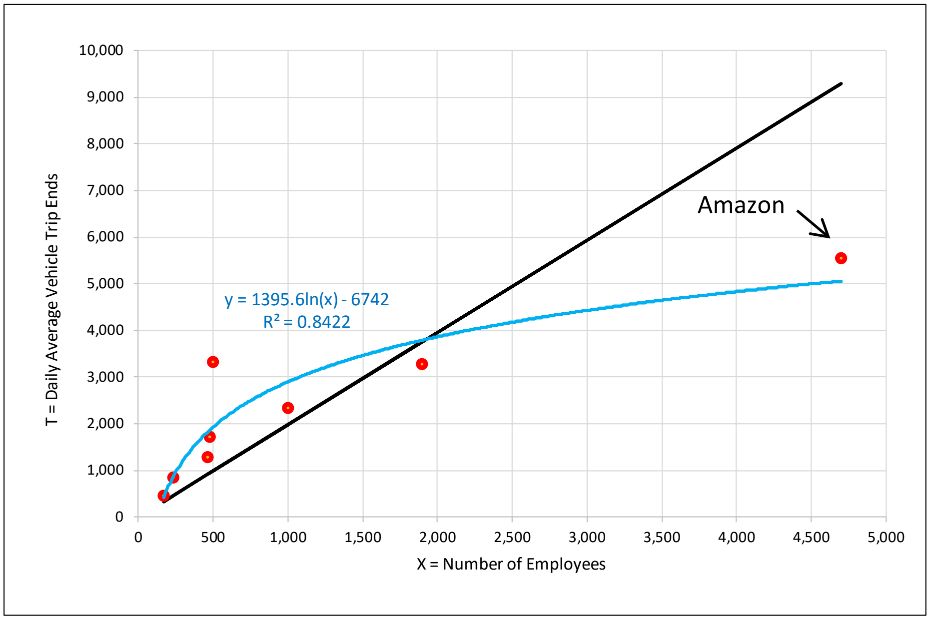
* Transload, Short-Term Storage category in 2016 TIE/ NAIOP/ SCAQMD study

By Employee

The WRCOG contacted the surveyed fulfillment centers and obtained employment data for eight of the eleven sites. Exhibit 7 shows a data plot for those eight sites for daily total vehicle trip ends against the number of employees. The best fit equation was logarithmic function which had an R^2 of 0.84, indicating a very good fit. Notably, the Amazon site, which was an outlier for trip generation based on floor area (see Exhibit 1), correlates more closely to other sites when employment is used instead. The average trip generation rate for fulfillments centers (represented by the black line in Exhibit 7) was found to be 2.0 trips/TSF

No comparison was made to any previous rates per employees because none of the previous high-cube warehouse related trip generation studies included correlation of trips with employment data.

Exhibit 7: Data Plot for Daily Total Vehicle Trip Ends against Employee (Fulfillment Center)



The data plots for the AM and PM peak hour total vehicle trip ends against the number of fulfillment center employees are shown in Exhibit 8 and Exhibit 9. The best fit equations are linear regressions (shown with black lines) which show a good R^2 for both the AM and PM peak periods.

Exhibit 8: Data Plot for AM Peak Hour Total Vehicle Trip Ends against Employee (Fulfillment Center)

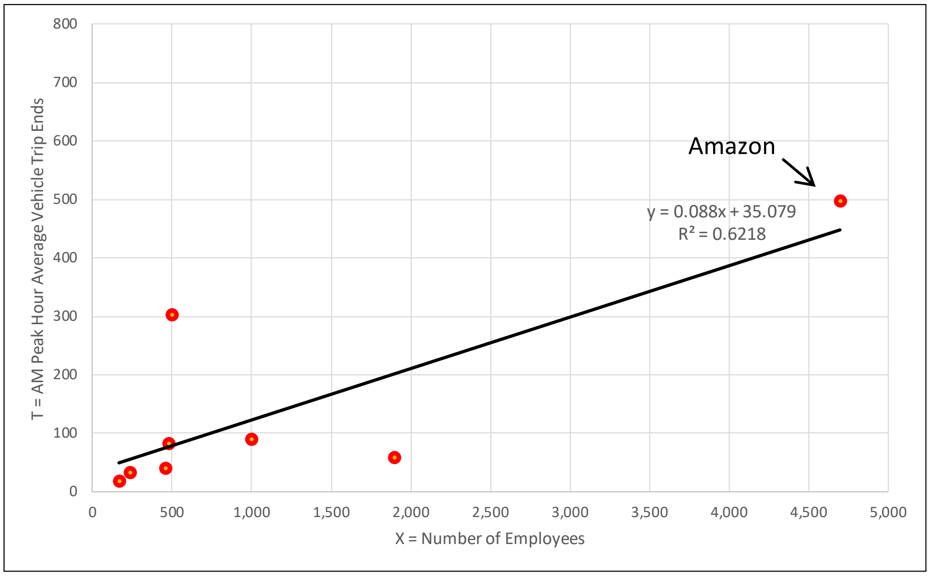


Exhibit 9: Data Plot for PM Peak Hour Total Vehicle Trip Ends against Employee (Fulfillment Center)

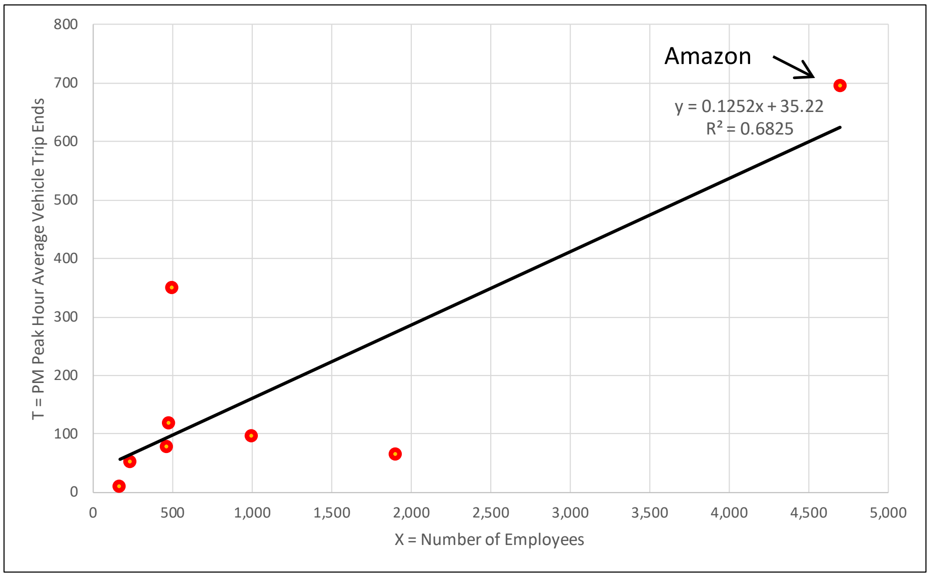


Exhibit 10 summarizes the AM and PM peak hour trip rates and the daily rates for trip generation per employee at fulfillment centers based on the findings of this study.

Exhibit 10: Summary of Trip Generation Rates per Employee for Fulfillment Centers

Vehicle Class	AM Peak Hour	PM Peak Hour	Daily
Cars	0.102	0.139	1.673
2-4 Axle Trucks	0.006	0.008	0.125
5-Axle Trucks	0.009	0.008	0.178
Total	0.118	0.155	1.977

Parcel Hubs

By Building Size

Exhibit 11 displays daily vehicle trip generation rates by building size for each of five parcel hub sites. They are sorted by the smallest to the largest building size from left to right. In this case the small sites generate significantly more trips of every kind than the larger sites, which is the opposite to the pattern observed for fulfillment centers.

Exhibit 11: Daily Trip Generation Rates at Parcel Hubs

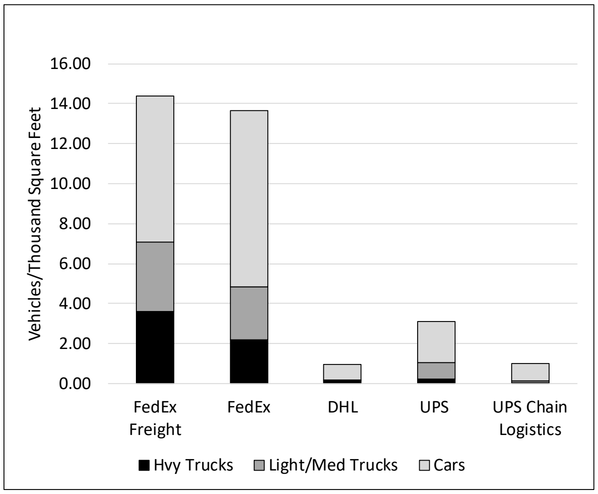


Exhibit 12 shows a data plot of daily vehicle trips of five parcel hubs against building size. As shown, a linear best fit was negative. During the collection of traffic data, construction activity was observed at the FedEx site potentially tainting the validity of these data to represent typical trip generation characteristics. To determine if the trip generation at this site was contributing to the poor data correlation, Exhibit 13 displays the same daily data plot without the FedEx site. The linear best fit shows a positive slope, but remains almost flat effectively indicating no correlation between the daily trips and building size based on the analysis of these sites.

The basic premise of the ITE trip generation approach is that the number of trips generated by a project is proportional to its size. That premise does not hold true for the parcel hubs in this sample and so no meaningful trip generation rates could be determined based on the data collected in support of this study. It should be recognized that a sample size of four or five sites represents the minimum recommended by ITE for valid trip generation studies, and for this reason, it is recommended that additional sites would need to be investigated and included in the data set to develop a more definitive finding on trip generation rates. Furthermore, it may be appropriate to determine the specific function at each site, due to the disparity between the rates observed at the FedEx sites versus the other three sites. It is likely that the function served by the respective sites is significantly different, as reflected in the trip generation rates, thereby necessitating reclassification of these uses for comparative purposes.

Exhibit 12: Data Plot for Daily Total Vehicle Trip Ends against Building Size (Parcel Hubs)

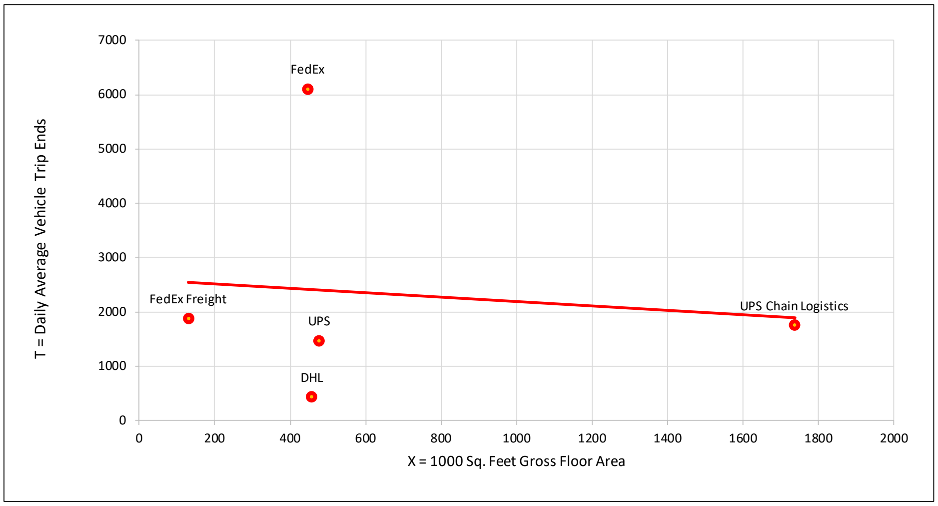
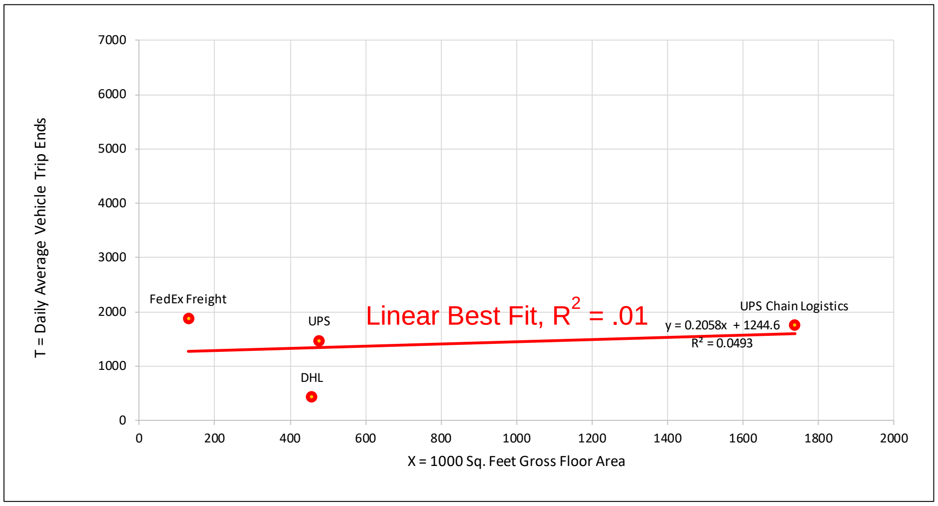


Exhibit 13: Data Plot for Daily Vehicle Trip Ends against Building Size without Construction Site



Conclusions

Our survey of 11 fulfillment centers produced trip generation rates based on the gross floor area of the sites that satisfies ITE's standards for use. The findings of the study indicate that the daily trip generation rates for fulfillment centers is approximately 2.1 trips per thousand square feet of gross floor area, which is roughly 50% higher than the comparable rate for conventional transload and short term storage warehouses previously defined in the ITE *Trip Generation Manual* Version 10. The results of the study further indicate that the higher rates were entirely due to more cars traffic at these sites; the trip generation rates for trucks was found to comparable to those at conventional warehouses.

Employment data were available for eight out of 11 fulfillment center sites. This provided the ability to determine trip generation rates per employee. The study results indicate that that trip generation for fulfillment centers is approximately 2.0 trips per employee. The study also found that the trip generation rate per employee correlated more closely that the trip generation rate per thousand square feet of gross floor area.

The data from the five parcel hubs did not show any statistically meaningful relationship between trips and building size. Therefore, no trip generation rate could be calculated. However, the data collected at these sites may provide a useful basis for further comparison with additional sites to provide more data points for analysis.

Item 7.D

High-Cube Warehouse Calculation

Attachment 2

TUMF Calculation Handbook – High Cube Warehouse

1.1. High-Cube Warehouses

1.1.1. Summary

For the purpose of determining the TUMF obligation, all types of high-cube warehouses, including fulfillment centers, transload and short-term storage warehouses and other similar distribution facilities will be considered industrial use types. The methodology outlined in **Worksheet A.2.8** and described as follows will be applied to determine the equivalent floor area for high-cube warehouses/fulfillment centers with a minimum gross floor area of 200,000 square feet, a minimum ceiling height of 24 feet and a minimum dock-high door loading ratio of 1 door per 10,000 square feet *(for the example calculation assume a high-cube warehouse with a gross floor area of 450,000 square feet, a ceiling height exceeding 24 feet and a dock-high door loading ratio exceeding 1:10,000)*:

1. Subtract 200,000 square feet from the total gross floor area
   (*i.e. for the example facility it is <u>450,000 – 200,000 = 250,000</u> square feet*)
2. Multiply the resultant value from step 1 which is total gross floor area in excess of 200,000 square feet by 0.36
   (*i.e. for the example facility it is <u>250,000 x 0.36 = 90,000</u> square feet*)
3. Add 200,000 square feet to the resultant value of step 2
   (*i.e. for the example facility it is <u>200,000 + 90,000 = 290,000</u> square feet*)
4. Use the resultant value of step 3 as the gross floor area to calculate the TUMF obligation using **Worksheet A.2.1** for standard non-residential fee calculations.

The TUMF obligation for a warehouse facility with a gross floor area of less than 200,000 square feet, a ceiling height of less than 24 feet and/or a dock-high door loading ratio of less than 1 door per 10,000 square feet will be calculated based on the actual gross floor area using **Worksheet A.2.1** for standard non-residential fee calculations. Furthermore, where other uses such as wholesale showrooms, retail showrooms or office suites are co-located with qualifying high-cube warehouse facilities, only the qualifying warehouse portion of the premises will be calculated using **Worksheet A.2.8**. The fee obligation for all other co-located facilities will be calculated based on the actual gross floor area and the appropriate land use category using **Worksheet A.2.1** for standard non-residential fee calculations.

1.1.2. Detailed Narrative

High-cube warehouses are primarily for the storage and/or consolidation of manufactured goods (and to a lesser extent, raw materials) prior to their distribution to retail locations or other warehouses. These facilities typically have a high level of on-site automation and logistics management enable highly-efficient processing of goods through the facility. High-cube warehouses include, but may not be limited to, the following types of facilities:

- High-cube transload and short-term storage facilities typically provide for consolidation and distribution of loads for manufacturers, wholesalers or retailers.

Transload and short-term storage facilities typically provide limited storage duration, high throughput and high-efficiency distribution.
- Fulfillment centers include high-cube warehouses typically characterized by significant storage and direct distribution of ecommerce products to the end users. These facilities typically handle smaller packages and quantities than other types of high-cube warehouses.
- High-cube parcel hub warehouses typically serve as regional and local freight-forwarding facilities of time sensitive shipments via air freight and ground carriers. These sites may also include truck maintenance, wash, and/or fueling facilities ancillary to the primary use of the site.
- High-cube cold storage warehouses are facilities that provide temperature-controlled environments for the storage and distribution of frozen foods or other perishable products.

For the purpose of determining the TUMF obligation, all high-cube warehouses are defined as follows:

> *Very large shell buildings commonly constructed using steel framed and/or concrete tilt-up techniques with a minimum gross floor area of 200,000 square feet, a minimum ceiling height of 24 feet and a minimum dock-high door loading ratio of 1 door per 10,000 square feet.*

In accordance with Section 6.2 and Appendix B of the Transportation Uniform Mitigation Fee Nexus Study 2016 Update Final Report (Western Riverside Council of Governments, As Adopted July 10, 2017), high-cube warehouses are considered to be industrial use types with the primary use of the facility generally meeting the description of Motor Freight Transportation and Warehousing (SIC Major Category 42). The TUMF obligation for industrial (and all non-residential) land uses is based on the gross floor area of buildings associated with the specific land use and is calculated using **Worksheet A.2.1** for standard non-residential fee calculations. However, in the case of high-cube warehouses, vehicle trips generated to and from the site are typically lower than traditional industrial uses due to the high-level of on-site automation and logistics management. For this reason, it is necessary to determine the gross floor area equivalency for the purpose of calculating the TUMF obligation.

A review of Trip Generation 9th Edition (Institute of Traffic Engineers, 2012) indicates the average weekday daily trip generation rate for high-cube warehouses is 1.68 trips per thousand square feet, while the weekday PM peak-hour trip generation rate for the same uses is approximately 0.16 trips per thousand square feet of building area. By comparison, traditional warehouse uses have a weekday daily trip generation rate of 3.56 trips per thousand square feet, and PM peak-hour trip generation rates of 0.45 trips per thousand square feet and 0.58 trips per employee. A study of the trip generation characteristics of fulfillment centers in the Inland Empire of Southern California completed in January 2019 by WSP for the Western Riverside Council of Governments (WRCOG) found trip generation rates of these facilities to be generally consistent with the rates prescribed in Trip Generation 9th Edition for all high-cube warehouse uses, with an average weekday daily trip generation rate of 2.13 trips per thousand square feet and an average weekday PM peak rate of 0.16 trips per thousand square feet.

Table 5.7 summarizes the various characteristics of high-cube warehouses, including trip generation, and establishes the equivalent square feet for the purpose of calculating the TUMF obligation for all high-cube warehouse facilities.

Table 5.7 – Characteristics of High-Cube Warehouses and Distribution Centers

Land Use Type	*Average Daily Vehicle Trips per 1,000 sqft*	*Average PM Peak Vehicle Trips per 1,000 sqft*	*Average PM Peak Trips per Employee*	*TUMF Weighted Equivalent sqft **
Warehousing (i) (150)	3.56	0.45	0.58	
High-Cube Warehouse (i) (152)	1.68	0.16		*0.36*
Fulfillment Centers (ii)	2.13	0.16	0.16	
Warehouse/Distribution Center (iii)	1.10	0.08		
All TUMF Industrial Use Types (i)	5.33			

Source: (i) Trip Generation 9th Edition, Institute of Traffic Engineers, 2012

(ii) TUMF High-Cube Warehouse Trip Generation Study, WRCOG, January 2019

(iii) San Bernardino/Riverside County Warehouse/Distribution Center Vehicle Trip Generation Study, Crain and Associates, January 2005

Note: * - TUMF weighted equivalent square feet based on relative trip generation per 1000 sqft between the average of High-Cube Warehouse and Fulfillment Centers and the median of all TUMF Industrial Uses (consistent with TUMF Nexus Study Trip Generation Rate Comparison).

The gross floor area equivalency for High-Cube Warehouses is based on the average of the trip generation characteristics of High-Cube Warehouse, which is quantified in the Trip Generation 9th Edition in terms of both daily and peak trips per thousand square feet gross floor area, and Fulfillment Centers, which is quantified in the TUMF High-Cube Warehouse Trip Generation Study in terms of both daily and peak trips per thousand square feet gross floor area as well as per employees. Based on this information, the simple average daily trip generation rate for a high-cube warehouse, including fulfillment centers, is approximately 1.90 trips per thousand square feet of gross floor area. To account for the variation in trip generation rates between high-cube warehouses, including fulfillment centers, and all TUMF industrial land use types, the gross floor area equivalency was weighted based on the relative trip generation between high-cube warehouses, including fulfillment centers, and the median of all TUMF Industrial Uses as used in the TUMF Nexus Study. The weighted gross floor area equivalency for high-cube warehouses is 0.36.

For the purpose of calculating the TUMF obligation for *High-Cube Warehouses* with a minimum gross floor area of 200,000 square feet, a minimum ceiling height of 24 feet and a minimum dock-high door loading ratio of 1 door per 10,000 square feet, the gross floor area *in excess of 200,000 square feet* will be multiplied by *0.36* and the resultant value *increased by 200,000 square feet* to determine the equivalent number of square feet of floor area. The *equivalent floor area will be used for the purpose of calculating the TUMF* at the rate prescribed by the respective local jurisdictions TUMF Ordinance and supported by the TUMF Nexus Study. For example, a high-cube warehouse with a gross floor area of 450,000 square feet, a ceiling height exceeding 24 feet and a dock-high door loading ratio exceeding 1:10,000 (for the example facility it is at least 45 dock-high door loading bays i.e. 450,000/10,000 = 45) the equivalent floor area would be 290,000 square feet ({[450,000 - 200,000] x 0.36} + 200,000 = 290,000)

The TUMF obligation for a warehouse facility with a gross floor area of less than 200,000 square feet, a ceiling height of less than 24 feet and/or a dock-high door loading ratio of less than 1 door per 10,000 square feet will be calculated based on the actual gross floor area using **Worksheet A.2.1** for standard non-residential fee calculations. Furthermore, where other uses such as wholesale showrooms, retail showrooms or office suites are co-located with qualifying high-cube warehouse facilities, only the qualifying warehouse portion of the premises will be calculated using **Worksheet A.2.8**. The fee obligation for all other co-located facilities will be calculated based on the actual gross floor area and the appropriate land use category using **Worksheet A.2.1** for standard non-residential fee calculations.

Worksheet A.2.8 High-Cube Warehouse TUMF Calculation Worksheet

☐ **– 200,000 =** ☐ ◄ **Total A**

Enter Gross Floor Area of Qualifying Building(s) (in square feet)

☐ **x 0.36 =** ☐ ◄ **Total B**

Enter Total A

☐ **+ 200,000 =** ☐

Enter Total B

Enter this value as (part of) the Total Gross Floor Area of Industrial Buildings in Worksheet A.2.1

Item 7.D

High-Cube Warehouse Calculation

Attachment 3

Trip Generation Study – Stakeholder comments

Daniel Ramirez-Cornejo

From:	Frank Sherkow <fsherkow@earthlink.net>
Sent:	Thursday, January 17, 2019 1:00 PM
To:	Daniel Ramirez-Cornejo
Cc:	'Jonathan Shardlow'; Chris Gray; 'Sandipan Bhattacharjee, P.E., AICP'; Matt Englhard
Subject:	RE: E-Commerce Trip Generation Rates
Attachments:	Survey Trip Gen Average-01.16.19_v2.xlsx

Daniel:

Here are some preliminary results from our analysis. As you open the excel file, you will see a summary of facilities sorted by groups that we believe are relevant and as consistent as possible with ITE and sound traffic engineering practices. I will refer to items on this file/tab in this email.

1. We believe that the square footage used in the report for the P&G facility is wrong, and reflects the Floor & Décor company (next door). The real square footage for the P&G facility should be 1,560,046 SF.
2. We conducted a hand-count of the parking spaces using aerial photos from Google Maps.
3. The consultant's reports refers to the size of facilities' sites as the driving factor as to whether they are e-commerce (fulfillment) facilities and how much traffic they might generate. The bigger the site the more trips, they say. "Largest sites tend to generate lots of car trips but few truck trips." The size of the site is NOT the cause for more trips. The auto parking spaces per building SF is the real relationship. It is one of the key factors as to whether the building is/will be e-commerce vs. High Cube Distribution Center. When reviewing a site plan, does it have a large number of auto parking spaces or not? Directly related is also the Total Trips (employees) per 1,000 SF. More goods handling will necessitate more employees, until/unless additional automation comes on the scene.

From our analysis, the group of facilities that were studied actually consists of 5 separate land use types or combinations of land uses:

a. Fulfillment centers (e-commerce) – Walmart (Chino) and Amazon (MV)
b. Distribution with Cold Storage (maybe mixed land uses on one site) – Walmart (Columbia Ave.)
c. Distribution without Cold Storage – P&G, Big 5, Home Depot, Nestles, Petco, Komar, ACT
d. Aggregation Distribution & Handling (probably mixed land uses on one site) – Ross
e. Parcel Hubs – FedEx, UPS, DHL

Referring to the spreadsheet column "S", note the significant differences between sub groups in Total Trips per 1,000 SF (building). True High Cube facilities (Distribution Centers without Cold Storage) will have a small trip rate, because there aren't as many employees per SF. Due to their efficiency of goods movements (with less handling), the truck traffic compared to all trips is a relatively high percentage for High Cube – see column "N". These trip rates are similar to those for Transloading or High Cube facilities in the ITE Trip Generation Handbook. They are also similar to previous data points collected by ITE and AQMD. They are NOT e-commerce of fulfillment facilities.

We know (from work with AQMD and ITE) that cold storage will have slightly higher trip rates, dependent on the type of goods (frozen vs. perishable). Clearly, the Walmart facility on Columbia Ave. is partially or totally cold storage. There is evidence online about its cold storage function.

The Ross facility (Perris) is a mixture of High Cube and goods handling (but not e-commerce). The trip rates and truck % is evidence of this. Ross's business model depends on selling goods that have been for sale in other stores. So, the facilities like the one in Perris are used to resort and regroup goods for sale in Ross stores. Thus, there are many more employees than at High Cube facilities per SF, but less than an e-commerce building. This mixture is NOT a recognized ITE land use, so we have set it aside.

The only facilities that are acting like true Fulfillment Centers or E-commerce facilities are Amazon (MV) and Walmart (Chino). Note that both of these companies have other facilities that are more like High Cube or Cold Storage, and even Parcel Hub facilities. So, each site should be viewed separately. See column "N" for the small proportion of truck trips vs. total trips. Also see column "S" to compare the higher total trip rates compared to High Cube Distribution Centers (similar for column "Q").

For purposes of establishing traffic impacts or development fees, the group of facilities that the consultant studied does NOT represent Fulfillment Centers. This is also reinforced by the data plot diagrams from the consultant's report.

The other item of note is that true e-commerce facilities are a relatively small portion of the warehouses built or being developed. Even when a facility uses the label of "fulfillment center," it does not mean that it functions as, or has the necessary characteristics of, a true e-commerce facility.

In reference to Parcel Hubs, these facilities are different from other warehouse facilities in size, shape, height, and design. Thus, they can easily be identified as a separate group for your purposes.

We welcome your questions or comments. We hope you will share this information with members of the Public Works Committee.

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

Daniel Ramirez-Cornejo

From: Frank Sherkow <fsherkow@earthlink.net>
Sent: Friday, January 11, 2019 3:46 PM
To: Daniel Ramirez-Cornejo
Cc: 'Jonathan Shardlow'; Chris Gray; 'Sandipan Bhattacharjee, P.E., AICP'
Subject: RE: E-Commerce Trip Generation Rates

Daniel:

Thanks for the quick response.

On the P&G building, here is what we had in our data:

Tenant	**Address Line 1**	**City**	**Building Total SF**	**Building Dock High Doors**	**Orignial Database - Parking Stalls**
Floor & Décor	24101 Iris Avenue	Moreno Valley	1,103,003	166	400
P&G	24015 Iris Avenue	Moreno Valley	1,560,046	268	862

I believe that someone has used the Floor & Decor square footage for the P&G building in your excel spreadsheet. Can you clarify?

Are you aware of any transit usage to these site? Any signs of significant ridesharing at any of these sites? The reason I ask, is that when you take each site's daily traffic flow and divide by the number of employees, the results are very puzzling in some cases. Don't know if you really care about the employment levels, but they should be within reason ranges.

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

From: Daniel Ramirez-Cornejo [mailto:dramirez-cornejo@wrcog.us]
Sent: Friday, January 11, 2019 9:34 AM
To: Frank Sherkow
Cc: 'Jonathan Shardlow'; Chris Gray; 'Sandipan Bhattacharjee, P.E., AICP'
Subject: RE: E-Commerce Trip Generation Rates

Good morning Frank,

The employment numbers were provided by the agencies in which the sites are located.

We have also provided responses to your previous questions on two sites as shown below:

1. For the P&G site, the physical address is shown as 24015 Iris Ave, Moreno Valley, CA 92551. The driveways were selected based on the building called out in the aerial photo below. Cosmos Street is an internal road of the same property as shown in the aerial photo.

2. The below is a street view from Riverside Drive to the shared driveway of Komar (building on the left) and Damco (on the right). As shown, the access from Damco (on the right) to the shared driveway is prohibited. Komar does the same for the northern aisle (on the left).

For reference, all traffic counts were collected with video cameras.

-Daniel

Daniel Ramirez-Cornejo
Program Manager
Western Riverside Council of Governments
3390 University Ave., Suite 450
Riverside, CA 92501-3315

Phone: (951) 405-6712
www.wrcog.us

"Respect Local Control...Provide Regional Perspective”

From: Frank Sherkow <fsherkow@earthlink.net>
Sent: Wednesday, January 9, 2019 11:52 AM
To: Daniel Ramirez-Cornejo <dramirez-cornejo@wrcog.us>
Cc: 'Jonathan Shardlow' <Jonathan.Shardlow@GreshamSavage.com>; Chris Gray <cgray@wrcog.us>; 'Sandipan Bhattacharjee, P.E., AICP' <sandipan@translutions.com>
Subject: RE: E-Commerce Trip Generation Rates

Daniel:

Thanks for the update.

A few items. We know from our work on development activities and working with tenants, plus our work on traffic impact studies, that the employment levels at these (and most other sites) fluctuates based on a regular seasonal pattern. Since the traffic counts appear have been gathered in Aug. 2018, we understand that this would represent an off-peak season period. This period last about 10 months during the year, but can vary based on local circumstances.

Can you tell us how you determined the employment numbers from your spreadsheet?

Based on our very preliminary work on the information from the consultant’s report and other data that we possess (omitting the parcel hubs for the time being), it appears that there is a mixture of High Cube, E-commerce, and Cold Storage facilities in the list provided (11 sites). Some individual sites may have a mixture of several of these land uses, and therefore, in our opinion, would not be good candidates for this type of analysis. They don’t have a pure representation of any of the recognized ITE land uses, thus, it would be difficult to apply the trips rates (and other factors) to a broader analysis or draw generalized conclusions about this sites.

When AQMD and NAIOP conducted similar studies, we always made sure of two things: 1. The sites were as pure a representative land uses as possible (not a mixture, like cold storage and high cube), and 2. The site possess driveways that could be isolated for traffic counts.

Unfortunately, some of these facilities, from your list, violate one or both of these criteria.

We are continuing to dig, so stay tuned. Thanks.

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

From: Daniel Ramirez-Cornejo [mailto:dramirez-cornejo@wrcog.us]
Sent: Wednesday, January 9, 2019 11:26 AM
To: Frank Sherkow
Cc: 'Jonathan Shardlow'; Chris Gray; 'Sandipan Bhattacharjee, P.E., AICP'
Subject: RE: E-Commerce Trip Generation Rates

Hi Frank,

Thank you for your comments on WRCOG's High-Cube Warehouse Trip Generation Study with regard to use of the facilities in the study to represent e-commerce trip rates.

We wanted to give you some further background on the study, why we did it, and how the study was performed.

Back in 2017 the Nexus Study was approved, we received some broad direction from our Executive Committee to look into the issue of whether the Nexus Study and the TUMF Program accurately reflects impacts associated with industrial uses. There was some limited direction provided to Staff to look at different industrial uses such parcel hubs, distribution centers, etc. given the perception that these uses generate more trips than typical industrial or high-cube uses.

We convened a working group of local agency staff who recommended a series of locations they were familiar with and also worked with a consultant (WSP) to identify facilities that could be classified as either a distribution center or a parcel hub.

After that, we collected data for each of the sites and summarized the data. We then presented the information to first our working group and then our Public Works Committee to get their feedback. They also recommended that we not have a separate category for these types of uses.

We will be reaching out to WSP to provide a detailed response with respect to the questions below. As requested we are including the worksheet with the data from each facility.

We would be happy to answer any additional questions that you have regarding the work that we've done and will be doing in the future.

Thank you,

-Daniel

Daniel Ramirez-Cornejo
Program Manager
Western Riverside Council of Governments
3390 University Ave., Suite 450
Riverside, CA 92501-3315
Phone: (951) 405-6712
www.wrcog.us

"Respect Local Control...Provide Regional Perspective"

From: Frank Sherkow <fsherkow@earthlink.net>
Sent: Monday, January 7, 2019 3:36 PM
To: Daniel Ramirez-Cornejo <dramirez-cornejo@wrcog.us>
Cc: 'Jonathan Shardlow' <Jonathan.Shardlow@GreshamSavage.com>; Chris Gray <cgray@wrcog.us>; 'Sandipan Bhattacharjee, P.E., AICP' <sandipan@translutions.com>
Subject: RE: E-Commerce Trip Generation Rates

Daniel:

Two preliminary questions:

1. Floor & Décor with an address of 24101 Iris and P&G with an address of 16110 Cosmos Street in MV. The traffic sheets and report says that the P&G facility was studied at 24015 Iris Ave. Can you clarify?
2. The Komar facility shares a driveway with a neighboring distribution center (Damco) onto Riverside Dr. What steps were taken to isolate the Komar traffic from other?

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

From: Frank Sherkow [mailto:fsherkow@earthlink.net]
Sent: Thursday, January 3, 2019 10:07 AM
To: 'Daniel Ramirez-Cornejo'
Cc: 'Jonathan Shardlow'; 'Chris Gray'; 'Sandipan Bhattacharjee, P.E., AICP'
Subject: RE: E-Commerce Trip Generation Rates

Daniel:

Thanks so much for your quick response. We stand ready to work with you on this important matter.

In the meantime, we will start to examine the traffic counts provided. Perhaps, we will have some comments in the near future.

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

From: Daniel Ramirez-Cornejo [mailto:dramirez-cornejo@wrcog.us]
Sent: Thursday, January 3, 2019 9:40 AM
To: Frank Sherkow
Cc: Jonathan Shardlow; Chris Gray; Sandipan Bhattacharjee, P.E., AICP
Subject: RE: E-Commerce Trip Generation Rates

Good morning Frank,

We will begin reviewing your comments and will respond accordingly. However, we wanted to ensure you receive the data requested. Per your request, we are attaching the spreadsheets with the counts taken in summer 2018.

Please let us know if you have any questions. Thank you,

-Daniel

Daniel Ramirez-Cornejo
Program Manager
Western Riverside Council of Governments
3390 University Ave., Suite 450
Riverside, CA 92501-3315
Phone: (951) 405-6712
www.wrcog.us

"Respect Local Control...Provide Regional Perspective"

From: Frank Sherkow <fsherkow@earthlink.net>
Sent: Wednesday, January 2, 2019 3:05 PM
To: Daniel Ramirez-Cornejo <dramirez-cornejo@wrcog.us>
Cc: Jonathan Shardlow <Jonathan.Shardlow@GreshamSavage.com>; Sandipan Bhattacharjee, P.E., AICP <sandipan@translutions.com>
Subject: E-Commerce Trip Generation Rates

Daniel:

I am writing to you concerning the Dec. 13, 2018 staff report about the High-Cube Warehouse Trip Generation Study and possible adjustments related to E-commerce facilities. To give you a bit of history, I represented NAIOP when the original High Cube fee levels were set. We continue to do consulting work for NAIOP and some of their members.

I have read your consultant's report about E-commerce facilities. The staff report states that, "The Trip Generation Study was conducted in a manner that meets the ITE standards for performing studies of this nature." Although the traffic counts may have done in accordance with the ITE Trip Generation Manual, the facilities selected and definitions for the E-commerce facilities do not seem to done in accordance with the ITE recent work on this issue.

I have attached a recent working prepare (referred to on page 2 of your staff report). Note that the ITE working paper refers to definitions for many of the large warehouse facilities, which I authored for ITE, with support of NAIOP members. There are physical site and buildings differences between the warehouse categories.

Having said that, not all E-commerce facilities are the same. For example, Amazon facilities may be "sort", "non-sort", "cross-dock", or some hybrids. My firm has done extensive traffic work on High Cube and E-commerce facilities in the Inland Empire. Some of these E-commerce facilities operate like High Cube facilities, while others have higher trip generation rates due to higher employee activities.

One major note of concern: Using the label, by the consultant, as "Fulfillment Centers" is most probably NOT ACCURATE.

The trip rates and parking capacity at some of these sites are significant indicators that some of these facilities are true High Cube buildings that feed local retail outlets, and not the end-customer. Even if the establishment uses the name "fulfillment center" in the title, it does not make them true E-commerce facilities for trip rates purposes.

Grouping these particular facilities together as a representation of E-commerce trip rates is not correct.

We would be glad to work with you, on behalf of NAIOP, to ensure that WRCOG has the most recent and correct information. We are glad to hear that, the WRCOG "staff is not recommending the inclusion of a separate component of the TUMF Calculation Handbook for fulfillment centers." However, as you explore possible adjustments to the TUMF fee program, NAIOP would like the opportunity to correct the record about this data and give WRCOG better information about this issue.

In the meantime, we would **formally request the electronic spreadsheets with the actual traffic counts for the 16 facilities** mentioned in the study. Please advise. Thanks.

Franklin E. Sherkow, P.E., T.E., P.S.E., Env SP, F.ASCE
Executive Vice President
Southstar Engineering & Consulting, Inc.
949-500-7878

Item 7.E

Western Riverside Council of Governments
Public Works Committee

Staff Report

Subject: **TUMF Calculation Handbook Revisions**

Contact: **Daniel Ramirez-Cornejo, Program Manager, dramirez-cornejo@wrcog.us, (951) 405-6712**

Date: **February 14, 2019**

The purpose of this item is to *present several proposed minor revisions to the Transportation Uniform Mitigation Fee (TUMF) Calculation Handbook and request input on additional revisions from the Committee.*

Requested Actions:

1. Recommend that the Executive Committee approve the proposed revisions to the TUMF Fee Calculation Handbook to include clarification language on the 3,000 square foot deduction policy for retail and service uses.
2. Discuss and provide input on proposed clarification to the issuance of credit for existing uses for the exemption outlined in the TUMF Administrative Plan.

WRCOG's Transportation Uniform Mitigation Fee (TUMF) Program is a regional fee program designed to provide transportation and transit infrastructure that mitigates the impact of new growth in Western Riverside County. Each of WRCOG's member jurisdictions and the March JPA participates in the Program through an adopted ordinance, collects fees from new development, and remits the fees to WRCOG. WRCOG, as administrator of the TUMF Program, allocates TUMF to the Riverside County Transportation Commission (RCTC), groupings of jurisdictions – referred to as TUMF Zones – based on the amounts of fees collected in these groups, the Western Riverside County Regional Conservation Authority (RCA) and the Riverside Transit Agency (RTA). The TUMF Fee Calculation Handbook details the methodology for calculating the TUMF obligation for different categories of new development and, where necessary, clarifies the definition and calculation methodology for uses not clearly defined in the respective TUMF Ordinances.

As part of the annual review of TUMF Program documents, staff has identified several items to be added or modified in the TUMF Fee Calculation Handbook.

3,000 Square Foot Deduction Policy

On August 7, 2017, the Executive Committee approved a 3,000 square foot (SF) deduction for all service and retail land use types. Since approval of the policy on August 7, 2017, most project applicants are not required to pay TUMF fees on the first 3,000 SF of retail and service projects. This policy benefits both new uses and existing uses that are expanding their operation to provide more economic development in the region. Staff have also interpreted this policy to include Class A and Class B office buildings, to each independent tenant space of a multi-tenant building, and to all defined land uses in the TUMF Fee Calculation Handbook.

On October 1, 2018, the Executive Committee approved an update to the 3,000 SF deduction to retail and service TUMF land uses that limits the reduction to development projects that are less than 20,000 SF, effective immediately. This means that a retail / service project that is 19,999 SF would receive the 3,000 SF deduction but a 20,000 SF retail / service project would not receive the 3,000 SF deduction.

There is currently no specific language in the TUMF Fee Calculation Handbook or any of the TUMF governing documents detailing how the 3,000 SF deduction policy is to be implemented. Staff have proposed clarifying language for addition to the TUMF Fee Calculation Handbook and has added a line in Worksheet A.2.1 for standard, non-residential TUMF calculations to provide guidance on administration of the 3,000 SF deduction. These proposed updates to the TUMF Fee Calculation Handbook are included as an attachment to this Staff Report.

Credit for Existing Uses

The TUMF Program contains an exemption for the reuse / reconstruction of existing buildings and the language in the TUMF Administrative Plan is as follows:

> "The rehabilitation and/or reconstruction of any habitable structure in use on or after January 1, 2000, provided that the same or fewer traffic trips are generated as a result thereof"

There is currently no official calculation methodology to guide staff in implementation of this exemption. Staff currently calculate credits for existing uses utilizing the fees and policies currently in effect. Staff is requesting input from the Public Works Committee (PWC) on the following two proposed implementation strategies for potential inclusion in the TUMF Fee Calculation Handbook:

- Option 1: Calculate credit based on the fees in effect at the time that the building was last in use, no earlier than January 1, 2000. This would mean that a credit would be awarded on the full building square footage for existing uses that were in place prior to introduction of the 3,000 SF deduction policy in August 2017; or

- Option 2: Continue calculating credits for existing uses based on the current fee schedules and calculation policies, including the 3,000 SF deduction.

The developer and/or member agency would continue to be responsible for providing documentation showing that the building was in use and occupied after January 1, 2000, to receive credit. If the PWC elects to move forward with Option 1, the developer and/or member agency would also be required to provide documentation of termination of use after January 1, 2000, in order to have credit calculated based on a previous fee schedule and calculation policy. If insufficient documentation is provided, credit would be awarded using the fees and policies currently in place.

Next Steps

Staff is requesting input from member agencies on the potential addition to the TUMF Fee Calculation Handbook to clarify application of the 3,000 SF deduction policy. Once staff has direction on allocating credit for existing uses, draft language will be brought to the PWC for possible recommendation to the Executive Committee for action.

Prior Action:

None.

Fiscal Impact:

Transportation Department activities are included in the Agency's adopted FY 2018/2019 Budget under the Transportation Department.

Attachment:

1. 3,000 SF Deduction Revisions for Fee Calculation Handbook.

Item 7.E

TUMF Calculation Handbook Revisions

Attachment 1

3,000 SF Deduction Revisions for Fee Calculation Handbook

1.1. 3,000 Square Foot Reduction for Retail and Service TUMF Land Uses

1.1.1. Summary

On August 7, 2017, the WRCOG Executive Committee implemented a policy of waiving the TUMF obligation for the first 3,000 square feet (SF) of gross floor area for all service and retail land uses due to concerns raised during the 2016 Nexus Study update over the impact of TUMF on retail uses. On October 1, 2018, the WRCOG Executive Committee updated the provisions of this policy to limit the fee reduction to only those retail and service land uses that have a total gross floor area of less than 20,000 SF.

1.1.2. Implementation

The policy enacted in August 2017 and updated in October 2018 provides a waiver from the TUMF obligation for the first 3,000 SF of gross floor area for new retail and service development projects as well as expansions to existing retail and service land uses where the net increase in the total gross floor area of the building(s) will be less than 20,000 SF. As such, no TUMF is paid on retail or service projects that increase the total gross floor area of the building(s) by less than 3,000 SF, and the gross floor area used as the basis to determine the fee obligation is reduced by 3,000 SF for retail or service projects that increase the total gross floor area of the building(s) by more than 3,000 SF but less than 20,000 SF. For the purposes of this policy, Class A/B offices are considered Service uses.

For mixed-use projects or projects with multiple tenants, the 3,000 SF reduction would apply to each individual use or each individual tenant to the extent that each tenant is operating independently of one another, and each is viewed as separate uses. This deduction is applied at the time of TUMF fee assessment and is based on the building as shown on plans at that time. Therefore, if a building is subdivided after TUMF fees are paid, TUMF would not be refunded.

1.1.3. Background

In response to concerns raised during the 2016 Nexus Study update, WRCOG staff undertook a study of several mid-size shopping centers in the subregion. Results from this study show that these shopping centers are generally anchored by a large tenant, typically occupying a space over 20,000 SF, and that these large spaces are surrounded by a number of smaller tenant spaces. The larger spaces are commonly occupied by large retailers such as grocery stores, clothing stores, and supermarkets; however, smaller tenant spaces are more commonly occupied by restaurants, beauty salons, dental offices, or electronics shops. Whereas the larger spaces may create a regional traffic draw, these smaller uses are generally more local-serving. For example, a new 200,000 SF retail super center may draw traffic from adjacent jurisdictions, as there may be a limited number of these retailers in the region. However, the smaller uses, such as a beauty salon or dental office, are generally located in every jurisdiction and will not likely create a large regional draw. Thus, even if a smaller use does generate additional traffic, this traffic will generally be local (i.e., new drive-through coffee shop locations, as there are numerous locations throughout the region).

A.2 Fee Calculation Worksheets for Non-Residential Use Types

Worksheet A.2.1 Standard Non-Residential TUMF Calculation Worksheet

1.		**X**		**=**		**Total A**
	Enter Total Gross Floor Area of Industrial Buildings (in square feet)		**Enter TUMF Industrial Rate Per Square Foot**			
2.		**X**		**=**		**Total B**
	Enter Total Gross Floor Area of Retail Buildings (in square feet)		**Enter TUMF Retail Rate Per Square Foot**			
3.		**X**		**=**		**Total C**
	Enter Total Gross Floor Area of Service Buildings (in square feet)		**Enter TUMF Service Rate Per Square Foot**			

4.		**+**		**+**		**=**	**$**
	Enter Total A		**Enter Total B**		**Enter Total C**		**TUMF Obligation**

☐ 3,000 SF Deduction Awarded (Total SF: ____________; Adjusted SF: ____________)

August 7, 2017 the WRCOG Executive Committee approved a 3,000 SF deduction for all service and retail TUMF land use types.

October 1, 2018 the WRCOG Executive Committee approved a revision to the 3,000 SF reduction policy for retail and service uses to limit this reduction to projects that are less than 20,000 SF.

Fresno COG 2019 Travel Model - Passenger Car Select Zone Distribution (West Neilsen Industrial)

cube

(Licensed to LSA Associates Inc)

Fresno COG 2019 Travel Model -Truck Select Zone Distribution (West Neilsen Industrial)

APPENDIX B:

TRAFFIC COUNT SHEETS AND SIGNAL TIMING SHEETS

Prepared by National Data & Surveying Services

N Marks Ave & W Belmont Ave

Peak Hour Turning Movement Count

ID: 21-030058-001
City: Fresno

Day: Tuesday
Date: 8/3/2021

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	4:00 PM - 06:00 PM

N Marks Ave

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	14	112	38	0	134
NOON	0	0	0	0	0
PM	22	110	24	0	289
	0	3	1	0	

W Belmont Ave

EASTBOUND

	AM	NOON	PM	
⇦	122	0	222	
↶	0	0	0	0
↱	18	0	19	1
→	115	0	163	2
↴	68	0	44	0

W Belmont Ave

WESTBOUND

		PM	NOON	AM
1	↰	53	0	11
1	←	115	0	66
1	↲	35	0	32
0	↶	0	0	1
	⇨	258	0	211

CONTROL

4-Way Stop

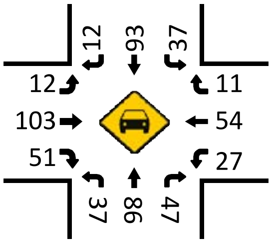
	AM	NOON	PM
TEV	680	0	960
PHF	0.83		0.88

N Marks Ave

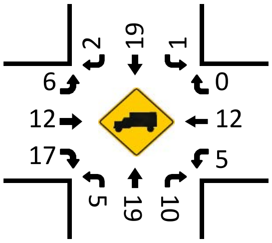
NORTHBOUND

	⇩	↶	↰	↑	↱
		0	1	1	1
PM	191	2	85	217	71
NOON	0	0	0	0	0
AM	213	1	42	105	57

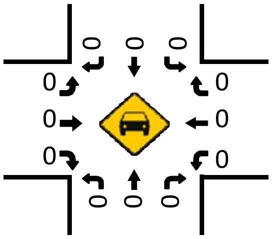
Cars (AM)



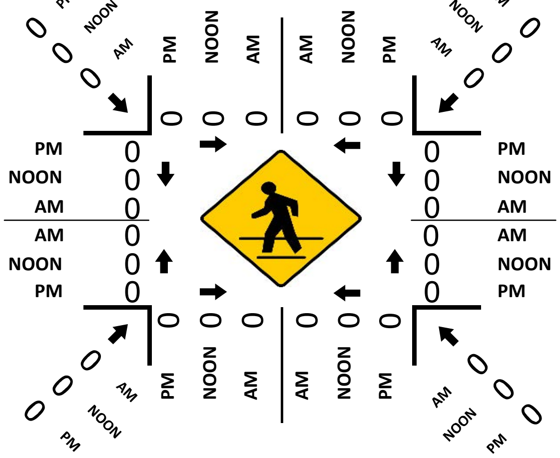
HT (AM)



Cars (NOON)



Pedestrians (Crosswalks)



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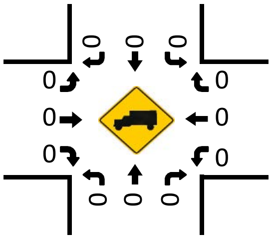

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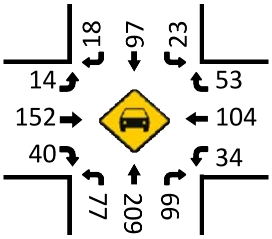
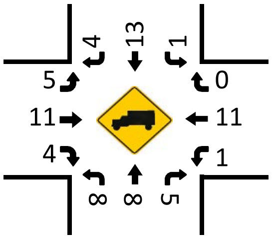


HT (PM)



Prepared by National Data & Surveying Services

N Marks Ave & W Nielsen Ave

Peak Hour Turning Movement Count

ID: 21-030058-002
City: Fresno

Day: Tuesday
Date: 8/3/2021

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

N Marks Ave — SOUTHBOUND

	↲	↓	↳	⮌	⇧
AM	27	176	8	0	213
NOON	0	0	0	0	0
PM	13	182	2	3	388
	1	2	1	0	

W Nielsen Ave — EASTBOUND

		AM	NOON	PM
⇦		82	0	47
⮌	0	0	0	0
⮥	1	10	0	22
➡	1	6	0	2
⮧	1	30	0	33

W Nielsen Ave — WESTBOUND

		PM	NOON	AM
⮤	1	10	0	8
⬅	1	7	0	4
⮦	1	64	0	14
⮎	0	0	0	0
⇨		29	0	74

CONTROL

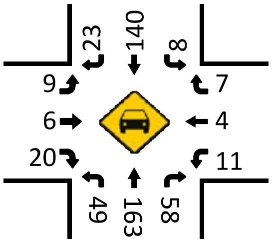
Signalized

	AM	NOON	PM
TEV	590	0	744
PHF	0.81		0.96

NORTHBOUND — N Marks Ave

	⇩	⮌	↰	↑	↱
		0	1	2	1
PM	280	1	27	353	25
NOON	0	0	0	0	0
AM	221	1	51	195	60

Cars (AM)



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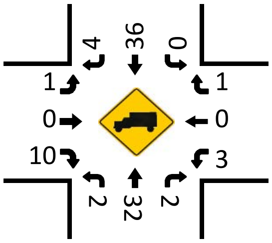
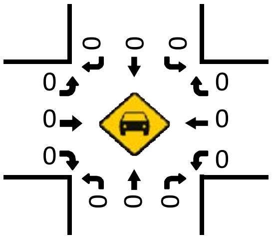
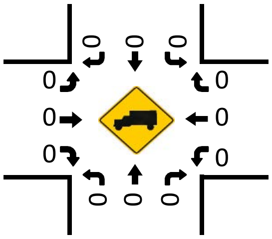


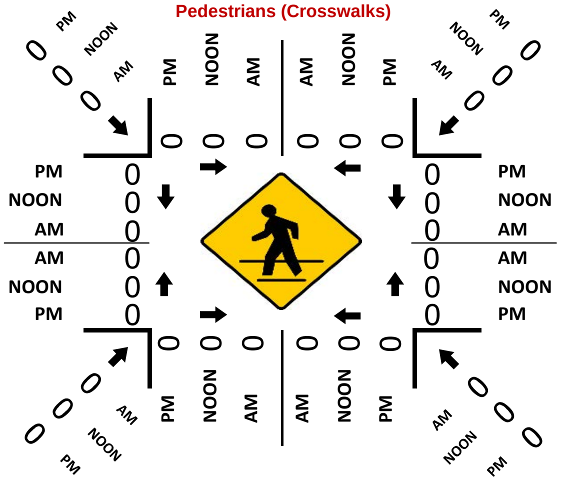
Cars (NOON)



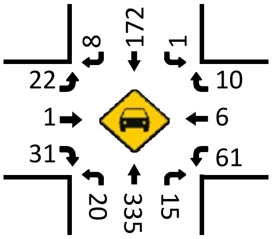
HT (NOON)



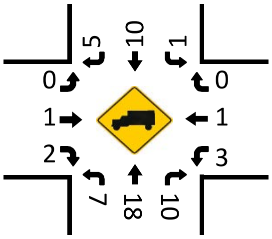
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

N Marks Ave & W Ray Johnson Dr

Peak Hour Turning Movement Count

ID: 21-030058-003
City: Fresno

Day: Tuesday
Date: 8/3/2021

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	4:00 PM - 06:00 PM

N Marks Ave

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	0	223	1	1	305
NOON	0	0	0	0	0
PM	0	281	4	0	404
	0	2	1	0	

W Ray Johnson Dr

EASTBOUND

	AM	NOON	PM
⇦	0	0	0
↶ 0	0	0	0
↱ 0	0	0	0
→ 0	0	0	0
↴ 0	0	0	0

W Ray Johnson Dr

WESTBOUND

	PM	NOON	AM
1 ↰	6	0	3
0 ←	0	0	0
1 ↙	17	0	8
0 ↷	0	0	0
⇨	14	0	7

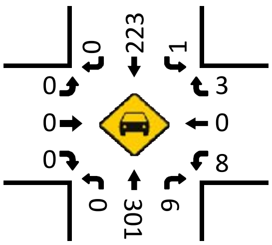
CONTROL			
Signalized			
TEV	543 AM	0 NOON	716 PM
PHF	0.80		0.92

NORTHBOUND

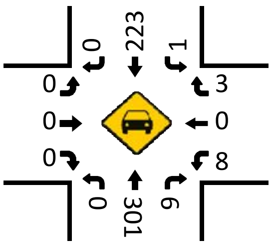
N Marks Ave

	⇩	↶	↰	↑	↱
		0	0	3	0
PM	298	0	0	398	10
NOON	0	0	0	0	0
AM	231	0	0	301	6

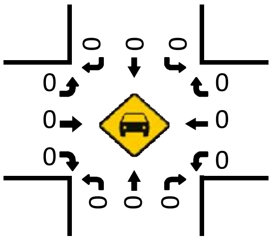
Totals (AM)



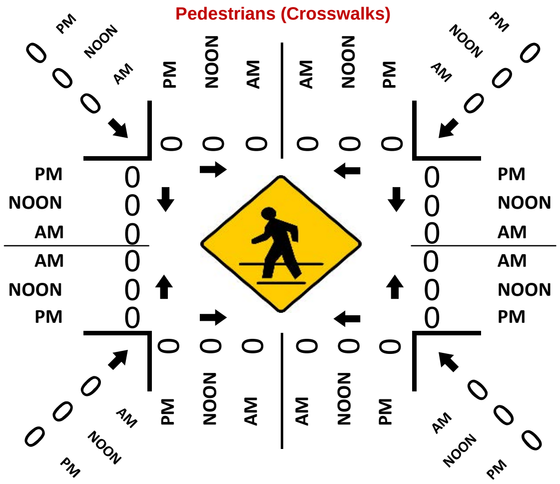
Totals (AM)



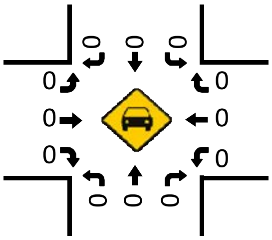
Totals (NOON)



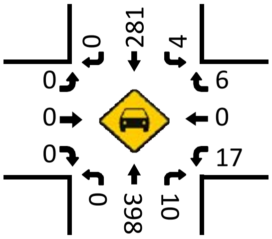
Pedestrians (Crosswalks)



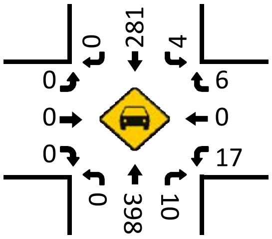
Totals (NOON)



Totals (PM)



Totals (PM)



Prepared by National Data & Surveying Services

N Marks Ave & SR-180 WB Ramps

Peak Hour Turning Movement Count

ID: 21-030058-004
City: Fresno

Day: Tuesday
Date: 8/3/2021

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	4:00 PM - 06:00 PM

N Marks Ave

SOUTHBOUND

	↲	↓	↳	U	⇧
AM	19	212	0	0	314
NOON	0	0	0	0	0
PM	20	286	0	0	413
	1	2	0	0	

SR-180 WB Ramps

EASTBOUND

	AM	NOON	PM	
⇦	19	0	20	
U	0	0	0	0
↰	0	0	0	0
→	0	0	0	0
↱	0	0	0	0

SR-180 WB Ramps

WESTBOUND

		PM	NOON	AM
2	↰	273	0	238
0	←	0	0	0
2	↲	219	0	173
0	U	0	0	0
	⇨	15	0	11

CONTROL

Signalized

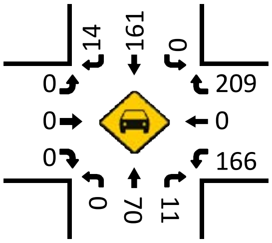
	AM	NOON	PM
TEV	729	0	953
PHF	0.84		0.98

NORTHBOUND

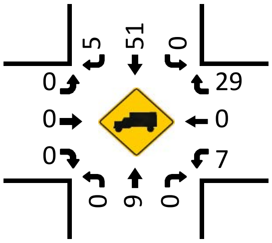
	⇩	U	↰	↑	↱
		0	0	2	1
PM	505	0	0	140	15
NOON	0	0	0	0	0
AM	385	0	0	76	11

N Marks Ave

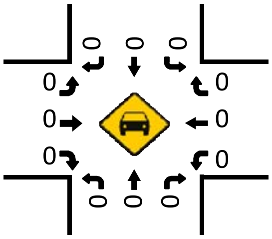
Cars (AM)



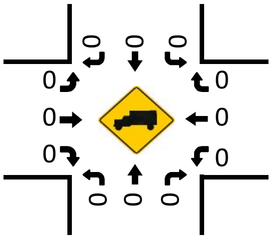
HT (AM)



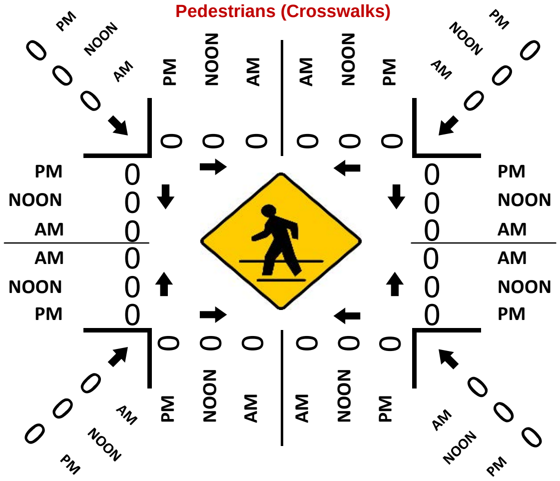
Cars (NOON)



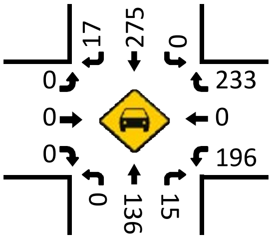
HT (NOON)



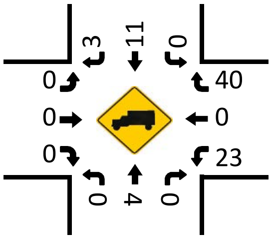
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



Prepared by National Data & Surveying Services

N Marks Ave & SR-180 EB Ramps

Peak Hour Turning Movement Count

ID: 21-030058-005
City: Fresno

Day: Tuesday
Date: 8/3/2021

	PEAK HOURS	COUNT PERIODS
AM	07:15 AM - 08:15 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	4:00 PM - 06:00 PM

N Marks Ave

SOUTHBOUND

	↲	↓	↳	U	⇧
AM	122	261	0	0	87
NOON	0	0	0	0	0
PM	171	336	0	0	155
	1	2	0	0	

SR-180 EB Ramps

EASTBOUND

	AM	NOON	PM	
⇦	122	0	171	
U	0	0	0	0
↱	10	0	17	1
→	0	0	0	0
↴	11	0	18	1

SR-180 EB Ramps

WESTBOUND

		PM	NOON	AM
↰	0	0	0	0
←	0	0	0	0
↙	0	0	0	0
U	0	0	0	0
⇨		264	0	215

CONTROL

Signalized

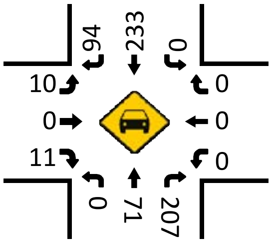
	AM	NOON	PM
TEV	696	0	944
PHF	0.92		0.92

NORTHBOUND

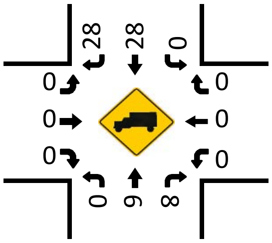
N Marks Ave

	⇩	U	↰	↑	↱
		0	0	2	2
PM	354	0	0	138	264
NOON	0	0	0	0	0
AM	272	0	0	77	215

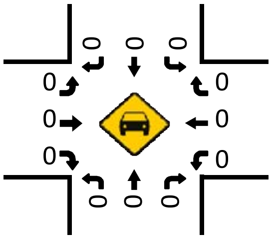
Cars (AM)



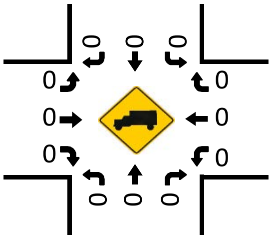
HT (AM)



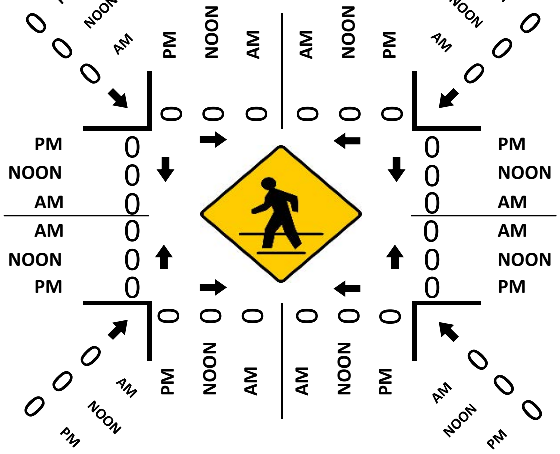
Cars (NOON)



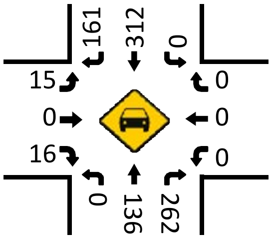
HT (NOON)



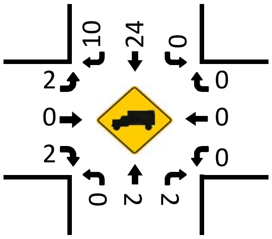
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



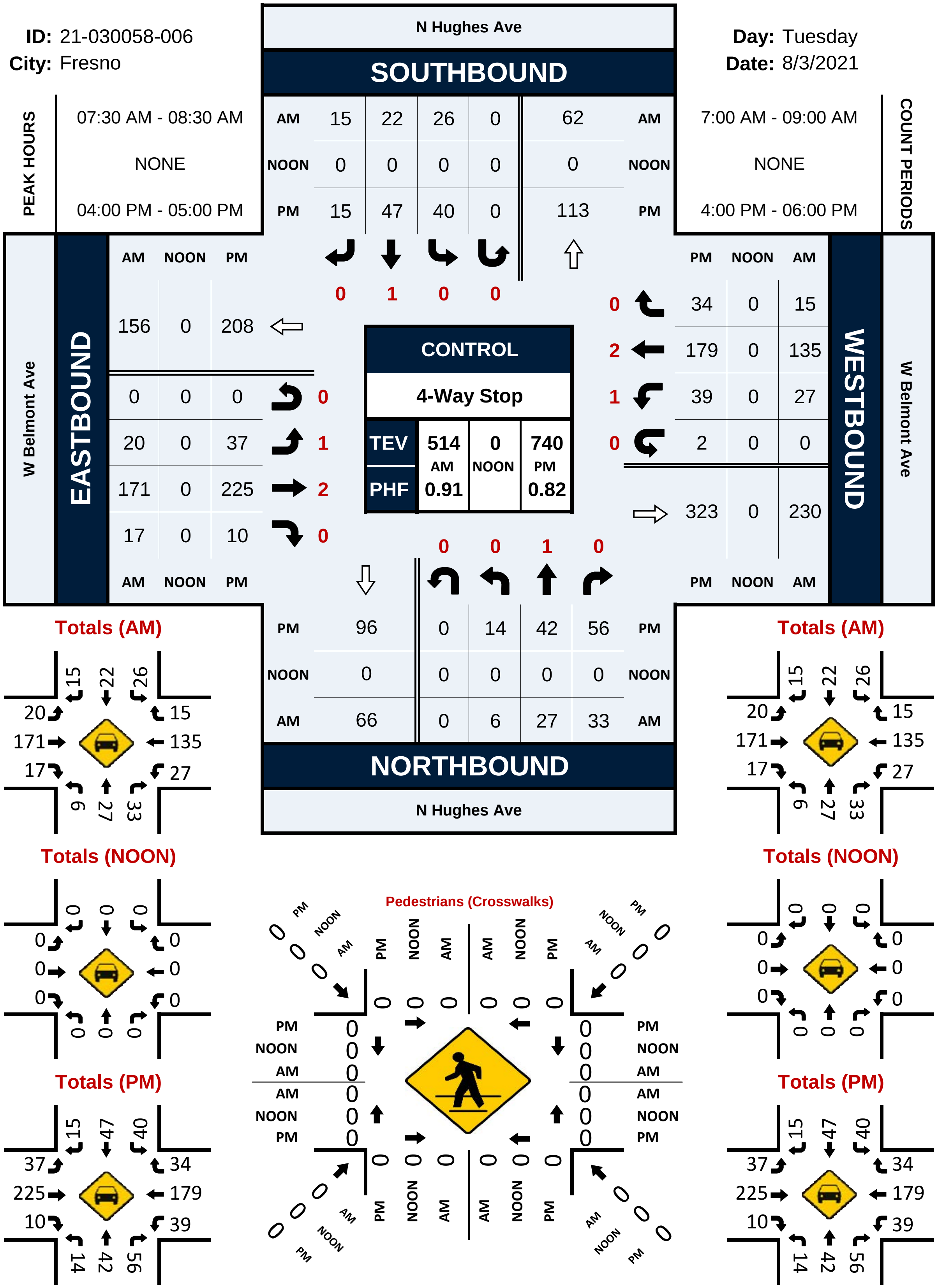
Prepared by National Data & Surveying Services

N Hughes Ave & W Belmont Ave

Peak Hour Turning Movement Count

ID: 21-030058-006
City: Fresno

Day: Tuesday
Date: 8/3/2021



Prepared by National Data & Surveying Services

N Hughes Ave & W Nielsen Ave

Peak Hour Turning Movement Count

ID: 21-030058-007
City: Fresno

Day: Tuesday
Date: 8/3/2021

PEAK HOURS		COUNT PERIODS
07:45 AM - 08:45 AM	AM	7:00 AM - 09:00 AM
NONE	NOON	NONE
04:00 PM - 05:00 PM	PM	4:00 PM - 06:00 PM

N Hughes Ave — SOUTHBOUND

AM	10	46	8	0	60	AM
NOON	0	0	0	0	0	NOON
PM	13	73	9	0	105	PM
	↲	↓	↳	↶	⇧	
	1	1	0	0		

W Nielsen Ave — EASTBOUND

AM	NOON	PM		
24	0	69	⇦	
0	0	0	↶	0
8	0	8	↰	1
33	0	22	→	1
24	0	11	↴	0
AM	NOON	PM		

W Nielsen Ave — WESTBOUND

		PM	NOON	AM
0	↰	14	0	8
1	←	31	0	9
1	↲	4	0	2
0	↷	0	0	0
	⇨	34	0	42
		PM	NOON	AM

CONTROL

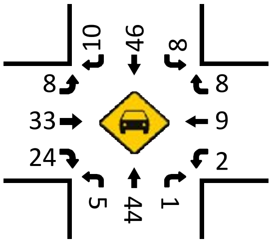
4-Way Stop

	AM	NOON	PM
TEV	198	0	296
PHF	0.84		0.82

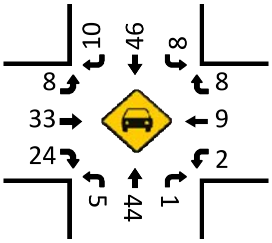
N Hughes Ave — NORTHBOUND

		0	0	1	0	
	⇩	↶	↰	↑	↱	
PM	88	0	25	83	3	PM
NOON	0	0	0	0	0	NOON
AM	72	0	5	44	1	AM

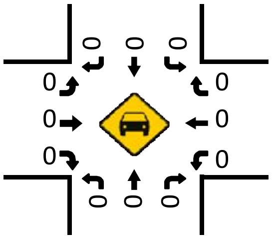
Totals (AM)



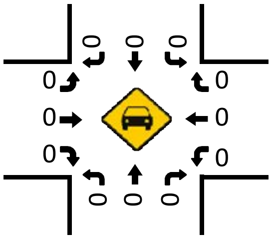
Totals (AM)



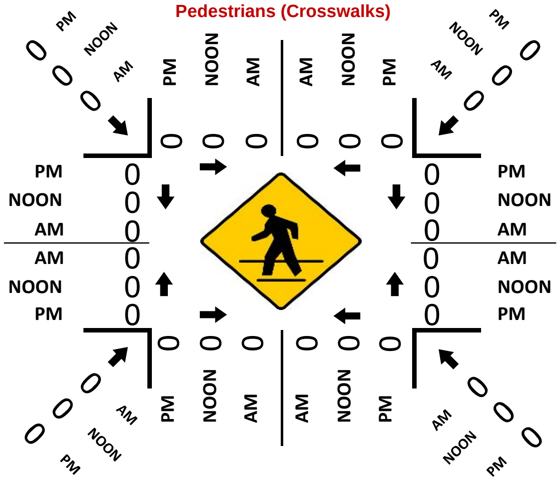
Totals (NOON)



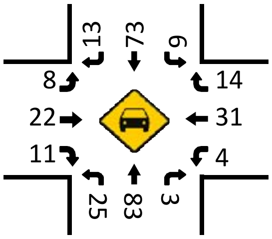
Totals (NOON)



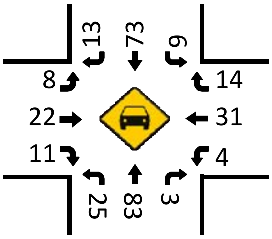
Pedestrians (Crosswalks)



Totals (PM)



Totals (PM)



ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

N Marks Ave and W Belmont Ave , Fresno

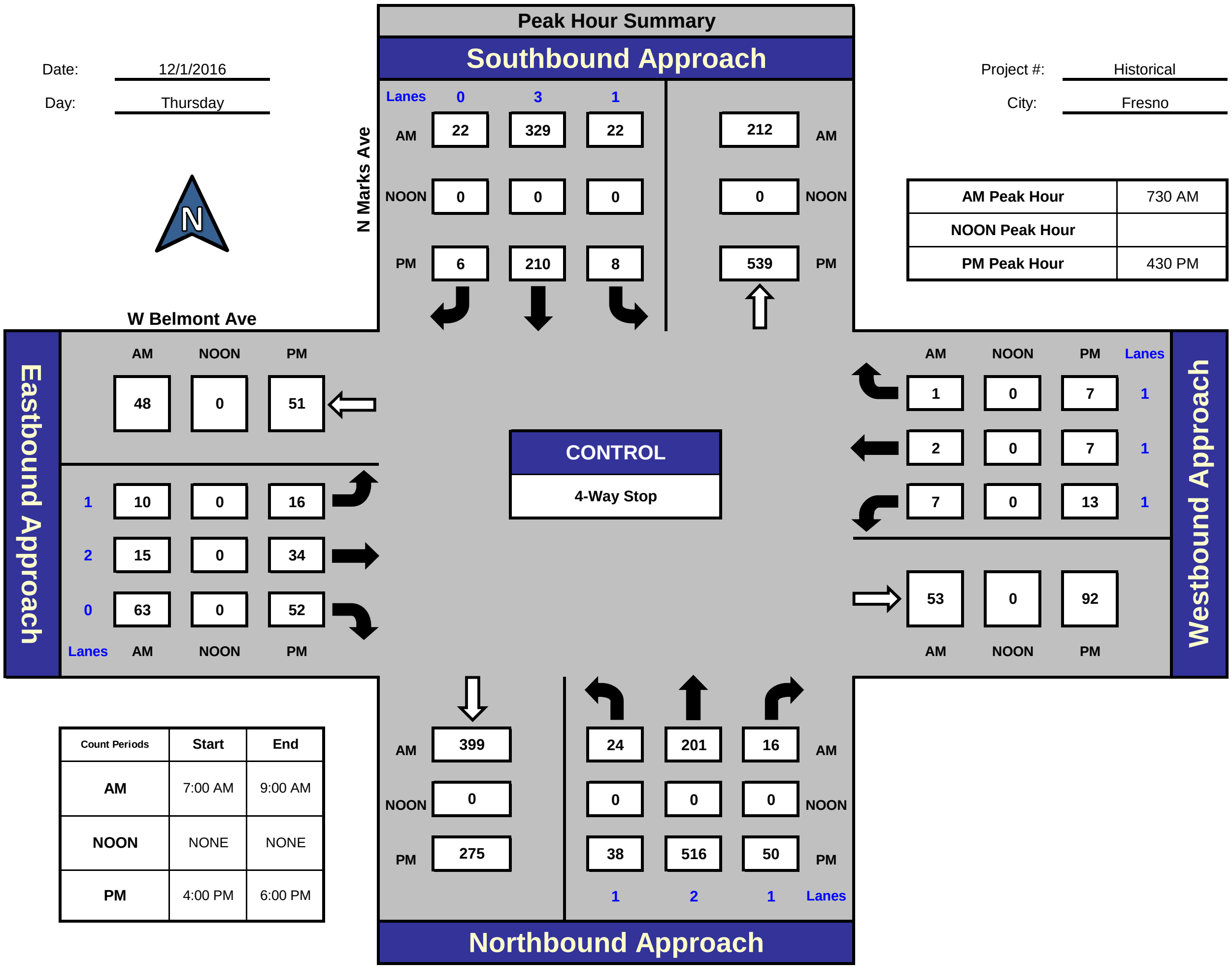
Date: 12/1/2016

Day: Thursday

Project #: Historical

City: Fresno

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM



Southbound Approach

	Left	Through	Right	Exit
Lanes	0	3	1	
AM	22	329	22	212
NOON	0	0	0	0
PM	6	210	8	539

Eastbound Approach

Lanes		AM	NOON	PM
	Exit	48	0	51
1	Left	10	0	16
2	Through	15	0	34
0	Right	63	0	52

Westbound Approach

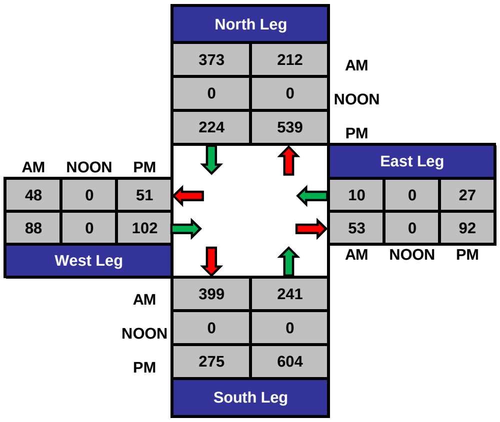
	AM	NOON	PM	Lanes
Right	1	0	7	1
Through	2	0	7	1
Left	7	0	13	1
Exit	53	0	92	

Northbound Approach

	Exit	Left	Through	Right
AM	399	24	201	16
NOON	0	0	0	0
PM	275	38	516	50
Lanes		1	2	1

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



North Leg

AM	373	212
NOON	0	0
PM	224	539

East Leg

	AM	NOON	PM
	10	0	27
	53	0	92

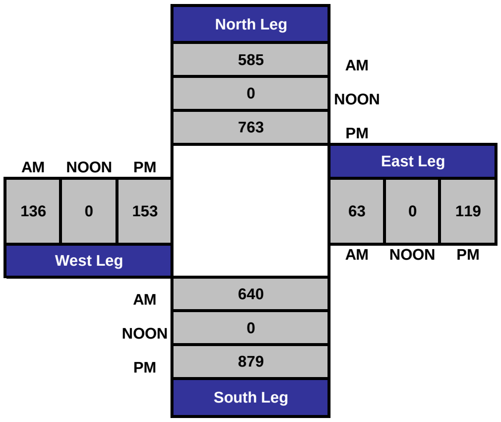
West Leg

	AM	NOON	PM
	48	0	51
	88	0	102

South Leg

AM	399	241
NOON	0	0
PM	275	604

Total Volume Per Leg



	North Leg	East Leg	West Leg	South Leg
AM	585	63	136	640
NOON	0	0	0	0
PM	763	119	153	879

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: Historical

Day: Thursday

Cars

City: Fresno

Date: 12/1/2016

AM

NS/EW Streets:	N Marks Ave			N Marks Ave			W Belmont Ave			W Belmont Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	3	0	1	2	0	1	1	1	
7:00 AM	2	33	2	3	37	1	2	4	11	0	1	0	96
7:15 AM	4	26	4	8	47	4	3	2	13	3	3	0	117
7:30 AM	9	48	3	8	101	6	3	6	17	1	0	0	202
7:45 AM	5	58	2	4	97	7	3	1	16	0	1	0	194
8:00 AM	4	55	4	3	73	2	2	5	19	2	1	1	171
8:15 AM	4	38	7	4	54	6	2	2	8	2	0	0	127
8:30 AM	7	48	12	6	61	4	5	5	9	1	0	0	158
8:45 AM	5	39	6	1	51	3	4	1	8	2	0	0	120
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	40	345	40	37	521	33	24	26	101	11	6	1	1185
APPROACH %'s :	9.41%	81.18%	9.41%	6.26%	88.16%	5.58%	15.89%	17.22%	66.89%	61.11%	33.33%	5.56%	

	UTURNS			
	NB	SB	EB	WB
7:00 AM	0	0	0	0
7:15 AM	0	0	0	0
7:30 AM	0	2	0	0
7:45 AM	0	3	0	0
8:00 AM	1	1	0	0
8:15 AM	0	0	0	0
8:30 AM	0	2	0	0
8:45 AM	0	0	0	0
	NB	SB	EB	WB
TOTAL VOLUMES :	1	8	0	0

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	22	199	16	19	325	21	10	14	60	5	2	1	694
PEAK HR FACTOR :		0.912			0.793			0.808			0.500		0.859

CONTROL : 4-Way Stop

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: Historical

Day: Thursday

Cars

City: Fresno

Date: 12/1/2016

PM

NS/EW Streets:	N Marks Ave			N Marks Ave			W Belmont Ave			W Belmont Ave							
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND				UTURNS			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
LANES:	1	2	1	1	3	0	1	2	0	1	1	1					
4:00 PM	10	121	11	2	58	5	2	5	14	1	2	1	232	1	2	0	0
4:15 PM	5	110	14	0	49	6	4	10	15	5	0	2	220	0	0	0	0
4:30 PM	6	104	8	0	63	1	3	8	12	8	3	4	220	0	0	0	0
4:45 PM	4	134	10	4	46	1	4	13	17	3	2	0	238	0	0	0	0
5:00 PM	9	131	17	4	50	1	6	5	13	2	2	2	242	0	0	0	0
5:15 PM	13	147	13	0	50	2	3	8	4	0	0	1	241	0	0	0	0
5:30 PM	3	147	11	1	38	3	0	2	12	2	0	0	219	0	0	0	0
5:45 PM	2	114	7	2	27	3	1	6	9	1	1	1	174	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	52	1008	91	13	381	22	23	57	96	22	10	11	1786	1	2	0	0
APPROACH %'s :	4.52%	87.58%	7.91%	3.13%	91.59%	5.29%	13.07%	32.39%	54.55%	51.16%	23.26%	25.58%					

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	32	516	48	8	209	5	16	34	46	13	7	7	941
PEAK HR FACTOR :		0.861			0.867			0.706			0.450		0.972

CONTROL : 4-Way Stop

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: Historical

Day: Thursday

HT

City: Fresno

Date: 12/1/2016

AM

NS/EW Streets:	N Marks Ave			N Marks Ave			W Belmont Ave			W Belmont Ave			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	3	0	1	2	0	1	1	1	
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	1	0	0	0	1	1	1	0	0	4
7:30 AM	1	0	0	1	0	1	0	0	0	0	0	0	3
7:45 AM	0	1	0	0	1	0	0	0	1	0	0	0	3
8:00 AM	1	1	0	0	1	0	0	1	2	1	0	0	7
8:15 AM	0	0	0	2	2	0	0	0	0	1	0	0	5
8:30 AM	0	0	1	0	0	0	1	0	0	1	0	0	3
8:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	4

UTURNS			
NB	SB	EB	WB
0	0	0	0
0	0	0	0
0	2	0	0
0	3	0	0
1	1	0	0
0	0	0	0
0	2	0	0
0	0	0	0

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	2	3	2	4	5	1	1	3	4	5	0	0	30
APPROACH %'s :	28.57%	42.86%	28.57%	40.00%	50.00%	10.00%	12.50%	37.50%	50.00%	100.00%	0.00%	0.00%	

NB	SB	EB	WB
1	8	0	0

PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	2	2	0	3	4	1	0	1	3	2	0	0	18
PEAK HR FACTOR :	0.500			0.500			0.333			0.500			0.859

CONTROL : 4-Way Stop

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: Historical

City: Fresno

HT

PM

Day: Thursday

Date: 12/1/2016

NS/EW Streets:	N Marks Ave			N Marks Ave			W Belmont Ave			W Belmont Ave					UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND								
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL		NB	SB	EB	WB
LANES:	1	2	1	1	3	0	1	2	0	1	1	1						
4:00 PM	2	1	0	0	0	0	0	0	0	0	0	0	3		1	2	0	0
4:15 PM	0	0	0	0	1	0	1	0	0	0	0	0	2		0	0	0	0
4:30 PM	2	0	0	0	0	0	0	0	1	0	0	0	3		0	0	0	0
4:45 PM	1	0	0	0	0	1	0	0	4	0	0	0	6		0	0	0	0
5:00 PM	1	0	1	0	1	0	0	0	0	0	0	0	3		0	0	0	0
5:15 PM	2	0	1	0	0	0	0	0	1	0	0	0	4		0	0	0	0
5:30 PM	0	0	0	0	1	0	0	0	2	0	0	0	3		0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL		NB	SB	EB	WB
TOTAL VOLUMES :	8	1	2	0	3	1	1	0	8	0	0	0	24		1	2	0	0
APPROACH %'s :	72.73%	9.09%	18.18%	0.00%	75.00%	25.00%	11.11%	0.00%	88.89%	#DIV/0!	#DIV/0!	#DIV/0!						

PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	6	0	2	0	1	1	0	0	6	0	0	0	16
PEAK HR FACTOR :		0.667			0.500			0.375			0.000		0.972

CONTROL : 4-Way Stop

Prepared by National Data & Surveying Services

VOLUME

Marks Ave Bet. Belmont Ave & Nielsen Ave

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_001

DAILY TOTALS	NB	SB	EB	WB	Total
	3,857	3,312	0	0	7,169

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	10		11				21		**12:00**	85		35				120	
00:15	7		5				12		**12:15**	44		64				108	
00:30	5		4				9		**12:30**	75		50				125	
00:45	4	26	12	32			16	58	**12:45**	55	259	52	201			107	460
01:00	7		9				16		**13:00**	71		36				107	
01:15	5		18				23		**13:15**	80		51				131	
01:30	3		9				12		**13:30**	66		44				110	
01:45	4	19	7	43			11	62	**13:45**	54	271	59	190			113	461
02:00	3		4				7		**14:00**	72		70				142	
02:15	8		3				11		**14:15**	59		66				125	
02:30	2		7				9		**14:30**	97		62				159	
02:45	9	22	5	19			14	41	**14:45**	125	353	73	271			198	624
03:00	4		2				6		**15:00**	117		65				182	
03:15	4		1				5		**15:15**	116		41				157	
03:30	6		1				7		**15:30**	113		36				149	
03:45	8	22	7	11			15	33	**15:45**	102	448	42	184			144	632
04:00	4		5				9		**16:00**	93		46				139	
04:15	8		8				16		**16:15**	74		54				128	
04:30	10		24				34		**16:30**	91		51				142	
04:45	16	38	10	47			26	85	**16:45**	101	359	56	207			157	566
05:00	15		13				28		**17:00**	77		50				127	
05:15	25		16				41		**17:15**	103		53				156	
05:30	23		18				41		**17:30**	75		45				120	
05:45	21	84	17	64			38	148	**17:45**	49	304	53	201			102	505
06:00	35		19				54		**18:00**	50		42				92	
06:15	21		27				48		**18:15**	54		45				99	
06:30	15		25				40		**18:30**	60		48				108	
06:45	49	120	50	121			99	241	**18:45**	36	200	40	175			76	375
07:00	36		44				80		**19:00**	25		38				63	
07:15	34		47				81		**19:15**	22		16				38	
07:30	33		46				79		**19:30**	14		26				40	
07:45	66	169	53	190			119	359	**19:45**	21	82	47	127			68	209
08:00	56		57				113		**20:00**	48		26				74	
08:15	39		55				94		**20:15**	30		13				43	
08:30	43		49				92		**20:30**	25		4				29	
08:45	52	190	47	208			99	398	**20:45**	21	124	16	59			37	183
09:00	47		84				131		**21:00**	22		22				44	
09:15	41		70				111		**21:15**	21		21				42	
09:30	41		87				128		**21:30**	31		10				41	
09:45	47	176	67	308			114	484	**21:45**	25	99	17	70			42	169
10:00	48		59				107		**22:00**	16		15				31	
10:15	39		90				129		**22:15**	14		20				34	
10:30	52		37				89		**22:30**	14		20				34	
10:45	53	192	66	252			119	444	**22:45**	11	55	10	65			21	120
11:00	45		70				115		**23:00**	13		11				24	
11:15	34		60				94		**23:15**	7		6				13	
11:30	68		54				122		**23:30**	11		7				18	
11:45	59	206	55	239			114	445	**23:45**	8	39	4	28			12	67
TOTALS		1264		1534				**2798**	**TOTALS**		2593		1778				**4371**
SPLIT %		45.2%		54.8%				**39.0%**	**SPLIT %**		59.3%		40.7%				**61.0%**

DAILY TOTALS	NB	SB	EB	WB	Total
	3,857	3,312	0	0	7,169

AM Peak Hour	11:45	09:00			**09:00**	**PM Peak Hour**	14:45	14:00			**14:30**
AM Pk Volume	263	308			**484**	**PM Pk Volume**	471	271			**696**
Pk Hr Factor	0.774	0.885			**0.924**	**Pk Hr Factor**	0.942	0.928			**0.879**
7 - 9 Volume	359	398	0	0	**757**	**4 - 6 Volume**	663	408	0	0	**1071**
7 - 9 Peak Hour	07:45	07:45			**07:45**	**4 - 6 Peak Hour**	16:30	16:15			**16:30**
7 - 9 Pk Volume	204	214	0	0	**418**	**4 - 6 Pk Volume**	372	211	0	0	**582**
Pk Hr Factor	0.773	0.939	0.000	0.000	**0.878**	**Pk Hr Factor**	0.903	0.942	0.000	0.000	**0.927**

Prepared by National Data & Surveying Services

VOLUME

Marks Ave Bet. Nielsen Ave & Ray Johnson Dr

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_002

DAILY TOTALS	NB	SB	EB	WB	Total
	5,128	3,822	0	0	8,950

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	12		22				34		**12:00**	97		63				160	
00:15	11		10				21		**12:15**	78		51				129	
00:30	6		6				12		**12:30**	99		68				167	
00:45	8	37	5	43			13	80	**12:45**	77	351	87	269			164	620
01:00	6		5				11		**13:00**	98		62				160	
01:15	7		6				13		**13:15**	99		69				168	
01:30	3		5				8		**13:30**	80		82				162	
01:45	7	23	5	21			12	44	**13:45**	91	368	63	276			154	644
02:00	3		1				4		**14:00**	94		64				158	
02:15	8		1				9		**14:15**	85		59				144	
02:30	5		3				8		**14:30**	119		76				195	
02:45	14	30	7	12			21	42	**14:45**	150	448	49	248			199	696
03:00	9		4				13		**15:00**	141		72				213	
03:15	9		19				28		**15:15**	123		81				204	
03:30	10		13				23		**15:30**	126		79				205	
03:45	13	41	14	50			27	91	**15:45**	125	515	75	307			200	822
04:00	8		16				24		**16:00**	93		84				177	
04:15	10		17				27		**16:15**	83		68				151	
04:30	16		23				39		**16:30**	115		80				195	
04:45	32	66	24	80			56	146	**16:45**	113	404	56	288			169	692
05:00	29		33				62		**17:00**	89		91				180	
05:15	31		39				70		**17:15**	106		65				171	
05:30	35		51				86		**17:30**	83		58				141	
05:45	45	140	43	166			88	306	**17:45**	57	335	56	270			113	605
06:00	53		51				104		**18:00**	50		30				80	
06:15	44		33				77		**18:15**	65		38				103	
06:30	33		50				83		**18:30**	64		47				111	
06:45	67	197	69	203			136	400	**18:45**	43	222	34	149			77	371
07:00	56		49				105		**19:00**	39		18				57	
07:15	55		61				116		**19:15**	47		13				60	
07:30	67		60				127		**19:30**	45		21				66	
07:45	102	280	66	236			168	516	**19:45**	38	169	24	76			62	245
08:00	91		52				143		**20:00**	42		20				62	
08:15	56		59				115		**20:15**	37		15				52	
08:30	61		52				113		**20:30**	31		19				50	
08:45	75	283	41	204			116	487	**20:45**	29	139	22	76			51	215
09:00	74		76				150		**21:00**	27		25				52	
09:15	89		30				119		**21:15**	28		24				52	
09:30	63		65				128		**21:30**	34		16				50	
09:45	76	302	62	233			138	535	**21:45**	25	114	15	80			40	194
10:00	65		55				120		**22:00**	17		8				25	
10:15	53		67				120		**22:15**	14		8				22	
10:30	72		50				122		**22:30**	17		11				28	
10:45	83	273	49	221			132	494	**22:45**	16	64	13	40			29	104
11:00	63		61				124		**23:00**	13		4				17	
11:15	51		61				112		**23:15**	17		5				22	
11:30	74		59				133		**23:30**	9		11				20	
11:45	91	279	62	243			153	522	**23:45**	9	48	11	31			20	79
TOTALS		1951		1712				**3663**	**TOTALS**		3177		2110				**5287**
SPLIT %		53.3%		46.7%				**40.9%**	**SPLIT %**		60.1%		39.9%				**59.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	5,128	3,822	0	0	8,950

	NB	SB	EB	WB	Total		NB	SB	EB	WB	Total
AM Peak Hour	11:45	09:30			**11:45**	**PM Peak Hour**	14:45	15:15			**15:00**
AM Pk Volume	365	249			**609**	**PM Pk Volume**	540	319			**822**
Pk Hr Factor	0.922	0.929			**0.912**	**Pk Hr Factor**	0.900	0.949			**0.965**
7 - 9 Volume	563	440	0	0	**1003**	**4 - 6 Volume**	739	558	0	0	**1297**
7 - 9 Peak Hour	07:30	07:15			**07:15**	**4 - 6 Peak Hour**	16:30	16:15			**16:30**
7 - 9 Pk Volume	316	239	0	0	**554**	**4 - 6 Pk Volume**	423	295	0	0	**715**
Pk Hr Factor	0.775	0.905	0.000	0.000	**0.824**	**Pk Hr Factor**	0.920	0.810	0.000	0.000	**0.917**

Prepared by National Data & Surveying Services

VOLUME

Marks Ave Bet. Ray Johnson Dr & SR-180 WB Ramps

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_003

DAILY TOTALS	NB	SB	EB	WB	Total
	5,301	4,079	0	0	9,380

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	14		21				35		12:00	95		64				159	
00:15	11		11				22		12:15	84		56				140	
00:30	7		8				15		12:30	93		75				168	
00:45	6	38	5	45			11	83	12:45	76	348	82	277			158	625
01:00	8		5				13		13:00	99		75				174	
01:15	8		9				17		13:15	104		70				174	
01:30	3		5				8		13:30	84		89				173	
01:45	9	28	8	27			17	55	13:45	98	385	65	299			163	684
02:00	3		1				4		14:00	90		72				162	
02:15	9		3				12		14:15	84		69				153	
02:30	5		3				8		14:30	126		79				205	
02:45	16	33	6	13			22	46	14:45	157	457	53	273			210	730
03:00	9		6				15		15:00	146		78				224	
03:15	10		17				27		15:15	131		83				214	
03:30	10		14				24		15:30	129		87				216	
03:45	12	41	17	54			29	95	15:45	125	531	81	329			206	860
04:00	8		16				24		16:00	91		85				176	
04:15	10		19				29		16:15	84		71				155	
04:30	17		26				43		16:30	115		93				208	
04:45	34	69	26	87			60	156	16:45	114	404	61	310			175	714
05:00	33		34				67		17:00	92		104				196	
05:15	32		41				73		17:15	107		70				177	
05:30	38		51				89		17:30	81		58				139	
05:45	48	151	40	166			88	317	17:45	60	340	57	289			117	629
06:00	52		48				100		18:00	49		37				86	
06:15	43		36				79		18:15	63		43				106	
06:30	34		51				85		18:30	71		47				118	
06:45	68	197	72	207			140	404	18:45	49	232	36	163			85	395
07:00	57		50				107		19:00	41		26				67	
07:15	54		65				119		19:15	51		15				66	
07:30	72		60				132		19:30	46		25				71	
07:45	100	283	73	248			173	531	19:45	37	175	29	95			66	270
08:00	103		55				158		20:00	50		21				71	
08:15	61		59				120		20:15	34		18				52	
08:30	73		52				125		20:30	36		24				60	
08:45	82	319	40	206			122	525	20:45	30	150	22	85			52	235
09:00	77		75				152		21:00	27		26				53	
09:15	92		40				132		21:15	27		21				48	
09:30	66		73				139		21:30	33		17				50	
09:45	78	313	66	254			144	567	21:45	27	114	17	81			44	195
10:00	68		58				126		22:00	19		10				29	
10:15	55		73				128		22:15	16		7				23	
10:30	71		52				123		22:30	18		10				28	
10:45	89	283	57	240			146	523	22:45	17	70	13	40			30	110
11:00	63		63				126		23:00	15		4				19	
11:15	54		69				123		23:15	11		7				18	
11:30	78		59				137		23:30	12		12				24	
11:45	100	295	65	256			165	551	23:45	7	45	12	35			19	80
TOTALS	2050		1803				**3853**		**TOTALS**	3251		2276				**5527**	
SPLIT %	53.2%		46.8%				**41.1%**		**SPLIT %**	58.8%		41.2%				**58.9%**	

DAILY TOTALS	NB	SB	EB	WB	Total
	5,301	4,079	0	0	9,380

AM Peak Hour	11:45	09:30			**11:45**	**PM Peak Hour**	14:45	15:15			**14:45**
AM Pk Volume	372	270			**632**	**PM Pk Volume**	563	336			**864**
Pk Hr Factor	0.930	0.925			**0.940**	**Pk Hr Factor**	0.896	0.966			**0.964**
7 - 9 Volume	602	454	0	0	**1056**	**4 - 6 Volume**	744	599	0	0	**1343**
7 - 9 Peak Hour	07:45	07:15			**07:30**	**4 - 6 Peak Hour**	16:30	16:15			**16:30**
7 - 9 Pk Volume	337	253	0	0	**583**	**4 - 6 Pk Volume**	428	329	0	0	**756**
Pk Hr Factor	0.818	0.866	0.000	0.000	**0.842**	**Pk Hr Factor**	0.930	0.791	0.000	0.000	**0.909**

Prepared by National Data & Surveying Services

VOLUME

Marks Ave Bet. SR-180 WB Ramps & SR-180 EB Ramps

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_004

DAILY TOTALS	NB	SB	EB	WB	Total
	5,209	4,576	0	0	9,785

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	9		23				32		**12:00**	88		65				153	
00:15	17		20				37		**12:15**	66		57				123	
00:30	12		14				26		**12:30**	73		59				132	
00:45	7	45	14	71			21	116	**12:45**	81	308	68	249			149	557
01:00	13		12				25		**13:00**	63		66				129	
01:15	13		17				30		**13:15**	88		54				142	
01:30	11		10				21		**13:30**	83		75				158	
01:45	10	47	7	46			17	93	**13:45**	71	305	69	264			140	569
02:00	6		5				11		**14:00**	98		88				186	
02:15	7		2				9		**14:15**	79		74				153	
02:30	7		6				13		**14:30**	92		57				149	
02:45	12	32	10	23			22	55	**14:45**	94	363	64	283			158	646
03:00	7		8				15		**15:00**	89		79				168	
03:15	10		8				18		**15:15**	96		81				177	
03:30	14		8				22		**15:30**	104		74				178	
03:45	8	39	19	43			27	82	**15:45**	83	372	77	311			160	683
04:00	6		18				24		**16:00**	99		77				176	
04:15	10		24				34		**16:15**	104		71				175	
04:30	28		21				49		**16:30**	114		77				191	
04:45	34	78	39	102			73	180	**16:45**	92	409	98	323			190	732
05:00	34		44				78		**17:00**	94		93				187	
05:15	50		39				89		**17:15**	89		93				182	
05:30	59		40				99		**17:30**	77		71				148	
05:45	47	190	66	189			113	379	**17:45**	57	317	81	338			138	655
06:00	42		49				91		**18:00**	74		62				136	
06:15	52		43				95		**18:15**	73		67				140	
06:30	51		46				97		**18:30**	75		64				139	
06:45	58	203	68	206			126	409	**18:45**	74	296	70	263			144	559
07:00	72		70				142		**19:00**	63		54				117	
07:15	70		72				142		**19:15**	54		55				109	
07:30	93		68				161		**19:30**	73		42				115	
07:45	106	341	71	281			177	622	**19:45**	44	234	50	201			94	435
08:00	73		62				135		**20:00**	70		40				110	
08:15	66		78				144		**20:15**	50		43				93	
08:30	79		58				137		**20:30**	56		48				104	
08:45	68	286	55	253			123	539	**20:45**	35	211	45	176			80	387
09:00	68		56				124		**21:00**	33		37				70	
09:15	67		40				107		**21:15**	46		46				92	
09:30	60		49				109		**21:30**	35		20				55	
09:45	87	282	51	196			138	478	**21:45**	38	152	50	153			88	305
10:00	61		54				115		**22:00**	35		23				58	
10:15	63		48				111		**22:15**	30		16				46	
10:30	62		56				118		**22:30**	35		23				58	
10:45	48	234	50	208			98	442	**22:45**	26	126	20	82			46	208
11:00	71		44				115		**23:00**	12		16				28	
11:15	60		64				124		**23:15**	12		15				27	
11:30	80		59				139		**23:30**	17		15				32	
11:45	78	289	82	249			160	538	**23:45**	9	50	20	66			29	116
TOTALS		2066		1867				**3933**	**TOTALS**		3143		2709				**5852**
SPLIT %		52.5%		47.5%				**40.2%**	**SPLIT %**		53.7%		46.3%				**59.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	5,209	4,576	0	0	9,785

AM Peak Hour	07:15	07:00			**07:00**	**PM Peak Hour**	16:00	16:30			**16:30**
AM Pk Volume	342	281			**622**	**PM Pk Volume**	409	361			**750**
Pk Hr Factor	0.807	0.976			**0.879**	**Pk Hr Factor**	0.897	0.921			**0.982**
7 - 9 Volume	627	534	0	0	**1161**	**4 - 6 Volume**	726	661	0	0	**1387**
7 - 9 Peak Hour	07:15	07:00			**07:00**	**4 - 6 Peak Hour**	16:00	16:30			**16:30**
7 - 9 Pk Volume	342	281	0	0	**622**	**4 - 6 Pk Volume**	409	361	0	0	**750**
Pk Hr Factor	0.807	0.976	0.000	0.000	**0.879**	**Pk Hr Factor**	0.897	0.921	0.000	0.000	**0.982**

Prepared by National Data & Surveying Services

VOLUME

Belmont Ave Bet. Marks Ave & Hughes Ave

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_005

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,991	3,249	7,240

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			9		12		21		12:00			73		59		132	
00:15			6		4		10		12:15			58		63		121	
00:30			5		11		16		12:30			90		51		141	
00:45			7	27	12	39	19	66	12:45			75	296	61	234	136	530
01:00			1		0		1		13:00			76		56		132	
01:15			0		0		0		13:15			70		62		132	
01:30			0		0		0		13:30			82		64		146	
01:45			0	1	0		0	1	13:45			63	291	60	242	123	533
02:00			0		0		0		14:00			77		59		136	
02:15			0		0		0		14:15			72		49		121	
02:30			1		1		2		14:30			67		81		148	
02:45			12	13	5	6	17	19	14:45			77	293	60	249	137	542
03:00			10		2		12		15:00			76		65		141	
03:15			10		4		14		15:15			92		79		171	
03:30			5		3		8		15:30			106		71		177	
03:45			7	32	9	18	16	50	15:45			79	353	70	285	149	638
04:00			6		6		12		16:00			91		72		163	
04:15			14		16		30		16:15			68		62		130	
04:30			14		12		26		16:30			71		56		127	
04:45			21	55	28	62	49	117	16:45			69	299	46	236	115	535
05:00			41		17		58		17:00			56		40		96	
05:15			53		16		69		17:15			46		57		103	
05:30			26		23		49		17:30			53		50		103	
05:45			35	155	29	85	64	240	17:45			61	216	44	191	105	407
06:00			27		23		50		18:00			55		38		93	
06:15			46		26		72		18:15			44		26		70	
06:30			42		26		68		18:30			40		34		74	
06:45			50	165	30	105	80	270	18:45			42	181	38	136	80	317
07:00			27		26		53		19:00			37		42		79	
07:15			47		22		69		19:15			52		39		91	
07:30			56		37		93		19:30			39		27		66	
07:45			70	200	45	130	115	330	19:45			29	157	38	146	67	303
08:00			55		34		89		20:00			29		31		60	
08:15			47		47		94		20:15			31		30		61	
08:30			49		40		89		20:30			29		15		44	
08:45			63	214	41	162	104	376	20:45			21	110	15	91	36	201
09:00			36		44		80		21:00			21		21		42	
09:15			53		39		92		21:15			13		26		39	
09:30			65		39		104		21:30			33		26		59	
09:45			59	213	51	173	110	386	21:45			12	79	13	86	25	165
10:00			48		59		107		22:00			15		26		41	
10:15			64		53		117		22:15			19		9		28	
10:30			72		51		123		22:30			11		16		27	
10:45			73	257	58	221	131	478	22:45			18	63	16	67	34	130
11:00			56		59		115		23:00			18		15		33	
11:15			66		63		129		23:15			12		11		23	
11:30			75		54		129		23:30			18		9		27	
11:45			69	266	63	239	132	505	23:45			7	55	11	46	18	101
TOTALS				1598		1240		**2838**	**TOTALS**				2393		2009		**4402**
SPLIT %				56.3%		43.7%		**39.2%**	**SPLIT %**				54.4%		45.6%		**60.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	3,991	3,249	7,240

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
AM Peak Hour			11:45	11:00	**11:45**	**PM Peak Hour**			15:15	15:15	**15:15**
AM Pk Volume			290	239	**526**	**PM Pk Volume**			368	292	**660**
Pk Hr Factor			0.806	0.948	**0.933**	**Pk Hr Factor**			0.868	0.924	**0.932**
7 - 9 Volume	0	0	414	292	**706**	**4 - 6 Volume**	0	0	515	427	**942**
7 - 9 Peak Hour			07:15	07:45	**07:30**	**4 - 6 Peak Hour**			16:00	16:00	**16:00**
7 - 9 Pk Volume	0	0	228	166	**391**	**4 - 6 Pk Volume**	0	0	299	236	**535**
Pk Hr Factor	0.000	0.000	0.814	0.883	**0.850**	**Pk Hr Factor**	0.000	0.000	0.821	0.819	**0.821**

Prepared by National Data & Surveying Services

VOLUME

Nielsen Ave Bet. Marks Ave & Hughes Ave

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_006

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	869	746	1,615

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			3		3		6		**12:00**			20		6		26	
00:15			0		3		3		**12:15**			10		3		13	
00:30			1		0		1		**12:30**			16		18		34	
00:45			3	7	2	8	5	15	**12:45**			17	63	13	40	30	103
01:00			1		1		2		**13:00**			16		21		37	
01:15			0		0		0		**13:15**			16		20		36	
01:30			3		0		3		**13:30**			17		18		35	
01:45			1	5	1	2	2	7	**13:45**			13	62	13	72	26	134
02:00			1		3		4		**14:00**			20		16		36	
02:15			1		0		1		**14:15**			14		16		30	
02:30			1		1		2		**14:30**			17		25		42	
02:45			1	4	2	6	3	10	**14:45**			15	66	13	70	28	136
03:00			0		0		0		**15:00**			19		23		42	
03:15			0		2		2		**15:15**			12		14		26	
03:30			1		2		3		**15:30**			11		27		38	
03:45			1	2	1	5	2	7	**15:45**			21	63	7	71	28	134
04:00			1		0		1		**16:00**			10		18		28	
04:15			1		0		1		**16:15**			12		7		19	
04:30			7		4		11		**16:30**			12		28		40	
04:45			14	23	3	7	17	30	**16:45**			10	44	18	71	28	115
05:00			4		3		7		**17:00**			7		22		29	
05:15			7		5		12		**17:15**			8		12		20	
05:30			12		13		25		**17:30**			10		8		18	
05:45			21	44	1	22	22	66	**17:45**			8	33	8	50	16	83
06:00			10		5		15		**18:00**			3		12		15	
06:15			8		3		11		**18:15**			12		13		25	
06:30			15		5		20		**18:30**			6		8		14	
06:45			22	55	4	17	26	72	**18:45**			12	33	15	48	27	81
07:00			10		5		15		**19:00**			17		11		28	
07:15			12		19		31		**19:15**			16		9		25	
07:30			17		4		21		**19:30**			20		14		34	
07:45			22	61	6	34	28	95	**19:45**			11	64	7	41	18	105
08:00			25		14		39		**20:00**			6		3		9	
08:15			7		5		12		**20:15**			3		5		8	
08:30			12		4		16		**20:30**			6		4		10	
08:45			12	56	9	32	21	88	**20:45**			7	22	4	16	11	38
09:00			8		5		13		**21:00**			4		3		7	
09:15			13		3		16		**21:15**			1		0		1	
09:30			12		9		21		**21:30**			5		2		7	
09:45			11	44	13	30	24	74	**21:45**			2	12	3	8	5	20
10:00			17		10		27		**22:00**			1		0		1	
10:15			12		9		21		**22:15**			4		1		5	
10:30			9		11		20		**22:30**			4		3		7	
10:45			8	46	6	36	14	82	**22:45**			1	10	1	5	2	15
11:00			16		11		27		**23:00**			1		0		1	
11:15			8		14		22		**23:15**			3		2		5	
11:30			9		9		18		**23:30**			0		0		0	
11:45			11	44	18	52	29	96	**23:45**			2	6	1	3	3	9
TOTALS				391		251		**642**	**TOTALS**				478		495		**973**
SPLIT %				60.9%		39.1%		**39.8%**	**SPLIT %**				49.1%		50.9%		**60.2%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	869	746	1,615

AM Peak Hour			07:15	11:00	**07:15**	**PM Peak Hour**			12:45	16:30	**14:15**
AM Pk Volume			76	52	**119**	**PM Pk Volume**			66	80	**142**
Pk Hr Factor			0.760	0.722	**0.763**	**Pk Hr Factor**			0.971	0.714	**0.845**
7 - 9 Volume	0	0	117	66	**183**	**4 - 6 Volume**	0	0	77	121	**198**
7 - 9 Peak Hour			07:15	07:15	**07:15**	**4 - 6 Peak Hour**			16:00	16:30	**16:30**
7 - 9 Pk Volume	0	0	76	43	**119**	**4 - 6 Pk Volume**	0	0	44	80	**117**
Pk Hr Factor	0.000	0.000	0.760	0.566	**0.763**	**Pk Hr Factor**	0.000	0.000	0.917	0.714	**0.731**

Prepared by National Data & Surveying Services

VOLUME

Hughes Ave Bet. Belmont Ave & Nielsen Ave

Day: Tuesday
Date: 8/3/2021

City: Riverside
Project #: CA21_030059_007

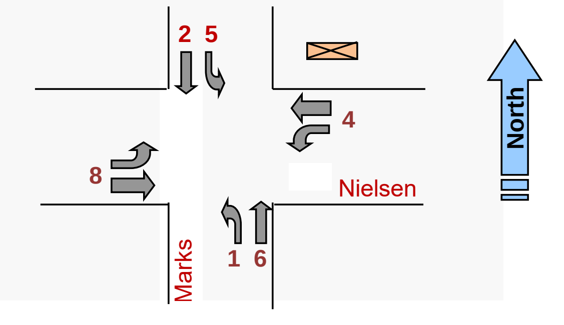
DAILY TOTALS	NB	SB	EB	WB	Total
	1,421	1,183	0	0	2,604

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	6		2				8		**12:00**	34		21				55	
00:15	5		3				8		**12:15**	31		14				45	
00:30	5		3				8		**12:30**	26		25				51	
00:45	1	17	4	12			5	29	**12:45**	23	114	28	88			51	202
01:00	2		3				5		**13:00**	11		12				23	
01:15	5		4				9		**13:15**	19		26				45	
01:30	7		3				10		**13:30**	22		17				39	
01:45	3	17	2	12			5	29	**13:45**	28	80	16	71			44	151
02:00	1		1				2		**14:00**	12		24				36	
02:15	3		6				9		**14:15**	27		29				56	
02:30	1		2				3		**14:30**	33		21				54	
02:45	2	7	2	11			4	18	**14:45**	37	109	24	98			61	207
03:00	1		4				5		**15:00**	33		20				53	
03:15	3		2				5		**15:15**	40		12				52	
03:30	3		4				7		**15:30**	29		26				55	
03:45	1	8	0	10			1	18	**15:45**	26	128	20	78			46	206
04:00	1		0				1		**16:00**	33		32				65	
04:15	3		0				3		**16:15**	27		21				48	
04:30	2		3				5		**16:30**	30		25				55	
04:45	7	13	8	11			15	24	**16:45**	19	109	18	96			37	205
05:00	12		8				20		**17:00**	48		11				59	
05:15	7		12				19		**17:15**	27		16				43	
05:30	16		14				30		**17:30**	17		21				38	
05:45	17	52	15	49			32	101	**17:45**	21	113	18	66			39	179
06:00	4		7				11		**18:00**	17		16				33	
06:15	14		7				21		**18:15**	17		18				35	
06:30	9		9				18		**18:30**	6		4				10	
06:45	16	43	15	38			31	81	**18:45**	0	40	2	40			2	80
07:00	12		12				24		**19:00**	8		2				10	
07:15	17		16				33		**19:15**	5		3				8	
07:30	14		11				25		**19:30**	2		0				2	
07:45	23	66	17	56			40	122	**19:45**	3	18	2	7			5	25
08:00	25		18				43		**20:00**	6		11				17	
08:15	19		15				34		**20:15**	10		14				24	
08:30	17		15				32		**20:30**	18		10				28	
08:45	16	77	16	64			32	141	**20:45**	15	49	9	44			24	93
09:00	28		17				45		**21:00**	12		13				25	
09:15	10		23				33		**21:15**	11		7				18	
09:30	21		16				37		**21:30**	15		5				20	
09:45	14	73	24	80			38	153	**21:45**	8	46	14	39			22	85
10:00	28		19				47		**22:00**	10		9				19	
10:15	27		15				42		**22:15**	11		8				19	
10:30	29		9				38		**22:30**	4		2				6	
10:45	20	104	32	75			52	179	**22:45**	5	30	3	22			8	52
11:00	27		22				49		**23:00**	4		8				12	
11:15	24		23				47		**23:15**	2		5				7	
11:30	20		22				42		**23:30**	4		6				10	
11:45	23	94	24	91			47	185	**23:45**	4	14	6	25			10	39
TOTALS		571		509				**1080**	**TOTALS**		850		674				**1524**
SPLIT %		52.9%		47.1%				**41.5%**	**SPLIT %**		55.8%		44.2%				**58.5%**

DAILY TOTALS	NB	SB	EB	WB	Total
	1,421	1,183	0	0	2,604

AM Peak Hour	11:45	10:45			**11:45**	**PM Peak Hour**	14:30	15:30			**14:15**
AM Pk Volume	114	99			**198**	**PM Pk Volume**	143	99			**224**
Pk Hr Factor	0.838	0.773			**0.900**	**Pk Hr Factor**	0.894	0.773			**0.918**
7 - 9 Volume	143	120	0	0	**263**	**4 - 6 Volume**	222	162	0	0	**384**
7 - 9 Peak Hour	07:45	07:45			**07:45**	**4 - 6 Peak Hour**	16:15	16:00			**16:00**
7 - 9 Pk Volume	84	65	0	0	**149**	**4 - 6 Pk Volume**	124	96	0	0	**205**
Pk Hr Factor	0.840	0.903	0.000	0.000	**0.866**	**Pk Hr Factor**	0.646	0.750	0.000	0.000	**0.788**

Movement	NL	ST		WT	SL	NT		ET		
Times [1.1.1]	1	2	3	4	5	6	7	8	9	10
Min Green	8	8	0	8	8	8		8		0
Gap, Ext	2	5.5	0	5.2	2	5.4		5.2		0
Max 1	20	35	0	48	20	35		48		0
Max 2	12	25	0	38	12	25		38		0
Yel Clearance	3.9	4.3	0	3.9	3.9	4.3		3.9		0
Red Clearance	1	1	0	2	1	1		2		0
Walk	0	5	0	5		5		5		0
Ped Clearance	0	22	0	28		21		28		0
Red Revert	2	2	0	2	2	2		2		0
Add Initial	0		0			0		0		0
Max Initial	0		0			0		0		0
Time B4 Reduct	0	8	0	8		8		8		0
Cars B4 Reduct	0		0			0		0		0
Time To Reduce	0	18	0	27		18		27		0
Reduce By	0		0			0		0		0
Min Gap	2	2	0	2	2	2		2		0
DyMaxLim	0		0			0		0		0
Max Step	0		0			0		0		0
Options [1.1.2]	1	2	3	4	5	6	7	8	9	10
Enable	X	X		X	X	X		X		
Min Recall										
Max Recall										
Ped Recall										
Soft Recall		X				X				
Lock Calls										
Auto Flash Entry										
Auto Flash Exit										
Dual Entry		X		X		X		X		
Enable Simul Gap										
Gaurantee Passage										
Rest In Walk										
Conditonal Service										
Non-Actuated 1										
Non-Actuated 2										
Add Init Calc										



Phase Options+ [1.1.3]

Options+	1	2	3	4	5	6	7	8	9	10
Reservice										
PedClr Thru Yel										
SkipRed-NoCall										
Red Rest										
Max II										
*Max III										
Max Inhibit										
Ped Delay										
Red Rest on Gap										
Conflicting Phase	0	0	0	0	0	0	0	0	0	0
Grn/Ped Delay										
Omit Yel, Yel P	0	0	0	0	0	0	0	0	0	0
Ped Out/Olp Ped										
StartYel, Next P	0	0	0	0	0	0	0	0	0	0
*StartupVehCall	1	2		4	5	6		8		
*StartupPedCall										

Phase Concurrency [1.1.4]

Phase	Ring	StartUp	Concurrent Phases					
1	1	RED	5	6	0	0		
2	1	GREEN	5	6	0	0		
3	1	RED	7	8	0	0		
4	1	RED	7	8	0	0		
5	2	RED	1	2	0	0		
6	2	GREEN	1	2	0	0		
7	2	RED	3	4	0	0		
8	2	RED	3	4	0	0		
9	0	RED	0	0	0	0		
10	0	RED	0	0	0	0		
11	0	RED	0	0	0	0		
12	0	RED	0	0	0	0		

Comm Ports [6.6]

Channel	Port	Echo	Mode
Async 1	SP1	NONE	0
Async 2	SP2	NONE	0
Async 3	SP8	NONE	0
Async 4	OFF	NONE	0
Sync 1	SP5S		
Sync 2	OFF		
TS2CVM	NONE		
Opticom	NONE		
GPS	NONE		

Unit Params [1.2.1]

Screen Size	8	Metric	OFF
Startup Flash	0	Red Revert	2
MCE Timeout	0	Auto Ped Clear	OFF
Loc Flsh Start	RSt	Display Time	60
Yellow < 3"	OFF	Tone Disable	ON
Allow Skip Yel	OFF	AudioPedTime	0
Start Red Tm	6	**Phase Mode**	STD8
Startup Calls	UseProg	CNA FreeTime	0
TOD Dimming	OFF	Diamond Mode	4Ph
ST over Prmpt	OFF	Free Ring Seq	1
Feature Profile	1	IO Mode	USER
Mx Seek TrkTm	0	Max Cyc Timer	0
Mx Seek Dwell	0	CycFlt Actn	ALARM
Prmpt/Ext Coor	EXT	Clrnc Decide	OFF
Aux Switch	STOPTM	**LPAlt Srs**	3-6
*InhFYA Red St	OFF	Security Delay	0
RingA1go	0		

* - 76.12B or newer

Times+ [1.1.7]

	1	2	3	4	5	6	7	8
Walk2	0	0	0	0	0	0	0	0
BikeClr	0	0	0	0	0	0	0	0
GrnFlash	0	0	0	0	0	0	0	0
SfClrMn	0	0	0	0	0	0	0	0
SfClrNoFlsh	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
NoPed Reserv								

Comm [6.2]

Port	Baud Rate	FCM
1	38400	6
2	9600	6
3	9600	6
4	9600	6

Comm [6.5]

					Host IPs			
IP Address:	0	0	0	77	ATMS			
Mask:	255	255	255	0	10	50	10	22
Gateway:	0	0	0	1	SG			
Port #:	5001				0	0	0	0

City of
FRESNO

Phase Seq. (2 ring) Chart [1.2.4]

Seq #	Ring	Phases					
1	1	1	2	3	4	0	0
	2	5	6	7	8	0	0
2	1	1	2	3	4	0	0
	2	6	5	7	8	0	0
3	1	2	1	3	4	0	0
	2	5	6	7	8	0	0
4	1	2	1	3	4	0	0
	2	6	5	7	8	0	0
5	1	1	2	3	4	0	0
	2	5	6	8	7	0	0
6	1	1	2	3	4	0	0
	2	6	5	8	7	0	0
7	1	2	1	3	4	0	0
	2	5	6	8	7	0	0
8	1	2	1	3	4	0	0
	2	6	5	8	7	0	0
9	1	1	2	4	3	0	0
	2	5	6	7	8	0	0
10	1	1	2	4	3	0	0
	2	6	5	7	8	0	0
11	1	2	1	4	3	0	0
	2	5	6	7	8	0	0
12	1	2	1	4	3	0	0
	2	6	5	7	8	0	0
13	1	1	2	4	3	0	0
	2	5	6	8	7	0	0
14	1	1	2	4	3	0	0
	2	6	5	8	7	0	0
15	1	2	1	4	3	0	0
	2	5	6	8	7	0	0
16	1	2	1	4	3	0	0
	2	6	5	8	7	0	0

Advance Warning [1.1.9]

	Ph	Tm
Aux Out #1	0	0
Aux Out #2	0	0

NAME: Marks & Nielsen **ID:** 1342 **Configuration:** Standard File

V76.12/13
Updated 12/6/17

Prepared by:	JT	**Date Installed / By:**	
Checked by:	PG	**Date Superseded:**	

Date Printed:
12/4/20

[2.1] Coord Modes+

Test OpMode	0	
Correction	SHRT/LNG	
Maximum	MAX INH	
Force Mode	FIXED	
Flash Mode	CHANNEL	

Coord Modes+ (Page 2)

FreeonSeqCh	ON	
Closed Loop	OFF	
External	OFF	
Latch Sec Frc	OFF	
Stop-in-Walk	OFF	
Ped Recycle	P1256_INH	
Expand Splt	OFF	
Easy Float	OFF	
Auto Reset	ON	
NTCIP Yield	+	0
Leave Walk		
Before	TIMED	
After	TIMED	

Marks & Nielsen

Intersection Name:

ID: 1342

City of FRESNO

Date Printed:
12/4/2020

[2.4] Patterns

Pat#	Cyc	Off	Split	Seq
1	0	0	1	1
2	0	0	2	1
3	0	0	3	1
4	0	0	4	1
5	0	0	5	1
6	0	0	6	1
7	0	0	7	1
8	0	0	8	1
9	0	0	9	1
10	0	0	10	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1

[2.7.1-24] Splits

Split	[2.7]	1	2	3	4	5	6	7	8	9	10
1	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
2	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
3	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
4	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
5	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
6	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
7	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
8	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
9	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
10	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
11	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
12	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
13	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON

[2.5] Transition

Pat#	Short	Long	Dwell	No Shortway Ø				E-Yld	Offset	Ret Hold	Flt	Min Veh	Min Ped	MI
1	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
2	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
3	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
4	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
5	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
6	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
7	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
8	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
9	10	25	0	0	0	0	0	0	EndGRN	-	-	-	-	OFF
10	10	25	0	0	0	0	0	0	EndGRN	-	-	-	-	OFF
11		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
12	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
13		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF

[2.1] Coord Modes+

Test OpMode	0
Correction	SHRT/LNG
Maximum	MAX INH
Force Mode	FIXED
Flash Mode	CHANNEL

Coord Modes+ (Page 2)

FreeonSeqCh	ON	
Closed Loop	OFF	
External	OFF	
Latch Sec Frc	OFF	
Stop-in-Walk	OFF	
Ped Recycle	P1256_INH	
Expand Split	OFF	
Easy Float	OFF	
Auto Reset	ON	
NTCIP Yield	+	0

Leave Walk

Before	TIMED
After	TIMED

Marks & Nielsen

Intersection Name:

ID: 1342

Date Printed:
12/4/2020

[2.4] Patterns

Pat#	Cyc	Off	Split	Seq
20	0	0	0	1
21	0	0	0	1
22	0	0	0	1
23	0	0	0	1
24	0	0	0	1
25	0	0	0	1
26	0	0	0	1
27	0	0	0	1
28	0	0	0	1
29	0	0	0	1
30	0	0	0	1
31	0	0	0	1
32	0	0	0	1

[2.7.1-24] Splits

Split	[2.7]	1	2	3	4	5	6	7	8	9	10
20	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
21	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
22	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
23	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
24	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
25	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
26	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
27	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
28	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
29	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
30	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
31	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
32	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON

[2.5] Transition

Pat#	Short	Long	Dwell	No Shortway Ø				E-Yld	Offset	Ret Hold	Flt	Min Veh	Min Ped	MI
20		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
21	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
22		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
23	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
24		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
25	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
26		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
27	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
28		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
29	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
30		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
31	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
32		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF

[2.7.X.3] TSP Split Table

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
1	0	0	1	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
2	0	0	2	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
3	0	0	3	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
4	0	0	4	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
5	0	0	5	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

[2.9.2.(1-8)] Strategy Tables

STRATEGY_1

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_2

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_3

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_4

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_5

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_6

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_7

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_8

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
6	0	0	6	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
9 - FREE	0	0	9	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Overlap 1-8 Program Parms & Parm+ [1.5.2.1] [1.5.2.8]

	Included Ø									NORMAL	
1	Modifier Ø									Grn	
	Conflict Ø									Yel	3
A	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
2	Modifier Ø									Grn	
	Conflict Ø									Yel	3
B	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
3	Modifier Ø									Grn	
	Conflict Ø									Yel	3
C	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
4	Modifier Ø									Grn	
	Conflict Ø									Yel	3
D	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
5	Modifier Ø									Grn	
	Conflict Ø									Yel	3
E	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
6	Modifier Ø									Grn	
	Conflict Ø									Yel	3
F	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
7	Modifier Ø									Grn	
	Conflict Ø									Yel	3
G	Conflict Olap									Red	1
	Conflict Ped										
	Included Ø									NORMAL	
8	Modifier Ø									Grn	
	Conflict Ø									Yel	3
H	Conflict Olap									Red	1
	Conflict Ped										

OLP GENERAL PARAMETERS [1.5.1]

Lock Inhibit	OFF
Conflict Lock Enable	OFF
Parent P Clearance	ON
Xtra Incl Phases	OFF
InhibitLockInterval	Always

Channel Parameters [1.8.3]

Pre Invert Rail Input	OFF

City of FRESNO

Preemption Options+ [3.Pre #.6]

Pre #	Enable	Type	Output	Pattern	Skip	Co+Pre	Flash	Max/Min
1	OFF	RAIL	TS2		OFF	OFF	OFF	MAX
2	OFF	RAIL	TS2	0	OFF	OFF	OFF	MAX
3	ON	EMERG	TS2		OFF	OFF	OFF	MAX
4	ON	EMERG	TS2	0	OFF	OFF	OFF	MAX
5	ON	EMERG	TS2		OFF	OFF	OFF	MAX
6	ON	EMERG	TS2	0	OFF	OFF	OFF	MAX

Preemption Times [3.#.1]

Pre #	Delay	MinDura	MaxPres	MinGrn	MinWlk	PedClr	Track Grn	Min Dwell
1								
2	0	0	0	0	0	0	0	0
3		10	60	6		25		10
4	0	10	60	6	0	25	0	10
5		10	60	6		25		10
6	0	10	60	6	0	25	0	10

Preemption, Options [3.#.3]

Pre #	Lock Input	Over-ride Auto Flash	Over-ride Higher Preempt	Flash Dwell	Link
1	OFF	OFF	OFF	ON	
2	OFF	OFF	OFF	OFF	0
3	OFF	OFF	OFF	OFF	
4	OFF	OFF	OFF	OFF	0
5	OFF	OFF	OFF	OFF	
6	OFF	OFF	OFF	OFF	0

Preemption, Times+ [3.#.4]

Pre No.	Extend Dwell	Return Max	Ped Clr	Yel	Red
1					
2	0	0	0	0	0
3		20	10	3.9	2
4	0	20	10	3.9	2
5		20	10	3.9	2
6	0	20	10	3.9	2

Pre 1 = RR1
Pre 2 = RR2
Pre 3 = EVA
Pre 4 = EVB
Pre 5 = EVC
Pre 6 = EVD

Prog Parms+ (MM>1>5>2>X>3)

OverlapB+: 1-A

Leading Green	OFF			FYA MCE Disable	OFF
Transit Input	0			FYA Skip Red	OFF
FYA Delay Time	0			FYA AfterPreempt	OFF
Ped Call Clear	OFF				
Ped ClearTime	0			FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0

OverlapB+: 2-B

Leading Green	OFF			FYA MCE Disable	OFF
Transit Input	0			FYA Skip Red	OFF
FYA Delay Time	0			FYA AfterPreempt	OFF
Ped Call Clear	OFF				
Ped ClearTime	0			FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0

Phases [3.#.2] - set the Dwell Phases

Pre #	Column	1	2	3	4	5	6	7	8	9	10
1	Dwell Veh										
	Peds										
2	Dwell Veh										
	Peds										
3	Dwell Veh	2	5								
	Peds										
4	Dwell Veh	4									
	Peds										
5	Dwell Veh	6	1								
	Peds										
6	Dwell Veh	8									
	Peds										

Phases [3.#.2] - Trk Veh

Pre #	Phases			
1				
2				
3				
4				
5				
6				

Exit Phases [3.#.2]

No.	Exit Phase			
1				
2				
3	2	5		
4	2	6		
5	1	6		
6	2	6		

Overlaps+ [3.#.5]

Pre #		Preempt Overlaps +									
1	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										
2	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										
3	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										
4	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										
5	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										
6	Track	0	0	0	0	0	0	0	0	0	0
	Dwell										

OverlapB+: 3-C

Leading Green	OFF				FYA MCE Disable	OFF
Transit Input	0				FYA Skip Red	OFF
FYA Delay Time	0				FYA AfterPreempt	OFF
Ped Call Clear	OFF					
Ped ClearTime	0				FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0	0

OverlapB+: 4-D

Leading Green	OFF				FYA MCE Disable	OFF
Transit Input	0				FYA Skip Red	OFF
FYA Delay Time	0				FYA AfterPreempt	OFF
Ped Call Clear	OFF					
Ped ClearTime	0				FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0	0

CHANNEL SETTINGS [1.8] plus UNIT PARAMETERS [1.2.1]

CHANNEL SETTINGS [1.8.1] / Chan Settings [1.8.2]

Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Phase / Olap #	1	2	3	4	5	6	7	8	1	2	3	4	2	4	6	8								
Channel Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	OLP	OLP	OLP	OLP	PED	PED	PED	PED	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH
Channel Flash	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz		X		X		X		X																
	Page 1								Page 2															

CHANNEL PARMETERS [1.8.3]

CH 17-24 Mapping:	DEFAULT
D-Conn Mapping:	NONE
Invert Rail Inputs:	OFF
C1-C11-ABC IO Mode:	USER

IO PARAMETERS [1.8.6]

C1-C11-ABC IO Mode:	USER
D-Conn Mapping:	NONE
T & F BIU Mapping	DEFAULT
Invert Rail Inputs:	OFF
EVP Ped Confirm	OFF

CHANNELS+ [1.8.4]

Channel	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Flash Green	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Flash Red	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Flash Yellow	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Inh Red Fl in Preempt	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Olap Ovrd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Override Type	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID: 1342 **NAME:** Marks & Nielsen

I/O LOGIC [1.8.7]

Prt Date: 12/4/2020

Row#	Result			Operand_1					Operand_2					Operand_3					Timer	
	I/O	Fcn	=	Inv	Src	I/0	Fun	Logic Func	Inv	Src	I/0	Fun	Logic Func	Inv	Src	I/0	Fun	Logic Func	Dly	Sec
1	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
2	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
3	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
4	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
5	I	0	=	-	0	I	OFF	----	-	0	I	OFF	-----	-	0	I	OFF	----	DLY	0
6	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
7	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
8	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
9	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
10	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0

Ped Parms (MM>5>4)

Det#	Call	No Act	Max Pres	Err Cnt
1	0	0	0	0
2	2	0	0	0
3	0	0	0	0
4	4	0	0	0
5	0	0	0	0
6	6	0	0	0
7	0	0	0	0
8	8	0	0	0

Veh Par 1-32 [5.1]											Vehicle Options 1-32 [5.2]									Parameters+ 1-32 [5.3]								Info Only	
Det #	Input Slot	Call Ø	Swi Ø	Dlay	Ext	Que	No Act	Max Pres	Err Cnt	Fail Time	Det #	Call	Ext	Que	Add Init	Red Lock	Yell Lock	occ	vol	Det #	Occupancy			Delay		Type	Src	Dir	Det #
																					G	Y	R	1	2				
1	1I1U	1					0	0	0	255	1	X	X	-	-	-	-	X	X	1	X	X	-			NORM		NBL1	1
2	2I2U	2	0	0	0	0	0	0	0	255	2	-	X	-	-	-	-	X	X	2	X	X	-	0	0	NORM	0		2
3	2I2L	2	0	0	2	0	0	0	0	255	3	X	-	-	-	-	-	X	X	3	X	X	-	0	0	STOPB	0		3
4	2I3U	2	0	0	2	0	0	0	0	255	4	X	-	-	-	-	-	X	X	4	X	X	-	0	0	STOPB	0		4
5	2I3L	2	0	0	2	0	0	0	0	255	5	X	-	-	-	-	-	X	X	5	X	X	-	0	0	STOPB	0	SBR1	5
6	2I4U	2	0	0	2	0	0	0	0	255	6	X	-	-	-	-	-	X	X	6	X	X	-	0	0	STOPB	0	SBT1	6
7	3I5U	8					0	0	0	255	7	X	X	-	-	-	-	X	X	7	X	X	-			NORM		EBL1	7
8	4I6U	4	0	0	0	0	0	0	0	255	8	-	X	-	-	-	-	X	X	8	X	X	-	0	0	NORM	0		8
9	4I6L	4	0	0	2	0	0	0	0	255	9	X	-	-	-	-	-	X	X	9	X	X	-	0	0	STOPB	0		9
10	4I7U	4	0	0	2	0	0	0	0	255	10	X	-	-	-	-	-	X	X	10	X	X	-	0	0	STOPB	0		10
11	4I7L	4		15	2		0	0	0	255	11	X	-	-	-	-	-	X	X	11	X	X	-			STOPB		WBR1	11
12	4I8U	4			2		0	0	0	255	12	X	-	-	-	-	-	X	X	12	X	X	-			STOPB		WBT1	12
13	1I9U	1	0	0	0	0	0	0	0	255	13	X	X	-	-	-	-	X	X	13	X	X	-	0	0	NORM	0		13
14	3I9L	8	0	0	0	0	0	0	0	255	14	X	X	-	-	-	-	X	X	14	X	X	-	0	0	NORM	0		14
15	5J1U	5	0	0	0	0	0	0	0	255	15	X	X	-	-	-	-	X	X	15	X	X	-	0	0	NORM	0	SBL1	15
16	6J2U	6					0	0	0	255	16	-	X	-	-	-	-	X	X	16	X	X	-			NORM			16
17	6J2L	6			2		0	0	0	255	17	X	-	-	-	-	-	X	X	17	X	X	-			STOPB			17
18	6J3U	6			2		0	0	0	255	18	X	-	-	-	-	-	X	X	18	X	X	-			STOPB			18
19	6J3L	6			2		0	0	0	255	19	X	-	-	-	-	-	X	X	19	X	X	-			STOPB		NBR1	19
20	6J4U	6			2		0	0	0	255	20	X	-	-	-	-	-	X	X	20	X	X	-			STOPB		NBT1	20
21	7J5U	4					0	0	0	255	21	X	X	-	-	-	-	X	X	21	X	X	-			NORM		WBL1	21
22	8J6U	8	0	0	0	0	0	0	0	255	22	-	X	-	-	-	-	X	X	22	X	X	-	0	0	NORM	0		22
23	8J6L	8	0	0	2	0	0	0	0	255	23	X	-	-	-	-	-	X	X	23	X	X	-	0	0	STOPB	0		23
24	8J7U	8	0	0	2	0	0	0	0	255	24	X	-	-	-	-	-	X	X	24	X	X	-	0	0	STOPB	0		24
25	8J7L	8	0	15	2	0	0	0	0	255	25	X	-	-	-	-	-	X	X	25	X	X	-	0	0	STOPB	0	EBR1	25
26	8J8U	8	0	0	2	0	0	0	0	255	26	X	-	-	-	-	-	X	X	26	X	X	-	0	0	STOPB	0	EBT1	26
27	5J9U	5					0	0	0	255	27	X	X	-	-	-	-	X	X	27	X	X	-			NORM			27
28	7J9L	4					0	0	0	255	28	X	X	-	-	-	-	X	X	28	X	X	-			NORM			28
29	2I11U	2	0	0	2	0	0	0	0	255	29	X	-	-	-	-	-	X	X	29	X	X	-	0	0	STOPB	0		29
30	4I11L	4	0	15	2	0	0	0	0	255	30	X	-	-	-	-	-	X	X	30	X	X	-	0	0	STOPB	0		30
31	6J11U	6			2		0	0	0	255	31	X	-	-	-	-	-	X	X	31	X	X	-			STOPB			31
32	8J11L	8		15	2		0	0	0	255	32	X	-	-	-	-	-	X	X	32	X	X	-			STOPB			32
33	1I1L	1	0	0	0	0	0	0	0	255	33	X	X	-	-	-	-	X	X	33	X	X	-	0	0	NORM	0		33
34	2I4L	2			2		0	0	0	255	34	X	-	-	-	-	-	X	X	34	X	X	-			STOPB		SBT2	34
35	3I5L	3	0	0	0	0	0	0	0	255	35	X	X	-	-	-	-	X	X	35	X	X	-	0	0	NORM	0		35
36	4I8L	4			2		0	0	0	255	36	X	-	-	-	-	-	X	X	36	X	X	-			STOPB			36
37	5J1L	5	0	0	0	0	0	0	0	255	37	X	X	-	-	-	-	X	X	37	X	X	-	0	0	NORM	0		37
38	6J4L	6			2		0	0	0	255	38	X	-	-	-	-	-	X	X	38	X	X	-			STOPB		NBT2	38
39	7J5L	7	0	0	0	0	0	0	0	255	39	X	X	-	-	-	-	X	X	39	X	X	-	0	0	NORM	0		39
40	8J8L	8			2		0	0	0	255	40	X	-	-	-	-	-	X	X	40	X	X	-			STOPB			40
41	4I10U	2					0	0	0	255	41	-	X	-	-	-	-	X	X	41	X	X	-			NORM			41
42	4I10L	2					0	0	0	255	42	-	X	-	-	-	-	X	X	42	X	X	-			NORM			42
43	8J10U	6					0	0	0	255	43	-	X	-	-	-	-	X	X	43	X	X	-			NORM			43
44	8J10L	6					0	0	0	255	44	-	X	-	-	-	-	X	X	44	X	X	-			NORM			44

ID: 1342 **Name:** Marks & Nielsen

Vol/Occ Period	0	Seconds
	5	Minutes

12/4/2020 .

Alt# 1 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 2 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 3 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 1 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Guar Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 2 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Enrty	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 3 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Enrty	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 4 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alternate Tables [2.6]

Pat#	POpt	PTime	DetGrp	Call/Inh	Olp Off								ASC	CNA1	Max2	Dia
					1	2	3	4	5	6	7	8				
1	0	0	0	0									0	Off		DFT
2													0	Off		DFT
3	0	0	0	0									0	Off		DFT
4													0	Off		DFT
5	0	0	0	0									0	Off		DFT
6													0	Off		DFT
7	0	0	0	0									0	Off		DFT
8													0	Off		DFT
9	0	0	0	0									0	Off		DFT
10													0	Off		DFT
11	0	0	0	0									0	Off		DFT
12													0	Off		DFT
13	0	0	0	0									0	Off		DFT
14													0	Off		DFT
15	0	0	0	0									0	Off		DFT
16													0	Off		DFT
17	0	0	0	0									0	Off		DFT
18													0	Off		DFT
19	0	0	0	0									0	Off		DFT
20													0	Off		DFT
21	0	0	0	0									0	Off		DFT
22													0	Off		DFT
23	0	0	0	0									0	Off		DFT
24													0	Off		DFT

Time Base Parameters [4.6]

Daylight Savings Time	ENABLE	
Time Base Sync Ref	0	
GMT Offset	-	8
Daylight Savings	**Mon**	**Week**
Spring	3	2
Fall	11	1

NOTE: % and MI parameters are not used and are not shown above.

City of FRESNO

NAME: **Marks & Nielsen**

12/4/2020 **ID:** **1342**

Annual Schedule [4.3]	Month												Day of Week							Date																																Day Plan
	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	1
2	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
3	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
4											X						X			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	-	-	-	4
5																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
6																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
7																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
8																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
9																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
10																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
11																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
12																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
13																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
14																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
15																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
16																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
17																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
18																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

NAME: Marks & Nielsen

ID No. 1342

DAY PLANS [4.4]

Plan 1				Plan 2				Plan 3				Plan 4				Plan 5				Plan 6				Plan 7				Plan 8				Plan 9				Plan 10			
Evt	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act	*Evt*	Hour	Min	Act
1		**1**	**54**	1		**1**	**54**	1		**1**	**54**	1	**0**	**1**	**54**	1				1				1				1				1				1			
2	0	0	0	2	0	0	0	2	0	0	0	2	**0**	0	0	2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0
3				3				3				3	**0**			3				3				3				3				3				3			
4	0	0	0	4	0	0	0	4	0	0	0	4	**0**	0	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0
5				5				5				5	**0**			5				5				5				5				5				5			
6	0	0	0	6	0	0	0	6	0	0	0	6	**0**	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
7				7				7				7	**0**			7				7				7				7				7				7			
8	0	0	0	8	0	0	0	8	0	0	0	8	**0**	0	0	8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0
9				9				9				9	**0**			9				9				9				9				9				9			
10	0	0	0	10	0	0	0	10	0	0	0	10	**0**	0	0	10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0

#	Alarm	Ev	Alr
1	Power Up Alarm.	X	X
2	Stop Timing	X	X
3	Cabinet Door Activation	-	-
4	Coordination Failure	X	X
5	External Alarm # 1	-	-
6	External Alarm # 2	-	-
7	External Alarm # 3	-	-
8	External Alarm # 4	-	-
9	Closed Loop Disabled	-	-
10	External Alarm # 5	-	-
11	External Alarm # 6	-	-
12	Manual Control Enable	X	X
13	Coord Free Input	-	-
14	Local Flash Input	X	X
15	CMU/MMU Flash Input	-	-
16	MMU Fault	X	X
17	Cycle Fault	X	-
18	Cycle Failure	X	-
19	Coordination Fault	X	X
20	Controller Fault	X	X
25	EEPROM CRC Fault	X	X
30	Coord Diagnostic Fault	X	X
37	Download Request	X	X
38	Pattern Change	-	-
49	Preempt 1 Input	X	X
50	Preempt 2 Input	X	X
51	Preempt 3 Input	X	X
52	Preempt 4 Input	X	X
53	Preempt 5 Input	X	X
54	Preempt 6 Input	X	X
55	Preempt 7 Input	-	-
56	Preempt 8 Input	-	-
57	Preempt 9 Input	-	-
58	Preempt 10 Input	-	-
59	EEPROM Compare Fault	X	X
60	Coordination Failure	X	X
63	TSP Active Trigger	-	-
73	Controller Access	X	X
81	FIO Changed Status	X	X

#1 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#2 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#3 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#4 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

I/O INPUT TABLE

	1	2	3	4	5	6	7	8
1	2	16	8	22	3	17	9	23
2	6	20	12	26	198	199	30	31
3	15	1	21	7	27	13	28	14
4	189	189	189	189	4	18	10	24
5	130	134	132	136	200	201	202	203
6	32	5	19	11	25	29	208	207
7	33	34	35	36	37	38	39	40
8	41	42	43	44	189	189	189	189

ACTION Table [4.5]

Act	Pat#	A1	A2	A3	S1	S2	S3	S4	S5	S6	S7	S8	P1	P2
1	1	-	-	-	-	-	-	-	-	-	-	-	0	0
2	2	-	-	-	-	-	-	-	-	-	-	-	0	0
3	3	-	-	-	-	-	-	-	-	-	-	-	0	0
4	4	-	-	-	-	-	-	-	-	-	-	-	0	0
5	5	-	-	-	-	-	-	-	-	-	-	-	0	0
6	6	-	-	-	-	-	-	-	-	-	-	-	0	0
7	7	-	-	-	-	-	-	-	-	-	-	-	0	0
8	8	-	-	-	-	-	-	-	-	-	-	-	0	0
9	9	-	-	-	-	-	-	-	-	-	-	-	0	0
10	10	-	-	-	-	-	-	-	-	-	-	-	0	0
11	11	-	-	-	-	-	-	-	-	-	-	-	0	0
12	12	-	-	-	-	-	-	-	-	-	-	-	0	0
13	13	-	-	-	-	-	-	-	-	-	-	-	0	0
14	14	-	-	-	-	-	-	-	-	-	-	-	0	0
15	15	-	-	-	-	-	-	-	-	-	-	-	0	0
16	0	-	-	-	-	-	-	-	-	-	-	-	0	0
54	254	-	-	-	-	-	-	-	-	-	-	-	0	0
55	0	-	-	-	-	-	-	-	-	-	-	-	0	0

Alarm Parameters [1.6.7.1]

Pattern Events:	ON
Local Txmt Alarms:	OFF
Reassign User Alarm #1 In (5):	0
Reassign User Alarm #2 In (6):	0
Preempt Events:	ON

City of
FRESNO

Date Printed
12/4/2020

ID: 1342 **Name:** Marks & Nielsen

I/O Inputs - 1.8.9.1.5

C-1 PIN	I/O Source	Function	Input Name
39	I1-1	2	Veh Det 2
40	I1-2	16	Veh Det 16
41	I1-3	8	Veh Det 8
42	I1-4	22	Veh Det 22
43	I1-5	3	Veh Det 3
44	I1-6	17	Veh Det 17
45	I1-7	9	Veh Det 9
46	I1-8	23	Veh Det 23
47	I2-1	6	Veh Det 6
48	I2-2	20	Veh Det 20
49	I2-3	12	Veh Det 12
50	I2-4	26	Veh Det 26
51	I2-5	198	Pre 1 In
52	I2-6	199	Pre 2 In
53	I2-7	30	Veh Det 30
54	I2-8	31	Veh Det 31
55	I3-1	15	Veh Det 15
56	I3-2	1	Veh Det 1
57	I3-3	21	Veh Det 21
58	I3-4	7	Veh Det 7
59	I3-5	27	Veh Det 27
60	I3-6	13	Veh Det 13
61	I3-7	28	Veh Det 28
62	I3-8	14	Veh Det 14
63	I4-5	4	Veh Det 4
64	I4-6	18	Veh Det 18
65	I4-7	10	Veh Det 10
66	I4-8	24	Veh Det 24
67	I5-1	130	Ped Call 2
68	I5-2	134	Ped Call 6
69	I5-3	132	Ped Call 4
70	I5-4	136	Ped Call 8
71	I5-5	200	Pre 3 In
72	I5-6	201	Pre 4 In
73	I5-7	202	Pre 5 In
74	I5-8	203	Pre 6 In
75	I6-1	32	Veh Det 32
76	I6-2	5	Veh Det 5
77	I6-3	19	Veh Det 19
78	I6-4	11	Veh Det 11
79	I6-5	25	Veh Det 25
80	I6-6	29	Veh Det 29
81	I6-7	208	Local Flash
82	I6-8	207	Comp StopTm

I/O OUTPUTS - 1.8.9.2.5

C-1 PIN	I/O Source	Function	Output Name
1	Logic Grd		
2	O1-1	14	Red Ch 14
3	O1-2	62	Grn Chan 14
4	O1-3	4	Red Ch 4
5	O1-4	28	Yel Chan 4
6	O1-5	52	Grn Chan 4
7	O1-6	3	Red Ch 3
8	O1-7	27	Yel Chan 3
9	O1-8	51	Grn Chan 3
10	O2-1	13	Red Ch 13
11	O2-2	61	Grn Chan 13
12	O2-3	2	Red Ch 2
13	O2-4	26	Yel Chan 2
14	Logic Grd		
15	O2-5	50	Grn Chan 2
16	O2-6	1	Red Ch 1
17	O2-7	25	Yel Chan 1
18	O2-8	49	Grn Chan 1
19	O3-1	16	Red Ch 16
20	O3-2	64	Grn Chan 16
21	O3-3	8	Red Ch 8
22	O3-4	32	Yel Chan 8
23	O3-5	56	Grn Chan 8
24	O3-6	7	Red Ch 7
25	O3-7	31	Yel Chan 7
26	O3-8	55	Grn Chan 7
27	O4-1	15	Red Ch 15
28	O4-2	63	Grn Chan 15
29	O4-3	6	Red Ch 6
30	O4-4	30	Yel Chan 6
31	O4-5	54	Grn Chan 6
32	O4-6	5	Red Ch 5
33	O4-7	29	Yel Chan 5
34	O4-8	53	Grn Chan 5
35	O5-1	37	Yel Chan 13
36	O5-2	39	Yel Chan 15
37	O5-3	38	Yel Chan 14
38	O5-4	40	Yel Chan 16
100	O5-5	42	Yel Chan 18
101	O5-6	41	Yel Chan 17
102	O5-7	115	Not Used
103	O5-8	114	Watchdog

C-1 PIN	I/O Source	Function	Output Name
83	O6-1	18	Red Ch 18
84	O6-2	66	Grn Chan 18
85	O6-3	12	Red Ch 12
86	O6-4	36	Yel Chan 12
87	O6-5	60	Grn Chan 12
88	O6-6	11	Red Ch 11
89	O6-7	35	Yel Chan 11
90	O6-8	59	Grn Chan 11
91	O7-1	17	Red Ch 17
92	Logic Grd		
93	O7-2	65	Grn Chan 17
94	O7-3	10	Red Ch 10
95	O7-4	34	Yel Chan 10
96	O7-5	58	Grn Chan 10
97	O7-6	9	Red Ch 9
98	O7-7	33	Yel Chan 9
99	O7-8	57	Grn Chan 9

I/O Outputs - 1.8.9.2.5

C-11 OUTPUTS

1	O8-1	115	Not Used
2	O8-2	115	Not Used
3	O8-3	115	Not Used
4	O8-4	115	Not Used

I/O Inputs - 1.8.9.1.5

C-11 INPUTS

15	I7-1	33	Veh Det 33
16	I7-2	34	Veh Det 34
17	I7-3	35	Veh Det 35
18	I7-4	36	Veh Det 36
19	I7-5	37	Veh Det 37
20	I7-6	38	Veh Det 38
21	I7-7	39	Veh Det 39
22	I7-8	40	Veh Det 40
23	I8-1	41	Veh Det 41
24	I8-2	42	Veh Det 42
25	I8-3	43	Veh Det 43
26	I8-4	44	Veh Det 44
27	I8-5	189	Unused
28	I8-6	189	Unused
29	I8-7	189	Unused
30	I8-8	189	Unused

City of FRESNO

ID: 1342

NAME: Marks & Nielsen

Date Printed:
12/4/2020

ID Number: 1342

LOCATION: Marks & Nielsen

City of Fresno
332 Cabinet
44 Detector Plus Setup

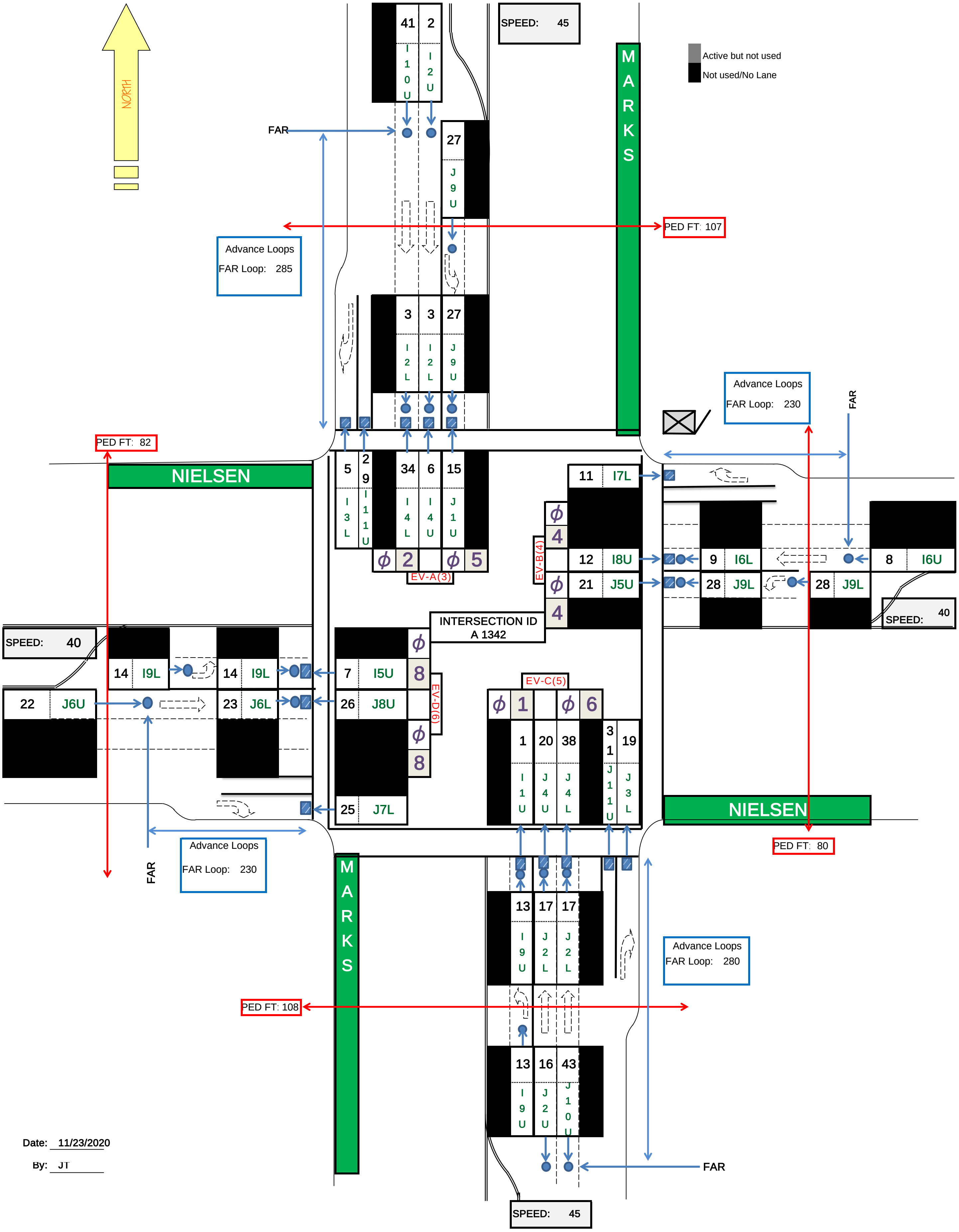
	DETECTOR ASSIGNMENTS											ISOLATORS		
"I"	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14
UPPER	Ph 1 Call&Ext T2-1&2 C1-56 Det 1 NBL1	Ph 2 Ext T2-5&6 C1-39 Det 2 SB Far	Ph 2 Call&TP3 T2-9&10 C1-63 Det 4 SB Mid	Ph 2 Call&TP3 T4-1&2 C1-47 Det 6 SBT1	Ph 3 Call&Ext T4-5&6 C1-58 Det 7 EBL1	Ph 4 Ext T4-9&10 C1-41 Det 8 WB Far	Ph 4 Call&TP3 T6-1&2 C1-65 Det 10 WB Mid	Ph 4 Call&TP3 T6-5&6 C1-49 Det 12 WBT1	Ph 1 Call&Ext T6-9&10 C1-60 Det 13 NBLt Bk	Ph 2/4 Ext T10-5&6 C11-23 Det 41	Ph 2 Call&Ext T8-1 C1-80 Det 29 BIKE	Ph 2 PPB T8-4 C1-67	Ph 6 PPB T8-7 C1-68	FLASH SENSE T8-10 C1-81
LOWER	Ph 1 Call&Ext T2-3&4 C11-15 Det 33 NBL2	Ph 2 Call&TP3 T2-7&8 C1-43 Det 3 SB Bk	Ph 2 Call&Ext T2-11&12 C1-76 Det 5 SBRt	Ph 2 Call&TP3 T4-3&4 C11-16 Det 34 SBT2	Ph 3 Call&Ext T4-7&8 C11-17 Det 35 EBL2	Ph 4 Call&TP3 T4-11&12 C1-45 Det 9 WB Bk	Ph 4 Call&Ext T6-3&4 C1-78 Det 11 WBRt	Ph 4 Call&TP3 T6-7&8 C11-18 Det 36 WBT2	Ph 3 Call&Ext T6-11&12 C1-62 Det 14 EBLt Bk	Ph 2/4 Ext T10-7&8 C11-24 Det 42	Ph 4 Call&Ext T8-2 C1-53 Det 30 BIKE	Ph 4 PPB T8-5 C1-69	Ph 8 PPB T8-8 C1-70	STOP TIMING T8-11 C1-82
"J"	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
UPPER	Ph 5 Call&Ext T3-1&2 C1-55 Det 15 SBL1	Ph 6 Ext T3-5&6 C1-40 Det 16 NB Far	Ph 6 Call&TP3 T3-9&10 C1-64 Det 18 NB Mid	Ph 6 Call&TP3 T5-1&2 C1-48 Det 20 NBT1	Ph 7 Call&Ext T5-5&6 C1-57 Det 21 WBL1	Ph 8 Ext T5-9&10 C1-42 Det 22 EB Far	Ph 8 Call&TP3 T7-1&2 C1-66 Det 24 EB Mid	Ph 8 Call&TP3 T7-5&6 C1-50 Det 26 EBT1	Ph 5 Call&Ext T7-9&10 C1-59 Det 27 SBLt Bk	Ph 6/8 Ext T10-9&10 C11-25 Det 43	Ph 6 Call&Ext T9-1 C1-54 Det 31 BIKE	EMER A Ph 2 + 5 T9-4 C1-71	EMER B Ph 4 + 7 T9-5 C1-72	RR1 FLASH T9-10 C1-51
LOWER	Ph 5 Call&Ext T3-3&4 C11-19 Det 37 SBL2	Ph 6 Call&TP3 T3-7&8 C1-44 Det 17 NB Bk	Ph 6 Call&Ext T3-11&12 C1-77 Det 19 NBRt	Ph 6 Call&TP3 T5-3&4 C11-20 Det 38 NBT2	Ph 7 Call&Ext T5-7&8 C11-21 Det 39 WBL2	Ph 8 Call&TP3 T5-11&12 C1-46 Det 23 EB Bk	Ph 8 Call&Ext T7-3&4 C1-79 Det 25 EBRt	Ph 8 Call&TP3 T7-7&8 C11-22 Det 40 EBT2	Ph 7 Call&Ext T7-11&12 C1-61 Det 28 WBLt Bk	Ph 6/8 EXT T10-11&12 C11-26 Det 44	Ph 8 Call&Ext T9-2 C1-75 Det 32 BIKE	EMER C Ph 1 + 6 T9-7 C1-73	EMER D Ph 3 + 8 T9-8 C1-74	RR2 LTD OP T9-11 C1-52

COMMENTS:

TIMING UPDATES AND MODIFICATIONS

ID: 1342 **NAME:** Marks & Nielsen

DATE	CHANGES MADE	ATMS or CABINET	BY
12/4/2020	New Intersection - Created timing calculations, FDW, & detector attributes per plan specifications.	ATMS	JT



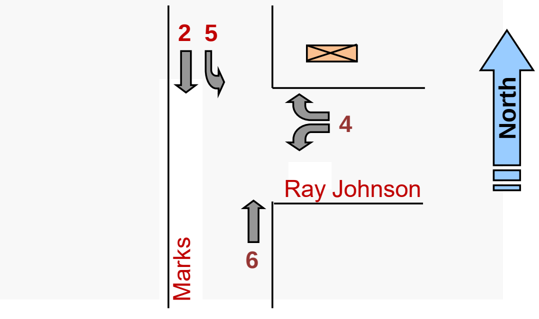
Date: 11/23/2020

By: JT

Detector Layout for the intersection of: MARKS & NIELSEN

Movement		ST		WT	SL	NT				
Times [1.1.1]	1	2	3	4	5	6	7	8	9	10
Min Green	0	8	0	6	6	8		0		0
Gap, Ext	0	4.3	0	5	2	4.3		0		0
Max 1	0	30	0	30	20	30		0		0
Max 2	0	20	0	20	15	20		0		0
Yel Clearance	0	4.3	0	3	3	4.3		0		0
Red Clearance	0	1	0	1	1	1		0		0
Walk	0		0	7		7		0		0
Ped Clearance	0		0	12		12		0		0
Red Revert	0	2	0	2	2	2		0		0
Add Initial	0		0			0		0		0
Max Initial	0		0			0		0		0
Time B4 Reduct	0	8	0	8		8		0		0
Cars B4 Reduct	0		0			0		0		0
Time To Reduce	0	15	0	15		15		0		0
Reduce By	0	0.6	0			0.6		0		0
Min Gap	0	2	0	2	2	2		0		0
DyMaxLim	0		0			0		0		0
Max Step	0		0			0		0		0

Options [1.1.2]	1	2	3	4	5	6	7	8	9	10
Enable		X		X	X	X				
Min Recall										
Max Recall										
Ped Recall										
Soft Recall		X				X				
Lock Calls										
Auto Flash Entry										
Auto Flash Exit										
Dual Entry		X				X				
Enable Simul Gap										
Gaurantee Passage										
Rest In Walk										
Conditonal Service										
Non-Actuated 1										
Non-Actuated 2										
Add Init Calc										



Phase Options+ [1.1.3]

Options+	1	2	3	4	5	6	7	8	9	10
Reservice										
PedClr Thru Yel										
SkipRed-NoCall										
Red Rest										
Max II										
*Max III										
Max Inhibit										
Ped Delay										
Red Rest on Gap										
Conflicting Phase	0	0	0	0	0	0	0	0	0	0
Grn/Ped Delay										
Omit Yel, Yel P	0	0	0	0	0	0	0	0	0	0
Ped Out/Olp Ped										
StartYel, Next P	0	0	0	0	0	0	0	0	0	0
*StartupVehCall		2		4	5	6				
*StartupPedCall										

Phase Concurrency [1.1.4]

Phase	Ring	StartUp	Concurrent Phases						
1	1	RED	5	6	0	0			
2	1	GREEN	5	6	0	0			
3	1	RED	7	8	0	0			
4	1	RED	7	8	0	0			
5	2	RED	1	2	0	0			
6	2	GREEN	1	2	0	0			
7	2	RED	3	4	0	0			
8	2	RED	3	4	0	0			
9	0	RED	0	0	0	0			
10	0	RED	0	0	0	0			
11	0	RED	0	0	0	0			
12	0	RED	0	0	0	0			

Comm Ports [6.6]

Channel	Port	Echo	Mode
Async 1	SP1	NONE	0
Async 2	SP2	NONE	0
Async 3	SP8	NONE	0
Async 4	OFF	NONE	0
Sync 1	**SP5S**		
Sync 2	**OFF**		
TS2CVM	NONE		
Opticom	NONE		
GPS	NONE		

Unit Params [1.2.1]

Screen Size	8	**Metric**	OFF
Startup Flash	0	Red Revert	2
MCE Timeout	0	Auto Ped Clear	OFF
Loc Flsh Start	RSt	Display Time	60
Yellow < 3"	OFF	Tone Disable	ON
Allow Skip Yel	OFF	AudioPedTime	0
Start Red Tm	6	**Phase Mode**	STD8
Startup Calls	UseProg	CNA FreeTime	0
TOD Dimming	OFF	Diamond Mode	4Ph
ST over Prmpt	OFF	Free Ring Seq	1
Feature Profile	1	IO Mode	USER
Mx Seek TrkTm	0	Max Cyc Timer	0
Mx Seek Dwell	0	CycFlt Actn	ALARM
Prmpt/Ext Coor	EXT	Clrnc Decide	OFF
Aux Switch	STOPTM	**LPAlt Srs**	3-6
*InhFYA Red St	OFF	Security Delay	0
RingA1go	0		

* - 76.12B or newer

Times+ [1.1.7]

	1	2	3	4	5	6	7	8
Walk2	0	0	0	0	0	0	0	0
BikeClr	0	0	0	0	0	0	0	0
GrnFlash	0	0	0	0	0	0	0	0
SfClrMn	0	0	0	0	0	0	0	0
SfClrNoFlsh	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF
NoPed Reserv								

Comm [6.2]

Port	Baud Rate	FCM
1	38400	6
2	9600	6
3	9600	6
4	9600	6

Comm [6.5]

					Host IPs			
IP Address:	10	50	20	32	ATMS			
Mask:	255	255	255	0	10	50	10	22
Gateway:	10	50	20	1	SG			
Port #:	5003				0	0	0	0

City of FRESNO

Phase Seq. (2 ring) Chart [1.2.4]

Seq #	Ring	Phases					
1	1	1	2	3	4	0	0
	2	5	6	7	8	0	0
2	1	1	2	3	4	0	0
	2	6	5	7	8	0	0
3	1	2	1	3	4	0	0
	2	5	6	7	8	0	0
4	1	2	1	3	4	0	0
	2	6	5	7	8	0	0
5	1	1	2	3	4	0	0
	2	5	6	8	7	0	0
6	1	1	2	3	4	0	0
	2	6	5	8	7	0	0
7	1	2	1	3	4	0	0
	2	5	6	8	7	0	0
8	1	2	1	3	4	0	0
	2	6	5	8	7	0	0
9	1	1	2	4	3	0	0
	2	5	6	7	8	0	0
10	1	1	2	4	3	0	0
	2	6	5	7	8	0	0
11	1	2	1	4	3	0	0
	2	5	6	7	8	0	0
12	1	2	1	4	3	0	0
	2	6	5	7	8	0	0
13	1	1	2	4	3	0	0
	2	5	6	8	7	0	0
14	1	1	2	4	3	0	0
	2	6	5	8	7	0	0
15	1	2	1	4	3	0	0
	2	5	6	8	7	0	0
16	1	2	1	4	3	0	0
	2	6	5	8	7	0	0

Advance Warning [1.1.9]

	Ph	Tm
Aux Out #1	0	0
Aux Out #2	0	0

NAME: Marks @ Ray Johnson **ID:** 1337 **Configuration:** Standard File

V76.12/13
Updated 12/6/17

Prepared by:	**JT**	**Date Installed / By:**	**3/1/2021 (JT)**
Checked by:	**JT**	**Date Superseded:**	

Date Printed:
2/23/21
Page 1

[2.1] Coord Modes+

Test OpMode	0
Correction	SHRT/LNG
Maximum	MAX INH
Force Mode	FIXED
Flash Mode	CHANNEL

Coord Modes+ (Page 2)

FreeonSeqCh	ON
Closed Loop	OFF
External	OFF
Latch Sec Frc	OFF
Stop-in-Walk	OFF
Ped Recycle	P1256_INH
Expand Splt	OFF
Easy Float	OFF
Auto Reset	ON
NTCIP Yield	+ 0

Leave Walk

Before	TIMED
After	TIMED

Intersection Name: Marks @ Ray Johnson

City of FRESNO

ID: 1337

Date Printed: 2/23/2021

[2.4] Patterns

Pat#	Cyc	Off	Split	Seq
1	0	0	1	1
2	0	0	2	1
3	0	0	3	1
4	0	0	4	1
5	0	0	5	1
6	0	0	6	1
7	0	0	7	1
8	0	0	8	1
9	0	0	9	1
10	0	0	10	1
11	0	0	0	1
12	0	0	0	1
13	0	0	0	1

[2.7.1-24] Splits

Split	[2.7]	1	2	3	4	5	6	7	8	9	10
1	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
2	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
3	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
4	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
5	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
6	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
7	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
8	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
9	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
10	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
11	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
12	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
13	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON

[2.5] Transition

Pat#	Short	Long	Dwell	No Shortway Ø				E-Yld	Offset	Ret Hold	Flt	Min Veh	Min Ped	MI
1	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
2	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
3	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
4	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
5	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
6	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
7	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
8	10	25	0	0	0	0	0	0	EndGRN	-	-	-	X	OFF
9	10	25	0	0	0	0	0	0	EndGRN	-	-	-	-	OFF
10	10	25	0	0	0	0	0	0	EndGRN	-	-	-	-	OFF
11		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
12	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
13		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF

[2.1] Coord Modes+

Test OpMode	0
Correction	SHRT/LNG
Maximum	MAX INH
Force Mode	FIXED
Flash Mode	CHANNEL

Coord Modes+ (Page 2)

FreeonSeqCh	ON	
Closed Loop	OFF	
External	OFF	
Latch Sec Frc	OFF	
Stop-in-Walk	OFF	
Ped Recycle	P1256_INH	
Expand Splt	OFF	
Easy Float	OFF	
Auto Reset	ON	
NTCIP Yield	+	0
Leave Walk		
Before	TIMED	
After	TIMED	

Intersection Name: Marks @ Ray Johnson

ID: 1337

City of FRESNO

[2.4] Patterns

Pat#	Cyc	Off	Split	Seq
20	0	0	0	1
21	0	0	0	1
22	0	0	0	1
23	0	0	0	1
24	0	0	0	1
25	0	0	0	1
26	0	0	0	1
27	0	0	0	1
28	0	0	0	1
29	0	0	0	1
30	0	0	0	1
31	0	0	0	1
32	0	0	0	1

[2.7.1-24] Splits

Split	[2.7]	1	2	3	4	5	6	7	8	9	10
20	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
21	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
22	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
23	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
24	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
25	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
26	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
27	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
28	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
29	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
30	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
31	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON
32	Split	0	0	0	0	0	0	0	0	0	0
	Crd-P										
	Mode	NON	NON	NON	NON	NON	NON	NON	NON	NON	NON

[2.5] Transition

Pat#	Short	Long	Dwell	No Shortway Ø				E-Yld	Offset	Ret Hold	Flt	Min Veh	Min Ped	MI
20		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
21	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
22		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
23	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
24		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
25	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
26		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
27	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
28		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
29	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
30		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
31	0	17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF
32		17	0	0	0	0	0	0	BegGRN	-	-	-	-	OFF

Date Printed:
2/23/2021

[2.7.X.3] TSP Split Table

Pat#	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
1	0	0	1	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						
2	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
	0	0	2	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						
3	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
	0	0	3	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						
4	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
	0	0	4	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						
5	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
	0	0	5	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

[2.9.2.(1-8)] Strategy Tables

STRATEGY_1

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_2

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_3

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_4

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_5

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_6

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_7

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

STRATEGY_8

SvcPhases	0	0	0	0
Phs Omits	0	0	0	0
Ped Omits	0	0	0	0

	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
6	0	0	6	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						
9 - FREE	Cyc	Off	Split	Seq	SPLITS	1	2	3	4	5	6	7	8	9	10
	0	0	9	1		0	0	0	0	0	0	0	0	0	0
					TSP - Max Reduction	0	0	0	0	0	0	0	0	0	0
					TSP - Max Extend	0	0	0	0	0	0	0	0	0	0
					Request	1	2	3	4						
					Strategy	0	0	0	0						
					TimSvcDes	0	0	0	0						
					TimEstDep	0	0	0	0						

Overlap 1-8 Program Parms & Parm+ [1.5.2.1] [1.5.2.8]

1	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
A	Conflict Olap									Red	1
	Conflict Ped										
2	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
B	Conflict Olap									Red	1
	Conflict Ped										
3	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
C	Conflict Olap									Red	1
	Conflict Ped										
4	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
D	Conflict Olap									Red	1
	Conflict Ped										
5	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
E	Conflict Olap									Red	1
	Conflict Ped										
6	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
F	Conflict Olap									Red	1
	Conflict Ped										
7	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
G	Conflict Olap									Red	1
	Conflict Ped										
8	Included Ø									NORMAL	
	Modifier Ø									Grn	
	Conflict Ø									Yel	3
H	Conflict Olap									Red	1
	Conflict Ped										

OLP GENERAL PARAMETERS [1.5.1]

Lock Inhibit	OFF
Conflict Lock Enable	OFF
Parent P Clearance	ON
Xtra Incl Phases	OFF
InhibitLockInterval	Always

Channel Parameters [1.8.3]

Pre Invert Rail Input	OFF

Preemption Options+ [3.Pre #.6]

Pre #	Enable	Type	Output	Pattern	Skip	Co+Pre	Flash	Max/Min
1	OFF	RAIL	TS2		OFF	OFF	OFF	MAX
2	OFF	RAIL	TS2	0	OFF	OFF	OFF	MAX
3	ON	EMERG	TS2		OFF	OFF	OFF	MAX
4	ON	EMERG	TS2	0	OFF	OFF	OFF	MAX
5	ON	EMERG	TS2		OFF	OFF	OFF	MAX
6	OFF	EMERG	TS2	0	OFF	OFF	OFF	MAX

Preemption Times [3.#.1]

Pre #	Delay	MinDura	MaxPres	MinGrn	MinWlk	PedClr	Track Grn	Min Dwell
1								
2	0	0	0	0	0	0	0	0
3		10	60	6		10		10
4	0	10	60	6	0	10	0	10
5		10	60	6		10		10
6	0	10	60	6	0	10	0	10

Preemption, Options [3.#.3]

Pre #	Lock Input	Over-ride Auto Flash		Over-ride Higher Preempt		Flash Dwell		Link
1	OFF		OFF		OFF		ON	
2	OFF		OFF		OFF		OFF	0
3	OFF		OFF		OFF		OFF	
4	OFF		OFF		OFF		OFF	0
5	OFF		OFF		OFF		OFF	
6	OFF		OFF		OFF		OFF	0

Preemption, Times+ [3.#.4]

Pre No.	Extend Dwell	Return Max	Ped Clr	Yel	Red
1					
2	0	0	0	0	0
3		20	10	3.6	1
4	0	20	10	3.6	1
5		20	10	3.6	1
6	0	20	10	3.6	1

Pre 1 = RR1
Pre 2 = RR2
Pre 3 = EVA
Pre 4 = EVB
Pre 5 = EVC
Pre 6 = EVD

Phases [3.#.2] - set the Dwell Phases

Pre #	Column	1	2	3	4	5	6	7	8	9	10
1	Dwell Veh										
	Peds										
2	Dwell Veh										
	Peds										
3	Dwell Veh	2	5								
	Peds										
4	Dwell Veh	4									
	Peds										
5	Dwell Veh	6									
	Peds										
6	Dwell Veh										
	Peds										

Phases [3.#.2] - Trk Veh

Pre #	Phases			
1				
2				
3				
4				
5				
6				

Exit Phases [3.#.2]

No.	Exit Phase			
1				
2				
3	2	5		
4	4			
5	6			
6				

Overlaps+ [3.#.5]

Pre #			Preempt Overlaps +									
1	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											
2	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											
3	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											
4	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											
5	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											
6	Track		0	0	0	0	0	0	0	0	0	0
	Dwell											

Prog Parms+ (MM>1>5>2>X>3)

OverlapB+: 1-A

Leading Green	OFF			FYA MCE Disable	OFF
Transit Input	0			FYA Skip Red	OFF
FYA Delay Time	0			FYA AfterPreempt	OFF
Ped Call Clear	OFF				
Ped ClearTime	0			FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0

OverlapB+: 2-B

Leading Green	OFF			FYA MCE Disable	OFF
Transit Input	0			FYA Skip Red	OFF
FYA Delay Time	0			FYA AfterPreempt	OFF
Ped Call Clear	OFF				
Ped ClearTime	0			FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0

OverlapB+: 3-C

Leading Green	OFF				FYA MCE Disable	OFF
Transit Input	0				FYA Skip Red	OFF
FYA Delay Time	0				FYA AfterPreempt	OFF
Ped Call Clear	OFF					
Ped ClearTime	0				FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0	0

OverlapB+: 4-D

Leading Green	OFF				FYA MCE Disable	OFF
Transit Input	0				FYA Skip Red	OFF
FYA Delay Time	0				FYA AfterPreempt	OFF
Ped Call Clear	OFF					
Ped ClearTime	0				FYA ImmedReturn	OFF
Green Ext Inh	0	0	0	0	0	0

City of FRESNO

ID: 1337 **Name:** Marks @ Rav Johnson

Date Printed:
2/23/2021

CHANNEL SETTINGS [1.8] plus UNIT PARAMETERS [1.2.1]

CHANNEL SETTINGS [1.8.1] / Chan Settings [1.8.2]

Channel	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Phase / Olap #	1	2	3	4	5	6	7	8	1	2	3	4	2	4	6	8								
Channel Type	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH	OLP	OLP	OLP	OLP	PED	PED	PED	PED	VEH	VEH	VEH	VEH	VEH	VEH	VEH	VEH
Channel Flash	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	RED	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK	DRK
Flash 1-2 Hertz		X		X		X		X																
	Page 1								Page 2															

CHANNEL PARMETERS [1.8.3]

CH 17-24 Mapping:	DEFAULT
D-Conn Mapping:	NONE
Invert Rail Inputs:	OFF
C1-C11-ABC IO Mode:	USER

IO PARAMETERS [1.8.6]

C1-C11-ABC IO Mode:	USER
D-Conn Mapping:	NONE
T & F BIU Mapping	DEFAULT
Invert Rail Inputs:	OFF
EVP Ped Confirm	OFF

CHANNELS+ [1.8.4]

Channel	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Flash Green	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Flash Red	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Flash Yellow	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Inh Red Fl in Preempt	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off	Off
Olap Ovrd	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Override Type	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ID: 1337 **NAME:** Marks @ Ray Johnson

I/O LOGIC [1.8.7]

Prt Date: 2/23/2021

Row#	Result		=	Operand_1					Operand_2					Operand_3					Timer	
	I/O	Fcn	=	Inv	Src	I/0	Fun	Logic Func	Inv	Src	I/0	Fun	Logic Func	Inv	Src	I/0	Fun	Logic Func	Dly	Sec
1	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
2	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
3	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
4	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
5	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
6	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
7	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
8	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
9	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0
10	I	0	=	-	0	I	OFF	----	-	0	I	OFF	----	-	0	I	OFF	----	DLY	0

Ped Parms (MM>5>4)

Det#	Call	No Act	Max Pres	Err Cnt
1	0	0	0	0
2	2	0	0	0
3	0	0	0	0
4	4	0	0	0
5	0	0	0	0
6	6	0	0	0
7	0	0	0	0
8	8	0	0	0

Veh Par 1-32 [5.1]											Vehicle Options 1-32 [5.2]									Parameters+ 1-32 [5.3]								Info Only	Det
Det	Input	Call	Swi	Dlay	Ext	Que	No	Max	Err	Fail	Det	Call	Ext	Que	Add	Red	Yell	occ	vol	Det	Occupancy			Delay		Type	Src		
#	Slot	Ø	Ø				Act	Pres	Cnt	Time	#				Init	Lock	Lock			#	G	Y	R	1	2			Dir	#
1	1I1U	1					0	0	0	255	1	X	X	-	-	-	-	X	X	1	X	X	-			NORM			1
2	2I2U	2	0	0	0	0	0	0	0	255	2	-	X	-	-	-	-	X	X	2	X	X	-	0	0	NORM	0		2
3	2I2L	2	0	0	0	0	0	0	0	255	3	X	X	-	-	-	-	X	X	3	X	X	-	0	0	NORM	0		3
4	2I3U	2	0	0	2	20	0	0	0	255	4	X	-	X	-	-	-	X	X	4	X	X	-	0	0	NORM	0		4
5	2I3L	2	0	0	2	10	0	0	0	255	5	X	-	X	-	-	-	X	X	5	X	X	-	0	0	NORM	0		5
6	2I4U	2	0	0	2	20	0	0	0	255	6	X	-	X	-	-	-	X	X	6	X	X	-	0	0	NORM	0	SBT1	6
7	3I5U	3					0	0	0	255	7	X	X	-	-	-	-	X	X	7	X	X	-			NORM			7
8	4I6U	4	0	0	0	0	0	0	0	255	8	-	X	-	-	-	-	X	X	8	X	X	-	0	0	NORM	0		8
9	4I6L	4	0	0	0	0	0	0	0	255	9	X	X	-	-	-	-	X	X	9	X	X	-	0	0	NORM	0		9
10	4I7U	4	0	0	2	20	0	0	0	255	10	X	-	X	-	-	-	X	X	10	X	X	-	0	0	NORM	0		10
11	4I7L	4		15	2	10	0	0	0	255	11	X	-	X	-	-	-	X	X	11	X	X	-			NORM		WBT2	11
12	4I8U	4			2	20	0	0	0	255	12	X	-	X	-	-	-	X	X	12	X	X	-			NORM		WBT1	12
13	1I9U	1	0	0	0	0	0	0	0	255	13	X	X	-	-	-	-	X	X	13	X	X	-	0	0	NORM	0		13
14	3I9L	3	0	0	0	0	0	0	0	255	14	X	X	-	-	-	-	X	X	14	X	X	-	0	0	NORM	0		14
15	5J1U	5	0	0	0	0	0	0	0	255	15	X	X	-	-	-	-	X	X	15	X	X	-	0	0	NORM	0	SBL1	15
16	6J2U	6					0	0	0	255	16	-	X	-	-	-	-	X	X	16	X	X	-			NORM			16
17	6J2L	6					0	0	0	255	17	X	X	-	-	-	-	X	X	17	X	X	-			NORM			17
18	6J3U	6			2	20	0	0	0	255	18	X	-	X	-	-	-	X	X	18	X	X	-			NORM			18
19	6J3L	6			2	10	0	0	0	255	19	X	-	X	-	-	-	X	X	19	X	X	-			NORM			19
20	6J4U	6			2	20	0	0	0	255	20	X	-	X	-	-	-	X	X	20	X	X	-			NORM		NBT1	20
21	7J5U	7					0	0	0	255	21	X	X	-	-	-	-	X	X	21	X	X	-			NORM			21
22	8J6U	8	0	0	0	0	0	0	0	255	22	-	X	-	-	-	-	X	X	22	X	X	-	0	0	NORM	0		22
23	8J6L	8	0	0	2	20	0	0	0	255	23	X	-	X	-	-	-	X	X	23	X	X	-	0	0	NORM	0		23
24	8J7U	8	0	0	2	20	0	0	0	255	24	X	-	X	-	-	-	X	X	24	X	X	-	0	0	NORM	0		24
25	8J7L	8	0	0	2	10	0	0	0	255	25	X	-	X	-	-	-	X	X	25	X	X	-	0	0	NORM	0		25
26	8J8U	8	0	0	2	20	0	0	0	255	26	X	-	X	-	-	-	X	X	26	X	X	-	0	0	NORM	0		26
27	5J9U	5					0	0	0	255	27	X	X	-	-	-	-	X	X	27	X	X	-			NORM			27
28	7J9L	7					0	0	0	255	28	X	X	-	-	-	-	X	X	28	X	X	-			NORM			28
29	2I11U	2	0	0	0	0	0	0	0	255	29	X	-	-	X	-	-	X	X	29	X	X	-	0	0	BIKE	0		29
30	4I11L	4	0	0	0	0	0	0	0	255	30	X	-	-	X	-	-	X	X	30	X	X	-	0	0	BIKE	0	SBT3	30
31	6J11U	6					0	0	0	255	31	X	-	-	X	-	-	X	X	31	X	X	-			BIKE		NBR1	31
32	8J11L	8					0	0	0	255	32	X	-	-	X	-	-	X	X	32	X	X	-			BIKE			32
33	1I1L	1	0	0	0	0	0	0	0	255	33	X	X	-	-	-	-	X	X	33	X	X	-	0	0	NORM	0		33
34	2I4L	2			2	20	0	0	0	255	34	X	-	X	-	-	-	X	X	34	X	X	-			NORM		SBT2	34
35	3I5L	3	0	0	0	0	0	0	0	255	35	X	X	-	-	-	-	X	X	35	X	X	-	0	0	NORM	0		35
36	4I8L	4			2	20	0	0	0	255	36	X	-	X	-	-	-	X	X	36	X	X	-			NORM			36
37	5J1L	5	0	0	0	0	0	0	0	255	37	X	X	-	-	-	-	X	X	37	X	X	-	0	0	NORM	0		37
38	6J4L	6			2	20	0	0	0	255	38	X	-	X	-	-	-	X	X	38	X	X	-			NORM		NBT2	38
39	7J5L	7	0	0	0	0	0	0	0	255	39	X	X	-	-	-	-	X	X	39	X	X	-	0	0	NORM	0		39
40	8J8L	8			2	20	0	0	0	255	40	X	-	X	-	-	-	X	X	40	X	X	-			NORM			40
41	4I10U	4					0	0	0	255	41	-	X	-	-	-	-	X	X	41	X	X	-			NORM			41
42	4I10L	4					0	0	0	255	42	-	X	-	-	-	-	X	X	42	X	X	-			NORM			42
43	8J10U	8					0	0	0	255	43	-	X	-	-	-	-	X	X	43	X	X	-			NORM			43
44	8J10L	8					0	0	0	255	44	-	X	-	-	-	-	X	X	44	X	X	-			NORM			44

ID: 1337 **Name:** Marks @ Ray Johnson

Vol/Occ Period	0	Seconds
	5	Minutes

.

2/23/2021

Alt# 1 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 2 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 3 Times Table [1.1.6.1]

Column#... ->	1	2	3	4	5	6	7	8
Assign Ø								
Min Grn								
Gap, Ext								
Max 1								
Max 2								
Yel Clr								
Red Clr								
Walk								
Ped Clr								

Alt# 1 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Guar Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 2 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Enrty	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 3 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Enrty	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alt# 4 Options Table [1.1.6.2]

Column # ->	1	2	3	4	5	6	7	8
Assign Ø		0		0		0		0
Lock Calls	-	-	-	-	-	-	-	-
Soft Recall	-	-	-	-	-	-	-	-
Dual Entry	-	-	-	-	-	-	-	-
Enabl SimGap	-	-	-	-	-	-	-	-
Gaur Passage	-	-	-	-	-	-	-	-
Rest In Walk	-	-	-	-	-	-	-	-
Cond Service	-	-	-	-	-	-	-	-
Reservice	-	-	-	-	-	-	-	-
Non-Act 1	-	-	-	-	-	-	-	-
Red Rest	-	-	-	-	-	-	-	-
Max2	-	-	-	-	-	-	-	-
Ped Delay	-	-	-	-	-	-	-	-
Conflicting Ø1		0		0		0		0

Alternate Tables [2.6]

Pat#	POpt	PTime	DetGrp	Call/Inh	Olp Off								ASC	CNA1	Max2	Dia
					1	2	3	4	5	6	7	8				
1	0	0	0	0									0	Off		DFT
2													0	Off		DFT
3	0	0	0	0									0	Off		DFT
4													0	Off		DFT
5	0	0	0	0									0	Off		DFT
6													0	Off		DFT
7	0	0	0	0									0	Off		DFT
8													0	Off		DFT
9	0	0	0	0									0	Off		DFT
10													0	Off		DFT
11	0	0	0	0									0	Off		DFT
12													0	Off		DFT
13	0	0	0	0									0	Off		DFT
14													0	Off		DFT
15	0	0	0	0									0	Off		DFT
16													0	Off		DFT
17	0	0	0	0									0	Off		DFT
18													0	Off		DFT
19	0	0	0	0									0	Off		DFT
20													0	Off		DFT
21	0	0	0	0									0	Off		DFT
22													0	Off		DFT
23	0	0	0	0									0	Off		DFT
24													0	Off		DFT

Time Base Parameters [4.6]

Daylight Savings Time	ENABLE	
Time Base Sync Ref	0	
GMT Offset	-	8
Daylight Savings	**Mon**	**Week**
Spring	3	2
Fall	11	1

NOTE: % and MI parameters are not used and are not shown above.

City of FRESNO

NAME: **Marks @ Ray Johnson**

2/23/2021

ID: **1337**

Annual Schedule [4.3]	Month												Day of Week							Date																															Day Plan
1	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	2
	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	3
	X	X	X	X	X	X	X	X	X	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	4
											X						X			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	X	X	X	-	-	-	
5	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
6	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
13	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
16	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
17	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	1
																				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

NAME: Marks @ Ray Johnson

ID No. 1337

DAY PLANS [4.4]

Plan 1				Plan 2				Plan 3				Plan 4				Plan 5			
Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act
1		1	54	1		1	54	1		1	54	1	0	1	54	1			
2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0
3				3				3				3	0			3			
4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0
5				5				5				5	0			5			
6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
7				7				7				7	0			7			
8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0
9				9				9				9	0			9			
10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0

Plan 6				Plan 7				Plan 8				Plan 9				Plan 10			
Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act	Evt	Hour	Min	Act
1				1				1				1				1			
2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0	2	0	0	0
3				3				3				3				3			
4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0	4	0	0	0
5				5				5				5				5			
6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
7				7				7				7				7			
8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0	8	0	0	0
9				9				9				9				9			
10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0	10	0	0	0

#	Alarm	Ev	Alr
1	Power Up Alarm.	X	X
2	Stop Timing	X	X
3	Cabinet Door Activation	-	-
4	Coordination Failure	X	X
5	External Alarm # 1	-	-
6	External Alarm # 2	-	-
7	External Alarm # 3	-	-
8	External Alarm # 4	-	-
9	Closed Loop Disabled	-	-
10	External Alarm # 5	-	-
11	External Alarm # 6	-	-
12	Manual Control Enable	X	X
13	Coord Free Input	-	-
14	Local Flash Input	X	X
15	CMU/MMU Flash Input	-	-
16	MMU Fault	X	X
17	Cycle Fault	X	-
18	Cycle Failure	X	-
19	Coordination Fault	X	X
20	Controller Fault	X	X
25	EEPROM CRC Fault	X	X
30	Coord Diagnostic Fault	X	X
37	Download Request	X	X
38	Pattern Change	-	-
49	Preempt 1 Input	X	X
50	Preempt 2 Input	X	X
51	Preempt 3 Input	X	X
52	Preempt 4 Input	X	X
53	Preempt 5 Input	X	X
54	Preempt 6 Input	X	X
55	Preempt 7 Input	-	-
56	Preempt 8 Input	-	-
57	Preempt 9 Input	-	-
58	Preempt 10 Input	-	-
59	EEPROM Compare Fault	X	X
60	Coordination Failure	X	X
63	TSP Active Trigger	-	-
73	Controller Access	X	X
81	FIO Changed Status	X	X

#1 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#2 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#3 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

#4 Bus Preempt

		Times		Prior. Phases			
Enable	OFF	Min	0	0	0	0	0
Coor+Pre	OFF	Max	0	---TSP---			
Lock Mode	MAX	Lock	0	Headway			0
No Skip	OFF	Alt Table	0	GrpLock			OFF
Qjump	OFF	HoldDwell	#N/A	FreeMod			OFF

I/O INPUT TABLE

	1	2	3	4	5	6	7	8
1	2	16	8	22	3	17	9	23
2	6	20	12	26	198	199	30	31
3	15	1	21	7	27	13	28	14
4	189	189	189	189	4	18	10	24
5	130	134	132	136	200	201	202	203
6	32	5	19	11	25	29	208	207
7	33	34	35	36	37	38	39	40
8	41	42	43	44	189	189	189	189

ACTION Table [4.5]

Act	Pat#	A1	A2	A3	S1	S2	S3	S4	S5	S6	S7	S8	P1	P2
1	1	-	-	-	-	-	-	-	-	-	-	-	0	0
2	2	-	-	-	-	-	-	-	-	-	-	-	0	0
3	3	-	-	-	-	-	-	-	-	-	-	-	0	0
4	4	-	-	-	-	-	-	-	-	-	-	-	0	0
5	5	-	-	-	-	-	-	-	-	-	-	-	0	0
6	6	-	-	-	-	-	-	-	-	-	-	-	0	0
7	7	-	-	-	-	-	-	-	-	-	-	-	0	0
8	8	-	-	-	-	-	-	-	-	-	-	-	0	0
9	9	-	-	-	-	-	-	-	-	-	-	-	0	0
10	10	-	-	-	-	-	-	-	-	-	-	-	0	0
11	11	-	-	-	-	-	-	-	-	-	-	-	0	0
12	12	-	-	-	-	-	-	-	-	-	-	-	0	0
13	13	-	-	-	-	-	-	-	-	-	-	-	0	0
14	14	-	-	-	-	-	-	-	-	-	-	-	0	0
15	15	-	-	-	-	-	-	-	-	-	-	-	0	0
16	0	-	-	-	-	-	-	-	-	-	-	-	0	0
54	254	-	-	-	-	-	-	-	-	-	-	-	0	0
55	0	-	-	-	-	-	-	-	-	-	-	-	0	0

Alarm Parameters [1.6.7.1]

Pattern Events:	ON
Local Txmt Alarms:	OFF
Reassign User Alarm #1 In (5):	0
Reassign User Alarm #2 In (6):	0
Preempt Events:	ON

City of FRESNO

Date Printed
2/23/2021

ID: 1337 **Name:** **Marks @ Ray Johnson**

I/O Inputs - 1.8.9.1.5

C-1 PIN	I/O Source	Function	Input Name
39	I1-1	2	Veh Det 2
40	I1-2	16	Veh Det 16
41	I1-3	8	Veh Det 8
42	I1-4	22	Veh Det 22
43	I1-5	3	Veh Det 3
44	I1-6	17	Veh Det 17
45	I1-7	9	Veh Det 9
46	I1-8	23	Veh Det 23
47	I2-1	6	Veh Det 6
48	I2-2	20	Veh Det 20
49	I2-3	12	Veh Det 12
50	I2-4	26	Veh Det 26
51	I2-5	198	Pre 1 In
52	I2-6	199	Pre 2 In
53	I2-7	30	Veh Det 30
54	I2-8	31	Veh Det 31
55	I3-1	15	Veh Det 15
56	I3-2	1	Veh Det 1
57	I3-3	21	Veh Det 21
58	I3-4	7	Veh Det 7
59	I3-5	27	Veh Det 27
60	I3-6	13	Veh Det 13
61	I3-7	28	Veh Det 28
62	I3-8	14	Veh Det 14
63	I4-5	4	Veh Det 4
64	I4-6	18	Veh Det 18
65	I4-7	10	Veh Det 10
66	I4-8	24	Veh Det 24
67	I5-1	130	Ped Call 2
68	I5-2	134	Ped Call 6
69	I5-3	132	Ped Call 4
70	I5-4	136	Ped Call 8
71	I5-5	200	Pre 3 In
72	I5-6	201	Pre 4 In
73	I5-7	202	Pre 5 In
74	I5-8	203	Pre 6 In
75	I6-1	32	Veh Det 32
76	I6-2	5	Veh Det 5
77	I6-3	19	Veh Det 19
78	I6-4	11	Veh Det 11
79	I6-5	25	Veh Det 25
80	I6-6	29	Veh Det 29
81	I6-7	208	Local Flash
82	I6-8	207	Comp StopTm

I/O OUTPUTS - 1.8.9.2.5

C-1 PIN	I/O Source	Function	Output Name
1	Logic Grd		
2	O1-1	14	Red Ch 14
3	O1-2	62	Grn Chan 14
4	O1-3	4	Red Ch 4
5	O1-4	28	Yel Chan 4
6	O1-5	52	Grn Chan 4
7	O1-6	3	Red Ch 3
8	O1-7	27	Yel Chan 3
9	O1-8	51	Grn Chan 3
10	O2-1	13	Red Ch 13
11	O2-2	61	Grn Chan 13
12	O2-3	2	Red Ch 2
13	O2-4	26	Yel Chan 2
14	Logic Grd		
15	O2-5	50	Grn Chan 2
16	O2-6	1	Red Ch 1
17	O2-7	25	Yel Chan 1
18	O2-8	49	Grn Chan 1
19	O3-1	16	Red Ch 16
20	O3-2	64	Grn Chan 16
21	O3-3	8	Red Ch 8
22	O3-4	32	Yel Chan 8
23	O3-5	56	Grn Chan 8
24	O3-6	7	Red Ch 7
25	O3-7	31	Yel Chan 7
26	O3-8	55	Grn Chan 7
27	O4-1	15	Red Ch 15
28	O4-2	63	Grn Chan 15
29	O4-3	6	Red Ch 6
30	O4-4	30	Yel Chan 6
31	O4-5	54	Grn Chan 6
32	O4-6	5	Red Ch 5
33	O4-7	29	Yel Chan 5
34	O4-8	53	Grn Chan 5
35	O5-1	37	Yel Chan 13
36	O5-2	39	Yel Chan 15
37	O5-3	38	Yel Chan 14
38	O5-4	40	Yel Chan 16
100	O5-5	42	Yel Chan 18
101	O5-6	41	Yel Chan 17
102	O5-7	115	Not Used
103	O5-8	114	Watchdog

C-1 PIN	I/O Source	Function	Output Name
83	O6-1	18	Red Ch 18
84	O6-2	66	Grn Chan 18
85	O6-3	12	Red Ch 12
86	O6-4	36	Yel Chan 12
87	O6-5	60	Grn Chan 12
88	O6-6	11	Red Ch 11
89	O6-7	35	Yel Chan 11
90	O6-8	59	Grn Chan 11
91	O7-1	17	Red Ch 17
92	Logic Grd		
93	O7-2	65	Grn Chan 17
94	O7-3	10	Red Ch 10
95	O7-4	34	Yel Chan 10
96	O7-5	58	Grn Chan 10
97	O7-6	9	Red Ch 9
98	O7-7	33	Yel Chan 9
99	O7-8	57	Grn Chan 9

I/O Outputs - 1.8.9.2.5

C-11 OUTPUTS

1	O8-1	115	Not Used
2	O8-2	115	Not Used
3	O8-3	115	Not Used
4	O8-4	115	Not Used

I/O Inputs - 1.8.9.1.5

C-11 INPUTS

15	I7-1	33	Veh Det 33
16	I7-2	34	Veh Det 34
17	I7-3	35	Veh Det 35
18	I7-4	36	Veh Det 36
19	I7-5	37	Veh Det 37
20	I7-6	38	Veh Det 38
21	I7-7	39	Veh Det 39
22	I7-8	40	Veh Det 40
23	I8-1	41	Veh Det 41
24	I8-2	42	Veh Det 42
25	I8-3	43	Veh Det 43
26	I8-4	44	Veh Det 44
27	I8-5	189	Unused
28	I8-6	189	Unused
29	I8-7	189	Unused
30	I8-8	189	Unused

City of
FRESNO

ID: 1337

NAME: Marks @ Ray Johnson

Date Printed:
2/23/2021

ID Number: 1337

LOCATION: Marks @ Ray Johnson

City of Fresno
332 Cabinet
44 Detector Plus Setup

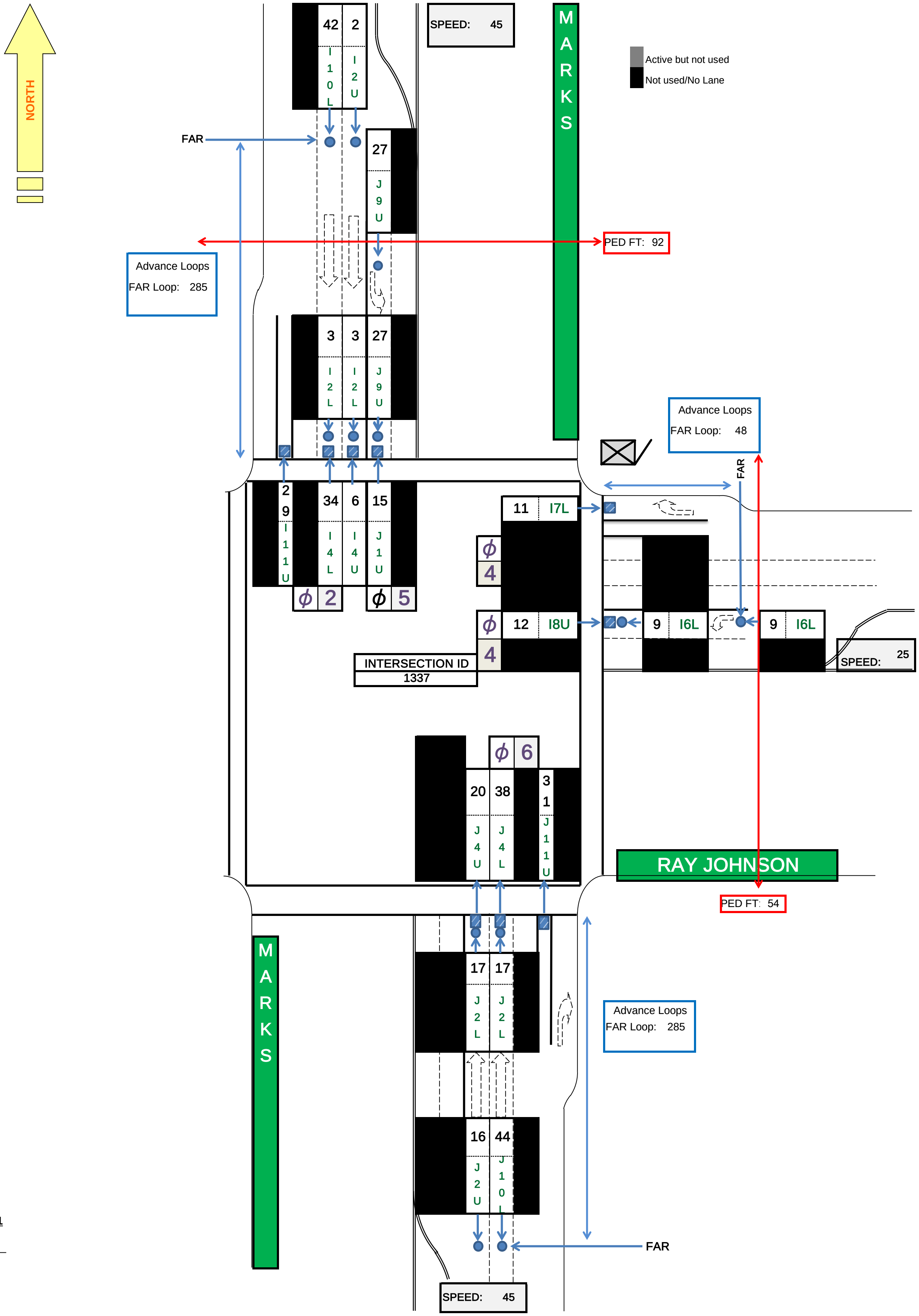
	DETECTOR ASSIGNMENTS											ISOLATORS		
"I"	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14
UPPER	Ph 1 Call&Ext T2-1&2 C1-56 Det 1 NBL1	Ph 2 Ext T2-5&6 C1-39 Det 2 SB Far	Ph 2 Call&TP3 T2-9&10 C1-63 Det 4 SB Mid	Ph 2 Call&TP3 T4-1&2 C1-47 Det 6 SBT1	Ph 3 Call&Ext T4-5&6 C1-58 Det 7 EBL1	Ph 4 Ext T4-9&10 C1-41 Det 8 WB Far	Ph 4 Call&TP3 T6-1&2 C1-65 Det 10 WB Mid	Ph 4 Call&TP3 T6-5&6 C1-49 Det 12 WBT1	Ph 1 Call&Ext T6-9&10 C1-60 Det 13 NBLt Bk	Ph 2/4 Ext T10-5&6 C11-23 Det 41	Ph 2 Call&Ext T8-1 C1-80 Det 29 BIKE	Ph 2 PPB T8-4 C1-67	Ph 6 PPB T8-7 C1-68	FLASH SENSE T8-10 C1-81
LOWER	Ph 1 Call&Ext T2-3&4 C11-15 Det 33 NBL2	Ph 2 Call&TP3 T2-7&8 C1-43 Det 3 SB Bk	Ph 2 Call&Ext T2-11&12 C1-76 Det 5 SBRt	Ph 2 Call&TP3 T4-3&4 C11-16 Det 34 SBT2	Ph 3 Call&Ext T4-7&8 C11-17 Det 35 EBL2	Ph 4 Call&TP3 T4-11&12 C1-45 Det 9 WB Bk	Ph 4 Call&Ext T6-3&4 C1-78 Det 11 WBRt	Ph 4 Call&TP3 T6-7&8 C11-18 Det 36 WBT2	Ph 3 Call&Ext T6-11&12 C1-62 Det 14 EBLt Bk	Ph 2/4 Ext T10-7&8 C11-24 Det 42	Ph 4 Call&Ext T8-2 C1-53 Det 30 BIKE	Ph 4 PPB T8-5 C1-69	Ph 8 PPB T8-8 C1-70	STOP TIMING T8-11 C1-82
"J"	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14
UPPER	Ph 5 Call&Ext T3-1&2 C1-55 Det 15 SBL1	Ph 6 Ext T3-5&6 C1-40 Det 16 NB Far	Ph 6 Call&TP3 T3-9&10 C1-64 Det 18 NB Mid	Ph 6 Call&TP3 T5-1&2 C1-48 Det 20 NBT1	Ph 7 Call&Ext T5-5&6 C1-57 Det 21 WBL1	Ph 8 Ext T5-9&10 C1-42 Det 22 EB Far	Ph 8 Call&TP3 T7-1&2 C1-66 Det 24 EB Mid	Ph 8 Call&TP3 T7-5&6 C1-50 Det 26 EBT1	Ph 5 Call&Ext T7-9&10 C1-59 Det 27 SBLt Bk	Ph 6/8 Ext T10-9&10 C11-25 Det 43	Ph 6 Call&Ext T9-1 C1-54 Det 31 BIKE	EMER A Ph 2 + 5 T9-4 C1-71	EMER B Ph 4 + 7 T9-5 C1-72	RR1 FLASH T9-10 C1-51
LOWER	Ph 5 Call&Ext T3-3&4 C11-19 Det 37 SBL2	Ph 6 Call&TP3 T3-7&8 C1-44 Det 17 NB Bk	Ph 6 Call&Ext T3-11&12 C1-77 Det 19 NBRt	Ph 6 Call&TP3 T5-3&4 C11-20 Det 38 NBT2	Ph 7 Call&Ext T5-7&8 C11-21 Det 39 WBL2	Ph 8 Call&TP3 T5-11&12 C1-46 Det 23 EB Bk	Ph 8 Call&Ext T7-3&4 C1-79 Det 25 EBRt	Ph 8 Call&TP3 T7-7&8 C11-22 Det 40 EBT2	Ph 7 Call&Ext T7-11&12 C1-61 Det 28 WBLt Bk	Ph 6/8 EXT T10-11&12 C11-26 Det 44	Ph 8 Call&Ext T9-2 C1-75 Det 32 BIKE	EMER C Ph 1 + 6 T9-7 C1-73	EMER D Ph 3 + 8 T9-8 C1-74	RR2 LTD OP T9-11 C1-52

COMMENTS:

TIMING UPDATES AND MODIFICATIONS

ID: 1337 **NAME:** Marks @ Ray Johnson

DATE	CHANGES MADE	ATMS or CABINET	BY
2/23/2021	Updated First Phases Ø2 & Ø6 to start green with a 6 second All Red-Start and removed Yellow Start from phases Ø4 & Ø8.		
	Also updated the Advanced Schedule, Console Parameters, and turned ON the Occupancy & Volume attributes for all 44 detectors.	ATMS	JT



Date: 2/23/2021

By: JT

Detector Layout for the intersection of: MARKS & RAY JOHNSON

State of California
DEPARTMENT OF TRANSPORTATION

2070 Controller Timing Chart

Caltrans TSCP Ver 2.21

Location:
System:
Master At:
District:
I/C:
Designed By:
Intalled By:
Service Info:

Timing Change:
By:
Date Start:
Date End:
Designed:
Installed:

		FLASH
	1)	[ ]
P	2)	[ ]
H	3)	[ ]
A	4)	[ ]
S	5)	[ ]
E	6)	[ ]
	7)	[ ]
	8)	[ ]
OVERLAP	A)	[ ]
	B)	[ ]
	C)	[ ]
	D)	[ ]
	E)	[ ]
	F)	[ ]

Intersection Layout

Comments and Notes:

RAM Checksum

Page 2:	D7FF	Page 8:	85AF
Page 3:	B2AB	Page 9:	FEC4
Page 4:	F29E	Page 10:	68FD
Page 5:	191A	Page 11:	C3CB
Page 6:	191A	Page 12:	D68F
Page 7:	0D5D	Page 13:	86F7

CONFIGURATION PHASE FLAGS

Phases (2-1-1-1)	
Permitted	- 2 - - - 6 - 8
Restricted	- - - - - - - -

Phase Recalls (2-1-1-2)	
Vehicle Min	- 2 - - - 6 - -
vehicle Max	- - - - - - - -
Pedestrian	- - - - - - - -
Bicyle	- - - - - - - -

Phase Locks (2-1-1-3)	
Red	- - - - - - - -
Yellow	- - - - - - - -
Force/Max	- - - - - - - -

Phase Features (2-1-1-4)	
Double Entry	- - - - - - - -
Rest In Walk	- - - - - - - -
Rest In Red	- - - - - - - -
Walk2	- - - - - - - -
Max Green 2	- - - - - - - -
Max Green 3	- - - - - - - -

Startup (2-1-1-5)	
First Green Phases	- 2 - - - 6 - -
Yellow Start Phases	- - - - - - - -
Vehicle Calls	- 2 - - - 6 - 8
Pedestrian Calls	- 2 - - - 6 - 8
Yellow Start Overlaps	- - - - - - - -
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	- - - - - - - -	1	- - - - - - - -
2	- - - - - - - -	2	- - - - - - - -
3	- - - - - - - -	3	- - - - - - - -
4	- - - - - - - -	4	- - - - - - - -
5	- - - - - - - -	5	- - - - - - - -
6	- - - - - - - -	6	- - - - - - - -
7	- - - - - - - -	7	- - - - - - - -
8	- - - - - - - -	8	- - - - - - - -

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	- - - - - - - -
Yellow Flash Overlap	- - - - - - - -
Flash In Red Phases	- - - - - - - -
Flash In Red Overlap	- - - - - - - -

Protected Permissive (2-1-2-4)	
Protected Permissive	- - - - - - - -

Special Operation (2-1-2-3)	
Single Exit Phase	- - - - - - - -
Driveway Signal Phases	- - - - - - - -
Driveway Signal Overlaps	- - - - - - - -
Leading Ped Phases	- - - - - - - -

Pedestrian (2-1-3)	
P1	- - - - - - - -
P2	- 2 - - - - - -
P3	- - - - - - - -
P4	- - - 4 - - - -
P5	- - - - - - - -
P6	- - - - - 6 - -
P7	- - - - - - - -
P8	- - - - - - - 8

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A [Arrow A]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
B [Arrow B]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
C [OL A]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
D [OL B]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
E [OL C]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
F [OL D]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -

[-] 332 Cabinet Overlap Assignment - For Reference Only

CHECKSUM: D7FF

State of California
DEPARTMENT OF TRANSPORTATION Location: CA 180 @ N Marks Ave WB Ramp Caltrans TSCP Ver 2.21

PHASE TIMING

PHASE (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	7	0	0	0	0	0	0
Flash Don't Walk	0	18	0	0	0	0	0	0
Minimum Green	0	10	0	0	0	10	0	8
Det Limit	0	20	0	0	0	20	0	20
Max Initial	0	0	0	0	0	0	0	0
Max Green 1	0	25	0	0	0	25	0	25
Max Green 2	0	35	0	0	0	35	0	35
Max Green 3	0	0	0	0	0	0	0	0
Extension	0.0	4.9	0.0	0.0	0.0	4.9	0.0	5.2
Maximum Gap	0.0	6.8	0.0	0.0	0.0	6.8	0.0	7.2
Minimum Gap	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0
Add Per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Gap By	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1
Reduce Every	1.0	0.5	1.0	1.0	1.0	0.5	1.0	0.4
Yellow	3.0	4.8	3.0	3.0	3.0	4.8	3.0	4.4
All-Red	0.0	2.0	0.0	0.0	0.0	2.0	0.0	2.0
Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A [Arrow A]	B [Arrow B]	C [OL A]	D [OL B]	E [OL C]	F [OL D]
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert (2-5)	
Time	5.0

Red To Se (2-6)	
Red To Sec	OFF

Max/Gap Out (2-7)	
Max Cnt	0
Gap Cnt	0

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State of California

DEPARTMENT OF TRANSPORTATION Location: CA 180 @ N Marks Ave WB Ramp Caltrans TSCP Ver 2.21

DETECTORS

Detector Attributes (5-1)				Slot	Detector Configuration (5-2)				
Det	Type	Phases	Lock		Det	Delay	Extend	Recall	Port
1	Count+Call+Extend	1 - - - - - - -	NO	1I1U	1	0	0.0	10	3.2
2	Count+Call+Extend	1 - - - - - - -	NO	1I1L	2	0	0.0	10	7.2
3	Extend	- 2 - - - - - -	NO	2I2U	3	0	0.0	10	1.1
4	Extend	- 2 - - - - - -	NO	2I2L	4	0	0.0	10	1.5
5	Call+Extend	- 2 - - - - - -	NO	2I3U	5	0	0.0	10	4.5
6	Limited	- 2 - - - - - -	NO	2I3L	6	0	0.0	10	6.2
7	Limited	- 2 - - - - - -	NO	2I4U	7	0	2.0	10	2.1
8	Limited	- 2 - - - - - -	NO	2I4L	8	0	2.0	10	7.4
9	Count+Call+Extend	- - 3 - - - - -	NO	3I5U	9	0	0.0	10	3.4
10	Count+Call+Extend	- - 3 - - - - -	NO	3I5L	10	0	0.0	10	7.6
11	Extend	- - - 4 - - - -	NO	4I6U	11	0	0.0	10	1.3
12	Extend	- - - 4 - - - -	NO	4I6L	12	0	0.0	10	1.7
13	Call+Extend	- - - 4 - - - -	NO	4I7U	13	0	0.0	10	4.7
14	Limited	- - - 4 - - - -	NO	4I7L	14	15	0.0	10	6.4
15	Limited	- - - 4 - - - -	NO	4I8U	15	0	0.0	10	2.3
16	Limited	- - - 4 - - - -	NO	4I8L	16	0	0.0	10	7.8
17	Call+Extend	1 - - - - - - -	NO	1I9U	17	0	0.0	10	3.6
18	Call+Extend	- - 3 - - - - -	NO	3I9L	18	0	0.0	10	3.8
19	Count+Call	- 2 - - - - - -	NO	2I10U	19	0	0.0	10	4.1
20	Count+Call	- - - 4 - - - -	NO	4I10L	20	0	0.0	10	4.2
21	Count+Call+Extend	- - - - 5 - - -	NO	5J1U	21	0	0.0	10	3.1
22	Count+Call+Extend	- - - - 5 - - -	NO	5J1L	22	0	0.0	10	7.1
23	Extend	- - - - - 6 - -	NO	6J2U	23	0	0.0	10	1.2
24	Extend	- - - - - 6 - -	NO	6J2L	24	0	0.0	10	1.6
25	Call+Extend	- - - - - 6 - -	NO	6J3U	25	0	0.0	10	4.6
26	Limited	- - - - - 6 - -	NO	6J3L	26	0	0.0	10	6.3
27	Limited	- - - - - 6 - -	NO	6J4U	27	0	2.0	10	2.2
28	Limited	- - - - - 6 - -	NO	6J4L	28	0	2.0	10	7.3
29	Count+Call+Extend	- - - - - - 7 -	NO	7J5U	29	0	0.0	10	3.3
30	Count+Call+Extend	- - - - - - 7 -	NO	7J5L	30	0	0.0	10	7.5
31	Extend	- - - - - - - 8	NO	8J6U	31	0	0.0	10	1.4
32	Extend	- - - - - - - 8	NO	8J6L	32	2	0.0	10	1.8
33	Call+Extend	- - - - - - - 8	NO	8J7U	33	15	0.0	10	4.8
34	Limited	- - - - - - - 8	NO	8J7L	34	15	0.0	10	6.5
35	Limited	- - - - - - - 8	NO	8J8U	35	0	0.0	10	2.4
36	Limited	- - - - - - - 8	NO	8J8L	36	0	0.0	10	7.7
37	Call+Extend	- - - - 5 - - -	NO	5J9U	37	0	0.0	10	3.5
38	Call+Extend	- - - - - - 7 -	NO	7J9L	38	0	0.0	10	3.7
39	Count+Call	- - - - - 6 - -	NO	6J10U	39	0	0.0	10	4.3
40	Count+Call	- - - - - - - 8	NO	8J10L	40	0	0.0	10	4.4
41	Pedestrian	- 2 - - - - - -	NO	2I12U	41	0	0.0	10	5.1
42	Pedestrian	- - - 4 - - - -	NO	4I12L	42	0	0.0	10	5.3
43	Pedestrian	- - - - - 6 - -	NO	6I13U	43	0	0.0	10	5.2
44	Pedestrian	- - - - - - - 8	NO	8I13L	44	0	0.0	10	5.4

Failure Times (5-3)	Minutes
Maximum On Time	0
Fail Reset Time	0

Failure Override (5-4)	
Detectors 1-8	- - - - - - - -
Detectors 9-16	- - - - - - - -
Detectors 17-24	- - - - - - - -
Detectors 25-32	- - - - - - - -
Detectors 33-40	- - - - - - - -
Detectors 41-44	- - - - - - - -

System Detector Assignment (5-5)

Sys Det	1	2	3	4	5	6	7	8
Det Num	0	0	0	0	0	0	0	0
Sys Det	9	10	11	12	13	14	15	16
Det Num	0	0	0	0	0	0	0	0

CIC Operation (5-6-1)	
Enable in Plans	- - - - - - - - -

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.0	

Detector-to-Phase Assignment (5-6-3)

Sys Det	1	2	3	4	5	6	7	8
Phase	0	0	0	0	0	0	0	0
Sys Det	9	10	11	12	13	14	15	16
Phase	0	0	0	0	0	0	0	0

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

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TOD SCHEDULE

Table 1 (8-2-1)			Table 2 (8-2-2)			Table 3 (8-2-3)			Table 4 (8-2-4)			Table 5 (8-2-5)			Table 6 (8-2-6)		
Time	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

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HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1	0	0	- - - - - - -	0
2	0	0	- - - - - - -	0
3	0	0	- - - - - - -	0
4	0	0	- - - - - - -	0
5	0	0	- - - - - - -	0
6	0	0	- - - - - - -	0
7	0	0	- - - - - - -	0
8	0	0	- - - - - - -	0
9	0	0	- - - - - - -	0
10	0	0	- - - - - - -	0
11	0	0	- - - - - - -	0
12	0	0	- - - - - - -	0
13	0	0	- - - - - - -	0
14	0	0	- - - - - - -	0
15	0	0	- - - - - - -	0
16	0	0	- - - - - - -	0

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1	0	0	- - - - - - -	0
2	0	0	- - - - - - -	0
3	0	0	- - - - - - -	0
4	0	0	- - - - - - -	0
5	0	0	- - - - - - -	0
6	0	0	- - - - - - -	0
7	0	0	- - - - - - -	0
8	0	0	- - - - - - -	0
9	0	0	- - - - - - -	0
10	0	0	- - - - - - -	0
11	0	0	- - - - - - -	0
12	0	0	- - - - - - -	0
13	0	0	- - - - - - -	0
14	0	0	- - - - - - -	0
15	0	0	- - - - - - -	0
16	0	0	- - - - - - -	0

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	- - - - - - - -
Holiday	- - - - - - - -

Daylight Saving (8-6)

Daylight Saving	YES

TOD Functions (8-3)

#	Start	End	DOW	Action	Phases
			1 2 3 4 5 6 7		
1	0530	2100	1 2 3 4 5 6 7	27	- 2 - - - 6 - 8
2	0000	0000	- - - - - - -	0	- - - - - - - -
3	0000	0000	- - - - - - -	0	- - - - - - - -
4	0000	0000	- - - - - - -	0	- - - - - - - -
5	0000	0000	- - - - - - -	0	- - - - - - - -
6	0000	0000	- - - - - - -	0	- - - - - - - -
7	0000	0000	- - - - - - -	0	- - - - - - - -
8	0000	0000	- - - - - - -	0	- - - - - - - -
9	0000	0000	- - - - - - -	0	- - - - - - - -
10	0000	0000	- - - - - - -	0	- - - - - - - -
11	0000	0000	- - - - - - -	0	- - - - - - - -
12	0000	0000	- - - - - - -	0	- - - - - - - -
13	0000	0000	- - - - - - -	0	- - - - - - - -
14	0000	0000	- - - - - - -	0	- - - - - - - -
15	0000	0000	- - - - - - -	0	- - - - - - - -
16	0000	0000	- - - - - - -	0	- - - - - - - -

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped

41. Protected Permissive
42. Protected Permissive
Action Code = Phases added to normal setting

100+Action Code = Phases removed
200+Action Code = Phases replaced

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COMMUNICATIONS

C2 (6-1-1)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

C20 (6-1-2)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

C21 (6-1-3)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

SOFT LOGIC

Soft Logic (6-2)							
#	Data	OP	Data	OP	Data	OP	Data
1	00.0	00	00.0	00	00.0	00	00.0
2	00.0	00	00.0	00	00.0	00	00.0
3	00.0	00	00.0	00	00.0	00	00.0
4	00.0	00	00.0	00	00.0	00	00.0
5	00.0	00	00.0	00	00.0	00	00.0
6	00.0	00	00.0	00	00.0	00	00.0
7	00.0	00	00.0	00	00.0	00	00.0
8	00.0	00	00.0	00	00.0	00	00.0
9	00.0	00	00.0	00	00.0	00	00.0
10	00.0	00	00.0	00	00.0	00	00.0
11	00.0	00	00.0	00	00.0	00	00.0
12	00.0	00	00.0	00	00.0	00	00.0
13	00.0	00	00.0	00	00.0	00	00.0
14	00.0	00	00.0	00	00.0	00	00.0
15	00.0	00	00.0	00	00.0	00	00.0
16	00.0	00	00.0	00	00.0	00	00.0

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

NETWORK

Network (6-4)				
Address	1			
Protocol	AB3418			
Port	27000			
IP Mode	Static IP			
IP Address	10	53	52	17
Netmask	255	255	255	0
Broadcast	10	53	52	255
Gateway	10	53	52	254

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RAILROAD PREEMPTION

RR	(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
1	Delay	0	Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Clear 1	10	- 2 - - 5 - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- 2 - 4 - 6 - 8	- - - - - -	- - - - - -	- - - - - -
	Clear 2	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Clear 3	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Hold	0	- - - - - - - -	- - - - - - - -	1 2 3 4 5 6 7 8	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	A B C D E F
	Exit	5									
	Min Grn	0									
	Ped Clr	0									

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Recall	Ped Call
- - - - - - - -	- - - - - -	1 2 3 4 5 6 7 8	- 2 - 4 - 6 - 8

Configuration (3-1-6)			
Port	Gate Port	Latching	Power-Up
2.5	0.0	Yes	Flashing

RR	(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
2	Delay	0	Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Clear 1	10	- - - 4 - - 7 -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- 2 - 4 - 6 - 8	- - - - - -	- - - - - -	- - - - - -
	Clear 2	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Clear 3	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Hold	0	1 2 3 - - 6 - -	- - - - - - - -	- - - - - - - -	- 2 - - - 6 - -	- - - - - - - -	- - - 4 - - - 8	- - - - - -	- - - - - -	- - - - - -
	Exit	0									
	Min Grn	0									
	Ped Clr	0									

Exit Parameters (3-2-5)			
Exit Ph Grn	Exit Ovl Grn	Exit Veh Recall	Exit Ped Call
- - - - - - - -	- - - - - -	- - - 4 - - 7 -	- - - - - - - -

Configuration (3-2-6)			
Port	Gate Port	Latching	Power-Up
2.6	0.0	Yes	Dark

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- 2 - - 5 - - -	- - - - - -

Port	Latching	Phase Termination
5.5	No	Advance

EVB (3-B)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- - - 4 - - 7 -	- - - - - -

Port	Latching	Phase	Phase Termination
5.6		No	Advance

EVC (3-C)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	1 - - - - 6 - -	- - - - - -

Port	Latching	Phase Termination
5.7	No	Advance

EVD (3-D)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- - 3 - - - - 8	- - - - - -

Port	Latching	Phase	Phase Termination
5.8		No	Advance

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INPUTS

		7 Wire I/C(2-1-5-1)			
		Input	Port	Input	Port
Enable	No	R1	3.8	Free	3.6
Max ON	0	R2	3.5	D2	2.8
Max OFF	0	R3	3.7	D3	6.1

Manual Control(2-1-5-2)	
Input	Port
Manual Adv	0.0
Adv Enable	0.0

Battery Backup (2-1-5-5)	
Port	Operation
2.7	Flashing

Cabinet Staus (2-1-5-3)	
Input	Port
Flash Bus	0.0
Door Ajar	0.0
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	0.0
2	0.0
3	0.0
4	0.0

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7

51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of
loadswitches 3 and 6

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YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs								Coord	Lag	Min Recall	Restricted
					1	2	3	4	5	6	7	8				
Plan C	0	0	0	0	0	0	0	0	0	0	0	0	- 2 - - - 6 - -	- 2 - 4 - 6 - 8	- - - - - - - -	- - - - - - - -
Plan D	0	0	0	0	0	0	0	0	0	0	0	0	- 2 - - - 6 - -	- 2 - 4 - 6 - 8	- - - - - - - -	- - - - - - - -

TRANSIT PRIORITY

Local Plans (3-E) 1...9 1...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 2	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 3	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 4	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 5	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 6	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 7	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 8	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 9	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 11	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 12	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 13	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 14	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 15	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 16	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 17	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 18	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 19	Green Factor	0	0	0	0	0	0	0	0	0	0	0

Enable Priority in Plan (3-E-A)					
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	- - - - - - - -	0.0	OPT	0	0
Plan 11-19	- - - - - - - -	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
0	- - - - - - - -
0	- - - - - - - -

Free Plans (3-E-E)	
Max Green	Hold Phase
0	- - - - - - - -

Access Utilities (9-5)	
Password	***
Timeout	30

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
	0.0	0.0	0.0	0	- - - - - - - -	0.0	0.0	0.0	0	0.0	0

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CONTROLLER ID

Manufacturer ID	Caltrans TSCP Ver 2.21
Model ID	Model 2070
Protocol Revision ID	AB3418

State of California
DEPARTMENT OF TRANSPORTATION

2070 Controller Timing Chart

Caltrans TSCP Ver 2.21

Location:
System:
Master At:

District:
I/C:

Designed By:
Intalled By:
Service Info:

Timing Change: By: Date Start: Date End: Designed: Installed:

		FLASH
	1)	[ ]
P	2)	[ ]
H	3)	[ ]
A	4)	[ ]
S	5)	[ ]
E	6)	[ ]
	7)	[ ]
	8)	[ ]
O		
V	A)	[ ]
E	B)	[ ]
R	C)	[ ]
L	D)	[ ]
A	E)	[ ]
P	F)	[ ]

Intersection Layout

Comments and Notes:

RAM Checksum

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CONFIGURATION PHASE FLAGS

Phases (2-1-1-1)	
Permitted	- 2 - 4 - 6 - -
Restricted	- - - - - - - -

Phase Recalls (2-1-1-2)	
Vehicle Min	- 2 - - - 6 - -
vehicle Max	- - - - - - - -
Pedestrian	- - - - - - - -
Bicyle	- - - - - - - -

Phase Locks (2-1-1-3)	
Red	- - - - - - - -
Yellow	- - - - - - - -
Force/Max	- - - - - - - -

Phase Features (2-1-1-4)	
Double Entry	- 2 - - - 6 - -
Rest In Walk	- - - - - - - -
Rest In Red	- - - - - - - -
Walk2	- - - - - - - -
Max Green 2	- 2 - 4 - 6 - -
Max Green 3	- - - - - - - -

Startup (2-1-1-5)	
First Green Phases	- 2 - - - 6 - -
Yellow Start Phases	- - - - - - - -
Vehicle Calls	- 2 - 4 - 6 - -
Pedestrian Calls	- 2 - 4 - 6 - -
Yellow Start Overlaps	- - - - - - - -
Startup All-Red	6.0

Call To Phase (2-1-2-1)		Omit On Green	
1	- - - - - - - -	1	- - - - - - - -
2	- - - - - - - -	2	- - - - - - - -
3	- - - - - - - -	3	- - - - - - - -
4	- - - - - - - -	4	- - - - - - - -
5	- - - - - - - -	5	- - - - - - - -
6	- - - - - - - -	6	- - - - - - - -
7	- - - - - - - -	7	- - - - - - - -
8	- - - - - - - -	8	- - - - - - - -

Flashing Colors (2-1-2-2)	
Yellow Flash Phases	- - - - - - - -
Yellow Flash Overlap	- - - - - - - -
Flash In Red Phases	- - - - - - - -
Flash In Red Overlap	- - - - - - - -

Protected Permissive (2-1-2-4)	
Protected Permissive	- - - - - - - -

Special Operation (2-1-2-3)	
Single Exit Phase	- - - - - - - -
Driveway Signal Phases	- - - - - - - -
Driveway Signal Overlaps	- - - - - - - -
Leading Ped Phases	- - - - - - - -

Pedestrian (2-1-3)	
P1	- - - - - - - -
P2	- - - - - - - -
P3	- - - - - - - -
P4	- - - - - - - -
P5	- - - - - - - -
P6	- - - - - 6 - -
P7	- - - - - - - -
P8	- - - - - - - -

Overlap (2-1-4)				
Overlap	Parent	Omit	No Start	Not
A [Arrow A]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
B [Arrow B]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
C [OL A]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
D [OL B]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
E [OL C]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -
F [OL D]	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -

[-] 332 Cabinet Overlap Assignment - For Reference Only

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PHASE TIMING

PHASE (2-2)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 1 ---	0	0	0	0	0	7	0	0
Flash Don't Walk	0	0	0	0	0	12	0	0
Minimum Green	0	10	0	8	0	10	0	0
Det Limit	0	20	0	20	0	20	0	0
Max Initial	0	0	0	0	0	0	0	0
Max Green 1	0	25	0	20	0	25	0	0
Max Green 2	0	35	0	30	0	35	0	0
Max Green 3	0	0	0	0	0	0	0	0
Extension	0.0	4.9	0.0	4.9	0.0	4.9	0.0	0.0
Maximum Gap	0.0	6.8	0.0	6.8	0.0	6.8	0.0	0.0
Minimum Gap	0.0	2.0	0.0	2.0	0.0	2.0	0.0	0.0
Add Per Vehicle	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reduce Gap By	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0
Reduce Every	0.0	0.5	0.0	0.4	0.0	0.5	0.0	0.0
Yellow	3.0	4.8	3.0	4.8	3.0	4.8	3.0	3.0
All-Red	0.0	2.1	0.0	2.0	0.0	2.1	0.0	0.0
Ped/Bike (2-3)	-1-	-2-	-3-	-4-	-5-	-6-	-7-	-8-
--- Walk 2 ---	0	0	0	0	0	0	0	0
Delay/Early Walk	0	0	0	0	0	0	0	0
Solid Don't Walk	0	0	0	0	0	0	0	0
Bike Green	0	0	0	0	0	0	0	0
Bike All-Red	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

OVERLAP TIMING

Overlap (2-4)	A [Arrow A]	B [Arrow B]	C [OL A]	D [OL B]	E [OL C]	F [OL D]
Green	0.0	0.0	0.0	0.0	0.0	0.0
Yellow	5.0	5.0	5.0	5.0	5.0	5.0
Red	0.0	0.0	0.0	0.0	0.0	0.0

Red Revert (2-5)	
Time	5.0

Red To Se (2-6)	
Red To Sec	OFF

Max/Gap Out (2-7)	
Max Cnt	3
Gap Cnt	4

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DETECTORS

Detector Attributes (5-1)				Slot	Detector Configuration (5-2)				
Det	Type	Phases	Lock		Det	Delay	Extend	Recall	Port
1	Count+Call+Extend	1 - - - - - - -	NO	1I1U	1	0	0.0	10	3.2
2	Count+Call+Extend	1 - - - - - - -	NO	1I1L	2	0	0.0	10	7.2
3	Extend	- 2 - - - - - -	NO	2I2U	3	0	0.0	10	1.1
4	Extend	- 2 - - - - - -	NO	2I2L	4	0	0.0	10	1.5
5	Call+Extend	- 2 - - - - - -	NO	2I3U	5	0	0.0	10	4.5
6	Limited	- 2 - - - - - -	NO	2I3L	6	0	0.0	10	6.2
7	Limited	- 2 - - - - - -	NO	2I4U	7	0	2.0	10	2.1
8	Limited	- 2 - - - - - -	NO	2I4L	8	0	2.0	10	7.4
9	Count+Call+Extend	- - 3 - - - - -	NO	3I5U	9	0	0.0	10	3.4
10	Count+Call+Extend	- - 3 - - - - -	NO	3I5L	10	0	0.0	10	7.6
11	Count+Call+Extend	- - - 4 - - - -	NO	4I6U	11	2	0.0	10	1.3
12	Count+Call+Extend	- - - 4 - - - -	NO	4I6L	12	2	0.0	10	1.7
13	Call+Extend	- - - 4 - - - -	NO	4I7U	13	0	0.0	10	4.7
14	Limited	- - - 4 - - - -	NO	4I7L	14	15	2.0	10	6.4
15	Limited	- - - 4 - - - -	NO	4I8U	15	0	2.0	10	2.3
16	Limited	- - - 4 - - - -	NO	4I8L	16	0	0.0	10	7.8
17	Call+Extend	1 - - - - - - -	NO	1I9U	17	0	0.0	10	3.6
18	Call+Extend	- - 3 - - - - -	NO	3I9L	18	0	0.0	10	3.8
19	Count+Call	- 2 - - - - - -	NO	2I10U	19	0	0.0	10	4.1
20	Count+Call	- - - 4 - - - -	NO	4I10L	20	0	0.0	10	4.2
21	Count+Call+Extend	- - - - 5 - - -	NO	5J1U	21	0	0.0	10	3.1
22	Count+Call+Extend	- - - - 5 - - -	NO	5J1L	22	0	0.0	10	7.1
23	Extend	- - - - - 6 - -	NO	6J2U	23	0	0.0	10	1.2
24	Extend	- - - - - 6 - -	NO	6J2L	24	0	0.0	10	1.6
25	Call+Extend	- - - - - 6 - -	NO	6J3U	25	0	0.0	10	4.6
26	Limited	- - - - - 6 - -	NO	6J3L	26	0	0.0	10	6.3
27	Limited	- - - - - 6 - -	NO	6J4U	27	0	0.0	10	2.2
28	Limited	- - - - - 6 - -	NO	6J4L	28	0	0.0	10	7.3
29	Count+Call+Extend	- - - - - - 7 -	NO	7J5U	29	0	0.0	10	3.3
30	Count+Call+Extend	- - - - - - 7 -	NO	7J5L	30	0	0.0	10	7.5
31	Extend	- - - - - - - 8	NO	8J6U	31	0	2.0	10	1.4
32	Extend	- - - - - - - 8	NO	8J6L	32	0	2.0	10	1.8
33	Call+Extend	- - - - - - - 8	NO	8J7U	33	0	0.0	10	4.8
34	Limited	- - - - - - - 8	NO	8J7L	34	0	0.0	10	6.5
35	Limited	- - - - - - - 8	NO	8J8U	35	0	0.0	10	2.4
36	Limited	- - - - - - - 8	NO	8J8L	36	0	0.0	10	7.7
37	Call+Extend	- - - - 5 - - -	NO	5J9U	37	0	0.0	10	3.5
38	Call+Extend	- - - - - - 7 -	NO	7J9L	38	0	0.0	10	3.7
39	Count+Call	- - - - - 6 - -	NO	6J10U	39	0	0.0	10	4.3
40	Count+Call	- - - - - - - 8	NO	8J10L	40	0	0.0	10	4.4
41	Pedestrian	- 2 - - - - - -	NO	2I12U	41	0	0.0	10	5.1
42	Pedestrian	- - - 4 - - - -	NO	4I12L	42	0	0.0	10	5.3
43	Pedestrian	- - - - - 6 - -	NO	6I13U	43	0	0.0	10	5.2
44	Pedestrian	- - - - - - - 8	NO	8I13L	44	0	0.0	10	5.4

Failure Times (5-3)	Minutes
Maximum On Time	0
Fail Reset Time	0

Failure Override (5-4)	
Detectors 1-8	- - - - - - - -
Detectors 9-16	- - - - - - - -
Detectors 17-24	- - - - - - - -
Detectors 25-32	- - - - - - - -
Detectors 33-40	- - - - - - - -
Detectors 41-44	- - - - - - - -

System Detector Assignment (5-5)								
Sys Det	1	2	3	4	5	6	7	8
Det Num	0	0	0	0	0	0	0	0
Sys Det	9	10	11	12	13	14	15	16
Det Num	0	0	0	0	0	0	0	0

CIC Operation (5-6-1)	
Enable in Plans	- - - - - - - - -

CIC Values (5-6-2)	Volume	Occupancy	Demand
Smoothing	0.66	0.66	0.66
Multiplier	4.0	0.33	
Exponent	0.50	1.0	

Detector-to-Phase Assignment (5-6-3)								
Sys Det	1	2	3	4	5	6	7	8
Phase	0	0	0	0	0	0	0	0
Sys Det	9	10	11	12	13	14	15	16
Phase	0	0	0	0	0	0	0	0

Input File Port-Bit Assignments

332 Cabinet - For Reference Only

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
I-	3.2	1.1	4.5	2.1	3.4	1.3	4.7	2.3	3.6	4.1	6.6	5.1	5.2	6.7
	7.2	1.5	6.2	7.4	7.6	1.7	6.4	7.8	3.8	4.2	2.7	5.3	5.4	6.8
J-	3.1	1.2	4.6	2.2	3.3	1.4	4.8	2.4	3.5	4.3	2.8	5.5	5.6	2.5
	7.1	1.6	6.3	7.3	7.5	1.8	6.5	7.7	3.7	4.4	6.1	5.7	5.8	2.6

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TOD SCHEDULE

Table 1 (8-2-1)			Table 2 (8-2-2)			Table 3 (8-2-3)			Table 4 (8-2-4)			Table 5 (8-2-5)			Table 6 (8-2-6)		
Time	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS	Hour	Plan	OS
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A
0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A	0000	0	A

WEEKDAY ASSIGNMENT

Weekday Table Assignments (8-2-7)						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	1	1	1	1	2	2

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HOLIDAY TABLES

Floating Holiday Table (8-2-8)

#	Mnth	Week	DOW	Table
1	0	0	- - - - - - -	0
2	0	0	- - - - - - -	0
3	0	0	- - - - - - -	0
4	0	0	- - - - - - -	0
5	0	0	- - - - - - -	0
6	0	0	- - - - - - -	0
7	0	0	- - - - - - -	0
8	0	0	- - - - - - -	0
9	0	0	- - - - - - -	0
10	0	0	- - - - - - -	0
11	0	0	- - - - - - -	0
12	0	0	- - - - - - -	0
13	0	0	- - - - - - -	0
14	0	0	- - - - - - -	0
15	0	0	- - - - - - -	0
16	0	0	- - - - - - -	0

Fixed Holiday Table (8-2-9)

#	Mnth	Day	DOW	Table
1	0	0	- - - - - - -	0
2	0	0	- - - - - - -	0
3	0	0	- - - - - - -	0
4	0	0	- - - - - - -	0
5	0	0	- - - - - - -	0
6	0	0	- - - - - - -	0
7	0	0	- - - - - - -	0
8	0	0	- - - - - - -	0
9	0	0	- - - - - - -	0
10	0	0	- - - - - - -	0
11	0	0	- - - - - - -	0
12	0	0	- - - - - - -	0
13	0	0	- - - - - - -	0
14	0	0	- - - - - - -	0
15	0	0	- - - - - - -	0
16	0	0	- - - - - - -	0

Solar Clock Data (8-4)

North Latitude	34
West Longitude	118
Local Time Zone	8

Sabbatical Clock (8-5)

Hebrew	Ped Recall
Sabbath	- - - - - - - - -
Holiday	- - - - - - - - -

Daylight Saving (8-6)

Daylight Saving	YES

TOD Functions (8-3)

#	Start	End	DOW 1 2 3 4 5 6 7	Action	Phases
1	0530	2100	1 2 3 4 5 6 7	27	- 2 - 4 - 6 - -
2	0000	0000	- - - - - - -	0	- - - - - - - -
3	0000	0000	- - - - - - -	0	- - - - - - - -
4	0000	0000	- - - - - - -	0	- - - - - - - -
5	0000	0000	- - - - - - -	0	- - - - - - - -
6	0000	0000	- - - - - - -	0	- - - - - - - -
7	0000	0000	- - - - - - -	0	- - - - - - - -
8	0000	0000	- - - - - - -	0	- - - - - - - -
9	0000	0000	- - - - - - -	0	- - - - - - - -
10	0000	0000	- - - - - - -	0	- - - - - - - -
11	0000	0000	- - - - - - -	0	- - - - - - - -
12	0000	0000	- - - - - - -	0	- - - - - - - -
13	0000	0000	- - - - - - -	0	- - - - - - - -
14	0000	0000	- - - - - - -	0	- - - - - - - -
15	0000	0000	- - - - - - -	0	- - - - - - - -
16	0000	0000	- - - - - - -	0	- - - - - - - -

Action Codes:
0. None
1. Permitted
2. Restricted
4. Veh Min Recall
5. Veh Max Recall
6. Ped Recall
7. Bike Recall
8. Red Lock
9. Yellow Lock
10. Force/Max Lock
11.Double Entry
12. Y-Coord C
13. Y-Coord D
14. Free
15. Flashing
16. Walk 2
17. Max Green 2
18. Max Green 3
19. Rest in Walk
20. Rest in Red
21. Free Lag Phases
22. Special Functions
23. Truck Preempt
24. Conditional Service
25. Conditional Service
26. Leading Ped

41. Protected Permissive
42. Protected Permissive
Action Code = Phases added to normal setting

100+Action Code = Phases removed
200+Action Code = Phases replaced

PAGE 9 **CHECKSUM:** **46BF**

COMMUNICATIONS

C2 (6-1-1)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

C20 (6-1-2)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

C21 (6-1-3)	
Address	0
Protocol	AB3418
Limit Access	None
Baud	1200
Parity	None
Data Bits	8 data bits
Stop Bits	1 stop bit
RTS On Time	20
RTS Off Time	20
Handshaking	Normal

SOFT LOGIC

Soft Logic (6-2)

#	Data	OP	Data	OP	Data	OP	Data
1	00.0	00	00.0	00	00.0	00	00.0
2	00.0	00	00.0	00	00.0	00	00.0
3	00.0	00	00.0	00	00.0	00	00.0
4	00.0	00	00.0	00	00.0	00	00.0
5	00.0	00	00.0	00	00.0	00	00.0
6	00.0	00	00.0	00	00.0	00	00.0
7	00.0	00	00.0	00	00.0	00	00.0
8	00.0	00	00.0	00	00.0	00	00.0
9	00.0	00	00.0	00	00.0	00	00.0
10	00.0	00	00.0	00	00.0	00	00.0
11	00.0	00	00.0	00	00.0	00	00.0
12	00.0	00	00.0	00	00.0	00	00.0
13	00.0	00	00.0	00	00.0	00	00.0
14	00.0	00	00.0	00	00.0	00	00.0
15	00.0	00	00.0	00	00.0	00	00.0
16	00.0	00	00.0	00	00.0	00	00.0

CALLBACK NUMBERS

Callback Numbers (6-3...3)	
Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

Line Out	0
Local Toll	0
Long Distance	0
Delay	10
Area Code	0
Phone Number	0 - 0

NETWORK

Network (6-4)				
Address	1			
Protocol	AB3418			
Port	27000			
IP Mode	Static IP			
IP Address	192	168	13	1
Netmask	255	255	255	0
Broadcast	192	168	13	255
Gateway	192	168	13	254

CHECKSUM: BAC2

RAILROAD PREEMPTION

RR 1	(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
	Delay	0	Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Clear 1	10	- 2 - - 5 - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- 2 - 4 - 6 - 8	- - - - - -	- - - - - -	- - - - - -
	Clear 2	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Clear 3	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Hold	0	- - - - - - - -	- - - - - - - -	1 2 3 4 5 6 7 8	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	A B C D E F
	Exit	5									
	Min Grn	0									
	Ped Clr	0									

Exit Parameters (3-1-5)			
Phase Green	Overlap Green	Vehicle Recall	Ped Call
- - - - - - - -	- - - - - -	1 2 3 4 5 6 7 8	- 2 - 4 - 6 - 8

Configuration (3-1-6)			
Port	Gate Port	Latching	Power-Up
2.5	0.0	Yes	Flashing

RR 2	(3-2-1)	Timing	Phase Flags (3-2-2)			Pedestrian Flags (3-2-3)			Overlap Flags (3-2-4)		
	Delay	0	Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Clear 1	10	- - - 4 - - 7 -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- 2 - 4 - 6 - 8	- - - - - -	- - - - - -	- - - - - -
	Clear 2	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Clear 3	0	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - - - -	- - - - - -	- - - - - -	- - - - - -
	Hold	0	1 2 3 - - 6 - -	- - - - - - - -	- - - - - - - -	- 2 - - - 6 - -	- - - - - - - -	- - - 4 - - - 8	- - - - - -	- - - - - -	- - - - - -
	Exit	0									
	Min Grn	0									
	Ped Clr	0									

Exit Parameters (3-2-5)			
Exit Ph Grn	Exit Ovl Grn	Exit Veh Recall	Exit Ped Call
- - - - - - - -	- - - - - -	- - - 4 - - 7 -	- - - - - - - -

Configuration (3-2-6)			
Port	Gate Port	Latching	Power-Up
2.6	0.0	Yes	Dark

EMERGENCY VEHICLE PREEMPTION

EVA (3-A)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- 2 - - 5 - - -	- - - - - -

Port	Latching	Phase Termination
5.5	No	Advance

EVC (3-C)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	1 - - - - 6 - -	- - - - - -

Port	Latching	Phase Termination
5.7	No	Advance

EVB (3-B)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- - - 4 - - 7 -	- - - - - -

Port	Latching	Phase	Phase Termination
5.6	No		Advance

EVD (3-D)	Preempt Timers			Phase Green	Overlap Grn
	Delay	Clear	Max		
	0	30	30	- - 3 - - - - 8	- - - - - -

Port	Latching	Phase	Phase Termination
5.8	No		Advance

CHECKSUM: C3CB

INPUTS

		7 Wire I/C(2-1-5-1)			
		Input	Port	Input	Port
Enable	No	R1	3.8	Free	3.6
Max ON	0	R2	3.5	D2	2.8
Max OFF	0	R3	3.7	D3	6.1

Manual Control(2-1-5-2)	
Input	Port
Manual Adv	6.6
Adv Enable	6.6

Battery Backup (2-1-5-5)	
Port	Operation
2.7	Flashing

Cabinet Staus (2-1-5-3)	
Input	Port
Flash Bus	0.0
Door Ajar	0.0
Flash Sense	6.7
Stop Time	6.8

Special Function (2-1-5-4)	
Input	Port
1	0.0
2	0.0
3	0.0
4	0.0

Y-Coordination (2-1-5-6)	
Port C	Port D
6.1	2.8

OUTPUTS

Loadswitch Assignments (2-1-6)							
A	1	2	22	3	4	24	9
B	5	6	26	7	8	28	10
X	13	14	0	11	12	0	0

Loadswitch Codes:
0 Unused (no output)
1-8 Vehicle 1-8
9-14 Overlap A-F
21-28 Ped 1-8
41-47 Special Functions
41 Protected Permissive Flashing Phase 1
43 Protected Permissive Flashing Phase 3
45 Protected Permissive Flashing Phase 5
47 Protected Permissive Flashing Phase 7
51-57 Special Functions
71-72 Seven Wire I/C

+ middle output of
loadswitches 3 and 6

CHECKSUM: EF20

YELLOW YIELD COORDINATION

					Force-Offs											
Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	1	2	3	4	5	6	7	8	Coord	Lag	Min Recall	Restricted
Plan C	0	0	0	0	0	0	0	0	0	0	0	0	- 2 - - - 6 - -	- 2 - 4 - 6 - 8	- - - - - - - -	- - - - - - - -
Plan D	0	0	0	0	0	0	0	0	0	0	0	0	- 2 - - - 6 - -	- 2 - 4 - 6 - 8	- - - - - - - -	- - - - - - - -

TRANSIT PRIORITY

Local Plans (3-E) 1...9 1...19		Early Green	Green Extend	Inhibit Cycles	Phase 1 Minimum	Phase 2 Minimum	Phase 3 Minimum	Phase 4 Minimum	Phase 5 Minimum	Phase 6 Minimum	Phase 7 Minimum	Phase 8 Minimum
Plan 1	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 2	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 3	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 4	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 5	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 6	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 7	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 8	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 9	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 11	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 12	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 13	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 14	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 15	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 16	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 17	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 18	Green Factor	0	0	0	0	0	0	0	0	0	0	0
Plan 19	Green Factor	0	0	0	0	0	0	0	0	0	0	0

Enable Priority in Plan (3-E-A)					
Enable in Plans		Input	Type	Stop	Go
Plan 1-9	- - - - - - - -	0.0	OPT	0	0
Plan 11-19	- - - - - - - -	0.0	OPT	0	0

Queue Jump (3-E-B)	
Grn Hold	Hold Phase
0	- - - - - - - -
0	- - - - - - - -

Free Plans (3-E-E)	
Max Green	Hold Phase
0	- - - - - - - -

Access Utilities (9-5)	
Password	***
Timeout	30

TRUCK PRIORITY

Truck Priority (3-F)	Passage	CarryOver	Clearance	Next Priority	Phase Green	Det 2 Port	Det 3 Port	Det 4 Port	Sign Output	Slave Input	Slave Output
	0.0	0.0	0.0	0	- - - - - - - -	0.0	0.0	0.0	0	0.0	0

CONTROLLER ID

Manufacturer ID	Caltrans TSCP Ver 2.21
Model ID	Model 2070
Protocol Revision ID	AB3418

APPENDIX C:

VOLUME DEVELOPMENT WORKSHEETS

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
1 Marks Avenue/Belmont Avenue												
2016 count												
NBL			49	49	1	50			97	97	2	99
NBT			261	261	7	268			589	589	7	596
NBR			67	67	3	70			76	76	4	80
SBL			39	39	0	39			25	25	0	25
SBT			424	424	25	449			259	259	34	293
SBR			28	28	0	28			26	26	0	26
EBL			24	24	0	24			24	24	0	24
EBT			127	127	0	127			174	174	0	174
EBR			87	87	7	94			63	63	9	72
WBL			39	39	13	52			36	36	16	52
WBT			78	78	0	78			126	126	0	126
WBR			11	11	0	11			53	53	0	53
North Leg												
Approach	0	0	491	491	25	516	0	0	310	310	34	344
Departure	0	0	296	296	7	303	0	0	666	666	7	673
Total	0	0	787	787	32	819	0	0	976	976	41	1,017
South Leg												
Approach	0	0	377	377	11	388	0	0	762	762	13	775
Departure	0	0	550	550	45	595	0	0	358	358	59	417
Total	0	0	927	927	56	983	0	0	1,120	1,120	72	1,192
East Leg												
Approach	0	0	128	128	13	141	0	0	215	215	16	231
Departure	0	0	233	233	3	236	0	0	275	275	4	279
Total	0	0	361	361	16	377	0	0	490	490	20	510
West Leg												
Approach	0	0	238	238	7	245	0	0	261	261	9	270
Departure	0	0	155	155	1	156	0	0	249	249	2	251
Total	0	0	393	393	8	401	0	0	510	510	11	521
Total Approaches												
Approach	0	0	1,234	1,234	56	1,290	0	0	1,548	1,548	72	1,620
Departure	0	0	1,234	1,234	56	1,290	0	0	1,548	1,548	72	1,620
Total	0	0	2,468	2,468	112	2,580	0	0	3,096	3,096	144	3,240

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
2 Marks Avenue/Nielsen Avenue												
NBL	55		55	62	0	62	36		36	37	0	37
NBT	227	82	309	349	0	349	371	177	548	568	0	568
NBR	62		62	70	28	98	35		35	36	38	74
SBL	8		8	9	0	9	9		9	10	0	10
SBT	212	114	326	343	0	343	192	81	273	318	0	318
SBR	31		31	34	0	34	18		18	20	0	20
EBL	11		11	12	0	12	22		22	24	0	24
EBT	6		6	7	1	8	3		3	3	1	4
EBR	40		40	42	0	42	35		35	41	0	41
WBL	17		17	18	7	25	67		67	78	9	87
WBT	4		4	4	0	4	8		8	9	0	9
WBR	9		9	10	0	10	10		10	11	0	11
North Leg												
Approach	251	114	365	386	0	386	219	81	300	348	0	348
Departure	247	82	329	371	0	371	403	177	580	603	0	603
Total	498	196	694	757	0	757	622	258	880	951	0	951
South Leg												
Approach	344	82	426	481	28	509	442	177	619	641	38	679
Departure	269	114	383	403	7	410	294	81	375	437	9	446
Total	613	196	809	884	35	919	736	258	994	1,078	47	1,125
East Leg												
Approach	30	0	30	32	7	39	85	0	85	98	9	107
Departure	76	0	76	86	29	115	47	0	47	49	39	88
Total	106	0	106	118	36	154	132	0	132	147	48	195
West Leg												
Approach	57	0	57	61	1	62	60	0	60	68	1	69
Departure	90	0	90	100	0	100	62	0	62	66	0	66
Total	147	0	147	161	1	162	122	0	122	134	1	135
Total Approaches												
Approach	682	196	878	960	36	996	806	258	1,064	1,155	48	1,203
Departure	682	196	878	960	36	996	806	258	1,064	1,155	48	1,203
Total	1,364	392	1,756	1,920	72	1,992	1,612	516	2,128	2,310	96	2,406

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
3 Marks Avenue/Ray Johnson Drive												
NBL	0		0	0	0	0	0		0	0	0	0
NBT	351	128	479	479	28	507	430	205	635	635	38	673
NBR	6		6	6	0	6	10		10	10	0	10
SBL	3		3	3	0	3	4		4	4	0	4
SBT	260	139	399	399	7	406	304	128	432	432	9	441
SBR	0		0	0	0	0	0		0	0	0	0
EBL	0		0	0	0	0	0		0	0	0	0
EBT	0		0	0	0	0	0		0	0	0	0
EBR	0		0	0	0	0	0		0	0	0	0
WBL	8		8	8	0	8	17		17	17	0	17
WBT	0		0	0	0	0	0		0	0	0	0
WBR	3		3	3	0	3	6		6	6	0	6
North Leg												
Approach	263	139	402	402	7	409	308	128	436	436	9	445
Departure	354	128	482	482	28	510	436	205	641	641	38	679
Total	617	267	884	884	35	919	744	334	1,078	1,078	47	1,125
South Leg												
Approach	357	128	485	485	28	513	440	205	645	645	38	683
Departure	268	139	407	407	7	414	321	128	449	449	9	458
Total	625	267	892	892	35	927	761	334	1,095	1,095	47	1,142
East Leg												
Approach	11	0	11	11	0	11	23	0	23	23	0	23
Departure	9	0	9	9	0	9	14	0	14	14	0	14
Total	20	0	20	20	0	20	37	0	37	37	0	37
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Total Approaches												
Approach	631	267	898	898	35	933	771	334	1,105	1,105	47	1,152
Departure	631	267	898	898	35	933	771	334	1,105	1,105	47	1,152
Total	1,262	534	1,796	1,796	70	1,866	1,542	667	2,209	2,209	94	2,303

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
4 Marks Avenue/SR-180 Westbound Ramps												
NBL	0		0	0	0	0	0		0	0	0	0
NBT	82		82	82	5	87	144		144	144	5	149
NBR	11		11	11	0	11	15		15	15	0	15
SBL	0		0	0	0	0	0		0	0	0	0
SBT	263	139	402	402	7	409	297	128	425	425	9	434
SBR	24		24	24	0	24	23		23	23	0	23
EBL	0		0	0	0	0	0		0	0	0	0
EBT	0		0	0	0	0	0		0	0	0	0
EBR	0		0	0	0	0	0		0	0	0	0
WBL	180		180	180	0	180	242		242	242	0	242
WBT	0		0	0	0	0	0		0	0	0	0
WBR	267	128	395	395	23	418	313	205	518	518	32	550
North Leg												
Approach	287	139	426	426	7	433	320	128	448	448	9	457
Departure	349	128	477	477	28	505	457	205	662	662	37	699
Total	636	267	903	903	35	938	777	334	1,111	1,111	46	1,157
South Leg												
Approach	93	0	93	93	5	98	159	0	159	159	5	164
Departure	443	139	582	582	7	589	539	128	667	667	9	676
Total	536	139	675	675	12	687	698	128	826	826	14	840
East Leg												
Approach	447	128	575	575	23	598	555	205	760	760	32	792
Departure	11	0	11	11	0	11	15	0	15	15	0	15
Total	458	128	586	586	23	609	570	205	775	775	32	807
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	24	0	24	24	0	24	23	0	23	23	0	23
Total	24	0	24	24	0	24	23	0	23	23	0	23
Total Approaches												
Approach	827	267	1,094	1,094	35	1,129	1,034	334	1,368	1,368	46	1,414
Departure	827	267	1,094	1,094	35	1,129	1,034	334	1,368	1,368	46	1,414
Total	1,654	534	2,188	2,188	70	2,258	2,068	667	2,735	2,735	92	2,827

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
5 Marks Avenue/SR-180 Eastbound Ramps												
NBL	0		0	0	0	0	0		0	0	0	0
NBT	83		83	83	3	86	140		140	140	3	143
NBR	223		223	223	0	223	266		266	266	0	266
SBL	0		0	0	0	0	0		0	0	0	0
SBT	289		289	291	0	291	360		360	359	1	360
SBR	150	139	289	291	7	298	181	128	309	308	8	316
EBL	10		10	10	2	12	19		19	19	2	21
EBT	0		0	0	0	0	0		0	0	0	0
EBR	11		11	11	0	11	20		20	20	0	20
WBL	0		0	0	0	0	0		0	0	0	0
WBT	0		0	0	0	0	0		0	0	0	0
WBR	0		0	0	0	0	0		0	0	0	0
North Leg												
Approach	439	139	578	582	7	589	541	128	669	667	9	676
Departure	93	0	93	93	5	98	159	0	159	159	5	164
Total	532	139	671	675	12	687	700	128	828	826	14	840
South Leg												
Approach	306	0	306	306	3	309	406	0	406	406	3	409
Departure	300	0	300	302	0	302	380	0	380	379	1	380
Total	606	0	606	608	3	611	786	0	786	785	4	789
East Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	223	0	223	223	0	223	266	0	266	266	0	266
Total	223	0	223	223	0	223	266	0	266	266	0	266
West Leg												
Approach	21	0	21	21	2	23	39	0	39	39	2	41
Departure	150	139	289	291	7	298	181	128	309	308	8	316
Total	171	139	310	312	9	321	220	128	348	347	10	357
Total Approaches												
Approach	766	139	905	909	12	921	986	128	1,114	1,112	14	1,126
Departure	766	139	905	909	12	921	986	128	1,114	1,112	14	1,126
Total	1,532	279	1,811	1,819	24	1,843	1,972	256	2,228	2,224	28	2,252

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
6 Hughes Avenue/Belmont Avenue												
NBL	6		6	6	0	6	14		14	14	0	14
NBT	27		27	27	1	28	42		42	42	1	43
NBR	33		33	33	5	38	56		56	56	5	61
SBL	26		26	26	0	26	40		40	40	0	40
SBT	22		22	22	3	25	47		47	47	5	52
SBR	15		15	15	0	15	15		15	15	0	15
EBL	20		20	20	0	20	37		37	37	0	37
EBT	192		192	192	3	195	239		239	239	4	243
EBR	17		17	17	0	17	10		10	10	0	10
WBL	27		27	27	17	44	43		43	43	20	63
WBT	152		152	152	12	164	190		190	190	15	205
WBR	15		15	15	0	15	34		34	34	0	34
North Leg												
Approach	63	0	63	63	3	66	102	0	102	102	5	107
Departure	62	0	62	62	1	63	113	0	113	113	1	114
Total	125	0	125	125	4	129	215	0	215	215	6	221
South Leg												
Approach	66	0	66	66	6	72	112	0	112	112	6	118
Departure	66	0	66	66	20	86	100	0	100	100	25	125
Total	132	0	132	132	26	158	212	0	212	212	31	243
East Leg												
Approach	194	0	194	194	29	223	267	0	267	267	35	302
Departure	251	0	251	251	8	259	335	0	335	335	9	344
Total	445	0	445	445	37	482	602	0	602	602	44	646
West Leg												
Approach	229	0	229	229	3	232	286	0	286	286	4	290
Departure	173	0	173	173	12	185	219	0	219	219	15	234
Total	402	0	402	402	15	417	505	0	505	505	19	524
Total Approaches												
Approach	552	0	552	552	41	593	767	0	767	767	50	817
Departure	552	0	552	552	41	593	767	0	767	767	50	817
Total	1,104	0	1,104	1,104	82	1,186	1,534	0	1,534	1,534	100	1,634

Table B-1 - Existing (2021) Peak Hour Volume Summary

	A.M. Peak Hour						P.M. Peak Hour					
	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project
7 Hughes Avenue/Nielsen Avenue												
NBL	5		5	5	4	9	25		25	25	6	31
NBT	44		44	44	2	46	83		83	83	2	85
NBR	1		1	1	0	1	3		3	3	0	3
SBL	8		8	8	2	10	9		9	9	2	11
SBT	46		46	46	1	47	73		73	73	1	74
SBR	10		10	10	0	10	13		13	13	0	13
EBL	8		8	8	0	8	8		8	8	0	8
EBT	35		35	35	0	35	25		25	25	0	25
EBR	24		24	24	1	25	11		11	11	2	13
WBL	2		2	2	0	2	4		4	4	0	4
WBT	10		10	10	2	12	35		35	35	2	37
WBR	8		8	8	7	15	14		14	14	9	23
North Leg												
Approach	64	0	64	64	3	67	95	0	95	95	3	98
Departure	60	0	60	60	9	69	105	0	105	105	11	116
Total	124	0	124	124	12	136	200	0	200	200	14	214
South Leg												
Approach	50	0	50	50	6	56	111	0	111	111	8	119
Departure	72	0	72	72	2	74	88	0	88	88	3	91
Total	122	0	122	122	8	130	199	0	199	199	11	210
East Leg												
Approach	20	0	20	20	9	29	53	0	53	53	11	64
Departure	44	0	44	44	2	46	37	0	37	37	2	39
Total	64	0	64	64	11	75	90	0	90	90	13	103
West Leg												
Approach	67	0	67	67	1	68	44	0	44	44	2	46
Departure	25	0	25	25	6	31	73	0	73	73	8	81
Total	92	0	92	92	7	99	117	0	117	117	10	127
Total Approaches												
Approach	201	0	201	201	19	220	303	0	303	303	24	327
Departure	201	0	201	201	19	220	303	0	303	303	24	327
Total	402	0	402	402	38	440	606	0	606	606	48	654

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
1 Marks Avenue/Belmont Avenue												
NBL	49	2	3	54	1	55	97	4	4	105	2	107
NBT	261	10	3	274	7	281	589	24	10	623	7	630
NBR	67	3	1	71	3	74	76	3	2	81	4	85
SBL	39	2	1	42	0	42	25	1	0	26	0	26
SBT	424	17	8	449	25	474	259	10	7	276	34	310
SBR	28	1	2	31	0	31	26	1	2	29	0	29
EBL	24	1	0	25	0	25	24	1	0	25	0	25
EBT	127	5	13	145	0	145	174	7	16	197	0	197
EBR	87	3	1	91	7	98	63	3	1	67	9	76
WBL	39	2	0	41	13	54	36	1	2	39	16	55
WBT	78	3	18	99	0	99	126	5	16	147	0	147
WBR	11	0	1	12	0	12	53	2	0	55	0	55
North Leg												
Approach	491	20	11	522	25	547	310	12	9	331	34	365
Departure	296	11	4	311	7	318	666	27	10	703	7	710
Total	787	31	15	833	32	865	976	39	19	1,034	41	1,075
South Leg												
Approach	377	15	7	399	11	410	762	31	16	809	13	822
Departure	550	22	9	581	45	626	358	14	10	382	59	441
Total	927	37	16	980	56	1,036	1,120	45	26	1,191	72	1,263
East Leg												
Approach	128	5	19	152	13	165	215	8	18	241	16	257
Departure	233	10	15	258	3	261	275	11	18	304	4	308
Total	361	15	34	410	16	426	490	19	36	545	20	565
West Leg												
Approach	238	9	14	261	7	268	261	11	17	289	9	298
Departure	155	6	23	184	1	185	249	10	22	281	2	283
Total	393	15	37	445	8	453	510	21	39	570	11	581
Total Approaches												
Approach	1,234	49	51	1,334	56	1,390	1,548	62	60	1,670	72	1,742
Departure	1,234	49	51	1,334	56	1,390	1,548	62	60	1,670	72	1,742
Total	2,468	98	102	2,668	112	2,780	3,096	124	120	3,340	144	3,484

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
2 Marks Avenue/Nielsen Avenue												
NBL	62	2	1	65	0	65	37	1	2	40	0	40
NBT	349	14	8	371	0	371	568	23	16	607	0	607
NBR	70	3	6	79	28	107	36	1	2	39	38	77
SBL	9	0	0	9	0	9	10	0	0	10	0	10
SBT	343	14	8	365	0	365	318	13	7	338	0	338
SBR	34	1	1	36	0	36	20	1	2	23	0	23
EBL	12	0	1	13	0	13	24	1	3	28	0	28
EBT	7	0	0	7	1	8	3	0	1	4	1	5
EBR	42	2	1	45	0	45	41	2	2	45	0	45
WBL	18	1	2	21	7	28	78	3	7	88	9	97
WBT	4	0	0	4	0	4	9	0	1	10	0	10
WBR	10	0	0	10	0	10	11	0	0	11	0	11
North Leg												
Approach	386	15	9	410	0	410	348	14	9	371	0	371
Departure	371	14	9	394	0	394	603	24	19	646	0	646
Total	757	29	18	804	0	804	951	38	28	1,017	0	1,017
South Leg												
Approach	481	19	15	515	28	543	641	25	20	686	38	724
Departure	403	17	11	431	7	438	437	18	16	471	9	480
Total	884	36	26	946	35	981	1,078	43	36	1,157	47	1,204
East Leg												
Approach	32	1	2	35	7	42	98	3	8	109	9	118
Departure	86	3	6	95	29	124	49	1	3	53	39	92
Total	118	4	8	130	36	166	147	4	11	162	48	210
West Leg												
Approach	61	2	2	65	1	66	68	3	6	77	1	78
Departure	100	3	2	105	0	105	66	2	5	73	0	73
Total	161	5	4	170	1	171	134	5	11	150	1	151
Total Approaches												
Approach	960	37	28	1,025	36	1,061	1,155	45	43	1,243	48	1,291
Departure	960	37	28	1,025	36	1,061	1,155	45	43	1,243	48	1,291
Total	1,920	74	56	2,050	72	2,122	2,310	90	86	2,486	96	2,582

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
3 Marks Avenue/Ray Johnson Drive												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	479	19	15	513	28	541	635	25	18	678	38	716
NBR	6	0	13	19	0	19	10	0	3	13	0	13
SBL	3	0	2	5	0	5	4	0	0	4	0	4
SBT	399	16	9	424	7	431	432	17	16	465	9	474
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	8	0	3	11	0	11	17	1	14	32	0	32
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	3	0	0	3	0	3	6	0	2	8	0	8
North Leg												
Approach	402	16	11	429	7	436	436	17	16	469	9	478
Departure	482	19	15	516	28	544	641	25	20	686	38	724
Total	884	35	26	945	35	980	1,078	42	36	1,156	47	1,202
South Leg												
Approach	485	19	28	532	28	560	645	25	21	691	38	729
Departure	407	16	12	435	7	442	449	18	30	497	9	506
Total	892	35	40	967	35	1,002	1,095	43	51	1,189	47	1,235
East Leg												
Approach	11	0	3	14	0	14	23	1	16	40	0	40
Departure	9	0	15	24	0	24	14	0	3	17	0	17
Total	20	0	18	38	0	38	37	1	19	57	0	57
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Total Approaches												
Approach	898	35	42	975	35	1,010	1,105	43	53	1,201	47	1,247
Departure	898	35	42	975	35	1,010	1,105	43	53	1,201	47	1,247
Total	1,796	70	84	1,950	70	2,020	2,209	86	106	2,401	94	2,494

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
4 Marks Avenue/SR-180 Westbound Ramps												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	82	3	21	106	5	111	144	6	14	164	5	169
NBR	11	0	0	11	0	11	15	1	0	16	0	16
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	402	16	3	421	7	428	425	17	10	452	9	461
SBR	24	1	8	33	0	33	23	1	20	44	0	44
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	180	7	6	193	0	193	242	10	18	270	0	270
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	395	16	3	414	23	437	518	21	3	542	32	574
North Leg												
Approach	426	17	11	454	7	461	448	18	30	496	9	505
Departure	477	19	24	520	28	548	662	27	17	706	37	743
Total	903	36	35	974	35	1,009	1,111	45	47	1,203	46	1,248
South Leg												
Approach	93	3	21	117	5	122	159	7	14	180	5	185
Departure	582	23	9	614	7	621	667	27	28	722	9	731
Total	675	26	30	731	12	743	826	34	42	902	14	916
East Leg												
Approach	575	23	9	607	23	630	760	31	21	812	32	844
Departure	11	0	0	11	0	11	15	1	0	16	0	16
Total	586	23	9	618	23	641	775	32	21	828	32	860
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	24	1	8	33	0	33	23	1	20	44	0	44
Total	24	1	8	33	0	33	23	1	20	44	0	44
Total Approaches												
Approach	1,094	43	41	1,178	35	1,213	1,368	56	65	1,489	46	1,534
Departure	1,094	43	41	1,178	35	1,213	1,368	56	65	1,489	46	1,534
Total	2,188	86	82	2,356	70	2,426	2,735	112	130	2,977	92	3,068

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
5 Marks Avenue/SR-180 Eastbound Ramps												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	83	3	3	89	3	92	140	6	3	149	3	152
NBR	223	9	14	246	0	246	266	11	9	286	0	286
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	291	12	6	309	0	309	359	14	18	391	1	392
SBR	291	12	1	304	7	311	308	12	7	327	8	335
EBL	10	0	18	28	2	30	19	1	11	31	2	33
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	11	0	0	11	0	11	20	1	0	21	0	21
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	582	24	7	613	7	620	667	26	25	718	9	727
Departure	93	3	21	117	5	122	159	7	14	180	5	185
Total	675	27	28	730	12	742	826	33	39	898	14	912
South Leg												
Approach	306	12	17	335	3	338	406	17	12	435	3	438
Departure	302	12	6	320	0	320	379	15	18	412	1	413
Total	608	24	23	655	3	658	785	32	30	847	4	851
East Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	223	9	14	246	0	246	266	11	9	286	0	286
Total	223	9	14	246	0	246	266	11	9	286	0	286
West Leg												
Approach	21	0	18	39	2	41	39	2	11	52	2	54
Departure	291	12	1	304	7	311	308	12	7	327	8	335
Total	312	12	19	343	9	352	347	14	18	379	10	389
Total Approaches												
Approach	909	36	42	987	12	999	1,112	45	48	1,205	14	1,219
Departure	909	36	42	987	12	999	1,112	45	48	1,205	14	1,219
Total	1,819	72	84	1,975	24	1,998	2,224	90	96	2,410	28	2,438

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
6 Hughes Avenue/Belmont Avenue												
NBL	6	0	1	7	0	7	14	1	8	23	0	23
NBT	27	1	1	29	1	30	42	2	8	52	1	53
NBR	33	1	4	38	5	43	56	2	20	78	5	83
SBL	26	1	0	27	0	27	40	2	0	42	0	42
SBT	22	1	8	31	3	34	47	2	1	50	5	55
SBR	15	1	0	16	0	16	15	1	0	16	0	16
EBL	20	1	0	21	0	21	37	1	0	38	0	38
EBT	192	8	15	215	3	218	239	10	18	267	4	271
EBR	17	1	8	26	0	26	10	0	1	11	0	11
WBL	27	1	20	48	17	65	43	2	3	48	20	68
WBT	152	6	20	178	12	190	190	8	18	216	15	231
WBR	15	1	0	16	0	16	34	1	0	35	0	35
North Leg												
Approach	63	3	8	74	3	77	102	5	1	108	5	113
Departure	62	3	1	66	1	67	113	4	8	125	1	126
Total	125	6	9	140	4	144	215	9	9	233	6	239
South Leg												
Approach	66	2	6	74	6	80	112	5	36	153	6	159
Departure	66	3	36	105	20	125	100	4	5	109	25	134
Total	132	5	42	179	26	205	212	9	41	262	31	293
East Leg												
Approach	194	8	40	242	29	271	267	11	21	299	35	334
Departure	251	10	19	280	8	288	335	14	38	387	9	396
Total	445	18	59	522	37	559	602	25	59	686	44	730
West Leg												
Approach	229	10	23	262	3	265	286	11	19	316	4	320
Departure	173	7	21	201	12	213	219	10	26	255	15	270
Total	402	17	44	463	15	478	505	21	45	571	19	590
Total Approaches												
Approach	552	23	77	652	41	693	767	32	77	876	50	926
Departure	552	23	77	652	41	693	767	32	77	876	50	926
Total	1,104	46	154	1,304	82	1,386	1,534	64	154	1,752	100	1,852

Table B-2 - Opening Year Cumulative (2023) Peak Hour Volume Summary

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
7 Hughes Avenue/Nielsen Avenue												
NBL	5	0	2	7	4	11	25	1	7	33	6	39
NBT	44	2	4	50	2	52	83	3	35	121	2	123
NBR	1	0	1	2	0	2	3	0	4	7	0	7
SBL	8	0	0	8	2	10	9	0	0	9	2	11
SBT	46	2	34	82	1	83	73	3	4	80	1	81
SBR	10	0	0	10	0	10	13	1	0	14	0	14
EBL	8	0	0	8	0	8	8	0	0	8	0	8
EBT	35	1	0	36	0	36	25	1	1	27	0	27
EBR	24	1	6	31	1	32	11	0	2	13	2	15
WBL	2	0	3	5	0	5	4	0	1	5	0	5
WBT	10	0	0	10	2	12	35	1	0	36	2	38
WBR	8	0	0	8	7	15	14	1	0	15	9	24
North Leg												
Approach	64	2	34	100	3	103	95	4	4	103	3	106
Departure	60	2	4	66	9	75	105	4	35	144	11	155
Total	124	4	38	166	12	178	200	8	39	247	14	261
South Leg												
Approach	50	2	7	59	6	65	111	4	46	161	8	169
Departure	72	3	43	118	2	120	88	3	7	98	3	101
Total	122	5	50	177	8	185	199	7	53	259	11	270
East Leg												
Approach	20	0	3	23	9	32	53	2	1	56	11	67
Departure	44	1	1	46	2	48	37	1	5	43	2	45
Total	64	1	4	69	11	80	90	3	6	99	13	112
West Leg												
Approach	67	2	6	75	1	76	44	1	3	48	2	50
Departure	25	0	2	27	6	33	73	3	7	83	8	91
Total	92	2	8	102	7	109	117	4	10	131	10	141
Total Approaches												
Approach	201	6	50	257	19	276	303	11	54	368	24	392
Departure	201	6	50	257	19	276	303	11	54	368	24	392
Total	402	12	100	514	38	552	606	22	108	736	48	784

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
1 Marks Avenue/Belmont Avenue						
NBL	73	1	74	163	2	165
NBT	288	7	295	654	7	661
NBR	93	3	96	91	4	95
SBL	73	0	73	34	0	34
SBT	471	25	496	290	34	324
SBR	32	0	32	50	0	50
EBL	31	0	31	37	0	37
EBT	239	0	239	220	0	220
EBR	113	7	120	70	9	79
WBL	43	13	56	41	16	57
WBT	104	0	104	182	0	182
WBR	13	0	13	67	0	67
North Leg						
Approach	576	25	601	374	34	408
Departure	332	7	339	758	7	765
Total	908	32	940	1,132	41	1,173
South Leg						
Approach	454	11	465	908	13	921
Departure	627	45	672	401	59	460
Total	1,081	56	1,137	1,309	72	1,381
East Leg						
Approach	160	13	173	290	16	306
Departure	405	3	408	345	4	349
Total	565	16	581	635	20	655
West Leg						
Approach	383	7	390	327	9	336
Departure	209	1	210	395	2	397
Total	592	8	600	722	11	733
Total Approaches						
Approach	1,573	56	1,629	1,899	72	1,971
Departure	1,573	56	1,629	1,899	72	1,971
Total	3,146	112	3,258	3,798	144	3,942

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
2 Marks Avenue/Nielsen Avenue						
NBL	68	0	68	42	0	42
NBT	390	0	390	638	0	638
NBR	93	28	121	41	38	79
SBL	14	0	14	11	0	11
SBT	383	0	383	354	0	354
SBR	39	0	39	24	0	24
EBL	14	0	14	33	0	33
EBT	10	1	11	4	1	5
EBR	46	0	46	47	0	47
WBL	22	7	29	92	9	101
WBT	4	0	4	11	0	11
WBR	11	0	11	12	0	12
North Leg						
Approach	436	0	436	389	0	389
Departure	415	0	415	683	0	683
Total	851	0	851	1,072	0	1,072
South Leg						
Approach	551	28	579	721	38	759
Departure	451	7	458	493	9	502
Total	1,002	35	1,037	1,214	47	1,261
East Leg						
Approach	37	7	44	115	9	124
Departure	117	29	146	56	39	95
Total	154	36	190	171	48	219
West Leg						
Approach	70	1	71	84	1	85
Departure	111	0	111	77	0	77
Total	181	1	182	161	1	162
Total Approaches						
Approach	1,094	36	1,130	1,309	48	1,357
Departure	1,094	36	1,130	1,309	48	1,357
Total	2,188	72	2,260	2,618	96	2,714

Table C-4-Build-Out (2035) Peak Hour Volume Summary

		AM Peak Hour			PM Peak Hour	
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
3	**Marks Avenue/Ray Johnson Drive**					
NBL	0	0	0	0	0	0
NBT	548	28	576	712	38	750
NBR	20	0	20	14	0	14
SBL	5	0	5	4	0	4
SBT	446	7	453	488	9	497
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	12	0	12	34	0	34
WBT	0	0	0	0	0	0
WBR	3	0	3	9	0	9
North Leg						
Approach	451	7	458	492	9	501
Departure	551	28	579	721	38	759
Total	1,002	35	1,037	1,213	47	1,260
South Leg						
Approach	568	28	596	726	38	764
Departure	458	7	465	522	9	531
Total	1,026	35	1,061	1,248	47	1,295
East Leg						
Approach	15	0	15	43	0	43
Departure	25	0	25	18	0	18
Total	40	0	40	61	0	61
West Leg						
Approach	0	0	0	0	0	0
Departure	0	0	0	0	0	0
Total	0	0	0	0	0	0
Total Approaches						
Approach	1,034	35	1,069	1,261	47	1,308
Departure	1,034	35	1,069	1,261	47	1,308
Total	2,068	70	2,138	2,522	94	2,616

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
4 **Marks Avenue/SR-180 Westbound Ramps**						
NBL	0	0	0	0	0	0
NBT	142	5	147	213	5	218
NBR	15	0	15	18	0	18
SBL	0	0	0	0	0	0
SBT	454	7	461	489	9	498
SBR	37	0	37	47	0	47
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	227	0	227	372	0	372
WBT	0	0	0	0	0	0
WBR	453	23	476	588	32	620
North Leg						
Approach	491	7	498	536	9	545
Departure	595	28	623	801	37	838
Total	1,086	35	1,121	1,337	46	1,383
South Leg						
Approach	157	5	162	231	5	236
Departure	681	7	688	861	9	870
Total	838	12	850	1,092	14	1,106
East Leg						
Approach	680	23	703	960	32	992
Departure	15	0	15	18	0	18
Total	695	23	718	978	32	1,010
West Leg						
Approach	0	0	0	0	0	0
Departure	37	0	37	47	0	47
Total	37	0	37	47	0	47
Total Approaches						
Approach	1,328	35	1,363	1,727	46	1,773
Departure	1,328	35	1,363	1,727	46	1,773
Total	2,656	70	2,726	3,454	92	3,546

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
5 Marks Avenue/SR-180 Eastbound Ramps						
NBL	0	0	0	0	0	0
NBT	128	3	131	198	3	201
NBR	358	0	358	296	0	296
SBL	0	0	0	0	0	0
SBT	361	0	361	517	1	518
SBR	320	7	327	344	8	352
EBL	29	2	31	33	2	35
EBT	0	0	0	0	0	0
EBR	11	0	11	22	0	22
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	0	0	0	0	0
North Leg						
Approach	681	7	688	861	9	870
Departure	157	5	162	231	5	236
Total	838	12	850	1,092	14	1,106
South Leg						
Approach	486	3	489	494	3	497
Departure	372	0	372	539	1	540
Total	858	3	861	1,033	4	1,037
East Leg						
Approach	0	0	0	0	0	0
Departure	358	0	358	296	0	296
Total	358	0	358	296	0	296
West Leg						
Approach	40	2	42	55	2	57
Departure	320	7	327	344	8	352
Total	360	9	369	399	10	409
Total Approaches						
Approach	1,207	12	1,219	1,410	14	1,424
Departure	1,207	12	1,219	1,410	14	1,424
Total	2,414	24	2,438	2,820	28	2,848

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
6 Hughes Avenue/Belmont Avenue						
NBL	17	0	17	35	0	35
NBT	93	1	94	55	1	56
NBR	62	5	67	82	5	87
SBL	28	0	28	44	0	44
SBT	47	3	50	107	5	112
SBR	21	0	21	37	0	37
EBL	53	0	53	55	0	55
EBT	276	3	279	281	4	285
EBR	59	0	59	28	0	28
WBL	50	17	67	48	20	68
WBT	187	12	199	233	15	248
WBR	17	0	17	37	0	37
North Leg						
Approach	96	3	99	188	5	193
Departure	163	1	164	147	1	148
Total	259	4	263	335	6	341
South Leg						
Approach	172	6	178	172	6	178
Departure	156	20	176	183	25	208
Total	328	26	354	355	31	386
East Leg						
Approach	254	29	283	318	35	353
Departure	366	8	374	407	9	416
Total	620	37	657	725	44	769
West Leg						
Approach	388	3	391	364	4	368
Departure	225	12	237	305	15	320
Total	613	15	628	669	19	688
Total Approaches						
Approach	910	41	951	1,042	50	1,092
Departure	910	41	951	1,042	50	1,092
Total	1,820	82	1,902	2,084	100	2,184

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
7 Hughes Avenue/Nielsen Avenue						
NBL	7	4	11	35	6	41
NBT	127	2	129	123	2	125
NBR	2	0	2	24	0	24
SBL	18	2	20	16	2	18
SBT	115	1	116	174	1	175
SBR	11	0	11	15	0	15
EBL	24	0	24	8	0	8
EBT	45	0	45	28	0	28
EBR	35	1	36	14	2	16
WBL	5	0	5	27	0	27
WBT	11	2	13	38	2	40
WBR	19	7	26	16	9	25
North Leg						
Approach	144	3	147	205	3	208
Departure	170	9	179	147	11	158
Total	314	12	326	352	14	366
South Leg						
Approach	136	6	142	182	8	190
Departure	155	2	157	215	3	218
Total	291	8	299	397	11	408
East Leg						
Approach	35	9	44	81	11	92
Departure	65	2	67	68	2	70
Total	100	11	111	149	13	162
West Leg						
Approach	104	1	105	50	2	52
Departure	29	6	35	88	8	96
Total	133	7	140	138	10	148
Total Approaches						
Approach	419	19	438	518	24	542
Departure	419	19	438	518	24	542
Total	838	38	876	1,036	48	1,084

Table B-2 - Near-Term Approved and Pending Project (2023) Peak Hour Volume Summary - Worst case

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
3 Marks Avenue/Ray Johnson Drive												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	479	19	15	513	68	581	635	25	18	678	88	766
NBR	6	0	13	19	0	19	10	0	3	13	0	13
SBL	3	0	2	5	0	5	4	0	0	4	0	4
SBT	399	16	9	424	17	441	432	17	16	465	21	486
SBR	0	0	0	0	0	0	0	0	0	0	0	0
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	8	0	3	11	0	11	17	1	14	32	0	32
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	3	0	0	3	0	3	6	0	2	8	0	8
North Leg												
Approach	402	16	11	429	17	446	436	17	16	469	21	490
Departure	482	19	15	516	68	584	641	25	20	686	88	774
Total	884	35	26	945	85	1,030	1,078	42	36	1,156	109	1,264
South Leg												
Approach	485	19	28	532	68	600	645	25	21	691	88	779
Departure	407	16	12	435	17	452	449	18	30	497	21	518
Total	892	35	40	967	85	1,052	1,095	43	51	1,189	109	1,297
East Leg												
Approach	11	0	3	14	0	14	23	1	16	40	0	40
Departure	9	0	15	24	0	24	14	0	3	17	0	17
Total	20	0	18	38	0	38	37	1	19	57	0	57
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0
Total Approaches												
Approach	898	35	42	975	85	1,060	1,105	43	53	1,201	109	1,309
Departure	898	35	42	975	85	1,060	1,105	43	53	1,201	109	1,309
Total	1,796	70	84	1,950	170	2,120	2,209	86	106	2,401	218	2,618

Table B-2 - Near-Term Approved and Pending Project (2023) Peak Hour Volume Summary - Worst case

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
4 Marks Avenue/SR-180 Westbound Ramps												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	82	3	21	106	5	111	144	6	14	164	7	171
NBR	11	0	0	11	0	11	15	1	0	16	0	16
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	402	16	3	421	17	438	425	17	10	452	20	472
SBR	24	1	8	33	0	33	23	1	20	44	0	44
EBL	0	0	0	0	0	0	0	0	0	0	0	0
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	0	0	0	0	0	0	0	0	0	0	0	0
WBL	180	7	6	193	0	193	242	10	18	270	0	270
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	395	16	3	414	63	477	518	21	3	542	82	624
North Leg												
Approach	426	17	11	454	17	471	448	18	30	496	20	516
Departure	477	19	24	520	68	588	662	27	17	706	89	795
Total	903	36	35	974	85	1,059	1,111	45	47	1,203	109	1,311
South Leg												
Approach	93	3	21	117	5	122	159	7	14	180	7	187
Departure	582	23	9	614	17	631	667	27	28	722	20	742
Total	675	26	30	731	22	753	826	34	42	902	27	929
East Leg												
Approach	575	23	9	607	63	670	760	31	21	812	82	894
Departure	11	0	0	11	0	11	15	1	0	16	0	16
Total	586	23	9	618	63	681	775	32	21	828	82	910
West Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	24	1	8	33	0	33	23	1	20	44	0	44
Total	24	1	8	33	0	33	23	1	20	44	0	44
Total Approaches												
Approach	1,094	43	41	1,178	85	1,263	1,368	56	65	1,489	109	1,597
Departure	1,094	43	41	1,178	85	1,263	1,368	56	65	1,489	109	1,597
Total	2,188	86	82	2,356	170	2,526	2,735	112	130	2,977	218	3,194

Table B-2 - Near-Term Approved and Pending Project (2023) Peak Hour Volume Summary - Worst case

	AM Peak Hour						PM Peak Hour					
	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project	Existing Without Project	2021-2023 Growth	Cumulative Projects Trips	Cumul Without Project	Net Project Trips	Cumul With Project
5 Marks Avenue/SR-180 Eastbound Ramps												
NBL	0	0	0	0	0	0	0	0	0	0	0	0
NBT	83	3	3	89	3	92	140	6	3	149	3	152
NBR	223	9	14	246	0	246	266	11	9	286	0	286
SBL	0	0	0	0	0	0	0	0	0	0	0	0
SBT	291	12	6	309	0	309	359	14	18	391	0	391
SBR	291	12	1	304	16	320	308	12	7	327	20	347
EBL	10	0	18	28	3	31	19	1	11	31	3	34
EBT	0	0	0	0	0	0	0	0	0	0	0	0
EBR	11	0	0	11	0	11	20	1	0	21	0	21
WBL	0	0	0	0	0	0	0	0	0	0	0	0
WBT	0	0	0	0	0	0	0	0	0	0	0	0
WBR	0	0	0	0	0	0	0	0	0	0	0	0
North Leg												
Approach	582	24	7	613	16	629	667	26	25	718	20	738
Departure	93	3	21	117	6	123	159	7	14	180	6	186
Total	675	27	28	730	22	752	826	33	39	898	26	924
South Leg												
Approach	306	12	17	335	3	338	406	17	12	435	3	438
Departure	302	12	6	320	0	320	379	15	18	412	0	412
Total	608	24	23	655	3	658	785	32	30	847	3	850
East Leg												
Approach	0	0	0	0	0	0	0	0	0	0	0	0
Departure	223	9	14	246	0	246	266	11	9	286	0	286
Total	223	9	14	246	0	246	266	11	9	286	0	286
West Leg												
Approach	21	0	18	39	3	42	39	2	11	52	3	55
Departure	291	12	1	304	16	320	308	12	7	327	20	347
Total	312	12	19	343	19	362	347	14	18	379	23	402
Total Approaches												
Approach	909	36	42	987	22	1,009	1,112	45	48	1,205	26	1,231
Departure	909	36	42	987	22	1,009	1,112	45	48	1,205	26	1,231
Total	1,819	72	84	1,975	44	2,018	2,224	90	96	2,410	52	2,462

Table C-4-Build-Out (2035) Peak Hour Volume Summary

		AM Peak Hour			PM Peak Hour		
		Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
3	**Marks Avenue/Ray Johnson Drive**						
NBL		0	0	0	0	0	0
NBT		548	68	616	712	88	800
NBR		20	0	20	14	0	14
SBL		5	0	5	4	0	4
SBT		446	17	463	488	21	509
SBR		0	0	0	0	0	0
EBL		0	0	0	0	0	0
EBT		0	0	0	0	0	0
EBR		0	0	0	0	0	0
WBL		12	0	12	34	0	34
WBT		0	0	0	0	0	0
WBR		3	0	3	9	0	9
North Leg							
	Approach	451	17	468	492	21	513
	Departure	551	68	619	721	88	809
	Total	1,002	85	1,087	1,213	109	1,322
South Leg							
	Approach	568	68	636	726	88	814
	Departure	458	17	475	522	21	543
	Total	1,026	85	1,111	1,248	109	1,357
East Leg							
	Approach	15	0	15	43	0	43
	Departure	25	0	25	18	0	18
	Total	40	0	40	61	0	61
West Leg							
	Approach	0	0	0	0	0	0
	Departure	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Total Approaches							
	Approach	1,034	85	1,119	1,261	109	1,370
	Departure	1,034	85	1,119	1,261	109	1,370
	Total	2,068	170	2,238	2,522	218	2,740

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
4 Marks Avenue/SR-180 Westbound Ramps						
NBL	0	0	0	0	0	0
NBT	142	5	147	213	7	220
NBR	15	0	15	18	0	18
SBL	0	0	0	0	0	0
SBT	454	17	471	489	20	509
SBR	37	0	37	47	0	47
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	227	0	227	372	0	372
WBT	0	0	0	0	0	0
WBR	453	63	516	588	82	670
North Leg						
Approach	491	17	508	536	20	556
Departure	595	68	663	801	89	890
Total	1,086	85	1,171	1,337	109	1,446
South Leg						
Approach	157	5	162	231	7	238
Departure	681	17	698	861	20	881
Total	838	22	860	1,092	27	1,119
East Leg						
Approach	680	63	743	960	82	1,042
Departure	15	0	15	18	0	18
Total	695	63	758	978	82	1,060
West Leg						
Approach	0	0	0	0	0	0
Departure	37	0	37	47	0	47
Total	37	0	37	47	0	47
Total Approaches						
Approach	1,328	85	1,413	1,727	109	1,836
Departure	1,328	85	1,413	1,727	109	1,836
Total	2,656	170	2,826	3,454	218	3,672

Table C-4-Build-Out (2035) Peak Hour Volume Summary

	AM Peak Hour			PM Peak Hour		
	Build-Out Without Project	Net Project Trips	Build-Out With Project	Build-Out Without Project	Net Project Trips	Build-Out With Project
5 Marks Avenue/SR-180 Eastbound Ramps						
NBL	0	0	0	0	0	0
NBT	128	3	131	198	3	201
NBR	358	0	358	296	0	296
SBL	0	0	0	0	0	0
SBT	361	0	361	517	0	517
SBR	320	16	336	344	20	364
EBL	29	3	32	33	3	36
EBT	0	0	0	0	0	0
EBR	11	0	11	22	0	22
WBL	0	0	0	0	0	0
WBT	0	0	0	0	0	0
WBR	0	0	0	0	0	0
North Leg						
Approach	681	16	697	861	20	881
Departure	157	6	163	231	6	237
Total	838	22	860	1,092	26	1,118
South Leg						
Approach	486	3	489	494	3	497
Departure	372	0	372	539	0	539
Total	858	3	861	1,033	3	1,036
East Leg						
Approach	0	0	0	0	0	0
Departure	358	0	358	296	0	296
Total	358	0	358	296	0	296
West Leg						
Approach	40	3	43	55	3	58
Departure	320	16	336	344	20	364
Total	360	19	379	399	23	422
Total Approaches						
Approach	1,207	22	1,229	1,410	26	1,436
Departure	1,207	22	1,229	1,410	26	1,436
Total	2,414	44	2,458	2,820	52	2,872

APPENDIX D:

INTERSECTION LEVEL OF SERVICE WORKSHEETS

Intersection	
Intersection Delay, s/veh	18.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	24	127	87	39	78	11	49	261	67	39	424	28
Future Vol, veh/h	24	127	87	39	78	11	49	261	67	39	424	28
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	29	153	105	47	94	13	59	314	81	47	511	34
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	13.8	13.3	20.6	21.1
HCM LOS	B	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	33%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	67%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	261	67	24	85	129	39	78	11	39	283
LT Vol	49	0	0	24	0	0	39	0	0	39	0
Through Vol	0	261	0	0	85	42	0	78	0	0	283
RT Vol	0	0	67	0	0	87	0	0	11	0	0
Lane Flow Rate	59	314	81	29	102	156	47	94	13	47	341
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.134	0.67	0.156	0.07	0.233	0.335	0.118	0.224	0.029	0.103	0.702
Departure Headway (Hd)	8.168	7.668	6.968	8.716	8.216	7.745	9.074	8.574	7.874	7.917	7.417
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	439	472	513	410	437	463	394	418	453	452	487
Service Time	5.927	5.427	4.727	6.482	5.982	5.511	6.847	6.347	5.647	5.672	5.172
HCM Lane V/C Ratio	0.134	0.665	0.158	0.071	0.233	0.337	0.119	0.225	0.029	0.104	0.7
HCM Control Delay	12.2	24.7	11	12.1	13.5	14.4	13.1	13.8	10.9	11.6	25.9
HCM Lane LOS	B	C	B	B	B	B	B	B	B	B	D
HCM 95th-tile Q	0.5	4.9	0.5	0.2	0.9	1.5	0.4	0.8	0.1	0.3	5.4

HCM 6th Signalized Intersection Summary
2: Marks Avenue & Nielsen Avenue

2740 West Nielsen Warehouse
Exist_NP_AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	12	7	42	18	4	10	62	349	70	9	343	34
Future Volume (veh/h)	12	7	42	18	4	10	62	349	70	9	343	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	15	9	52	22	5	12	77	431	86	11	423	42
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	169	140	118	163	140	118	123	2716	1211	38	2545	1135
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.75	0.02	0.71	0.71
Sat Flow, veh/h	1418	1900	1610	1363	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	15	9	52	22	5	12	77	431	86	11	423	42
Grp Sat Flow(s),veh/h/ln	1418	1900	1610	1363	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.0	0.5	3.2	1.6	0.3	0.7	4.3	3.5	1.5	0.6	4.1	0.8
Cycle Q Clear(g_c), s	1.3	0.5	3.2	2.1	0.3	0.7	4.3	3.5	1.5	0.6	4.1	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	169	140	118	163	140	118	123	2716	1211	38	2545	1135
V/C Ratio(X)	0.09	0.06	0.44	0.14	0.04	0.10	0.62	0.16	0.07	0.29	0.17	0.04
Avail Cap(c_a), veh/h	661	798	676	635	798	676	260	2716	1211	260	2545	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	45.3	46.6	46.2	45.2	45.4	47.6	3.7	3.4	50.6	5.2	4.7
Incr Delay (d2), s/veh	0.5	0.5	5.9	0.9	0.2	0.9	1.9	0.1	0.1	1.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.2	1.5	0.6	0.1	0.3	2.0	1.0	0.4	0.3	1.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	45.7	52.5	47.1	45.4	46.3	49.5	3.8	3.5	52.2	5.3	4.8
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		76			39			594			476	
Approach Delay, s/veh		50.5			46.6			9.7			6.3	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	79.3		13.6	7.1	84.3		13.6
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	6.3	6.1		4.1	2.6	5.5		5.2
Green Ext Time (p_c), s	0.0	5.7		0.2	0.0	6.1		0.6

Intersection Summary			
HCM 6th Ctrl Delay			12.2
HCM 6th LOS			B

HCM 6th Signalized Intersection Summary

2740 West Nielsen Warehouse

3: Marks Avenue & Ray Johnson Drive

Exist_NP_AM

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	8	3	479	6	3	399
Future Volume (veh/h)	8	3	479	6	3	399
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	10	4	599	8	4	499
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	48	43	2913	39	15	3094
Arrive On Green	0.03	0.03	0.80	0.80	0.01	0.86
Sat Flow, veh/h	1810	1610	3743	49	1810	3705
Grp Volume(v), veh/h	10	4	296	311	4	499
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1891	1810	1805
Q Serve(g_s), s	0.4	0.2	3.2	3.2	0.2	1.8
Cycle Q Clear(g_c), s	0.4	0.2	3.2	3.2	0.2	1.8
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	48	43	1441	1510	15	3094
V/C Ratio(X)	0.21	0.09	0.21	0.21	0.26	0.16
Avail Cap(c_a), veh/h	588	523	1441	1510	362	3094
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.88	0.88	0.99	0.99
Uniform Delay (d), s/veh	38.1	38.0	1.9	1.9	39.4	0.9
Incr Delay (d2), s/veh	4.4	2.0	0.3	0.3	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.4	0.5	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.5	40.0	2.2	2.2	42.6	1.1
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	14		607			503
Approach Delay, s/veh	41.8		2.2			1.4
Approach LOS	D		A			A
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.9		6.1	4.7	69.2
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.8		2.4	2.2	5.2
Green Ext Time (p_c), s		5.3		0.0	0.0	5.0
Intersection Summary						
HCM 6th Ctrl Delay			2.3			
HCM 6th LOS			A			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	180	0	395	0	82	11	0	402	24
Future Volume (veh/h)	0	0	0	180	0	395	0	82	11	0	402	24
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				250	0	549	0	114	0	0	558	0
Peak Hour Factor				0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1071	0	953	0	1981		0	1981	
Arrive On Green				0.30	0.00	0.30	0.00	0.55	0.00	0.00	0.55	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				250	0	549	0	114	0	0	558	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.4	0.0	12.3	0.0	1.3	0.0	0.0	7.0	0.0
Cycle Q Clear(g_c), s				4.4	0.0	12.3	0.0	1.3	0.0	0.0	7.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1071	0	953	0	1981		0	1981	
V/C Ratio(X)				0.23	0.00	0.58	0.00	0.06		0.00	0.28	
Avail Cap(c_a), veh/h				1516	0	1349	0	1981		0	1981	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				22.6	0.0	25.4	0.0	8.9	0.0	0.0	10.2	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.5	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	4.7	0.0	0.4	0.0	0.0	2.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.1	0.0	27.9	0.0	9.0	0.0	0.0	10.6	0.0
LnGrp LOS				C	A	C	A	A		A	B	
Approach Vol, veh/h					799			114	A		558	A
Approach Delay, s/veh					26.4			9.0			10.6	
Approach LOS					C			A			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		53.4				53.4		31.6				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		3.3				9.0		14.3				
Green Ext Time (p_c), s		1.8				9.9		10.8				

Intersection Summary			
HCM 6th Ctrl Delay			19.1
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	10	0	11	0	0	0	0	83	223	0	291	291
Future Volume (veh/h)	10	0	11	0	0	0	0	83	223	0	291	291
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	11	0	12				0	90	0	0	316	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	76	0	67				0	1420		0	2698	
Arrive On Green	0.04	0.00	0.04				0.00	0.75	0.00	0.00	0.75	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	11	0	12				0	90	0	0	316	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	0.4	0.0	0.5				0.0	0.8	0.0	0.0	1.6	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.5				0.0	0.8	0.0	0.0	1.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	76	0	67				0	1420		0	2698	
V/C Ratio(X)	0.15	0.00	0.18				0.00	0.06		0.00	0.12	
Avail Cap(c_a), veh/h	646	0	575				0	1420		0	2698	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.97	0.00
Uniform Delay (d), s/veh	30.0	0.0	30.1				0.0	2.2	0.0	0.0	2.3	0.0
Incr Delay (d2), s/veh	4.0	0.0	5.7				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.3				0.0	0.1	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	35.8				0.0	2.3	0.0	0.0	2.4	0.0
LnGrp LOS	C	A	D				A	A		A	A	
Approach Vol, veh/h		23						90	A		316	A
Approach Delay, s/veh		34.9						2.3			2.4	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		55.5		9.5		55.5
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		2.8		2.5		3.6
Green Ext Time (p_c), s		1.1		0.1		5.1

Intersection Summary	
HCM 6th Ctrl Delay	4.1
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			↰↑↱			↰↑↱	
Traffic Vol, veh/h	20	192	17	27	152	15	6	27	33	26	22	15
Future Vol, veh/h	20	192	17	27	152	15	6	27	33	26	22	15
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	211	19	30	167	16	7	30	36	29	24	16
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Righ	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	8.8	8.6	8.7	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	9%	100%	0%	0%	100%	0%	0%	41%
Vol Thru, %	41%	0%	100%	79%	0%	100%	77%	35%
Vol Right, %	50%	0%	0%	21%	0%	0%	23%	24%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	20	128	81	27	101	66	63
LT Vol	6	20	0	0	27	0	0	26
Through Vol	27	0	128	64	0	101	51	22
RT Vol	33	0	0	17	0	0	15	15
Lane Flow Rate	73	22	141	89	30	111	72	69
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.107	0.034	0.199	0.122	0.046	0.159	0.1	0.109
Departure Headway (Hd)	5.32	5.601	5.098	4.95	5.636	5.133	4.972	5.662
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	671	638	703	723	635	697	719	631
Service Time	3.072	3.342	2.838	2.69	3.377	2.874	2.713	3.415
HCM Lane V/C Ratio	0.109	0.034	0.201	0.123	0.047	0.159	0.1	0.109
HCM Control Delay	8.7	8.5	9.1	8.4	8.7	8.8	8.3	9.1
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.7	0.4	0.1	0.6	0.3	0.4

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	35	24	2	10	8	5	44	1	8	46	10
Future Vol, veh/h	8	35	24	2	10	8	5	44	1	8	46	10
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	42	29	2	12	10	6	52	1	10	55	12
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	7.7	7.5	8.3	7.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	10%	100%	0%	100%	0%	15%	0%
Vol Thru, %	88%	0%	59%	0%	56%	85%	0%
Vol Right, %	2%	0%	41%	0%	44%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	8	59	2	18	54	10
LT Vol	5	8	0	2	0	8	0
Through Vol	44	0	35	0	10	46	0
RT Vol	1	0	24	0	8	0	10
Lane Flow Rate	60	10	70	2	21	64	12
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.08	0.014	0.089	0.004	0.027	0.085	0.013
Departure Headway (Hd)	4.842	5.359	4.572	5.407	4.593	4.779	4.004
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	743	671	787	665	783	739	878
Service Time	2.848	3.064	2.277	3.112	2.298	2.578	1.803
HCM Lane V/C Ratio	0.081	0.015	0.089	0.003	0.027	0.087	0.014
HCM Control Delay	8.3	8.1	7.7	8.1	7.4	8	6.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0	0.3	0	0.1	0.3	0

Intersection	
Intersection Delay, s/veh	95.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	24	174	63	36	126	53	97	589	76	25	259	26
Future Vol, veh/h	24	174	63	36	126	53	97	589	76	25	259	26
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	27	198	72	41	143	60	110	669	86	28	294	30
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	15.7	15.5	176.8	17.1
HCM LOS	C	C	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	48%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	52%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	97	589	76	24	116	121	36	126	53	25	173
LT Vol	97	0	0	24	0	0	36	0	0	25	0
Through Vol	0	589	0	0	116	58	0	126	0	0	173
RT Vol	0	0	76	0	0	63	0	0	53	0	0
Lane Flow Rate	110	669	86	27	132	138	41	143	60	28	196
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.25	1.426	0.167	0.069	0.317	0.317	0.105	0.35	0.136	0.07	0.459
Departure Headway (Hd)	8.171	7.671	6.971	9.747	9.247	8.882	9.896	9.396	8.696	9.426	8.926
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	475	516	370	391	407	365	385	415	382	406
Service Time	5.904	5.404	4.704	7.447	6.947	6.582	7.596	7.096	6.396	7.126	6.626
HCM Lane V/C Ratio	0.249	1.408	0.167	0.073	0.338	0.339	0.112	0.371	0.145	0.073	0.483
HCM Control Delay	13.6	225.1	11.1	13.2	16.2	15.7	13.8	17.1	12.8	12.8	19
HCM Lane LOS	B	F	B	B	C	C	B	C	B	B	C
HCM 95th-tile Q	1	32.6	0.6	0.2	1.3	1.3	0.3	1.5	0.5	0.2	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	24	3	41	78	9	11	37	568	36	10	318	20
Future Volume (veh/h)	24	3	41	78	9	11	37	568	36	10	318	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	25	3	43	81	9	11	39	592	38	10	331	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	181	160	135	183	160	135	94	2683	1197	35	2566	1145
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.08	0.05	0.74	0.74	0.02	0.71	0.71
Sat Flow, veh/h	1414	1900	1610	1381	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	25	3	43	81	9	11	39	592	38	10	331	21
Grp Sat Flow(s),veh/h/ln	1414	1900	1610	1381	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.7	0.2	2.6	6.0	0.5	0.7	2.2	5.3	0.7	0.6	3.1	0.4
Cycle Q Clear(g_c), s	2.2	0.2	2.6	6.2	0.5	0.7	2.2	5.3	0.7	0.6	3.1	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	181	160	135	183	160	135	94	2683	1197	35	2566	1145
V/C Ratio(X)	0.14	0.02	0.32	0.44	0.06	0.08	0.42	0.22	0.03	0.29	0.13	0.02
Avail Cap(c_a), veh/h	656	798	676	647	798	676	260	2683	1197	260	2566	1145
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.3	44.1	45.2	46.9	44.3	44.3	48.2	4.1	3.5	50.8	4.8	4.4
Incr Delay (d2), s/veh	0.8	0.1	3.1	3.9	0.3	0.6	1.1	0.2	0.0	1.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	1.1	2.2	0.2	0.3	1.0	1.5	0.2	0.3	0.9	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	44.2	48.4	50.9	44.6	44.9	49.3	4.3	3.6	52.4	4.9	4.5
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		71			101			669			362	
Approach Delay, s/veh		47.4			49.7			6.9			6.2	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	79.9		14.7	6.9	83.3		14.7
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	4.2	5.1		8.2	2.6	7.3		4.6
Green Ext Time (p_c), s	0.0	4.3		0.7	0.0	7.6		0.5

Intersection Summary			
HCM 6th Ctrl Delay			12.7
HCM 6th LOS			B

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	17	6	635	10	4	432
Future Volume (veh/h)	17	6	635	10	4	432
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	18	7	690	11	4	470
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	77	69	2846	45	15	3036
Arrive On Green	0.04	0.04	0.78	0.78	0.01	0.84
Sat Flow, veh/h	1810	1610	3732	58	1810	3705
Grp Volume(v), veh/h	18	7	342	359	4	470
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1890	1810	1805
Q Serve(g_s), s	0.8	0.3	4.1	4.1	0.2	1.9
Cycle Q Clear(g_c), s	0.8	0.3	4.1	4.1	0.2	1.9
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	77	69	1413	1479	15	3036
V/C Ratio(X)	0.23	0.10	0.24	0.24	0.26	0.15
Avail Cap(c_a), veh/h	588	523	1413	1479	362	3036
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.88	0.88	0.99	0.99
Uniform Delay (d), s/veh	37.0	36.8	2.3	2.3	39.4	1.2
Incr Delay (d2), s/veh	3.3	1.4	0.4	0.3	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	0.7	0.7	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.3	38.2	2.7	2.7	42.6	1.3
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	25		701			474
Approach Delay, s/veh	39.7		2.7			1.6
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		72.6		7.4	4.7	67.9
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.9		2.8	2.2	6.1
Green Ext Time (p_c), s		5.0		0.1	0.0	5.7

Intersection Summary			
HCM 6th Ctrl Delay			3.0
HCM 6th LOS			A

4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	242	0	518	0	144	15	0	425	23
Future Volume (veh/h)	0	0	0	242	0	518	0	144	15	0	425	23
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				299	0	640	0	178	0	0	525	0
Peak Hour Factor				0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1190	0	1059	0	1862		0	1862	
Arrive On Green				0.33	0.00	0.33	0.00	0.52	0.00	0.00	0.52	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				299	0	640	0	178	0	0	525	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				5.1	0.0	14.2	0.0	2.1	0.0	0.0	7.0	0.0
Cycle Q Clear(g_c), s				5.1	0.0	14.2	0.0	2.1	0.0	0.0	7.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1190	0	1059	0	1862		0	1862	
V/C Ratio(X)				0.25	0.00	0.60	0.00	0.10		0.00	0.28	
Avail Cap(c_a), veh/h				1516	0	1349	0	1862		0	1862	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				20.9	0.0	23.9	0.0	10.5	0.0	0.0	11.7	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.6	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.1	0.0	5.3	0.0	0.8	0.0	0.0	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.4	0.0	26.5	0.0	10.6	0.0	0.0	12.0	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					939			178	A		525	A
Approach Delay, s/veh					24.8			10.6			12.0	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		50.7				50.7		34.3				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		4.1				9.0		16.2				
Green Ext Time (p_c), s		3.0				9.3		11.8				

Intersection Summary			
HCM 6th Ctrl Delay			19.2
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

5: Marks Avenue & SR-180 Eastbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	19	0	20	0	0	0	0	140	266	0	359	308
Future Volume (veh/h)	19	0	20	0	0	0	0	140	266	0	359	308
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	21	0	22				0	152	0	0	390	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	120	0	107				0	1373		0	2609	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	21	0	22				0	152	0	0	390	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	0.7	0.0	0.8				0.0	1.6	0.0	0.0	2.2	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.8				0.0	1.6	0.0	0.0	2.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	120	0	107				0	1373		0	2609	
V/C Ratio(X)	0.17	0.00	0.21				0.00	0.11		0.00	0.15	
Avail Cap(c_a), veh/h	646	0	575				0	1373		0	2609	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.97	0.00
Uniform Delay (d), s/veh	28.7	0.0	28.7				0.0	2.7	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	3.1	0.0	4.3				0.0	0.2	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4				0.0	0.3	0.0	0.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	33.0				0.0	2.9	0.0	0.0	2.9	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		43						152	A		390	A
Approach Delay, s/veh		32.4						2.9			2.9	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		53.9		11.1		53.9
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		3.6		2.8		4.2
Green Ext Time (p_c), s		2.1		0.3		6.4

Intersection Summary	
HCM 6th Ctrl Delay	5.1
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✣			✣	
Traffic Vol, veh/h	37	239	10	43	190	34	14	42	56	40	47	15
Future Vol, veh/h	37	239	10	43	190	34	14	42	56	40	47	15
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	45	291	12	52	232	41	17	51	68	49	57	18
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	10.5	10	10.7	11.1
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	12%	100%	0%	0%	100%	0%	0%	39%
Vol Thru, %	38%	0%	100%	89%	0%	100%	65%	46%
Vol Right, %	50%	0%	0%	11%	0%	0%	35%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	112	37	159	90	43	127	97	102
LT Vol	14	37	0	0	43	0	0	40
Through Vol	42	0	159	80	0	127	63	47
RT Vol	56	0	0	10	0	0	34	15
Lane Flow Rate	137	45	194	109	52	154	119	124
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.231	0.079	0.313	0.173	0.092	0.25	0.184	0.224
Departure Headway (Hd)	6.088	6.297	5.79	5.711	6.329	5.822	5.574	6.479
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	589	569	622	628	566	616	643	554
Service Time	3.832	4.034	3.526	3.447	4.067	3.56	3.311	4.223
HCM Lane V/C Ratio	0.233	0.079	0.312	0.174	0.092	0.25	0.185	0.224
HCM Control Delay	10.7	9.6	11.2	9.6	9.7	10.5	9.6	11.1
HCM Lane LOS	B	A	B	A	A	B	A	B
HCM 95th-tile Q	0.9	0.3	1.3	0.6	0.3	1	0.7	0.9

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	25	11	4	35	14	25	83	3	9	73	13
Future Vol, veh/h	8	25	11	4	35	14	25	83	3	9	73	13
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	30	13	5	43	17	30	101	4	11	89	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.1	8.2	9.1	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	23%	100%	0%	100%	0%	11%	0%
Vol Thru, %	75%	0%	69%	0%	71%	89%	0%
Vol Right, %	3%	0%	31%	0%	29%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	8	36	4	49	82	13
LT Vol	25	8	0	4	0	9	0
Through Vol	83	0	25	0	35	73	0
RT Vol	3	0	11	0	14	0	13
Lane Flow Rate	135	10	44	5	60	100	16
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.187	0.015	0.061	0.008	0.083	0.138	0.019
Departure Headway (Hd)	4.964	5.701	4.983	5.691	4.986	4.973	4.216
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	724	629	720	630	719	723	850
Service Time	2.984	3.426	2.707	3.414	2.709	2.693	1.936
HCM Lane V/C Ratio	0.186	0.016	0.061	0.008	0.083	0.138	0.019
HCM Control Delay	9.1	8.5	8	8.5	8.2	8.5	7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.7	0	0.2	0	0.3	0.5	0.1

Intersection	
Intersection Delay, s/veh	20.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	24	127	94	52	78	11	50	268	70	39	449	28
Future Vol, veh/h	24	127	94	52	78	11	50	268	70	39	449	28
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	29	153	113	63	94	13	60	323	84	47	541	34
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	14.5	13.8	22.8	24.4
HCM LOS	B	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	31%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	69%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	50	268	70	24	85	136	52	78	11	39	299
LT Vol	50	0	0	24	0	0	52	0	0	39	0
Through Vol	0	268	0	0	85	42	0	78	0	0	299
RT Vol	0	0	70	0	0	94	0	0	11	0	0
Lane Flow Rate	60	323	84	29	102	164	63	94	13	47	361
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.14	0.707	0.168	0.072	0.239	0.363	0.162	0.229	0.03	0.106	0.761
Departure Headway (Hd)	8.384	7.884	7.184	8.947	8.447	7.965	9.287	8.787	8.087	8.099	7.599
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	459	498	399	424	450	385	407	441	442	476
Service Time	6.153	5.653	4.953	6.723	6.223	5.74	7.071	6.571	5.871	5.863	5.363
HCM Lane V/C Ratio	0.141	0.704	0.169	0.073	0.241	0.364	0.164	0.231	0.029	0.106	0.758
HCM Control Delay	12.5	27.7	11.4	12.4	13.9	15.3	13.9	14.2	11.1	11.8	30.9
HCM Lane LOS	B	D	B	B	B	C	B	B	B	B	D
HCM 95th-tile Q	0.5	5.4	0.6	0.2	0.9	1.6	0.6	0.9	0.1	0.4	6.5

2: Marks Avenue & Nielsen Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	12	8	42	25	4	10	62	349	98	9	343	34
Future Volume (veh/h)	12	8	42	25	4	10	62	349	98	9	343	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	15	10	52	31	5	12	77	431	121	11	423	42
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	141	119	163	141	119	123	2713	1210	38	2543	1134
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.75	0.02	0.70	0.70
Sat Flow, veh/h	1418	1900	1610	1362	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	15	10	52	31	5	12	77	431	121	11	423	42
Grp Sat Flow(s),veh/h/ln	1418	1900	1610	1362	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.0	0.5	3.2	2.3	0.3	0.7	4.3	3.5	2.1	0.6	4.1	0.8
Cycle Q Clear(g_c), s	1.3	0.5	3.2	2.8	0.3	0.7	4.3	3.5	2.1	0.6	4.1	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	170	141	119	163	141	119	123	2713	1210	38	2543	1134
V/C Ratio(X)	0.09	0.07	0.44	0.19	0.04	0.10	0.62	0.16	0.10	0.29	0.17	0.04
Avail Cap(c_a), veh/h	661	798	676	634	798	676	260	2713	1210	260	2543	1134
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	45.2	46.5	46.5	45.1	45.3	47.6	3.7	3.5	50.6	5.2	4.7
Incr Delay (d2), s/veh	0.5	0.5	5.8	1.3	0.2	0.9	1.9	0.1	0.2	1.6	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	1.5	0.8	0.1	0.3	2.0	1.0	0.5	0.3	1.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	45.7	52.3	47.9	45.4	46.2	49.5	3.8	3.7	52.2	5.3	4.8
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		77			48			629			476	
Approach Delay, s/veh		50.3			47.2			9.4			6.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.1	79.3		13.7	7.1	84.2		13.7				
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9				
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1				
Max Q Clear Time (g_c+I1), s	6.3	6.1		4.8	2.6	5.5		5.2				
Green Ext Time (p_c), s	0.0	5.7		0.3	0.0	6.4		0.6				

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	8	3	507	6	3	406
Future Volume (veh/h)	8	3	507	6	3	406
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	10	4	634	8	4	508
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	48	43	2915	37	15	3094
Arrive On Green	0.03	0.03	0.80	0.80	0.01	0.86
Sat Flow, veh/h	1810	1610	3746	46	1810	3705
Grp Volume(v), veh/h	10	4	313	329	4	508
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1892	1810	1805
Q Serve(g_s), s	0.4	0.2	3.4	3.4	0.2	1.9
Cycle Q Clear(g_c), s	0.4	0.2	3.4	3.4	0.2	1.9
Prop In Lane	1.00	1.00		0.02	1.00	
Lane Grp Cap(c), veh/h	48	43	1441	1511	15	3094
V/C Ratio(X)	0.21	0.09	0.22	0.22	0.26	0.16
Avail Cap(c_a), veh/h	588	523	1441	1511	362	3094
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	0.99	0.99
Uniform Delay (d), s/veh	38.1	38.0	2.0	2.0	39.4	1.0
Incr Delay (d2), s/veh	4.4	2.0	0.3	0.3	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.5	0.5	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.5	40.0	2.3	2.3	42.6	1.1
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	14		642			512
Approach Delay, s/veh	41.8		2.3			1.4
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.9		6.1	4.7	69.2
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.9		2.4	2.2	5.4
Green Ext Time (p_c), s		5.5		0.0	0.0	5.3

Intersection Summary			
HCM 6th Ctrl Delay			2.4
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↰	↗↗		↑↑	↗		↑↱	
Traffic Volume (veh/h)	0	0	0	180	0	418	0	87	11	0	409	24
Future Volume (veh/h)	0	0	0	180	0	418	0	87	11	0	409	24
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				250	0	581	0	121	0	0	568	0
Peak Hour Factor				0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1108	0	986	0	1944		0	1944	
Arrive On Green				0.31	0.00	0.31	0.00	0.54	0.00	0.00	0.54	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				250	0	581	0	121	0	0	568	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.4	0.0	13.0	0.0	1.4	0.0	0.0	7.3	0.0
Cycle Q Clear(g_c), s				4.4	0.0	13.0	0.0	1.4	0.0	0.0	7.3	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1108	0	986	0	1944		0	1944	
V/C Ratio(X)				0.23	0.00	0.59	0.00	0.06		0.00	0.29	
Avail Cap(c_a), veh/h				1516	0	1349	0	1944		0	1944	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				22.0	0.0	25.0	0.0	9.4	0.0	0.0	10.7	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.6	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	4.9	0.0	0.5	0.0	0.0	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.5	0.0	27.6	0.0	9.4	0.0	0.0	11.1	0.0
LnGrp LOS				C	A	C	A	A		A	B	
Approach Vol, veh/h					831			121	A		568	A
Approach Delay, s/veh					26.0			9.4			11.1	
Approach LOS					C			A			B	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		52.6				52.6		32.4
Change Period (Y+Rc), s		6.8				6.8		6.4
Max Green Setting (Gmax), s		36.2				36.2		35.6
Max Q Clear Time (g_c+I1), s		3.4				9.3		15.0
Green Ext Time (p_c), s		1.9				10.1		11.0

Intersection Summary	
HCM 6th Ctrl Delay	19.1
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
5: Marks Avenue & SR-180 Eastbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	12	0	11	0	0	0	0	86	223	0	291	298
Future Volume (veh/h)	12	0	11	0	0	0	0	86	223	0	291	298
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	13	0	12				0	93	0	0	316	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	81	0	72				0	1415		0	2688	
Arrive On Green	0.04	0.00	0.04				0.00	0.74	0.00	0.00	0.74	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	13	0	12				0	93	0	0	316	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	0.4	0.0	0.5				0.0	0.9	0.0	0.0	1.6	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.5				0.0	0.9	0.0	0.0	1.6	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	81	0	72				0	1415		0	2688	
V/C Ratio(X)	0.16	0.00	0.17				0.00	0.07		0.00	0.12	
Avail Cap(c_a), veh/h	646	0	575				0	1415		0	2688	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.97	0.00
Uniform Delay (d), s/veh	29.9	0.0	29.9				0.0	2.2	0.0	0.0	2.3	0.0
Incr Delay (d2), s/veh	4.2	0.0	4.9				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.3				0.0	0.1	0.0	0.0	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	0.0	34.8				0.0	2.3	0.0	0.0	2.4	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		25						93	A		316	A
Approach Delay, s/veh		34.4						2.3			2.4	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		55.3		9.7		55.3
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		2.9		2.5		3.6
Green Ext Time (p_c), s		1.2		0.1		5.1

Intersection Summary	
HCM 6th Ctrl Delay	4.2
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

6: Hughes Avenue & Belmont Avenue

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	20	195	17	44	164	15	6	28	38	26	25	15
Future Vol, veh/h	20	195	17	44	164	15	6	28	38	26	25	15
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	22	214	19	48	180	16	7	31	42	29	27	16
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	9	8.8	8.9	9.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	8%	100%	0%	0%	100%	0%	0%	39%
Vol Thru, %	39%	0%	100%	79%	0%	100%	78%	38%
Vol Right, %	53%	0%	0%	21%	0%	0%	22%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	72	20	130	82	44	109	70	66
LT Vol	6	20	0	0	44	0	0	26
Through Vol	28	0	130	65	0	109	55	25
RT Vol	38	0	0	17	0	0	15	15
Lane Flow Rate	79	22	143	90	48	120	77	73
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.118	0.035	0.205	0.126	0.076	0.173	0.107	0.116
Departure Headway (Hd)	5.384	5.668	5.165	5.018	5.674	5.17	5.018	5.751
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	662	630	693	712	630	691	711	620
Service Time	3.147	3.418	2.914	2.768	3.425	2.921	2.769	3.515
HCM Lane V/C Ratio	0.119	0.035	0.206	0.126	0.076	0.174	0.108	0.118
HCM Control Delay	8.9	8.6	9.3	8.5	8.9	9	8.4	9.3
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.8	0.4	0.2	0.6	0.4	0.4

Intersection	
Intersection Delay, s/veh	7.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	35	25	2	12	15	9	46	1	10	47	10
Future Vol, veh/h	8	35	25	2	12	15	9	46	1	10	47	10
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	42	30	2	14	18	11	55	1	12	56	12
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	7.8	7.5	8.4	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	16%	100%	0%	100%	0%	18%	0%
Vol Thru, %	82%	0%	58%	0%	44%	82%	0%
Vol Right, %	2%	0%	42%	0%	56%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	56	8	60	2	27	57	10
LT Vol	9	8	0	2	0	10	0
Through Vol	46	0	35	0	12	47	0
RT Vol	1	0	25	0	15	0	10
Lane Flow Rate	67	10	71	2	32	68	12
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.091	0.014	0.091	0.004	0.041	0.093	0.014
Departure Headway (Hd)	4.89	5.399	4.604	5.44	4.547	4.92	4.131
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	736	665	781	660	790	732	870
Service Time	2.9	3.112	2.317	3.153	2.26	2.63	1.84
HCM Lane V/C Ratio	0.091	0.015	0.091	0.003	0.041	0.093	0.014
HCM Control Delay	8.4	8.2	7.8	8.2	7.5	8.1	6.9
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.3	0	0.3	0	0.1	0.3	0

Intersection	
Intersection Delay, s/veh	104
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	24	174	72	52	126	53	99	596	80	25	293	26
Future Vol, veh/h	24	174	72	52	126	53	99	596	80	25	293	26
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	27	198	82	59	143	60	113	677	91	28	333	30
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	16.5	16	198.4	19.1
HCM LOS	C	C	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	45%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	55%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	99	596	80	24	116	130	52	126	53	25	195
LT Vol	99	0	0	24	0	0	52	0	0	25	0
Through Vol	0	596	0	0	116	58	0	126	0	0	195
RT Vol	0	0	80	0	0	72	0	0	53	0	0
Lane Flow Rate	112	677	91	27	132	148	59	143	60	28	222
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.263	1.492	0.183	0.071	0.325	0.349	0.156	0.358	0.139	0.072	0.53
Departure Headway (Hd)	8.431	7.931	7.231	10.063	9.563	9.175	10.19	9.69	8.99	9.673	9.173
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	426	461	496	358	378	394	354	374	401	373	395
Service Time	6.174	5.674	4.974	7.763	7.263	6.875	7.89	7.39	6.69	7.373	6.873
HCM Lane V/C Ratio	0.263	1.469	0.183	0.075	0.349	0.376	0.167	0.382	0.15	0.075	0.562
HCM Control Delay	14.2	254.1	11.6	13.5	16.8	16.7	14.8	17.7	13.1	13.1	21.8
HCM Lane LOS	B	F	B	B	C	C	B	C	B	B	C
HCM 95th-tile Q	1	35	0.7	0.2	1.4	1.5	0.5	1.6	0.5	0.2	3

HCM 6th Signalized Intersection Summary
2: Marks Avenue & Nielsen Avenue

2740 West Nielsen Warehouse
Exist_WP_PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	24	4	41	87	9	11	37	568	74	10	318	20
Future Volume (veh/h)	24	4	41	87	9	11	37	568	74	10	318	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	25	4	43	91	9	11	39	592	77	10	331	21
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	193	176	149	194	176	149	94	2653	1183	35	2536	1131
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	0.05	0.73	0.73	0.02	0.70	0.70
Sat Flow, veh/h	1414	1900	1610	1380	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	25	4	43	91	9	11	39	592	77	10	331	21
Grp Sat Flow(s),veh/h/ln	1414	1900	1610	1380	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.7	0.2	2.6	6.7	0.5	0.7	2.2	5.5	1.4	0.6	3.2	0.4
Cycle Q Clear(g_c), s	2.2	0.2	2.6	6.9	0.5	0.7	2.2	5.5	1.4	0.6	3.2	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	193	176	149	194	176	149	94	2653	1183	35	2536	1131
V/C Ratio(X)	0.13	0.02	0.29	0.47	0.05	0.07	0.42	0.22	0.07	0.29	0.13	0.02
Avail Cap(c_a), veh/h	656	798	676	646	798	676	260	2653	1183	260	2536	1131
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	43.3	44.4	46.5	43.4	43.5	48.2	4.4	3.9	50.8	5.1	4.7
Incr Delay (d2), s/veh	0.7	0.1	2.5	4.1	0.3	0.5	1.1	0.2	0.1	1.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.1	1.1	2.5	0.2	0.3	1.0	1.5	0.4	0.3	1.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	43.5	46.9	50.6	43.7	44.0	49.3	4.6	4.0	52.4	5.2	4.7
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		72			111			708			362	
Approach Delay, s/veh		46.1			49.4			7.0			6.5	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.3	79.1		15.6	6.9	82.5		15.6
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	4.2	5.2		8.9	2.6	7.5		4.6
Green Ext Time (p_c), s	0.0	4.3		0.8	0.0	7.9		0.5

Intersection Summary	
HCM 6th Ctrl Delay	12.9
HCM 6th LOS	B

3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	17	6	673	10	4	441
Future Volume (veh/h)	17	6	673	10	4	441
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	18	7	732	11	4	479
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	77	69	2849	43	15	3036
Arrive On Green	0.04	0.04	0.78	0.78	0.01	0.84
Sat Flow, veh/h	1810	1610	3735	55	1810	3705
Grp Volume(v), veh/h	18	7	363	380	4	479
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1890	1810	1805
Q Serve(g_s), s	0.8	0.3	4.4	4.4	0.2	1.9
Cycle Q Clear(g_c), s	0.8	0.3	4.4	4.4	0.2	1.9
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	77	69	1413	1479	15	3036
V/C Ratio(X)	0.23	0.10	0.26	0.26	0.26	0.16
Avail Cap(c_a), veh/h	588	523	1413	1479	362	3036
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	0.99	0.99
Uniform Delay (d), s/veh	37.0	36.8	2.4	2.4	39.4	1.2
Incr Delay (d2), s/veh	3.3	1.4	0.4	0.4	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	0.7	0.7	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	40.3	38.2	2.7	2.7	42.6	1.3
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	25		743			483
Approach Delay, s/veh	39.7		2.7			1.6
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		72.6		7.4	4.7	67.9
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.9		2.8	2.2	6.4
Green Ext Time (p_c), s		5.1		0.1	0.0	6.1

Intersection Summary			
HCM 6th Ctrl Delay			3.0
HCM 6th LOS			A

HCM 6th Signalized Intersection Summary
4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↰	↗↗		↑↑	↗		↑↱	
Traffic Volume (veh/h)	0	0	0	242	0	550	0	149	15	0	434	23
Future Volume (veh/h)	0	0	0	242	0	550	0	149	15	0	434	23
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				299	0	679	0	184	0	0	536	0
Peak Hour Factor				0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1228	0	1092	0	1825		0	1825	
Arrive On Green				0.34	0.00	0.34	0.00	0.51	0.00	0.00	0.51	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				299	0	679	0	184	0	0	536	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				5.1	0.0	15.0	0.0	2.3	0.0	0.0	7.3	0.0
Cycle Q Clear(g_c), s				5.1	0.0	15.0	0.0	2.3	0.0	0.0	7.3	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1228	0	1092	0	1825		0	1825	
V/C Ratio(X)				0.24	0.00	0.62	0.00	0.10		0.00	0.29	
Avail Cap(c_a), veh/h				1516	0	1349	0	1825		0	1825	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				20.2	0.0	23.5	0.0	11.0	0.0	0.0	12.2	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.7	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.0	0.0	5.6	0.0	0.8	0.0	0.0	2.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.7	0.0	26.2	0.0	11.1	0.0	0.0	12.6	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					978			184	A		536	A
Approach Delay, s/veh					24.5			11.1			12.6	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		49.8				49.8		35.2				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		4.3				9.3		17.0				
Green Ext Time (p_c), s		3.1				9.5		11.8				

Intersection Summary			
HCM 6th Ctrl Delay			19.3
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	21	0	20	0	0	0	0	143	266	0	360	316
Future Volume (veh/h)	21	0	20	0	0	0	0	143	266	0	360	316
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	23	0	22				0	155	0	0	391	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	124	0	110				0	1369		0	2602	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	23	0	22				0	155	0	0	391	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	0.8	0.0	0.8				0.0	1.6	0.0	0.0	2.2	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.8				0.0	1.6	0.0	0.0	2.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	124	0	110				0	1369		0	2602	
V/C Ratio(X)	0.19	0.00	0.20				0.00	0.11		0.00	0.15	
Avail Cap(c_a), veh/h	646	0	575				0	1369		0	2602	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.97	0.00
Uniform Delay (d), s/veh	28.6	0.0	28.6				0.0	2.8	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	3.3	0.0	4.0				0.0	0.2	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.4				0.0	0.3	0.0	0.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.8	0.0	32.6				0.0	2.9	0.0	0.0	3.0	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		45						155	A		391	A
Approach Delay, s/veh		32.2						2.9			3.0	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		53.7		11.3		53.7
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		3.6		2.8		4.2
Green Ext Time (p_c), s		2.2		0.3		6.4

Intersection Summary	
HCM 6th Ctrl Delay	5.2
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	37	243	10	63	205	34	14	43	61	40	52	15
Future Vol, veh/h	37	243	10	63	205	34	14	43	61	40	52	15
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	45	296	12	77	250	41	17	52	74	49	63	18
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	10.8	10.4	11	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	12%	100%	0%	0%	100%	0%	0%	37%
Vol Thru, %	36%	0%	100%	89%	0%	100%	67%	49%
Vol Right, %	52%	0%	0%	11%	0%	0%	33%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	37	162	91	63	137	102	107
LT Vol	14	37	0	0	63	0	0	40
Through Vol	43	0	162	81	0	137	68	52
RT Vol	61	0	0	10	0	0	34	15
Lane Flow Rate	144	45	198	111	77	167	125	130
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.249	0.081	0.325	0.18	0.137	0.273	0.197	0.24
Departure Headway (Hd)	6.218	6.429	5.921	5.843	6.413	5.905	5.669	6.621
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	577	556	607	613	559	607	631	542
Service Time	3.969	4.176	3.667	3.589	4.16	3.651	3.415	4.374
HCM Lane V/C Ratio	0.25	0.081	0.326	0.181	0.138	0.275	0.198	0.24
HCM Control Delay	11	9.7	11.5	9.9	10.2	10.9	9.8	11.5
HCM Lane LOS	B	A	B	A	B	B	A	B
HCM 95th-tile Q	1	0.3	1.4	0.7	0.5	1.1	0.7	0.9

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	25	13	4	37	23	31	85	3	11	74	13
Future Vol, veh/h	8	25	13	4	37	23	31	85	3	11	74	13
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	30	16	5	45	28	38	104	4	13	90	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.2	8.2	9.3	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	26%	100%	0%	100%	0%	13%	0%
Vol Thru, %	71%	0%	66%	0%	62%	87%	0%
Vol Right, %	3%	0%	34%	0%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	119	8	38	4	60	85	13
LT Vol	31	8	0	4	0	11	0
Through Vol	85	0	25	0	37	74	0
RT Vol	3	0	13	0	23	0	13
Lane Flow Rate	145	10	46	5	73	104	16
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.202	0.016	0.064	0.008	0.101	0.145	0.019
Departure Headway (Hd)	5.017	5.755	5.01	5.733	4.96	5.033	4.266
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	717	623	715	625	723	713	840
Service Time	3.041	3.482	2.738	3.459	2.686	2.757	1.989
HCM Lane V/C Ratio	0.202	0.016	0.064	0.008	0.101	0.146	0.019
HCM Control Delay	9.3	8.6	8.1	8.5	8.2	8.6	7.1
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.8	0	0.2	0	0.3	0.5	0.1

Intersection	
Intersection Delay, s/veh	26.2
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	25	145	98	54	99	12	55	281	74	42	474	31
Future Vol, veh/h	25	145	98	54	99	12	55	281	74	42	474	31
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	30	175	118	65	119	14	66	339	89	51	571	37
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	16.1	15.4	28.9	32.3
HCM LOS	C	C	D	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	33%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	67%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	281	74	25	97	146	54	99	12	42	316
LT Vol	55	0	0	25	0	0	54	0	0	42	0
Through Vol	0	281	0	0	97	48	0	99	0	0	316
RT Vol	0	0	74	0	0	98	0	0	12	0	0
Lane Flow Rate	66	339	89	30	116	176	65	119	14	51	381
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.164	0.791	0.191	0.079	0.29	0.416	0.177	0.308	0.035	0.121	0.857
Departure Headway (Hd)	8.915	8.415	7.715	9.456	8.956	8.487	9.81	9.31	8.61	8.6	8.1
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	404	433	466	379	402	425	366	386	416	418	449
Service Time	6.637	6.137	5.437	7.207	6.707	6.239	7.567	7.067	6.367	6.318	5.818
HCM Lane V/C Ratio	0.163	0.783	0.191	0.079	0.289	0.414	0.178	0.308	0.034	0.122	0.849
HCM Control Delay	13.4	36.3	12.3	13	15.3	17.2	14.7	16.2	11.7	12.5	43.2
HCM Lane LOS	B	E	B	B	C	C	B	C	B	B	E
HCM 95th-tile Q	0.6	7	0.7	0.3	1.2	2	0.6	1.3	0.1	0.4	8.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	13	8	45	28	4	10	65	371	107	9	365	36
Future Volume (veh/h)	13	8	45	28	4	10	65	371	107	9	365	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	16	10	56	35	5	12	80	458	132	11	451	44
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	171	142	120	163	142	120	124	2711	1209	38	2539	1132
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.75	0.02	0.70	0.70
Sat Flow, veh/h	1418	1900	1610	1357	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	16	10	56	35	5	12	80	458	132	11	451	44
Grp Sat Flow(s),veh/h/ln	1418	1900	1610	1357	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.1	0.5	3.5	2.6	0.3	0.7	4.5	3.8	2.3	0.6	4.4	0.9
Cycle Q Clear(g_c), s	1.4	0.5	3.5	3.1	0.3	0.7	4.5	3.8	2.3	0.6	4.4	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	171	142	120	163	142	120	124	2711	1209	38	2539	1132
V/C Ratio(X)	0.09	0.07	0.47	0.21	0.04	0.10	0.64	0.17	0.11	0.29	0.18	0.04
Avail Cap(c_a), veh/h	661	798	676	632	798	676	260	2711	1209	260	2539	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	45.2	46.6	46.6	45.1	45.3	47.6	3.7	3.5	50.6	5.3	4.8
Incr Delay (d2), s/veh	0.6	0.5	6.5	1.5	0.2	0.8	2.0	0.1	0.2	1.6	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	1.6	0.9	0.1	0.3	2.0	1.0	0.6	0.3	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	45.7	53.1	48.2	45.3	46.1	49.6	3.9	3.7	52.2	5.4	4.8
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		82			52			670			506	
Approach Delay, s/veh		50.8			47.4			9.3			6.4	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.1	79.1		13.7	7.1	84.2		13.7
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	6.5	6.4		5.1	2.6	5.8		5.5
Green Ext Time (p_c), s	0.0	6.0		0.3	0.0	6.9		0.6

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	11	3	541	19	5	431
Future Volume (veh/h)	11	3	541	19	5	431
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	14	4	676	24	6	539
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	60	53	2803	99	23	3071
Arrive On Green	0.03	0.03	0.79	0.79	0.01	0.85
Sat Flow, veh/h	1810	1610	3651	126	1810	3705
Grp Volume(v), veh/h	14	4	343	357	6	539
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1877	1810	1805
Q Serve(g_s), s	0.6	0.2	4.0	4.0	0.3	2.1
Cycle Q Clear(g_c), s	0.6	0.2	4.0	4.0	0.3	2.1
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	60	53	1423	1480	23	3071
V/C Ratio(X)	0.23	0.08	0.24	0.24	0.27	0.18
Avail Cap(c_a), veh/h	588	523	1423	1480	362	3071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.88	0.88	0.99	0.99
Uniform Delay (d), s/veh	37.7	37.5	2.2	2.2	39.1	1.0
Incr Delay (d2), s/veh	4.2	1.3	0.4	0.3	2.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.6	0.6	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.9	38.8	2.6	2.6	41.4	1.2
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	18		700			545
Approach Delay, s/veh	41.2		2.6			1.6
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.4		6.6	5.0	68.4
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.1		2.6	2.3	6.0
Green Ext Time (p_c), s		5.9		0.0	0.0	5.7

Intersection Summary			
HCM 6th Ctrl Delay			2.7
HCM 6th LOS			A

4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	193	0	437	0	111	11	0	428	33
Future Volume (veh/h)	0	0	0	193	0	437	0	111	11	0	428	33
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				268	0	607	0	154	0	0	594	0
Peak Hour Factor				0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1144	0	1018	0	1908		0	1908	
Arrive On Green				0.32	0.00	0.32	0.00	0.53	0.00	0.00	0.53	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				268	0	607	0	154	0	0	594	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.6	0.0	13.5	0.0	1.8	0.0	0.0	7.9	0.0
Cycle Q Clear(g_c), s				4.6	0.0	13.5	0.0	1.8	0.0	0.0	7.9	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1144	0	1018	0	1908		0	1908	
V/C Ratio(X)				0.23	0.00	0.60	0.00	0.08		0.00	0.31	
Avail Cap(c_a), veh/h				1516	0	1349	0	1908		0	1908	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				21.5	0.0	24.5	0.0	9.9	0.0	0.0	11.3	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.6	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.9	0.0	5.1	0.0	0.6	0.0	0.0	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.0	0.0	27.1	0.0	9.9	0.0	0.0	11.7	0.0
LnGrp LOS				C	A	C	A	A		A	B	
Approach Vol, veh/h					875			154	A		594	A
Approach Delay, s/veh					25.5			9.9			11.7	
Approach LOS					C			A			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		51.7				51.7		33.3				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		3.8				9.9		15.5				
Green Ext Time (p_c), s		2.5				10.5		11.4				

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

5: Marks Avenue & SR-180 Eastbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	30	0	11	0	0	0	0	92	246	0	309	311
Future Volume (veh/h)	30	0	11	0	0	0	0	92	246	0	309	311
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	33	0	12				0	100	0	0	336	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	124	0	110				0	1369		0	2602	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	33	0	12				0	100	0	0	336	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.1	0.0	0.5				0.0	1.0	0.0	0.0	1.9	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.5				0.0	1.0	0.0	0.0	1.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	124	0	110				0	1369		0	2602	
V/C Ratio(X)	0.27	0.00	0.11				0.00	0.07		0.00	0.13	
Avail Cap(c_a), veh/h	646	0	575				0	1369		0	2602	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.7	0.0	28.4				0.0	2.7	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	5.2	0.0	2.0				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2				0.0	0.2	0.0	0.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	30.4				0.0	2.8	0.0	0.0	2.9	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		45						100	A		336	A
Approach Delay, s/veh		33.0						2.8			2.9	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		53.7		11.3		53.7
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		3.0		3.1		3.9
Green Ext Time (p_c), s		1.3		0.3		5.4

Intersection Summary			
HCM 6th Ctrl Delay			5.7
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	9.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	21	218	26	65	190	16	7	30	43	27	34	16
Future Vol, veh/h	21	218	26	65	190	16	7	30	43	27	34	16
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	23	240	29	71	209	18	8	33	47	30	37	18
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	9.3	9.2	9.3	9.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	9%	100%	0%	0%	100%	0%	0%	35%
Vol Thru, %	38%	0%	100%	74%	0%	100%	80%	44%
Vol Right, %	54%	0%	0%	26%	0%	0%	20%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	21	145	99	65	127	79	77
LT Vol	7	21	0	0	65	0	0	27
Through Vol	30	0	145	73	0	127	63	34
RT Vol	43	0	0	26	0	0	16	16
Lane Flow Rate	88	23	160	108	71	139	87	85
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.137	0.037	0.235	0.154	0.115	0.204	0.125	0.14
Departure Headway (Hd)	5.594	5.806	5.302	5.116	5.792	5.287	5.145	5.953
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	635	613	672	695	615	674	691	597
Service Time	3.381	3.578	3.074	2.888	3.564	3.059	2.917	3.741
HCM Lane V/C Ratio	0.139	0.038	0.238	0.155	0.115	0.206	0.126	0.142
HCM Control Delay	9.3	8.8	9.7	8.8	9.3	9.4	8.7	9.7
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.5	0.1	0.9	0.5	0.4	0.8	0.4	0.5

Intersection	
Intersection Delay, s/veh	8.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			↰	↱
Traffic Vol, veh/h	8	36	32	5	12	15	11	52	2	10	83	10
Future Vol, veh/h	8	36	32	5	12	15	11	52	2	10	83	10
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	43	38	6	14	18	13	62	2	12	99	12
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8	7.7	8.6	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	17%	100%	0%	100%	0%	11%	0%
Vol Thru, %	80%	0%	53%	0%	44%	89%	0%
Vol Right, %	3%	0%	47%	0%	56%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	65	8	68	5	27	93	10
LT Vol	11	8	0	5	0	10	0
Through Vol	52	0	36	0	12	83	0
RT Vol	2	0	32	0	15	0	10
Lane Flow Rate	77	10	81	6	32	111	12
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.107	0.015	0.106	0.009	0.042	0.152	0.014
Departure Headway (Hd)	4.971	5.543	4.71	5.592	4.699	4.933	4.177
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	723	648	763	642	763	730	859
Service Time	2.989	3.26	2.426	3.312	2.418	2.649	1.893
HCM Lane V/C Ratio	0.107	0.015	0.106	0.009	0.042	0.152	0.014
HCM Control Delay	8.6	8.3	8	8.4	7.6	8.5	7
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.4	0	0.4	0	0.1	0.5	0

Intersection	
Intersection Delay, s/veh	129
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	25	197	76	55	147	55	107	630	85	26	310	29
Future Vol, veh/h	25	197	76	55	147	55	107	630	85	26	310	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	28	224	86	63	167	63	122	716	97	30	352	33
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	18.3	17.9	251.5	21.5
HCM LOS	C	C	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	46%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	54%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	107	630	85	25	131	142	55	147	55	26	207
LT Vol	107	0	0	25	0	0	55	0	0	26	0
Through Vol	0	630	0	0	131	66	0	147	0	0	207
RT Vol	0	0	85	0	0	76	0	0	55	0	0
Lane Flow Rate	122	716	97	28	149	161	62	167	62	30	235
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.297	1.651	0.204	0.076	0.38	0.393	0.169	0.431	0.149	0.077	0.582
Departure Headway (Hd)	8.8	8.3	7.6	10.544	10.044	9.668	10.679	10.179	9.479	10.191	9.691
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	409	444	471	342	361	375	338	356	381	354	376
Service Time	6.556	6.056	5.356	8.244	7.744	7.368	8.379	7.879	7.179	7.891	7.391
HCM Lane V/C Ratio	0.298	1.613	0.206	0.082	0.413	0.429	0.183	0.469	0.163	0.085	0.625
HCM Control Delay	15.3	323.9	12.3	14.1	18.8	18.5	15.5	20.4	13.8	13.7	25
HCM Lane LOS	C	F	B	B	C	C	C	C	B	B	C
HCM 95th-tile Q	1.2	41.5	0.8	0.2	1.7	1.8	0.6	2.1	0.5	0.2	3.5

HCM 6th Signalized Intersection Summary
2: Marks Avenue & Nielsen Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	28	5	45	97	10	11	40	607	77	10	338	23
Future Volume (veh/h)	28	5	45	97	10	11	40	607	77	10	338	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	29	5	47	101	10	11	42	632	80	10	352	24
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	205	192	163	204	192	163	97	2621	1169	35	2496	1114
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.73	0.73	0.02	0.69	0.69
Sat Flow, veh/h	1413	1900	1610	1374	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	29	5	47	101	10	11	42	632	80	10	352	24
Grp Sat Flow(s),veh/h/ln	1413	1900	1610	1374	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	2.0	0.2	2.8	7.5	0.5	0.6	2.4	6.1	1.5	0.6	3.5	0.5
Cycle Q Clear(g_c), s	2.5	0.2	2.8	7.8	0.5	0.6	2.4	6.1	1.5	0.6	3.5	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	192	163	204	192	163	97	2621	1169	35	2496	1114
V/C Ratio(X)	0.14	0.03	0.29	0.49	0.05	0.07	0.43	0.24	0.07	0.29	0.14	0.02
Avail Cap(c_a), veh/h	655	798	676	642	798	676	260	2621	1169	260	2496	1114
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	42.5	43.7	46.0	42.6	42.7	48.1	4.8	4.1	50.8	5.5	5.1
Incr Delay (d2), s/veh	0.7	0.1	2.3	4.3	0.3	0.4	1.1	0.2	0.1	1.7	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.1	1.2	2.7	0.2	0.3	1.1	1.8	0.4	0.3	1.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	42.6	45.9	50.3	42.9	43.1	49.2	5.0	4.3	52.4	5.7	5.1
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		81			122			754			386	
Approach Delay, s/veh		45.2			49.1			7.4			6.8	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.5	77.9		16.5	6.9	81.5		16.5
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	4.4	5.5		9.8	2.6	8.1		4.8
Green Ext Time (p_c), s	0.0	4.6		0.9	0.0	8.4		0.6

Intersection Summary	
HCM 6th Ctrl Delay	13.3
HCM 6th LOS	B

3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	32	8	716	13	4	474
Future Volume (veh/h)	32	8	716	13	4	474
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	9	778	14	4	515
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	113	100	2768	50	15	2965
Arrive On Green	0.06	0.06	0.76	0.76	0.01	0.82
Sat Flow, veh/h	1810	1610	3723	65	1810	3705
Grp Volume(v), veh/h	35	9	387	405	4	515
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1888	1810	1805
Q Serve(g_s), s	1.5	0.4	5.2	5.2	0.2	2.4
Cycle Q Clear(g_c), s	1.5	0.4	5.2	5.2	0.2	2.4
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	113	100	1377	1440	15	2965
V/C Ratio(X)	0.31	0.09	0.28	0.28	0.26	0.17
Avail Cap(c_a), veh/h	588	523	1377	1440	362	2965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.87	0.87	0.98	0.98
Uniform Delay (d), s/veh	35.9	35.4	2.9	2.9	39.4	1.5
Incr Delay (d2), s/veh	3.3	0.8	0.4	0.4	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	1.0	1.0	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	36.2	3.3	3.3	42.6	1.6
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	44		792			519
Approach Delay, s/veh	38.5		3.3			1.9
Approach LOS	D		A			A
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		71.0		9.0	4.7	66.3
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.4		3.5	2.2	7.2
Green Ext Time (p_c), s		5.5		0.2	0.0	6.4
Intersection Summary						
HCM 6th Ctrl Delay			3.9			
HCM 6th LOS			A			

4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰↑	↱↱		↑↑	↱		↑↑↱	
Traffic Volume (veh/h)	0	0	0	270	0	574	0	169	16	0	461	44
Future Volume (veh/h)	0	0	0	270	0	574	0	169	16	0	461	44
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				333	0	709	0	209	0	0	569	0
Peak Hour Factor				0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1265	0	1126	0	1787		0	1787	
Arrive On Green				0.35	0.00	0.35	0.00	0.50	0.00	0.00	0.50	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				333	0	709	0	209	0	0	569	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				5.6	0.0	15.6	0.0	2.6	0.0	0.0	8.0	0.0
Cycle Q Clear(g_c), s				5.6	0.0	15.6	0.0	2.6	0.0	0.0	8.0	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1265	0	1126	0	1787		0	1787	
V/C Ratio(X)				0.26	0.00	0.63	0.00	0.12		0.00	0.32	
Avail Cap(c_a), veh/h				1516	0	1349	0	1787		0	1787	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				19.8	0.0	23.0	0.0	11.5	0.0	0.0	12.9	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.7	0.0	0.1	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.3	0.0	5.8	0.0	1.0	0.0	0.0	2.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.3	0.0	25.7	0.0	11.6	0.0	0.0	13.3	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					1042			209	A		569	A
Approach Delay, s/veh					24.0			11.6			13.3	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		48.9				48.9		36.1
Change Period (Y+Rc), s		6.8				6.8		6.4
Max Green Setting (Gmax), s		36.2				36.2		35.6
Max Q Clear Time (g_c+I1), s		4.6				10.0		17.6
Green Ext Time (p_c), s		3.6				10.0		12.1

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	33	0	21	0	0	0	0	152	286	0	392	335
Future Volume (veh/h)	33	0	21	0	0	0	0	152	286	0	392	335
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	36	0	23				0	165	0	0	426	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	146	0	130				0	1346		0	2558	
Arrive On Green	0.08	0.00	0.08				0.00	0.71	0.00	0.00	0.71	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	36	0	23				0	165	0	0	426	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.9				0.0	1.8	0.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.9				0.0	1.8	0.0	0.0	2.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	146	0	130				0	1346		0	2558	
V/C Ratio(X)	0.25	0.00	0.18				0.00	0.12		0.00	0.17	
Avail Cap(c_a), veh/h	646	0	575				0	1346		0	2558	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.0	0.0	27.9				0.0	3.0	0.0	0.0	3.1	0.0
Incr Delay (d2), s/veh	4.0	0.0	3.0				0.0	0.2	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.4				0.0	0.4	0.0	0.0	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	30.8				0.0	3.2	0.0	0.0	3.3	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		59						165	A		426	A
Approach Delay, s/veh		31.6						3.2			3.3	
Approach LOS		C						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	53.0	12.0	53.0
Change Period (Y+Rc), s	6.9	6.8	6.9
Max Green Setting (Gmax), s	28.1	23.2	28.1
Max Q Clear Time (g_c+I1), s	3.8	3.2	4.5
Green Ext Time (p_c), s	2.3	0.5	6.9

Intersection Summary	
HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	11.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	38	271	11	68	231	35	23	53	83	42	55	16
Future Vol, veh/h	38	271	11	68	231	35	23	53	83	42	55	16
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	46	330	13	83	282	43	28	65	101	51	67	20
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	11.9	11.3	12.8	12.3
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	14%	100%	0%	0%	100%	0%	0%	37%
Vol Thru, %	33%	0%	100%	89%	0%	100%	69%	49%
Vol Right, %	52%	0%	0%	11%	0%	0%	31%	14%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	159	38	181	101	68	154	112	113
LT Vol	23	38	0	0	68	0	0	42
Through Vol	53	0	181	90	0	154	77	55
RT Vol	83	0	0	11	0	0	35	16
Lane Flow Rate	194	46	220	124	83	188	137	138
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.35	0.087	0.383	0.212	0.156	0.326	0.229	0.267
Departure Headway (Hd)	6.496	6.774	6.264	6.186	6.757	6.246	6.023	6.986
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	551	526	571	577	529	573	593	511
Service Time	4.271	4.546	4.035	3.957	4.525	4.015	3.791	4.768
HCM Lane V/C Ratio	0.352	0.087	0.385	0.215	0.157	0.328	0.231	0.27
HCM Control Delay	12.8	10.2	12.9	10.6	10.8	12	10.6	12.3
HCM Lane LOS	B	B	B	B	B	B	B	B
HCM 95th-tile Q	1.6	0.3	1.8	0.8	0.5	1.4	0.9	1.1

Intersection	
Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✣			↰	↱
Traffic Vol, veh/h	8	27	15	5	38	24	39	123	7	11	81	14
Future Vol, veh/h	8	27	15	5	38	24	39	123	7	11	81	14
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	10	33	18	6	46	29	48	150	9	13	99	17
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.5	8.5	10.1	8.6
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	23%	100%	0%	100%	0%	12%	0%
Vol Thru, %	73%	0%	64%	0%	61%	88%	0%
Vol Right, %	4%	0%	36%	0%	39%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	169	8	42	5	62	92	14
LT Vol	39	8	0	5	0	11	0
Through Vol	123	0	27	0	38	81	0
RT Vol	7	0	15	0	24	0	14
Lane Flow Rate	206	10	51	6	76	112	17
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.289	0.016	0.074	0.01	0.108	0.16	0.021
Departure Headway (Hd)	5.047	5.949	5.193	5.925	5.147	5.118	4.355
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	713	601	688	604	695	700	821
Service Time	3.077	3.69	2.934	3.665	2.888	2.851	2.087
HCM Lane V/C Ratio	0.289	0.017	0.074	0.01	0.109	0.16	0.021
HCM Control Delay	10.1	8.8	8.4	8.7	8.5	8.8	7.2
HCM Lane LOS	B	A	A	A	A	A	A
HCM 95th-tile Q	1.2	0	0.2	0	0.4	0.6	0.1

Intersection	
Intersection Delay, s/veh	21.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	31	239	113	43	104	13	73	288	93	73	471	32
Future Vol, veh/h	31	239	113	43	104	13	73	288	93	73	471	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	252	119	45	109	14	77	303	98	77	496	34
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	17.2	14.9	23.1	23.9
HCM LOS	C	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	41%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	59%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	73	288	93	31	159	193	43	104	13	73	314
LT Vol	73	0	0	31	0	0	43	0	0	73	0
Through Vol	0	288	0	0	159	80	0	104	0	0	314
RT Vol	0	0	93	0	0	113	0	0	13	0	0
Lane Flow Rate	77	303	98	33	168	203	45	109	14	77	331
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.19	0.707	0.209	0.083	0.404	0.465	0.124	0.284	0.033	0.182	0.738
Departure Headway (Hd)	8.896	8.396	7.696	9.173	8.673	8.262	9.832	9.332	8.632	8.662	8.162
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	405	434	468	392	418	438	366	386	416	416	446
Service Time	6.611	6.111	5.411	6.89	6.39	5.979	7.563	7.063	6.363	6.362	5.862
HCM Lane V/C Ratio	0.19	0.698	0.209	0.084	0.402	0.463	0.123	0.282	0.034	0.185	0.742
HCM Control Delay	13.7	29	12.4	12.7	17.2	18	14	15.7	11.7	13.3	30.6
HCM Lane LOS	B	D	B	B	C	C	B	C	B	B	D
HCM 95th-tile Q	0.7	5.4	0.8	0.3	1.9	2.4	0.4	1.2	0.1	0.7	6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	14	10	46	22	4	11	68	390	93	14	383	39
Future Volume (veh/h)	14	10	46	22	4	11	68	390	93	14	383	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	15	11	48	23	4	12	72	411	98	15	403	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	170	139	118	161	139	118	121	2694	1202	49	2550	1137
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.75	0.03	0.71	0.71
Sat Flow, veh/h	1419	1900	1610	1365	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	15	11	48	23	4	12	72	411	98	15	403	41
Grp Sat Flow(s),veh/h/ln	1419	1900	1610	1365	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.0	0.6	3.0	1.7	0.2	0.7	4.1	3.4	1.7	0.9	3.9	0.8
Cycle Q Clear(g_c), s	1.2	0.6	3.0	2.2	0.2	0.7	4.1	3.4	1.7	0.9	3.9	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	170	139	118	161	139	118	121	2694	1202	49	2550	1137
V/C Ratio(X)	0.09	0.08	0.41	0.14	0.03	0.10	0.60	0.15	0.08	0.31	0.16	0.04
Avail Cap(c_a), veh/h	662	798	676	635	798	676	260	2694	1202	260	2550	1137
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.8	45.3	46.5	46.4	45.2	45.4	47.6	3.8	3.6	50.1	5.1	4.6
Incr Delay (d2), s/veh	0.5	0.6	5.2	0.9	0.2	0.9	1.7	0.1	0.1	1.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	1.3	0.6	0.1	0.3	1.8	0.9	0.4	0.4	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	45.9	51.7	47.3	45.4	46.3	49.3	3.9	3.7	51.4	5.2	4.7
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		74			39			581			459	
Approach Delay, s/veh		49.7			46.8			9.5			6.7	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.9	79.5		13.6	7.7	83.7		13.6				
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9				
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1				
Max Q Clear Time (g_c+I1), s	6.1	5.9		4.2	2.9	5.4		5.0				
Green Ext Time (p_c), s	0.0	5.4		0.2	0.0	6.0		0.6				

Intersection Summary	
HCM 6th Ctrl Delay	12.2
HCM 6th LOS	B

3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	12	3	548	20	5	446
Future Volume (veh/h)	12	3	548	20	5	446
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	3	577	21	5	469
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	54	48	2818	102	19	3082
Arrive On Green	0.03	0.03	0.79	0.79	0.01	0.85
Sat Flow, veh/h	1810	1610	3648	129	1810	3705
Grp Volume(v), veh/h	13	3	293	305	5	469
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1877	1810	1805
Q Serve(g_s), s	0.6	0.1	3.2	3.2	0.2	1.7
Cycle Q Clear(g_c), s	0.6	0.1	3.2	3.2	0.2	1.7
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	54	48	1432	1489	19	3082
V/C Ratio(X)	0.24	0.06	0.20	0.20	0.26	0.15
Avail Cap(c_a), veh/h	588	523	1432	1489	362	3082
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.92	0.92	0.99	0.99
Uniform Delay (d), s/veh	37.9	37.7	2.0	2.0	39.3	1.0
Incr Delay (d2), s/veh	4.8	1.1	0.3	0.3	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.5	0.5	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.7	38.9	2.3	2.3	41.9	1.1
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	16		598			474
Approach Delay, s/veh	42.0		2.3			1.5
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.6		6.4	4.8	68.8
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.7		2.6	2.2	5.2
Green Ext Time (p_c), s		5.0		0.0	0.0	4.9

Intersection Summary			
HCM 6th Ctrl Delay			2.6
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↰	↗↗		↑↑	↗		↑↱	
Traffic Volume (veh/h)	0	0	0	227	0	453	0	142	15	0	454	37
Future Volume (veh/h)	0	0	0	227	0	453	0	142	15	0	454	37
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				239	0	477	0	149	0	0	478	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				976	0	869	0	2075		0	2075	
Arrive On Green				0.27	0.00	0.27	0.00	0.57	0.00	0.00	0.57	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				239	0	477	0	149	0	0	478	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.4	0.0	10.8	0.0	1.6	0.0	0.0	5.5	0.0
Cycle Q Clear(g_c), s				4.4	0.0	10.8	0.0	1.6	0.0	0.0	5.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				976	0	869	0	2075		0	2075	
V/C Ratio(X)				0.24	0.00	0.55	0.00	0.07		0.00	0.23	
Avail Cap(c_a), veh/h				1516	0	1349	0	2075		0	2075	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				24.3	0.0	26.6	0.0	8.0	0.0	0.0	8.9	0.0
Incr Delay (d2), s/veh				0.6	0.0	2.5	0.0	0.1	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	4.1	0.0	0.5	0.0	0.0	1.9	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.9	0.0	29.1	0.0	8.1	0.0	0.0	9.1	0.0
LnGrp LOS				C	A	C	A	A		A	A	
Approach Vol, veh/h					716			149	A		478	A
Approach Delay, s/veh					27.7			8.1			9.1	
Approach LOS					C			A			A	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		55.7				55.7		29.3				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		3.6				7.5		12.8				
Green Ext Time (p_c), s		2.5				8.6		10.1				

Intersection Summary			
HCM 6th Ctrl Delay			18.9
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
5: Marks Avenue & SR-180 Eastbound Ramps

2740 West Nielsen Warehouse
BO_NP_AM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	29	0	11	0	0	0	0	128	358	0	361	320
Future Volume (veh/h)	29	0	11	0	0	0	0	128	358	0	361	320
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	31	0	12				0	135	0	0	380	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	120	0	107				0	1373		0	2609	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	31	0	12				0	135	0	0	380	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.1	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	120	0	107				0	1373		0	2609	
V/C Ratio(X)	0.26	0.00	0.11				0.00	0.10		0.00	0.15	
Avail Cap(c_a), veh/h	646	0	575				0	1373		0	2609	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.98	0.00
Uniform Delay (d), s/veh	28.8	0.0	28.5				0.0	2.7	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	5.1	0.0	2.1				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2				0.0	0.3	0.0	0.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	30.7				0.0	2.8	0.0	0.0	2.9	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		43						135	A		380	A
Approach Delay, s/veh		33.0						2.8			2.9	
Approach LOS		C						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	53.9	11.1	53.9
Change Period (Y+Rc), s	6.9	6.8	6.9
Max Green Setting (Gmax), s	28.1	23.2	28.1
Max Q Clear Time (g_c+I1), s	3.4	3.1	4.1
Green Ext Time (p_c), s	1.8	0.3	6.2

Intersection Summary	
HCM 6th Ctrl Delay	5.2
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	10.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	53	276	59	50	187	17	17	93	62	28	47	21
Future Vol, veh/h	53	276	59	50	187	17	17	93	62	28	47	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	56	291	62	53	197	18	18	98	65	29	49	22
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	10.5	10	11.6	10.7
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	10%	100%	0%	0%	100%	0%	0%	29%
Vol Thru, %	54%	0%	100%	61%	0%	100%	79%	49%
Vol Right, %	36%	0%	0%	39%	0%	0%	21%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	53	184	151	50	125	79	96
LT Vol	17	53	0	0	50	0	0	28
Through Vol	93	0	184	92	0	125	62	47
RT Vol	62	0	0	59	0	0	17	21
Lane Flow Rate	181	56	194	159	53	131	84	101
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.308	0.098	0.312	0.244	0.095	0.218	0.135	0.182
Departure Headway (Hd)	6.128	6.307	5.8	5.522	6.479	5.971	5.818	6.474
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	587	568	620	650	553	601	615	554
Service Time	3.872	4.046	3.538	3.261	4.22	3.712	3.559	4.222
HCM Lane V/C Ratio	0.308	0.099	0.313	0.245	0.096	0.218	0.137	0.182
HCM Control Delay	11.6	9.7	11.2	10	9.9	10.4	9.5	10.7
HCM Lane LOS	B	A	B	A	A	B	A	B
HCM 95th-tile Q	1.3	0.3	1.3	1	0.3	0.8	0.5	0.7

7: Hughes Avenue & Nielsen Avenue

Intersection	
Intersection Delay, s/veh	8.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	24	45	35	5	11	19	7	127	2	18	115	11
Future Vol, veh/h	24	45	35	5	11	19	7	127	2	18	115	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	47	37	5	12	20	7	134	2	19	121	12
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.5	8	9.4	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	5%	100%	0%	100%	0%	14%	0%
Vol Thru, %	93%	0%	56%	0%	37%	86%	0%
Vol Right, %	1%	0%	44%	0%	63%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	136	24	80	5	30	133	11
LT Vol	7	24	0	5	0	18	0
Through Vol	127	0	45	0	11	115	0
RT Vol	2	0	35	0	19	0	11
Lane Flow Rate	143	25	84	5	32	140	12
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.201	0.041	0.116	0.009	0.043	0.197	0.014
Departure Headway (Hd)	5.055	5.79	4.978	5.874	4.923	5.07	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	710	619	720	609	726	708	832
Service Time	3.083	3.522	2.71	3.611	2.66	2.797	2.026
HCM Lane V/C Ratio	0.201	0.04	0.117	0.008	0.044	0.198	0.014
HCM Control Delay	9.4	8.8	8.4	8.7	7.9	9	7.1
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.7	0.1	0.4	0	0.1	0.7	0

Intersection	
Intersection Delay, s/veh	115.4
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	37	220	70	41	182	67	163	654	91	34	290	50
Future Vol, veh/h	37	220	70	41	182	67	163	654	91	34	290	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	39	232	74	43	192	71	172	688	96	36	305	53
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	18.2	19.5	220.3	19.9
HCM LOS	C	C	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	51%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	49%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	163	654	91	37	147	143	41	182	67	34	193
LT Vol	163	0	0	37	0	0	41	0	0	34	0
Through Vol	0	654	0	0	147	73	0	182	0	0	193
RT Vol	0	0	91	0	0	70	0	0	67	0	0
Lane Flow Rate	172	688	96	39	154	151	43	192	71	36	204
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.421	1.595	0.203	0.105	0.397	0.374	0.118	0.498	0.17	0.095	0.515
Departure Headway (Hd)	8.842	8.342	7.642	10.545	10.045	9.703	10.652	10.152	9.452	10.29	9.79
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	407	441	468	342	361	373	339	358	382	350	370
Service Time	6.603	6.103	5.403	8.245	7.745	7.403	8.352	7.852	7.152	7.99	7.49
HCM Lane V/C Ratio	0.423	1.56	0.205	0.114	0.427	0.405	0.127	0.536	0.186	0.103	0.551
HCM Control Delay	17.9	299.7	12.4	14.5	19.2	18.1	14.8	22.5	14.1	14.1	22.4
HCM Lane LOS	C	F	B	B	C	C	B	C	B	B	C
HCM 95th-tile Q	2	38.5	0.8	0.3	1.8	1.7	0.4	2.7	0.6	0.3	2.8

2: Marks Avenue & Nielsen Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	33	4	47	92	11	12	42	638	41	11	354	24
Future Volume (veh/h)	33	4	47	92	11	12	42	638	41	11	354	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	34	4	49	96	11	12	44	665	43	11	369	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	198	185	157	199	185	157	100	2630	1173	38	2507	1118
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.06	0.73	0.73	0.02	0.69	0.69
Sat Flow, veh/h	1410	1900	1610	1373	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	34	4	49	96	11	12	44	665	43	11	369	25
Grp Sat Flow(s),veh/h/ln	1410	1900	1610	1373	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	2.4	0.2	3.0	7.1	0.6	0.7	2.5	6.4	0.8	0.6	3.7	0.5
Cycle Q Clear(g_c), s	2.9	0.2	3.0	7.3	0.6	0.7	2.5	6.4	0.8	0.6	3.7	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	185	157	199	185	157	100	2630	1173	38	2507	1118
V/C Ratio(X)	0.17	0.02	0.31	0.48	0.06	0.08	0.44	0.25	0.04	0.29	0.15	0.02
Avail Cap(c_a), veh/h	654	798	676	642	798	676	260	2630	1173	260	2507	1118
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.4	42.9	44.1	46.2	43.0	43.1	48.0	4.7	4.0	50.6	5.5	5.0
Incr Delay (d2), s/veh	1.0	0.1	2.7	4.2	0.3	0.5	1.1	0.2	0.1	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.1	1.3	2.6	0.3	0.3	1.1	1.9	0.2	0.3	1.1	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	43.0	46.8	50.4	43.4	43.6	49.2	5.0	4.0	52.2	5.6	5.0
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		87			119			752			405	
Approach Delay, s/veh		46.0			49.1			7.5			6.8	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	78.2		16.1	7.1	81.8		16.1				
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9				
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1				
Max Q Clear Time (g_c+I1), s	4.5	5.7		9.3	2.6	8.4		5.0				
Green Ext Time (p_c), s	0.0	4.8		0.9	0.0	8.4		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			13.4
HCM 6th LOS			B

3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	34	9	712	14	4	488
Future Volume (veh/h)	34	9	712	14	4	488
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	36	9	749	15	4	514
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	114	102	2758	55	15	2962
Arrive On Green	0.06	0.06	0.76	0.76	0.01	0.82
Sat Flow, veh/h	1810	1610	3714	72	1810	3705
Grp Volume(v), veh/h	36	9	373	391	4	514
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1887	1810	1805
Q Serve(g_s), s	1.5	0.4	5.0	5.0	0.2	2.4
Cycle Q Clear(g_c), s	1.5	0.4	5.0	5.0	0.2	2.4
Prop In Lane	1.00	1.00		0.04	1.00	
Lane Grp Cap(c), veh/h	114	102	1375	1438	15	2962
V/C Ratio(X)	0.31	0.09	0.27	0.27	0.26	0.17
Avail Cap(c_a), veh/h	588	523	1375	1438	362	2962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.91	0.91	0.99	0.99
Uniform Delay (d), s/veh	35.8	35.3	2.9	2.9	39.4	1.5
Incr Delay (d2), s/veh	3.3	0.8	0.4	0.4	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	1.0	1.0	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	36.1	3.3	3.3	42.6	1.6
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	45		764			518
Approach Delay, s/veh	38.5		3.3			1.9
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		70.9		9.1	4.7	66.3
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.4		3.5	2.2	7.0
Green Ext Time (p_c), s		5.5		0.2	0.0	6.2

Intersection Summary			
HCM 6th Ctrl Delay			4.0
HCM 6th LOS			A

HCM 6th Signalized Intersection Summary
4: Marks Avenue & SR-180 Westbound Ramps

2740 West Nielsen Warehouse
BO_NP_PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	372	0	588	0	213	18	0	489	47
Future Volume (veh/h)	0	0	0	372	0	588	0	213	18	0	489	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				392	0	619	0	224	0	0	515	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1204	0	1071	0	1849		0	1849	
Arrive On Green				0.33	0.00	0.33	0.00	0.51	0.00	0.00	0.51	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				392	0	619	0	224	0	0	515	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				6.9	0.0	13.5	0.0	2.7	0.0	0.0	6.9	0.0
Cycle Q Clear(g_c), s				6.9	0.0	13.5	0.0	2.7	0.0	0.0	6.9	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1204	0	1071	0	1849		0	1849	
V/C Ratio(X)				0.33	0.00	0.58	0.00	0.12		0.00	0.28	
Avail Cap(c_a), veh/h				1516	0	1349	0	1849		0	1849	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				21.2	0.0	23.4	0.0	10.8	0.0	0.0	11.8	0.0
Incr Delay (d2), s/veh				0.7	0.0	2.3	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.8	0.0	5.0	0.0	1.0	0.0	0.0	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				22.0	0.0	25.7	0.0	10.9	0.0	0.0	12.2	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					1011			224	A		515	A
Approach Delay, s/veh					24.3			10.9			12.2	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		50.3				50.3		34.7				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		4.7				8.9		15.5				
Green Ext Time (p_c), s		3.9				9.1		12.8				

Intersection Summary			
HCM 6th Ctrl Delay			19.0
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
5: Marks Avenue & SR-180 Eastbound Ramps

2740 West Nielsen Warehouse
BO_NP_PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	33	0	22	0	0	0	0	198	296	0	517	344
Future Volume (veh/h)	33	0	22	0	0	0	0	198	296	0	517	344
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	35	0	23				0	208	0	0	544	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	145	0	129				0	1348		0	2561	
Arrive On Green	0.08	0.00	0.08				0.00	0.71	0.00	0.00	0.71	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	35	0	23				0	208	0	0	544	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.9				0.0	2.3	0.0	0.0	3.4	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.9				0.0	2.3	0.0	0.0	3.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	145	0	129				0	1348		0	2561	
V/C Ratio(X)	0.24	0.00	0.18				0.00	0.15		0.00	0.21	
Avail Cap(c_a), veh/h	646	0	575				0	1348		0	2561	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.1	0.0	27.9				0.0	3.1	0.0	0.0	3.2	0.0
Incr Delay (d2), s/veh	3.9	0.0	3.0				0.0	0.2	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.4				0.0	0.5	0.0	0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	30.9				0.0	3.3	0.0	0.0	3.4	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		58						208	A		544	A
Approach Delay, s/veh		31.6						3.3			3.4	
Approach LOS		C						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	53.0	12.0	53.0
Change Period (Y+Rc), s	6.9	6.8	6.9
Max Green Setting (Gmax), s	28.1	23.2	28.1
Max Q Clear Time (g_c+I1), s	4.3	3.2	5.4
Green Ext Time (p_c), s	3.0	0.5	8.8

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	55	281	28	48	233	37	35	55	82	44	107	37
Future Vol, veh/h	55	281	28	48	233	37	35	55	82	44	107	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	58	296	29	51	245	39	37	58	86	46	113	39
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	11.6	11.2	12.5	13.4
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	20%	100%	0%	0%	100%	0%	0%	23%
Vol Thru, %	32%	0%	100%	77%	0%	100%	68%	57%
Vol Right, %	48%	0%	0%	23%	0%	0%	32%	20%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	172	55	187	122	48	155	115	188
LT Vol	35	55	0	0	48	0	0	44
Through Vol	55	0	187	94	0	155	78	107
RT Vol	82	0	0	28	0	0	37	37
Lane Flow Rate	181	58	197	128	51	164	121	198
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.328	0.11	0.347	0.219	0.097	0.291	0.207	0.368
Departure Headway (Hd)	6.528	6.839	6.328	6.164	6.91	6.399	6.168	6.691
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	547	522	566	579	516	558	578	534
Service Time	4.309	4.615	4.103	3.939	4.689	4.177	3.946	4.47
HCM Lane V/C Ratio	0.331	0.111	0.348	0.221	0.099	0.294	0.209	0.371
HCM Control Delay	12.5	10.5	12.5	10.7	10.4	11.8	10.6	13.4
HCM Lane LOS	B	B	B	B	B	B	B	B
HCM 95th-tile Q	1.4	0.4	1.5	0.8	0.3	1.2	0.8	1.7

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	28	14	27	38	16	35	123	24	16	174	15
Future Vol, veh/h	8	28	14	27	38	16	35	123	24	16	174	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	8	29	15	28	40	17	37	129	25	17	183	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.6	8.8	10	9.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	19%	100%	0%	100%	0%	8%	0%
Vol Thru, %	68%	0%	67%	0%	70%	92%	0%
Vol Right, %	13%	0%	33%	0%	30%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	182	8	42	27	54	190	15
LT Vol	35	8	0	27	0	16	0
Through Vol	123	0	28	0	38	174	0
RT Vol	24	0	14	0	16	0	15
Lane Flow Rate	192	8	44	28	57	200	16
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.271	0.014	0.066	0.048	0.085	0.283	0.019
Departure Headway (Hd)	5.091	6.138	5.397	6.091	5.377	5.09	4.344
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	705	581	661	586	664	706	822
Service Time	3.13	3.894	3.153	3.843	3.129	2.827	2.081
HCM Lane V/C Ratio	0.272	0.014	0.067	0.048	0.086	0.283	0.019
HCM Control Delay	10	9	8.5	9.2	8.6	9.8	7.2
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	1.1	0	0.2	0.2	0.3	1.2	0.1

Intersection	
Intersection Delay, s/veh	23.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↱	
Traffic Vol, veh/h	31	239	120	56	104	13	74	295	96	73	496	32
Future Vol, veh/h	31	239	120	56	104	13	74	295	96	73	496	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	33	252	126	59	109	14	78	311	101	77	522	34
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	18.2	15.4	25.5	28.1
HCM LOS	C	C	D	D

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	40%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	60%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	74	295	96	31	159	200	56	104	13	73	331
LT Vol	74	0	0	31	0	0	56	0	0	73	0
Through Vol	0	295	0	0	159	80	0	104	0	0	331
RT Vol	0	0	96	0	0	120	0	0	13	0	0
Lane Flow Rate	78	311	101	33	168	210	59	109	14	77	348
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.197	0.742	0.222	0.085	0.414	0.495	0.165	0.29	0.034	0.188	0.803
Departure Headway (Hd)	9.104	8.604	7.904	9.394	8.894	8.474	10.052	9.552	8.852	8.807	8.307
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	395	422	455	382	406	427	357	377	405	408	435
Service Time	6.849	6.349	5.649	7.139	6.639	6.219	7.805	7.305	6.605	6.548	6.048
HCM Lane V/C Ratio	0.197	0.737	0.222	0.086	0.414	0.492	0.165	0.289	0.035	0.189	0.8
HCM Control Delay	14.1	32.4	12.9	13	17.8	19.3	14.8	16.2	11.9	13.6	37.3
HCM Lane LOS	B	D	B	B	C	C	B	C	B	B	E
HCM 95th-tile Q	0.7	6	0.8	0.3	2	2.7	0.6	1.2	0.1	0.7	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	14	11	46	29	4	11	68	390	121	14	383	39
Future Volume (veh/h)	14	11	46	29	4	11	68	390	121	14	383	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	15	12	48	31	4	12	72	411	127	15	403	41
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	171	141	119	162	141	119	121	2692	1201	49	2548	1136
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.75	0.75	0.03	0.71	0.71
Sat Flow, veh/h	1419	1900	1610	1364	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	15	12	48	31	4	12	72	411	127	15	403	41
Grp Sat Flow(s),veh/h/ln	1419	1900	1610	1364	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	1.0	0.6	3.0	2.3	0.2	0.7	4.1	3.4	2.3	0.9	3.9	0.8
Cycle Q Clear(g_c), s	1.2	0.6	3.0	2.9	0.2	0.7	4.1	3.4	2.3	0.9	3.9	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	171	141	119	162	141	119	121	2692	1201	49	2548	1136
V/C Ratio(X)	0.09	0.09	0.40	0.19	0.03	0.10	0.60	0.15	0.11	0.31	0.16	0.04
Avail Cap(c_a), veh/h	662	798	676	633	798	676	260	2692	1201	260	2548	1136
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.7	45.3	46.4	46.6	45.1	45.4	47.6	3.8	3.7	50.1	5.1	4.7
Incr Delay (d2), s/veh	0.5	0.6	5.1	1.3	0.2	0.9	1.7	0.1	0.2	1.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.3	1.3	0.8	0.1	0.3	1.8	0.9	0.6	0.4	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	45.9	51.5	48.0	45.3	46.2	49.3	4.0	3.9	51.4	5.2	4.7
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		75			47			610			459	
Approach Delay, s/veh		49.5			47.3			9.3			6.7	
Approach LOS		D			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.9	79.4		13.7	7.7	83.6		13.7
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1
Max Q Clear Time (g_c+I1), s	6.1	5.9		4.9	2.9	5.4		5.0
Green Ext Time (p_c), s	0.0	5.4		0.3	0.0	6.2		0.6

Intersection Summary	
HCM 6th Ctrl Delay	12.3
HCM 6th LOS	B

HCM 6th Signalized Intersection Summary
3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	12	3	576	20	5	453
Future Volume (veh/h)	12	3	576	20	5	453
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	3	606	21	5	477
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	54	48	2824	98	19	3082
Arrive On Green	0.03	0.03	0.79	0.79	0.01	0.85
Sat Flow, veh/h	1810	1610	3655	123	1810	3705
Grp Volume(v), veh/h	13	3	307	320	5	477
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1878	1810	1805
Q Serve(g_s), s	0.6	0.1	3.4	3.4	0.2	1.8
Cycle Q Clear(g_c), s	0.6	0.1	3.4	3.4	0.2	1.8
Prop In Lane	1.00	1.00		0.07	1.00	
Lane Grp Cap(c), veh/h	54	48	1432	1490	19	3082
V/C Ratio(X)	0.24	0.06	0.21	0.21	0.26	0.15
Avail Cap(c_a), veh/h	588	523	1432	1490	362	3082
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.91	0.91	0.99	0.99
Uniform Delay (d), s/veh	37.9	37.7	2.1	2.1	39.3	1.0
Incr Delay (d2), s/veh	4.8	1.1	0.3	0.3	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.5	0.5	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.7	38.9	2.4	2.4	41.9	1.1
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	16		627			482
Approach Delay, s/veh	42.0		2.4			1.5
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.6		6.4	4.8	68.8
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.8		2.6	2.2	5.4
Green Ext Time (p_c), s		5.1		0.0	0.0	5.1

Intersection Summary			
HCM 6th Ctrl Delay			2.6
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↲	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	227	0	476	0	147	15	0	461	37
Future Volume (veh/h)	0	0	0	227	0	476	0	147	15	0	461	37
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				239	0	501	0	155	0	0	485	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1007	0	896	0	2045		0	2045	
Arrive On Green				0.28	0.00	0.28	0.00	0.57	0.00	0.00	0.57	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				239	0	501	0	155	0	0	485	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.3	0.0	11.3	0.0	1.7	0.0	0.0	5.7	0.0
Cycle Q Clear(g_c), s				4.3	0.0	11.3	0.0	1.7	0.0	0.0	5.7	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1007	0	896	0	2045		0	2045	
V/C Ratio(X)				0.24	0.00	0.56	0.00	0.08		0.00	0.24	
Avail Cap(c_a), veh/h				1516	0	1349	0	2045		0	2045	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	1.00	0.00
Uniform Delay (d), s/veh				23.7	0.0	26.2	0.0	8.3	0.0	0.0	9.2	0.0
Incr Delay (d2), s/veh				0.6	0.0	2.5	0.0	0.1	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	4.3	0.0	0.6	0.0	0.0	2.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				24.3	0.0	28.7	0.0	8.4	0.0	0.0	9.5	0.0
LnGrp LOS				C	A	C	A	A		A	A	
Approach Vol, veh/h					740			155	A		485	A
Approach Delay, s/veh					27.3			8.4			9.5	
Approach LOS					C			A			A	

Timer - Assigned Phs		2				6		8
Phs Duration (G+Y+Rc), s		54.9				54.9		30.1
Change Period (Y+Rc), s		6.8				6.8		6.4
Max Green Setting (Gmax), s		36.2				36.2		35.6
Max Q Clear Time (g_c+I1), s		3.7				7.7		13.3
Green Ext Time (p_c), s		2.6				8.7		10.4

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	31	0	11	0	0	0	0	131	358	0	361	327
Future Volume (veh/h)	31	0	11	0	0	0	0	131	358	0	361	327
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	33	0	12				0	138	0	0	380	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	124	0	110				0	1369		0	2602	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	33	0	12				0	138	0	0	380	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.1	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s	1.1	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	124	0	110				0	1369		0	2602	
V/C Ratio(X)	0.27	0.00	0.11				0.00	0.10		0.00	0.15	
Avail Cap(c_a), veh/h	646	0	575				0	1369		0	2602	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.98	0.00
Uniform Delay (d), s/veh	28.7	0.0	28.4				0.0	2.7	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	5.2	0.0	2.0				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2				0.0	0.3	0.0	0.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	30.4				0.0	2.9	0.0	0.0	2.9	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		45						138	A		380	A
Approach Delay, s/veh		33.0						2.9			2.9	
Approach LOS		C						A			A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	53.7	11.3	53.7
Change Period (Y+Rc), s	6.9	6.8	6.9
Max Green Setting (Gmax), s	28.1	23.2	28.1
Max Q Clear Time (g_c+I1), s	3.4	3.1	4.1
Green Ext Time (p_c), s	1.9	0.3	6.2

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	10.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	53	279	59	67	199	17	17	94	67	28	50	21
Future Vol, veh/h	53	279	59	67	199	17	17	94	67	28	50	21
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	56	294	62	71	209	18	18	99	71	29	53	22
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	10.7	10.2	11.9	10.9
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	10%	100%	0%	0%	100%	0%	0%	28%
Vol Thru, %	53%	0%	100%	61%	0%	100%	80%	51%
Vol Right, %	38%	0%	0%	39%	0%	0%	20%	21%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	178	53	186	152	67	133	83	99
LT Vol	17	53	0	0	67	0	0	28
Through Vol	94	0	186	93	0	133	66	50
RT Vol	67	0	0	59	0	0	17	21
Lane Flow Rate	187	56	196	160	71	140	88	104
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.324	0.099	0.321	0.25	0.128	0.234	0.143	0.191
Departure Headway (Hd)	6.216	6.404	5.896	5.62	6.541	6.032	5.887	6.587
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	577	559	609	638	547	594	608	544
Service Time	3.965	4.149	3.64	3.364	4.289	3.78	3.635	4.342
HCM Lane V/C Ratio	0.324	0.1	0.322	0.251	0.13	0.236	0.145	0.191
HCM Control Delay	11.9	9.9	11.4	10.2	10.3	10.6	9.6	10.9
HCM Lane LOS	B	A	B	B	B	B	A	B
HCM 95th-tile Q	1.4	0.3	1.4	1	0.4	0.9	0.5	0.7

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	24	45	36	5	13	26	11	129	2	20	116	11
Future Vol, veh/h	24	45	36	5	13	26	11	129	2	20	116	11
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	25	47	38	5	14	27	12	136	2	21	122	12
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.5	8.1	9.5	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	8%	100%	0%	100%	0%	15%	0%
Vol Thru, %	91%	0%	56%	0%	33%	85%	0%
Vol Right, %	1%	0%	44%	0%	67%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	142	24	81	5	39	136	11
LT Vol	11	24	0	5	0	20	0
Through Vol	129	0	45	0	13	116	0
RT Vol	2	0	36	0	26	0	11
Lane Flow Rate	149	25	85	5	41	143	12
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.211	0.041	0.119	0.009	0.056	0.203	0.014
Departure Headway (Hd)	5.093	5.83	5.013	5.907	4.932	5.11	4.333
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	704	614	715	606	725	703	825
Service Time	3.125	3.563	2.746	3.645	2.67	2.841	2.064
HCM Lane V/C Ratio	0.212	0.041	0.119	0.008	0.057	0.203	0.015
HCM Control Delay	9.5	8.8	8.4	8.7	8	9.1	7.1
HCM Lane LOS	A	A	A	A	A	A	A
HCM 95th-tile Q	0.8	0.1	0.4	0	0.2	0.8	0

Intersection	
Intersection Delay, s/veh	123.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑ ↑↱		↰	↑	↱	↰	↑	↱	↰	↑ ↑↱	
Traffic Vol, veh/h	37	220	79	57	182	67	165	661	95	34	324	50
Future Vol, veh/h	37	220	79	57	182	67	165	661	95	34	324	50
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	39	232	83	60	192	71	174	696	100	36	341	53
Number of Lanes	1	2	0	1	1	1	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	19.2	20.1	241.3	22.5
HCM LOS	C	C	F	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	100%	48%	0%	100%	0%	0%	100%
Vol Right, %	0%	0%	100%	0%	0%	52%	0%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	165	661	95	37	147	152	57	182	67	34	216
LT Vol	165	0	0	37	0	0	57	0	0	34	0
Through Vol	0	661	0	0	147	73	0	182	0	0	216
RT Vol	0	0	95	0	0	79	0	0	67	0	0
Lane Flow Rate	174	696	100	39	154	160	60	192	71	36	227
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.439	1.662	0.219	0.108	0.407	0.407	0.168	0.51	0.174	0.097	0.586
Departure Headway (Hd)	9.098	8.598	7.898	10.867	10.367	10.004	10.952	10.452	9.752	10.543	10.043
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	394	424	453	332	349	362	329	347	370	342	362
Service Time	6.873	6.373	5.673	8.567	8.067	7.704	8.652	8.152	7.452	8.243	7.743
HCM Lane V/C Ratio	0.442	1.642	0.221	0.117	0.441	0.442	0.182	0.553	0.192	0.105	0.627
HCM Control Delay	18.9	329.7	12.9	14.9	20	19.4	15.9	23.5	14.5	14.4	26
HCM Lane LOS	C	F	B	B	C	C	C	C	B	B	D
HCM 95th-tile Q	2.2	40.7	0.8	0.4	1.9	1.9	0.6	2.8	0.6	0.3	3.6

2: Marks Avenue & Nielsen Avenue

BO_WP_PM

	↰	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑	↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	33	5	47	101	11	12	42	638	79	11	354	24
Future Volume (veh/h)	33	5	47	101	11	12	42	638	79	11	354	24
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	34	5	49	105	11	12	44	665	82	11	369	25
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	209	199	169	209	199	169	100	2603	1161	38	2479	1106
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.06	0.72	0.72	0.02	0.69	0.69
Sat Flow, veh/h	1410	1900	1610	1371	1900	1610	1810	3610	1610	1810	3610	1610
Grp Volume(v), veh/h	34	5	49	105	11	12	44	665	82	11	369	25
Grp Sat Flow(s),veh/h/ln	1410	1900	1610	1371	1900	1610	1810	1805	1610	1810	1805	1610
Q Serve(g_s), s	2.3	0.2	3.0	7.8	0.5	0.7	2.5	6.6	1.6	0.6	3.7	0.5
Cycle Q Clear(g_c), s	2.9	0.2	3.0	8.1	0.5	0.7	2.5	6.6	1.6	0.6	3.7	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	209	199	169	209	199	169	100	2603	1161	38	2479	1106
V/C Ratio(X)	0.16	0.03	0.29	0.50	0.06	0.07	0.44	0.26	0.07	0.29	0.15	0.02
Avail Cap(c_a), veh/h	654	798	676	641	798	676	260	2603	1161	260	2479	1106
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	42.2	43.4	45.8	42.3	42.4	48.0	5.0	4.3	50.6	5.7	5.2
Incr Delay (d2), s/veh	0.9	0.1	2.2	4.3	0.3	0.4	1.1	0.2	0.1	1.6	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.1	1.3	2.8	0.3	0.3	1.1	2.0	0.4	0.3	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.5	42.3	45.6	50.2	42.6	42.8	49.2	5.2	4.4	52.2	5.9	5.3
LnGrp LOS	D	D	D	D	D	D	D	A	A	D	A	A
Approach Vol, veh/h		88			128			791			405	
Approach Delay, s/veh		45.0			48.8			7.6			7.1	
Approach LOS		D			D			A			A	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.7	77.4		16.9	7.1	81.0		16.9				
Change Period (Y+Rc), s	4.9	5.3		5.9	4.9	5.3		5.9				
Max Green Setting (Gmax), s	15.1	29.7		44.1	15.1	29.7		44.1				
Max Q Clear Time (g_c+I1), s	4.5	5.7		10.1	2.6	8.6		5.0				
Green Ext Time (p_c), s	0.0	4.8		1.0	0.0	8.7		0.6				
Intersection Summary												
HCM 6th Ctrl Delay			13.5									
HCM 6th LOS			B									

3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	34	9	750	14	4	497
Future Volume (veh/h)	34	9	750	14	4	497
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	36	9	789	15	4	523
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	114	102	2761	52	15	2962
Arrive On Green	0.06	0.06	0.76	0.76	0.01	0.82
Sat Flow, veh/h	1810	1610	3719	69	1810	3705
Grp Volume(v), veh/h	36	9	393	411	4	523
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1888	1810	1805
Q Serve(g_s), s	1.5	0.4	5.3	5.3	0.2	2.4
Cycle Q Clear(g_c), s	1.5	0.4	5.3	5.3	0.2	2.4
Prop In Lane	1.00	1.00		0.04	1.00	
Lane Grp Cap(c), veh/h	114	102	1375	1438	15	2962
V/C Ratio(X)	0.31	0.09	0.29	0.29	0.26	0.18
Avail Cap(c_a), veh/h	588	523	1375	1438	362	2962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.90	0.90	0.98	0.98
Uniform Delay (d), s/veh	35.8	35.3	2.9	2.9	39.4	1.5
Incr Delay (d2), s/veh	3.3	0.8	0.5	0.4	3.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	1.0	1.1	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	36.1	3.4	3.3	42.6	1.6
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	45		804			527
Approach Delay, s/veh	38.5		3.4			1.9
Approach LOS	D		A			A
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		70.9		9.1	4.7	66.3
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.4		3.5	2.2	7.3
Green Ext Time (p_c), s		5.6		0.2	0.0	6.5
Intersection Summary						
HCM 6th Ctrl Delay			4.0			
HCM 6th LOS			A			

4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	372	0	620	0	218	18	0	498	47
Future Volume (veh/h)	0	0	0	372	0	620	0	218	18	0	498	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				392	0	653	0	229	0	0	524	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1235	0	1099	0	1817		0	1817	
Arrive On Green				0.34	0.00	0.34	0.00	0.50	0.00	0.00	0.50	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				392	0	653	0	229	0	0	524	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				6.8	0.0	14.2	0.0	2.9	0.0	0.0	7.2	0.0
Cycle Q Clear(g_c), s				6.8	0.0	14.2	0.0	2.9	0.0	0.0	7.2	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1235	0	1099	0	1817		0	1817	
V/C Ratio(X)				0.32	0.00	0.59	0.00	0.13		0.00	0.29	
Avail Cap(c_a), veh/h				1516	0	1349	0	1817		0	1817	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				20.7	0.0	23.1	0.0	11.2	0.0	0.0	12.3	0.0
Incr Delay (d2), s/veh				0.7	0.0	2.4	0.0	0.1	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.8	0.0	5.3	0.0	1.0	0.0	0.0	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				21.4	0.0	25.5	0.0	11.3	0.0	0.0	12.7	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					1045			229	A		524	A
Approach Delay, s/veh					23.9			11.3			12.7	
Approach LOS					C			B			B	

Timer - Assigned Phs	2	6	8
Phs Duration (G+Y+Rc), s	49.6	49.6	35.4
Change Period (Y+Rc), s	6.8	6.8	6.4
Max Green Setting (Gmax), s	36.2	36.2	35.6
Max Q Clear Time (g_c+I1), s	4.9	9.2	16.2
Green Ext Time (p_c), s	3.9	9.3	12.8

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

5: Marks Avenue & SR-180 Eastbound Ramps

BO_WP_PM

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	35	0	22	0	0	0	0	201	296	0	518	352
Future Volume (veh/h)	35	0	22	0	0	0	0	201	296	0	518	352
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	37	0	23				0	212	0	0	545	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	147	0	131				0	1345		0	2555	
Arrive On Green	0.08	0.00	0.08				0.00	0.71	0.00	0.00	0.71	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	37	0	23				0	212	0	0	545	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.9				0.0	2.4	0.0	0.0	3.4	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.9				0.0	2.4	0.0	0.0	3.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	147	0	131				0	1345		0	2555	
V/C Ratio(X)	0.25	0.00	0.18				0.00	0.16		0.00	0.21	
Avail Cap(c_a), veh/h	646	0	575				0	1345		0	2555	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.0	0.0	27.8				0.0	3.1	0.0	0.0	3.3	0.0
Incr Delay (d2), s/veh	4.0	0.0	2.9				0.0	0.3	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.4				0.0	0.5	0.0	0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	30.7				0.0	3.4	0.0	0.0	3.5	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		60						212	A		545	A
Approach Delay, s/veh		31.5						3.4			3.5	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		52.9		12.1		52.9						
Change Period (Y+Rc), s		6.9		6.8		6.9						
Max Green Setting (Gmax), s		28.1		23.2		28.1						
Max Q Clear Time (g_c+I1), s		4.4		3.2		5.4						
Green Ext Time (p_c), s		3.1		0.5		8.8						

Intersection Summary	
HCM 6th Ctrl Delay	5.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Intersection Delay, s/veh	12.3
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱			✥			✥	
Traffic Vol, veh/h	55	285	28	68	248	37	35	56	87	44	112	37
Future Vol, veh/h	55	285	28	68	248	37	35	56	87	44	112	37
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	58	300	29	72	261	39	37	59	92	46	118	39
Number of Lanes	1	2	0	1	2	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	3	3
HCM Control Delay	11.9	11.5	13	13.9
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	20%	100%	0%	0%	100%	0%	0%	23%
Vol Thru, %	31%	0%	100%	77%	0%	100%	69%	58%
Vol Right, %	49%	0%	0%	23%	0%	0%	31%	19%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	178	55	190	123	68	165	120	193
LT Vol	35	55	0	0	68	0	0	44
Through Vol	56	0	190	95	0	165	83	112
RT Vol	87	0	0	28	0	0	37	37
Lane Flow Rate	187	58	200	129	72	174	126	203
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.346	0.112	0.359	0.226	0.139	0.313	0.219	0.385
Departure Headway (Hd)	6.653	6.972	6.46	6.297	6.996	6.484	6.262	6.828
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	536	511	554	566	509	550	569	524
Service Time	4.444	4.757	4.245	4.082	4.784	4.271	4.049	4.617
HCM Lane V/C Ratio	0.349	0.114	0.361	0.228	0.141	0.316	0.221	0.387
HCM Control Delay	13	10.6	12.9	10.9	10.9	12.2	10.8	13.9
HCM Lane LOS	B	B	B	B	B	B	B	B
HCM 95th-tile Q	1.5	0.4	1.6	0.9	0.5	1.3	0.8	1.8

Intersection	
Intersection Delay, s/veh	9.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			✥			↰	↱
Traffic Vol, veh/h	8	28	16	27	40	25	41	125	24	18	175	15
Future Vol, veh/h	8	28	16	27	40	25	41	125	24	18	175	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	8	29	17	28	42	26	43	132	25	19	184	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	2
HCM Control Delay	8.7	8.8	10.3	9.8
HCM LOS	A	A	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	22%	100%	0%	100%	0%	9%	0%
Vol Thru, %	66%	0%	64%	0%	62%	91%	0%
Vol Right, %	13%	0%	36%	0%	38%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	190	8	44	27	65	193	15
LT Vol	41	8	0	27	0	18	0
Through Vol	125	0	28	0	40	175	0
RT Vol	24	0	16	0	25	0	15
Lane Flow Rate	200	8	46	28	68	203	16
Geometry Grp	6	7	7	7	7	7	7
Degree of Util (X)	0.286	0.014	0.07	0.048	0.102	0.29	0.019
Departure Headway (Hd)	5.142	6.189	5.427	6.132	5.355	5.142	4.392
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	698	576	657	582	666	697	812
Service Time	3.186	3.952	3.189	3.888	3.11	2.884	2.134
HCM Lane V/C Ratio	0.287	0.014	0.07	0.048	0.102	0.291	0.02
HCM Control Delay	10.3	9	8.6	9.2	8.7	10	7.2
HCM Lane LOS	B	A	A	A	A	A	A
HCM 95th-tile Q	1.2	0	0.2	0.2	0.3	1.2	0.1

HCM 6th Signalized Intersection Summary
3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↗	↘	↓
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	11	3	581	19	5	441
Future Volume (veh/h)	11	3	581	19	5	441
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	14	4	726	24	6	551
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	60	53	2811	93	23	3071
Arrive On Green	0.03	0.03	0.79	0.79	0.01	0.85
Sat Flow, veh/h	1810	1610	3661	118	1810	3705
Grp Volume(v), veh/h	14	4	367	383	6	551
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1879	1810	1805
Q Serve(g_s), s	0.6	0.2	4.3	4.3	0.3	2.2
Cycle Q Clear(g_c), s	0.6	0.2	4.3	4.3	0.3	2.2
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	60	53	1423	1481	23	3071
V/C Ratio(X)	0.23	0.08	0.26	0.26	0.27	0.18
Avail Cap(c_a), veh/h	588	523	1423	1481	362	3071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.86	0.86	1.00	1.00
Uniform Delay (d), s/veh	37.7	37.5	2.3	2.3	39.1	1.1
Incr Delay (d2), s/veh	4.2	1.3	0.4	0.4	2.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.2	0.7	0.7	0.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.9	38.8	2.6	2.6	41.4	1.2
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	18		750			557
Approach Delay, s/veh	41.2		2.6			1.6
Approach LOS	D		A			A
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.4		6.6	5.0	68.4
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.2		2.6	2.3	6.3
Green Ext Time (p_c), s		6.0		0.0	0.0	6.2
Intersection Summary						
HCM 6th Ctrl Delay			2.7			
HCM 6th LOS			A			

4: Marks Avenue & SR-180 Westbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	193	0	477	0	111	11	0	438	33
Future Volume (veh/h)	0	0	0	193	0	477	0	111	11	0	438	33
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				268	0	662	0	154	0	0	608	0
Peak Hour Factor				0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1201	0	1068	0	1852		0	1852	
Arrive On Green				0.33	0.00	0.33	0.00	0.51	0.00	0.00	0.51	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				268	0	662	0	154	0	0	608	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.5	0.0	14.7	0.0	1.8	0.0	0.0	8.4	0.0
Cycle Q Clear(g_c), s				4.5	0.0	14.7	0.0	1.8	0.0	0.0	8.4	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1201	0	1068	0	1852		0	1852	
V/C Ratio(X)				0.22	0.00	0.62	0.00	0.08		0.00	0.33	
Avail Cap(c_a), veh/h				1516	0	1349	0	1852		0	1852	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				20.5	0.0	23.9	0.0	10.5	0.0	0.0	12.1	0.0
Incr Delay (d2), s/veh				0.4	0.0	2.7	0.0	0.1	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	5.5	0.0	0.7	0.0	0.0	3.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.9	0.0	26.6	0.0	10.6	0.0	0.0	12.6	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					930			154	A		608	A
Approach Delay, s/veh					25.0			10.6			12.6	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		50.4				50.4		34.6				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		3.8				10.4		16.7				
Green Ext Time (p_c), s		2.5				10.6		11.5				

Intersection Summary	
HCM 6th Ctrl Delay	19.2
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	31	0	11	0	0	0	0	92	246	0	309	320
Future Volume (veh/h)	31	0	11	0	0	0	0	92	246	0	309	320
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	34	0	12				0	100	0	0	336	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	126	0	112				0	1368		0	2598	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	34	0	12				0	100	0	0	336	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.5				0.0	1.0	0.0	0.0	1.9	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.5				0.0	1.0	0.0	0.0	1.9	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	126	0	112				0	1368		0	2598	
V/C Ratio(X)	0.27	0.00	0.11				0.00	0.07		0.00	0.13	
Avail Cap(c_a), veh/h	646	0	575				0	1368		0	2598	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.7	0.0	28.4				0.0	2.7	0.0	0.0	2.8	0.0
Incr Delay (d2), s/veh	5.2	0.0	1.9				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2				0.0	0.2	0.0	0.0	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	30.3				0.0	2.8	0.0	0.0	2.9	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		46						100	A		336	A
Approach Delay, s/veh		33.0						2.8			2.9	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		53.7		11.3		53.7						
Change Period (Y+Rc), s		6.9		6.8		6.9						
Max Green Setting (Gmax), s		28.1		23.2		28.1						
Max Q Clear Time (g_c+I1), s		3.0		3.2		3.9						
Green Ext Time (p_c), s		1.3		0.3		5.4						

Intersection Summary	
HCM 6th Ctrl Delay	5.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	32	8	766	13	4	486
Future Volume (veh/h)	32	8	766	13	4	486
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	35	9	833	14	4	528
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	113	100	2771	47	15	2965
Arrive On Green	0.06	0.06	0.76	0.76	0.01	0.82
Sat Flow, veh/h	1810	1610	3728	61	1810	3705
Grp Volume(v), veh/h	35	9	414	433	4	528
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1889	1810	1805
Q Serve(g_s), s	1.5	0.4	5.6	5.6	0.2	2.4
Cycle Q Clear(g_c), s	1.5	0.4	5.6	5.6	0.2	2.4
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	113	100	1377	1441	15	2965
V/C Ratio(X)	0.31	0.09	0.30	0.30	0.26	0.18
Avail Cap(c_a), veh/h	588	523	1377	1441	362	2965
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.85	0.85	1.00	1.00
Uniform Delay (d), s/veh	35.9	35.4	2.9	2.9	39.4	1.5
Incr Delay (d2), s/veh	3.3	0.8	0.5	0.5	3.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	1.1	1.1	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	36.2	3.4	3.4	42.7	1.6
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	44		847			532
Approach Delay, s/veh	38.5		3.4			1.9
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		71.0		9.0	4.7	66.3
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.4		3.5	2.2	7.6
Green Ext Time (p_c), s		5.7		0.2	0.0	6.8

Intersection Summary			
HCM 6th Ctrl Delay			3.9
HCM 6th LOS			A

4: Marks Avenue & SR-180 Westbound Ramps

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↖	↰	↗↗		↑↑	↗		↑↱	
Traffic Volume (veh/h)	0	0	0	270	0	624	0	171	16	0	472	44
Future Volume (veh/h)	0	0	0	270	0	624	0	171	16	0	472	44
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				333	0	770	0	211	0	0	583	0
Peak Hour Factor				0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1315	0	1170	0	1738		0	1738	
Arrive On Green				0.36	0.00	0.36	0.00	0.48	0.00	0.00	0.48	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				333	0	770	0	211	0	0	583	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				5.5	0.0	17.0	0.0	2.7	0.0	0.0	8.5	0.0
Cycle Q Clear(g_c), s				5.5	0.0	17.0	0.0	2.7	0.0	0.0	8.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1315	0	1170	0	1738		0	1738	
V/C Ratio(X)				0.25	0.00	0.66	0.00	0.12		0.00	0.34	
Avail Cap(c_a), veh/h				1516	0	1349	0	1738		0	1738	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				19.0	0.0	22.6	0.0	12.1	0.0	0.0	13.6	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.9	0.0	0.1	0.0	0.0	0.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.2	0.0	6.3	0.0	1.0	0.0	0.0	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				19.4	0.0	25.5	0.0	12.3	0.0	0.0	14.1	0.0
LnGrp LOS				B	A	C	A	B		A	B	
Approach Vol, veh/h					1103			211	A		583	A
Approach Delay, s/veh					23.7			12.3			14.1	
Approach LOS					C			B			B	
Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		47.7				47.7		37.3				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		4.7				10.5		19.0				
Green Ext Time (p_c), s		3.6				10.1		11.9				

Intersection Summary	
HCM 6th Ctrl Delay	19.5
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	34	0	21	0	0	0	0	152	286	0	391	347
Future Volume (veh/h)	34	0	21	0	0	0	0	152	286	0	391	347
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	37	0	23				0	165	0	0	425	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	147	0	131				0	1345		0	2555	
Arrive On Green	0.08	0.00	0.08				0.00	0.71	0.00	0.00	0.71	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	37	0	23				0	165	0	0	425	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.9				0.0	1.8	0.0	0.0	2.5	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.9				0.0	1.8	0.0	0.0	2.5	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	147	0	131				0	1345		0	2555	
V/C Ratio(X)	0.25	0.00	0.18				0.00	0.12		0.00	0.17	
Avail Cap(c_a), veh/h	646	0	575				0	1345		0	2555	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.0	0.0	27.8				0.0	3.0	0.0	0.0	3.1	0.0
Incr Delay (d2), s/veh	4.0	0.0	2.9				0.0	0.2	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.4				0.0	0.4	0.0	0.0	0.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.0	0.0	30.7				0.0	3.2	0.0	0.0	3.3	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		60						165	A		425	A
Approach Delay, s/veh		31.5						3.2			3.3	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		52.9		12.1		52.9
Change Period (Y+Rc), s		6.9		6.8		6.9
Max Green Setting (Gmax), s		28.1		23.2		28.1
Max Q Clear Time (g_c+I1), s		3.8		3.2		4.5
Green Ext Time (p_c), s		2.3		0.5		6.9

Intersection Summary			
HCM 6th Ctrl Delay			5.9
HCM 6th LOS			A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: Marks Avenue & Ray Johnson Drive

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	12	3	616	20	5	463
Future Volume (veh/h)	12	3	616	20	5	463
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	13	3	648	21	5	487
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	54	48	2831	92	19	3082
Arrive On Green	0.03	0.03	0.79	0.79	0.01	0.85
Sat Flow, veh/h	1810	1610	3664	116	1810	3705
Grp Volume(v), veh/h	13	3	328	341	5	487
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1879	1810	1805
Q Serve(g_s), s	0.6	0.1	3.7	3.7	0.2	1.8
Cycle Q Clear(g_c), s	0.6	0.1	3.7	3.7	0.2	1.8
Prop In Lane	1.00	1.00		0.06	1.00	
Lane Grp Cap(c), veh/h	54	48	1432	1491	19	3082
V/C Ratio(X)	0.24	0.06	0.23	0.23	0.26	0.16
Avail Cap(c_a), veh/h	588	523	1432	1491	362	3082
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.89	0.89	1.00	1.00
Uniform Delay (d), s/veh	37.9	37.7	2.1	2.1	39.3	1.0
Incr Delay (d2), s/veh	4.8	1.1	0.3	0.3	2.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.5	0.6	0.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.7	38.9	2.4	2.4	42.0	1.1
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	16		669			492
Approach Delay, s/veh	42.0		2.4			1.5
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		73.6		6.4	4.8	68.8
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		3.8		2.6	2.2	5.7
Green Ext Time (p_c), s		5.2		0.0	0.0	5.5

Intersection Summary						
HCM 6th Ctrl Delay			2.6			
HCM 6th LOS			A			

HCM 6th Signalized Intersection Summary
4: Marks Avenue & SR-180 Westbound Ramps

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	227	0	516	0	147	15	0	471	37
Future Volume (veh/h)	0	0	0	227	0	516	0	147	15	0	471	37
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				239	0	543	0	155	0	0	496	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1059	0	942	0	1993		0	1993	
Arrive On Green				0.29	0.00	0.29	0.00	0.55	0.00	0.00	0.55	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				239	0	543	0	155	0	0	496	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				4.3	0.0	12.2	0.0	1.7	0.0	0.0	6.1	0.0
Cycle Q Clear(g_c), s				4.3	0.0	12.2	0.0	1.7	0.0	0.0	6.1	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1059	0	942	0	1993		0	1993	
V/C Ratio(X)				0.23	0.00	0.58	0.00	0.08		0.00	0.25	
Avail Cap(c_a), veh/h				1516	0	1349	0	1993		0	1993	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				22.8	0.0	25.6	0.0	8.9	0.0	0.0	9.9	0.0
Incr Delay (d2), s/veh				0.5	0.0	2.6	0.0	0.1	0.0	0.0	0.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.8	0.0	4.6	0.0	0.6	0.0	0.0	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				23.3	0.0	28.1	0.0	9.0	0.0	0.0	10.2	0.0
LnGrp LOS				C	A	C	A	A		A	B	
Approach Vol, veh/h					782			155	A		496	A
Approach Delay, s/veh					26.7			9.0			10.2	
Approach LOS					C			A			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		53.7				53.7		31.3				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		3.7				8.1		14.2				
Green Ext Time (p_c), s		2.6				8.9		10.7				

Intersection Summary	
HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes
User approved volume balancing among the lanes for turning movement.
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

5: Marks Avenue & SR-180 Eastbound Ramps

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	32	0	11	0	0	0	0	131	358	0	361	336
Future Volume (veh/h)	32	0	11	0	0	0	0	131	358	0	361	336
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	34	0	12				0	138	0	0	380	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	126	0	112				0	1368		0	2598	
Arrive On Green	0.07	0.00	0.07				0.00	0.72	0.00	0.00	0.72	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	34	0	12				0	138	0	0	380	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.2	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Cycle Q Clear(g_c), s	1.2	0.0	0.5				0.0	1.4	0.0	0.0	2.1	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	126	0	112				0	1368		0	2598	
V/C Ratio(X)	0.27	0.00	0.11				0.00	0.10		0.00	0.15	
Avail Cap(c_a), veh/h	646	0	575				0	1368		0	2598	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.98	0.00
Uniform Delay (d), s/veh	28.7	0.0	28.4				0.0	2.8	0.0	0.0	2.9	0.0
Incr Delay (d2), s/veh	5.2	0.0	1.9				0.0	0.1	0.0	0.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.2				0.0	0.3	0.0	0.0	0.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	30.3				0.0	2.9	0.0	0.0	3.0	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		46						138	A		380	A
Approach Delay, s/veh		33.0						2.9			3.0	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		53.7		11.3		53.7						
Change Period (Y+Rc), s		6.9		6.8		6.9						
Max Green Setting (Gmax), s		28.1		23.2		28.1						
Max Q Clear Time (g_c+I1), s		3.4		3.2		4.1						
Green Ext Time (p_c), s		1.9		0.3		6.2						

Intersection Summary	
HCM 6th Ctrl Delay	5.4
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
3: Marks Avenue & Ray Johnson Drive

2740 West Nielsen Warehouse
BO_WP_PM_CT

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↑↱		↰	↑↑
Traffic Volume (veh/h)	34	9	800	14	4	509
Future Volume (veh/h)	34	9	800	14	4	509
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	36	9	842	15	4	536
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0
Cap, veh/h	114	102	2765	49	15	2962
Arrive On Green	0.06	0.06	0.76	0.76	0.01	0.82
Sat Flow, veh/h	1810	1610	3724	65	1810	3705
Grp Volume(v), veh/h	36	9	419	438	4	536
Grp Sat Flow(s),veh/h/ln	1810	1610	1805	1888	1810	1805
Q Serve(g_s), s	1.5	0.4	5.8	5.8	0.2	2.5
Cycle Q Clear(g_c), s	1.5	0.4	5.8	5.8	0.2	2.5
Prop In Lane	1.00	1.00		0.03	1.00	
Lane Grp Cap(c), veh/h	114	102	1375	1439	15	2962
V/C Ratio(X)	0.31	0.09	0.30	0.30	0.26	0.18
Avail Cap(c_a), veh/h	588	523	1375	1439	362	2962
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.89	0.89	1.00	1.00
Uniform Delay (d), s/veh	35.8	35.3	2.9	2.9	39.4	1.5
Incr Delay (d2), s/veh	3.3	0.8	0.5	0.5	3.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.4	1.1	1.2	0.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	39.1	36.1	3.5	3.4	42.7	1.6
LnGrp LOS	D	D	A	A	D	A
Approach Vol, veh/h	45		857			540
Approach Delay, s/veh	38.5		3.4			2.0
Approach LOS	D		A			A

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		70.9		9.1	4.7	66.3
Change Period (Y+Rc), s		5.3		4.0	4.0	5.3
Max Green Setting (Gmax), s		44.7		26.0	16.0	24.7
Max Q Clear Time (g_c+I1), s		4.5		3.5	2.2	7.8
Green Ext Time (p_c), s		5.8		0.2	0.0	6.8

Intersection Summary			
HCM 6th Ctrl Delay			4.0
HCM 6th LOS			A

HCM 6th Signalized Intersection Summary
2740 West Nielsen Warehouse

4: Marks Avenue & SR-180 Westbound Ramps

BO_WP_PM_CT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↱↱		↑↑	↱		↑↱	
Traffic Volume (veh/h)	0	0	0	372	0	670	0	220	18	0	509	47
Future Volume (veh/h)	0	0	0	372	0	670	0	220	18	0	509	47
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach					No			No			No	
Adj Sat Flow, veh/h/ln				1900	1900	1900	0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h				392	0	705	0	232	0	0	536	0
Peak Hour Factor				0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %				0	0	0	0	0	0	0	0	0
Cap, veh/h				1280	0	1139	0	1773		0	1773	
Arrive On Green				0.35	0.00	0.35	0.00	0.49	0.00	0.00	0.49	0.00
Sat Flow, veh/h				3619	0	3220	0	3705	1610	0	3800	0
Grp Volume(v), veh/h				392	0	705	0	232	0	0	536	0
Grp Sat Flow(s),veh/h/ln				1810	0	1610	0	1805	1610	0	1805	0
Q Serve(g_s), s				6.7	0.0	15.4	0.0	3.0	0.0	0.0	7.5	0.0
Cycle Q Clear(g_c), s				6.7	0.0	15.4	0.0	3.0	0.0	0.0	7.5	0.0
Prop In Lane				1.00		1.00	0.00		1.00	0.00		0.00
Lane Grp Cap(c), veh/h				1280	0	1139	0	1773		0	1773	
V/C Ratio(X)				0.31	0.00	0.62	0.00	0.13		0.00	0.30	
Avail Cap(c_a), veh/h				1516	0	1349	0	1773		0	1773	
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.00	1.00	0.00	0.00	0.99	0.00
Uniform Delay (d), s/veh				19.9	0.0	22.7	0.0	11.8	0.0	0.0	12.9	0.0
Incr Delay (d2), s/veh				0.6	0.0	2.5	0.0	0.2	0.0	0.0	0.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				2.7	0.0	5.7	0.0	1.1	0.0	0.0	2.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				20.5	0.0	25.3	0.0	11.9	0.0	0.0	13.4	0.0
LnGrp LOS				C	A	C	A	B		A	B	
Approach Vol, veh/h					1097			232	A		536	A
Approach Delay, s/veh					23.6			11.9			13.4	
Approach LOS					C			B			B	

Timer - Assigned Phs		2				6		8				
Phs Duration (G+Y+Rc), s		48.5				48.5		36.5				
Change Period (Y+Rc), s		6.8				6.8		6.4				
Max Green Setting (Gmax), s		36.2				36.2		35.6				
Max Q Clear Time (g_c+I1), s		5.0				9.5		17.4				
Green Ext Time (p_c), s		4.0				9.4		12.7				

Intersection Summary			
HCM 6th Ctrl Delay			19.2
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱						↑↱	↱		↑↑	↱
Traffic Volume (veh/h)	36	0	22	0	0	0	0	201	296	0	517	364
Future Volume (veh/h)	36	0	22	0	0	0	0	201	296	0	517	364
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900				0	1900	1900	0	1900	1900
Adj Flow Rate, veh/h	38	0	23				0	212	0	0	544	0
Peak Hour Factor	0.95	0.95	0.95				0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0				0	0	0	0	0	0
Cap, veh/h	149	0	132				0	1343		0	2553	
Arrive On Green	0.08	0.00	0.08				0.00	0.71	0.00	0.00	0.71	0.00
Sat Flow, veh/h	1810	0	1610				0	1900	3220	0	3705	1610
Grp Volume(v), veh/h	38	0	23				0	212	0	0	544	0
Grp Sat Flow(s),veh/h/ln	1810	0	1610				0	1900	1610	0	1805	1610
Q Serve(g_s), s	1.3	0.0	0.9				0.0	2.4	0.0	0.0	3.4	0.0
Cycle Q Clear(g_c), s	1.3	0.0	0.9				0.0	2.4	0.0	0.0	3.4	0.0
Prop In Lane	1.00		1.00				0.00		1.00	0.00		1.00
Lane Grp Cap(c), veh/h	149	0	132				0	1343		0	2553	
V/C Ratio(X)	0.26	0.00	0.17				0.00	0.16		0.00	0.21	
Avail Cap(c_a), veh/h	646	0	575				0	1343		0	2553	
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	1.00	0.00	0.00	0.96	0.00
Uniform Delay (d), s/veh	28.0	0.0	27.8				0.0	3.1	0.0	0.0	3.3	0.0
Incr Delay (d2), s/veh	4.1	0.0	2.8				0.0	0.3	0.0	0.0	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.4				0.0	0.5	0.0	0.0	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	0.0	30.6				0.0	3.4	0.0	0.0	3.5	0.0
LnGrp LOS	C	A	C				A	A		A	A	
Approach Vol, veh/h		61						212	A		544	A
Approach Delay, s/veh		31.5						3.4			3.5	
Approach LOS		C						A			A	

Timer - Assigned Phs		2		4		6						
Phs Duration (G+Y+Rc), s		52.9		12.1		52.9						
Change Period (Y+Rc), s		6.9		6.8		6.9						
Max Green Setting (Gmax), s		28.1		23.2		28.1						
Max Q Clear Time (g_c+I1), s		4.4		3.3		5.4						
Green Ext Time (p_c), s		3.1		0.5		8.8						

Intersection Summary	
HCM 6th Ctrl Delay	5.5
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: Marks Avenue & Belmont Avenue

2740 West Nielsen Warehouse
Exist_WP_AM_MIT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	24	127	94	52	78	11	50	268	70	39	449	28
Future Volume (veh/h)	24	127	94	52	78	11	50	268	70	39	449	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	29	153	113	63	94	13	60	323	84	47	541	34
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	54	235	163	85	252	214	83	1087	921	73	2046	912
Arrive On Green	0.03	0.12	0.12	0.05	0.13	0.13	0.05	0.57	0.57	0.04	0.57	0.57
Sat Flow, veh/h	1810	2039	1412	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	29	134	132	63	94	13	60	323	84	47	541	34
Grp Sat Flow(s),veh/h/ln	1810	1805	1646	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.3	5.7	6.2	2.7	3.6	0.6	2.6	7.0	1.9	2.0	6.1	0.7
Cycle Q Clear(g_c), s	1.3	5.7	6.2	2.7	3.6	0.6	2.6	7.0	1.9	2.0	6.1	0.7
Prop In Lane	1.00		0.86	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	54	208	190	85	252	214	83	1087	921	73	2046	912
V/C Ratio(X)	0.54	0.65	0.69	0.74	0.37	0.06	0.72	0.30	0.09	0.64	0.26	0.04
Avail Cap(c_a), veh/h	147	417	381	170	463	392	215	1087	921	215	2046	912
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	33.8	34.0	37.6	31.7	30.3	37.7	8.8	7.7	37.8	8.8	7.7
Incr Delay (d2), s/veh	8.2	3.3	4.5	11.8	0.9	0.1	11.1	0.7	0.2	9.0	0.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.6	2.6	1.5	1.7	0.2	1.4	2.8	0.6	1.1	2.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	37.2	38.6	49.4	32.6	30.5	48.7	9.5	7.9	46.8	9.2	7.7
LnGrp LOS	D	D	D	D	C	C	D	A	A	D	A	A
Approach Vol, veh/h		295			170			467			622	
Approach Delay, s/veh		38.7			38.6			14.3			11.9	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.7	50.3	8.3	13.7	8.2	49.8	6.9	15.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	26.5	7.5	18.5	9.5	26.5	6.5	19.5
Max Q Clear Time (g_c+I1), s	4.0	9.0	4.7	8.2	4.6	8.1	3.3	5.6
Green Ext Time (p_c), s	0.0	2.0	0.0	1.1	0.0	3.6	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
1: Marks Avenue & Belmont Avenue

2740 West Nielsen Warehouse
Exist_WP_PM_MIT

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	24	174	72	52	126	53	99	596	80	25	293	26
Future Volume (veh/h)	24	174	72	52	126	53	99	596	80	25	293	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	27	198	82	59	143	60	112	677	91	28	333	30
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	51	294	118	83	255	216	145	1109	940	52	1922	857
Arrive On Green	0.03	0.12	0.12	0.05	0.13	0.13	0.08	0.58	0.58	0.03	0.53	0.53
Sat Flow, veh/h	1810	2517	1006	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	27	140	140	59	143	60	112	677	91	28	333	30
Grp Sat Flow(s),veh/h/ln	1810	1805	1719	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.2	5.9	6.3	2.6	5.6	2.7	4.9	18.4	2.0	1.2	3.8	0.7
Cycle Q Clear(g_c), s	1.2	5.9	6.3	2.6	5.6	2.7	4.9	18.4	2.0	1.2	3.8	0.7
Prop In Lane	1.00		0.59	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	51	211	201	83	255	216	145	1109	940	52	1922	857
V/C Ratio(X)	0.53	0.66	0.70	0.71	0.56	0.28	0.77	0.61	0.10	0.53	0.17	0.04
Avail Cap(c_a), veh/h	113	406	387	113	428	362	342	1109	940	113	1922	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	33.8	34.0	37.7	32.4	31.1	36.1	10.8	7.4	38.3	9.6	8.9
Incr Delay (d2), s/veh	8.2	3.6	4.3	12.4	1.9	0.7	8.3	2.5	0.2	8.2	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	2.7	2.8	1.4	2.7	1.1	2.4	7.5	0.7	0.7	1.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	37.4	38.3	50.1	34.4	31.8	44.3	13.3	7.6	46.5	9.8	9.0
LnGrp LOS	D	D	D	D	C	C	D	B	A	D	A	A
Approach Vol, veh/h		307			262			880			391	
Approach Delay, s/veh		38.6			37.3			16.6			12.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	51.2	8.2	13.8	10.9	47.1	6.8	15.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	34.0	5.0	18.0	15.1	23.9	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.2	20.4	4.6	8.3	6.9	5.8	3.2	7.6
Green Ext Time (p_c), s	0.0	4.2	0.0	1.1	0.1	2.1	0.0	0.6

Intersection Summary			
HCM 6th Ctrl Delay			22.3
HCM 6th LOS			C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	25	145	98	54	99	12	55	281	74	42	474	31
Future Volume (veh/h)	25	145	98	54	99	12	55	281	74	42	474	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	30	175	118	65	119	14	66	339	89	51	571	37
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	55	261	167	86	267	227	87	1067	904	77	2006	895
Arrive On Green	0.03	0.12	0.12	0.05	0.14	0.14	0.05	0.56	0.56	0.04	0.56	0.56
Sat Flow, veh/h	1810	2113	1349	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	30	148	145	65	119	14	66	339	89	51	571	37
Grp Sat Flow(s),veh/h/ln	1810	1805	1657	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.3	6.3	6.7	2.8	4.6	0.6	2.9	7.6	2.1	2.2	6.7	0.8
Cycle Q Clear(g_c), s	1.3	6.3	6.7	2.8	4.6	0.6	2.9	7.6	2.1	2.2	6.7	0.8
Prop In Lane	1.00		0.81	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	55	223	205	86	267	227	87	1067	904	77	2006	895
V/C Ratio(X)	0.55	0.66	0.71	0.75	0.44	0.06	0.76	0.32	0.10	0.67	0.28	0.04
Avail Cap(c_a), veh/h	147	417	383	170	463	392	215	1067	904	215	2006	895
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	33.5	33.7	37.6	31.5	29.8	37.6	9.4	8.1	37.7	9.4	8.1
Incr Delay (d2), s/veh	8.1	3.4	4.5	12.3	1.2	0.1	12.6	0.8	0.2	9.5	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.9	2.9	1.5	2.1	0.2	1.6	3.1	0.7	1.2	2.5	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	36.9	38.2	49.9	32.7	29.9	50.2	10.1	8.4	47.2	9.7	8.2
LnGrp LOS	D	D	D	D	C	C	D	B	A	D	A	A
Approach Vol, veh/h		323			198			494			659	
Approach Delay, s/veh		38.3			38.1			15.2			12.5	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.9	49.4	8.3	14.4	8.3	49.0	6.9	15.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	26.5	7.5	18.5	9.5	26.5	6.5	19.5
Max Q Clear Time (g_c+I1), s	4.2	9.6	4.8	8.7	4.9	8.7	3.3	6.6
Green Ext Time (p_c), s	0.0	2.1	0.0	1.2	0.0	3.8	0.0	0.5

Intersection Summary	
HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	25	197	76	55	147	55	107	630	85	26	310	29
Future Volume (veh/h)	25	197	76	55	147	55	107	630	85	26	310	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	28	224	86	62	167	62	122	716	97	30	352	33
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	52	324	121	85	273	231	157	1087	921	55	1862	830
Arrive On Green	0.03	0.13	0.13	0.05	0.14	0.14	0.09	0.57	0.57	0.03	0.52	0.52
Sat Flow, veh/h	1810	2574	959	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	28	155	155	62	167	62	122	716	97	30	352	33
Grp Sat Flow(s),veh/h/ln	1810	1805	1727	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.2	6.6	6.9	2.7	6.6	2.7	5.3	20.7	2.2	1.3	4.2	0.8
Cycle Q Clear(g_c), s	1.2	6.6	6.9	2.7	6.6	2.7	5.3	20.7	2.2	1.3	4.2	0.8
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	52	227	217	85	273	231	157	1087	921	55	1862	830
V/C Ratio(X)	0.53	0.68	0.71	0.73	0.61	0.27	0.78	0.66	0.11	0.55	0.19	0.04
Avail Cap(c_a), veh/h	113	406	389	113	428	362	342	1087	921	113	1862	830
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	33.4	33.6	37.6	32.2	30.5	35.8	11.8	7.8	38.2	10.4	9.6
Incr Delay (d2), s/veh	8.2	3.6	4.3	15.1	2.2	0.6	7.8	3.1	0.2	8.1	0.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.0	3.1	1.5	3.1	1.1	2.6	8.5	0.7	0.7	1.6	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	37.1	37.9	52.8	34.4	31.1	43.6	14.8	8.0	46.4	10.6	9.7
LnGrp LOS	D	D	D	D	C	C	D	B	A	D	B	A
Approach Vol, veh/h		338			291			935			415	
Approach Delay, s/veh		38.2			37.6			17.9			13.1	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.9	50.3	8.2	14.6	11.4	45.8	6.8	16.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	34.0	5.0	18.0	15.1	23.9	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.3	22.7	4.7	8.9	7.3	6.2	3.2	8.6
Green Ext Time (p_c), s	0.0	4.1	0.0	1.2	0.2	2.2	0.0	0.7

Intersection Summary			
HCM 6th Ctrl Delay			23.3
HCM 6th LOS			C

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	31	239	120	56	104	13	74	295	96	73	496	32
Future Volume (veh/h)	31	239	120	56	104	13	74	295	96	73	496	32
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	33	252	126	59	109	14	78	311	101	77	522	34
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	59	349	169	83	306	259	101	1000	847	100	1897	846
Arrive On Green	0.03	0.15	0.15	0.05	0.16	0.16	0.06	0.53	0.53	0.06	0.53	0.53
Sat Flow, veh/h	1810	2357	1142	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	33	191	187	59	109	14	78	311	101	77	522	34
Grp Sat Flow(s),veh/h/ln	1810	1805	1694	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.4	8.1	8.5	2.6	4.1	0.6	3.4	7.4	2.5	3.4	6.4	0.8
Cycle Q Clear(g_c), s	1.4	8.1	8.5	2.6	4.1	0.6	3.4	7.4	2.5	3.4	6.4	0.8
Prop In Lane	1.00		0.67	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	59	267	251	83	306	259	101	1000	847	100	1897	846
V/C Ratio(X)	0.56	0.72	0.75	0.71	0.36	0.05	0.77	0.31	0.12	0.77	0.28	0.04
Avail Cap(c_a), veh/h	147	417	392	170	463	392	215	1000	847	215	1897	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.1	32.5	32.6	37.7	29.9	28.4	37.2	10.7	9.6	37.3	10.5	9.2
Incr Delay (d2), s/veh	8.1	3.6	4.4	10.8	0.7	0.1	11.5	0.8	0.3	11.6	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	3.7	3.7	1.4	1.9	0.2	1.8	3.1	0.9	1.8	2.4	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	36.1	37.0	48.5	30.6	28.5	48.7	11.6	9.9	48.9	10.9	9.3
LnGrp LOS	D	D	D	D	C	C	D	B	A	D	B	A
Approach Vol, veh/h		411			182			490			633	
Approach Delay, s/veh		37.3			36.2			17.1			15.4	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.9	46.6	8.2	16.3	9.0	46.5	7.1	17.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	26.5	7.5	18.5	9.5	26.5	6.5	19.5
Max Q Clear Time (g_c+I1), s	5.4	9.4	4.6	10.5	5.4	8.4	3.4	6.1
Green Ext Time (p_c), s	0.0	2.0	0.0	1.4	0.0	3.4	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑	↱	↰	↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	37	220	79	57	182	67	165	661	95	34	324	50
Future Volume (veh/h)	37	220	79	57	182	67	165	661	95	34	324	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	39	232	83	60	192	71	174	696	100	36	341	53
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0	0	0	0
Cap, veh/h	66	333	116	83	260	220	215	1078	914	62	1744	778
Arrive On Green	0.04	0.13	0.13	0.05	0.14	0.14	0.12	0.57	0.57	0.03	0.48	0.48
Sat Flow, veh/h	1810	2626	914	1810	1900	1610	1810	1900	1610	1810	3610	1610
Grp Volume(v), veh/h	39	157	158	60	192	71	174	696	100	36	341	53
Grp Sat Flow(s),veh/h/ln	1810	1805	1735	1810	1900	1610	1810	1900	1610	1810	1805	1610
Q Serve(g_s), s	1.7	6.7	7.0	2.6	7.8	3.2	7.5	20.0	2.3	1.6	4.3	1.4
Cycle Q Clear(g_c), s	1.7	6.7	7.0	2.6	7.8	3.2	7.5	20.0	2.3	1.6	4.3	1.4
Prop In Lane	1.00		0.53	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	66	229	220	83	260	220	215	1078	914	62	1744	778
V/C Ratio(X)	0.59	0.69	0.72	0.72	0.74	0.32	0.81	0.65	0.11	0.58	0.20	0.07
Avail Cap(c_a), veh/h	113	406	390	113	428	362	342	1078	914	113	1744	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.98	0.98	0.98	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	33.4	33.5	37.7	33.2	31.2	34.4	11.8	8.0	38.1	11.8	11.0
Incr Delay (d2), s/veh	8.3	3.6	4.3	13.3	4.1	0.8	7.4	2.9	0.2	8.2	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	3.1	3.1	1.4	3.8	1.3	3.7	8.2	0.8	0.8	1.7	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	37.0	37.8	50.9	37.3	32.0	41.8	14.7	8.2	46.3	12.0	11.2
LnGrp LOS	D	D	D	D	D	C	D	B	A	D	B	B
Approach Vol, veh/h		354			323			970			430	
Approach Delay, s/veh		38.4			38.6			18.9			14.8	
Approach LOS		D			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.3	49.9	8.2	14.7	14.0	43.2	7.4	15.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	34.0	5.0	18.0	15.1	23.9	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.6	22.0	4.6	9.0	9.5	6.3	3.7	9.8
Green Ext Time (p_c), s	0.0	4.1	0.0	1.2	0.2	2.2	0.0	0.8

Intersection Summary			
HCM 6th Ctrl Delay			24.4
HCM 6th LOS			C

APPENDIX E:

QUEUING ANALYSIS WORKSHEETS

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	56	53	48	48	44	55	96	55	27	93	80
Average Queue (ft)	14	36	32	20	30	10	28	59	38	19	54	29
95th Queue (ft)	39	52	39	39	48	30	54	88	57	38	82	55
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)											6	1
Queuing Penalty (veh)											17	3

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	9	52	22	5	12	77	431	86	11	423	42
v/c Ratio	0.12	0.05	0.24	0.17	0.03	0.06	0.47	0.15	0.06	0.08	0.16	0.04
Control Delay	45.2	43.3	7.7	46.6	42.8	0.5	54.4	3.5	1.3	46.6	6.6	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	43.3	7.7	46.6	42.8	0.5	54.4	3.5	1.3	46.6	6.6	0.4
Queue Length 50th (ft)	9	6	0	14	3	0	50	25	0	7	49	0
Queue Length 95th (ft)	26	19	14	34	14	0	85	64	12	23	73	1
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	601	798	721	600	798	721	259	2943	1332	259	2622	1195
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.07	0.04	0.01	0.02	0.30	0.15	0.06	0.04	0.16	0.04

Intersection Summary

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	10	4	607	4	499
v/c Ratio	0.05	0.02	0.18	0.02	0.14
Control Delay	32.9	21.7	2.1	33.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	21.7	2.1	33.0	0.8
Queue Length 50th (ft)	5	0	0	2	0
Queue Length 95th (ft)	17	8	77	10	32
Internal Link Dist (ft)	203		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	527	3330	361	3445
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.18	0.01	0.14

Intersection Summary

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	125	125	549	114	15	591
v/c Ratio	0.38	0.38	0.56	0.05	0.01	0.25
Control Delay	32.4	32.4	4.9	6.1	0.0	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	32.4	4.9	6.1	0.0	6.8
Queue Length 50th (ft)	62	62	0	10	0	60
Queue Length 95th (ft)	82	82	6	17	0	76
Internal Link Dist (ft)		1020		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1509	2362	1615	2346
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.36	0.05	0.01	0.25

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	11	12	211	121	316	316
v/c Ratio	0.04	0.02	0.08	0.08	0.10	0.20
Control Delay	23.7	0.1	1.8	0.1	2.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	1.8	0.1	2.9	0.3
Queue Length 50th (ft)	4	0	0	0	0	0
Queue Length 95th (ft)	16	0	17	0	37	0
Internal Link Dist (ft)		833	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	849	2712	1470	3077	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.08	0.08	0.10	0.20

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	54	56	55	31	54	32	55	54
Average Queue (ft)	15	33	38	17	34	26	32	27
95th Queue (ft)	43	44	55	42	47	44	54	47
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	NB	SB	SB
Directions Served	L	TR	TR	LTR	LT	R
Maximum Queue (ft)	26	45	31	75	54	30
Average Queue (ft)	7	20	15	32	32	7
95th Queue (ft)	26	35	39	56	54	27
Link Distance (ft)		2470	752	448	2526	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	205					100
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	77	156	133	66	44	344	435	165	48	458	241
Average Queue (ft)	19	48	38	32	36	22	53	237	39	24	63	46
95th Queue (ft)	43	79	76	79	57	41	159	349	89	49	190	137
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)			3					13			16	10
Queuing Penalty (veh)			4					12			29	16

Queues

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	3	43	81	9	11	39	592	38	10	331	21
v/c Ratio	0.14	0.01	0.16	0.44	0.04	0.04	0.27	0.21	0.03	0.07	0.13	0.02
Control Delay	40.4	37.3	4.0	48.9	37.9	0.3	50.6	5.2	0.2	46.5	6.9	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.4	37.3	4.0	48.9	37.9	0.3	50.6	5.2	0.2	46.5	6.9	0.1
Queue Length 50th (ft)	15	2	0	51	5	0	25	47	0	6	42	0
Queue Length 95th (ft)	39	10	11	94	19	0	58	125	2	23	72	0
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	600	798	721	603	798	721	259	2810	1275	259	2623	1195
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.00	0.06	0.13	0.01	0.02	0.15	0.21	0.03	0.04	0.13	0.02

Intersection Summary

3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	7	701	4	470
v/c Ratio	0.09	0.04	0.22	0.02	0.14
Control Delay	33.1	19.5	2.9	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	19.5	2.9	33.0	1.4
Queue Length 50th (ft)	8	0	0	2	0
Queue Length 95th (ft)	27	11	108	11	36
Internal Link Dist (ft)	661		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	529	3161	361	3275
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.22	0.01	0.14

Intersection Summary

4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	149	150	640	178	19	553
v/c Ratio	0.41	0.42	0.58	0.08	0.01	0.24
Control Delay	31.4	31.5	4.5	6.9	0.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	31.5	4.5	6.9	0.0	7.6
Queue Length 50th (ft)	73	73	0	16	0	57
Queue Length 95th (ft)	105	105	22	32	0	89
Internal Link Dist (ft)		1017		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1562	2290	1615	2275
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.41	0.08	0.01	0.24

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↑	↱	↓	↙
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	21	22	297	144	390	335
v/c Ratio	0.08	0.04	0.11	0.10	0.13	0.21
Control Delay	23.7	0.1	1.9	0.1	3.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	1.9	0.1	3.0	0.3
Queue Length 50th (ft)	7	0	0	0	0	0
Queue Length 95th (ft)	24	0	25	0	47	0
Internal Link Dist (ft)		821	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	794	2741	1470	3062	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.03	0.11	0.10	0.13	0.21

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	31	77	58	70	55	55	56	31
Average Queue (ft)	24	34	39	30	33	34	35	31
95th Queue (ft)	45	51	57	55	44	47	60	31
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	26	22	31	31	56	55	31
Average Queue (ft)	2	12	4	26	32	35	7
95th Queue (ft)	14	29	21	43	54	55	27
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Queuing and Blocking Report
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Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	55	53	48	48	21	55	103	53	27	109	44
Average Queue (ft)	24	39	31	20	23	5	27	63	32	19	64	27
95th Queue (ft)	45	57	51	40	46	20	47	96	50	38	99	47
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)											12	0
Queuing Penalty (veh)											35	1

2: Marks Avenue & Nielsen Avenue

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	10	52	31	5	12	77	431	121	11	423	42
v/c Ratio	0.11	0.06	0.23	0.23	0.03	0.05	0.47	0.15	0.09	0.08	0.16	0.04
Control Delay	44.1	42.5	7.4	47.2	42.0	0.5	54.4	3.7	1.2	46.6	6.8	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	42.5	7.4	47.2	42.0	0.5	54.4	3.7	1.2	46.6	6.8	0.4
Queue Length 50th (ft)	9	6	0	20	3	0	50	26	0	7	50	0
Queue Length 95th (ft)	26	20	14	43	13	0	85	67	14	23	75	1
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	601	798	721	599	798	721	259	2923	1330	259	2602	1187
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.07	0.05	0.01	0.02	0.30	0.15	0.09	0.04	0.16	0.04

Intersection Summary

3: Marks Avenue & Ray Johnson Drive

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	10	4	642	4	508
v/c Ratio	0.05	0.02	0.19	0.02	0.15
Control Delay	32.9	21.7	2.1	33.0	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	21.7	2.1	33.0	0.8
Queue Length 50th (ft)	5	0	0	2	0
Queue Length 95th (ft)	17	8	82	10	32
Internal Link Dist (ft)	203		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	527	3330	361	3445
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.19	0.01	0.15

Intersection Summary

Queues
4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	125	125	581	121	15	601
v/c Ratio	0.38	0.38	0.57	0.05	0.01	0.26
Control Delay	31.8	31.8	4.8	6.3	0.0	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	31.8	4.8	6.3	0.0	7.1
Queue Length 50th (ft)	62	62	0	11	0	61
Queue Length 95th (ft)	81	81	5	19	0	80
Internal Link Dist (ft)		1020		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1527	2346	1615	2331
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.38	0.05	0.01	0.26

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

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	↗	→	↑	↱	↓	↙
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	13	12	214	121	316	324
v/c Ratio	0.05	0.02	0.08	0.08	0.10	0.20
Control Delay	23.7	0.1	1.8	0.1	2.9	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	1.8	0.1	2.9	0.3
Queue Length 50th (ft)	5	0	0	0	0	0
Queue Length 95th (ft)	18	0	17	0	37	0
Internal Link Dist (ft)		833	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	849	2712	1470	3073	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.08	0.08	0.10	0.20

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	31	52	53	55	55	32	74	56
Average Queue (ft)	14	33	32	29	32	22	34	31
95th Queue (ft)	38	42	40	50	40	44	57	52
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	25	46	31	31	55	55	30
Average Queue (ft)	5	22	1	16	33	33	8
95th Queue (ft)	21	37	12	41	44	52	29
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	52	121	116	68	61	43	344	533	56	26	239	193
Average Queue (ft)	21	50	37	22	33	17	114	281	34	19	58	39
95th Queue (ft)	46	85	69	51	53	34	333	484	56	38	130	107
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		0	1					29			11	7
Queuing Penalty (veh)		1	1					29			21	12

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	25	4	43	91	9	11	39	592	77	10	331	21
v/c Ratio	0.13	0.02	0.15	0.47	0.04	0.04	0.27	0.21	0.06	0.07	0.13	0.02
Control Delay	39.5	36.5	3.9	49.1	37.1	0.3	50.6	5.4	1.8	46.5	7.2	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	36.5	3.9	49.1	37.1	0.3	50.6	5.4	1.8	46.5	7.2	0.1
Queue Length 50th (ft)	15	2	0	57	5	0	25	50	0	6	43	0
Queue Length 95th (ft)	38	12	11	103	19	0	58	128	18	23	73	0
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	600	798	721	602	798	721	259	2789	1266	259	2602	1186
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.01	0.06	0.15	0.01	0.02	0.15	0.21	0.06	0.04	0.13	0.02

Intersection Summary

Queues

3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	18	7	743	4	479
v/c Ratio	0.09	0.04	0.24	0.02	0.15
Control Delay	33.1	19.5	2.9	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.1	19.5	2.9	33.0	1.4
Queue Length 50th (ft)	8	0	0	2	0
Queue Length 95th (ft)	27	11	116	11	37
Internal Link Dist (ft)	661		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	529	3161	361	3275
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.24	0.01	0.15

Intersection Summary

Queues
4: Marks Avenue & SR-180 Westbound Ramps

Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	149	150	679	184	19	564
v/c Ratio	0.41	0.42	0.60	0.08	0.01	0.25
Control Delay	31.4	31.5	4.6	6.9	0.0	7.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.4	31.5	4.6	6.9	0.0	7.6
Queue Length 50th (ft)	73	73	0	17	0	59
Queue Length 95th (ft)	105	105	21	32	0	91
Internal Link Dist (ft)		1017		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1584	2290	1615	2278
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.21	0.43	0.08	0.01	0.25

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↑	↱	↓	↲
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	23	22	300	144	391	343
v/c Ratio	0.08	0.04	0.12	0.10	0.14	0.21
Control Delay	23.7	0.1	2.5	0.1	4.0	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	2.5	0.1	4.0	0.3
Queue Length 50th (ft)	8	0	10	0	28	0
Queue Length 95th (ft)	25	0	25	0	47	0
Internal Link Dist (ft)		821	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	793	2516	1470	2797	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.03	0.12	0.10	0.14	0.21

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	54	54	56	31	54	53	77	78
Average Queue (ft)	21	35	34	29	36	31	38	36
95th Queue (ft)	47	54	53	40	51	44	60	63
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	25	44	28	52	54	56	31
Average Queue (ft)	4	15	1	27	33	36	13
95th Queue (ft)	20	34	11	46	44	53	37
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	100	73	71	45	45	54	122	56	26	152	63
Average Queue (ft)	13	46	39	25	26	7	33	73	34	24	64	35
95th Queue (ft)	37	77	60	52	46	27	56	114	49	36	107	58
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		0									14	1
Queuing Penalty (veh)		0									42	4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	16	10	56	35	5	12	80	458	132	11	451	44
v/c Ratio	0.11	0.05	0.25	0.25	0.03	0.05	0.48	0.16	0.10	0.08	0.17	0.04
Control Delay	43.8	42.1	8.6	47.4	41.5	0.4	54.6	3.8	1.2	46.6	7.1	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.8	42.1	8.6	47.4	41.5	0.4	54.6	3.8	1.2	46.6	7.1	0.6
Queue Length 50th (ft)	10	6	0	22	3	0	52	29	0	7	55	0
Queue Length 95th (ft)	28	19	18	47	13	0	87	72	15	23	82	2
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	601	798	721	599	798	721	259	2913	1328	259	2588	1181
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.01	0.08	0.06	0.01	0.02	0.31	0.16	0.10	0.04	0.17	0.04

Intersection Summary

3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	14	4	700	6	539
v/c Ratio	0.07	0.02	0.22	0.03	0.16
Control Delay	32.9	21.3	2.8	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	21.3	2.8	33.0	1.4
Queue Length 50th (ft)	6	0	0	3	0
Queue Length 95th (ft)	20	8	91	12	35
Internal Link Dist (ft)	203		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	527	3156	361	3280
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.22	0.02	0.16

Intersection Summary

4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	134	134	607	154	15	640
v/c Ratio	0.39	0.39	0.57	0.07	0.01	0.28
Control Delay	31.6	31.6	4.7	6.6	0.0	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.6	31.6	4.7	6.6	0.0	7.4
Queue Length 50th (ft)	66	66	0	14	0	66
Queue Length 95th (ft)	85	85	4	24	0	86
Internal Link Dist (ft)		1020		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1543	2322	1615	2300
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.19	0.39	0.07	0.01	0.28

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↑	↱	↓	↲
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	33	12	234	133	336	338
v/c Ratio	0.11	0.02	0.09	0.09	0.12	0.21
Control Delay	23.8	0.1	2.3	0.1	4.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	0.1	2.3	0.1	4.2	0.3
Queue Length 50th (ft)	11	0	7	0	24	0
Queue Length 95th (ft)	32	0	20	0	42	0
Internal Link Dist (ft)		833	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	833	2467	1470	2782	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.09	0.09	0.12	0.21

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	31	54	56	56	55	55	55	31
Average Queue (ft)	19	31	36	30	33	29	33	27
95th Queue (ft)	44	31	52	50	44	50	53	42
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	26	45	31	31	52	55	31
Average Queue (ft)	6	25	4	22	27	34	5
95th Queue (ft)	23	42	22	44	50	53	23
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	78	52	47	63	45	345	883	512	27	96	88
Average Queue (ft)	15	51	34	25	38	25	224	485	148	21	59	40
95th Queue (ft)	40	80	48	47	60	45	468	923	450	38	85	75
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)								59			12	1
Queuing Penalty (veh)								63			24	2

Queues

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	29	5	47	101	10	11	42	632	80	10	352	24
v/c Ratio	0.14	0.02	0.16	0.50	0.04	0.04	0.29	0.24	0.07	0.07	0.14	0.02
Control Delay	39.0	36.0	4.5	49.1	36.4	0.3	51.0	6.1	2.0	46.5	7.9	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	36.0	4.5	49.1	36.4	0.3	51.0	6.1	2.0	46.5	7.9	0.0
Queue Length 50th (ft)	17	3	0	63	6	0	27	56	0	6	47	0
Queue Length 95th (ft)	42	13	15	111	20	0	62	141	19	23	81	0
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	599	798	721	601	798	721	259	2624	1195	259	2434	1115
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.07	0.17	0.01	0.02	0.16	0.24	0.07	0.04	0.14	0.02

Intersection Summary

3: Marks Avenue & Ray Johnson Drive

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	35	9	792	4	515
v/c Ratio	0.17	0.05	0.27	0.02	0.17
Control Delay	33.4	18.0	3.8	33.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	18.0	3.8	33.0	2.1
Queue Length 50th (ft)	16	0	45	2	26
Queue Length 95th (ft)	41	13	132	11	44
Internal Link Dist (ft)	661		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	530	2972	361	3089
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.27	0.01	0.17

Intersection Summary

4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	166	167	709	209	20	623
v/c Ratio	0.43	0.43	0.60	0.09	0.01	0.28
Control Delay	30.5	30.6	4.3	7.6	0.0	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.5	30.6	4.3	7.6	0.0	8.4
Queue Length 50th (ft)	80	81	0	21	0	71
Queue Length 95th (ft)	111	111	21	38	0	106
Internal Link Dist (ft)		1017		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1602	2234	1615	2211
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23	0.44	0.09	0.01	0.28

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	36	23	321	155	426	364
v/c Ratio	0.12	0.04	0.13	0.11	0.15	0.23
Control Delay	23.7	0.1	2.6	0.1	4.3	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	2.6	0.1	4.3	0.3
Queue Length 50th (ft)	12	0	12	0	32	0
Queue Length 95th (ft)	34	0	28	0	53	0
Internal Link Dist (ft)		821	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	771	2502	1470	2777	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.03	0.13	0.11	0.15	0.23

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	55	55	56	75	56	55	56	58
Average Queue (ft)	20	35	37	30	36	39	47	36
95th Queue (ft)	50	55	54	60	51	57	65	52
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	26	41	31	54	77	31	31
Average Queue (ft)	8	19	1	27	37	28	11
95th Queue (ft)	28	33	12	47	57	43	34
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	141	160	46	69	21	75	184	93	66	137	110
Average Queue (ft)	21	63	49	19	32	5	37	81	36	29	69	42
95th Queue (ft)	44	107	100	44	56	20	62	141	60	47	109	77
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		2	0								19	3
Queuing Penalty (veh)		5	0								66	8

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	11	48	23	4	12	72	411	98	15	403	41
v/c Ratio	0.12	0.06	0.22	0.18	0.02	0.06	0.45	0.14	0.08	0.11	0.15	0.03
Control Delay	45.0	43.5	6.7	46.7	42.5	0.5	54.0	4.4	1.4	47.2	6.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.0	43.5	6.7	46.7	42.5	0.5	54.0	4.4	1.4	47.2	6.4	0.3
Queue Length 50th (ft)	9	7	0	15	3	0	47	24	0	10	46	0
Queue Length 95th (ft)	29	24	18	39	13	0	91	70	17	31	78	3
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	602	798	721	598	798	721	259	2852	1296	259	2627	1197
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.07	0.04	0.01	0.02	0.28	0.14	0.08	0.06	0.15	0.03

Intersection Summary

Queues
3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	13	3	598	5	469
v/c Ratio	0.07	0.02	0.19	0.03	0.14
Control Delay	32.9	22.3	2.7	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	22.3	2.7	33.0	1.4
Queue Length 50th (ft)	6	0	0	2	0
Queue Length 95th (ft)	22	8	89	13	35
Internal Link Dist (ft)	203		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	526	3158	361	3281
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.19	0.01	0.14

Intersection Summary

4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	119	120	477	149	16	517
v/c Ratio	0.37	0.37	0.52	0.06	0.01	0.22
Control Delay	32.4	32.4	4.9	6.0	0.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	32.4	4.9	6.0	0.0	6.5
Queue Length 50th (ft)	58	58	0	13	0	50
Queue Length 95th (ft)	102	103	39	28	0	86
Internal Link Dist (ft)		1020		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1467	2371	1615	2349
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.33	0.06	0.01	0.22

Intersection Summary

5: Marks Avenue & SR-180 Eastbound Ramps

Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	31	12	324	188	380	337
v/c Ratio	0.11	0.02	0.12	0.13	0.12	0.21
Control Delay	23.7	0.1	1.8	0.2	3.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.1	1.8	0.2	3.2	0.3
Queue Length 50th (ft)	11	0	0	0	0	0
Queue Length 95th (ft)	31	0	25	0	47	0
Internal Link Dist (ft)		833	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	801	2694	1470	3050	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.12	0.13	0.12	0.21

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	54	55	78	54	55	51	122	56
Average Queue (ft)	28	35	48	28	39	30	51	35
95th Queue (ft)	50	50	71	47	57	43	84	56
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	49	44	31	31	96	55	31
Average Queue (ft)	24	22	4	20	36	44	15
95th Queue (ft)	45	33	19	43	60	63	39
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	95	55	48	111	44	345	907	520	27	71	46
Average Queue (ft)	30	79	40	28	59	30	286	622	214	21	51	30
95th Queue (ft)	32	104	59	56	118	48	479	1092	588	38	78	49
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		0			0			76			10	1
Queuing Penalty (veh)		1			0			124			24	2

Queues

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	34	4	49	96	11	13	44	665	43	11	369	25
v/c Ratio	0.18	0.02	0.17	0.48	0.04	0.05	0.31	0.24	0.03	0.08	0.14	0.02
Control Delay	40.1	36.2	5.1	49.1	36.9	0.3	51.3	5.7	0.5	46.6	7.5	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.1	36.2	5.1	49.1	36.9	0.3	51.3	5.7	0.5	46.6	7.5	0.0
Queue Length 50th (ft)	20	2	0	60	7	0	29	58	0	7	48	0
Queue Length 95th (ft)	47	12	16	107	22	0	64	147	4	25	84	0
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	598	798	721	602	798	721	259	2777	1261	259	2586	1180
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.07	0.16	0.01	0.02	0.17	0.24	0.03	0.04	0.14	0.02

Intersection Summary

Queues
3: Marks Avenue & Ray Johnson Drive

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	36	9	764	4	514
v/c Ratio	0.17	0.05	0.26	0.02	0.17
Control Delay	33.4	18.0	3.8	33.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	18.0	3.8	33.0	2.1
Queue Length 50th (ft)	17	0	43	2	26
Queue Length 95th (ft)	42	13	126	11	45
Internal Link Dist (ft)	661		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	530	2970	361	3087
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.26	0.01	0.17

Intersection Summary

Queues
4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	196	196	619	224	19	564
v/c Ratio	0.48	0.48	0.54	0.10	0.01	0.26
Control Delay	30.6	30.6	3.9	8.2	0.0	8.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.6	30.6	3.9	8.2	0.0	8.8
Queue Length 50th (ft)	94	94	0	24	0	65
Queue Length 95th (ft)	143	143	38	48	0	115
Internal Link Dist (ft)		1017		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1550	2185	1615	2162
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.27	0.40	0.10	0.01	0.26

Intersection Summary

Queues
5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↑	↱	↓	↙
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	35	23	358	162	544	362
v/c Ratio	0.12	0.05	0.14	0.11	0.20	0.22
Control Delay	23.8	0.2	2.8	0.1	4.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	0.2	2.8	0.1	4.4	0.3
Queue Length 50th (ft)	12	0	15	0	42	0
Queue Length 95th (ft)	33	0	32	0	68	0
Internal Link Dist (ft)		821	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	711	2529	1470	2779	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.03	0.14	0.11	0.20	0.22

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	53	78	85	31	55	54	73	56
Average Queue (ft)	26	35	43	26	37	35	45	41
95th Queue (ft)	47	50	73	43	54	49	66	60
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	26	22	31	53	56	56	31
Average Queue (ft)	5	13	19	26	46	46	11
95th Queue (ft)	20	30	43	51	64	64	35
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	31	118	74	65	64	22	71	122	55	51	180	148
Average Queue (ft)	22	69	42	26	34	6	33	80	35	30	94	67
95th Queue (ft)	44	110	65	50	58	21	63	123	51	54	158	136
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		1									40	4
Queuing Penalty (veh)		3									140	12

2: Marks Avenue & Nielsen Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	15	12	48	31	4	12	72	411	127	15	403	41
v/c Ratio	0.11	0.07	0.22	0.23	0.02	0.05	0.45	0.15	0.10	0.11	0.15	0.03
Control Delay	44.0	42.7	6.4	47.1	41.8	0.5	54.0	4.6	1.4	47.2	6.7	0.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.0	42.7	6.4	47.1	41.8	0.5	54.0	4.6	1.4	47.2	6.7	0.4
Queue Length 50th (ft)	9	7	0	20	2	0	47	25	0	10	47	0
Queue Length 95th (ft)	29	25	18	49	13	0	91	72	19	31	81	3
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	602	798	721	598	798	721	259	2833	1294	259	2608	1189
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.02	0.07	0.05	0.01	0.02	0.28	0.15	0.10	0.06	0.15	0.03

Intersection Summary

	↙	↖	↑	↘	↓
Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	13	3	627	5	477
v/c Ratio	0.07	0.02	0.20	0.03	0.15
Control Delay	32.9	22.3	2.7	33.0	1.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	32.9	22.3	2.7	33.0	1.4
Queue Length 50th (ft)	6	0	0	2	0
Queue Length 95th (ft)	22	8	94	13	36
Internal Link Dist (ft)	203		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	526	3158	361	3281
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.02	0.01	0.20	0.01	0.15

Intersection Summary

4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	119	120	501	155	16	524
v/c Ratio	0.37	0.37	0.53	0.07	0.01	0.22
Control Delay	32.4	32.4	4.9	6.0	0.0	6.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.4	32.4	4.9	6.0	0.0	6.5
Queue Length 50th (ft)	58	58	0	13	0	51
Queue Length 95th (ft)	102	103	40	28	0	87
Internal Link Dist (ft)		1020		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1481	2371	1615	2349
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.34	0.07	0.01	0.22

Intersection Summary

Queues
5: Marks Avenue & SR-180 Eastbound Ramps

	⤴	→	↑	↱	↓	↲
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	33	12	327	188	380	344
v/c Ratio	0.11	0.02	0.13	0.13	0.14	0.21
Control Delay	23.8	0.1	2.2	0.2	4.2	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	0.1	2.2	0.2	4.2	0.3
Queue Length 50th (ft)	11	0	9	0	27	0
Queue Length 95th (ft)	32	0	25	0	47	0
Internal Link Dist (ft)		833	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	801	2476	1470	2782	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.01	0.13	0.13	0.14	0.21

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	50	55	76	53	56	55	91	56
Average Queue (ft)	26	40	42	27	37	32	52	36
95th Queue (ft)	47	58	63	49	53	47	80	58
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	26	47	31	53	56	55	30
Average Queue (ft)	11	28	10	28	44	39	5
95th Queue (ft)	32	51	33	49	63	56	24
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 1: Marks Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	TR	L	T	R	L	T	R	L	T	TR
Maximum Queue (ft)	51	98	50	48	90	46	345	1698	1136	87	112	20
Average Queue (ft)	25	59	29	34	51	22	204	1040	661	35	57	20
95th Queue (ft)	57	99	51	52	84	49	473	1738	1289	70	102	20
Link Distance (ft)		721		2483	2483			2528	2528		647	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	105		105			125	230			135		50
Storage Blk Time (%)		0						91			16	
Queuing Penalty (veh)		1						150			39	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	34	5	49	105	11	13	44	665	82	11	369	25
v/c Ratio	0.17	0.02	0.16	0.51	0.04	0.04	0.31	0.25	0.07	0.08	0.15	0.02
Control Delay	39.2	35.6	4.9	49.2	36.2	0.2	51.3	6.3	2.1	46.6	8.1	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	35.6	4.9	49.2	36.2	0.2	51.3	6.3	2.1	46.6	8.1	0.0
Queue Length 50th (ft)	20	3	0	66	6	0	29	60	0	7	50	0
Queue Length 95th (ft)	47	13	16	115	22	0	64	151	20	25	86	0
Internal Link Dist (ft)		651			2488			502			2547	
Turn Bay Length (ft)	55		55	215		210	240		215	245		215
Base Capacity (vph)	598	798	721	601	798	721	259	2614	1192	259	2424	1111
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.01	0.07	0.17	0.01	0.02	0.17	0.25	0.07	0.04	0.15	0.02

Intersection Summary

Lane Group	WBL	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	36	9	804	4	523
v/c Ratio	0.17	0.05	0.27	0.02	0.17
Control Delay	33.4	18.0	3.9	33.0	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	33.4	18.0	3.9	33.0	2.1
Queue Length 50th (ft)	17	0	46	2	27
Queue Length 95th (ft)	42	13	134	11	45
Internal Link Dist (ft)	661		557		502
Turn Bay Length (ft)	75			110	
Base Capacity (vph)	586	530	2970	361	3087
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.06	0.02	0.27	0.01	0.17

Intersection Summary

Queues
4: Marks Avenue & SR-180 Westbound Ramps

	↙	←	↖	↑	↗	↓
Lane Group	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	196	196	653	229	19	573
v/c Ratio	0.47	0.47	0.55	0.11	0.01	0.27
Control Delay	30.4	30.4	3.9	8.3	0.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	30.4	3.9	8.3	0.0	9.0
Queue Length 50th (ft)	94	94	0	24	0	67
Queue Length 95th (ft)	143	143	39	50	0	117
Internal Link Dist (ft)		1017		815		557
Turn Bay Length (ft)	340		205		475	
Base Capacity (vph)	718	718	1569	2178	1615	2155
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.27	0.42	0.11	0.01	0.27

Intersection Summary

Queues
5: Marks Avenue & SR-180 Eastbound Ramps

	↗	→	↑	↗	↓	↙
Lane Group	EBL	EBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	37	23	359	165	545	371
v/c Ratio	0.13	0.05	0.14	0.11	0.20	0.23
Control Delay	23.7	0.2	2.8	0.2	4.4	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.7	0.2	2.8	0.2	4.4	0.3
Queue Length 50th (ft)	13	0	15	0	42	0
Queue Length 95th (ft)	34	0	33	0	69	0
Internal Link Dist (ft)		821	375		815	
Turn Bay Length (ft)				270		460
Base Capacity (vph)	644	711	2530	1470	2776	1615
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.03	0.14	0.11	0.20	0.23

Intersection Summary

Intersection: 6: Hughes Avenue & Belmont Avenue

Movement	EB	EB	EB	WB	WB	WB	NB	SB
Directions Served	L	T	TR	L	T	TR	LTR	LTR
Maximum Queue (ft)	55	78	77	54	55	56	56	56
Average Queue (ft)	23	35	39	30	39	38	47	47
95th Queue (ft)	48	62	60	44	57	55	63	64
Link Distance (ft)		2483	2483		704	704	2526	321
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	145			165				
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 7: Hughes Avenue & Nielsen Avenue

Movement	EB	EB	WB	WB	NB	SB	SB
Directions Served	L	TR	L	TR	LTR	LT	R
Maximum Queue (ft)	25	22	31	31	56	55	31
Average Queue (ft)	2	17	19	25	41	45	9
95th Queue (ft)	14	32	43	45	60	63	32
Link Distance (ft)		2470		752	448	2526	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	205		205				100
Storage Blk Time (%)							
Queuing Penalty (veh)							

APPENDIX F:

FREEWAY LEVELS OF SERVICE ANALYSIS WORKSHEET

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2023 Near Term Approved and Pending
Jurisdiction	Caltrans	Time Period Analyzed	A.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	West of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2530	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2082	Heavy Vehicle Adjustment Factor (f_{HV})	0.892
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1242
Total Trucks, %	12.10	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.52
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.0
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	2	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (LA),ft	1500	165
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi)	2082	42
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.10	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.892	1.000
Flow Rate (vi),pc/h	2483	45
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.52	0.02

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Number of Outer Lanes on Freeway (NO)	0
Distance to Upstream Ramp (LUP), ft	-	Speed Index (DS)	0.302
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Distance to Downstream Ramp (LDOWN), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	65.3
Prop. Freeway Vehicles in Lane 1 and 2 (PFD)	1.000	Outer Lanes Freeway Speed (SO), mi/h	82.7
Flow in Lanes 1 and 2 (v12), pc/h	2483	Ramp Junction Speed (S), mi/h	65.3
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Average Density (D), pc/mi/ln	19.0
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	24.1

HCS7 Basic Freeway Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1560	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2040	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1219
Total Trucks, %	12.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.51
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	72.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.6
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1360	930
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2040	260
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.40	23.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.813
Flow Rate (v_i),pc/h	2438	340
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.58	0.18

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.337
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	64.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2438	Ramp Junction Speed (S), mi/h	64.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2778	Average Density (D), pc/mi/ln	21.7
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	21.2

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2300	237
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	13.60	3.70
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.880	0.964
Flow Rate (v_i),pc/h	2780	262
Capacity (c), pc/h	7200	2100
Volume-to-Capacity Ratio (v/c)	0.42	0.12

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	9999.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	55.000
Downstream Equilibrium Distance (L_{EQ}), ft	9999.0	Flow Outer Lanes (v_{OA}), pc/h/ln	0
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	75.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.0
Flow in Lanes 1 and 2 (v_{12}), pc/h	0	Ramp Junction Speed (S), mi/h	74.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	0	Average Density (D), pc/mi/ln	13.4
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	13.4

HCS7 Basic Freeway Report

Project Information

Segment Number	6	Segment Name	East of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	4335	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2537	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1011
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.7
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2023 Near Term Approved and Pending
Jurisdiction	Caltrans	Time Period Analyzed	A.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	2300	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2258	Heavy Vehicle Adjustment Factor (f_{HV})	0.898
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	892
Total Trucks, %	11.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.37
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.1
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	2	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	185	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2258	Heavy Vehicle Adjustment Factor (f_{HV})	0.898
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	669
Total Trucks, %	11.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.28
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.1
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	4	2
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided Two-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2258	616
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	11.40	8.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.898	0.919
Flow Rate (v_i),pc/h	2675	713
Capacity (c), pc/h	9600	4200
Volume-to-Capacity Ratio (v/c)	0.28	0.17

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.362
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	726
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	63.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.260	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	1223	Ramp Junction Speed (S), mi/h	72.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	9.2
Level of Service (LOS)	A	Density in Ramp Influence Area (D_R), pc/mi/ln	1.3

HCS7 Basic Freeway Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	10	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1642	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	654
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.9
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1500	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1642	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	982
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.41
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.3
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	6	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1120	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1642	11
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	1.000
Flow Rate (v_i),pc/h	1963	12
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.41	0.01

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.309
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	65.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	1963	Ramp Junction Speed (S), mi/h	65.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	1975	Average Density (D), pc/mi/ln	15.2
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	15.9

HCS7 Freeway Merge Report

Project Information

Segment Number	7	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	900
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1653	26
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	26.30
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.792
Flow Rate (v_i),pc/h	1976	35
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.42	0.02

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.269
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	66.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	1976	Ramp Junction Speed (S), mi/h	66.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2011	Average Density (D), pc/mi/ln	15.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	15.6

HCS7 Basic Freeway Report

Project Information

Segment Number	8	Segment Name	West of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2060	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1679	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1004
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.6
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2023 Near Term Approved and Pending WP
Jurisdiction	Caltrans	Time Period Analyzed	P.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	West of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2530	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1499	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	896
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.37
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	2	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	165
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1499	49
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	11.40
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.898
Flow Rate (v_i),pc/h	1792	58
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.37	0.03

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.303
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	65.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	1792	Ramp Junction Speed (S), mi/h	65.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	13.7
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	18.2

HCS7 Basic Freeway Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1560	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1450	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	866
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.36
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	72.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.8
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (LA),ft	1360	930
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi)	1450	328
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	5.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (fHV)	0.890	0.945
Flow Rate (vi),pc/h	1733	369
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.44	0.19

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Number of Outer Lanes on Freeway (NO)	0
Distance to Upstream Ramp (LUP), ft	-	Speed Index (MS)	0.306
Downstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Distance to Downstream Ramp (LDOWN), ft	-	On-Ramp Influence Area Speed (SR), mi/h	65.2
Prop. Freeway Vehicles in Lane 1 and 2 (PFM)	1.000	Outer Lanes Freeway Speed (SO), mi/h	75.4
Flow in Lanes 1 and 2 (v12), pc/h	1733	Ramp Junction Speed (S), mi/h	65.2
Flow Entering Ramp-Infl. Area (vR12), pc/h	2102	Average Density (D), pc/mi/ln	16.1
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	15.9

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1778	284
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	11.10	0.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.900	0.992
Flow Rate (v_i),pc/h	2102	305
Capacity (c), pc/h	7200	2100
Volume-to-Capacity Ratio (v/c)	0.33	0.15

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	9999.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	55.000
Downstream Equilibrium Distance (L_{EQ}), ft	9999.0	Flow Outer Lanes (v_{OA}), pc/h/ln	0
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	75.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.0
Flow in Lanes 1 and 2 (v_{12}), pc/h	0	Ramp Junction Speed (S), mi/h	74.4
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	0	Average Density (D), pc/mi/ln	10.6
Level of Service (LOS)	A	Density in Ramp Influence Area (D_R), pc/mi/ln	10.6

HCS7 Basic Freeway Report

Project Information

Segment Number	6	Segment Name	East of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	4335	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2062	Heavy Vehicle Adjustment Factor (f_{HV})	0.912
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	802
Total Trucks, %	9.70	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.9
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2023 Near Term Approved and Pending
Jurisdiction	Caltrans	Time Period Analyzed	P.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	2300	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2761	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1101
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.0
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	2	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	185	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2761	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	826
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	4	2
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided Two-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2761	793
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.50	12.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.889	0.887
Flow Rate (v_i),pc/h	3304	951
Capacity (c), pc/h	9600	4200
Volume-to-Capacity Ratio (v/c)	0.34	0.23

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.384
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	871
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	62.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.260	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	1563	Ramp Junction Speed (S), mi/h	71.8
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	11.5
Level of Service (LOS)	A	Density in Ramp Influence Area (D_R), pc/mi/ln	4.2

HCS7 Basic Freeway Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	10	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1968	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	784
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.33
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.1
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.7
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1500	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1968	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1176
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.49
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.0
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	6	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1120	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1968	16
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	1.000
Flow Rate (v_i),pc/h	2352	17
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.49	0.01

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.323
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	64.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2352	Ramp Junction Speed (S), mi/h	64.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2369	Average Density (D), pc/mi/ln	18.3
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	19.0

HCS7 Freeway Merge Report

Project Information

Segment Number	7	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	900
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1984	38
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.20	15.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.891	0.870
Flow Rate (v_i),pc/h	2369	46
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.50	0.02

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.284
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	65.9
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2369	Ramp Junction Speed (S), mi/h	65.9
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2415	Average Density (D), pc/mi/ln	18.3
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	18.7

HCS7 Basic Freeway Report

Project Information

Segment Number	8	Segment Name	West of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2060	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2022	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1208
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.50
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	16.5
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2040
Jurisdiction	Caltrans	Time Period Analyzed	A.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	West of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2530	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2655	Heavy Vehicle Adjustment Factor (f_{HV})	0.891
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1585
Total Trucks, %	12.20	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.66
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.5
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	2	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	165
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2655	43
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.20	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.891	1.000
Flow Rate (v_i),pc/h	3170	46
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.66	0.02

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.302
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	65.3
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	3170	Ramp Junction Speed (S), mi/h	65.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	24.3
Level of Service (LOS)	D	Density in Ramp Influence Area (D_R), pc/mi/ln	30.0

HCS7 Basic Freeway Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1560	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2612	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1561
Total Trucks, %	12.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.1
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1360	930
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2612	273
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.40	23.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.813
Flow Rate (v_i),pc/h	3122	357
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.72	0.19

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.401
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	62.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	3122	Ramp Junction Speed (S), mi/h	62.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3479	Average Density (D), pc/mi/ln	28.1
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	26.7

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2885	345
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	13.40	3.70
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.882	0.964
Flow Rate (v_i),pc/h	3480	381
Capacity (c), pc/h	7200	2100
Volume-to-Capacity Ratio (v/c)	0.54	0.18

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	9999.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	55.000
Downstream Equilibrium Distance (L_{EQ}), ft	9999.0	Flow Outer Lanes (v_{OA}), pc/h/ln	0
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	74.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.0
Flow in Lanes 1 and 2 (v_{12}), pc/h	0	Ramp Junction Speed (S), mi/h	74.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	0	Average Density (D), pc/mi/ln	17.3
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	17.3

HCS7 Basic Freeway Report

Project Information

Segment Number	6	Segment Name	East of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	4335	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3230	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1287
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.54
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.6
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2035 Cumulative WP
Jurisdiction	Caltrans	Time Period Analyzed	A.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	2300	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2564	Heavy Vehicle Adjustment Factor (f_{HV})	0.898
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1012
Total Trucks, %	11.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.42
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	13.8
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	2	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	185	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2564	Heavy Vehicle Adjustment Factor (f_{HV})	0.898
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	759
Total Trucks, %	11.40	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.3
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	4	2
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided Two-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2564	683
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	11.40	8.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.898	0.919
Flow Rate (v_i),pc/h	3037	791
Capacity (c), pc/h	9600	4200
Volume-to-Capacity Ratio (v/c)	0.32	0.19

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.369
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	831
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	63.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.260	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	1375	Ramp Junction Speed (S), mi/h	72.5
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	10.5
Level of Service (LOS)	A	Density in Ramp Influence Area (D_R), pc/mi/ln	2.6

HCS7 Basic Freeway Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	10	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1881	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	749
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.31
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1500	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1881	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1124
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.47
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.3
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	6	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1120	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1881	15
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	1.000
Flow Rate (v_i),pc/h	2248	16
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.47	0.01

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.319
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	64.7
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2248	Ramp Junction Speed (S), mi/h	64.7
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2264	Average Density (D), pc/mi/ln	17.5
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	18.2

HCS7 Freeway Merge Report

Project Information

Segment Number	7	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	900
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1896	29
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.20	26.30
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.891	0.792
Flow Rate (v_i),pc/h	2264	39
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.48	0.02

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.279
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	66.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2264	Ramp Junction Speed (S), mi/h	66.1
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2303	Average Density (D), pc/mi/ln	17.4
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	17.8

HCS7 Basic Freeway Report

Project Information

Segment Number	8	Segment Name	West of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2060	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1925	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1152
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.48
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.7
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2035
Jurisdiction	Caltrans	Time Period Analyzed	P.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	West of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2530	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1846	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1104
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.46
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	15.0
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	2	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	165
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1846	52
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.20	11.40
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.891	0.898
Flow Rate (v_i),pc/h	2204	62
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.46	0.03

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.304
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	65.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	82.7
Flow in Lanes 1 and 2 (v_{12}), pc/h	2204	Ramp Junction Speed (S), mi/h	65.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	16.9
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	21.7

HCS7 Basic Freeway Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1560	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1794	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1072
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.45
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	72.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.6
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1360	930
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	1794	344
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	5.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.945
Flow Rate (v_i),pc/h	2144	387
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.53	0.20

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.324
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	64.6
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	2144	Ramp Junction Speed (S), mi/h	64.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2531	Average Density (D), pc/mi/ln	19.6
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	19.3

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	3	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2138	294
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	11.30	0.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.898	0.992
Flow Rate (v_i),pc/h	2533	315
Capacity (c), pc/h	7200	2100
Volume-to-Capacity Ratio (v/c)	0.40	0.15

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	9999.0	Number of Outer Lanes on Freeway (N_O)	1
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	55.000
Downstream Equilibrium Distance (L_{EQ}), ft	9999.0	Flow Outer Lanes (v_{OA}), pc/h/ln	0
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	75.4
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.0
Flow in Lanes 1 and 2 (v_{12}), pc/h	0	Ramp Junction Speed (S), mi/h	74.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	0	Average Density (D), pc/mi/ln	12.6
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), pc/mi/ln	12.6

HCS7 Basic Freeway Report

Project Information

Segment Number	6	Segment Name	East of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	4335	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2432	Heavy Vehicle Adjustment Factor (f_{HV})	0.909
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	949
Total Trucks, %	10.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.40
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.6
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	12.9
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Analyst		Date	9/8/2021
Agency	LSA	Analysis Year	2035 Cumulative WP
Jurisdiction	Caltrans	Time Period Analyzed	P.M. Peak Hour
Project Description		Unit	United States Customary
Segment Number	1	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	2300	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3547	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1415
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	72.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.6
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	2	Segment Name	East of Marks Avenue
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	4	Terrain Type	Level
Segment Length (L), ft	185	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	3547	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1061
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.4
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Diverge Report

Project Information

Segment Number	3	Segment Name	Marks Avenue Off-Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	4	2
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Deceleration Length (L_A),ft	1500	1500
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided Two-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	3547	924
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.50	12.80
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.889	0.887
Flow Rate (v_i),pc/h	4245	1108
Capacity (c), pc/h	9600	4200
Volume-to-Capacity Ratio (v/c)	0.44	0.26

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	2
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (D_S)	0.398
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	1161
Distance to Downstream Ramp (L_{DOWN}), ft	-	Off-Ramp Influence Area Speed (S_R), mi/h	62.1
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FD})	0.260	Outer Lanes Freeway Speed (S_O), mi/h	82.1
Flow in Lanes 1 and 2 (v_{12}), pc/h	1924	Ramp Junction Speed (S), mi/h	71.6
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	14.8
Level of Service (LOS)	A	Density in Ramp Influence Area (D_R), pc/mi/ln	7.3

HCS7 Basic Freeway Report

Project Information

Segment Number	4	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	3	Terrain Type	Level
Segment Length (L), ft	10	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2623	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1045
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.44
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	14.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Basic Freeway Report

Project Information

Segment Number	5	Segment Name	Marks Avenue Off-Ramp to Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	1500	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2623	Heavy Vehicle Adjustment Factor (f_{HV})	0.890
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1568
Total Trucks, %	12.30	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.65
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.2
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

HCS7 Freeway Merge Report

Project Information

Segment Number	6	Segment Name	Marks Avenue Loop-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	25.0
Segment Length (L) / Acceleration Length (L_A),ft	1120	800
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2623	18
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	0.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	1.000
Flow Rate (v_i),pc/h	3135	19
Capacity (c), pc/h	4800	1900
Volume-to-Capacity Ratio (v/c)	0.66	0.01

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.372
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	63.0
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	3135	Ramp Junction Speed (S), mi/h	63.0
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3154	Average Density (D), pc/mi/ln	25.0
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	25.1

HCS7 Freeway Merge Report

Project Information

Segment Number	7	Segment Name	Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	75.4	45.0
Segment Length (L) / Acceleration Length (L_A),ft	1500	900
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Freeway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Final Capacity Adjustment Factor (CAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000

Demand and Capacity

Demand Volume (V_i)	2641	41
Peak Hour Factor (PHF)	0.94	0.94
Total Trucks, %	12.30	15.00
Single-Unit Trucks (SUT), %	-	-
Tractor-Trailers (TT), %	-	-
Heavy Vehicle Adjustment Factor (f_{HV})	0.890	0.870
Flow Rate (v_i),pc/h	3157	50
Capacity (c), pc/h	4800	2100
Volume-to-Capacity Ratio (v/c)	0.67	0.02

Speed and Density

Upstream Equilibrium Distance (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.336
Downstream Equilibrium Distance (L_{EQ}), ft	-	Flow Outer Lanes (v_{OA}), pc/h/ln	-
Distance to Downstream Ramp (L_{DOWN}), ft	-	On-Ramp Influence Area Speed (S_R), mi/h	64.2
Prop. Freeway Vehicles in Lane 1 and 2 (P_{FM})	1.000	Outer Lanes Freeway Speed (S_O), mi/h	75.4
Flow in Lanes 1 and 2 (v_{12}), pc/h	3157	Ramp Junction Speed (S), mi/h	64.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	3207	Average Density (D), pc/mi/ln	25.0
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), pc/mi/ln	24.9

HCS7 Basic Freeway Report

Project Information

Segment Number	8	Segment Name	West of Marks Avenue Slip-On Ramp
Time Period Number	1	Segment Analysis Time Period	07:00-07:15

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	2060	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.50
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	73.6
Right-Side Lateral Clearance, ft	10		

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	1.000
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2682	Heavy Vehicle Adjustment Factor (f_{HV})	0.889
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	1604
Total Trucks, %	12.50	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2400
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.67
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	22.8
Total Ramp Density Adjustment	1.8	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.6		

APPENDIX G:

VEHICLE MILES TRAVELED ANALYSIS WORKSHEET

LSA

Appendix G

VMT Calculation Worksheet

2740 W Nielsen Ave - VMT Analysis

Dt: 11/21/2021

2019	Project	Regional Threshold *
Total Employees (a)	4,920	
Internal-Internal (II) employee tour and sub-tour VMT (b)	63,890	
II VMT per employee (c=b/a)	13.0	
External-Internal (XI) VMT per employee (TAZ 1375) (d)	6.4	
Total (II+XI) VMT per employee (e=c+d)	19.4	
Adjustment for new base (City of Fresno) (f)	1.02	
VMT per employee (g=e*f)	**19.8**	**25.6**

**: Regional Threshold obtained from CEQA Guidelines for Vehicle Miles Traveled Thresholds for the City of Fresno , Adopted: June 25, 2020*

notes: Original/Parent TAZ for the project is 723. No development was included in the model for the TAZ 723 resulting in 0 XI VMT. TAZ 1375 was chosen as it has similar characters as project - high employment (303 emp), no residential uses.

APPENDIX H:

CRASH DATA

Table H-A - Non-Freeway Collision Summary

Collission Date	1/15/2019	12/19/2018
Collission Time	17:30	17:52
Primary Road	Hughes Avenue	SR-180 Westbound to Marks Avenue
Secondary Road	Nielsen Avenue	Marks Avenue
Distance from Intersection (ft)	1185	5
Severity of Collision	Fatal	Complaint of Pain
Fatality	1	0
Injury	0	1
Pedestrian Involvement	Yes	No
Bike Involvement	No	No
Motorcycle Involvement	No	No
Truck Involvement	No	No

Notes:

Data obtained from the Statewide Integrated Traffic Records System (SWITRS) for the time period of January 2018 to December 2020.

CALIFORNIA STATE HIGHWAYS
STATEWIDE TRAVEL AND CRASH RATES

LANE TYPE	2018 ROAD MILES	2018 TRAVEL (MVM)	2018			3-YR Rates (2016, 2017, 2018)		
			CRASHES		VICTIMS	CRASHES		VICTIMS
			TOTAL PER MVM	FATAL+ INJURY PER MVM	FATALITIES PER 100 MVM	TOTAL PER MVM	FATAL + INJURY PER MVM	FATALITIES PER 100 MVM
RURAL (INSIDE + OUTSIDE CITY)								
2 AND 3 LN	7,081.8	10,363.0	1.04	0.46	3.45	1.10	0.49	3.55
4+ UND	69.1	238.5	1.13	0.44	3.77	1.09	0.42	3.67
4+ DIV	321.9	1,757.0	0.81	0.29	1.42	0.88	0.32	1.47
SUBTOTAL	7,472.7	12,358.5	1.01	0.44	3.17	1.07	0.46	3.27
2 AND 3 LN EXP	712.5	1,671.2	0.72	0.29	2.09	0.75	0.32	2.32
4+ DIV EXP	568.9	3,774.2	0.61	0.22	1.17	0.64	0.23	1.27
NON FWY	8,754.2	17,804.0	0.90	0.38	2.65	0.95	0.40	2.76
FREEWAY	1,719.3	24,489.7	0.50	0.17	0.88	0.51	0.17	0.88
TOTAL	10,473.5	42,293.7	0.67	0.25	1.62	0.69	0.27	1.67
URBAN (INSIDE + OUTSIDE CITY)								
2 AND 3 LN	918.2	3,639.0	1.29	0.54	1.84	1.32	0.56	1.93
4+ UND	86.5	702.5	1.46	0.68	2.28	1.61	0.72	2.06
4+ DIV	591.2	6,958.4	1.24	0.62	1.55	1.32	0.64	1.50
SUBTOTAL	1,595.9	11,299.9	1.27	0.60	1.69	1.34	0.62	1.67
2 AND 3 LN EXP	101.4	403.0	0.86	0.32	1.24	0.90	0.36	1.34
4+ DIV EXP	185.1	2,452.0	0.84	0.32	0.94	0.86	0.34	1.05
NON FWY	1,882.4	14,154.9	1.18	0.54	1.55	1.24	0.56	1.55
FREEWAY	2,687.3	134,454.1	1.04	0.33	0.47	1.04	0.33	0.49
TOTAL	4,569.7	148,609.0	1.06	0.35	0.58	1.06	0.35	0.59
STATEWIDE								
2 AND 3 LN	8,000.0	14,002.0	1.11	0.48	3.04	1.16	0.51	3.13
4+ UND	155.5	941.0	1.37	0.62	2.66	1.48	0.65	2.47
4+ DIV	913.1	8,715.4	1.15	0.55	1.53	1.24	0.58	1.50
SUBTOTAL	9,068.7	23,658.4	1.13	0.51	2.46	1.20	0.54	2.50
2 AND 3 LN EXP	813.9	2,074.3	0.74	0.29	1.93	0.78	0.32	2.12
4+ DIV EXP	754.1	6,226.2	0.70	0.26	1.08	0.73	0.28	1.19
NON FWY	10,636.6	31,958.9	1.02	0.45	2.16	1.08	0.47	2.22
FREEWAY	4,406.6	158,943.8	0.96	0.30	0.54	0.96	0.31	0.55
TOTAL	15,043.2	190,902.7	0.97	0.33	0.81	0.98	0.33	0.83

Statewide Travel / Crash Summary

FOR 2018 PREPARED 10/08/2020

TRAVEL AND CRASH SUMMARY FOR FRE COUNTY

	ROAD	TRAVEL	CRASHES				VICTIMS	
LANE TYPE	MILES	(MVM)	TOTAL	PDO	INJURY	FATAL	KILLED	INJURED
RURAL								
2 AND 3 LN	308.6	521.6	467	262	193	12	14	322
4+ UND	1.8	6.1	18	9	7	2	2	9
4+ DIV	9.2	84.2	93	56	34	3	3	68
SUBTOTAL	319.5	611.8	578	327	234	17	19	399
2 AND 3 LN EXP	8.0	37.8	38	24	14	0	0	24
4+ DIV EXP	9.3	21.4	11	7	4	0	0	4
NON FWY	336.9	671.1	627	358	252	17	19	427
FREEWAY	67.0	986.2	321	207	107	7	10	199
TOTAL	403.9	1,657.3	948	565	359	24	29	626
URBAN								
2 AND 3 LN	39.4	72.6	72	40	32	0	0	61
4+ UND	2.5	6.0	10	6	4	0	0	5
4+ DIV	4.1	14.6	27	16	11	0	0	20
SUBTOTAL	46.0	93.2	109	62	47	0	0	86
2 AND 3 LN EXP	0.2	0.4	0	0	0	0	0	0
4+ DIV EXP	0.0	0.0	0	0	0	0	0	0
NON FWY	46.3	93.5	109	62	47	0	0	86
FREEWAY	68.4	2,147.1	2,192	1,550	635	7	7	965
TOTAL	114.6	2,240.7	2,301	1,612	682	7	7	1,051
COUNTYWIDE								
2 AND 3 LN	348.0	594.2	539	302	225	12	14	383
4+ UND	4.3	12.1	28	15	11	2	2	14
4+ DIV	13.3	98.7	120	72	45	3	3	88
SUBTOTAL	365.6	705.0	687	389	281	17	19	485
2 AND 3 LN EXP	8.2	38.2	38	24	14	0	0	24
4+ DIV EXP	9.3	21.4	11	7	4	0	0	4
NON FWY	383.1	764.6	736	420	299	17	19	513
FREEWAY	135.4	3,133.4	2,513	1,757	742	14	17	1,164
TOTAL	518.6	3,898.0	3,249	2,177	1,041	31	36	1,677

10/6/2020

BASIC AVERAGE CRASH RATE TABLE FOR HIGHWAYS

RATE	BASE	+ ADT	PCT	PCT	PCT		TERRAIN	DESIGN		**CRASH COSTS ($1,000)**	
GROUP	RATE	FACTOR	FAT	INJ	F+I	HIGHWAY TYPE	OR ADT	SPEED	AREA	F+I	ALL
H 01	0.78	0.29900 /	2.5	40.2	42.7	CONVENTIONAL 2 LANES OR LESS	FLAT	<=55	RURAL	806.8	349.4
H 02	0.70	0.00000	3.2	38.9	42.1	CONVENTIONAL 2 LANES OR LESS	FLAT	>55	RURAL	1001.4	426.6
H 03	1.14	0.72800 /	2.6	44.3	46.9	CONVENTIONAL 2 LANES OR LESS	ROLL	<=55	RURAL	772.1	366.7
H 04	0.65	0.47100 /	3.5	41.5	45.0	CONVENTIONAL 2 LANES OR LESS	ROLL	>55	RURAL	1021.1	464.2
H 05	1.57	0.42100 /	2.6	47.0	49.6	CONVENTIONAL 2 LANES OR LESS	MTN	<=55	RURAL	738.5	370.6
H 06	0.91	0.47600 /	2.8	42.3	45.1	CONVENTIONAL 2 LANES OR LESS	MTN	>55	RURAL	846.2	386.3
H 07	1.60	0.00000	1.0	38.3	39.3	CONVENTIONAL 2 LANES OR LESS		<45	SUBURBAN	417.1	170.6
H 08	1.32	0.00000	1.7	44.3	46.0	CONVENTIONAL 2 LANES OR LESS		45-55	SUBURBAN	538.5	253.7
H 09	0.62	0.02100 *	1.7	39.4	41.1	CONVENTIONAL 2 LANES OR LESS		>55	SUBURBAN	585.0	246.9
H 10	1.20	0.00000	1.0	39.9	40.9	CONVENTIONAL 2 LANES OR LESS		<45	URBAN	409.2	173.1
H 11	0.82	0.00000	1.6	47.2	48.8	CONVENTIONAL 2 LANES OR LESS		>=45	URBAN	498.0	248.0
H 12	1.12	0.00000	2.9	39.4	42.3	CONVENTIONAL 3 LANES			RURAL	918.3	393.4
H 13	1.44	0.00000	1.4	37.9	39.3	CONVENTIONAL 3 LANES			SUBURBAN	524.5	212.8
H 14	1.17	0.00000	2.1	38.8	40.9	CONVENTIONAL 3 LANES			URBAN	695.7	290.3
H 15	0.61	0.00000	2.1	36.7	38.8	EXPRESSWAY 3 LANES OR LESS	FLAT		RURAL	757.5	299.2
H 16	0.68	0.00000	3.2	36.8	40.0	EXPRESSWAY 3 LANES OR LESS	ROLL		RURAL	1045.9	423.5
H 17	0.97	0.00000	2.6	40.3	42.9	EXPRESSWAY 3 LANES OR LESS	MTN		RURAL	829.7	360.9
H 18	0.64	0.00000	2.8	41.7	44.5	EXPRESSWAY 3 LANES OR LESS		<=55	SUBURBAN	812.5	367.7
H 19	0.86	0.00000	2.6	33.5	36.1	EXPRESSWAY 3 LANES OR LESS		>55	SUBURBAN	908.5	335.0
H 20	0.62	0.00000	3.0	48.8	51.8	EXPRESSWAY 3 LANES OR LESS			URBAN	765.7	401.3
H 21	1.05	0.00000	1.9	34.9	36.8	UNDIVIDED 4 LANES	FLAT		RURAL	729.7	274.0
H 22	0.73	0.00000	2.0	34.4	36.4	UNDIVIDED 4 LANES	ROLL/MTN		RURAL	766.6	284.5
H 23	0.93	0.00000	2.1	27.4	29.5	UNDIVIDED 4 LANES		<=55	SUBURBAN	899.7	273.2
H 24	1.23	0.00000	2.0	35.5	37.5	UNDIVIDED 4 LANES		>55	SUBURBAN	711.3	273.6
H 25	0.94	0.00000	0.7	38.2	38.9	UNDIVIDED 4 LANES		<45	URBAN	340.5	138.4
H 26	0.67	0.00000	1.0	38.9	39.9	UNDIVIDED 4 LANES		>=45	URBAN	415.7	171.7
H 27	0.91	0.00000	3.1	31.3	34.4	UNDIVIDED 5-6 LANES	FLAT		RURAL	1158.6	404.2
H 28	0.91	0.00000	3.1	31.3	34.4	UNDIVIDED 5-6 LANES	ROLL/MTN		RURAL	1158.6	404.2
H 29	0.41	0.00000	2.6	48.7	51.3	UNDIVIDED 5-6 LANES		<=55	SUBURBAN	683.4	355.9
H 30	0.41	0.00000	2.6	48.7	51.3	UNDIVIDED 5-6 LANES		>55	SUBURBAN	683.4	355.9
H 31	1.37	0.00000	1.0	33.3	34.3	UNDIVIDED 5-6 LANES		<45	URBAN	459.3	163.9
H 32	3.02	0.00000	0.4	27.0	27.4	UNDIVIDED 5-6 LANES		>=45	URBAN	304.3	90.4

10/6/2020

BASIC AVERAGE CRASH RATE TABLE FOR INTERSECTIONS

RATE		BASE	+ ADT	PCT	PCT	PCT	INTERSECTION			CRASH COST ($1000)	
GROUP		RATE	FACTOR	FAT	INJ	F+ I	TYPE*	CONTROL TYPE	AREA	F+I	ALL
I	01	0.130	0.00000	1.4	44.4	45.8	F, M and S	NO CONTROL	RURAL	494.9	231.3
I	02	0.250	0.00000	2.5	44.1	46.6	F, M and S	STOP & YIELD SIGNS (EXC 4WAY)	RURAL	752.2	355.1
I	03	0.490	0.00000	0.8	32.7	33.5	F, M and S	4 WAY STOP	RURAL	420.4	146.5
I	04	0.540	0.00000	1.0	37.0	38.0	F, M and S	SIGNALS	RURAL	447.5	175.4
I	05	0.460	0.00000	1.5	36.0	37.5	F, M and S	4 WAY FLASHERS	RURAL	600.0	230.4
I	06	0.160	0.00000	0.8	45.8	46.6	F, M and S	NO CONTROL	SUBURBAN	329.7	159.5
I	07	0.240	0.00000	1.7	41.2	42.9	F, M and S	STOP & YIELD SIGNS (EXC 4WAY)	SUBURBAN	566.7	249.4
I	08	0.430	0.00000	0.7	40.3	41.0	F, M and S	4 WAY STOP	SUBURBAN	328.7	141.3
I	09	0.420	0.00000	0.5	37.4	37.9	F, M and S	SIGNALS	SUBURBAN	287.8	115.9
I	10	0.340	0.00000	0.8	39.9	40.7	F, M and S	4 WAY FLASHERS	SUBURBAN	356.0	151.4
I	11	0.050	0.00000	2.6	44.9	47.5	F, M and S	NO CONTROL	URBAN	731.8	352.7
I	12	0.140	0.00000	1.1	46.2	47.3	F, M and S	STOP & YIELD SIGNS (EXC 4WAY)	URBAN	396.5	192.7
I	13	0.170	0.00000	0.4	26.8	27.2	F, M and S	4 WAY STOP	URBAN	305.4	90.1
I	14	0.240	0.00000	0.5	46.9	47.4	F, M and S	SIGNALS	URBAN	261.2	128.9
I	15	0.260	0.00000	1.5	41.4	42.9	F, M and S	4 WAY FLASHERS	URBAN	521.2	229.1
I	16	0.130	0.00000	1.4	41.0	42.4	T, Y and Z	NO CONTROL	RURAL	522.2	226.4
I	17	0.190	0.00000	1.7	39.8	41.5	T, Y and Z	STOP & YIELD SIGNS (EXC 4WAY)	RURAL	610.8	258.5
I	18	0.560	0.00000	2.0	35.7	37.7	T, Y and Z	4 WAY STOP	RURAL	745.5	286.4
I	19	0.450	0.00000	0.5	34.6	35.1	T, Y and Z	SIGNALS	RURAL	313.0	115.4
I	20	0.560	0.00000	2.0	35.7	37.7	T, Y and Z	4 WAY FLASHERS	RURAL	745.5	286.4
I	21	0.140	0.00000	0.6	39.1	39.7	T, Y and Z	NO CONTROL	SUBURBAN	308.1	128.9
I	22	0.170	0.00000	1.2	39.9	41.1	T, Y and Z	STOP & YIELD SIGNS (EXC 4WAY)	SUBURBAN	456.7	194.2
I	23	0.180	0.00000	1.7	25.5	27.2	T, Y and Z	4 WAY STOP	SUBURBAN	808.1	227.8
I	24	0.290	0.00000	0.5	37.7	38.2	T, Y and Z	SIGNALS	SUBURBAN	286.7	116.3
I	25	0.180	0.00000	2.9	25.5	28.4	T, Y and Z	4 WAY FLASHERS	SUBURBAN	1226.0	356.1
I	26	0.060	0.00000	1.9	41.7	43.6	T, Y and Z	NO CONTROL	URBAN	613.0	272.7
I	27	0.090	0.00000	1.2	46.9	48.1	T, Y and Z	STOP & YIELD SIGNS (EXC 4WAY)	URBAN	414.5	204.4
I	28	0.070	0.00000	1.1	38.6	39.7	T, Y and Z	4 WAY STOP	URBAN	443.9	182.1
I	29	0.200	0.00000	0.5	46.8	47.3	T, Y and Z	SIGNALS	URBAN	261.4	128.8
I	30	0.070	0.00000	2.6	38.6	41.2	T, Y and Z	4 WAY FLASHERS	URBAN	821.0	343.9
I	31	0.740	0.00000	0.8	19.1	19.9	R	YIELD ON ALL APPROACHES	ALL*	585.5	125.0

Traffic Accident Surveillance and Analysis System (TASAS)
Crash Data Summary:

The contents of these reports shall be considered confidential and may be privileged pursuant to 23 U.S.C. Section 409 and are for the sole use of the intended recipient(s). Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please contact the sender by reply e-mail and destroy all copies of the original message. Do not print, copy or forward.

Table 1 summarizes collision rates for the requested Route 180 mainline segment in eastbound and westbound directions from Postmile (PM) R53.668 to Postmile (PM) R55.668 in the County of Fresno. The Table B reports were generated on October 26, 2021 and they depict existing collision rates per million vehicle miles for the most recent 36-month period from January 1, 2018 to December 31, 2020 from the Traffic Accident Surveillance and Analysis System (TASAS).

TABLE 1

TASAS Table B Collision Rates (01-01-2018 to 12-31-2020)

Fre 180 Segment	**TOTAL No. of Collisions**	**ACTUAL (per million vehicle miles)**			**AVERAGE (per million vehicle miles)**		
		Fatal Collisions	**Fatal + Injury Collisions**	**Total (1)**	**Fatal Collisions**	**Fatal + Injury Collisions**	**Total (1)**
Eastbound PM R53.668 / R55.668	21	0.000	0.15	0.64	0.007	0.30	0.86
Westbound PM R53.668 / R55.668	15	0.000	0.28	0.46	0.0007	0.30	0.86

(1) All reported collisions (includes Property Damage Only (PDO) Collisions)

<u>Eastbound Fre 180 (PM R53.668 to PM R55.668)</u>

Analysis of the TASAS Table B records shows a total of 21 collisions within the segment of eastbound Route 180 from PM R53.668 to PM R55.668 and study periods summarized above, with a total rate of fatal and injury related collisions that is below the average for similar facilities statewide, and a total rate of collisions that is below the average for similar facilities statewide.

Detailed analysis per the TASAS Selective Accident Retrieval (TSAR) generated on October 26, 2021 shows that the primary collision factors in the segment were:

- "Improper Turn,"
- "Other Violations,"
- "Speeding,"
- "Influence of Alcohol," and
- "Unknown."

The types of collision included:

- 9 "Hit Object,"
- 4 "Rear End,"
- 4 "Sideswipe,"
- 3 "Overturn," and
- 1 "Broadside."

The objects struck from the 9 hit object collisions included the following:

- 2 "Other Object on The Road,"
- 2 "No Object Involved"
- 2 "Does Not Apply"
- 1 "Light or Signal Pole"
- 1 "Dike or Curb," and
- 1 "End of Guardrail."

Of the 21 total collisions, 14 occurred in daylight and 2 of the total occurred under wet conditions.

Westbound Fre 180 (PM R53.668 to PM R55.668)

Analysis of the TASAS Table B records shows a total of 15 collisions within the segment of westbound Route 180 from PM R53.668 to PM R55.668 and study periods summarized above, with a total rate of fatal and injury related collisions that is below the average for similar facilities statewide, and a total rate of collisions that is below the average for similar facilities statewide.

Detailed analysis per the TASAS Selective Accident Retrieval (TSAR) generated on October 26, 2021 shows that the primary collision factors in the segment were:

- "Speeding,"
- "Improper Turn,"
- "Influence of Alcohol,"
- "Unknown," and
- "Other Than Driver."

The types of collision included:

- 4 "Hit Object,"
- 4 "Rear End,"
- 3 "Sideswipe,"
- 3 "Overturn," and
- 1 "Other."

The objects struck from the 4 hit object collisions included the following:

- 2 "Guardrail,"
- 1 "Overturned," and
- 1 "Vehicle."

Of the 15 total collisions, 8 occurred in daylight and 2 of the total occurred under wet conditions.

End of summary.

WB/AML

Mitigation Measure Monitoring Program for Development Permit Application No. P21-02699 and Tentative Parcel Map No. P21-05930

This Mitigation Monitoring and Reporting Program (MMRP) was formulated based upon the findings of the Initial Study/Mitigated Negative Declaration (IS/MND) prepared for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project). The MMRP, which is found in Table A of this section, lists mitigation measures recommended in the IS/MND for the proposed project and identifies mitigation monitoring requirements.

This MMRP has been prepared to comply with the requirements of State law (Public Resources Code Section 21081.6). State law requires the adoption of an MMRP when mitigation measures are required to avoid significant impacts. This requirement facilitates implementation of all mitigation measures adopted through the California Environmental Quality Act (CEQA) process. The MMRP is intended to ensure compliance during implementation of the project.

The MMRP is organized in a matrix format. The first column identifies the mitigation measure. The second column, entitled “Mitigation Responsibility,” refers to the party responsible for implementing the mitigation measure. The third column, entitled “Monitoring/Reporting Agency,” refers to the agency responsible for oversight or ensuring that the mitigation measure is implemented. The fourth column, entitled “Monitoring Schedule,” refers to when monitoring will occur to ensure that the mitigating action is completed. The fifth column, entitled “Verification,” will be initialed and dated by the individual designated to verify adherence to the project specific mitigation.

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Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
I. AESTHETICS				
Mitigation Measure AES-1: Lighting systems for street and parking areas shall include shields to direct light to the roadway surfaces and parking areas. Vertical shields on the light fixtures shall also be used to direct light away from adjacent light sensitive land uses such as residences.	Prior to issuance of building permits	Project Applicant	Planning & Development Department	
Mitigation Measure AES-2: Lighting systems for public facilities such as active play areas shall provide adequate illumination for the activity; however, low intensity light fixtures and shields shall be used to minimize spillover light onto adjacent properties.	Prior to issuance of building permits	Project Applicant	Planning & Development Department	
Mitigation Measure AES-3: Lighting systems for non-residential uses, not including public facilities, shall provide shields on the light fixtures and orient the lighting system away from adjacent properties. Low intensity light fixtures shall also be used if excessive spillover light onto adjacent properties will occur.	Prior to issuance of building permits	Project Applicant	Planning & Development Department	
Mitigation Measure AES-4: Lighting systems for freestanding signs shall not exceed 100 foot Lamberts (FT-L) when adjacent to streets which have an average light intensity of less than 2.0 horizontal footcandles and shall not exceed 500 FT-L when adjacent to streets which have an average light intensity of 2.0 horizontal footcandles or greater.	Prior to issuance of building permits	Project Applicant	Planning & Development Department	
Mitigation Measure AES-5: Materials used on building facades shall be non-reflective.	Prior to development project approval	Project Applicant	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

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II. AGRICULTURE AND FORESTRY				
There are no significant impacts to agriculture and forestry resources.				
III. AIR QUALITY				
There are no significant impacts to air quality.				
IV. BIOLOGICAL RESOURCES				
Mitigation Measure BIO-1: If project construction activities occur during nesting season (between February 1 and August 31), a qualified biologist shall conduct pre-construction surveys for active migratory bird nests at the project site within 14 days of the onset of these activities.	During Project Construction if During the Nesting Season (February 1 to August 31)	Construction Contractor	Planning & Development Department	
Mitigation Measure BIO-2: Should any active nests be discovered in or near proposed construction zones, the biologist shall identify a suitable construction-free buffer around the nest. This buffer shall be identified on the ground with flagging or fencing, and shall be maintained until the biologist has determined that the young have fledged.	During Project Construction	Construction Contractor	Planning & Development Department	
V. CULTURAL RESOURCES				
Mitigation Measure CUL-1: If previously unknown resources are encountered before or during grading activities, construction shall stop in the immediate vicinity of the find and a qualified historical resources specialist shall be consulted to determine whether the resource requires further study. The qualified historical resources specialist shall make recommendations to the City on the measures that shall be implemented to protect the discovered	Prior to commencement of, and during, construction activities	Construction Contractor	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the *State CEQA Guidelines* and the City's Historic Preservation Ordinance. If the resources are determined to be unique historical resources as defined under Section 15064.5 of the *State CEQA Guidelines*, measures shall be identified by the monitor and recommended to the lead agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any historical artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study.				
Mitigation Measure CUL-2: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for prehistoric archaeological resources shall be conducted. The following procedures shall be followed.	Prior to commencement of, and during, construction activities	Construction Contractor	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
• If prehistoric resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that buried prehistoric archaeological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archaeologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with CEQA Guidelines Section 15064.5. If the resources are determined to be unique prehistoric archaeological resources as defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the lead agency. Appropriate measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any prehistoric archaeological artifacts recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of				

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
providing long-term preservation to allow future scientific study. If prehistoric resources are found during the field survey or literature review, the resources shall be inventoried using appropriate State record forms and submit the forms to the Southern San Joaquin Valley Information Center. The resources shall be evaluated for significance. If the resources are found to be significant, measures shall be identified by the qualified archaeologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include an archaeological monitor. The monitoring period shall be determined by the qualified archaeologist. If additional prehistoric archaeological resources are found during excavation and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.				

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
Mitigation Measure CUL-3: In the event that human remains are unearthed during excavation and grading activities of any future development project, all activity shall cease immediately. Pursuant to Health and Safety Code (HSC) Section 7050.5, no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98(a). If the remains are determined to be of Native American descent, the coroner shall within 24 hours notify the Native American Heritage Commission (NAHC). The NAHC shall then contact the most likely descendent of the deceased Native American, who shall then serve as the consultant on how to proceed with the remains. Pursuant to PRC Section 5097.98(b), upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located is not damaged or disturbed by further development activity until the landowner has discussed and conferred with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.	Prior to commencement of, and during, construction activities	Construction Contractor	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
VI. ENERGY				
There are no significant impacts to energy.				
VII. GEOLOGY AND SOILS				
Mitigation Measure GEO-1: Subsequent to a preliminary City review of the project grading plans, if there is evidence that a project will include excavation or construction activities within previously undisturbed soils, a field survey and literature search for unique paleontological/geological resources shall be conducted. The following procedures shall be followed: • If unique paleontological/geological resources are not found during either the field survey or literature search, excavation and/or construction activities can commence. In the event that unique paleontological/geological resources are discovered during excavation and/or construction activities, construction shall stop in the immediate vicinity of the find and a qualified paleontologist shall be consulted to determine whether the resource requires further study. The qualified paleontologist shall make recommendations to the City on the measures that shall be implemented to protect the discovered resources, including but not limited to, excavation of the finds and evaluation of the finds. If the resources are determined to be significant, mitigation measures shall be identified by the monitor and recommended to the lead agency. Appropriate mitigation measures for	Prior to commencement of, and during, construction activities	Construction Contractor	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. No further grading shall occur in the area of the discovery until the lead agency approves the measures to protect these resources. Any paleontological/geological resources recovered as a result of mitigation shall be provided to a City-approved institution or person who is capable of providing long-term preservation to allow future scientific study. • If unique paleontological/geological resources are found during the field survey or literature review, the resources shall be inventoried and evaluated for significance. If the resources are found to be significant, mitigation measures shall be identified by the qualified paleontologist. Similar to above, appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds. In addition, appropriate mitigation for excavation and construction activities in the vicinity of the resources found during the field survey or literature review shall include a paleontological monitor. The monitoring period shall be determined by the qualified paleontologist. If additional paleontological/ geological resources are found during excavation				

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
and/or construction activities, the procedure identified above for the discovery of unknown resources shall be followed.				
VIII. GREENHOUSE GAS EMISSIONS				
There are no significant impacts to greenhouse gas emissions.				
IX. HAZARDS AND HAZARDOUS MATERIAL				
There are no significant impacts to hazards and hazardous material.				
X. HYDROLOGY AND WATER QUALITY				
There are no significant impacts to hydrology and water quality.				
XI. LAND USE AND PLANNING				
There are no significant impacts to land use and planning.				
XII. MINERAL RESOURCES				
There are no significant impacts to mineral resources.				
XIII. NOISE				
Mitigation Measure NOI-1: The project contractor shall implement the following measures during construction of the project: • Equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers consistent with manufacturers' standards. • Designate a "disturbance coordinator" at the City who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too	During Project Construction	Construction Contractor	Planning & Development Department	

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
early, bad muffler) and would determine and implement reasonable measures warranted to correct the problem.				
Mitigation Measure NOI-2: All loading dock activities shall be prohibited at the loading dock doors on the south end of Building 1 during the nighttime hours (10:00 p.m. to 7:00 a.m.) or once operational, provide documentation to the City of Fresno Planning and Development Department that demonstrates that nighttime loading dock activities would comply with the noise level specifications of the City's Municipal Code.	Prior to issuance of building permits	Project Applicant	Planning & Development Department	
XIV. POPULATION AND HOUSING				
There are no significant impacts to population and housing.				
XV. PUBLIC SERVICES				
There are no significant impacts to public services.				
XVI. RECREATION				
There are no significant impacts to recreation.				
XVII. TRANSPORTATION				
There are no significant impacts to transportation.				
XVII. TRIBAL CULTURAL RESOURCES				
Mitigation Measure TRIBE-1: Implement Mitigation Measure CUL-1.				
XIX. UTILITIES AND SERVICE SYSTEMS				
There are no significant impacts to utilities and service systems.				

Table A: Mitigation Monitoring and Reporting Program

MITIGATION MEASURE	Timing for Mitigation Measure	Mitigation Responsibility	Monitoring/ Reporting Agency	Verification (Initials and Date)
XX. WILDFIRE				
There are no significant impacts to wildfire.				

Source: LSA (March 2022).