PUBLIC REVIEW DRAFT

ENVIRONMENTAL IMPACT REPORT

TECHNICAL APPENDICES – VOLUME II – APPENDICES J – M

2740 WEST NIELSEN AVENUE OFFICE/WAREHOUSE PROJECT

FRESNO, CALIFORNIA

LSA

February 2023

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APPENDIX J

PHASE II ENVIRONMENTAL SITE ASSESSMENT

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SALEM
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February 3, 2021

Job No. 1-420-1016

Mr. Jake Kurth
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Subject: **PHASE II ENVIRONMENTAL SITE ASSESSMENT**
FORMER CALIFORNIA COMPRESS FACILITY
2740 WEST NIELSON AVENUE
FRESNO, CALIFORNIA

Dear Mr. Kurth:

At your request and authorization, SALEM Engineering Group, Inc. (SALEM) has prepared this Phase II Environmental Site Assessment (ESA) for the Former California Compress Facility property located at 2740 West Nielson Avenue in Fresno, California.

We appreciate the opportunity to assist you with this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office at (559) 271-9700.

Respectfully submitted,

SALEM Engineering Group, Inc.

Shannon Lodge, PG, QSD
Senior Project Manager

GEOTECHNICAL • ENVIRONMENTAL • GEOLOGY • MATERIALS TESTING & INSPECTION • FORENSIC • LABORATORY

SALEM engineering group, inc.

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FORMER CALIFORNIA COMPRESS FACILITY
2740 WEST NIELSON AVENUE
FRESNO, CALIFORNIA

SALEM PROJECT NO. 1-420-1016
FEBRUARY 3, 2021

PREPARED FOR:

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Job No. 1-420-1016

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February 3, 2021 **Job No. 1-420-1016**

PHASE II ENVIRONMENTAL SITE ASSESSMENT

FORMER CALIFORNIA COMPRESS FACILITY
2740 WEST NIELSON AVENUE
FRESNO, CALIFORNIA

1.0 EXECUTIVE SUMMARY

Salem Engineering Group, Inc. (SALEM) performed a Phase II Environmental Site Assessment (ESA) to investigate the Former California Compress Facility property located at 2740 West Nielson Avenue in Fresno, California (subject property). The subject property comprises an approximately 44.95-acre rectangular-shaped subject property and consists of two parcels (Fresno County Assessor's Parcel Numbers [APNs] 458-020-71 and 458-020-72). The investigation was performed in accordance with SALEM's Proposal No. P1-420-1899 dated December 15, 2020.

During the course of SALEM's January 29, 2021 Phase I ESA, SALEM identified the following evidence of Recognized Environmental Conditions (RECs) in connection with the subject property as defined by ASTM E1527-13:

- At least three known septic systems were associated with the former structures on the subject property, two of which were visually identified during SALEM's November 19, 2020 site reconnaissance as remaining at the subject property. The former septic systems may have acted as a conduit for contaminants to enter on-site soil from potential past unauthorized disposal of hazardous substances and/or petroleum products utilized for vehicle maintenance into drains, sinks and toilets. SALEM recommended conducting a Limited Soil Assessment (LSA) in the vicinity of the septic systems to determine if on-site soils have been impacted by unauthorized releases of the constituents of concern into the septic systems.

- Historic operations at the subject property included the handling and storage of cotton which required an extensive fire suppression system. Two water basins were historically located in the southern portion of the subject property. SALEM personnel located more than 25 features across the subject property indicative of a fire suppression system including stand pipes, traffic bollards, and fire hydrants. The system reportedly included diesel-powered water pumps supplied from an aboveground storage tank (AST) historically located in the south-central portion of the subject property. The former diesel AST location was identifiable by concrete footings and a fire extinguisher. Additional concrete footings indicative of propane ASTs were observed in the north-central portion of the subject property. No staining or signs of leakage were observed in the vicinity of the former ASTs. However, SALEM recommended conducting a LSA to assess on-site shallow soils for potential petroleum hydrocarbon impacts in the vicinity of the former diesel AST.

- A soil mound was observed in the southern portion of the subject property and was reported to have been excavation dirt and asphalt produced when the floor of a warehouse was switched from asphalt to concrete to accommodate heavy machinery. No obvious visual evidence of hazardous substances and/or petroleum products or staining was observed on the surface of the stockpile. Based upon the absence of documentation regarding the source of the stockpiled soil, SALEM recommended collecting samples of the stockpiled soil in order to determine if the soil had been impacted by constituents of concern prior to either transporting the soil off-site for disposal or utilizing the soil on-site as clean-fill if needed during the redevelopment of the subject property.

The following Historical Recognized Environmental Condition (HREC) was identified:

- The former California Compress facility operated four underground storage tanks (USTs) consisting of a 10,000-gallon fuel oil UST historically located on what is now the north adjacent property; a 4,000-gallon double-walled steel diesel UST; a 4,000-gallon single-walled steel diesel UST; and a 1,000-gallon single-walled steel regular unleaded gasoline UST historically located in the southwest portion of the subject property. Records indicate all UST were properly permitted and removed under the regulatory agency oversight of Fresno County Environmental Health Division (FCEHD). A record of a "Hazardous Material Release" was recorded on June 5, 1995 indicating soil contamination from petroleum products discovered during removal of a UST. California Regional Water Quality Control Board (RWQCB) records indicate that FCEHD issued a "case closed" designation for the California Compress leaking underground storage tank (LUST) site on July 3, 1996.

Scannell Properties requested that SALEM perform a Phase II ESA to address the RECs and HREC identified in SALEM's January 29, 2021 Phase I ESA, to gather data regarding current site conditions, to establish baseline soil and soil vapor concentrations, and to evaluate if soil vapor conditions pose a potential vapor intrusion risk to future occupants at the subject property.

The following data summary is based on a review of field and laboratory data obtained during SALEM's investigation at the subject property:

- According to RWQCB records for the Fresno Drum, Eastern Parcel facility, located at 733 South Hughes Avenue, approximately 0.65-mile south of the subject property, groundwater in the vicinity of the subject property was reported at a depth of approximately 65 to 80 feet below ground surface (bgs) with a general direction of flow toward the northeast. However, local groundwater level and flow direction may vary due to seasonal fluctuations in precipitation, usage demands, geology, and/or surface topography. Groundwater was not encountered during the course of this investigation.

- A geophysical survey was conducted on January 4, 2021 which identified the suspected former UST pit. The pit displayed a different soil density compared to the surrounding areas and the surface area of this location displayed patched/cut concrete and asphalt. Additionally, two of the three suspected septic systems were positively identified. No other anomalies indicative of potential buried fuel USTs and associated appurtenances, additional backfilled UST cavities, or other sub-grade structures of environmental concern (hoists, clarifiers, and sumps) were identified during the performance of the geophysical survey.

- SALEM installed eight soil borings (SV-1 through SV-6, SB-7, and SB-8) to depths ranging from 10 to 15 feet bgs. Borings SV-1 through SV-6 were converted to dual-completion soil vapor sample points with probes at 5 and 10 feet bgs. Borings SV-1, SV-3, and SV-6 were located near the former and suspect septic tank locations; SV-2 and SB-7 were located near the former UST pit in the southwest portion of the subject property; SV-4 and SV-5 were located near the former diesel and propane AST locations, respectively; and SB-8 was located adjacent to a ring of traffic bollards historically associated with the fire suppression system in the south portion of the subject property.

- Generally, soil types consisted of light brown, well sorted, medium- to fine-grained sand (SP) sand to approximately 10 feet bgs, underlain by brown silt with sparse very fine-grained sand (ML) to the maximum depth drilled of 15 feet bgs. Drilling refusal was met at a depth of 7 feet bgs at location SB-8 near the fire suppression equipment in the south portion of the subject property. A subsurface manmade feature is the suspected cause; however, due to the absence of apparent contamination the area was not investigated further.

- Total petroleum hydrocarbons (TPH) were identified above laboratory method detection limits in 16 of the 18 soil samples analyzed. TPH as diesel (TPHd, carbon range C10-C24) was identified at concentrations ranging from 6.6 milligrams per kilogram (mg/kg) to 24 mg/kg. Additional TPH detected was consistent with mostly oil range hydrocarbons (TPHo) at concentrations ranging from 5.8 mg/kg to 360 mg/kg. TPH concentrations were below their respective established San Francisco Regional Water Quality Control Board (RWQCB-SF) Commercial/Industrial Environmental Screening Levels (ESLs) set at 260 mg/kg for TPHd and 1,600 mg/kg for TPHo.

- Volatile organic compounds (VOCs) and polychlorinated biphenyls (PCBs) were not identified above laboratory method detection limits in any of the soil samples analyzed. Data suggests that VOCs and PCBs are not constituents of potential concern (COPCs) in soil at the subject property.

- Semi-volatile organic compounds (SVOCs) detected in the composite soil samples collected from the soil stockpile located in the south portion of the subject property consisted of benzo(a)anthracene (0.41 to 0.49 mg/kg), chrysene (0.38 mg/kg), fluoranthene (0.49 mg/kg), phenanthrene (0.57 mg/kg), and pyrene (1.3 mg/kg). All detected concentrations of SVOCs were below their respective RWQCB-SF Commercial/Industrial ESLs.

- Arsenic was detected in soil samples collected at 5 feet bgs in SV-4 (11 mg/kg), SB-7 (14 mg/kg), and SB-8 (45 mg/kg). These values exceed the RWQCB-SF Commercial/Industrial ESL set at 0.31 mg/kg for cancer risk and appear to be slightly elevated in comparison to arsenic concentrations in Fresno County (1.8 to 6.0 mg/kg) and to regional arsenic concentrations in the San Joaquin Valley (Wilson, et al, 1990) that range from 0.8 to 20 mg/kg.

- Additional Title 22 metals detected included barium, cobalt, chromium, copper, nickel, lead, vanadium, and zinc at concentrations below their respective established RWQCB-SF Commercial/Industrial ESLs. No other Title 22/CAM 17 metals were detected above laboratory detection limits.

- VOCs were not identified above laboratory method detection limits in any of the soil vapor samples.

Based on these results, SALEM believes that no additional assessment activities are required. The subject property is suitable for unrestricted use and no engineering controls (i.e. VOC vapor barrier) are required. In the event the subject property will undergo any redevelopment which would include soil disturbance, SALEM recommends that a Soil Management Plan (SMP) be prepared to address soil management procedures that may arise based on historical use of the subject property and the known TPH and arsenic impacts.

2.0 INTRODUCTION AND PROJECT OBJECTIVES

SALEM conducted a Phase II ESA on behalf of Scannell Properties to investigate the Former California Compress Facility property located at 2740 West Nielson Avenue in Fresno, California (subject property – see Figure 1). The investigation was performed in accordance with SALEM's Proposal No. P1-420-1899 dated December 15, 2020.

The subject property comprises an approximately 44.95-acre rectangular-shaped subject property that consists of two parcels (Fresno County APNs 458-020-71 and 458-020-72), at 2740 West Nielsen Avenue, located on the north side of West Nielsen Avenue between North Marks Avenue and South Hughes Avenue in Fresno, California.

SALEM's January 29, 2021 Phase I ESA identified the following evidence of RECs in connection with the subject property as defined by ASTM E1527-13:

- At least three known septic systems were associated with the former structures on the subject property, two of which were visually identified during SALEM's November 19, 2020 site reconnaissance as remaining at the subject property. The former septic systems may have acted as a conduit for contaminants to enter on-site soil from potential past unauthorized disposal of hazardous substances and/or petroleum products utilized for vehicle maintenance into drains, sinks and toilets. SALEM recommended conducting an LSA in the vicinity of the septic systems to determine if on-site soils have been impacted by unauthorized releases of the COPCs into the septic systems.

- Historic operations at the subject property included the handling and storage of cotton which required an extensive fire suppression system. Two water basins were historically located in the southern portion of the subject property. SALEM personnel located more than 25 features across the subject property indicative of a fire suppression system including stand pipes, traffic bollards, and fire hydrants. The system reportedly included diesel-powered water pumps supplied from an AST historically located in the south-central portion of the subject property. The former diesel AST location was identifiable by concrete footings and a fire extinguisher. Additional concrete footings indicative of propane ASTs were observed in the north-central portion of the subject property. No staining or signs of leakage were observed in the vicinity of the former ASTs. However, SALEM recommended conducting an LSA to assess on-site shallow soils for potential petroleum hydrocarbon impacts in the vicinity of the former diesel AST.

- A soil mound was observed in the southern portion of the subject property and was reported to have been excavation dirt and asphalt produced when the floor of a warehouse was switched from asphalt to concrete to accommodate heavy machinery. No obvious visual evidence of hazardous substances and/or petroleum products or staining was observed on the surface of the stockpile. Based upon the absence of documentation regarding the source of the stockpiled soil, SALEM recommended collecting samples of the stockpiled soil in order to determine if the soil had been impacted by constituents of concern prior to either transporting the soil off-site for disposal or utilizing the soil on-site as clean-fill if needed during the redevelopment of the subject property.

The following HREC was identified:

- The former California Compress facility operated four USTs consisting of a 10,000-gallon fuel oil UST historically located on what is now the north adjacent property; a 4,000-gallon double-walled steel diesel UST; a 4,000-gallon single-walled steel diesel UST; and a 1,000-gallon single-walled steel regular unleaded gasoline UST historically located in the southwest portion of the subject property. Records indicate all USTs were properly permitted and removed under the regulatory agency oversight of FCEHD. A record of a "Hazardous Material Release" was recorded on June 5, 1995 indicating soil contamination from petroleum products discovered during removal of a UST. RWQCB records indicate that FCEHD issued a "case closed" designation for the California Compress LUST site on July 3, 1996.

SALEM recommended conducting a Phase II ESA to determine if the subject property has been negatively impacted by the historical facility operations, if soil vapor conditions pose a potential vapor intrusion risk to future occupants at the subject property, and to evaluate potential construction concerns (vapor barrier engineering, design, and installation and off-haul of potentially-contaminated soils) associated with the redevelopment process. In addition, SALEM recommended conducting a geophysical survey at the subject property to confirm the presence or absence of sub-grade structures of environmental concern, including the USTs associated with the former site operations.

3.0 SCOPE OF WORK

The Phase II ESA scope of services included the following:

- Coordination of pre-field activities including procurement of any necessary permits, evaluation of groundwater data, and access permission;
- Development of a site-specific Health and Safety Plan (HSP);
- Performance of private subsurface utility screening;
- Advancement of eight soil borings (SV-1 through SV-6, SB-7, and SB-8) to depths ranging from 10 to 15 feet bgs, with the collection of soil samples at 5-foot intervals from each boring;
- Installation of vapor probes at depths of 5 and 10 feet bgs in borings SV-1 through SV-6;
- Collection of twelve primary and one duplicate soil vapor sample;
- Analytical testing of soil and soil vapor; and
- Preparation of a report that documents field activities, analytical results, and summarizes the findings.

3.1 Pre Field Activities

3.1.1 Site Safety

SALEM completed a Site HSP for the work proposed at the subject property. A copy of the HSP was kept on-site during field activities. The HSP detailed the work to be performed, safety precautions, emergency response procedures, nearest hospital information, hospital route maps, emergency contact numbers, and onsite personnel responsible for managing emergency situations (intended to protect on-site workers and the public).

3.1.2 Permits

Permits for the soil borings were not required for this scope of work.

3.1.3 Utility Clearance and Geophysical Survey

The proposed soil boring locations were marked with white paint and Underground Service Alert (USA) was notified at least 48 hours before beginning field activities. USA notified its subscribed members, requesting them to mark their underground utility locations near marked boring locations as required by California State law.

On January 4, 2021 SALEM utilized GPRS of Modesto, California to conduct a private utility survey and locate potential buried fuel USTs of 500-gallon capacity or greater and associated appurtenances, or a backfilled UST cavity, as well as other sub-grade structures of environmental concern (hoists, clarifiers, and sumps). GPRS employed electromagnetic magnetic induction (EMI) and ground penetrating radar (GPR) investigation methods. The surface trace of detected features was marked on the ground with spray paint.

4.0 SOIL AND SOIL VAPOR INVESTIGATION METHODOLOGY

Field work for the soil sampling, nested vapor well installation, and soil vapor sampling was performed on January 7-8, 2021. Soil boring and vapor probe locations are shown on Figure 2.

Before arriving at the subject property, the drill rig, tools, and accessories were thoroughly decontaminated with a steam cleaner. Downhole drilling tools and sampling equipment, such as bits, rods, and sample barrels were manually washed/rinsed, pressure washed, and/or steam cleaned between borings and sample intervals at the designated decontamination area.

4.1 Soil Sampling and Soil Vapor Probe Installation Procedures

SALEM installed eight soil borings to depths ranging from 10 to 15 feet bgs depending on the feature being investigated. Borings SV-1, SV-3, and SV-6 were located near the former and suspect septic tank locations; SV-2 and SB-7 were located near the former UST pit in the southwest portion of the subject property; SV-4 and SV-5 were located near the former diesel and propane AST locations, respectively; and SB-8 was located adjacent to a ring of traffic bollards historically associated with the fire suppression system in the south portion of the subject property. The borings were advanced using an AMS Powerprobe™ direct-push rig operated by TEG of Northern California of Rancho Cordova, California. A 4-foot long Long-Bore Soil Sampler, lined with acetate sleeves, was attached to the bottom of the drive rod. Soil samples were continuously collected at each boring location and retained at 5-foot intervals for laboratory analysis. At each sample interval, the sampler was retrieved, and the acetate sleeve was removed. A portion of the acetate sleeve was cut away from the soil core, capped with Teflon sheets and rubber end caps, and labelled with the sample name, sample date and time, and sampler's initials. The samples were recorded on a chain-of-custody document, sealed in a zip-lock bag, and placed in cold storage pending submittal to Sierra Analytical Laboratory of Laguna Hills, California, for chemical analysis. A description of the soil was recorded on field boring logs in general accordance with the Unified Soil Classification System (USCS). Two soil samples from each boring location were analyzed for total petroleum hydrocarbons – carbon range analysis (TPH-CRA), VOCs and fuel oxygenates, and Title 22 metals using EPA Methods 8015B, 8260B, and 6010B/7471A, respectively.

Additionally, eight surface soil samples from the soil and asphalt debris stockpile located near the southern boundary of the subject property were collected and composited into two soil samples (SS-1 and SS-2). Each composite soil sample was analyzed for TPH-CRA, VOCs, Title 22 metals, PCBs, and SVOCs using EPA Methods 8015B, 8260B, 6010B/7471A, 8082A, and 8270C, respectively.

Soil analytical results are summarized in Tables 1 and 2. Laboratory analytical results and chain-of-custody documentation are provided in Appendix A.

Borings SV-1 through SV-6 were converted into dual-completion soil vapor sample points. Nested soil vapor probes were installed at depths of 5 and 10 feet bgs in each soil vapor sample location. A 1/8-inch diameter Nylaflow tube, attached to a sample port, was inserted into the open boring and set approximately 3 inches off the bottom. Number 3 washed aquarium sand was poured into the borehole until the sand extended from approximately 3 inches below and 3 inches above the slotted portion of the tube. Approximately 6 inches of fine bentonite crumble was placed in the hole as an annular seal and hydrated with water. Additional bentonite crumble was alternately placed in the hole and hydrated in intervals, to the ground surface. Each Nylaflow tube was labeled with the sample point identification and sample depth.

4.2 Soil Vapor Sampling

Soil vapor samples were collected from the soil vapor probes on January 7, 2021 by SALEM personnel. Soil vapor sample procedures were completed in accordance with the July 2015 Advisory, Active Soil Gas Investigations, published jointly by the Department of Toxic Substances Control (DTSC), California Environmental Protection Agency (CalEPA), and the Los Angeles and San Francisco Regional Water Quality Control Boards.

4.2.1 Shut-in Testing

Before purging and sampling of the soil vapor probes, a shut-in test was conducted on the sampling train to check for leaks in the above-ground fittings. The shut-in test was conducted by attaching the complete sample train assembly to the termination valve on the soil vapor probe. With the valve attached to the soil vapor probe in the "off" position, a plastic syringe was used to evacuate the sample train of air to a minimum measured vacuum of approximately 100 inches of water. The vacuum was observed using an in-line vacuum gauge which was positioned before the purge point. The vacuum gauge was observed for approximately 1 minute and all above ground connections were considered "air-tight" when the pressure on the gauge did not noticeably dissipate. Sampling did not commence until the above-ground fittings were deemed air-tight.

4.2.2 Leak Testing

Leak testing, using a liquid tracer, was performed on each individual soil vapor probe in order to test the integrity of the entire sampling system. Its purpose was to evaluate whether an adequate seal was established at the soil vapor probe interface with the ground surface, as well as a leak check of all above ground fittings to ensure that the samples collected are not being diluted by ambient air. The leak check compound isopropyl alcohol was used to evaluate sample integrity. The leak check compound was applied to a paper towel and kept in a closed plastic zip closure bag until it was ready to be used.

Before purging and sampling of the soil vapor probe, the zip closure bag was opened and placed directly at the point of entry of the soil vapor probe into the borehole. Additional saturated towels were also placed near the above-ground sample train connections to ensure there were no leaks in the fittings.

4.2.3 Soil Vapor Sample Collection and Analysis

A plastic syringe was used to purge each probe. The syringe was attached to a 3-way valve, which was then connected to the on/off valve on the soil vapor probe. This 3-way valve allows the sample train to be connected to one port on the valve, and the purge equipment to be attached to the other. This ensured that all of the sample train assembly being used for the collection of the sample was upstream of the purging device. Three purge volumes (calculated to include the sand pack, dry bentonite, and vapor tubing volume) were removed from probes that were able to provide a vapor response to ensure that ambient air from the sampling system was removed, and to demonstrate that samples collected were representative of subsurface conditions.

SALEM personnel practiced careful monitoring of purge volumes and flow rates. An air-tight 3-way valve was attached to the syringe that allowed the purge air to be drawn into the system and then evacuated out the syringe's side port. The syringe was attached to an in-line vacuum gauge so that probe vacuum could be monitored as the syringe drew in the purge vapor. The in-line vacuum gauge ensured that probe vacuum pressures were less than 100 inches of water during purging. During purging, the flow rate was timed so that it did not exceed 200 milliliters per minute. Please note that the syringe was used only for purging the soil vapor probes and was not used in the collection of the soil vapor samples.

Soil vapor samples were collected using appropriate gas-tight containers required for the specified analyses. The sample collection assemblies and containers were attached to the soil vapor probe via a 3-way valve before purging the device to avoid cross-contamination. SALEM utilized airtight calibrated Summa canisters to collect vapor samples from each probe. The Summa canister was attached via a luer lock connection to a 3-way valve, which allowed the sample to be drawn into the canister and then sealed off by rotating the valve. The canister was attached to the 3-way valve connected to the soil vapor probe on/off valve, and before the purging device. After purging of the soil vapor probe was complete, the valve was rotated so that the flow path of the soil vapor probe was diverted to the Summa canister. The valve on the Summa canister was opened slowly to allow the soil vapor to flow into the canister at a rate of 200 milliliters per minute or less. When the Summa canister was full, as indicated by a negative pressure gauge, the valve on the canister was closed and the canister was then disconnected and immediately placed into a storage container to prevent photo-degradation of the target analytes from direct sunlight.

For each sample, the sample name, date, and time of collection, vapor flow information and results of QA/QC inspections were recorded on field data sheets. Sample name, date, and time were recorded on a chain-of-custody document and transferred to the stationary laboratory for analysis.

Upon submittal to H&P's analytical laboratory, the samples were injected into a gas chromatograph/mass spectrometer (GC/MS) and analyzed for VOCs and fuel oxygenates using EPA Method 8260SV. Gasoline fuel additives, and solvents that may have been utilized during auto servicing operations, contain VOCs.

Laboratory analytical results for soil vapor samples are summarized in Table 3. Laboratory analytical results and chain-of-custody documentation are provided in Appendix A.

4.2.4 Vapor Probe Abandonment

The soil vapor probe tubing was pulled from each boring after the completion of soil vapor sampling activities. Each location was resurfaced to match existing grade.

5.0 FINDINGS

5.1 Geology and Hydrogeology

The subject property is located within the San Joaquin Valley. The San Joaquin Valley, which includes the Fresno area, is a topographic and structural basin that is bounded on the east by the Sierra Nevada and on the west by the Coast Ranges. The Sierra Nevada, a fault block dipping gently southwestward, is composed of igneous and metamorphic rocks of pre-Tertiary age that form the basement complex beneath the San Joaquin Valley. The Coast Ranges contain folded and faulted sedimentary rocks of Mesozoic and Cenozoic age, which are similar to those rocks that underlie the Valley at depth and non-conformably overlie the basement complex; gently dipping to nearly horizontal sedimentary rocks of Tertiary and Quaternary age overlie the older rocks. These younger rocks are mostly of continental origin and in the Fresno area they were derived from the Sierra Nevada. The Coast Ranges evolved as a result of folding, faulting and accretion of diverse geologic terrains. They are broken by numerous faults, the San Andreas Fault being the most notable feature.

The San Joaquin Valley represents the southern portion of the Central Valley of California, also referred to as the Great Valley geomorphic province. The most extensive geomorphic units in the province include dissected uplands, low alluvial plains and fans, river floodplains and channels, and overflow lands and lake bottoms. The valley represents the alluvial, flood, and delta plains of two major rivers (the Sacramento and San Joaquin rivers) and their tributaries. The high alluvial fans are the largest geomorphic features in the Fresno area. These fans lie from 10 to 90 feet above the channels of the present day rivers and are not subject to inundation by the rivers. The Merced area alluvial fans form part of a continuum of fans along the eastern margin of the San Joaquin Valley structural trough. The sediments are derived from the Sierra

Nevada to the east — most of the sediment is of probable glacial origin. The east side fans are formed by meandering or braided stream floodplain processes that contain more well-sorted, fine-grained material and have gentler slopes than the semiarid fans on the west side of the San Joaquin Valley. The east side fans have low relief with very gentle gradients.

According to RWQCB records for the Fresno Drum, Eastern Parcel facility, located at 733 South Hughes Avenue, approximately 0.65-mile south of the subject property, groundwater in the vicinity of the subject property was reported at a depth of approximately 65 to 80 feet bgs with a general direction of flow toward the northeast. However, local groundwater level and flow direction may vary due to seasonal fluctuations in precipitation, usage demands, geology, and/or surface topography.

5.2 Field Observations

At the time of SALEM's January 2021 Phase II ESA, the subject property observed to be vacant land mostly covered in asphalt and concrete with areas of grass and remnants of former landscaping.

Exposed surface soils did not exhibit obvious signs of discoloration at the subject property. No additional obvious evidence (fill pipes, dispensers, etc.) of USTs was noted within the area observed. No standing water or major depressions were observed on the subject property. Two areas exhibited patched/cut concrete and asphalt.

The geophysical survey conducted on January 4, 2021 identified the suspected former UST pit. The pit displayed a different soil density compared to the surrounding areas and the surface area of this location displayed patched/cut concrete and asphalt. Additionally, two of the three suspected septic systems were positively identified. No other anomalies indicative of potential buried fuel USTs and associated appurtenances, additional backfilled UST cavities, or other sub-grade structures of environmental concern (hoists, clarifiers, and sumps) were identified during the performance of the geophysical survey.

Soil boring locations are shown on Figure 2. Generally, soil types consisted of light brown, well sorted, medium- to fine-grained sand (SP) to approximately 10 feet bgs, underlain by brown silt with sparse very fine-grained sand (ML) to the maximum depth drilled of 15 feet bgs. Drilling refusal was met at a depth of 7 feet bgs at location SB-8 near the fire suppression equipment in the south portion of the subject property, a subsurface manmade feature is the suspected cause; however, due to the absence of apparent contamination the area was not investigated further.

5.3 Analytical Results

Soil analytical results are summarized in Tables 1 and 2, and soil vapor analytical results are summarized in Table 3. Copies of the laboratory reports and chain-of-custody documentation are included in Appendix A.

5.3.1 Soil Analytical Results

Laboratory analytical results for soil were as follows:

- TPH was identified above laboratory method detection limits as diesel (TPHd, carbon range C10-C24) at concentrations ranging from 6.6 mg/kg to 24 mg/kg. Additional TPH detected was consistent with mostly oil range hydrocarbons (TPHo) at concentrations ranging from 5.8 mg/kg to 360 mg/kg.
- PCBs were not identified above laboratory method detection limits in the analyzed soil samples.
- VOCs were not identified above laboratory method detection limits in the analyzed soil samples.
- SVOCs detected included: benzo(a)anthracene at concentrations ranging from 0.41 to 0.49 mg/kg; chrysene at concentrations ranging from below laboratory detection limits (0.33 mg/kg) to 0.38

mg/kg; fluoranthene at concentrations ranging from below laboratory detection limits (0.33 mg/kg) to 0.49 mg/kg; phenanthrene at concentrations ranging from below laboratory detection limits (0.33 mg/kg) to 0.57 mg/kg; and pyrene at concentrations ranging from below laboratory detection limits (0.33 mg/kg) to 1.3 mg/kg.

- Title 22/CAM 17 metals detected included: arsenic at concentrations ranging from below laboratory detection limits (4.0 mg/kg) to 45 mg/kg; barium at concentrations ranging from 22 to 110 mg/kg; cobalt at concentrations ranging from 2.2 to 13 mg/kg; chromium at concentrations ranging from 5.3 to 36 mg/kg; copper at concentrations ranging from below laboratory detection limits (9.0 mg/kg) to 120 mg/kg; nickel at concentrations ranging from 5.8 to 42 mg/kg; lead at concentrations ranging from below laboratory detection limits (3.1 mg/kg) to 12 mg/kg; vanadium at concentrations ranging from 8.4 to 38 mg/kg; and zinc at concentrations ranging from 9.3 to 38 mg/kg.

5.3.2 Soil Vapor Analytical Results

Laboratory analytical results for soil vapor were as follows:

- VOCs were not identified above laboratory method detection limits in soil vapor samples.
- The sampling tracer compound isopropyl alcohol was not detected above laboratory method detection limits in any of the samples.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The following data summary is based on a review of field and laboratory data obtained during SALEM's January 7 and 8, 2020 investigation at the subject property:

- According to RWQCB records for the Fresno Drum, Eastern Parcel facility, located at 733 South Hughes Avenue, approximately 0.65-mile south of the subject property, groundwater in the vicinity of the subject property was reported at a depth of approximately 65 to 80 feet bgs with a general direction of flow toward the northeast. However, local groundwater level and flow direction may vary due to seasonal fluctuations in precipitation, usage demands, geology, and/or surface topography. Groundwater was not encountered during the course of this investigation.

- A geophysical survey was conducted on January 4, 2021 which identified the suspected former UST pit. The pit displayed a different soil density compared to the surrounding areas and the surface area of this location displayed patched/cut concrete and asphalt. Additionally, two of the three suspected septic systems were positively identified. No other anomalies indicative of potential buried fuel USTs and associated appurtenances, additional backfilled UST cavities, or other sub-grade structures of environmental concern (hoists, clarifiers, and sumps) were identified during the performance of the geophysical survey.

- SALEM installed eight soil borings (SV-1 through SV-6, SB-7, and SB-8) to depths ranging from 10 to 15 feet bgs. Borings SV-1 through SV-6 were completed converted to dual-completion soil vapor sample points with probes at 5 and 10 feet bgs. Borings SV-1, SV-3, and SV-6 were located near the former and suspect septic tank locations; SV-2 and SB-7 were located near the former UST pit in the southwest portion of the subject property; SV-4 and SV-5 were located near the former diesel and propane AST locations, respectively; and SB-8 was located adjacent to a ring of traffic bollards historically associated with the fire suppression system in the south portion of the subject property.

- Generally, soil types consisted of light brown, well sorted, medium- to fine-grained sand (SP), to approximately 10 feet bgs, underlain by brown silt with sparse very fine-grained sand (ML) to the maximum depth drilled of 15 feet bgs. Drilling refusal was met at a depth of 7 feet bgs at location SB-8 near the fire suppression equipment in the south portion of the subject property, a subsurface manmade feature is the suspected cause; however, due to the absence of apparent contamination the area was not investigated further.

- TPH was identified above laboratory method detection limits in 16 of the 18 soil samples analyzed. TPH as diesel (TPHd, carbon range C10-C24) was identified at concentrations ranging from 6.6 mg/kg to 24 mg/kg. Additional TPH detected was consistent with mostly oil range hydrocarbons (TPHo) at concentrations ranging from 5.8 mg/kg to 360 mg/kg. TPH concentrations were below their respective established RWQCB-SF Commercial/Industrial ESLs set at 260 mg/kg for TPHd and 1,600 mg/kg for TPHo.

- VOCs and PCBs were not identified above laboratory method detection limits in any of the soil samples analyzed. Data suggests that VOCs and PCBs are not COPCs in soil at the subject property.

- SVOCs detected in the composite soil samples collected from the soil stockpile located in the south portion of the subject property consisted of benzo(a)anthracene (0.41 to 0.49 mg/kg), chrysene (0.38 mg/kg), fluoranthene (0.49 mg/kg), phenanthrene (0.57 mg/kg), and pyrene 1.3 mg/kg). All detected concentrations of SVOCs were below their respective RWQCB-SF Commercial/Industrial ESLs.

- Arsenic was detected in soil samples collected at 5 feet bgs at SV-4 (11 mg/kg), SB-7 (14 mg/kg), and SB-8 (45 mg/kg). These values exceed the RWQCB-SF Commercial/Industrial ESL set at 0.31 mg/kg for cancer risk and appear to be slightly elevated in comparison to arsenic concentrations in Fresno County (1.8 to 6.0 mg/kg) and to regional arsenic concentrations in the San Joaquin Valley (Wilson, et al, 1990) that range from 0.8 to 20 mg/kg.

- Additional Title 22 metals detected included barium, cobalt, chromium, copper, nickel, lead, vanadium, and zinc at concentrations below their respective established RWQCB-SF Commercial/Industrial ESLs. No other Title 22/CAM 17 metals were detected above laboratory detection limits.

- VOCs were not identified above laboratory method detection limits in any of the soil vapor samples.

Based on these results, SALEM believes that no additional assessment activities are required. The subject property is suitable for unrestricted use and no engineering controls (i.e. VOC vapor barrier) are required. In the event the subject property will undergo any redevelopment which would include soil disturbance, SALEM recommends that an SMP be prepared to address soil management procedures that may arise based on historical use of the subject property and the known TPH and arsenic impacts.

7.0 LIMITATIONS

This Phase II ESA Report has been prepared for the exclusive use of Scannell Properties and its affiliates. Unauthorized use of or reliance on the information contained in this report, unless given express written consent by SALEM, is strictly prohibited.

The purpose of an environmental site assessment is to reasonably evaluate the potential for adverse impact from past practices at a given property or neighboring properties. In performing an environmental site assessment, it is understood that a balance must be struck between a reasonable inquiry into the environmental issues and an exhaustive analysis of each conceivable issue of potential concern. The professional opinions in this report are based in part on the interpretation of data from discrete sampling locations that may not represent conditions at locations not sampled.

The property owners are solely responsible for notifying all governmental agencies and the public of the existence, release, or disposal of any hazardous materials/wastes or petroleum products at the subject property, whether before, during, or after the performance of SALEM's services. SALEM assumes neither responsibility nor liability for any claim, loss of property value, damage, or injury which results from hazardous materials, wastes or petroleum products being present or encountered at a given site.

8.0 REFERENCES

The following list summarizes the references utilized in preparing this report:

- Department of Toxic Substances Control and Regional Water Quality Control Board, *Soil Gas Advisory*, July 2015.
- California Regional Water Quality Control Board, *Environmental Screening Levels Table*, January 2019.
- SALEM Engineering Group, Inc., *Phase I Environmental Site Assessment, Former California Compress Facility, 2740 West Nielson Avenue, Fresno, California*, January 29, 2021.
- USEPA Region 9, November 2020. *Regional Screening Levels (RSL) Summary Table*.
- Wilson, S.A., Kennedy, K.A., Gent, C.A., Briggs, P.H., Tidball, R.R., and McNeal, J.M., 1990, *Analysis of Soil Samples From the San Joaquin Valley of California, US Geological Survey Open File Report 90-214.*

If you have any questions, or if we can be of further assistance, please do not hesitate to contact our office at (559) 271-9700.

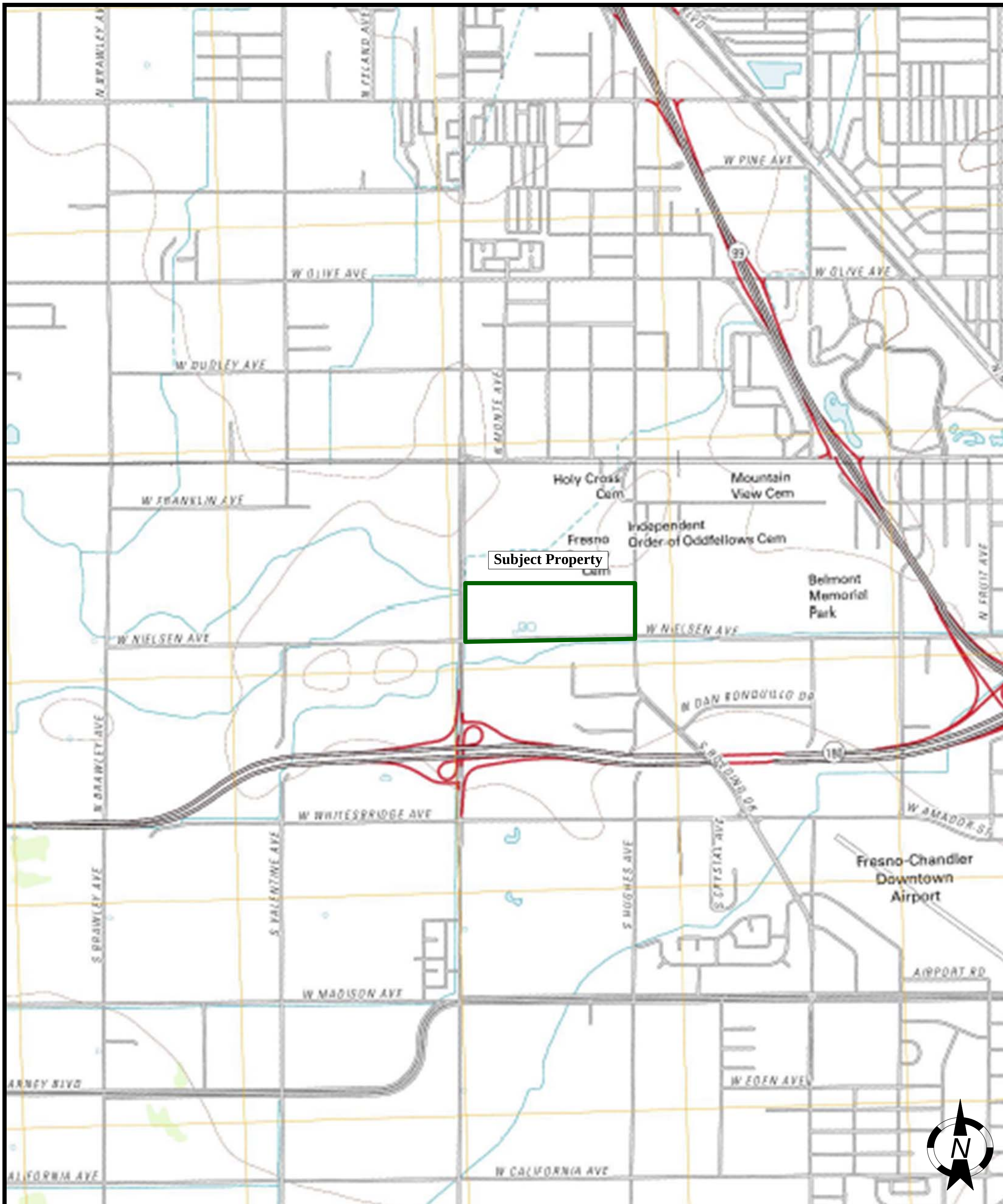
Respectfully submitted,

SALEM Engineering Group, Inc.

Shannon Lodge, PG, QSD
Senior Project Manager

James S. Robert, L.G., L.H.G.
Senior Hydrogeologist

Figures

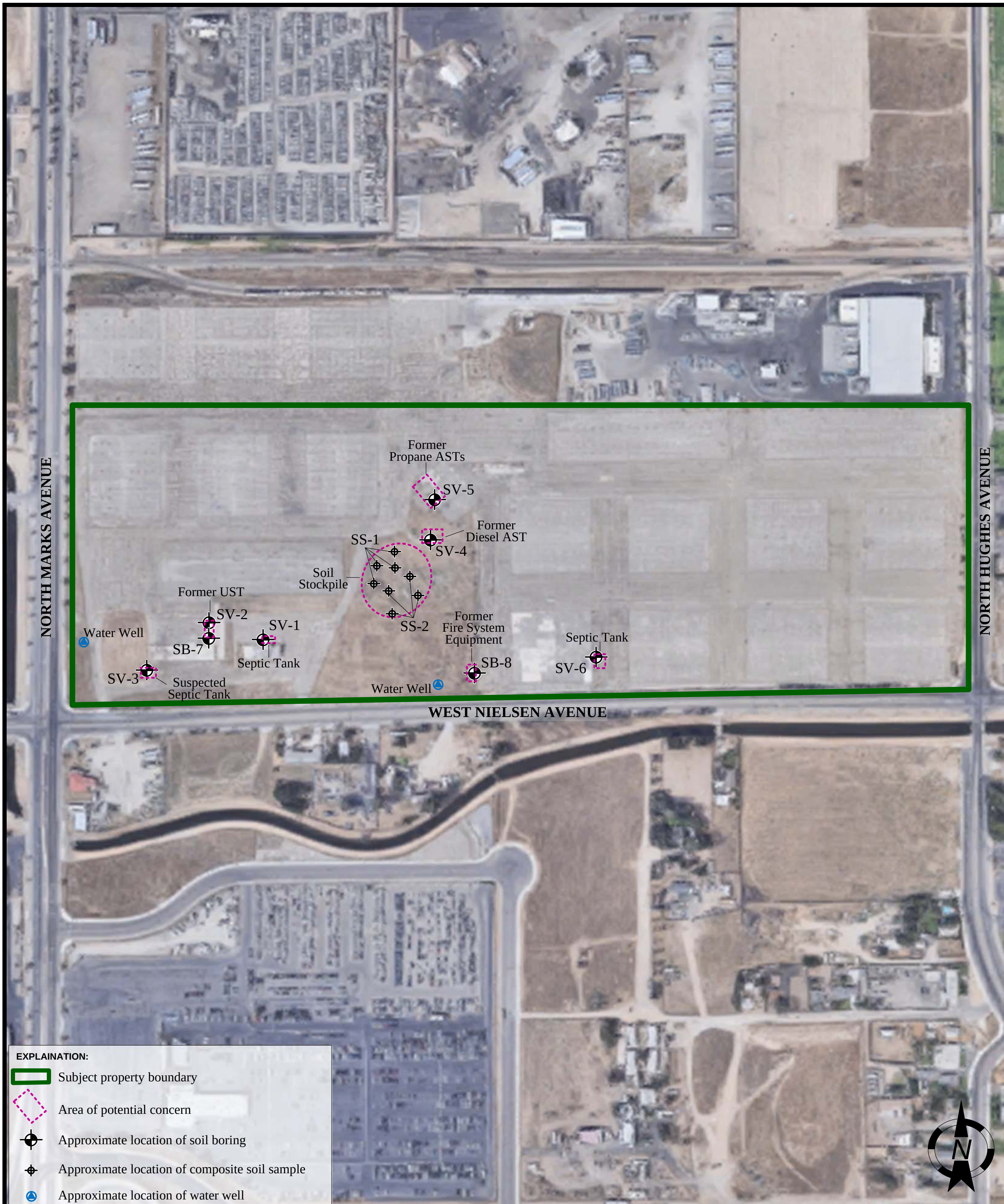


SITE LOCATION

SCALE:	DATE:
NTS	Feb. 2021
DRAWN BY:	**APPROVED BY:**
BR	SL
PROJECT NO.:	**FIGURE NO.:**
1-420-1016	1

FORMER CALIFORNIA COMPRESS FACILITY
2740 WEST NIELSEN AVENUE
FRESNO, CALIFORNIA

SALEM engineering group, inc.



SITE MAP WITH SAMPLE LOCATIONS	SCALE: NTS	DATE: fEB. 2021	SALEM engineering group, inc.
FORMER CALIFORNIA COMPRESS FACILITY 2740 WEST NIELSEN AVENUE FRESNO, CALIFORNIA	DRAWN BY: BR	APPROVED BY: SL	
	PROJECT NO.: 1-420-1016	FIGURE NO.: 2	

Tables

TABLE 1
SOIL DATA, TPH-CRA AND VOCS
Former California Compress Facility
2740 West Nielson Avenue

Soil Sampling Date	Soil Sample Identification	TPH-CRA by EPA Method 8015B (mg/kg)	PCBs by EPA Method 8015B (mg/kg)	VOCs by EPA Method 8260B (µg/kg)	Benzo (a) anthracene by EPA Method 8270C (mg/kg)	Chrysene by EPA Method 8270C (mg/kg)	Fluoranthene by EPA Method 8270C (mg/kg)	Phenanthrene by EPA Method 8270C (mg/kg)	Pyrene by EPA Method 8270C (mg/kg)	SVOCs* by EPA Method 8270C (mg/kg)
CRWQCB Commercial/Industrial Environmental Screening Level		Diesel Fuel 260 mg/kg; Motor Oil 1,600 mg/kg	Varies	Varies	200 mg/kg	2,100 mg/kg	30,000 mg/kg	NE	23,000	Varies
1/7/2021	SS-1	9.8; 360	ND (0.050)	ND (5.0)	0.41	0.38	0.49	0.57	1.3	ND (5.0)
1/7/2021	SS-2	8.1; 78	ND (0.050)	ND (5.0)	0.49	ND (0.33)	ND (0.33)	ND (0.33)	ND (0.33)	ND (5.0)
1/7/2021	SV-1 @5'	24; 38	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/7/2021	SV-1 @15'	ND (5.0)	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-2 @10'	9.5; 10	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-2 @15'	ND (5.0)	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-3 @5'	7.6; 5.8	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-3 @15'	7.4; 6.6	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-4 @5'	8.2; 6.2	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-4 @10'	6.6; ND (5.0)	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-5 @5'	10; 8.9	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-5 @10'	8.6; ND (5.0)	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-6 @5'	10; 8.6	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SV-6 @15'	19; 16	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SB-7 @5'	11; 6.2	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SB-7 @10'	13; 12	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SB-8 @410'	6.6; 11	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)
1/8/2021	SB-8 @7'	7.7; ND (5.0)	NA	ND (5.0)	NA	NA	NA	NA	NA	ND (5.0)

@#' = depth of sample collection in feet below ground surface
µg/kg = micrograms per kilogram
mg/kg = milligrams per kilogram
NE = Not established
ND = not identified above stated method detection limit
TPH-CRA = Total Petroleum Hydrocarbons - Carbon Range Analysis
; = reported as: Diesel Range Organics; TPH
PCBs = Polychlorinated Biphenyls
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
* = all other SVOCs not otherwise listed
RWQCB-SF = San Francisco Regional Water Quality Control Board
ESL = Environmental Screening Level

TABLE 2
SOIL DATA, TITLE 22 METALS*
Former California Compress Facility
2740 West Nielson Avenue
Fresno, California

Date Sampled	Sample Collection Point	Arsenic (mg/kg)	Barium (mg/kg)	Cobalt (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Nickel (mg/kg)	Lead (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
1/7/2021	SS-1	ND (4.0)	52	5.2	12	120	12	12	19	39
1/7/2021	SS-2	ND (4.0)	53	4.7	13	14	15	7.7	18	29
1/7/2021	SV-1 @5'	ND (4.0)	22	2.3	6.1	ND (9.0)	5.8	ND (3.1)	8.7	9.9
1/7/2021	SV-1 @10'	ND (4.0)	82	8.2	21	16	26	ND (3.1)	27	29
1/8/2021	SV-2 @10'	ND (4.0)	36	3.6	9.0	ND (9.0)	12	ND (3.1)	13	12
1/8/2021	SV-2 @15'	ND (4.0)	78	7.2	16	16	10	4.3	32	29
1/8/2021	SV-3 @5'	ND (4.0)	24	2.2	5.3	ND (9.0)	5.6	ND (3.1)	8.4	9.3
1/8/2021	SV-3 @15'	ND (4.0)	29	2.8	6.5	ND (9.0)	5.1	ND (3.1)	14	11
1/8/2021	SV-4 @5'	**11**	25	2.4	6.4	ND (9.0)	6.0	ND (3.1)	9.7	9.3
1/8/2021	SV-4 @10'	ND (4.0)	110	11	21	16	23	ND (3.1)	33	35
1/8/2021	SV-5 @5'	ND (4.0)	43	4.9	12	ND (9.0)	14	ND (3.1)	16	17
1/8/2021	SV-5 @10'	ND (4.0)	110	11	31	20	35	ND (3.1)	38	37
1/8/2021	SV-6 @5'	ND (4.0)	78	8.2	23	15	18	ND (3.1)	31	30
1/8/2021	SV-6 @15'	ND (4.0)	32	3.3	10	ND (9.0)	9.2	ND (3.1)	17	13
1/8/2021	SB-7 @5'	**14**	33	3.2	8.4	ND (9.0)	10	ND (3.1)	10	13
1/8/2021	SB-7 @10'	ND (4.0)	84	9.6	24	16	32	ND (3.1)	28	30
1/8/2021	SB-8 @5'	**45**	100	8.8	22	14	24	3.9	31	39
1/8/2021	SB-8 @7'	ND (4.0)	100	13	36	19	42	ND (3.1)	37	38
RWQCB-SF Commercial/Industrial ESL:		0.31	220,000	350	1,800,000	47,000	11,000	320	5,800	350,000

* = metals not listed were ND
@#' = depth of sample collection in feet below ground surface
mg/kg = milligrams per kilogram
ND = not detected above analytical method detection limit
(#) = analytical method detection limit
BOLD = concentration exceeds ESL
RWQCB-SF = San Francisco Regional Water Quality Control Board
ESL = Environmental Screening Level

TABLE 3

SOIL VAPOR QUALITY DATA
Former California Compress Facility
2740 West Nielson Avenue
Fresno, California

Date Sampled	Sample Collection Point	Volatile Organic Compounds
1/7/21	SV-1 @5'	ND
1/7/21	SV-1 @10'	ND
1/7/21	SV-2 @5'	ND
1/7/21	SV-2 @10' DUP	ND
1/7/21	SV-2 @10' DUP	ND
1/7/21	SV-3 @5'	ND
1/7/21	SV-3 @10'	ND
1/7/21	SV-4 @5'	ND
1/7/21	SV-4 @10'	ND
1/7/21	SV-5 @5'	ND
1/7/21	SV-5 @10'	ND
1/7/21	SV-6 @5'	ND
1/7/21	SV-6 @10'	ND
RWQCB-SF Commercial/Industrial Soil Vapor ESL		Varies

All samples analyzed by EPA Method 8260SV by gas chromatograph/mass spectrometer
µg/L = micrograms per liter air
ND = not detected above analytical method detection limit
DUP = duplicate sample
RWQCB-SF = San Francisco Regional Water Quality Control Board
ESL= Environmental Screening Level

APPENDIX

A

22 January 2021

Shannon Lodge
SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno, CA 93722

RE:Former Fresno Compress

Work Order No.: 2101114

Attached are the results of the analyses for samples received by the laboratory on 01/11/21 10:30.

The samples were received by Sierra Analytical Labs, Inc. with a chain of custody record attached or completed at the submittal of the samples.

The analyses were performed according to the prescribed method as outlined by EPA, Standard Methods, and A.S.T.M.

The remaining portions of the samples will be disposed of within 30 days from the date of this report.
If you require any additional retaining time, please advise us.

Sincerely,

Richard K. Forsyth

Laboratory Director

SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SS-1	2101114-01	Soil	01/07/21 10:45	01/11/21 10:30
SS-2	2101114-02	Soil	01/07/21 10:50	01/11/21 10:30
SV-1@5	2101114-03	Soil	01/07/21 08:25	01/11/21 10:30
SV-1@10	2101114-04	Soil	01/07/21 08:40	01/11/21 10:30
SV-2@10	2101114-05	Soil	01/08/21 08:15	01/11/21 10:30
SV-2@15	2101114-06	Soil	01/08/21 08:20	01/11/21 10:30
SV-3@5	2101114-07	Soil	01/08/21 08:55	01/11/21 10:30
SV-3@10	2101114-08	Soil	01/08/21 09:00	01/11/21 10:30
SV-4@5	2101114-09	Soil	01/08/21 09:15	01/11/21 10:30
SV-4@10	2101114-10	Soil	01/08/21 09:20	01/11/21 10:30
SV-5@5'	2101114-11	Soil	01/08/21 09:35	01/11/21 10:30
SV-5@10'	2101114-12	Soil	01/08/21 09:40	01/11/21 10:30
SV-6@5'	2101114-13	Soil	01/08/21 10:00	01/11/21 10:30
SV-6@15'	2101114-14	Soil	01/08/21 10:05	01/11/21 10:30
SV-7@5'	2101114-15	Soil	01/08/21 08:30	01/11/21 10:30
SV-7@10'	2101114-16	Soil	01/08/21 08:35	01/11/21 10:30
SV-8@4'	2101114-17	Soil	01/08/21 10:20	01/11/21 10:30
SV-8@7'	2101114-18	Soil	01/08/21 10:25	01/11/21 10:30

CASE NARRATIVE

SAMPLE RECEIPT:	Samples were received intact, at 6 °C, and accompanied by chain of custody documentation.
PRESERVATION:	Samples requiring preservation were verified prior to sample preparation and analysis.
HOLDING TIMES:	All holding times were met, unless otherwise noted in the report with data qualifiers.
QA/QC CRITERIA:	All quality objective criteria were met, except as noted in the report with data qualifiers.

26052 Merit Circle Suite 104, Laguna Hills, California 92653
Telephone: (949) 348-9389 Fax: (949) 348-9115
E-Mail: sierralabs @ sierralabs.net

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**52**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**5.2**	0.80	"	"	"	"	"	"	
Chromium	**12**	1.2	"	"	"	"	"	"	
Copper	**120**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**12**	3.4	"	"	"	"	"	"	
Lead	**12**	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**19**	3.9	"	"	"	"	"	"	
Zinc	**39**	2.0	"	"	"	"	"	"	
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**53**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**4.7**	0.80	"	"	"	"	"	"	
Chromium	**13**	1.2	"	"	"	"	"	"	
Copper	**14**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**15**	3.4	"	"	"	"	"	"	
Lead	**7.7**	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**18**	3.9	"	"	"	"	"	"	
Zinc	**29**	2.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

SV-1@5 (2101114-03) Soil Sampled: 01/07/21 08:25 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**22**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**2.3**	0.80	"	"	"	"	"	"	
Chromium	**6.1**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**5.8**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**8.7**	3.9	"	"	"	"	"	"	
Zinc	**9.9**	2.0	"	"	"	"	"	"	

SV-1@10 (2101114-04) Soil Sampled: 01/07/21 08:40 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**82**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**8.2**	0.80	"	"	"	"	"	"	
Chromium	**21**	1.2	"	"	"	"	"	"	
Copper	**16**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**26**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**27**	3.9	"	"	"	"	"	"	
Zinc	**29**	2.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

SV-2@10 (2101114-05) Soil   Sampled: 01/08/21 08:15   Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**36**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**3.6**	0.80	"	"	"	"	"	"	
Chromium	**9.0**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.20	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**12**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**13**	3.9	"	"	"	"	"	"	
Zinc	**12**	2.0	"	"	"	"	"	"	

SV-2@15 (2101114-06) Soil   Sampled: 01/08/21 08:20   Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**78**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**7.2**	0.80	"	"	"	"	"	"	
Chromium	**16**	1.2	"	"	"	"	"	"	
Copper	**16**	9.0	"	"	"	"	"	"	
Mercury	ND	0.20	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**10**	3.4	"	"	"	"	"	"	
Lead	**4.3**	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**32**	3.9	"	"	"	"	"	"	
Zinc	**29**	2.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	Reported:
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-3@5 (2101114-07) Soil Sampled: 01/08/21 08:55 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**24**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**2.2**	0.80	"	"	"	"	"	"	
Chromium	**5.3**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**5.6**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**8.4**	3.9	"	"	"	"	"	"	
Zinc	**9.3**	2.0	"	"	"	"	"	"	
SV-3@10 (2101114-08) Soil Sampled: 01/08/21 09:00 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**29**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**2.8**	0.80	"	"	"	"	"	"	
Chromium	**6.5**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**5.1**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**14**	3.9	"	"	"	"	"	"	
Zinc	**11**	2.0	"	"	"	"	"	"	

SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-4@5 (2101114-09) Soil Sampled: 01/08/21 09:15 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	**11**	4.0	"	"	"	"	"	"	
Barium	**25**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**2.4**	0.80	"	"	"	"	"	"	
Chromium	**6.4**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**6.0**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**9.7**	3.9	"	"	"	"	"	"	
Zinc	**9.3**	2.0	"	"	"	"	"	"	
SV-4@10 (2101114-10) Soil Sampled: 01/08/21 09:20 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**110**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**11**	0.80	"	"	"	"	"	"	
Chromium	**21**	1.2	"	"	"	"	"	"	
Copper	**16**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**23**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**33**	3.9	"	"	"	"	"	"	
Zinc	**35**	2.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-5@5' (2101114-11) Soil Sampled: 01/08/21 09:35 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**43**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**4.9**	0.80	"	"	"	"	"	"	
Chromium	**12**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**14**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**16**	3.9	"	"	"	"	"	"	
Zinc	**17**	2.0	"	"	"	"	"	"	
SV-5@10' (2101114-12) Soil Sampled: 01/08/21 09:40 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**110**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**11**	0.80	"	"	"	"	"	"	
Chromium	**31**	1.2	"	"	"	"	"	"	
Copper	**20**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**35**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**38**	3.9	"	"	"	"	"	"	
Zinc	**37**	2.0	"	"	"	"	"	"	

SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@5' (2101114-13) Soil Sampled: 01/08/21 10:00 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**78**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**8.2**	0.80	"	"	"	"	"	"	
Chromium	**23**	1.2	"	"	"	"	"	"	
Copper	**15**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**18**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**31**	3.9	"	"	"	"	"	"	
Zinc	**30**	2.0	"	"	"	"	"	"	
SV-6@15' (2101114-14) Soil Sampled: 01/08/21 10:05 Received: 01/11/21 10:30									
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**32**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**3.3**	0.80	"	"	"	"	"	"	
Chromium	**10**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**9.2**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**17**	3.9	"	"	"	"	"	"	
Zinc	**13**	2.0	"	"	"	"	"	"	

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

SV-7@5' (2101114-15) Soil Sampled: 01/08/21 08:30 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	**14**	4.0	"	"	"	"	"	"	
Barium	**33**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**3.2**	0.80	"	"	"	"	"	"	
Chromium	**8.4**	1.2	"	"	"	"	"	"	
Copper	ND	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**10**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**10**	3.9	"	"	"	"	"	"	
Zinc	**13**	2.0	"	"	"	"	"	"	

SV-7@10' (2101114-16) Soil Sampled: 01/08/21 08:35 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**84**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**9.6**	0.80	"	"	"	"	"	"	
Chromium	**24**	1.2	"	"	"	"	"	"	
Copper	**16**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**32**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**28**	3.9	"	"	"	"	"	"	
Zinc	**30**	2.0	"	"	"	"	"	"	

SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-8@4' (2101114-17) Soil	**Sampled: 01/08/21 10:20**	**Received: 01/11/21 10:30**							
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	**45**	4.0	"	"	"	"	"	"	
Barium	**100**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**8.8**	0.80	"	"	"	"	"	"	
Chromium	**22**	1.2	"	"	"	"	"	"	
Copper	**14**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**24**	3.4	"	"	"	"	"	"	
Lead	**3.9**	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**31**	3.9	"	"	"	"	"	"	
Zinc	**39**	2.0	"	"	"	"	"	"	
SV-8@7' (2101114-18) Soil	**Sampled: 01/08/21 10:25**	**Received: 01/11/21 10:30**							
Silver	ND	1.0	mg/kg	1	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Arsenic	ND	4.0	"	"	"	"	"	"	
Barium	**100**	1.0	"	"	"	"	"	"	
Beryllium	ND	1.2	"	"	"	"	"	"	
Cadmium	ND	1.7	"	"	"	"	"	"	
Cobalt	**13**	0.80	"	"	"	"	"	"	
Chromium	**36**	1.2	"	"	"	"	"	"	
Copper	**19**	9.0	"	"	"	"	"	"	
Mercury	ND	0.23	"	"	B1A1213	01/12/21	01/12/21 14:07	EPA 7471A	
Molybdenum	ND	1.0	"	"	B1A1211	01/12/21	01/12/21 19:36	EPA 6010B	
Nickel	**42**	3.4	"	"	"	"	"	"	
Lead	ND	3.1	"	"	"	"	"	"	
Antimony	ND	9.0	"	"	"	"	"	"	
Selenium	ND	6.2	"	"	"	"	"	"	
Thallium	ND	4.0	"	"	"	"	"	"	
Vanadium	**37**	3.9	"	"	"	"	"	"	
Zinc	**38**	2.0	"	"	"	"	"	"	

SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*107 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	ND	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	**1.2**	1.0	"	"	"	"	"	"	
C18 <= HC < C20	**4.8**	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**7.7**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	**90**	1.0	"	"	"	"	"	"	
C28 <= HC < C32	**130**	1.0	"	"	"	"	"	"	
HC >= C32	**130**	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**360**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**9.8**	5.0	"	"	"	"	"	"	
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*151 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	ND	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	**2.9**	1.0	"	"	"	"	"	"	
C18 <= HC < C20	**2.8**	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.1**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	**12**	1.0	"	"	"	"	"	"	
C28 <= HC < C32	**29**	1.0	"	"	"	"	"	"	
HC >= C32	**30**	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**78**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**8.1**	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-1@5 (2101114-03) Soil Sampled: 01/07/21 08:25 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*108 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	**1.8**	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.6**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**2.8**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**2.9**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	**1.2**	1.0	"	"	"	"	"	"	
C18 <= HC < C20	**1.3**	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**12**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	**3.7**	1.0	"	"	"	"	"	"	
HC >= C32	**9.6**	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**38**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**24**	5.0	"	"	"	"	"	"	
SV-1@10 (2101114-04) Soil Sampled: 01/07/21 08:40 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*77.8 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	ND	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	ND	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

SV-2@10 (2101114-05) Soil Sampled: 01/08/21 08:15 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*79.7 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	**1.1**	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.1**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**2.1**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.3**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**3.0**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**9.5**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**10**	5.0	"	"	"	"	"	"	

SV-2@15 (2101114-06) Soil Sampled: 01/08/21 08:20 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: o-Terphenyl		*73.2 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	ND	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	ND	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-3@5 (2101114-07) Soil Sampled: 01/08/21 08:55 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*97.0 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.5**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.3**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**3.0**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**5.8**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**7.6**	5.0	"	"	"	"	"	"	
SV-3@10 (2101114-08) Soil Sampled: 01/08/21 09:00 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*86.5 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	**1.1**	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.6**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**1.2**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.0**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.7**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**6.6**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**7.4**	5.0	"	"	"	"	"	"	

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Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-4@5 (2101114-09) Soil Sampled: 01/08/21 09:15 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*73.1 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.2**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**2.1**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.9**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**6.2**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**8.2**	5.0	"	"	"	"	"	"	
SV-4@10 (2101114-10) Soil Sampled: 01/08/21 09:20 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*61.8 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	**1.8**	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.3**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.2**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**6.6**	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-5@5' (2101114-11) Soil Sampled: 01/08/21 09:35 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*118 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.8**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**2.3**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.4**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**3.5**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**8.9**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**10**	5.0	"	"	"	"	"	"	
SV-5@10' (2101114-12) Soil Sampled: 01/08/21 09:40 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*83.1 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.0**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**1.7**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**2.1**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**8.6**	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@5' (2101114-13) Soil Sampled: 01/08/21 10:00 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*64.0 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	**1.1**	1.0	"	"	"	"	"	"	
C9 <= HC < C10	**1.1**	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.3**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**3.2**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.0**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**8.6**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**10**	5.0	"	"	"	"	"	"	
SV-6@15' (2101114-14) Soil Sampled: 01/08/21 10:05 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*107 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**3.8**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**3.4**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**2.9**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**6.0**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**16**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**19**	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-7@5' (2101114-15) Soil Sampled: 01/08/21 08:30 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*89.9 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**2.6**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**2.5**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.8**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**1.9**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**6.2**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**11**	5.0	"	"	"	"	"	"	
SV-7@10' (2101114-16) Soil Sampled: 01/08/21 08:35 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*73.0 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.7**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	**1.7**	1.0	"	"	"	"	"	"	
C14 <= HC < C16	**1.4**	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	**1.0**	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**5.8**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**12**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**13**	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	Reported: 01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-8@4' (2101114-17) Soil Sampled: 01/08/21 10:20 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*77.3 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	**1.0**	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	**3.3**	1.0	"	"	"	"	"	"	
C24 <= HC < C28	**2.8**	1.0	"	"	"	"	"	"	
C28 <= HC < C32	**2.1**	1.0	"	"	"	"	"	"	
HC >= C32	**1.9**	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	**11**	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**6.6**	5.0	"	"	"	"	"	"	
SV-8@7' (2101114-18) Soil Sampled: 01/08/21 10:25 Received: 01/11/21 10:30									
Surrogate: o-Terphenyl		*78.9 %*	*60-175*		*B1A1808*	*01/18/21*	*01/18/21 14:45*	*EPA 8015B*	
HC < C8	ND	1.0	"	"	"	"	"	"	
C8 <= HC < C9	ND	1.0	"	"	"	"	"	"	
C9 <= HC < C10	ND	1.0	"	"	"	"	"	"	
C10 <= HC < C11	ND	1.0	"	"	"	"	"	"	
C11 <= HC < C12	ND	1.0	"	"	"	"	"	"	
C12 <= HC < C14	ND	1.0	"	"	"	"	"	"	
C14 <= HC < C16	ND	1.0	"	"	"	"	"	"	
C16 <= HC < C18	ND	1.0	"	"	"	"	"	"	
C18 <= HC < C20	ND	1.0	"	"	"	"	"	"	
C20 <= HC < C24	ND	1.0	"	"	"	"	"	"	
C24 <= HC < C28	ND	1.0	"	"	"	"	"	"	
C28 <= HC < C32	ND	1.0	"	"	"	"	"	"	
HC >= C32	ND	1.0	"	"	"	"	"	"	
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"	"	"	"	"	"	
Diesel Range Organics (C10-C24)	**7.7**	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Polychlorinated Biphenyls by EPA Method 8082

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30									
Surrogate: Decachlorobiphenyl		*59.2 %*	*42-147*		*B1A1406*	*01/11/21*	*01/15/21 08:21*	*EPA 8082*	
Surrogate: Tetrachloro-meta-xylene		*65.1 %*	*42-147*		"	"	"	"	
PCB-1016	ND	0.050	"	"	"	"	"	"	
PCB-1221	ND	0.050	"	"	"	"	"	"	
PCB-1232	ND	0.050	"	"	"	"	"	"	
PCB-1242	ND	0.050	"	"	"	"	"	"	
PCB-1248	ND	0.050	"	"	"	"	"	"	
PCB-1254	ND	0.050	"	"	"	"	"	"	
PCB-1260	ND	0.050	"	"	"	"	"	"	
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Surrogate: Decachlorobiphenyl		*55.1 %*	*42-147*		*B1A1406*	*01/11/21*	*01/15/21 08:21*	*EPA 8082*	
Surrogate: Tetrachloro-meta-xylene		*103 %*	*42-147*		"	"	"	"	
PCB-1016	ND	0.050	"	"	"	"	"	"	
PCB-1221	ND	0.050	"	"	"	"	"	"	
PCB-1232	ND	0.050	"	"	"	"	"	"	
PCB-1242	ND	0.050	"	"	"	"	"	"	
PCB-1248	ND	0.050	"	"	"	"	"	"	
PCB-1254	ND	0.050	"	"	"	"	"	"	
PCB-1260	ND	0.050	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*96.8 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 11:47*	*EPA 8260B*	
Surrogate: Toluene-d8		*87.0 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*94.1 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 11:47	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	Reported: 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*109 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*87.4 %*	*81-117*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*94.0 %*	*74-121*		"	"	"	"	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-1@5 (2101114-03) Soil Sampled: 01/07/21 08:25 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*104 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*91.9 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*90.7 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-1@5 (2101114-03) Soil Sampled: 01/07/21 08:25 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-1@10 (2101114-04) Soil Sampled: 01/07/21 08:40 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*110 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*91.3 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*89.0 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-1@10 (2101114-04) Soil	**Sampled: 01/07/21 08:40**	**Received: 01/11/21 10:30**							
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-2@10 (2101114-05) Soil Sampled: 01/08/21 08:15 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*99.2 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*84.4 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*88.6 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-2@10 (2101114-05) Soil Sampled: 01/08/21 08:15 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-2@15 (2101114-06) Soil	**Sampled: 01/08/21 08:20**	**Received: 01/11/21 10:30**							
Surrogate: Dibromofluoromethane		*99.0 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*89.3 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*105 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-2@15 (2101114-06) Soil	**Sampled: 01/08/21 08:20**	**Received: 01/11/21 10:30**							
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-3@5 (2101114-07) Soil Sampled: 01/08/21 08:55 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*96.7 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*92.6 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*102 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-3@5 (2101114-07) Soil Sampled: 01/08/21 08:55 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-3@10 (2101114-08) Soil	**Sampled: 01/08/21 09:00**	**Received: 01/11/21 10:30**							
Surrogate: Dibromofluoromethane		*115 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*90.0 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*104 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported: 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-3@10 (2101114-08) Soil Sampled: 01/08/21 09:00 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-4@5 (2101114-09) Soil Sampled: 01/08/21 09:15 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*109 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*96.5 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*104 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-4@5 (2101114-09) Soil Sampled: 01/08/21 09:15 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-4@10 (2101114-10) Soil Sampled: 01/08/21 09:20 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*120 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*98.9 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*102 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-4@10 (2101114-10) Soil	**Sampled: 01/08/21 09:20**	**Received: 01/11/21 10:30**							
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported: 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-5@5' (2101114-11) Soil Sampled: 01/08/21 09:35 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*113 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*96.6 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*100 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-5@5' (2101114-11) Soil Sampled: 01/08/21 09:35 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-5@10' (2101114-12) Soil Sampled: 01/08/21 09:40 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*114 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*88.0 %*	*81-117*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*107 %*	*74-121*		"	"	"	"	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-5@10' (2101114-12) Soil Sampled: 01/08/21 09:40 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported: 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@5' (2101114-13) Soil Sampled: 01/08/21 10:00 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*104 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*85.5 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*87.4 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@5' (2101114-13) Soil	**Sampled: 01/08/21 10:00**	**Received: 01/11/21 10:30**							
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@15' (2101114-14) Soil Sampled: 01/08/21 10:05 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*106 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*91.0 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*88.7 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-6@15' (2101114-14) Soil Sampled: 01/08/21 10:05 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-7@5' (2101114-15) Soil Sampled: 01/08/21 08:30 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*102 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*103 %*	*81-117*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*90.7 %*	*74-121*		"	"	"	"	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-7@5' (2101114-15) Soil Sampled: 01/08/21 08:30 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-7@10' (2101114-16) Soil Sampled: 01/08/21 08:35 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Surrogate: Dibromofluoromethane		*94.8 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*87.4 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*89.4 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported: 01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-7@10' (2101114-16) Soil Sampled: 01/08/21 08:35 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-8@4' (2101114-17) Soil Sampled: 01/08/21 10:20 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*114 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*86.3 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*87.8 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-8@4' (2101114-17) Soil Sampled: 01/08/21 10:20 Received: 01/11/21 10:30									
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SV-8@7' (2101114-18) Soil Sampled: 01/08/21 10:25 Received: 01/11/21 10:30									
Surrogate: Dibromofluoromethane		*108 %*	*80-120*		*B1A1404*	*01/14/21*	*01/14/21 12:25*	*EPA 8260B*	
Surrogate: Toluene-d8		*92.7 %*	*81-117*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*89.3 %*	*74-121*		*"*	*"*	*"*	*"*	
Benzene	ND	5.0	"	"	"	"	"	"	
Bromobenzene	ND	5.0	"	"	"	"	"	"	
Bromochloromethane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
n-Butylbenzene	ND	5.0	"	"	"	"	"	"	
sec-Butylbenzene	ND	5.0	"	"	"	"	"	"	
tert-Butylbenzene	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
Chloromethane	ND	5.0	"	"	"	"	"	"	
2-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
4-Chlorotoluene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	5.0	"	"	"	"	"	"	
Dibromomethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
Dichlorodifluoromethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,3-Dichloropropane	ND	5.0	"	"	"	"	"	"	
2,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
1,1-Dichloropropene	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
Di-isopropyl ether	ND	5.0	"	"	"	"	"	"	
Ethyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress		
4729 West Jacquelyn Avenue	Project Number: 1-420-1016		Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge		01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B

Sierra Analytical Labs, Inc.

SV-8@7' (2101114-18) Soil Sampled: 01/08/21 10:25 Received: 01/11/21 10:30

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Ethylbenzene	ND	5.0	µg/kg	1	B1A1404	01/14/21	01/14/21 12:25	EPA 8260B	
Hexachlorobutadiene	ND	5.0	"	"	"	"	"	"	
Isopropylbenzene	ND	5.0	"	"	"	"	"	"	
p-Isopropyltoluene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
n-Propylbenzene	ND	5.0	"	"	"	"	"	"	
Styrene	ND	5.0	"	"	"	"	"	"	
Tert-amyl methyl ether	ND	5.0	"	"	"	"	"	"	
Tert-butyl alcohol	ND	25	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Toluene	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	5.0	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	5.0	"	"	"	"	"	"	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
m,p-Xylene	ND	5.0	"	"	"	"	"	"	
o-Xylene	ND	5.0	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30									
Surrogate: 2-Fluorophenol		*116 %*	*25-121*		*B1A1405*	*01/14/21*	*01/14/21 09:42*	*EPA 8270C*	
Surrogate: Phenol-d6		*53.7 %*	*24-113*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*56.3 %*	*23-120*		"	"	"	"	
Surrogate: 2-Fluorobiphenyl		*44.6 %*	*30-115*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*60.3 %*	*19-122*		"	"	"	"	
Surrogate: Terphenyl-d14		*93.9 %*	*18-137*		"	"	"	"	
Acenaphthene	ND	0.33	"	"	"	"	"	"	
Acenaphthylene	ND	0.33	"	"	"	"	"	"	
Anthracene	ND	0.33	"	"	"	"	"	"	
Benzidine	ND	0.33	"	"	"	"	"	"	
Benzo (a) anthracene	**0.41**	0.33	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.33	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.33	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.33	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	0.33	"	"	"	"	"	"	
Benzyl alcohol	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.33	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.33	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.33	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.33	"	"	"	"	"	"	
4-Chloroaniline	ND	0.33	"	"	"	"	"	"	
2-Chlorophenol	ND	0.33	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.33	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.33	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.33	"	"	"	"	"	"	
Chrysene	**0.38**	0.33	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.33	"	"	"	"	"	"	
Dibenzofuran	ND	0.33	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.33	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.33	"	"	"	"	"	"	
Diethyl phthalate	ND	0.33	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.33	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.33	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.33	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.33	"	"	"	"	"	"	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-1 (2101114-01) Soil Sampled: 01/07/21 10:45 Received: 01/11/21 10:30									
4,6-Dinitro-2-methylphenol	ND	0.33	mg/kg	1	B1A1405	01/14/21	01/14/21 09:42	EPA 8270C	
2,4-Dinitrotoluene	ND	0.33	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	0.33	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.33	"	"	"	"	"	"	
1,2-Diphenylhydrazine	ND	0.33	"	"	"	"	"	"	
Fluoranthene	**0.49**	0.33	"	"	"	"	"	"	
Fluorene	ND	0.33	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.33	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.33	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.33	"	"	"	"	"	"	
Hexachloroethane	ND	0.33	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.33	"	"	"	"	"	"	
Isophorone	ND	0.33	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.33	"	"	"	"	"	"	
2-Methylphenol	ND	0.33	"	"	"	"	"	"	
4-Methylphenol	ND	0.33	"	"	"	"	"	"	
Naphthalene	ND	0.33	"	"	"	"	"	"	
2-Nitroaniline	ND	0.33	"	"	"	"	"	"	
3-Nitroaniline	ND	0.33	"	"	"	"	"	"	
4-Nitroaniline	ND	0.33	"	"	"	"	"	"	
Nitrobenzene	ND	0.33	"	"	"	"	"	"	
2-Nitrophenol	ND	0.33	"	"	"	"	"	"	
4-Nitrophenol	ND	0.33	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.33	"	"	"	"	"	"	
Diphenylamine	ND	0.33	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.33	"	"	"	"	"	"	
Pentachlorophenol	ND	0.33	"	"	"	"	"	"	
Phenanthrene	**0.57**	0.33	"	"	"	"	"	"	
Phenol	ND	0.33	"	"	"	"	"	"	
Pyrene	**1.3**	0.33	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.33	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	0.33	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.33	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
Surrogate: 2-Fluorophenol		*55.7 %*	*25-121*		*B1A1405*	*01/14/21*	*01/14/21 10:22*	*EPA 8270C*	
Surrogate: Phenol-d6		*55.5 %*	*24-113*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*29.1 %*	*23-120*		"	"	"	"	
Surrogate: 2-Fluorobiphenyl		*57.7 %*	*30-115*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*56.3 %*	*19-122*		"	"	"	"	
Surrogate: Terphenyl-d14		*46.3 %*	*18-137*		"	"	"	"	
Acenaphthene	ND	0.33	"	"	"	"	"	"	
Acenaphthylene	ND	0.33	"	"	"	"	"	"	
Anthracene	ND	0.33	"	"	"	"	"	"	
Benzidine	ND	0.33	"	"	"	"	"	"	
Benzo (a) anthracene	ND	0.33	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	0.33	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	0.33	"	"	"	"	"	"	
Benzo (a) pyrene	ND	0.33	"	"	"	"	"	"	
Benzo (g,h,i) perylene	ND	0.33	"	"	"	"	"	"	
Benzyl alcohol	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroethyl)ether	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroethoxy)methane	ND	0.33	"	"	"	"	"	"	
Bis(2-ethylhexyl)phthalate	ND	0.33	"	"	"	"	"	"	
Bis(2-chloroisopropyl)ether	ND	0.33	"	"	"	"	"	"	
4-Bromophenyl phenyl ether	ND	0.33	"	"	"	"	"	"	
Butyl benzyl phthalate	ND	0.33	"	"	"	"	"	"	
4-Chloroaniline	ND	0.33	"	"	"	"	"	"	
2-Chlorophenol	ND	0.33	"	"	"	"	"	"	
4-Chloro-3-methylphenol	ND	0.33	"	"	"	"	"	"	
2-Chloronaphthalene	ND	0.33	"	"	"	"	"	"	
4-Chlorophenyl phenyl ether	ND	0.33	"	"	"	"	"	"	
Chrysene	ND	0.33	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	0.33	"	"	"	"	"	"	
Dibenzofuran	ND	0.33	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.33	"	"	"	"	"	"	
3,3´-Dichlorobenzidine	ND	0.33	"	"	"	"	"	"	
2,4-Dichlorophenol	ND	0.33	"	"	"	"	"	"	
Diethyl phthalate	ND	0.33	"	"	"	"	"	"	
2,4-Dimethylphenol	ND	0.33	"	"	"	"	"	"	
Dimethyl phthalate	ND	0.33	"	"	"	"	"	"	
Di-n-butyl phthalate	ND	0.33	"	"	"	"	"	"	
2,4-Dinitrophenol	ND	0.33	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
SS-2 (2101114-02) Soil Sampled: 01/07/21 10:50 Received: 01/11/21 10:30									
4,6-Dinitro-2-methylphenol	ND	0.33	mg/kg	1	B1A1405	01/14/21	01/14/21 10:22	EPA 8270C	
2,4-Dinitrotoluene	ND	0.33	"	"	"	"	"	"	
2,6-Dinitrotoluene	ND	0.33	"	"	"	"	"	"	
Di-n-octyl phthalate	ND	0.33	"	"	"	"	"	"	
1,2-Diphenylhydrazine	ND	0.33	"	"	"	"	"	"	
Fluoranthene	ND	0.33	"	"	"	"	"	"	
Fluorene	ND	0.33	"	"	"	"	"	"	
Hexachlorobenzene	ND	0.33	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.33	"	"	"	"	"	"	
Hexachlorocyclopentadiene	ND	0.33	"	"	"	"	"	"	
Hexachloroethane	ND	0.33	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	0.33	"	"	"	"	"	"	
Isophorone	ND	0.33	"	"	"	"	"	"	
2-Methylnaphthalene	ND	0.33	"	"	"	"	"	"	
2-Methylphenol	ND	0.33	"	"	"	"	"	"	
4-Methylphenol	ND	0.33	"	"	"	"	"	"	
Naphthalene	ND	0.33	"	"	"	"	"	"	
2-Nitroaniline	ND	0.33	"	"	"	"	"	"	
3-Nitroaniline	ND	0.33	"	"	"	"	"	"	
4-Nitroaniline	ND	0.33	"	"	"	"	"	"	
Nitrobenzene	ND	0.33	"	"	"	"	"	"	
2-Nitrophenol	ND	0.33	"	"	"	"	"	"	
4-Nitrophenol	ND	0.33	"	"	"	"	"	"	
N-Nitrosodimethylamine	ND	0.33	"	"	"	"	"	"	
Diphenylamine	ND	0.33	"	"	"	"	"	"	
N-Nitrosodi-n-propylamine	ND	0.33	"	"	"	"	"	"	
Pentachlorophenol	ND	0.33	"	"	"	"	"	"	
Phenanthrene	ND	0.33	"	"	"	"	"	"	
Phenol	ND	0.33	"	"	"	"	"	"	
Pyrene	ND	0.33	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.33	"	"	"	"	"	"	
2,4,5-Trichlorophenol	ND	0.33	"	"	"	"	"	"	
2,4,6-Trichlorophenol	ND	0.33	"	"	"	"	"	"	

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1211 - EPA 3050B										
Blank (B1A1211-BLK1)				Prepared & Analyzed: 01/12/21						
Cadmium	ND	1.7	mg/kg							
Silver	ND	1.0	"							
Nickel	ND	3.4	"							
Copper	ND	9.0	"							
Lead	ND	3.1	"							
Antimony	ND	9.0	"							
Cobalt	ND	0.80	"							
Chromium	ND	1.2	"							
Selenium	ND	6.2	"							
Molybdenum	ND	1.0	"							
Thallium	ND	4.0	"							
Beryllium	ND	1.2	"							
Vanadium	ND	3.9	"							
Barium	ND	1.0	"							
Zinc	ND	2.0	"							
Arsenic	ND	4.0	"							
LCS (B1A1211-BS1)				Prepared & Analyzed: 01/12/21						
Beryllium	107	1.2	mg/kg	100		107	80-120			
Barium	105	1.0	"	100		105	80-120			
Cobalt	106	0.80	"	100		106	80-120			
Chromium	105	1.2	"	100		105	80-120			
Arsenic	95.4	4.0	"	100		95.4	78-122			
Copper	105	9.0	"	100		105	78-122			
Silver	100	1.0	"	100		100	60-140			
Cadmium	103	1.7	"	100		103	80-120			
Selenium	98.2	6.2	"	100		98.2	76-124			
Nickel	102	3.4	"	100		102	80-120			
Zinc	106	2.0	"	100		106	80-120			
Lead	92.3	3.1	"	100		92.3	80-120			
Antimony	104	9.0	"	100		104	75-125			
Vanadium	102	3.9	"	100		102	80-120			
Molybdenum	94.0	1.0	"	100		94.0	80-120			
Thallium	95.9	4.0	"	100		95.9	80-120			

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Metals by EPA 6000/7000 Series Methods - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1211 - EPA 3050B										
LCS Dup (B1A1211-BSD1)				Prepared & Analyzed: 01/12/21						
Zinc	104	2.0	mg/kg	100		104	80-120	2.52	20	
Silver	97.4	1.0	"	100		97.4	60-140	2.76	40	
Vanadium	100	3.9	"	100		100	80-120	1.26	20	
Arsenic	98.7	4.0	"	100		98.7	78-122	3.32	20	
Thallium	105	4.0	"	100		105	80-120	9.23	20	
Barium	105	1.0	"	100		105	80-120	0.310	20	
Copper	107	9.0	"	100		107	78-122	1.67	20	
Beryllium	107	1.2	"	100		107	80-120	0.257	20	
Antimony	107	9.0	"	100		107	75-125	3.27	20	
Cadmium	102	1.7	"	100		102	80-120	0.878	20	
Lead	96.3	3.1	"	100		96.3	80-120	4.22	20	
Cobalt	106	0.80	"	100		106	80-120	0.0942	20	
Chromium	107	1.2	"	100		107	80-120	1.91	20	
Nickel	103	3.4	"	100		103	80-120	0.730	20	
Molybdenum	97.2	1.0	"	100		97.2	80-120	3.29	20	
Selenium	99.7	6.2	"	100		99.7	76-124	1.49	20	
Matrix Spike (B1A1211-MS1)	**Source: 2101114-01**			Prepared & Analyzed: 01/12/21						
Barium	174	1.0	mg/kg	99.2	51.7	123	70-130			
Silver	93.3	1.0	"	99.2	ND	94.1	60-140			
Arsenic	107	4.0	"	99.2	1.86	106	70-130			
Beryllium	104	1.2	"	99.2	ND	104	70-130			
Cadmium	101	1.7	"	99.2	ND	102	70-130			
Cobalt	108	0.80	"	99.2	5.16	104	70-130			
Chromium	117	1.2	"	99.2	11.6	106	70-130			
Copper	237	9.0	"	99.2	117	121	70-130			
Molybdenum	92.7	1.0	"	99.2	0.855	92.6	70-130			
Nickel	114	3.4	"	99.2	11.8	103	70-130			
Lead	113	3.1	"	99.2	12.1	102	70-130			
Antimony	105	9.0	"	99.2	ND	105	60-140			
Selenium	104	6.2	"	99.2	0.635	104	70-130			
Thallium	100	4.0	"	99.2	ND	101	70-130			
Vanadium	120	3.9	"	99.2	19.2	101	70-130			
Zinc	152	2.0	"	99.2	39.4	114	70-130			

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	Reported:
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Metals by EPA 6000/7000 Series Methods - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1211 - EPA 3050B										
Matrix Spike Dup (B1A1211-MSD1)		**Source: 2101114-01**		Prepared & Analyzed: 01/12/21						
Cadmium	104	1.7	mg/kg	99.3	ND	105	70-130	2.78	20	
Vanadium	122	3.9	"	99.3	19.2	104	70-130	2.17	20	
Chromium	120	1.2	"	99.3	11.6	109	70-130	2.07	20	
Zinc	155	2.0	"	99.3	39.4	116	70-130	1.83	20	
Arsenic	108	4.0	"	99.3	1.86	107	70-130	1.14	20	
Thallium	98.7	4.0	"	99.3	ND	99.4	70-130	1.42	20	
Copper	239	9.0	"	99.3	117	123	70-130	0.841	30	
Antimony	105	9.0	"	99.3	ND	106	60-140	0.856	20	
Nickel	116	3.4	"	99.3	11.8	105	70-130	1.41	20	
Silver	90.7	1.0	"	99.3	ND	91.3	60-140	2.89	40	
Lead	114	3.1	"	99.3	12.1	103	70-130	1.08	30	
Beryllium	106	1.2	"	99.3	ND	107	70-130	2.44	20	
Cobalt	110	0.80	"	99.3	5.16	106	70-130	1.71	20	
Barium	178	1.0	"	99.3	51.7	127	70-130	1.89	20	
Selenium	105	6.2	"	99.3	0.635	105	70-130	0.718	20	
Molybdenum	94.5	1.0	"	99.3	0.855	94.3	70-130	1.96	20	
Batch B1A1213 - EPA 7471A										
Blank (B1A1213-BLK1)				Prepared & Analyzed: 01/12/21						
Mercury	ND	0.23	mg/kg							
LCS (B1A1213-BS1)				Prepared & Analyzed: 01/12/21						
Mercury	0.17	0.23	mg/kg	0.167		99.9	70-130			
Matrix Spike (B1A1213-MS1)		**Source: 2101114-01**		Prepared & Analyzed: 01/12/21						
Mercury	0.19	0.23	mg/kg	0.158	0.03	96.3	70-130			

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Metals by EPA 6000/7000 Series Methods - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1213 - EPA 7471A										
Matrix Spike Dup (B1A1213-MSD1)		**Source: 2101114-01**		Prepared & Analyzed: 01/12/21						
Mercury	0.19	0.23	mg/kg	0.161	0.03	99.5	70-130	4.50	30	

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Total Petroleum Hydrocarbons Carbon Range Analysis by GC-FID - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1808 - EPA 3550B Solid Ext										
Blank (B1A1808-BLK1)				Prepared & Analyzed: 01/18/21						
Surrogate: o-Terphenyl	*2.85*		*mg/kg*	*2.50*		*114*	*60-175*			
HC < C8	ND	1.0	"							
C8 <= HC < C9	ND	1.0	"							
C9 <= HC < C10	ND	1.0	"							
C10 <= HC < C11	ND	1.0	"							
C11 <= HC < C12	ND	1.0	"							
C12 <= HC < C14	ND	1.0	"							
C14 <= HC < C16	ND	1.0	"							
C16 <= HC < C18	ND	1.0	"							
C18 <= HC < C20	ND	1.0	"							
C20 <= HC < C24	ND	1.0	"							
C24 <= HC < C28	ND	1.0	"							
C28 <= HC < C32	ND	1.0	"							
HC >= C32	ND	1.0	"							
Total Petroleum Hydrocarbons (C7-C36)	ND	5.0	"							
Diesel Range Organics (C10-C24)	ND	5.0	"							
LCS (B1A1808-BS1)				Prepared & Analyzed: 01/18/21						
Diesel Range Organics (C10-C24)	17.9	5.0	mg/kg	20.0		89.5	80-120			
Matrix Spike (B1A1808-MS1)		**Source: 2101114-06**		Prepared & Analyzed: 01/18/21						
Diesel Range Organics (C10-C24)	22.2	5.0	mg/kg	20.0	ND	111	50-150			
Matrix Spike Dup (B1A1808-MSD1)		**Source: 2101114-06**		Prepared & Analyzed: 01/18/21						
Diesel Range Organics (C10-C24)	20.4	5.0	mg/kg	20.0	ND	102	50-150	8.41	30	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Polychlorinated Biphenyls by EPA Method 8082 - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1406 - EPA 3550B Solid Ext										
Blank (B1A1406-BLK1)				Prepared: 01/11/21	Analyzed: 01/15/21					
Surrogate: Decachlorobiphenyl	*ND*		*mg/kg*	*0.00833*		*53.4*	*42-147*			
Surrogate: Tetrachloro-meta-xylene	*ND*		*"*	*0.00833*		*48.8*	*42-147*			
PCB-1016	ND	0.050	"							
PCB-1221	ND	0.050	"							
PCB-1232	ND	0.050	"							
PCB-1242	ND	0.050	"							
PCB-1248	ND	0.050	"							
PCB-1254	ND	0.050	"							
PCB-1260	ND	0.050	"							
LCS (B1A1406-BS1)				Prepared: 01/11/21	Analyzed: 01/15/21					
Surrogate: Decachlorobiphenyl	*0.00833*		*mg/kg*	*0.00833*		*100*	*42-147*			
Surrogate: Tetrachloro-meta-xylene	*0.00833*		*"*	*0.00833*		*100*	*42-147*			
PCB-1260	0.0536	0.050	"	0.0667		80.3	80-120			
Matrix Spike (B1A1406-MS1)		**Source: 2101023-01**		Prepared: 01/11/21	Analyzed: 01/15/21					
Surrogate: Decachlorobiphenyl	*0.00833*		*mg/kg*	*0.00833*		*100*	*42-147*			
Surrogate: Tetrachloro-meta-xylene	*0.00833*		*"*	*0.00833*		*100*	*42-147*			
PCB-1260	0.0662	0.050	"	0.0667	ND	99.3	50-150			
Matrix Spike Dup (B1A1406-MSD1)		**Source: 2101023-01**		Prepared: 01/11/21	Analyzed: 01/15/21					
Surrogate: Decachlorobiphenyl	*0.00833*		*mg/kg*	*0.00833*		*100*	*42-147*			
Surrogate: Tetrachloro-meta-xylene	*0.00833*		*"*	*0.00833*		*100*	*42-147*			
PCB-1260	0.0715	0.050	"	0.0667	ND	107	50-150	7.71	30	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1404 - EPA 5035 P & T										
Blank (B1A1404-BLK1)				Prepared & Analyzed: 01/14/21						
Surrogate: Dibromofluoromethane	*52.7*		*µg/kg*	*50.0*		*105*	*80-120*			
Surrogate: Toluene-d8	*42.0*		*"*	*50.0*		*84.0*	*81-117*			
Surrogate: 4-Bromofluorobenzene	*46.4*		*"*	*50.0*		*92.9*	*74-121*			
Benzene	ND	5.0	"							
Bromobenzene	ND	5.0	"							
Bromochloromethane	ND	5.0	"							
Bromodichloromethane	ND	5.0	"							
Bromoform	ND	5.0	"							
Bromomethane	ND	5.0	"							
n-Butylbenzene	ND	5.0	"							
sec-Butylbenzene	ND	5.0	"							
tert-Butylbenzene	ND	5.0	"							
Carbon tetrachloride	ND	5.0	"							
Chlorobenzene	ND	5.0	"							
Chloroethane	ND	5.0	"							
Chloroform	ND	5.0	"							
Chloromethane	ND	5.0	"							
2-Chlorotoluene	ND	5.0	"							
4-Chlorotoluene	ND	5.0	"							
Dibromochloromethane	ND	5.0	"							
1,2-Dibromo-3-chloropropane	ND	5.0	"							
1,2-Dibromoethane (EDB)	ND	5.0	"							
Dibromomethane	ND	5.0	"							
1,2-Dichlorobenzene	ND	5.0	"							
1,3-Dichlorobenzene	ND	5.0	"							
1,4-Dichlorobenzene	ND	5.0	"							
Dichlorodifluoromethane	ND	5.0	"							
1,1-Dichloroethane	ND	5.0	"							
1,2-Dichloroethane	ND	5.0	"							
1,1-Dichloroethene	ND	5.0	"							
cis-1,2-Dichloroethene	ND	5.0	"							
trans-1,2-Dichloroethene	ND	5.0	"							
1,2-Dichloropropane	ND	5.0	"							
1,3-Dichloropropane	ND	5.0	"							
2,2-Dichloropropane	ND	5.0	"							
1,1-Dichloropropene	ND	5.0	"							
cis-1,3-Dichloropropene	ND	5.0	"							

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SALEM Engineering Group - Fresno	Project:	Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number:	1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager:	Shannon Lodge	01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1404 - EPA 5035 P & T										
Blank (B1A1404-BLK1)				Prepared & Analyzed: 01/14/21						
trans-1,3-Dichloropropene	ND	5.0	µg/kg							
Di-isopropyl ether	ND	5.0	"							
Ethyl tert-butyl ether	ND	5.0	"							
Ethylbenzene	ND	5.0	"							
Hexachlorobutadiene	ND	5.0	"							
Isopropylbenzene	ND	5.0	"							
p-Isopropyltoluene	ND	5.0	"							
Methylene chloride	ND	5.0	"							
Methyl tert-butyl ether	ND	5.0	"							
Naphthalene	ND	5.0	"							
n-Propylbenzene	ND	5.0	"							
Styrene	ND	5.0	"							
Tert-amyl methyl ether	ND	5.0	"							
Tert-butyl alcohol	ND	25	"							
1,1,1,2-Tetrachloroethane	ND	5.0	"							
1,1,2,2-Tetrachloroethane	ND	5.0	"							
Tetrachloroethene	ND	5.0	"							
Toluene	ND	5.0	"							
1,2,3-Trichlorobenzene	ND	5.0	"							
1,2,4-Trichlorobenzene	ND	5.0	"							
1,1,1-Trichloroethane	ND	5.0	"							
1,1,2-Trichloroethane	ND	5.0	"							
Trichloroethene	ND	5.0	"							
Trichlorofluoromethane	ND	5.0	"							
1,2,3-Trichloropropane	ND	5.0	"							
1,2,4-Trimethylbenzene	ND	5.0	"							
1,3,5-Trimethylbenzene	ND	5.0	"							
Vinyl chloride	ND	5.0	"							
m,p-Xylene	ND	5.0	"							
o-Xylene	ND	5.0	"							

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Volatile Organics & Fuel Oxygenates (GC/MS) by EPA Method 8260B - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1404 - EPA 5035 P & T										
LCS (B1A1404-BS1)				Prepared & Analyzed: 01/14/21						
Surrogate: Dibromofluoromethane	*50.0*		*µg/kg*	*50.0*		*100*	*80-120*			
Surrogate: Toluene-d8	*50.0*		*"*	*50.0*		*100*	*81-117*			
Surrogate: 4-Bromofluorobenzene	*50.0*		*"*	*50.0*		*100*	*74-121*			
Benzene	52.2	5.0	"	50.0		104	80-120			
Chlorobenzene	47.4	5.0	"	50.0		94.8	80-120			
1,1-Dichloroethene	48.5	5.0	"	50.0		97.0	80-120			
Toluene	48.6	5.0	"	50.0		97.1	80-120			
Trichloroethene	53.4	5.0	"	50.0		107	80-120			
Matrix Spike (B1A1404-MS1)	**Source: 2101114-01**			Prepared & Analyzed: 01/14/21						
Surrogate: Dibromofluoromethane	*50.0*		*µg/kg*	*50.0*		*100*	*80-120*			
Surrogate: Toluene-d8	*50.0*		*"*	*50.0*		*100*	*81-117*			
Surrogate: 4-Bromofluorobenzene	*50.0*		*"*	*50.0*		*100*	*74-121*			
Benzene	49.8	5.0	"	50.0	ND	99.6	37-151			
Chlorobenzene	42.8	5.0	"	50.0	ND	85.6	37-160			
1,1-Dichloroethene	48.6	5.0	"	50.0	ND	97.1	50-150			
Toluene	59.3	5.0	"	50.0	ND	119	47-150			
Trichloroethene	49.1	5.0	"	50.0	ND	98.2	71-157			
Matrix Spike Dup (B1A1404-MSD1)	**Source: 2101114-01**			Prepared & Analyzed: 01/14/21						
Surrogate: Dibromofluoromethane	*50.0*		*µg/kg*	*50.0*		*100*	*80-120*			
Surrogate: Toluene-d8	*50.0*		*"*	*50.0*		*100*	*81-117*			
Surrogate: 4-Bromofluorobenzene	*50.0*		*"*	*50.0*		*100*	*74-121*			
Benzene	53.8	5.0	"	50.0	ND	108	37-151	7.67	30	
Chlorobenzene	43.0	5.0	"	50.0	ND	86.1	37-160	0.559	30	
1,1-Dichloroethene	52.1	5.0	"	50.0	ND	104	50-150	7.11	30	
Toluene	61.5	5.0	"	50.0	ND	123	47-150	3.71	30	
Trichloroethene	48.2	5.0	"	50.0	ND	96.5	71-157	1.75	30	

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SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	**Reported:** 01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sierra Analytical Labs, Inc.

Batch B1A1405 - EPA 3550B Solid Ext

Blank (B1A1405-BLK1) Prepared & Analyzed: 01/14/21

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Surrogate: 2-Fluorophenol	*0.283*		*mg/kg*	*0.500*		*56.5*	*25-121*			
Surrogate: Phenol-d6	*0.232*		*"*	*0.500*		*46.5*	*24-113*			
Surrogate: Nitrobenzene-d5	*0.267*		*"*	*0.500*		*53.4*	*23-120*			
Surrogate: 2-Fluorobiphenyl	*0.227*		*"*	*0.500*		*45.5*	*30-115*			
Surrogate: 2,4,6-Tribromophenol	*0.188*		*"*	*0.500*		*37.6*	*19-122*			
Surrogate: Terphenyl-d14	*0.215*		*"*	*0.500*		*42.9*	*18-137*			
Acenaphthene	ND	0.33	"							
Acenaphthylene	ND	0.33	"							
Anthracene	ND	0.33	"							
Benzidine	ND	0.33	"							
Benzo (a) anthracene	ND	0.33	"							
Benzo (b) fluoranthene	ND	0.33	"							
Benzo (k) fluoranthene	ND	0.33	"							
Benzo (a) pyrene	ND	0.33	"							
Benzo (g,h,i) perylene	ND	0.33	"							
Benzyl alcohol	ND	0.33	"							
Bis(2-chloroethyl)ether	ND	0.33	"							
Bis(2-chloroethoxy)methane	ND	0.33	"							
Bis(2-ethylhexyl)phthalate	ND	0.33	"							
Bis(2-chloroisopropyl)ether	ND	0.33	"							
4-Bromophenyl phenyl ether	ND	0.33	"							
Butyl benzyl phthalate	ND	0.33	"							
4-Chloroaniline	ND	0.33	"							
2-Chlorophenol	ND	0.33	"							
4-Chloro-3-methylphenol	ND	0.33	"							
2-Chloronaphthalene	ND	0.33	"							
4-Chlorophenyl phenyl ether	ND	0.33	"							
Chrysene	ND	0.33	"							
Dibenz (a,h) anthracene	ND	0.33	"							
Dibenzofuran	ND	0.33	"							
1,3-Dichlorobenzene	ND	0.33	"							
1,2-Dichlorobenzene	ND	0.33	"							
1,4-Dichlorobenzene	ND	0.33	"							
3,3´-Dichlorobenzidine	ND	0.33	"							
2,4-Dichlorophenol	ND	0.33	"							
Diethyl phthalate	ND	0.33	"							
2,4-Dimethylphenol	ND	0.33	"							

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SALEM Engineering Group - Fresno
4729 West Jacquelyn Avenue
Fresno CA, 93722

Project: Former Fresno Compress
Project Number: 1-420-1016
Project Manager: Shannon Lodge

Reported:
01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1405 - EPA 3550B Solid Ext										
Blank (B1A1405-BLK1)				Prepared & Analyzed: 01/14/21						
Dimethyl phthalate	ND	0.33	mg/kg							
Di-n-butyl phthalate	ND	0.33	"							
2,4-Dinitrophenol	ND	0.33	"							
4,6-Dinitro-2-methylphenol	ND	0.33	"							
2,4-Dinitrotoluene	ND	0.33	"							
2,6-Dinitrotoluene	ND	0.33	"							
Di-n-octyl phthalate	ND	0.33	"							
1,2-Diphenylhydrazine	ND	0.33	"							
Fluoranthene	ND	0.33	"							
Fluorene	ND	0.33	"							
Hexachlorobenzene	ND	0.33	"							
Hexachlorobutadiene	ND	0.33	"							
Hexachlorocyclopentadiene	ND	0.33	"							
Hexachloroethane	ND	0.33	"							
Indeno (1,2,3-cd) pyrene	ND	0.33	"							
Isophorone	ND	0.33	"							
2-Methylnaphthalene	ND	0.33	"							
2-Methylphenol	ND	0.33	"							
4-Methylphenol	ND	0.33	"							
Naphthalene	ND	0.33	"							
2-Nitroaniline	ND	0.33	"							
3-Nitroaniline	ND	0.33	"							
4-Nitroaniline	ND	0.33	"							
Nitrobenzene	ND	0.33	"							
2-Nitrophenol	ND	0.33	"							
4-Nitrophenol	ND	0.33	"							
N-Nitrosodimethylamine	ND	0.33	"							
Diphenylamine	ND	0.33	"							
N-Nitrosodi-n-propylamine	ND	0.33	"							
Pentachlorophenol	ND	0.33	"							
Phenanthrene	ND	0.33	"							
Phenol	ND	0.33	"							
Pyrene	ND	0.33	"							
1,2,4-Trichlorobenzene	ND	0.33	"							
2,4,5-Trichlorophenol	ND	0.33	"							
2,4,6-Trichlorophenol	ND	0.33	"							

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno 4729 West Jacquelyn Avenue Fresno CA, 93722	Project: Former Fresno Compress Project Number: 1-420-1016 Project Manager: Shannon Lodge	Reported: 01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1405 - EPA 3550B Solid Ext										
LCS (B1A1405-BS1)				Prepared & Analyzed: 01/14/21						
Surrogate: 2-Fluorophenol	*0.500*		*mg/kg*	*0.500*		*100*	*25-121*			
Surrogate: Phenol-d6	*0.500*		*"*	*0.500*		*100*	*24-113*			
Surrogate: Nitrobenzene-d5	*0.333*		*"*	*0.500*		*66.7*	*23-120*			
Surrogate: 2-Fluorobiphenyl	*0.333*		*"*	*0.500*		*66.7*	*30-115*			
Surrogate: 2,4,6-Tribromophenol	*0.500*		*"*	*0.500*		*100*	*19-122*			
Surrogate: Terphenyl-d14	*0.333*		*"*	*0.500*		*66.7*	*18-137*			
Acenaphthene	0.362	0.33	"	0.333		109	47-145			
2-Chlorophenol	0.790	0.33	"	0.667		118	23-134			
4-Chloro-3-methylphenol	0.644	0.33	"	0.667		96.5	22-147			
1,4-Dichlorobenzene	0.343	0.33	"	0.333		103	20-124			
2,4-Dinitrotoluene	0.202	0.33	"	0.333		60.7	39-139			
4-Nitrophenol	ND	0.33	"	0.667			0-132			
N-Nitrosodi-n-propylamine	0.304	0.33	"	0.333		91.3	0-230			
Pentachlorophenol	0.179	0.33	"	0.667		26.9	14-176			
Phenol	0.702	0.33	"	0.667		105	5-112			
Pyrene	0.367	0.33	"	0.333		110	52-115			
1,2,4-Trichlorobenzene	0.350	0.33	"	0.333		105	44-142			
Matrix Spike (B1A1405-MS1)		**Source: 2101140-01**		Prepared & Analyzed: 01/14/21						
Surrogate: 2-Fluorophenol	*0.596*		*mg/kg*	*0.500*		*119*	*25-121*			
Surrogate: Phenol-d6	*0.271*		*"*	*0.500*		*54.2*	*24-113*			
Surrogate: Nitrobenzene-d5	*0.269*		*"*	*0.500*		*53.7*	*23-120*			
Surrogate: 2-Fluorobiphenyl	*0.215*		*"*	*0.500*		*43.0*	*30-115*			
Surrogate: 2,4,6-Tribromophenol	*0.192*		*"*	*0.500*		*38.4*	*19-122*			
Surrogate: Terphenyl-d14	*0.472*		*"*	*0.500*		*94.4*	*18-137*			
Acenaphthene	0.361	0.33	"	0.333	ND	108	47-145			
2-Chlorophenol	0.782	0.33	"	0.667	ND	117	23-134			
4-Chloro-3-methylphenol	0.625	0.33	"	0.667	ND	93.8	22-147			
1,4-Dichlorobenzene	0.326	0.33	"	0.333	ND	97.7	20-124			
2,4-Dinitrotoluene	0.159	0.33	"	0.333	ND	47.6	39-139			
4-Nitrophenol	ND	0.33	"	0.667	ND		0-132			
N-Nitrosodi-n-propylamine	0.280	0.33	"	0.333	ND	84.1	0-230			
Pentachlorophenol	0.183	0.33	"	0.667	ND	27.4	14-176			
Phenol	0.636	0.33	"	0.667	ND	95.4	5-112			
Pyrene	0.377	0.33	"	0.333	ND	113	52-115			
1,2,4-Trichlorobenzene	0.343	0.33	"	0.333	ND	103	44-142			

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SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	Reported:
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sierra Analytical Labs, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B1A1405 - EPA 3550B Solid Ext										
Matrix Spike Dup (B1A1405-MSD1)		**Source: 2101140-01**		Prepared & Analyzed: 01/14/21						
Surrogate: 2-Fluorophenol	*0.500*		*mg/kg*	*0.500*		*100*	*25-121*			
Surrogate: Phenol-d6	*0.500*		*"*	*0.500*		*100*	*24-113*			
Surrogate: Nitrobenzene-d5	*0.333*		*"*	*0.500*		*66.7*	*23-120*			
Surrogate: 2-Fluorobiphenyl	*0.333*		*"*	*0.500*		*66.7*	*30-115*			
Surrogate: 2,4,6-Tribromophenol	*0.500*		*"*	*0.500*		*100*	*19-122*			
Surrogate: Terphenyl-d14	*0.333*		*"*	*0.500*		*66.7*	*18-137*			
Acenaphthene	0.372	0.33	"	0.333	ND	112	47-145	3.09	30	
2-Chlorophenol	0.776	0.33	"	0.667	ND	116	23-134	0.727	30	
4-Chloro-3-methylphenol	0.653	0.33	"	0.667	ND	97.9	22-147	4.28	30	
1,4-Dichlorobenzene	0.355	0.33	"	0.333	ND	107	20-124	8.71	30	
2,4-Dinitrotoluene	0.175	0.33	"	0.333	ND	52.4	39-139	9.60	30	
4-Nitrophenol	ND	0.33	"	0.667	ND		0-132		30	
N-Nitrosodi-n-propylamine	0.303	0.33	"	0.333	ND	91.0	0-230	7.88	30	
Pentachlorophenol	0.192	0.33	"	0.667	ND	28.8	14-176	4.98	30	
Phenol	0.663	0.33	"	0.667	ND	99.5	5-112	4.15	30	
Pyrene	0.336	0.33	"	0.333	ND	101	52-115	11.5	30	
1,2,4-Trichlorobenzene	0.356	0.33	"	0.333	ND	107	44-142	3.53	30	

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SIERRA ANALYTICAL

SALEM Engineering Group - Fresno	Project: Former Fresno Compress	
4729 West Jacquelyn Avenue	Project Number: 1-420-1016	**Reported:**
Fresno CA, 93722	Project Manager: Shannon Lodge	01/22/21 12:05

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

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H&P Mobile Geochemistry Inc.

15 January 2021

Shannon Lodge
SALEM Engineering Grp, Inc. - Fresno
4729 W. Jacquelyn Ave.
Fresno, CA 93722

H&P Project: SLM010821-12
Client Project: Former Compress

Dear Shannon Lodge:

Enclosed is the analytical report for the above referenced project. The data herein applies to samples as received by H&P Mobile Geochemistry, Inc. on 08-Jan-21 which were analyzed in accordance with the attached Chain of Custody record(s).

The results for all sample analyses and required QA/QC analyses are presented in the following sections and summarized in the documents:

- Sample Summary
- Case Narrative (if applicable)
- Sample Results
- Quality Control Summary
- Notes and Definitions / Appendix
- Chain of Custody
- Sampling Logs (if applicable)

Unless otherwise noted, I certify that all analyses were performed and reviewed in compliance with our Quality Systems Manual and Standard Operating Procedures. This report shall not be reproduced, except in full, without the written approval of H&P Mobile Geochemistry, Inc.

We at H&P Mobile Geochemistry, Inc. sincerely appreciate the opportunity to provide analytical services to you on this project. If you have any questions or concerns regarding this analytical report, please contact me at your convenience at 760-804-9678.

Sincerely,

Lisa Eminhizer
Laboratory Director

H&P Mobile Geochemistry, Inc. is certified under the California ELAP and the National Environmental Laboratory Accreditation Conference (NELAC) for the fields of proficiency and analytes listed on those certificates. H& P is approved as an Environmental Testing Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs for the fields of proficiency and analytes included in the certification process and to the extent offered by the accreditation agency . Unless otherwise noted, accreditation certificate numbers, expiration of certificates, and scope of accreditation can be found at: www.handpmg.com/about/certifications. Fields of services and analytes contained in this report that are not listed on the certificates should be considered uncertified or unavailable for certification.

H&P Mobile
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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SV-1 @ 5	E101012-01	Vapor	07-Jan-21	08-Jan-21
SV-1 @ 10	E101012-02	Vapor	07-Jan-21	08-Jan-21
SV-2 @ 5	E101012-03	Vapor	07-Jan-21	08-Jan-21
SV-2 @ 10	E101012-04	Vapor	07-Jan-21	08-Jan-21
SV-2 @ 10 DUP	E101012-05	Vapor	07-Jan-21	08-Jan-21
SV-3 @ 5	E101012-06	Vapor	07-Jan-21	08-Jan-21
SV-3 @ 10	E101012-07	Vapor	07-Jan-21	08-Jan-21
SV-4 @ 5	E101012-08	Vapor	07-Jan-21	08-Jan-21
SV-4 @ 10	E101012-09	Vapor	07-Jan-21	08-Jan-21
SV-5 @ 5	E101012-10	Vapor	07-Jan-21	08-Jan-21
SV-5 @ 10	E101012-11	Vapor	07-Jan-21	08-Jan-21
SV-6 @ 5	E101012-12	Vapor	07-Jan-21	08-Jan-21
SV-6 @ 10	E101012-13	Vapor	07-Jan-21	08-Jan-21

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4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

DETECTIONS SUMMARY

Sample ID: **SV-1 @ 5** Laboratory ID: **E101012-01**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-1 @ 10** Laboratory ID: **E101012-02**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-2 @ 5** Laboratory ID: **E101012-03**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-2 @ 10** Laboratory ID: **E101012-04**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-2 @ 10 DUP** Laboratory ID: **E101012-05**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-3 @ 5** Laboratory ID: **E101012-06**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-3 @ 10** Laboratory ID: **E101012-07**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-4 @ 5** Laboratory ID: **E101012-08**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

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4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Sample ID: **SV-4 @ 10** Laboratory ID: **E101012-09**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-5 @ 5** Laboratory ID: **E101012-10**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-5 @ 10** Laboratory ID: **E101012-11**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-6 @ 5** Laboratory ID: **E101012-12**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

Sample ID: **SV-6 @ 10** Laboratory ID: **E101012-13**

Analyte	Result	Reporting Limit	Units	Method	Notes
No Detections Reported					

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SALEM Engineering Grp, Inc. - Fresno 4729 W. Jacquelyn Ave. Fresno, CA 93722	Project: SLM010821-12 Project Number: Former Compress Project Manager: Shannon Lodge	Reported: 15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 @ 5 (E101012-01) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 @ 5 (E101012-01) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*122 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*107 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*103 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*98.4 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 @ 10 (E101012-02) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-1 @ 10 (E101012-02) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*121 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*110 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*104 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*	*75-125*		"	"	"	"	

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4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 5 (E101012-03) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 5 (E101012-03) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*118 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*105 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*103 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*97.1 %*	*75-125*		"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno 4729 W. Jacquelyn Ave. Fresno, CA 93722	Project: SLM010821-12 Project Number: Former Compress Project Manager: Shannon Lodge	Reported: 15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 10 (E101012-04) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 10 (E101012-04) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*124 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*113 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*102 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*102 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 10 DUP (E101012-05) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project:	SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number:	Former Compress	Reported:
Fresno, CA 93722	Project Manager:	Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-2 @ 10 DUP (E101012-05) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*122 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*108 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*102 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*97.9 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-3 @ 5 (E101012-06) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-3 @ 5 (E101012-06) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*120 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*112 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*99.6 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*98.6 %*	*75-125*		"	"	"	"	

H&P Mobile
Geochemistry Inc.

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-3 @ 10 (E101012-07) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-3 @ 10 (E101012-07) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*121 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*105 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*103 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*98.6 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-4 @ 5 (E101012-08) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-4 @ 5 (E101012-08) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*122 %*	*75-125*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*114 %*	*75-125*		"	"	"	"	
Surrogate: Toluene-d8		*101 %*	*75-125*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*99.9 %*	*75-125*		"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-4 @ 10 (E101012-09) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-4 @ 10 (E101012-09) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*125 %*	*75-125*		*"*	*"*	*"*	*"*	*S-GC*
Surrogate: 1,2-Dichloroethane-d4		*119 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*102 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*101 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno 4729 W. Jacquelyn Ave. Fresno, CA 93722	Project: SLM010821-12 Project Number: Former Compress Project Manager: Shannon Lodge	Reported: 15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-5 @ 5 (E101012-10) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

H&P Mobile
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SALEM Engineering Grp, Inc. - Fresno	Project:	SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number:	Former Compress	Reported:
Fresno, CA 93722	Project Manager:	Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-5 @ 5 (E101012-10) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*124 %*		*75-125*	"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*111 %*		*75-125*	"	"	"	"	
Surrogate: Toluene-d8		*100 %*		*75-125*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*101 %*		*75-125*	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-5 @ 10 (E101012-11) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-5 @ 10 (E101012-11) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*124 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*113 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*100 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*100 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-6 @ 5 (E101012-12) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-6 @ 5 (E101012-12) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*129 %*	*75-125*		*"*	*"*	*"*	*"*	*S-GC*
Surrogate: 1,2-Dichloroethane-d4		*116 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*99.5 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*101 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno 4729 W. Jacquelyn Ave. Fresno, CA 93722	Project: SLM010821-12 Project Number: Former Compress Project Manager: Shannon Lodge	Reported: 15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-6 @ 10 (E101012-13) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
Isopropyl alcohol (LCC)	ND	8.0	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Dichlorodifluoromethane (F12)	ND	0.40	"	"	"	"	"	"	
Chloromethane	ND	0.40	"	"	"	"	"	"	
Vinyl chloride	ND	0.040	"	"	"	"	"	"	
Bromomethane	ND	0.40	"	"	"	"	"	"	
Chloroethane	ND	0.40	"	"	"	"	"	"	
Trichlorofluoromethane (F11)	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"	"	"	"	"	"	
Methylene chloride (Dichloromethane)	ND	0.40	"	"	"	"	"	"	
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
1,1-Dichloroethane	ND	0.40	"	"	"	"	"	"	
2,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	0.40	"	"	"	"	"	"	
Chloroform	ND	0.080	"	"	"	"	"	"	
Bromochloromethane	ND	0.40	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,1-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Carbon tetrachloride	ND	0.080	"	"	"	"	"	"	
1,2-Dichloroethane (EDC)	ND	0.080	"	"	"	"	"	"	
Benzene	ND	0.080	"	"	"	"	"	"	
Trichloroethene	ND	0.080	"	"	"	"	"	"	
1,2-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Bromodichloromethane	ND	0.40	"	"	"	"	"	"	
Dibromomethane	ND	0.40	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
Toluene	ND	0.80	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.40	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.40	"	"	"	"	"	"	
1,2-Dibromoethane (EDB)	ND	0.40	"	"	"	"	"	"	
1,3-Dichloropropane	ND	0.40	"	"	"	"	"	"	
Tetrachloroethene	ND	0.080	"	"	"	"	"	"	
Dibromochloromethane	ND	0.40	"	"	"	"	"	"	
Chlorobenzene	ND	0.080	"	"	"	"	"	"	
Ethylbenzene	ND	0.40	"	"	"	"	"	"	
1,1,1,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
m,p-Xylene	ND	0.40	"	"	"	"	"	"	

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SALEM Engineering Grp, Inc. - Fresno	Project:	SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number:	Former Compress	Reported:
Fresno, CA 93722	Project Manager:	Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Dilution Factor	Batch	Prepared	Analyzed	Method	Notes
SV-6 @ 10 (E101012-13) Vapor Sampled: 07-Jan-21 Received: 08-Jan-21									
o-Xylene	ND	0.40	ug/l	0.04	EA11402	14-Jan-21	14-Jan-21	H&P 8260SV	
Styrene	ND	0.40	"	"	"	"	"	"	
Bromoform	ND	0.40	"	"	"	"	"	"	
Isopropylbenzene (Cumene)	ND	0.40	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.40	"	"	"	"	"	"	
1,2,3-Trichloropropane	ND	0.40	"	"	"	"	"	"	
n-Propylbenzene	ND	0.40	"	"	"	"	"	"	
Bromobenzene	ND	0.40	"	"	"	"	"	"	
1,3,5-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
2-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
4-Chlorotoluene	ND	0.40	"	"	"	"	"	"	
tert-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2,4-Trimethylbenzene	ND	0.40	"	"	"	"	"	"	
sec-Butylbenzene	ND	0.40	"	"	"	"	"	"	
p-Isopropyltoluene	ND	0.40	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
n-Butylbenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	0.40	"	"	"	"	"	"	
1,2-Dibromo-3-chloropropane	ND	4.0	"	"	"	"	"	"	
1,2,4-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Hexachlorobutadiene	ND	0.40	"	"	"	"	"	"	
Naphthalene	ND	0.080	"	"	"	"	"	"	
1,2,3-Trichlorobenzene	ND	0.40	"	"	"	"	"	"	
Surrogate: Dibromofluoromethane		*122 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 1,2-Dichloroethane-d4		*112 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: Toluene-d8		*99.7 %*	*75-125*		*"*	*"*	*"*	*"*	
Surrogate: 4-Bromofluorobenzene		*103 %*	*75-125*		*"*	*"*	*"*	*"*	

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA11402 - EPA 5030										
Blank (EA11402-BLK1)				Prepared & Analyzed: 14-Jan-21						
Isopropyl alcohol (LCC)	ND	8.0	ug/l							
Dichlorodifluoromethane (F12)	ND	0.40	"							
Chloromethane	ND	0.40	"							
Vinyl chloride	ND	0.040	"							
Bromomethane	ND	0.40	"							
Chloroethane	ND	0.40	"							
Trichlorofluoromethane (F11)	ND	0.40	"							
1,1-Dichloroethene	ND	0.40	"							
1,1,2 Trichlorotrifluoroethane (F113)	ND	0.40	"							
Methylene chloride (Dichloromethane)	ND	0.40	"							
Methyl tertiary-butyl ether (MTBE)	ND	0.40	"							
trans-1,2-Dichloroethene	ND	0.40	"							
1,1-Dichloroethane	ND	0.40	"							
2,2-Dichloropropane	ND	0.40	"							
cis-1,2-Dichloroethene	ND	0.40	"							
Chloroform	ND	0.080	"							
Bromochloromethane	ND	0.40	"							
1,1,1-Trichloroethane	ND	0.40	"							
1,1-Dichloropropene	ND	0.40	"							
Carbon tetrachloride	ND	0.080	"							
1,2-Dichloroethane (EDC)	ND	0.080	"							
Benzene	ND	0.080	"							
Trichloroethene	ND	0.080	"							
1,2-Dichloropropane	ND	0.40	"							
Bromodichloromethane	ND	0.40	"							
Dibromomethane	ND	0.40	"							
cis-1,3-Dichloropropene	ND	0.40	"							
Toluene	ND	0.80	"							
trans-1,3-Dichloropropene	ND	0.40	"							
1,1,2-Trichloroethane	ND	0.40	"							
1,2-Dibromoethane (EDB)	ND	0.40	"							
1,3-Dichloropropane	ND	0.40	"							
Tetrachloroethene	ND	0.080	"							
Dibromochloromethane	ND	0.40	"							

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SALEM Engineering Grp, Inc. - Fresno	Project:	SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number:	Former Compress	Reported:
Fresno, CA 93722	Project Manager:	Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA11402 - EPA 5030										
Blank (EA11402-BLK1)				Prepared & Analyzed: 14-Jan-21						
Chlorobenzene	ND	0.080	ug/l							
Ethylbenzene	ND	0.40	"							
1,1,1,2-Tetrachloroethane	ND	0.40	"							
m,p-Xylene	ND	0.40	"							
o-Xylene	ND	0.40	"							
Styrene	ND	0.40	"							
Bromoform	ND	0.40	"							
Isopropylbenzene (Cumene)	ND	0.40	"							
1,1,2,2-Tetrachloroethane	ND	0.40	"							
1,2,3-Trichloropropane	ND	0.40	"							
n-Propylbenzene	ND	0.40	"							
Bromobenzene	ND	0.40	"							
1,3,5-Trimethylbenzene	ND	0.40	"							
2-Chlorotoluene	ND	0.40	"							
4-Chlorotoluene	ND	0.40	"							
tert-Butylbenzene	ND	0.40	"							
1,2,4-Trimethylbenzene	ND	0.40	"							
sec-Butylbenzene	ND	0.40	"							
p-Isopropyltoluene	ND	0.40	"							
1,3-Dichlorobenzene	ND	0.40	"							
1,4-Dichlorobenzene	ND	0.40	"							
n-Butylbenzene	ND	0.40	"							
1,2-Dichlorobenzene	ND	0.40	"							
1,2-Dibromo-3-chloropropane	ND	4.0	"							
1,2,4-Trichlorobenzene	ND	0.40	"							
Hexachlorobutadiene	ND	0.40	"							
Naphthalene	ND	0.080	"							
1,2,3-Trichlorobenzene	ND	0.40	"							
Surrogate: Dibromofluoromethane	*2.45*		*"*	*2.00*		*123*	*75-125*			
Surrogate: 1,2-Dichloroethane-d4	*2.16*		*"*	*2.00*		*108*	*75-125*			
Surrogate: Toluene-d8	*2.05*		*"*	*2.00*		*102*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2.08*		*"*	*2.00*		*104*	*75-125*			

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SALEM Engineering Grp, Inc. - Fresno	Project: SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number: Former Compress	Reported:
Fresno, CA 93722	Project Manager: Shannon Lodge	15-Jan-21 15:55

Volatile Organic Compounds by H&P 8260SV - Quality Control

H&P Mobile Geochemistry, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EA11402 - EPA 5030										
LCS (EA11402-BS1)				Prepared & Analyzed: 14-Jan-21						
Dichlorodifluoromethane (F12)	3.7	0.50	ug/l	5.00		74.6	70-130			
Vinyl chloride	4.3	0.050	"	5.00		86.7	70-130			
Chloroethane	4.6	0.50	"	5.00		91.8	70-130			
Trichlorofluoromethane (F11)	4.5	0.50	"	5.00		90.2	70-130			
1,1-Dichloroethene	5.2	0.50	"	5.00		105	70-130			
1,1,2 Trichlorotrifluoroethane (F113)	4.8	0.50	"	5.00		96.1	70-130			
Methylene chloride (Dichloromethane)	4.2	0.50	"	5.00		84.6	70-130			
trans-1,2-Dichloroethene	4.6	0.50	"	5.00		91.3	70-130			
1,1-Dichloroethane	4.5	0.50	"	5.00		89.2	70-130			
cis-1,2-Dichloroethene	5.0	0.50	"	5.00		100	70-130			
Chloroform	4.5	0.10	"	5.00		90.1	70-130			
1,1,1-Trichloroethane	4.7	0.50	"	5.00		93.4	70-130			
Carbon tetrachloride	4.9	0.10	"	5.00		97.6	70-130			
1,2-Dichloroethane (EDC)	4.7	0.10	"	5.00		94.0	70-130			
Benzene	4.6	0.10	"	5.00		92.5	70-130			
Trichloroethene	4.9	0.10	"	5.00		97.6	70-130			
Toluene	4.5	1.0	"	5.00		90.0	70-130			
1,1,2-Trichloroethane	4.5	0.50	"	5.00		89.6	70-130			
Tetrachloroethene	4.5	0.10	"	5.00		91.0	70-130			
Ethylbenzene	4.7	0.50	"	5.00		93.1	70-130			
1,1,1,2-Tetrachloroethane	4.6	0.50	"	5.00		91.0	70-130			
m,p-Xylene	9.5	0.50	"	10.0		94.6	70-130			
o-Xylene	4.6	0.50	"	5.00		91.1	70-130			
1,1,2,2-Tetrachloroethane	4.0	0.50	"	5.00		80.4	70-130			
Surrogate: Dibromofluoromethane	*2.88*		*"*	*2.50*		*115*	*75-125*			
Surrogate: 1,2-Dichloroethane-d4	*2.50*		*"*	*2.50*		*100*	*75-125*			
Surrogate: Toluene-d8	*2.65*		*"*	*2.50*		*106*	*75-125*			
Surrogate: 4-Bromofluorobenzene	*2.51*		*"*	*2.50*		*100*	*75-125*			

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SALEM Engineering Grp, Inc. - Fresno	Project:	SLM010821-12	
4729 W. Jacquelyn Ave.	Project Number:	Former Compress	Reported:
Fresno, CA 93722	Project Manager:	Shannon Lodge	15-Jan-21 15:55

Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate(s).
LCC	Leak Check Compound
ND	Analyte NOT DETECTED at or above the reporting limit
MDL	Method Detection Limit
%REC	Percent Recovery
RPD	Relative Percent Difference

All soil results are reported in wet weight.

Appendix

H&P Mobile Geochemistry, Inc. is approved as an Environmental Testing Laboratory and Mobile Laboratory in accordance with the DoD-ELAP Program and ISO/IEC 17025:2005 programs through PJLA, accreditation number 69070 for EPA Method TO-15, EPA Method 8260B and H&P 8260SV.

H&P is approved by the State of California as an Environmental Laboratory and Mobile Laboratory in conformance with the Environmental Laboratory Accreditation Program (ELAP) for the category of Volatile and Semi-Volatile Organic Chemistry of Hazardous Waste, certification numbers 2740, 2741, 2743 & 2745.

H&P is approved by the State of Louisiana Department of Environmental Quality under the National Environmental Laboratory Accreditation Conference (NELAC) certification number 04138

The complete list of stationary and mobile laboratory certifications along with the fields of testing (FOTs) and analyte lists are available at www.handpmg.com/about/certifications.

H&P Mobile Geochemistry, Inc.

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& Field Office - Signal Hill, CA
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VAPOR / AIR Chain of Custody

DATE: 1/7/21
Page 1 of 2

Lab Client and Project Information

Lab Client/Consultant: Salem Engineering Group	Project Name / #: Former Compress
Lab Client Project Manager: Shannon Lodge	Project Location: Fresno
Lab Client Address: 4729 W. Jacquelyn Ave	Report E-Mail(s): shannon@salem.net
Lab Client City, State, Zip: Fresno, CA 93711	
Phone Number: (559) 907-9742	

Sample Receipt (Lab Use Only)

Date Rec'd: 1/8/21	Control #: 210001.01
H&P Project # SLM010821-12	
Lab Work Order # E101012	
Sample Intact: ☑ Yes ☐ No ☐ See Notes Below	
Receipt Gauge ID: 30005	Temp: RT
Outside Lab:	
Receipt Notes/Tracking #: 1Z93TT61905094 1995; 1Z93TT6190493 89201	
Lab PM Initials: SM	

Reporting Requirements

☒ Standard Report ☐ Level III ☐ Level IV
☐ Excel EDD ☐ Other EDD:
☐ CA Geotracker Global ID:

Turnaround Time

☒ **Standard** (7 days for preliminary report, 10 days for final report)
☐ **Rush** (specify):

Sampler Information

Sampler(s): S. Lodge
Signature: [signature]
Date: 1/7/21

Additional Instructions to Laboratory:

LRLs

*** Preferred VOC units (please choose one):**
☒ µg/L ☐ µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa, Tedlar, Tube, etc.	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☒ 8260SV ☐ TO-15	VOCs Short List / Project List ☐ 8260SV ☐ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15	TPHv as Gas ☐ 8260SVm ☐ TO-15m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☒ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2				
SV-1 @5		1/7/21	12:20	SV	400mL	004	.70	X						X						
SV-1 @10		↓	12:30	↓	↓	038	.39	↓						↓						
SV-2 @5		↓	12:40	↓	↓	140	.43	↓						↓						
SV-2 @10		↓	12:45	↓	↓	015	.17	↓						↓						
SV-2 @10 Dup		↓	12:50	↓	↓	238	.24	↓						↓						
SV-3 @5		↓	13:00	↓	↓	069	.39	↓						↓						
SV-3 @10		↓	13:05	↓	↓	050	.56	↓						↓						
SV-4 @5		↓	13:20	↓	↓	147	.15	↓						↓						
SV-4 @10		↓	13:25	↓	↓	156	.08	↓						↓						
SV-5 @5		↓	13:35	↓	↓	231	.51	↓						↓						

Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
[signature]	Salem	1/7/21	3:00	UPS			
				[signature]	H&P	1/8/2021	1200

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

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VAPOR / AIR Chain of Custody

DATE: 1/7/21
Page 2 of 2

Lab Client and Project Information

Lab Client/Consultant: Salem Engineering Group	Project Name / #: 1-420-1016 Former compress
Lab Client Project Manager: Shannon Lodge	Project Location: Fresno
Lab Client Address: 4729 W. Jacquelyn Ave	Report E-Mail(s): shannon@salem.net
Lab Client City, State, Zip: Fresno, CA 93722	
Phone Number: (559) 907-9742	

Sample Receipt (Lab Use Only)

Date Rec'd: 1/8/21	Control #: 210001.01
H&P Project # SLM010821-12	
Lab Work Order # E101012	
Sample Intact: ☑ Yes ☐ No ☐ See Notes Below	
Receipt Gauge ID: 30005	Temp: RT
Outside Lab:	
Receipt Notes/Tracking #:	
Lab PM Initials: SM	

Reporting Requirements

☑ Standard Report ☐ Level III ☐ Level IV
☐ Excel EDD ☐ Other EDD:
☐ CA Geotracker Global ID:

Turnaround Time

☑ **Standard** (7 days for preliminary report, 10 days for final report)
☐ **Rush** (specify):

Sampler Information

Sampler(s): S. Lodge
Signature: [signature]
Date: 1/7/21

Additional Instructions to Laboratory:

LRLs

*** Preferred VOC units (please choose one):**
☑ µg/L ☐ µg/m³ ☐ ppbv ☐ ppmv

SAMPLE NAME	FIELD POINT NAME (if applicable)	DATE mm/dd/yy	TIME 24hr clock	SAMPLE TYPE Indoor Air (IA), Ambient Air (AA), Subslab (SS), Soil Vapor (SV)	CONTAINER SIZE & TYPE 400mL/1L/6L Summa, Tedlar, Tube, etc.	CONTAINER ID (###)	Lab use only: Receipt Vac	VOCs Standard Full List ☑ 8260SV ☐ TO-15	VOCs Short List / Project List ☐ 8260SV ☐ TO-15	Oxygenates ☐ 8260SV ☐ TO-15	Naphthalene ☐ 8260SV ☐ TO-15	TPHv as Gas ☐ 8260SVm ☐ TO-15m	Aromatic/Aliphatic Fractions ☐ 8260SVm ☐ TO-15m	Leak Check Compound ☐ DFA ☑ IPA ☐ He	Methane by EPA 8015m	Fixed Gases by ASTM D1945 ☐ CO2 ☐ O2 ☐ N2			
SV-5@10		1/7/21	13:45	SV	400mL	058	.09	✓						X					
SV-6@5		↓	14:00	↓	↓	199	.35	X						X					
SV-6@10		↓	14:10	↓	↓	226	.40	X						X					

Approved/Relinquished by:	Company:	Date:	Time:	Received by:	Company:	Date:	Time:
[signature]	Salem	1/7/21	3:00	UPS			
				[signature]	H&P	1/8/21	1200

*Approval constitutes as authorization to proceed with analysis and acceptance of conditions on back

Job Summary

Job Date : 1/4/2021

Customer	Salem Engineering Group	**Phone Number**	(559) 907-9742
Billing Address	**City**	**State**	**Zip**
4729 W. Jacquelyn Ave.	Fresno	CA	93722

Job Details

Jobsite Location	2740 WEST NEILSON AVENUE
City	FRESNO
State	CA

WA Number	238455
Job Num	
PO Num	1-420-1016

Lead Technician TOLLESON, KODY **Phone** 510-468-8610 **Email** kody.tolleson@gprsinc.com

Thank you for using GPRS on your project. We appreciate the opportunity to work with you. If you have questions regarding the results of this scanning, please contact the lead GPRS technician on this project.

EQUIPMENT USED

The following equipment was used on this project:

- Underground Scanning GPR antenna. Typically capable of detecting objects up to 8' deep or more in ideal conditions but maximum effective depth can vary widely and depends on site and soil conditions. Depth penetration is most commonly limited by moisture and clay/conductive soils. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors.
- Electromagnetic Pipe and Cable Locator. Detects electromagnetic fields. Used to actively trace conductive pipes and tracer wires, or passively detect power and radio signals traveling along conductive pipes and utilities. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors.
- Magnetometer. Detects ferromagnetic objects at depths up to 8' by detecting their magnetic fields. Effective at detecting well heads, buried manholes, and other iron objects.

Work Performed

Ground Penetrating Radar Systems performed the following work on this project:

Underground Utility

The scope of work included scanning the specified area to locate underground utilities. A tracer signal was sent along any accessible metallic utility or tracer wire, and the area was scanned with GPR to locate any additional targets. The locations of any detected utilities and anomalies were marked directly at the site with paint, flags, stakes, or other appropriate means, and results were reviewed with onsite personnel unless otherwise noted.

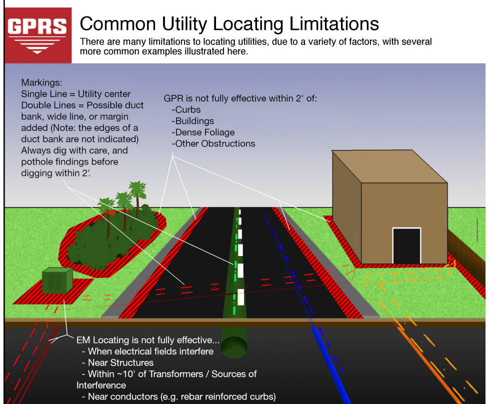
- The scope of work included scanning the areas around proposed soil borings. A radius of approximately 10' around each proposed soil boring was scanned unless otherwise noted. A total of 7 boring locations were scanned.
- The customer requested to have 7 location scanned prior to soil borings. The customer also requested to search for 3 septic tanks and a UST.

Job Summary

Job Date : 1/4/2021

- The effective depth of GPR will vary throughout a site depending on surface and soil conditions. In this area, the maximum effective GPR depth was approximately 1-4 feet.
- 2 out of 3 septic tanks were located and there was no data circular that was consistent with that of a UST. Unknown objects were located across the site and marked out. Please avoid all markings by a minimum of 2' when working.

Pictures

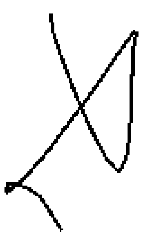


Utility Limitations

TERMS & CONDITIONS

http://www.gprsinc.com/termsandconditions.html

SIGNATURE



Contact Name

Shannon Lodge   (559) 907-9742   Shannon@salem.net

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ELECTRICAL SHOCK
Electrical conduits or other utilities that are embedded within the concrete slab/wall.
INJURY – CUTS & LACERATIONS
Electrical conduits or other utilities that are embedded within the concrete slab/wall.
STRUCTURAL DAMAGE
Structural steel, rebar or even post-tension cables that are within the concrete.
SILICA & DUST EXPOSURE
Exposure to dust, silica, exhaust fumes, gases and other objects or particles in the air.
PINCH POINTS OR KICK BACK
Lack of proper use or operation of cutting equipment can cause pinch points or dangerous kick back.
TOPICS OF DISCUSSION
DISCUSS THE DIFFERENT TYPES OF SAW CUTTING AND CORE DRILLING THAT COULD BE PRESENT ON YOUR SITE.
HOW AN INDIVIDUAL CAN MITIGATE RISK WHEN CUTTING OR CORING CONCRETE.
BEST PRACTICES WHEN CHOOSING THE RIGHT COMPANY TO SCAN, CUT, AND CORE YOUR CONCRETE
DISCUSS THE COMMON RISKS AND HAZARDS ASSOCIATED WITH CONCRETE SAWING AND DRILLING.
DISCUSSION OF BEST PRACTICES FOR PERSONAL PROTECTIVE EQUIPMENT (PPE) & COMPANY PROVIDED SAFETY MEASURES
OSHA STANDARDS AND BEST PRACTICES FOR WORKING SAFELY WITH SILICA
SCHEDULE YOUR FREE 15 MIN JOB SITE SAFETY MEETING
MEETINGS BEING SCHEDULED THE WEEK OF JANUARY: 18TH-22ND
5 STEPS FOR SAFE CUTTING & CORING
1. ASK PERSONNEL AT FACILITY FOR KNOWLEDGE ON SLAB CONSTRUCTION
2. WALK THE SITE IN ORDER TO LOCATE VISUAL INDICATIONS OF CONDUITS OR POST TENSION CABLES, BEAMS OR OTHER OBSTRUCTIONS
3. REVIEW ANY AVAILABLE STRUCTURAL DRAWINGS OR RECORDS
4. HIRE A PROFESSIONAL CONCRETE SCANNING FIRM
a. ENSURE THEY USE MULTIPLE TECHNOLOGIES
b. ENSURE THEY PROVIDE A RECORD OF RESULTS
c. WALK THE SITE BEFORE AND AFTER THE SCAN
5. HOLD A CORE/SAW CUT MEETING
a. REVIEW ANY EXISTING MAPS, DRAWINGS OR RECORDS
b. CROSS REFERENCE SCAN RESULTS WITH DRAWINGS
c. REVIEW POTENTIAL HAZARDS/CONFLICTS AND REQUIRED PPE WITH ALL INVOLVED PERSONNEL

APPENDIX K

WATER SUPPLY ASSESSMENT

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SB 610 WATER SUPPLY ASSESSMENT

2740 WEST NIELSEN AVENUE OFFICE/WAREHOUSE PROJECT

FRESNO, CALIFORNIA

LSA

October 2022

SB 610 WATER SUPPLY ASSESSMENT

2740 WEST NIELSEN AVENUE OFFICE/WAREHOUSE PROJECT

FRESNO, CALIFORNIA

Submitted to:

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

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Project No. SNN2102

LSA

October 2022

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FIGURES AND TABLES

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LIST OF ABBREVIATIONS AND ACRONYMS

1,2,3-TCP	1,2,3-trichloropropane
AF	acre-feet
AFY	acre-feet per year
CALGreen Code	California Green Building Standards Code
CEQA	California Environmental Quality Act
City	City of Fresno
County	County of Fresno
CPC	California Plumbing Code
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CY	calendar year
DBCP	1,2-dibromo-3-chloropropane
DDR	Department of Drinking Water
DPU	Department of Public Utilities
DWR	Department of Water Resources
FID	Fresno Irrigation District
FMFCD	Fresno Metropolitan Flood Control District
GIS	Geographic Information System
gpm	gallons per minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IGSM	Integrated Groundwater and Surface Water Model
Metro Plan	Fresno Metropolitan Water Resource Management Plan
mg/L	milligrams per liter
mgd	million gallons per day
NESWTF	Northeast Surface Water Treatment Facility
NFWRF	North Fresno Wastewater Reclamation Facility

PCE	perchloroethylene
PFAS	per- and polyfluoroalkyl substances
PG&E	Pacific Gas and Electric Company
project	2740 West Nielsen Avenue Office/Warehouse Project
RWMP	Recycled Water Master Plan
RWRF	Regional Wastewater Reclamation Facility
SB	Senate Bill
SESWTF	Southeast Surface Water Treatment Facility
SOI	Sphere of Influence
SR	State Route
SWRCB	State Water Resources Control Board
SWTF	surface water treatment facility
TCE	trichloroethylene
TDS	total dissolved solids
TTDF	Tertiary Treatment and Disinfection Facility
USBR	United States Bureau of Reclamation
UV	ultraviolet
UWMP	Urban Water Management Plan
WRF	Wastewater Reclamation Facility
WSA	Water Supply Assessment
WSCP	Water Shortage Contingency Plan
WSIP	Water Storage Investment Program
WY	water year

INTRODUCTION

The City of Fresno (City) is conducting an environmental review under the requirements of the California Environmental Quality Act (CEQA) for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project) in Fresno, Fresno County, California. This Water Supply Assessment (WSA) has been prepared pursuant to the requirements of Senate Bill (SB) 610, which requires public water agencies, parties, or purveyors that may supply water to certain proposed development projects to prepare a WSA for use in environmental documentation for such projects, pursuant to CEQA. This WSA contains information from the City of Fresno 2020 Urban Water Management Plan (UWMP),[1] which was adopted by the City in June 2021. A WSA is required for any project that is subject to CEQA and includes an industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupy more than 40 acres of land, or having more than 650,000 square feet of floor area.

PROJECT DESCRIPTION

The 48.03-acre project site is currently vacant but previously consisted of an industrial warehouse that has since 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 (SR) 180, which is located approximately 0.3 mile south of the project site, and SR-99, which is located approximately 0.8 mile east of the project site. Figure 1 shows the site's regional and local context. Figure 2 depicts an aerial photograph of the project site and surrounding land uses.

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 consist 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.

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

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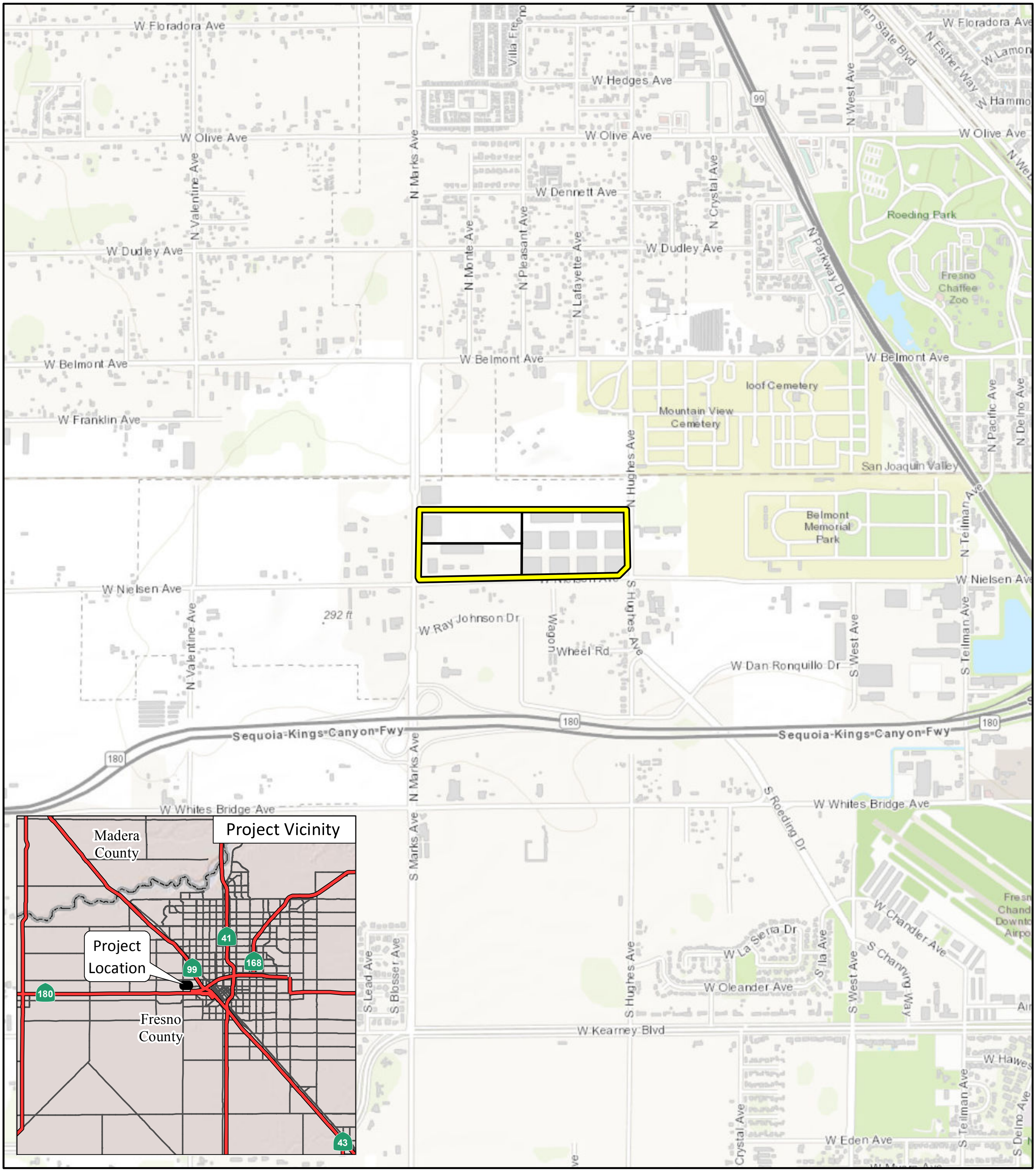
[1] Fresno, City of. 2021. *City of Fresno 2020 Urban Water Management Plan*. June.



LSA

LEGEND

Project Location

Proposed Parcels

0 1000 2000 FEET

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

N

0 500 1000

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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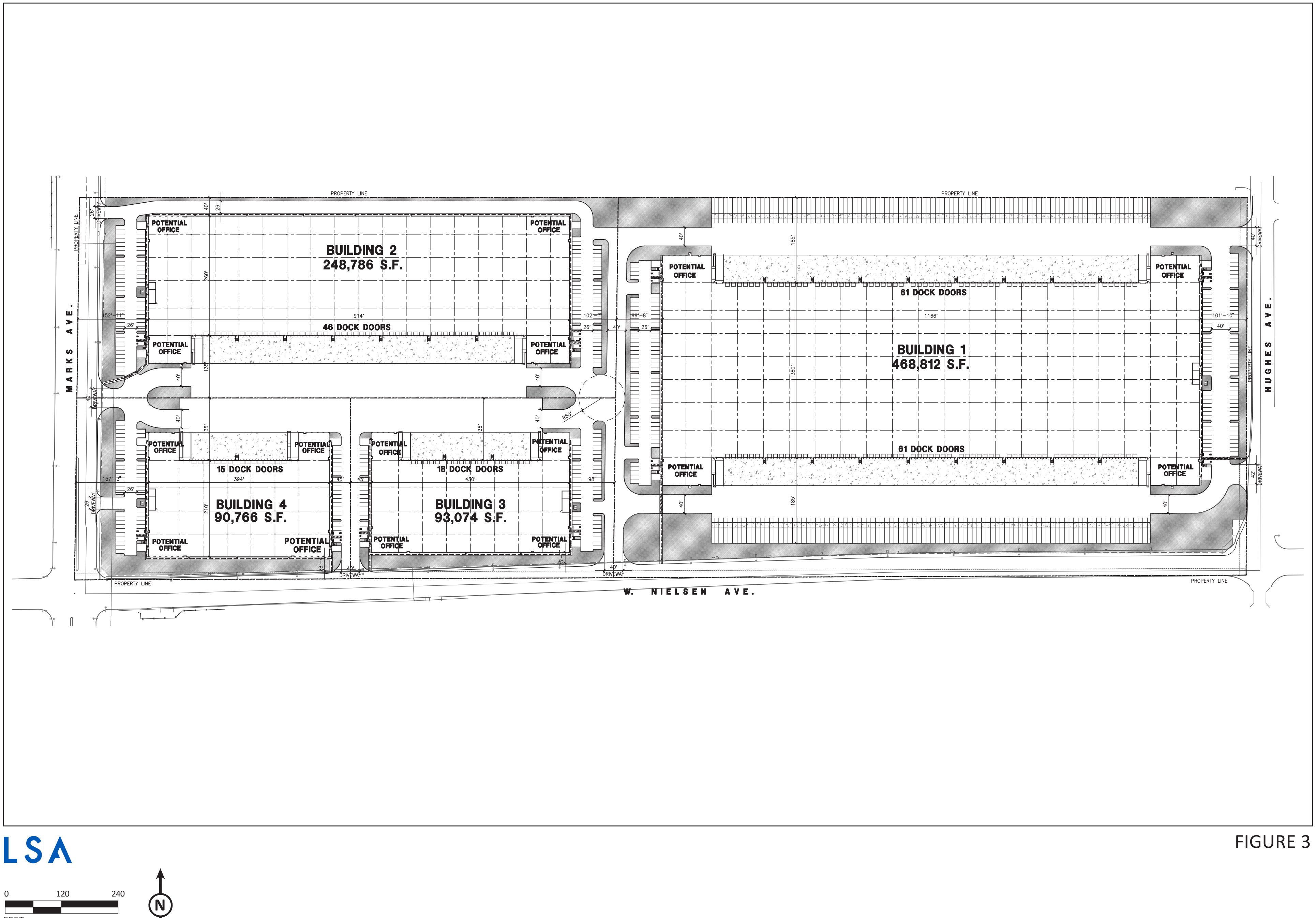


FIGURE 3

SOURCE: HPA Architecture, Inc., 2021

2740 West Nielsen Office/Warehouse Project
Site Plan

FreP:\SNN2102 2740 W. Nielsen\PRODUCTS\Graphics\Figure 3.ai (10/5/2021)

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, would be located along the eastern and western edges of the project site, and would be behind two 8-foot-tall gates, which would be installed to separate the general parking area from the truck storage and dock loading area.

Consistent with City requirements, drought-tolerant landscaping would be provided throughout the project site.

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. 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. 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. 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 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.

Construction of the proposed project is anticipated to occur in two phases over a total 24-month period. 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 Fresno.

WATER SUPPLY RIGHTS AND ENTITLEMENTS

The City of Fresno relies on groundwater from the North Kings Subbasin; surface water from the Central Valley Project (CVP), through a contract with the United States Bureau of Reclamation (USBR); Kings River water, through a contract with Fresno Irrigation District (FID); and recycled water to meet current and future water demands. The following pages are extracted directly from the 2020 UWMP (Pages 6-1 through 6-32) in satisfaction of Water Code sections 10910(A)(1) and 10910(D)(2). This information is applicable to the entire City of Fresno municipal water service area, including the project site.

GROUNDWATER

The City overlies the Kings Subbasin, which is part of the greater San Joaquin Valley Groundwater Basin. The City is one of many water purveyors that use groundwater from the Kings Subbasin.

The City has a network of over 270 municipal wells and currently operates approximately 202 municipal supply wells within the Kings Subbasin. Until late 2004, the City relied solely on groundwater to meet the water demands. The City's desire is to continue to use groundwater within a larger conjunctive use program that maximizes its existing water rights and surface water supply sources.

Basin Description

The Department of Water Resources (DWR) has partitioned the State into 10 major hydrologic regions (also referred to as "basins") and then further divided each basin into subbasins. The City is located in the Kings Subbasin (DWR Groundwater Subbasin Number 5-22.08) and lies within the larger San Joaquin Valley Groundwater Basin in the Central Valley of California. The Kings Subbasin covers approximately 1,530 square miles.

Basin Location

The San Joaquin Valley Groundwater Basin is bounded to the north by the Sacramento-San Joaquin Delta and Sacramento Valley, to the east by the Sierra Nevada, to the south by the San Emigdio and Tehachapi mountains, and to the west by the Coast Ranges. The Kings Subbasin, located within the southern half of the San Joaquin Valley Groundwater Basin, is bounded to the north by the San Joaquin River, to the east by the alluvium-granite rock interface of the Sierra Nevada foothills, to the south by the southern fork of the Kings River, and to the west by the Delta-Mendota and Westside Subbasins. The Kings Subbasin is split into seven Groundwater Sustainability Agency (GSA) management areas, with Fresno located in the North Kings GSA. Figure 6-1 of the 2020 UWMP illustrates the location of Fresno within the Kings Subbasin.

Area Geology

The upper several hundred feet of geology within the Kings Subbasin generally consists of highly permeable, coarse-grained deposits, which are termed older alluvium. Figure 6-2 of the 2020 UWMP presents an idealized hydrogeologic cross-section that illustrates the general depth of various lithologic features within the Kings Subbasin, near Fresno.

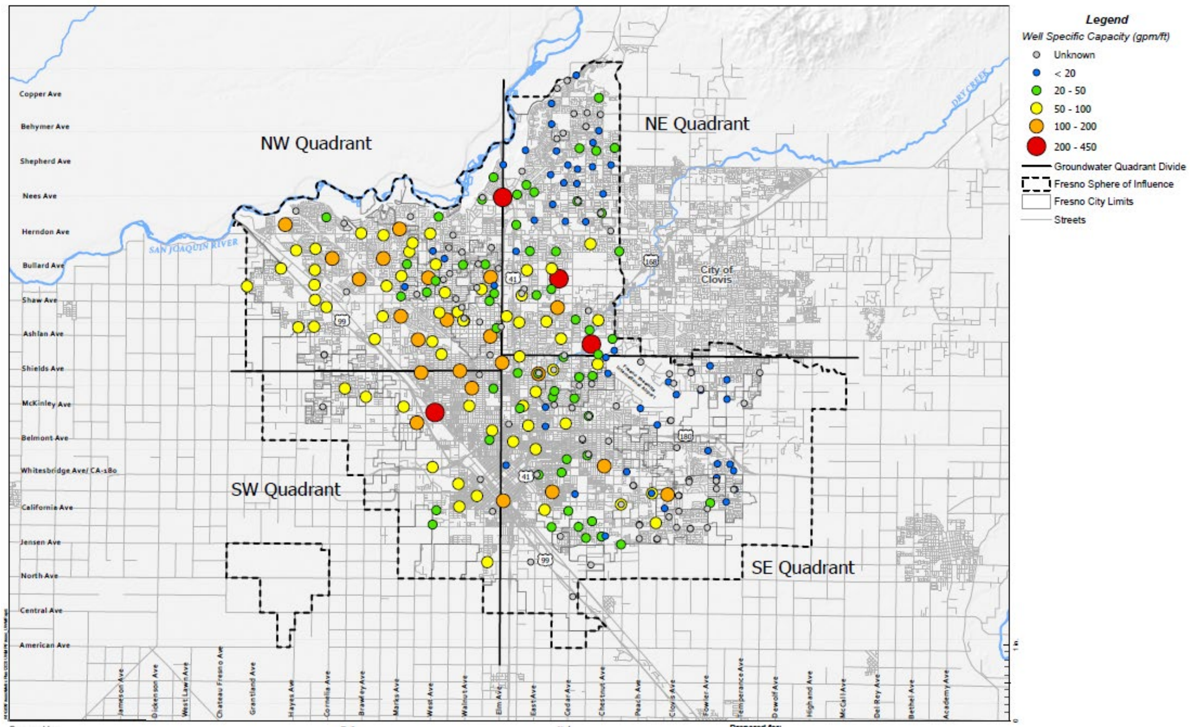
Coarse-grained stream channel deposits, associated with deposits by the ancestral San Joaquin and Kings Rivers, underlie much of northwest Fresno. There is a laterally extensive clay layer, at an average depth of approximately 250 feet below the ground surface, beneath most of the south and southeastern portions of Fresno.

Below the older alluvium, to depths ranging about 600–1,200 feet below ground surface, the finer-grained sediments of the tertiary-quaternary continental deposits are typically encountered. Substantial groundwater has been produced and utilized from these depths by the City. However, deeper deposits located in the southeastern and northern portions of Fresno have produced less groundwater.

There are also reduced deposits in the northern and eastern portions of Fresno, at depths generally below 700 or 800 feet, which are associated with high concentrations of iron, manganese, arsenic, hydrogen sulfide, and methane gas. Groundwater at these depths does not generally provide a significant source for municipal supply wells.

Aquifer Characteristics

The aquifer beneath Fresno was characterized using data compiled during aquifer tests performed at the City's production wells. As part of updating the detailed hydrogeologic evaluation, aquifer test data (pump tests) were reviewed to update the hydrogeologic analysis and evaluate the specific capacity data. The specific capacity indicates the ability of a particular well to produce water. Figure 4 shows the estimated specific capacity of each active well from early 2020 pump test data. As shown in the figure, the northwestern and southwestern portions of Fresno have wells with higher specific capacities.



Source: 2020 Urban Water Management Plan, Figure 6-3 (City of Fresno 2021).

Figure 4: City Wells Specific Capacity

Groundwater Management

In 2014, a three-bill legislative package was signed into law, composed of Assembly Bill 1739, SB 1168, and SB 1319, collectively known as the Sustainable Groundwater Management Act (SGMA) of 2014, which is codified in Section 10720 et seq. of the California Water Code. This legislation created a statutory framework for groundwater management in California that can be sustained during the planning and implementation horizon without causing undesirable results. SGMA requires governments and water agencies of "critically overdrafted" basins to reach sustainability by 2040. The Kings Subbasin was designated a critically overdrafted basin in the DWR's Bulletin 118. The North Kings GSA is working within the SGMA framework to reach groundwater sustainability.

The City was a founding member of the North Kings GSA, which consists of the following public agencies:

- FID
- City of Fresno
- City of Clovis
- City of Kerman
- County of Fresno

- Biola Community Services District
- Garfield Water District
- International Water District

The Kings Subbasin contains seven GSAs, including the North Kings GSA, as listed below and shown in Figure 6-1 of the 2020 UWMP:

- Central Kings GSA
- James Irrigation District GSA
- Kings River East GSA
- McMullin Area GSA
- North Kings GSA
- North Fork Kings GSA
- South Kings GSA

The seven GSAs operate cooperatively across the basin via a coordination agreement that ensures common approaches to sustainability items such as similarity of data usage and methodologies, consistent interpretations of the basin setting, and common assumptions and development of water budgets, monitoring networks, sustainable management criteria, and data management systems.

As required by SGMA, the North Kings GSA considers six sustainability indicators:

- Chronic lowering of groundwater levels, indicating significant and unreasonable depletion of supply

- Significant and unreasonable reduction of groundwater storage

- Significant and unreasonable seawater intrusion

- Significant and unreasonable degraded water quality

- Significant and unreasonable land subsidence

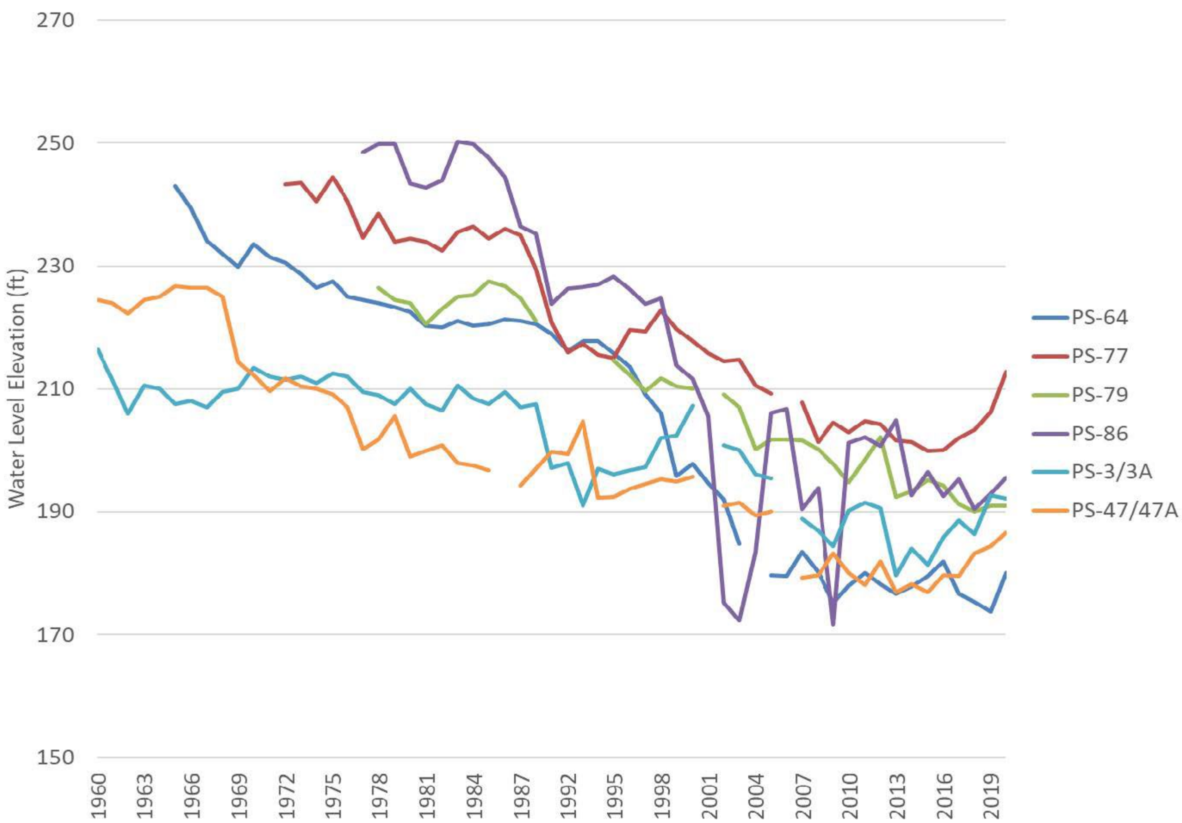
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

Each indicator has an identified undesirable result, measurable objective, and minimum threshold. The measurable objective and minimum threshold allow the North Kings GSA to evaluate their progress for the subject indicator and determine if conditions are improving, remaining stable or degrading. The sustainability indicators of primary concern within the City are groundwater levels, groundwater storage, and groundwater quality. The methodology for the water quality indicators has been developed and the methodology is still being developed for the groundwater levels and groundwater storage indicators. A copy of the Groundwater Sustainability Plan (GSP) is provided in Appendix G of the 2020 UWMP.

Overdraft Conditions

SGMA directs DWR to identify groundwater basins and subbasins in conditions of critical overdraft. As defined by SGMA, "A basin is subject to critical overdraft when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." As mentioned, DWR classifies the Kings Basin as being in a state of critical overdraft in its Bulletin 118, and the future of the groundwater basin has been projected to see continued overdraft conditions.

The Kings Subbasin groundwater aquifer supplies the City, other municipalities, agriculture, and rural residential areas with a consistent source of water. Like much of the Kings Subbasin, groundwater levels beneath Fresno were relatively shallow at 25 feet below ground surface in 1940, prior to the start of World War II. After the war, the State, including the City, began growing at a rapid rate. For the period from 1959 to 1968, it was reported groundwater levels declined at a rate of 2.8 feet per year. The City continued to rely on the groundwater aquifer for decades, monitoring groundwater levels continuously. Groundwater levels since 1990 have declined at a lower rate than previously. Rates of decline slowed further starting in 2004, when the Northeast Surface Water Treatment Facility (NESWTF) started operations and the City renewed focus on increasing groundwater recharge. In 2019 and 2020, surface water accounted for more than half of the total water supply in Fresno. With the reduced pumping due to higher reliance on surface water, the groundwater levels have begun to increase in certain areas of Fresno in the last few years. Figure 5 provides a depiction of the City's depth to groundwater for six representative wells across the Sphere of Influence (SOI) since 1960.



Source: 2020 Urban Water Management Plan, Figure 6-4 (City of Fresno 2021).

Figure 5: Time Series of Groundwater Levels at Representative Wells

The City expects to continue to operate its three surface water treatment facilities (SWTFs) and pump groundwater at a lower rate than historically so that the groundwater basin can recover. According to the 2020 UWMP, one of the City's primary objectives is to maximize the use of available surface water treatment supplies to reduce overall reliance on groundwater. Additionally, the City plans to continue its groundwater recharge program to protect the groundwater basin. Figure 6-5 of the 2020 UWMP shows the active and proposed recharge basins and FID Canals the City utilizes as part of groundwater recharge program.

Groundwater Quality

Groundwater within the North Kings Subbasin generally meets primary and secondary drinking water standards for municipal water use and is described as being bicarbonate-type water, including calcium, magnesium, and sodium as the dominant ions. Total dissolved solids (TDS) concentrations rarely exceed 600 milligrams per liter (mg/L) and range from 200 to 700 mg/L. However, the groundwater basin has been impacted by multiple chemical contaminants that affect the City's ability to fully utilize the groundwater basin resources without some type of wellhead treatment in certain areas.

Figure 6-6 of the 2020 UWMP presents the general location of regional plumes and major point sources within Fresno. The primary contaminants are nitrate, 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane (1,2,3-TCP), and other volatile organic compounds like trichloroethylene (TCE) and perchloroethylene (PCE). The City has received settlements in a number of lawsuits related to these contaminants and has constructed wellhead treatment systems and implemented blending plans for a number of wells. Approximately 40 City wells are being treated for contaminants such as PCE, DBCP, TCE, 1,2,3-TCP, perfluorooctanoic acid, perfluorooctanesulfonic acid, ethylene dibromide, and nitrate, and an additional 20 wells include treatment for iron, manganese, and hydrogen sulfide removal or corrosion control.

As shown in Figure 6-6 of the 2020 UWMP, extensive groundwater contamination nearly covers the City's entire water service area; only areas located in the northwest appear to be relatively unaffected by regional groundwater contamination. Also, many of the City's wells are impacted by one or more of the contaminant plumes (indicated by the presence of overlapping plumes on the figure). The figure also shows the approximately 93 existing active wells that are impacted by at least one contaminant plume and the 60 existing wells with wellhead treatment. The City is also managing contamination from spreading by pumping specific wells to control the plume.

Estimated Groundwater Yield

As part of the City's ongoing preparation of the Fresno Metropolitan Water Resource Management Plan (Metro Plan) update, the City is developing a storage accounting framework to estimate groundwater yield. The storage framework will track the City's groundwater recharge, pumping, and flows into and out of the City's SOI and incorporate bi-annual monitoring of well water level readings on a grid basis.

The most recent available information on the City's groundwater yield is from a hydrologic groundwater and surface water model that was prepared for the Upper Kings Basin Integrated Regional Water Management Authority. The City contributed additional funding to the effort so the model would be more refined for its service area and capable of assisting in the development of the City's previous Metro Plan. The Kings Basin Integrated Groundwater and Surface Water Model (IGSM) was completed in 2007 and provided outputs specific to the City's SOI. The IGSM was developed and calibrated utilizing data for the period of 1964–2004. Building off the calibrated IGSM, additional modeling was conducted in 2008 to evaluate the City's proposed water supply plan and its ability to attain the balanced use of groundwater by the buildout year of 2025. The estimated groundwater yield within the City's SOI presented in this section is based on the modeling efforts to establish the various natural elements of the underlying aquifer.

Natural Recharge

As a result of the IGSM effort, the long-term average deep percolation from rainfall and irrigation-applied water for the period of 1964–2004 was found to be 42,700 acre-feet per year (AFY) for the entire SOI. However, as urbanization continues within the SOI, the amount of deep percolation will decline because of increased runoff and less open land for natural recharge. For 2005, it was estimated deep percolation would be about 37,000 AFY and would reduce annually, ultimately declining to and remaining at 27,000 AFY by buildout in 2025. The current General Plan anticipates SOI buildout will occur in 2056. Holding the 2005 value of 37,000 AFY and extending the 27,000 AFY to 2056, intermediate values were straight-line interpolated. Additionally, the City currently covers 73,500 acres of the 100,277 acres within its SOI, representing 73 percent urbanization, which would approximate the City's water system service area. Table A shows estimated natural recharge through 2045.

Table A: Normal Year Supply and Demand Comparison (acre-feet per year)

	2020	2025	2030	2035	2040	2045
Natural Recharge[1]	24,970	25,480	25,910	26,280	26,570	26,790
Net Subsurface Inflow[1]	47,510	49,910	52,320	54,720	57,120	59,530
Sustainable Yield	**72,480**	**75,390**	**78,230**	**81,000**	**83,690**	**86,320**
Intentional Recharge[2]	60,000	62,700	65,400	68,100	70,800	73,500
Total Estimated Groundwater Yield	**132,480**	**138,090**	**143,630**	**149,100**	**154,490**	**159,820**

Source: 2020 Urban Water Management Plan, Table 6-1 (City of Fresno 2021).

[1] Based on the Kings Basin Integrated Groundwater and Surface Water Model and projected City land growth.

[2] Projected normal year intentional recharge from Table 4-7 of the 2020 Urban Water Management Plan.

Net Subsurface Inflow

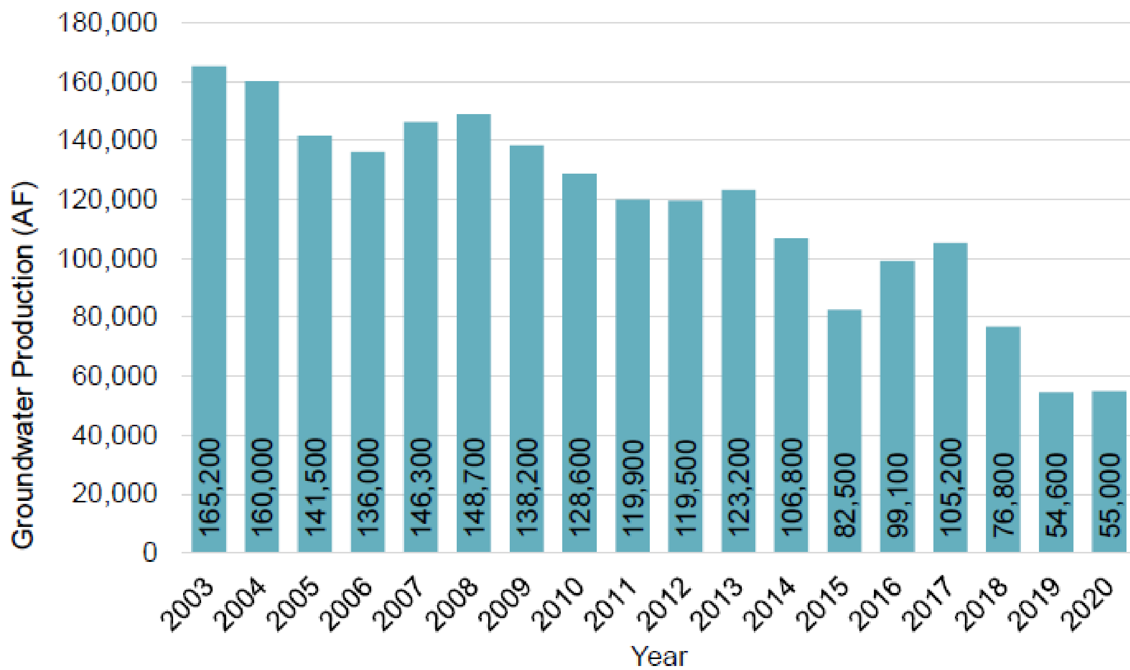
Again, utilizing information developed from the IGSM, average net subsurface inflow into the SOI was characterized as being 64,800 acre-feet (AF) annually for the period of 1964–2004. Applying the previously described 73 percent proportioning factor of the developed SOI area to overall SOI area, approximately 47,510 AFY would be attributed to the City's water service area in 2020. This value will increase in future years as the City annexes more land until the SOI is built out. Table A shows the estimated subsurface inflows for future years. The City has historically benefited from the net subsurface inflows and requires these flows for replenishment necessary to maintain the sustainable yield of the groundwater aquifer system.

Intentional Groundwater Recharge

The City has long made efforts toward offsetting the decline of groundwater levels and minimizing overdraft conditions through an active intentional recharge program that started in 1971. Through cooperative agreements with FMFCD and FID, the City has access to not only City-owned basins, but also those of these two agencies. Utilizing available surface water supplies, the City recharged on average approximately 60,000 AFY from 2000 to 2019; however, with the reduction in available surface water supplies, intentional recharge declined to 34,700 AF in 2014 and 19,800 AF in 2015, followed by an increase in recharge in years 2016, 2017, and 2019 to help replenish the aquifer. In 2019, the City's recharge of 82,993 AF was the maximum annual recharge attained during this period. The City has averaged over 60,000 AFY the previous 5 years and plans to gradually increase recharge by about 540 AFY each year. However, during wet years, the City will recharge more water when it is available to allow to the City to draw on additional groundwater during dry years, when surface water is not available. Intentional recharge is included in the non-potable demand projections as well as contributing to the estimated groundwater yield presented in Table A.

Historic Groundwater Pumping

The City has historically relied on groundwater as its main supply source prior to the construction of its SWTFs. With the recent investments in surface water infrastructure, the City has been able to drastically reduce its groundwater pumping. Figure 6 shows the historic groundwater pumping since 2003. As shown, pumping has dropped significantly since 2003, the City's peak year for groundwater production.



Source: 2020 Urban Water Management Plan, Figure 6-7 (City of Fresno 2021).

Figure 6: Historic Groundwater Production

SURFACE WATER

With the completion and operation of the Southeast Surface Water Treatment Facility (SESWTF), surface water is now a primary water supply used to meet potable demands within Fresno. The City contracts with FID for Kings River water and with the USBR for CVP water from the Friant-Kern Canal. The surface water supply is used either for potable uses through treatment and distribution or delivery to recharge basins for groundwater recharge. The Kings River water year (WY) is October through September, while USBR uses a WY of March through February. The City has historically used a calendar year (CY) for its analysis, so monthly water supply information was compiled in CY format for this report.

USBR Friant Division Contract Supply

The City, through an agreement originally executed in January 1961, secured a surface water supply from the USBR CVP Friant Division. This agreement, for an annual water supply of 60,000 AF of Class 1 water, was last renewed in 2010 as a Section 9(d) contract that provides water from the San Joaquin River in perpetuity. A copy of the renewed contract is provided in Appendix H of the UWMP. The USBR CVP Friant Division facilities generally include Friant Dam (Millerton Reservoir), the Friant-Kern Canal, and the Madera Canal. The Friant-Kern Canal is maintained and operated by the Friant Water Authority. The USBR water supply is a wholesale supply.

Construction of Friant Dam was completed in 1947, and the dam began making diversions to the Friant-Kern Canal in 1949. Full operations of the CVP Friant Division did not commence until the Madera Canal was completed in 1951. Class 1 water was intended to be a supply that would be dependable in practically every year, regardless of the type of hydrologic WY. Class 2 water is essentially excess water available as determined by USBR and is less reliable than Class 1 water.

Class 1 water was historically very reliable until the 2006 San Joaquin River Restoration Settlement Agreement between the departments of the Interior and Commerce, the Natural Resources Defense Council, and the Friant Water Users Authority (which is now the Friant Water Authority). The City is a member of the Friant Water Authority. The settlement ended an 18-year legal dispute over the operation of Friant Dam brought by a coalition of conservation and fishing groups. The agreement characterized Class 1 deliveries by six hydrologic year types based on a recurrence over an 82-year simulation (1922–2003): wet, normal-wet, normal-dry, dry, critical-high, and critical-low. The projected surface water available for the City from USBR during each hydrologic year defined by the 2006 Settlement Agreement is summarized in Table B. As shown in the table, the average simulated delivery is 53,680 AFY and the median simulated delivery, which is similar to normal year delivery, is 60,000 AFY. The median value is higher than the average value because 100% allocation of 60,000 AF is simulated in 50 of 82 years but the dry and critical years result in substantial reductions, which bring down the average allocation.

Table B: Available USBR Simulated Allocation (1922-2003)

Water Year Type	Percent of Years over Simulation Period of Deliveries[1]	Number of Years in that Year Type	Range of Allocation to City (AF)	Average Allocation to City (AF)
Wet	Highest 20%	16	60,000	60,000
Normal-Wet	50% to 80%	25	60,000	60,000
Normal-Dry	20% to 50%	25	47,500 to 60,000	57,060
Dry	5% to 20%	12	28,100 to 46,800	36,575
Critical[2]	Lowest 5%	4	13,900 to 24,700	19,025
Total		**82**	**Average**	**53,680**
			Median	**60,000**

Source: 2020 Urban Water Management Plan, Table 6-2 (City of Fresno 2021).
[1] As defined in 2006 Settlement Agreement
[2] Includes both critical-high and critical-low, which are differentiated by the amount of unimpaired runoff. The simulation uses deliveries through 2006 and does not include the zero allocation years in 2014 and 2015.
AF = acre-feet

The Settlement Agreement estimates the reduced supply available to the City compared to historic supplies, most evident in dry years. Restrictions on exports from the Delta have hindered the USBR from making deliveries to the Exchange Contractors via the Delta-Mendota Canal. The Exchange Contractors allowed the formation of the CVP Friant Division by agreeing to not exercise their historic pre-1914 water rights to the San Joaquin and Kings rivers if guaranteed water deliveries continued through the Delta-Mendota Canal or other facilities. If USBR is unable to deliver water to the Exchange Contractors, they have the right to receive their water from the San Joaquin River, which reduces the Class 1 water availability.

Reduced deliveries from the Delta to the Exchange Contractors resulted in the CVP Friant Division contractors with zero allocations of Class 1 water in USBR WY 2014 and 2015, though the City received USBR deliveries in CY 2014 (prior to the USBR WY starting in March). Annual USBR deliveries since 2007 are shown in Figure 6-6 of the 2020 UWMP.

In addition to the Class 1 water available to the City, the USBR contract also makes available water classified as: recovered water account water; Section 215 water; and unreleased restoration flows, unreleased recirculation flows, and uncontrolled season flows. The complexities of each water type are beyond the scope of this report but are mentioned here to reflect the other water acquisition opportunities afforded to the City through this contract. The San Joaquin River water supply has excellent water quality as it originates from snowmelt from the high Sierras and has not been detrimentally impacted.

Fresno Irrigation District Supply

FID is one of 28 agencies that receives an entitlement of water from the Kings River through the Kings River Water Association. Water entitlements for Kings River Water Association contract members are determined based on a methodology that was initially developed in 1917–1919 to establish entitlements for early claimed rights holders. The methodology was based on historic mean daily natural flow conditions at Piedra, which is approximately 3 miles downstream from the then yet to be built Pine Flat Dam and "at the heart of Kings River uses, regulation, and stream control and storage."

On December 20, 2016, the Revised, Amended, and Restated Cooperative Agreement was executed between FID and the City for Water Utilization and Conveyance (2016 FID Agreement). The 2016 FID Agreement replaces the 1976 Cooperative Agreement and ends in 2035. The agreement identifies the City's contracted percentage of FID's Kings River water based on the City's water service area located within the FID service area as a percentage of the FID land area. FID land area varies slightly every year because it is dependent on the acreage receiving water deliveries for that year rather than the total acreage within FID (roughly 200,000 acres). As the City incorporates new land area into its service area, the percentage of FID supply increases. However, the 2016 FID Agreement sets the maximum percentage as 29.0 percent, although the City's service area is anticipated to expand and encompass more than 29.0 percent of FID's service area between 2025 and 2030. In 2020, the City's percentage of overall FID Kings River deliveries was 25.79 percent. The FID Agreement identifies that the 29.0 percent maximum was based on moderate growth in Growth Area 1 of the City's SOI (shown in Exhibit C in the 2016 Agreement). As such, the supply projections in this plan limit the City's FID supply with the 29.0 percent cap, but if the agreement were revised in the future the City's FID allocation percentage could grow beyond 29.0 percent as the water service area expands.

The City has historically not used all of its available allocation in any given year, although it pays a flat rate for its total allocation regardless of use. Water unused by the City is reallocated by FID to its other customers.

The City's potential supply from FID was summarized using actual Kings River deliveries for CYs 1964–2019, then categorized by the same WY types used for the USBR Friant supply. The range and average FID deliveries by WY type are shown in Table C. The average of all 56 CY delivery totals of FID Kings River deliveries is 452,541 AF, which equates to an average potential City supply of 131,237 AF, assuming the maximum 29.0 percent City supply percentage. Table D lists the historic and projected allocation of FID's Kings River water for the City in normal (average) CYs. The City percentage of FID supplies was estimated assuming the City's water service area will grow from 59,100 acres to 84,300 acres by buildout.

Table C: FID Diversions by Water Year Type (1964 to 2019)

Water Year Type	Percent of Years[1]	Number of Years between 194 and 2019	Total FID Deliveries (AF)[2]		Example Average Available to City[3]
			Range	Average	
Wet	Highest 20%	11	563,500 to 644,600	590,700	171,300
Normal-Wet	50% to 80%	17	452,800 to 563,300	513,700	149,000
Normal-Dry	20% to 50%	17	362,600 to 448,000	415,000	120,400
Dry	5% to 20%	8	253,700 to 362,000	315,700	91,600
Critical	Lowest 5%	3	158,100 to 253,300	210,200	61,000
		56	**Average**	**453,800**	**131,600**

Source: 2020 Urban Water Management Plan, Table 6-3 (City of Fresno 2021).

1 As defined in the 2006 Settlement Agreement

2 Assigns water year type defined in the 2006 Settlement Agreement to FID deliveries from 1964 to 2019.

3 Based on the maximum 29.0 percent City supply percentage to provide an example City supply amount.

AF = acre-feet

Table D: Projected FID Kings River Allocation for City, Normal Years

Year	Projected Total FID Allocation, AFY	Projected Allocation to City, AFY[1]
2025	27.55%	125,030
2030	29.00%	131,600
2035	29.00%	131,600
2040	29.00%	131,600
2045	29.00%	131,600

Source: 2020 Urban Water Management Plan, Table 6-4 (City of Fresno 2021).
[1] Projected City Allocation (%) x 453,800 AFY (estimated normal year diversion by FID, per Table 6-3 of the 2020 Urban Water Management Plan [Table G])
AFY = acre-feet per year
FID = Fresno Irrigation Dis

STORMWATER

The Fresno-Clovis Metropolitan Area and surrounding rural vicinities are within the service area boundaries of the FMFCD, which has primary responsibility for managing the local stormwater flows. Most stormwater in Fresno drains to urban stormwater basins, where the water is retained to attenuate peak-flow runoff and recharge stormwater, or is pumped to local irrigation canals for conveyance away from the municipal areas. FMFCD's operation of stormwater basins is predicated on maintaining storage capacity for rain events, which limits accessibility for recharge activities during the rainy season. FMFCD estimates the amount of stormwater that is recharged each wet season. However, recharge attained with the FMFCD basins largely occurs in May through October, when limited storage capacity is required. Dry-season recharge is accomplished by diverting surface waters from the Kings River and Millerton Reservoir using City-allocated surface water. It is difficult to estimate stormwater recharge volumes as there is no physical measurement of stormwater flows into the basins, and infiltration rates can vary with water elevation and degree of siltation in the basin. However, FMFCD estimates that stormwater recharge in urban basins during the winter months may range from 7,000 AF per year to 22,200 AF per year.

WASTEWATER AND RECYCLED WATER

Recycled Water Coordination

The City is currently expanding its recycled water supplies to increase offset use of potable water for landscape irrigation. In 2010, the City completed a Recycled Water Master Plan (adopted by the City Council in 2013) to evaluate and plan for increased recycled water use in Fresno. The City's last Metro Plan, adopted in 2014, also outlined projects to increase the use of recycled water to offset potable demands. The City is currently updating the Metro

Plan and will reevaluate recommendations and projects to increase recycled water use. The City owns and operates two water reclamation facilities (WRFs): (1) the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) and (2) the North Fresno Wastewater Reclamation Facility (NFWRF), both of which can produce Title 22 recycled water for use within the City's service area.

Coordination with other water agencies and potential consumers within the planning area is inherently within the purview of the City's Department of Public Utilities (DPU) as this department provides both water and wastewater services. DPU has been on the forefront of numerous water supply preservation, enhancement, and development projects and programs for decades. The concept of multiagency coordination is fully embraced by the department, as is evident with the previously discussed joint agency agreements and the commitment to construct new infrastructure to further develop new resources. The endeavor to develop recycled water as a resource was a requirement of a development in north Fresno, where the developer was conditioned to have a net-zero impact on water resources. The fundamental component of this development was the construction and dedication of the NFWRF to the City.

There are only a few agencies besides the City that have wastewater collection and treatment facilities within and immediately adjacent to the plan area. These agencies include the City of Clovis, Malaga County Water District, Pinedale County Water District, and Pinedale Public Utility District.

As the City is the primary responsible agency for wastewater collection and treatment for its annexed areas and certain County islands, it has taken the lead role of developing and implementing recycled water facilities to serve the same area.

City of Clovis

The RWRF was developed under a Joint Powers Authority agreement executed in 1977 among the City of Fresno, the City of Clovis, and the County of Fresno. Both of the cities contribute to the cost of operations and maintenance and capital expenditures for the RWRF based on formulas in the agreement. This facility provides service for most of Clovis' sewer flows.

The City of Clovis recently constructed its own wastewater treatment facility that produces tertiary-level effluent and is distributed in a dedicated purple pipe system within portions of its service area.

County of Fresno

The County of Fresno, like the City of Clovis, is a party to the RWRF Joint Powers Authority for treatment of flows from unincorporated areas encompassed by the City's service area.

Malaga County Water District

Malaga County Water District provides water and sewer service to an unincorporated County area of about 2.25 square miles, which covers a small portion of the City's SOI. The district provides wastewater collection and treatment for residential and non-residential customers.

Pinedale County Water District

Pinedale County Water District provides water, sewer, and solid waste service to an area of about 2 square miles, which covers an unincorporated County island and a portion of Fresno. The district provides wastewater collection to an area of 699 acres and diverts the flow to the City's collection system for treatment at the RWRF.

Pinedale Public Utility District

Pinedale Public Utility District provides wastewater, street lighting, street sweeping, and landscape maintenance. The district services an area of 362 acres in the northern portion of Fresno, serving both an unincorporated County island and portions of the city. The collected wastewater is diverted to the City's collection system for treatment at the RWRF.

Wastewater Collection, Treatment, and Disposal

The City's wastewater collection system was originally developed in 1891 with the installation of a 24-inch outfall sewer that discharged to a 40-acre sewer farm located southwest of town. The amount of land and number of facilities at this location continued to be expanded as Fresno grew over the years. Today, the City's wastewater collection system consists of about 1,630 miles of pipes ranging in size from 4 inches in diameter to 84 inches in diameter. This collection system also utilizes 15 lift stations throughout Fresno, ranging in pumping capacity from 0.25 million gallons per day (mgd) to 2.2 mgd.

Wastewater Treatment and Discharge Within Service Area

The City is served by two wastewater treatment plants, briefly described below.

Fresno-Clovis Regional Wastewater Reclamation Facility. The RWRF has developed from what was once a sewer farm to a state-of-the-art wastewater treatment facility. In 1966, the City of Fresno was appointed the sewering agency for the local metropolitan region and shortly after began long-range planning and construction of new facilities to handle increasing flows and regulatory requirements. The RWRF treats flows from not only Fresno, but also sewered County areas (some County areas remain unsewered), the City of Clovis, Pinedale County Water District, and Pinedale Public Utility District.

Flows received at this facility peaked at 81,100 AF in 2006 and have been steadily decreasing since, with the average influent flow about 63,000 AF over the last 5 years. The

RWRF includes preliminary, primary, secondary, and tertiary treatment units with disinfection. Secondary treatment consists of three treatment trains with an annual average capacity of 87 mgd, consisting of 30 mgd for Train A and 57 mgd for Trains B and C combined. In 2017, a 5 mgd tertiary treatment system—the Tertiary Treatment and Disinfection Facility (TTDF)—was completed. The system can be expanded to 15 mgd and ultimately to 30 mgd.

The City has three primary means of effluent disposal:

1. Undisinfected secondary effluent to on-site and off-site farmland for restricted irrigation
2. Undisinfected secondary effluent to percolation ponds
3. Disinfected tertiary effluent to the recycled water distribution system

The percolated effluent has been deemed equivalent to Title 22 tertiary-treated water by the State Water Resources Control Board (SWRCB) Department of Drinking Water (DDW). The City has been extracting this water for reuse in areas within and surrounding the RWRF, as well as to FID's canals, through an exchange agreement for delivery to FID agricultural customers.

The discharged effluent is within the City boundaries and located just southwest of the metropolitan area. The treated effluent percolation ponds are within the City's SOI and hydrologic sphere that benefit the City's overall regional water budget.

North Fresno Wastewater Reclamation Facility. The NFWRF was constructed as part of a residential, commercial, and golf course master planned development located in the northern portion of Fresno. As a condition of the planned community, the developer was required to construct a wastewater treatment facility that would produce tertiary-level effluent for use within the development to ensure the overall project had a net-zero impact on water resources. This facility is presently rated at 0.71 mgd (average monthly flow) and 1.07 mgd (maximum daily flow). However, the ultraviolet (UV) light disinfection system was only validated for 300 gallons per minute (gpm) (0.43 mgd), which is the current flow limit until the DDW approves a higher flow. This facility is expandable to 1.25 mgd (average monthly flow). The disinfected tertiary effluent from the plant is largely used to irrigate the Copper River Ranch Golf Course. Of the 325 AF of wastewater treated in 2020, 54 AF was used for irrigation of turf. Treated but unused effluent is diverted to the City's collection system to the RWRF.

Recycled Water System Description

The 2014 Metro Plan recommended expanding reuse by: (1) using the NFWRF effluent to irrigate the Copper River Ranch Golf Course; and (2) deriving up to 25,000 AFY of recycled water for landscape irrigation or other non-potable uses from the RWRF or new satellite WRFs. Since then, the City has irrigated the Copper River Ranch Golf Course with recycled water and has constructed much of the southwest recycled water distribution system. However, the City is currently updating the Metro Plan and reevaluating the target volume of reuse in Fresno beyond the southwest system considering new conditions and regulations, including the potential for potable reuse in the future.

Fresno-Clovis Regional Wastewater Reclamation Facility

As mentioned above, the RWRF produces undisinfected secondary effluent for restricted irrigation to on-site and off-site farmlands and disinfected tertiary-treated effluent for the recycled water distribution system.

The City's RWRF diverts a portion of the undisinfected secondary effluent to irrigate non-food crops grown adjacent to this facility. The practice of using the secondary effluent to irrigate non-food crops has been carried out for decades and is expected to continue for the foreseeable future. The City owns nearly 3,300 acres of land for and around the RWRF, consisting of percolation ponds (1,750 acres) and other land available to farm non-food crops. Table E provides the annual quantities of recycled water applied to these crops for the period from 2015 to 2019.

Table E: Historic Recycled Water Used Within Service Area (AF)

Recycle Water Facility	2015	2015	2017	2018	2019	2020
RWRF, Secondary Effluent (Non-Food Crop Irrigation)	8,688	7,329	4,540	7,031	3,652	3,845
RWRF, Tertiary Effluent	531	485	423	867	912	858
NFWRF	62	110	0	0	19	54
Total	**9,281**	**7,924**	**4,963**	**7,898**	**4,583**	**4,757**

Source: 2020 Urban Water Management Plan, Table 6-5 (City of Fresno 2021).
Note: Reuse at the NFWRF was zero in 2017 and 2018 because the recycled water delivery system was offline for system repairs.
AF = acre-feet
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility

Additionally, the RWRF produces Title 22 disinfected tertiary-treated effluent through the TTDF completed in 2017 and through tertiary-equivalent soil aquifer-treated recycled water recovered from the percolated secondary effluent. A series of 15 groundwater wells located at the RWRF are used to extract previously percolated effluent groundwater from beneath the facility. The extracted groundwater has the potential to be used for higher beneficial use if it can be demonstrated this water has attained a level of treatment satisfactory to meet disinfected tertiary levels. The City embarked on a joint project with the WateReuse Research Foundation to demonstrate to State regulatory agencies the soil aquifer-treated recycled water met Title 22 levels. The culmination of this study is presented in a final report entitled "Demonstration of Filtration and Disinfection Compliance Through Soil-Aquifer Treatment," which was completed in 2013. This study concluded that, based on the documented sampled water quality data, the extracted groundwater met requirements for classification as disinfected tertiary-level recycled water. The SWRCB DDW stated that the percolated effluent water meets the tertiary treatment classification, and the City is making plans for its use as part of its recycled water production and distribution system. The combined rated production yield of the 15 wells, if run year-round, would be approximately 32,000 AFY. The City plans to blend the recycled extraction well water with the disinfected tertiary-level recycled water produced from the 5 mgd TTDF to feed the southwest recycled water distribution system. As new sales grow for the recycled water, additional recycled extraction of well water will be utilized to feed the City's southwest recycled water system.

The tertiary-equivalent soil aquifer-treated recycled water (recovered groundwater) is also used for on-site irrigation and transport to FID canals for delivery to customers during the irrigation season, as facilitated through an exchange agreement with FID.

Since the completion of the 2010 Recycled Water Master Plan (RWMP), the City has constructed most of the southwest recycled water system, shown in Figure 6-9 of the UWMP. The southwest recycled water system consists of a 3.2-million-gallon recycled water reservoir located at the RWRF, a 6,000 gpm (8.64 mgd) recycled water pump station located at the RWRF, a 640 gpm booster pump station (Roeding Park Booster), and 15.7 miles of 10-inch to 54-inch recycled water pipeline. Roughly 7.5 miles of pipeline remain to be constructed. The City also updated the demand and distribution system from the 2010 RWMP with the 2019 Citywide Recycled Water Demand and Southwest Recycled Water System Analysis to identify potential recycled water customers. This recent analysis will be incorporated into the latest Metro Plan update.

North Fresno Water Reclamation Facility

As described earlier, the City has an existing recycled water plant in the northern portion of Fresno that receives and treats sewage from the residential, commercial, and golf course master-planned community. The NFWRF was constructed in 2008 but was not fully operational until 2009 due to the inability to run properly in extremely low-flow conditions. Subsequent modifications at the plant allowed it to run on a regular basis in 2010 and again in 2014 for UV approval. The amount of reuse has varied substantially since 2016 because the delivery system was offline in 2017 and 2018 for treated water basin slope repairs. City staff indicated that 2016 is representative of operations going forward. The disinfected tertiary effluent is conveyed in a dedicated pipeline to an adjacent golf course for irrigation purposes. The quantities used for irrigation purposes are shown in Table E for the period of 2015–2019.

Potential, Current, and Project Recycled Water Rates

The 2020 actual recycled water use and projected recycled water use in Fresno's service area is included in Table F. Secondary undisinfected reuse is projected to continue to be used to irrigate non-food crops adjacent to the RWRF in the future. The projected secondary undisinfected use going forward is based on the average use from 2015 to 2020. Additionally, the amount of tertiary recycled water from the RWRF is projected to increase to provide 6,210 AF for landscape and agricultural irrigation as the southwest recycled water system is built out. Projected tertiary recycled water from the NFWRF for golf course irrigation is projected to be 110 AF annually through 2045.

The 2015 UWMP anticipated that 21,200 AFY of recycled water would be produced and utilized in 2020. The previous projected increases in recycled water were based on recommendations from the 2010 RWMP, which included projects to increase recycled water use for landscape irrigation, agricultural irrigation, industrial use, and blending with raw surface water for groundwater recharge. Since the 2010 RWMP, the City has focused on constructing the southwest recycled water system to increase landscape and agricultural irrigation in the southwest portion of Fresno. The City is also currently updating the Metro Plan that is evaluating recycled water alternatives in Fresno and is expected to update its RWMP following the Metro Plan update to serve as a new guiding planning document for recycled water use by the City.

Table F: Recycled Water within Service Area

Beneficial Use Type	Potential Beneficial Uses of Recycled Water	Number of Potential Uses of Recycled Water (AF)	General Description of 2020 Uses	Level of Treatment	2020 (AF)	2025 (AF)	2030 (AF)	2035 (AF)	2040 (AF)	2045 (AF)
Agricultural irrigation[1]	Non-food crop irrigation	7,900	Irrigate non-food crops	Secondary, Undisinfected	3,845	7,900	7,900	7,900	7,900	7,900
Landscape irrigation (excludes golf course)	Landscape irrigation	5,800	Landscape irrigation; distributed through the southwest recycled water distribution system	Tertiary	858	5,800	5,800	5,800	5,800	5,800
Agricultural irrigation[1]	Food crop irrigation	410	Irrigate limited food crops; distributed through the southwest recycled water distribution system	Tertiary	-	410	410	410	410	410
Golf course irrigation	Landscape irrigation	110	Copper River Golf Course	Tertiary	54	110	110	110	110	110
-				**Total:**	**4,757**	**14,220**	**14,220**	**14,220**	**14,220**	**14,220**

Source: 2020 Urban Water Management Plan, Table 6-6 (City of Fresno 2021).
Table footnotes continued on next page.

Notes: Name of Supplier Producing (Treating) the Recycled Water: City of Fresno
Name of Supplier Operating the Recycled Water Distribution System: City of Fresno
Supplemental Volume of Water Added in 2020: 0%
Source of 2020 Supplemental Water: N/A

[1] Recycled water for agricultural irrigation does not offset the City's potable water demands, and as such, is excluded from projected recycled water in subsequent tables.

AF = acre-feet

Actions to Encourage and Optimize Future Water Use

The 2010 RWMP identified the need for the City to adopt an ordinance to establish a recycled water policy and criteria for its use within the City's SOI. On July 14, 2014, the Recycled Water Ordinance was adopted by the City Council, laying the foundation for the expanded use of recycled water within Fresno.

The focus of the ordinance includes the following:

- Establish an Administrative Authority.
- Establish approved uses of recycled water.
- Define areas of potential eligibility for recycled water service.
- Specify voluntary uses of recycled water, depending on user classifications.
- Require installation of a transmission and distribution infrastructure.
- Encourage the use of voluntary retrofits for existing users that may not be addressed in the ordinance.
- Require the City of Fresno to prepare Rules and Regulations.
- Provide enforcement and severability clauses.
- Establishing a means for the City to provide recycled water at a negotiated price.

Efforts to further the use of recycled water include the requirement that new developments within planned major recycled water distribution mains must install purple pipe. Then, as the City's capital projects construct a distribution infrastructure, these segments will be in place to facilitate connections to new customers, reduce program costs by avoiding digging up new street improvements, and reduce disruption to vehicular traffic.

Most of the southwest recycled water distribution system from the RWRF completed construction in 2021. The City has identified potential customers to connect to the recycled water system once it is completed to offset potable demand and increase recycled water use in Fresno.

DESALINATED WATER OPPORTUNITIES

Fresno is located in the central San Joaquin Valley; therefore, seawater desalination is not applicable to the City. Additionally, the groundwater that exists within the immediate area of Fresno is not brackish in nature and does not require desalination treatment.

WATER EXCHANGES AND TRANSFERS

Exchanges and Transfer Opportunities

USBRR Supply

The Central Valley Project Improvement Act (CVPIA) of 1992 authorized the transfer of all or a portion of a CVP contractor's water supply to any other California water users or water agencies. The CVPIA allows water transfers as long as they are consistent with federal and State water laws. The primary component of the CVPIA that specifies water transfer provisions for federal water supplies is Section 3405(a), which includes provisions regarding maximum annual water transfer, beneficial use, and approvals.

As part of the City's current Metro Plan update, the City is evaluating potential future water transfers and exchanges of its periodically available USBR water. Currently, the City does not have any plans to transfer its USBR water to other California water users.

FID/RWRF Groundwater Exchange Supply

Since 1974, the City has had an agreement with FID to exchange recycled water for the delivery of surface water east of Fresno (Appendix I of the 2020 UWMP). The agreement between fid and the city for exchange of recycled water allows for water pumped from beneath the RWRF to be conveyed to FID's Dry Creek and Houghton canals for delivery to growers west of Fresno. In exchange for the water delivered to FID by the City, FID agreed to deliver 46% of the total from either its Kings River entitlement or USBR Class II supply to growers or basins in the eastern portion of FID "insofar as is feasible and practical." The water is to be considered additional to the water that would have been delivered to the eastern portion of FID, such that the additional delivered water used by growers is assumed to offset groundwater pumping in the area and, therefore, provide a groundwater basin benefit. This is an indirect benefit to the City.

The agreement includes a minimum of 100,000 AF delivered over a 10-year period and no more than 30,000 AF in any given year. As shown in Figure 6-10 of the 2020 UWMP, the City exceeded the maximum yearly delivery in 2003 and 2004 and has maintained more than 100,000 AF of deliveries over a 10-year period. However, since 2016, the City has reduced RWRF groundwater exchange deliveries. The City is currently discussing an update to the agreement with FID, while the 2020 Metro Plan will identify and recommend other beneficial uses for the City's percolated effluent.

Emergency Interties

In 2007, the cities of Fresno and Clovis executed an agreement for interconnection of their potable water systems to provide service during emergencies and other times of hardship in either community. The agreement covers interconnections, including apportionment of capital costs, at two locations: Leonard Avenue at the Gould Canal alignment and Behymer Avenue at Willow Avenue.

The agreement provided for temporary deliveries from Clovis to southeast Fresno through the Leonard Avenue connection through 2013. The Leonard Avenue interconnection was constructed and remains in place for emergency uses through manual operation.

The agreement also provided for temporary deliveries from Fresno to northern Clovis through the Behymer Avenue connection through 2015. However, the Behymer Avenue interconnection has yet to be constructed and, if constructed in the future, would serve only for emergency use.

FUTURE WATER PROJECTS

The City is currently updating its Metro Plan, which will recommend programs and projects to improve the City's water supply portfolio and continue providing a safe, reliable, and sustainable water supply. While the outcomes of the Metro Plan update are currently being developed, the City's ongoing and future projects to improve its supply portfolio include:

- Expansion of the recycled water distribution system
- Expansion of the groundwater recharge program
- Expansion of surface water treatment capacity
- Beneficial transfers and exchanges

Expand Recycled Water Distribution System

As described above, the City has made significant improvements to its recycled water system over the last 5 years and is currently expanding its recycled water distribution system. The expanded distribution system allows an additional 5,000 AF of recycled water use in the City to offset potable demands that can be used in all hydrological year types. The expansion is projected to be completed by 2025.

Expand Groundwater Recharge Capacity

With the acknowledgement that the groundwater aquifer is and will remain an integral resource, the City is currently evaluating an expanded recharge program as part of the Metro Plan update. Expanding intentional recharge may include the development of new dedicated intentional recharge facilities and/or joint projects for basins with FMFCD and potentially FID. The target for recharge expansion is to maximize storage within the groundwater basin and optimize use of available surface water supplies in normal years. The stored water will be used more in the single-dry-year and consecutive-dry-years scenarios, when surface water supplies are less available. The timing for groundwater recharge capacity expansion will be examined as part of the Metro Plan update and, for the

UWMP, is assumed to increase to allow for an additional 540 AFY of recharge to occur on average each year.

Expand Surface Water Treatment Capacity

A key component to the success of the City's ability to reverse the long-time overreliance on groundwater is the construction of its surface water treatment facilities. These have allowed the City to optimize the use of available surface water supplies. The City's NESWTF currently has a 30 mgd capacity and the capability to expand up to 60 mgd. The SESWTF is currently permitted to produce up to 54 mgd but, with the subsequent rerating of the media filters, will be capable of operating at a rated capacity of 80 mgd. The timing for the SWTF expansion will be examined as part of the Metro Plan update and determined based on need as the City grows and demands increase.

Beneficial Transfers and Exchanges

The City is evaluating future beneficial transfers and exchanges of the City's USBR water in normal water years when available water supplies exceed demands.

SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

Summaries of the above-discussed existing and planned sources of water are provided in Table G and Table H below.

Table G: Actual Water Supplies

Water Supply	2020	
	Actual Volume, AFY	Water Quality
Groundwater	55,028	Drinking Water
USBR CVP	37,447	Drinking Water
FID Kings River	71,292	Drinking Water
Recycled Water, RWRF	858	Recycled Water
Recycled Water, NFWRF	54	Recycled Water
Total	**164,679**	

Source: 2020 Urban Water Management Plan, Table 6-7 (City of Fresno 2021).
AFY = acre-feet per year
CVP = Central Valley Project
FID = Fresno Irrigation District
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility
USBR = United States Bureau of Reclamation

Table H: Projected Water Supplies

Water Supply	Reasonably Available Volume, AFY				
	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
USBR CVP	60,000	60,000	60,000	60,000	60,000
FID Kings River	125,030	131,600	131,600	131,600	131,600
Recycled Water, RWRF	5,800	5,800	5,800	5,800	5,800
Recycled Water, NFWRF	110	110	110	110	110
Total	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**

Source: 2020 Urban Water Management Plan, Table 6-8 (City of Fresno 2021).
AFY = acre-feet per year
CVP = Central Valley Project
FID = Fresno Irrigation District
NFWRF = North Fresno Wastewater Reclamation Facility
RWRF = Regional Wastewater Reclamation Facility
USBR = United States Bureau of Reclamation

Supply Management

The City currently balances its surface water supplies and groundwater based on minimum production for operation of the SWTFs and minimum groundwater pumping to manage and control contamination plumes and prevent their spread. The minimum operation conditions typically occur in the low-demand winter months, and the City can increase surface water production during peak-demand months when surface water is available. In normal and wet years, the City intends to rely on more surface water supply and recharge raw surface water to replenish the groundwater basin and build storage for dry years. In dry years, when surface water is less available, the City will ramp up well production to meet demands. The City is expected to continue this supply management strategy in the future.

Special Conditions

This section details climate change and future regulatory conditions that impact the City's supply sources.

Climate Change Effects

Climate models disagree on average annual precipitation projections but agree on other hydrologic metrics relevant to water resources management, including:

- Snowpack declines
- Increased fraction of precipitation on extreme rainfall days
- Shorter, sharper rainy season
- Increased evapotranspiration
- Higher frequency of extremely wet and extremely dry years
- Higher incidence of an extreme dry year followed by an extreme wet year or vice versa

Climate change impacts were evaluated in the North Kings GSP using DWR climate change datasets, which were developed for the California Water Commission's Water Storage Investment Program (WSIP). The North Kings GSP analyzed WSIP water supply projections and found climate change will have no significant impact on the FID Kings River diversions. The North Kings GSP estimates the timing of the inflows to water reservoir and surface water supplies is anticipated to shift significantly due to warmer temperatures causing precipitation to arrive as rainfall instead of snowmelt. The warmer temperatures are also predicted to cause the snowmelt to turn to runoff earlier each spring. These climate impacts are estimated in the North Kings GSP to slightly increase inflows to the Kings River (0.6% in 2040 and 0.3% in 2070); however, they are not expected to impact the Kings River diversions significantly, and the timing will have a greater impact on water management, including a possible greater need for additional storage. The North Kings GSP also estimated climate impacts to the San Joaquin River supplies available to the CVP Friant Division Contractors, including the City's USBR Class I supplies, and found the WSIP dataset estimates a slight reduction in future water supplies. The 2020 UWMP considers water supply during an extreme-dry-year or multi-dry-year scenario, which may occur more often due to climate change.

Regulatory Conditions

The City has existing contracts for its surface water supplies that are not facing any reduction due to forthcoming regulation. The City's groundwater supply is from an unadjudicated basin and is also considered reliable. The GSA is currently working toward determining a safe yield for the Kings Subbasin, which is the amount of water than can be pumped from the basin over a long-term period without producing undesirable results. The City is an active member of the GSA, working collaboratively to bring the basin into balance while protecting the City's groundwater supply.

Additionally, forthcoming California regulations for per- and polyfluoroalkyl substances (PFAS) may impact certain wells within Fresno. The City is currently monitoring and treating some groundwater wells for PFAS. These regulations are not expected to impact the City's ability to use its full groundwater supply.

ENERGY INTENSITY

Pursuant to California Water Code Section 10631.2(a), readily available information regarding energy intensity shall be reported in the 2020 UWMP. For the City, this includes the total energy usage at each production facility, including each well site and the three SWTFs. The electrical usage includes the energy to produce, treat, and pump the water into the distribution system. Because the City's distribution system includes over 200 groundwater wells, Table I presents the total energy usage, water produced, and average energy intensity for all groundwater wells and for each SWTF following the methodology presented in Appendix O of the DWR 2020 UWMP Guidebook. The energy intensity varies significantly among groundwater wells depending on the depth to the groundwater table, if the well includes treatment beyond disinfection, and other local conditions. The total energy intensity for all production and treatment in the City's distribution system in 2020 was 384 kilowatt-hours per AF.

Table I: Water System Energy Intensity in 2020

	Wells	NESWTF	SESWTF	T-3 SWTF	Total
Groundwater	27,667,366	5,845,314	13,416,000	454,470	**47,386,150**
USBR CVP	56,445	20,724	45,367	875	**123,411**
FID Kings River	490	282	296	520	**384**

Source: 2020 Urban Water Management Plan, Table 6-9 (City of Fresno 2021).
CVP = Central Valley Project
FID = Fresno Irrigation District
NESWTF = Northeast Surface Water Treatment Facility
SESWTF = Southeast Surface Water Treatment Facility
T-3 SWTF T-3 = Water Storage and Modular Surface Water Treatment Facility
USBR = United States Bureau of Reclamation

WATER SUPPLY

This section discusses projected supplies and demands for a normal year, single dry year, and 5-year consecutive drought. As shown in Table J, the City is projected to have greater than 100,000 AF of available supply after meeting demands in normal years. As shown in Table K, the City's surface water supplies are reduced in a single dry year, but all potable demands are met and groundwater recharge of raw surface water is reduced. As shown in Table L, the City is projected to meet all demands during a 5-year drought with its existing supplies. Potable demands are unrestricted, and non-potable water used for groundwater recharge is reduced in years 3 and 4 of a 5-year drought.

Table J: Normal Year Supply and Demand Comparison (acre-feet per year)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	60,000	60,000	60,000	60,000	60,000
Surface Water – FID	125,030	131,600	131,600	131,600	131,600
Recycled Water	5,910	5,910	,5910	5,910	5,910
Supply Totals	**329,030**	**341,140**	**346,610**	**352,000**	**357,330**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
Difference	**129,826**	**128,384**	**124,300**	**120,124**	**115,883**

Source: 2020 Urban Water Management Plan, Table 7-1 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

Table K: Single Dry Year Supply and Demand Comparison (acre-feet per year)

	2025	2030	2035	2040	2045
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	45,852	45,852	45,852	45,852	45,852
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**189,852**	**159,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	27,588	28,776	29,964	31,152	32,340
Demand Totals	**164,092**	**176,132**	**184,174**	**192,228**	**200,287**
Difference	**25,760**	**19,260**	**16,668**	**14,024**	**11,295**

Source: 2020 Urban Water Management Plan, Table 7-2 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

Table L: Multiple Dry Years Supply and Demand Comparison

	2025	2030	2035	2040	2045
First Year					
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	30,000	30,000	30,000	30,000	30,000
Surface Water – FID	99,725	99,725	99,725	99,725	99,725
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**273,725**	**279,265**	**284,735**	**290,125**	**295,455**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
Difference	**74,521**	**66,509**	**62,425**	**58,249**	**54,008**
Second Year					
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	37,200	37,200	37,200	37,200	37,200

Table L: Multiple Dry Years Supply and Demand Comparison

	2025	2030	2035	2040	2045
Surface Water – FID	93,426	93,426	93,426	93,426	93,426
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**274,626**	**280,166**	**285,636**	**291,026**	**296,356**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**
Difference	**75,422**	**67,410**	**63,326**	**59,150**	**54,909**
Third Year					
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	73,568	73,568	73,568	73,568	73,568
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**217,568**	**223,108**	**228,578**	**233,968**	**239,298**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	53,763	46,281	43,526	40,677	37,761
Demand Totals	**190,267**	**193,637**	**197,736**	**201,753**	**205,708**
Difference	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fourth Year					
Groundwater	138,090	143,630	149,100	154,490	159,820
Surface Water – USBR	0	0	0	0	0
Surface Water – FID	45,852	45,852	45,852	45,852	45,852
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**189,852**	**195,392**	**200,862**	**206,252**	**211,582**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	26,047	18,564	15,810	12,960	10,045
Demand Totals	**162,551**	**165,920**	**170,020**	**174,036**	**177,992**
Difference	**27,301**	**29,471**	**30,842**	**32,215**	**33,589**
Fifth Year					
Groundwater	138,090	143,630	149,100	154,490	159,820

Table L: Multiple Dry Years Supply and Demand Comparison

	2025	2030	2035	2040	2045
Surface Water – USBR	45,000	45,000	45,000	45,000	45,000
Surface Water – FID	125,840	125,840	125,840	125,840	125,840
Recycled Water	5,910	5,910	5,910	5,910	5,910
Supply Totals	**314,840**	**320,380**	**325,580**	**331,240**	**336,570**
Potable Demand	136,504	147,356	154,210	161,076	167,947
Non-Potable Demand	62,700	65,400	68,100	70,800	73,500
Demand Totals	**199,204**	**212,756**	**222,310**	**231,876**	**241,449**
Difference	**115,636**	**107,624**	**103,540**	**99,364**	**95,123**

Source: 2020 Urban Water Management Plan, Table 7-3 (City of Fresno 2021).
FID = Fresno Irrigation District
USBR = United States Bureau of Reclamation

CONTINGENCY ANALYSIS APPLICABLITY

The City's adopted 2020 UWMP contains an overview of the City's Water Shortage Contingency Plan (WSCP). The City's WSCP is used to provide guidance to the City's governing body and staff and the public by identifying response actions to allow for efficient management of any water shortage with predictability and accountability. Preparation provides the tools to maintain reliable supplies and reduce the impacts of supply interruptions due to extended drought and catastrophic supply interruptions. The WSCP, applicable to the entire City of Fresno municipal water service area, is fully applicable to the project and protective of the adequacy of the project's water supply.

As discussed in the 2020 UWMP, the WSCP describes the following:

1. **Water Supply Reliability Analysis:** Summarizes the City's water supply analysis and reliability and identifies any key issues that may trigger a shortage condition

2. **Annual Water Supply and Demand Assessment Procedures:** Describes the key data inputs, evaluation criteria, and methodology for assessing the system's reliability for the coming year and the steps to formally declare any water shortage levels and response actions

3. **Six Standard Shortage Stages:** Establishes water shortage levels to clearly identify and prepare for shortages

4. **Shortage Response Actions:** Describes the response actions that may be implemented or considered for each stage to reduce gaps between supply and demand as well as minimize social and economic impacts to the community

5. **Communication Protocols:** Describes communication protocols under each stage to ensure customers, the public, and government agencies are informed of shortage conditions and requirements

6. **Compliance and Enforcement:** Defines compliance and enforcement actions available to administer demand reductions

7. **Legal Authority:** Lists the legal documents that grant the City the authority to declare a water shortage and implement and enforce response actions

8. **Financial Consequences of WSCP Implementation:** Describes the anticipated financial impact of implementing water shortage stages and identifies mitigation strategies to offset financial burdens

9. **Monitoring and Reporting:** Summarizes the monitoring and reporting techniques to evaluate the effectiveness of shortage response actions and overall WSCP implementation, with results used to determine if additional shortage response actions should be activated or if efforts are successful and response actions should be reduced

10. **WSCP Refinement Procedures:** Describes the factors that may trigger updates to the WSCP and outlines how to complete an update

11. **Special Water Features Distinctions:** Identifies exemptions for ponds, lakes, fountains, pools, and spas, etc.

12. **Plan Adoption, Submittal, and Availability:** Describes the process for the WSCP adoption, submittal, and availability after each revision

As identified in the 2020 UWMP, the 2020 WSCP is included as Appendix J to the 2020 UWMP.

WATER DEMAND

This section discusses the citywide future estimated water use and estimated water demand associated with the proposed project.

CITYWIDE DEMAND FACTORS FOR WATER USE

The City's 2020 UWMP estimated future water demands based on land use demand factors using 2018 metered consumption data. These demand factors were applied to the 2020 land use acreage by category to develop the demand projection beginning in 2020. Demand factors for land uses that grow over time and represent new developments were assigned a lower demand factor than the demand factors for existing development. Additionally, demand factors were assumed to slowly reduce over time due to passive conservation, which includes the replacement of older water fixtures and appliances with more efficient types. Table M shows the projected annual water use by land use type for 2025, 2030, 2035, 2040, and 2045.

Table M: Citywide Demands for Potable and Non-Potable Water (acre-feet per year)

Use Type	2025	2030	2035	2040	2045
Single-Family	76,255	80,429	82,934	85,437	87,936
Multi-Family	19,000	20,654	21,737	22,831	23,935
Commercial[1]	19,052	21,135	22,587	24,041	25,496
Industrial	7,410	9,003	9,922	10,841	11,758
Landscape	4,490	5,035	5,422	5,809	6,196
Groundwater Recharge[2]	62,700	65,400	68,100	70,800	73,500
Other[3]	200	200	200	200	200
Losses	10,097	10,900	11,408	11,917	12,426
Total	**199,204**	**212,756**	**222,310**	**231,876**	**241,447**

Source: 2020 Urban Water Management Plan, Tables 4-6 and 4-7 (City of Fresno 2021).
Notes:
1 Includes industrial/governmental uses.
2 Raw water.
3 Travel meters.

As shown in Table M, overall water demands are projected to increase from 199,204 AFY in 2025 to 241,447 AFY in 2045, an increase of approximately 21 percent. The increase in water use for industrial uses is projected to increase at a faster rate of approximately 59 percent over the same period, from 7,410 AFY in 2025 to 11,758 AFY in 2045. Based on Table 4-3 of the 2020 UWMP, industrial acreage is expected to increase from 4,500 acres in

2020 to 9,300 acres in 2056, an increase of approximately 107 percent. As discussed above, demand factors for land uses that grow over time and represent new developments were assigned a lower demand factor than the demand factors for existing development.

PROPOSED PROJECT WATER DEMAND

Methodology

The potable demand projections in the 2020 UWMP for normal water use utilize land use-based projections. Under this methodology, existing land use and demand was accounted separately from future land use and demand. This allows different demand factors to be applied to current land use areas and future land use areas. Future land use areas represent future customers and developments that are expected to be more water-efficient than existing land uses and buildings due to the California Plumbing Code (CPC) and use of higher-efficiency appliances and landscapes.

The existing and future land use acreage was sourced from the City's Geographic Information System (GIS) database and the City's General Plan. The existing land use shapefile and associated acreage for each land use classification were used to represent 2020 land use data. Areas not served by the City were excluded from the existing land use shapefile. The future land use shapefile corresponds with the planned land use at buildout as described in the City's General Plan representing the year 2056. Although the City does not have any plans to serve areas currently served by others within the City limits, all areas within the City's SOI were assumed to be served by the City by buildout for conservative planning purposes. Table N lists the land use acreage by land use category for the 2020 and buildout 2056 water service areas used in the City's 2020 UWMP.

Table N: Existing and Future Water Service Area Acreage

Land Use Category	2020 Water Service Area [1,3,4]		2056 Water Service Area[2]	
	Acres	Percent	Acres	Percent
Single-Family Residential	27,700	47%	40,000	47%
Multifamily Residential	3,700	6%	3,800	5%
Commercial	4,500	8%	8,600	10%
Public Facility	5,600	9%	7,200	9%
Industrial	4,500	8%	9,300	11%
Open Space/Landscape Irrigation	13,100	22%	11,000	13%
Mixed Use[3]	0	0%	3,900	5%
Downtown[3]	0	0%	600	1%
Total	**59,100**	**100%**	**84,300**	**100%**

Source: 2020 Urban Water Management Plan, Table 4-3 (City of Fresno 2021).

Notes:

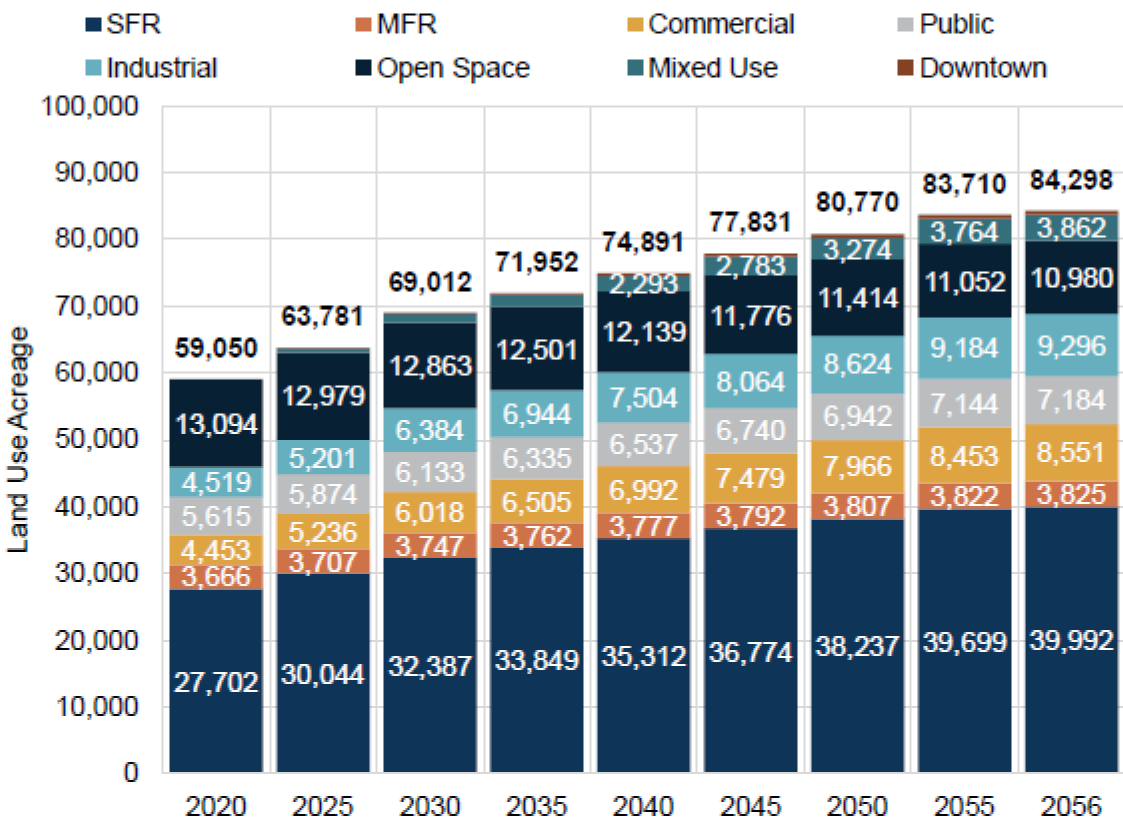
1 Acreage from City of Fresno GIS Shapefile of Land Uses provided 8/12/20 and reduced to the City's water service area (excludes Pinedale, Bakman, and California State University, Fresno, as well as unserved areas outside the City limits and SOI).

2 Future land use shapefile provided by the City on 8/12/20 and aligns with the General Plan for buildout in year 2056. The buildout service area acreage listed excludes the Fresno-Clovis Regional Wastewater Reclamation Facility; land used for road, highways, and railroads; and the north area outside of the SOI.

3 Mixed use and downtown land use categories are not in the existing land use shapefile. They are described in the General Plan as new designations for redevelopment of existing areas that contain a mix of land uses.

4 Approximately 11,300 acres of non-water-demanding vacant/partially vacant land is excluded from the 2020 water service area acreage.

The land use acreage between 2020 and 2056 was estimated in 5-year increments based on areas planned to be developed by 2030 from the City's Planning Department, and by linearly interpolating the remainder of the change in acreage for each land use category between 2030 and 2056. Figure 7 shows the existing and projected land use by customer class used to develop the projections.



Source: 2020 Urban Water Management Plan, Figure 4-3 (City of Fresno 2021).

Figure 7: Existing and Projected Land Use

Assumptions

Project-specific water demand was calculated using the methodology from the 2020 UWMP, as described above, based on the following assumptions:

- Figure 7 above (Figure 4-3 of the 2020 UWMP) indicates there will be 5,201 acres of industrial uses in Fresno in 2025.
- Table M above (Table 4-6 of the 2020 UWMP) indicates the projected water demand for industrial land uses in 2025 will be 7,410 AFY.

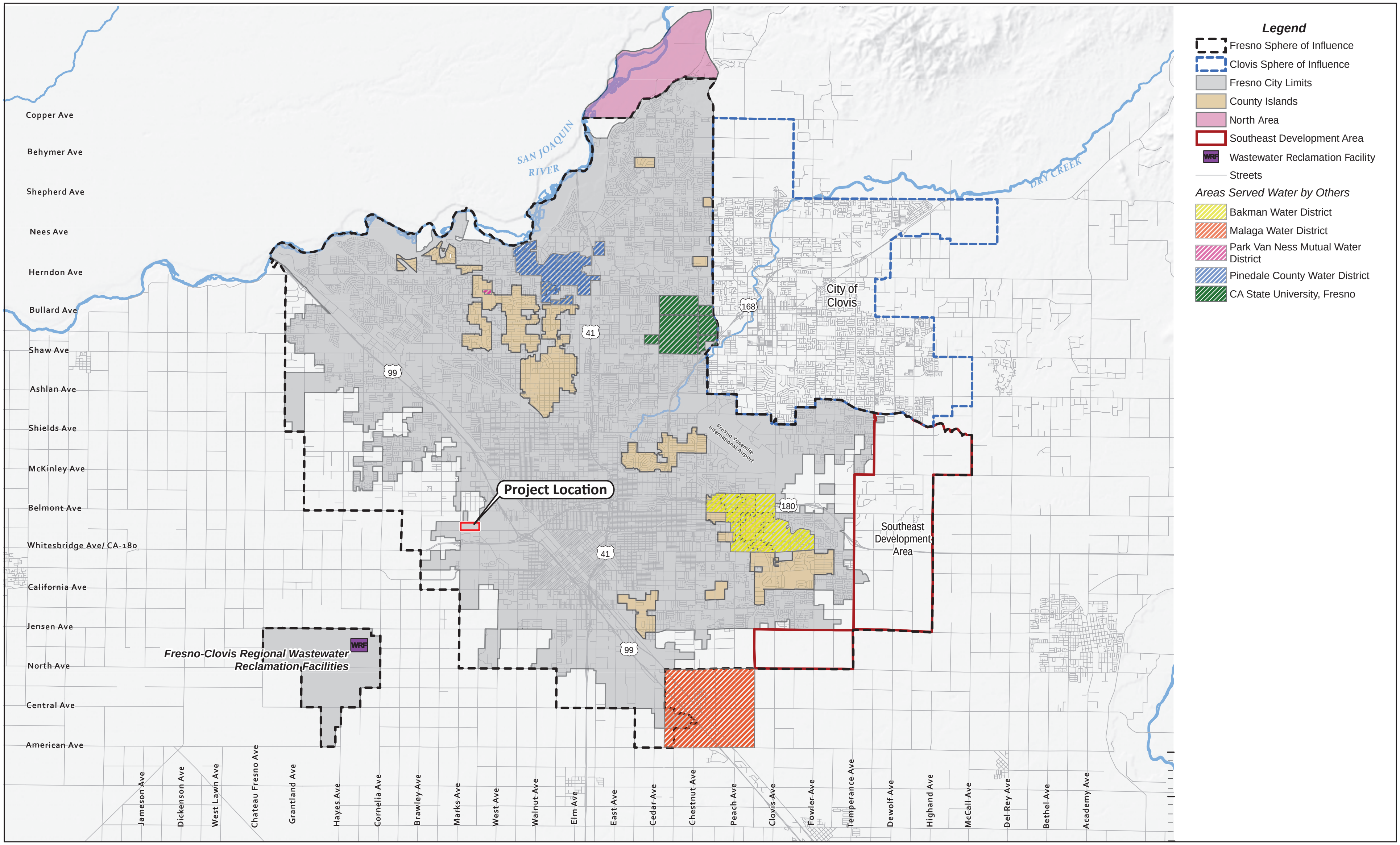
Therefore, it is assumed that industrial land uses, such as the proposed project, will demand approximately 1.42 AFY per acre in 2025.

Proposed Project Water Demand

The total project site is 48.03 acres. Therefore, based on the assumptions identified above, the proposed project is estimated to demand approximately 68.2 AFY.

APPLICABILITY OF THE URBAN WATER MANAGEMENT PLAN

The proposed project site is included in the land use area covered by the City's 2020 UWMP. Figure 8 shows the location of the project site in relation to the water service area boundaries covered by the 2020 UWMP. In addition, Figure 9 shows the proposed project's designation of Heavy Industrial. As shown in Table 4-3 of the 2020 UWMP, land use acreages and water demand in the 2020 UWMP were based on the City's General Plan land use designations for 2020 and buildout in 2056. As such, as shown in Figure 9, the acreage associated with the proposed project was assumed Industrial in the 2020 UWMP; therefore, it is assumed that demand for water was accounted for in the 2020 UWMP. There is no evidence, in consideration of the calculated project water demand, that such demand exceeds that estimated in the 2020 UWMP. The adequacy of the water supply for the project is thus consistent with the basis of the analysis of the City's water supply in the adopted 2020 UWMP.



LSA

FIGURE 8

Project Site Boundary

N

0 1.5 3

MILES

2740 West Nielsen Office/Warehouse Project

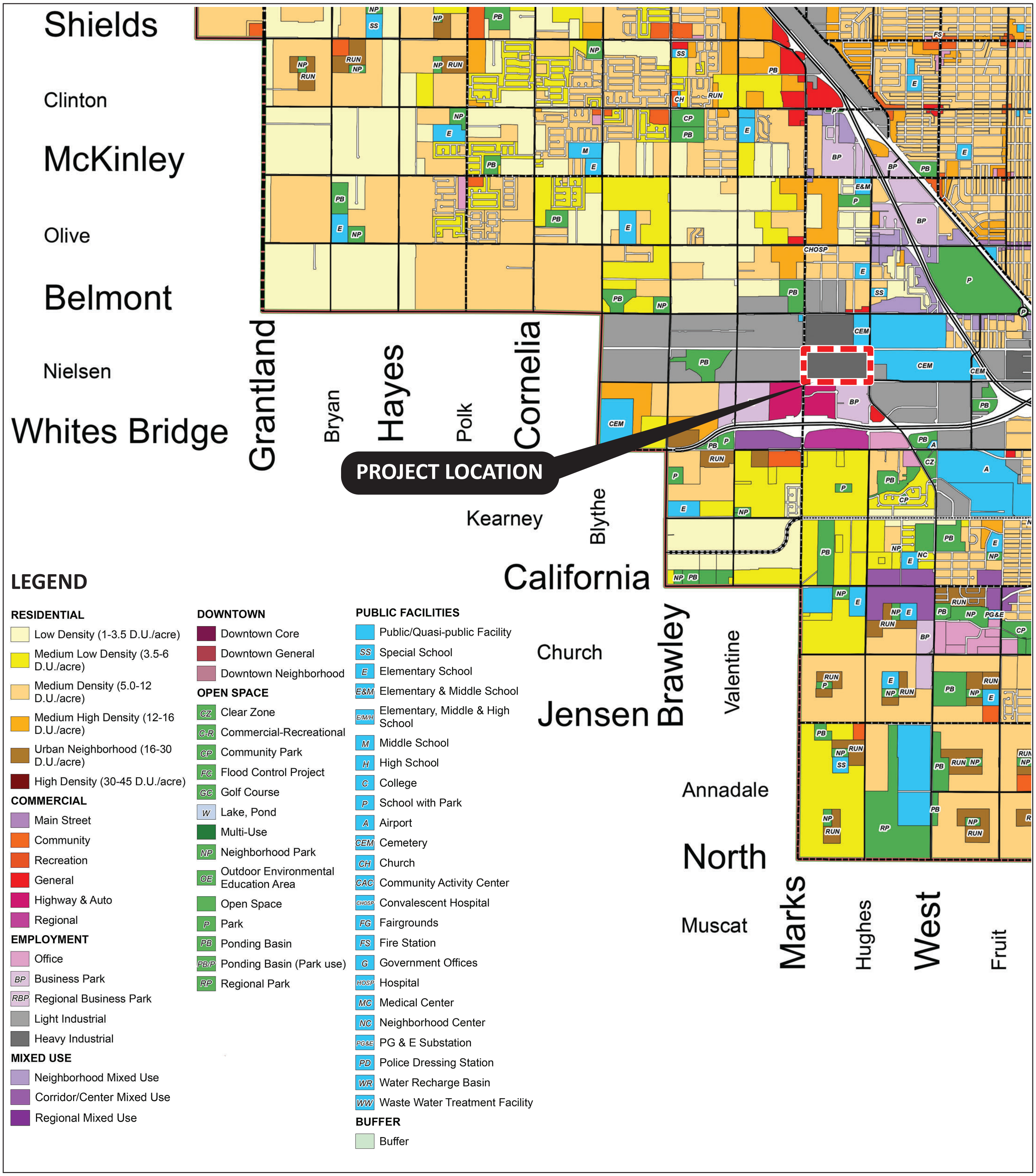
Project Site in Relation to the 2020 UWMP Water Service Area Boundaries

SOURCE: Source: 2020 Urban Water Management Plan, Figure 3-1 (City of Fresno 2021).

I:\SNN2102\G\Fig 8_Proj Site Relation to UWMP Boundaries.ai (7/20/2022)

LSA

FIGURE 9



NOT TO SCALE

SOURCE: City of Fresno, 2022

2740 West Nielsen Office/Warehouse Project

Project Site General Plan Land Use Designation

ASSESSMENT FINDINGS

It is concluded that the City of Fresno's water system has sufficient capacity to supply the proposed 2740 West Nielsen Avenue Office/Warehouse Project and other projected demands within the City's service area through the year 2045. Therefore, it is recommended that the City of Fresno Water Division approve this assessment and forward the report to the City of Fresno Planning Department for inclusion in the CEQA documentation for the proposed project.

APPENDIX L

NOISE IMPACT ANALYSIS MEMORANDUM

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LSA

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

MEMORANDUM

DATE: February 3, 2023

TO: Jake Kurth, Scannell Properties

FROM: JT Stephens, Principal

SUBJECT: Noise Impact Analysis Memorandum for the 2740 West Nielsen Avenue Office/Warehouse Project

LSA has prepared a technical noise impact analysis memorandum for the proposed 2740 West Nielsen Avenue Office/Warehouse Project (project) in Fresno, Fresno County, California. This technical noise impact analysis memorandum evaluates the potential noise and vibration impacts and noise reduction measures associated with the project. This analysis includes a description of existing regulatory framework and an assessment of project-related construction and operational noise and vibration emissions. Measures to reduce or eliminate significant impacts are discussed.

PROJECT DESCRIPTION

The currently vacant 48.03-acre project site is at 2740 West Nielsen (Assessor's Parcel Numbers 458-020-71 and 458-020-72) in the Fresno, in Fresno 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 location map is shown as Figure 1 (all figures are provided in Attachment A).

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 907,780 square feet. The buildings' exteriors would be up to 44 feet high with an interior height of up to 36 feet and designed with a total of 193 loading dock doors on the north and south sides of the buildings. Building 1 would be 468,760 square feet and would provide 122 loading dock doors, Building 2 would be 248,820 square feet and would provide 45 loading dock doors, Building 3 would be 96,250 square feet and would provide 14 loading dock doors, and Building 4 would be 93,850 square feet and would provide 11 loading dock doors. The project site plan is shown in Figure 2.

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 fewer hours than covered in this analysis.

Construction of the proposed project is anticipated in two phases taking place over a total 24-month period starting in the third quarter of 2023 and ending in 2025. The first phase would include the construction of Buildings 2, 3, and 4 and would last 12 months. The second phase would include the construction of Building 1 and would last 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 Fresno.

Sensitive Receptors and Land Uses in the Project Vicinity

Sensitive receptors include residences, schools, hospitals, and similar uses that are sensitive to noise and vibration. 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 approximately 110 feet south of the project site across West Nielsen Avenue.

BACKGROUND

Characteristics of Sound

Noise is usually defined as unwanted sound and consists of any sound that may produce physiological or psychological damage and/or interfere with communication, work, rest, recreation, or sleep. To the human ear, sound has two significant characteristics: pitch and loudness. Pitch is generally related to annoyance, while loudness can affect our ability to hear through hearing damage. Pitch is the number of complete vibrations, or cycles per second, of a wave, resulting in the tone's range from high to low. Loudness is the strength of a sound that describes a noisy or quiet environment and is measured by the amplitude of the sound wave. Loudness is determined by the intensity of the sound waves, combined with the reception characteristics of the human ear. Sound pressure refers to how hard the sound wave strikes an object, which in turn produces the sound's effect. This characteristic of sound can be measured precisely with instruments. The project analysis defines the noise environment of the planning area in terms of sound pressure levels and the project's effect on sensitive land uses.

Measurement of Sound

Sound intensity is measured with the A-weighted decibel scale to correct for the relative frequency response of the human ear. That is, an A-weighted noise level de-emphasizes low and very high frequencies of sound, similar to the human ear's de-emphasis of these frequencies. Decibels, unlike linear units (e.g., inches or pounds), are measured on a logarithmic scale representing points on a sharply rising curve.

For example, 10 decibels (dB) is 10 times more intense than 1 dB, 20 dB is 100 times more intense than 1 dB, and 30 dB is 1,000 times more intense than 1 dB. Thirty decibels (30 dB) represents 1,000 times as much acoustic energy as 1 dB. The decibel scale increases as the square of the change, representing the sound pressure energy. A sound as soft as human breathing is about 10 times greater than 0 dB. The decibel system of measuring sound gives a rough connection between the physical intensity of sound and its perceived loudness to the human ear. A 10 dB increase in sound level is perceived by the human ear as only a doubling of the sound's loudness. Ambient sounds generally range from 30 dB (very quiet) to 100 dB (very loud).

Sound levels generate from a source, and their decibel level decreases as the distance from that source increases. Sound levels dissipate exponentially with distance from their noise sources. For a single point source, sound levels decrease approximately 6 dB for each doubling of distance from the source. This drop-off rate is appropriate for noise generated by stationary equipment. If noise is produced by a line source (e.g., highway traffic or railroad operations) the sound decreases 3 dB for each doubling of distance in a hard site environment. Line source sound levels decrease 4.5 dB for each doubling of distance in a relatively flat environment with absorptive vegetation.

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. The 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} and Community Noise Equivalent Level (CNEL) or the day-night average noise level (L_{dn}) based on A-weighted decibels (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 noise occurring from 7:00 p.m. to 10:00 p.m. (defined as relaxation hours) and a 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 relaxation and sleeping hours. CNEL and L_{dn} are within 1 dBA of each other and are normally interchangeable. The City uses the CNEL noise scale for long-term noise impact assessment.

Other noise rating scales of importance when assessing the annoyance factor include the maximum instantaneous noise level (L_{max}), which is the highest exponential time-averaged sound level that occurs during a stated time period. The noise environments discussed in this analysis for short-term noise impacts are specified in terms of maximum levels denoted by L_{max}, which reflects peak operating conditions and addresses the annoying aspects of intermittent noise. It is often used together with another noise scale, or noise standards in terms of percentile noise levels, in noise ordinances for enforcement purposes. For example, the L_{10} noise level represents the noise level exceeded 10 percent of the time during a stated period. The L_{50} noise level represents the median noise level. Half the time the noise level exceeds this level, and half the time it is less than this level. The L_{90} noise level represents the noise level exceeded 90 percent of the time and is considered the background noise level during a monitoring period. For a relatively constant noise source, the L_{eq} and L_{50} are approximately the same.

Noise impacts can be described in three categories. The first category includes audible impacts that refer to increases in noise levels noticeable to humans. Audible increases in noise levels generally refer to a change of 3 dB or greater because this level has been found to be barely perceptible in exterior environments. The second category, potentially audible, refers to a change in the noise level between 1 dB and 3 dB. This range of noise levels has been found to be noticeable only in laboratory environments. The last category includes changes in noise levels of less than 1 dB, which are inaudible to the human ear. Only audible changes in existing ambient or background noise levels are considered potentially significant.

Table A lists definitions of acoustical terms, and Table B shows common sound levels and their sources.

Table A: Definitions of Acoustical Terms

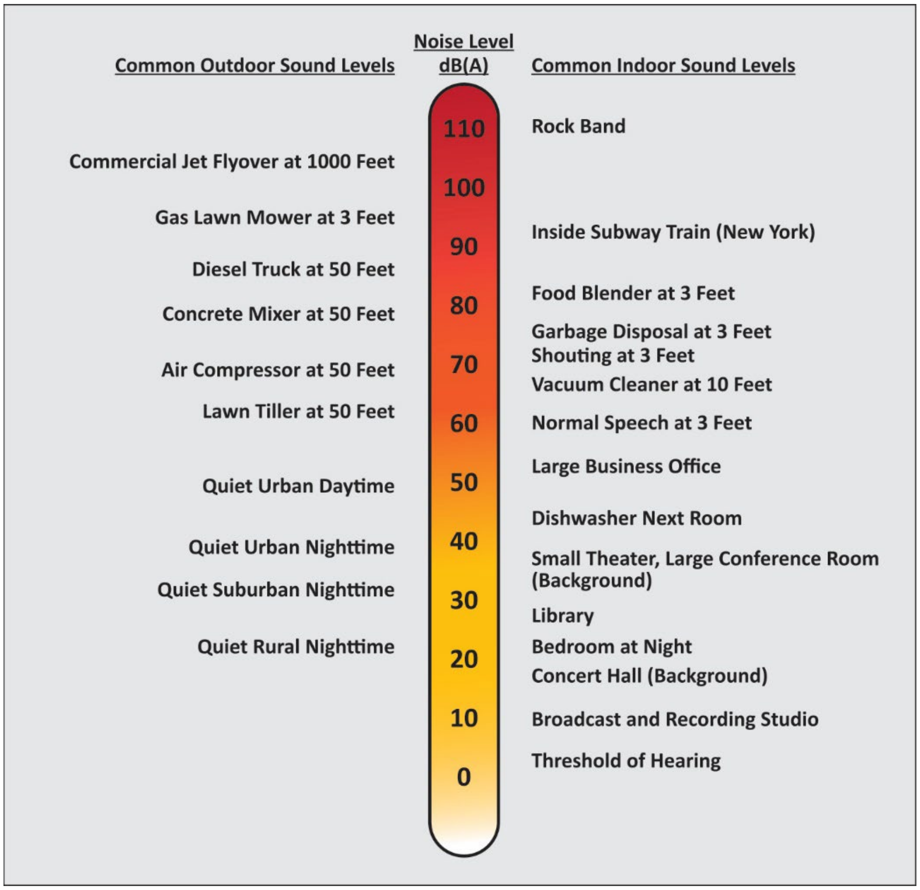
Term	Definitions
Decibel, dB	A unit of sound level that denotes the ratio between two quantities that are proportional to power; the number of decibels is 10 times the logarithm (to the base 10) of this ratio.
Frequency, Hz	Of a function periodic in time, the number of times that the quantity repeats itself in 1 second (i.e., the number of cycles per second).
A-Weighted Sound Level, dBA	The sound level obtained by use of A-weighting. The A-weighting filter de-emphasizes the very low and very high-frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. (All sound levels in this report are A-weighted unless reported otherwise.)
L_{01}, L_{10}, L_{50}, L_{90}	The fast A-weighted noise levels that are equaled or exceeded by a fluctuating sound level 1%, 10%, 50%, and 90% of a stated time period, respectively.
Equivalent Continuous Noise Level, L_{eq}	The level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time varying sound.
Community Noise Equivalent Level, CNEL	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 5 dBA to sound levels occurring in the evening from 7:00 p.m. to 10:00 p.m. and after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level, L_{dn}	The 24-hour A-weighted average sound level from midnight to midnight, obtained after the addition of 10 dBA to sound levels occurring in the night between 10:00 p.m. and 7:00 a.m.
L_{max}, L_{min}	The maximum and minimum A-weighted sound levels measured on a sound level meter, during a designated time interval, using fast time averaging.
Ambient Noise Level	The all-encompassing noise associated with a given environment at a specified time. It is usually a composite of sound from many sources from many directions, near and far; no particular sound is dominant.
Intrusive	The noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content, as well as the prevailing ambient noise level.

Source: *Handbook of Acoustical Measurements and Noise Control* (Harris 1991).

Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to sound levels higher than 85 dBA. Exposure to high sound levels affects the entire system, with prolonged sound exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. In comparison, extended periods of sound exposure above 90 dBA would result in permanent cell damage. When the sound level reaches 120 dBA, a tickling sensation occurs in the human ear, even with short-term exposure. This level of sound is called the threshold of feeling. As the sound reaches 140 dBA, the tickling sensation is replaced by a feeling of pain in the ear (i.e., the threshold of pain). A sound level of 160–165 dBA will result in dizziness or a loss of equilibrium. The ambient or background noise problem is widespread and generally more concentrated in urban areas than in outlying, less-developed areas.

Table B: Typical A-Weighted Sound Levels



Source: Compiled by LSA (2016).

Fundamentals of Vibration

Vibration refers to ground-borne noise and perceptible motion. Ground-borne vibration is almost exclusively a concern inside buildings and is rarely perceived as a problem outdoors, where the motion may be discernible, but without the effects associated with the shaking of a building there is less adverse reaction. 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 occupants as the motion of building surfaces, the rattling of items sitting on shelves or hanging on walls, or a low-frequency rumbling noise. The rumbling noise is caused by the vibration of walls, floors, and ceilings that radiate 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 ground-borne vibration are construction activities (e.g., blasting, pile-driving, and operating heavy-duty earthmoving equipment), steel-wheeled trains, and occasional traffic on rough roads. Problems with both ground-borne vibration and noise from these sources are usually localized to areas within approximately 100 feet (ft) from the vibration source, although there are examples of ground-borne vibration causing interference out to distances greater than 200 ft. When roadways are smooth, vibration from traffic, even heavy trucks, is rarely perceptible. It is assumed for most projects that the roadway surface will be smooth enough that ground-borne vibration from street traffic will not exceed the impact criteria; however, both construction of the project and the freight train operations could result in ground-borne vibration that may be perceptible and annoying.

Ground-borne noise is not likely to be a problem because noise arriving via the normal airborne path will usually be greater than ground-borne noise.

Ground-borne vibration has the potential to disturb people and damage buildings. Although it is very rare for train-induced ground-borne vibration to cause even cosmetic building damage, it is not uncommon for construction processes such as blasting and pile-driving to cause vibration of sufficient amplitudes to damage nearby buildings. Ground-borne vibration is usually measured in terms of vibration velocity, either the root-mean-square (RMS) velocity or peak particle velocity (PPV). The RMS is best for characterizing human response to building vibration, and PPV is used to characterize potential for damage. Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as:

$$L_v = 20 \log_{10} [V/V_{ref}]$$

where "L_v" is the vibration velocity in decibels (VdB), "V" is the RMS velocity amplitude, and "V_{ref}" is the reference velocity amplitude, or 1×10^{-6} inches/second (in/sec) used in the United States. Table C illustrates human response to various vibration levels, as described in the *Federal Transit Administration (FTA) Noise and Vibration Impact Assessment Manual* (FTA Manual) (2018).

Factors that influence ground-borne vibration and noise include:

- **Vibration Source:** Vehicle suspension, wheel types and condition, railroad track/roadway surface, railroad track support system, speed, transit structure, and depth of vibration source.
- **Vibration Path:** Soil type, rock layers, soil layering, depth to water table, and frost depth.
- **Vibration Receiver:** Foundation type, building construction, and acoustical absorption.

Among the factors listed above, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of ground-borne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock.

Table C: Human Response to Different Levels of Ground-Borne Noise and Vibration

Vibration Velocity Level	Noise Level		Human Response
	Low Frequency[1]	Mid Frequency[2]	
65 VdB	25 dBA	40 dBA	Approximate threshold of perception for many humans. Low-frequency sound is usually inaudible; mid-frequency sound is excessive for quiet sleeping areas.
75 VdB	35 dBA	50 dBA	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find transit vibration at this level unacceptable. Low-frequency noise is acceptable for sleeping areas; mid-frequency noise is annoying in most quiet occupied areas.
85 VdB	45 dBA	60 dBA	Vibration is acceptable only if there are an infrequent number of events per day. Low-frequency noise is unacceptable for sleeping areas; mid-frequency noise is unacceptable even for infrequent events with institutional land uses, such as schools and churches.

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2018).
1 Approximate noise level when vibration spectrum peak is near 30 Hz.
2 Approximate noise level when vibration spectrum peak is near 60 Hz.
dBA = A-weighted decibels
FTA = Federal Transit Administration
Hz = Hertz
VdB = vibration velocity decibels

Experience with ground-borne vibration indicates (1) vibration propagation is more efficient in stiff, clay soils than in loose, sandy soils; and (2) shallow rock seems to concentrate the vibration energy close to the surface and can result in ground-borne vibration problems at large distances from a railroad track. Factors such as layering of the soil and the depth to the water table can have significant effects on the propagation of ground-borne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils.

REGULATORY SETTING

Noise and vibration regulations are addressed through the efforts of various federal, State, and local government agencies. The agencies responsible for regulating noise are discussed below.

Federal Regulations

United States Environmental Protection Agency

In 1972, Congress enacted the United States Noise Control Act. This act authorized the United States Environmental Protection Agency (USEPA) to publish descriptive data on the effects of noise and establish levels of sound "requisite to protect the public welfare with an adequate margin of safety." These levels are separated into health (hearing loss levels) and welfare (annoyance levels). For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to 70 dBA during a 24-hour period of time. At 55 dBA L_{dn}, 95 percent sentence clarity (intelligibility) may be expected at 11 ft, with no community reaction. However, 1 percent of the population may complain about noise at this level and 17 percent may indicate annoyance. The USEPA cautions that these identified levels are guidelines, not standards (USEPA 1974).

Federal Transit Administration

Vibration standards included in the FTA Manual are used in this analysis for ground-borne vibration impacts on human annoyance, as shown in Table C. The criteria presented in Table D account for the variations in project types, which differ widely among projects.

Table D: Interpretation of Vibration Criteria for Detailed Analysis

Land Use	Max L_v (VdB)[1]	Description of Use
Workshop	90	Vibration that is distinctly felt. Appropriate for workshops and similar areas not as sensitive to vibration.
Office	84	Vibration that can be felt. Appropriate for offices and similar areas not as sensitive to vibration.
Residential Day	78	Vibration that is barely felt. Adequate for computer equipment and low-power optical microscopes (up to 20×).
Residential Night and Operating Rooms	72	Vibration is not felt, but ground-borne noise may be audible inside quiet rooms. Suitable for medium-power microscopes (100×) and other equipment of low sensitivity.

Source: *Transit Noise and Vibration Impact Assessment Manual* (FTA 2018).
[1] As measured in 1/3-Octave bands of frequency over the frequency range 8 to 80 Hertz.
FTA = Federal Transit Administration
L_V = velocity in decibels
VdB = vibration velocity decibels
Max = maximum

The criteria for environmental impact from ground-borne vibration and noise are based on the maximum levels for a single event. Table E lists the potential vibration building damage criteria associated with construction activities, as suggested in the FTA Manual.

Table E: Construction Vibration Damage Criteria

Building Category	PPV (in/sec)	Approximate L_V (VdB)[1]
Reinforced concrete, steel, or timber (no plaster)	0.50	102
Engineered concrete and masonry (no plaster)	0.30	98
Non-engineered timber and masonry buildings	0.20	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: *Transit Noise and Vibration Impact Assessment* (FTA 2018).
[1] RMS vibration velocity in decibels (VdB) re 1 µin/sec.
µin/sec = microinches per second
FTA = Federal Transit Administration
in/sec = inch/inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

FTA Manual guidelines show that for potential annoyance thresholds, a level of up to 78 VdB is acceptable during the daytime hours at residential uses while a level of 87 VdB is appropriate for office uses, and a level of 90 VdB is appropriate for workshop uses. To assess damage potential, a vibration level of up to 102 VdB (equivalent to 0.5 in/sec in PPV) is considered safe for buildings consisting of reinforced concrete, steel, or timber (no plaster) and would not result in any construction vibration damage. For a non-engineered timber and masonry building, the construction building vibration damage criterion is 94 VdB (0.2 in/sec in PPV).

State Regulations

The State of California has established regulations that help prevent adverse impacts to occupants of buildings near noise sources. Referred to as the *State Noise Insulation Standard*, it requires buildings to meet performance standards through design and/or building materials that would offset any noise source in the vicinity of the receptor. State regulations include requirements for the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are found in California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A.

The State has also established land use compatibility guidelines for determining acceptable noise levels for specified land uses.

Local Regulations

The following is a summary of the applicable policies included in the City's General Plan and Municipal Code that are related to noise and applicable to the proposed project.

City of Fresno General Plan

The City's General Plan (2014) includes a set of policies (detailed below) and programs that form a blueprint for the physical development of the city. The following policies related to noise and applicable to the proposed project 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 F and Table G, below.

Table F: 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: General Plan (City of Fresno, 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

dB = decibels

L_{dn} = day-night average noise level

Table G: Stationary Noise Sources

	Daytime (7:00 a.m. – 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: General Plan (City of Fresno, 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 = decibels

dBA = A-weighted decibels

- **Policy NS-1-b: Conditionally Acceptable Exterior Noise Exposure Range.** Establish the conditionally acceptable noise exposure level range for residential and other noise sensitive uses to be 65 dB L_{dn} or require appropriate noise reducing mitigation measures as determined by a site-specific acoustical analysis to comply with the desirable and conditionally acceptable exterior noise level and the required interior noise level standards set in Table F.

- **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 F 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.

  The aforementioned measures are not exhaustive and alternative designs may be approved by the City, provided that a qualified Acoustical Consultant submits information demonstrating that the alternative design(s) will achieve and maintain the specific targets for outdoor activity areas and interior spaces.

- **Policy 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 F and G to determine impacts and require developers to mitigate these impacts in conformance with Tables F and G 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 L_{dn} or CNEL or more above the ambient noise limits established in this General Plan Update.

- **Policy NS-1-m: Transportation Related Noise Impacts.** For projects subject to City approval, require that the project sponsor mitigate noise created by new transportation and transportation-related stationary noise sources, including roadway improvement projects, so that resulting noise levels do not exceed the City's adopted standards for noise-sensitive land uses.

- **Policy NS-1-o: Sound Wall Guidelines.** Acoustical studies and noise mitigation measures for projects shall specify the heights, materials, and design for sound walls and other noise barriers. Aesthetic considerations shall also be addressed in these studies and mitigation measures such as variable noise barrier heights, a combination of a landscaped berm with wall, and reduced barrier height in combination with increased distance or elevation differences between noise source and noise receptor, with a maximum allowable height of 15 feet. The City will develop guidelines for aesthetic design measures of sound walls, and may commission area wide noise mitigation studies that can serve as templates for acoustical treatment that can be applied to similar situations in the urban area.

City of Fresno Municipal Code

Chapter 10, Article 1 (Noise Regulations), of the Fresno Municipal Code (2022) establishes excessive noise guidelines and exemptions. The following portions of the Municipal Code are applicable to the proposed project.

SEC. 10-102. Definitions. (b) Ambient Noise. "Ambient noise" is the all-encompassing noise associated with a given environment, being usually a composite of sounds from many sources near and far. For the purpose of this ordinance, ambient noise level is the level obtained when the noise level is averaged over a period of 15 minutes, without inclusion of the offending noise, at the location and time of day at which a comparison with the offending noise is to be made. Where the ambient noise level is less than that designated in this section, the noise level specified in Table H shall be deemed to be the ambient noise level for that location.

Table H: Ambient Noise Levels

District	Time	Sound Level Decibels
Residential	10:00 p.m. to 7:00 a.m.	50
Residential	7:00 p.m. to 10:00 p.m.	55
Residential	7:00 a.m. to 7:00 p.m.	60
Commercial	10:00 p.m. to 7:00 a.m.	60
Commercial	7:00 a.m. to 10:00 p.m.	65
Industrial	anytime	70

Source: Chapter 10, Article 1 (Noise Regulations) (City of Fresno, 2022).

SEC. 10-105. Excessive Noise Prohibited. No person shall make, cause, or suffer or permit to be made or caused upon any premises or upon any public street, alley, or place within the city, any sound or noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing or working in the area, unless such noise or sound is specifically authorized by or in accordance with this article. The provisions of this section shall apply to, but shall be limited to, the control, use, and operation of the following noise sources:

(a) Radios, musical instruments, phonographs, television sets, or other machines or devices used for the amplification, production, or reproduction of sound or the human voice.

(b) Animals or fowl creating, generating, or emitting any cry or behavioral sound.

(c) Machinery or equipment, such as fans, pumps, air conditioning units, engines, turbines, compressors, generators, motors or similar devices, equipment, or apparatus.

(d) Construction equipment or work, including the operation, use or employment of pile drivers, hammers, saws, drills, derricks, hoists, or similar construction equipment or tools.

SEC. 10-109. Exceptions. The provisions of this article shall not apply to:

(a) Construction, repair or remodeling work accomplished pursuant to a building, electrical, plumbing, mechanical, or other construction permit issued by the city or other governmental agency, or to site preparation and grading, provided such work takes place between the hours of 7:00 a.m. and 10:00 p.m. on any day except Sunday.

(b) Emergency work.

(c) Any act or acts which are prohibited by any law of the State of California or the United States.

OVERVIEW OF THE EXISTING NOISE ENVIRONMENT

This section describes the existing noise environment in the project site vicinity. Noise monitoring and traffic noise modeling were used to quantify existing and future noise levels at the project site.

In Fresno, vehicle traffic is the primary source of noise. Other significant local noise sources include airport noise, railroad operations, and stationary source noise.

Existing Noise Level Measurements

To assess existing noise levels, LSA conducted two long-term and four short-term noise measurements at the proposed project site. The long-term noise measurements were recorded on September 28, 2022 and on September 29, 2022. The long-term noise measurements captured data to calculate the hourly L_{eq} and CNEL at each location, which incorporate the nighttime hours. Sources that dominate the existing noise environment include traffic on West Nielsen Avenue and Hughes Avenue, as well as railway activities and nearby aircraft operations. Noise measurement data collected during long-term noise monitoring are summarized in Table I and shown in Figure 3. Noise measurement sheets are provided in Attachment B.

Table I: Long-Term Noise Level Measurements

Location	Daytime Hours Noise Levels[1] (dBA L_{eq})	Evening Hours Noise Levels[2] (dBA L_{eq})	Nighttime Hours Noise Levels[3] (dBA L_{eq})	Average Daily Noise Level (dBA CNEL)	Average Noise Level 7 a.m. to 10 p.m. (dBA L_{eq})	Average Noise Level 10 p.m. to 7 a.m. (dBA L_{eq})
LT-1: West of 2625 W Nielsen Avenue. On a tree, approximately 40 feet away from W Neilson centerline	61.0-68.3	56.2-61.4	52.0-66.2	67.6	62.3	59.1
LT-2: North of site, near rail tracks, approximately 30 feet from track closest to site.	46.6-66.6	55.8-65.3	50.2-56.4	62.0	56.7	53.3
ST-1[4]: Between second and third tree north of cemetery entrance. Approximately 35 feet from N Hughes Avenue centerline	58.8-66.1	54.0-59.2	49.8-64.0	65.4	60.1	56.9
ST-2[4]: North of Belmont Avenue. Approximately 40 feet away from centerline. By 2560 Belmont Avenue entrance (AAA Welding).	61.6-68.9	56.8-62.0	52.6-66.8	68.2	62.9	59.7
ST-3[4]: West of N Marks Avenue, south of overpass entrance, by power pole. Approximately 50 feet away from Marks Ave. centerline	62.8-70.1	58.0-63.2	53.8-68.0	69.4	64.1	60.9
ST-4[4]: South of Nielsen Avenue, approximately 40 feet away from centerline. East of 2307 W Nielsen Ave entrance.	61.5-68.8	56.7-61.9	52.5-66.7	68.1	62.8	59.6

Source: Compiled by LSA. (October 2022).

[1] Daytime Noise Levels = noise levels during the hours of 7:00 a.m. to 7:00 p.m.

[2] Evening Noise Levels = noise levels during the hours of 7:00 p.m. to 10:00 p.m.

[3] Nighttime Noise Levels = noise levels during the hours of 10:00 p.m. to 7:00 a.m.

[4] Hourly and daily noise levels at short-term noise monitoring locations were estimated by the noise profile of nearby long-term measurements

dBA = A-weighted decibels

CNEL = Community Noise Equivalent Level

L_{eq} = equivalent continuous sound level

Existing Traffic Noise

The guidelines included in the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) were used to evaluate traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values.

Traffic volumes were obtained from the *Traffic Impact Analysis* (LSA 2022). A specific breakdown of the vehicle percentages based on type and time of day is provided in Attachment C. Table J provides the existing traffic noise levels in the project vicinity. These traffic noise levels are representative of a worst-case scenario that assumes a flat terrain and no shielding between the traffic and the noise contours.

Table J: Existing Traffic Noise Levels Without Project

Roadway Segment	ADT	Centerline to 70 dBA CNEL (feet)	Centerline to 65 dBA CNEL (feet)	Centerline to 60 dBA CNEL (feet)	CNEL (dBA) 50 feet from Centerline of Outermost Lane
Marks Avenue between Belmont Avenue and Nielsen Avenue	10,190	158	486	1,532	72.8
Marks Avenue between Nielsen Avenue and Ray Johnson Drive	11,554	178	551	1,737	73.3
Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps	12,019	185	573	1,807	73.5
Belmont Avenue between Marks Avenue and Hughes Avenue	7,240	92	280	881	71.0
Nielsen Avenue between Marks Avenue and Hughes Avenue	1,614	< 50	71	199	64.0
Hughes Avenue between Nielsen Avenue and Belmont Avenue	2,604	< 50	105	318	66.3

Source: Compiled by LSA (October 2022).
Notes: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
ADT = average daily traffic
CNEL = Community Noise Equivalent Level
dBA = A-weighted decibels
SR- = State Route

Airport Operations

There are currently three airports within the City of Fresno: Fresno Yosemite International Airport, Fresno-Chandler Executive Airport, and Sierra Sky Park Airport. Commercial jet aircraft operations are limited to Fresno Yosemite International Airport. The Air National Guard is also stationed there and operates military jets and other aircraft. Private and commercial operations with smaller aircraft use Fresno Chandler Downtown Airport, while only small private aircraft use Sierra Sky Park Airport.

The nearest airports to the project site include Fresno Chandler Executive Airport, located 0.8 mile from the project site, the Sierra Sky Airport, 6.7 miles from the project site, and Fresno International Airport, 7.1 miles from the project site. Each of these airports is included in the Fresno County Airport Land Use Compatibility Plan (ALUCP), which 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. The ALUCP includes CNEL noise contours based on projected airport and aircraft operations. The project site is not within an ALUCP.

Railroad Operations

The two major rail lines that traverse the city are the Union Pacific Railroad line, which is generally runs along State Route (SR) 99, and the BNSF Railway, which diverges from SR-99 in the southwest and travels through downtown (behind City Hall) to the northwest. The Union Pacific line is generally within a heavy commercial and industrial corridor, although residential uses occur in the vicinity of the line north of Shaw Avenue. The Union Pacific line limits its use to only freight traffic. South of downtown, BNSF Railway is bounded by industrial uses, while north of downtown, the line is generally within a residential area. The BNSF Railway carries both freight and passenger traffic (Amtrak).

The closest rail line to the project site is 315 feet north of the project site.

Stationary Noise Sources

Stationary noise sources can also have an effect on the population, and unlike mobile, transportation-related noise sources, these sources generally have a more permanent and consistent impact on people. These stationary noise sources involve a wide spectrum of uses and activities, including various industrial uses, commercial operations, agricultural production, school playgrounds, high school football games, on-site heating, ventilation, and air conditioning (HVAC) units, generators, lawn maintenance equipment, and swimming pool pumps.

Even with incorporation of the best available noise control technology, noise emanating from industrial uses can be substantial and exceed local noise standards. These noise sources can be continuous and may contain tonal components that may be annoying to nearby receptors. Although industrial uses in Fresno are typically in industrial districts near freeways and commercial uses and away from residences and other sensitive noise receptors, noise sources associated with commercial uses such as automotive repair facilities, recycling centers, and loading docks may occur in the vicinity of residential uses.

IMPACT ANALYSIS

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 1 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.

Construction is completed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on the site and, therefore, the noise levels surrounding the site 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 K lists typical construction equipment noise levels recommended for noise impact assessments, based on a distance of 50 ft between the equipment and a noise receptor, taken from the Federal Highway Administration (FHWA) *Roadway Construction Noise Model User's Guide* (FHWA 2006).

Table K: 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
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 (Federal Highway Administration 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 K, 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.

In addition to the reference maximum noise level, the usage factor provided in Table K is used to calculate the hourly noise level impact for each piece of equipment based on the following equation:

$$L_{eq}(equip) = E.L. + 10\log(U.F.) - 20\log\left(\frac{D}{50}\right)$$

where: *L_{eq} (equip)* = L_{eq} at a receiver resulting from the operation of a single piece of equipment over a specified time period

E.L. = noise emission level of the particular piece of equipment at a reference distance of 50 ft

U.F. = usage factor that accounts for the fraction of time that the equipment is in use over the specified period of time

D = distance from the receiver to the piece of equipment

Each piece of construction equipment operates as an individual point source. Using the following equation, a composite noise level can be calculated when multiple sources of noise operate simultaneously:

$$Leq\ (composite) = 10 * \log_{10}\left(\sum_{1}^{n} 10^{\frac{Ln}{10}}\right)$$

Using the equations from the methodology above, the reference information in Table K, and the construction equipment list provided, the composite noise level of the two loudest pieces of equipment for each construction phase was calculated. The project construction composite noise levels at a distance of 50 ft for would range from 74 dBA L_{eq} to 84 dBA L_{eq}, with the highest noise levels occurring during the grading phase.

Once composite noise levels are calculated, reference noise levels can then be adjusted for distance using the following equation:

$$Leq\ (at\ distance\ X) = Leq\ (at\ 50\ feet) - 20 * \log_{10}\left(\frac{X}{50}\right)$$

In general, this equation shows that doubling the distance would decrease noise levels by 6 dBA, while halving the distance would increase noise levels by 6 dBA.

To determine the applicable distance, the acoustical average distance is utilized. The acoustical average distance is used to represent noise sources that are mobile or distributed over an area. The average acoustical distance is calculated by multiplying the shortest distance between the receiver and the noise source area by the farthest distance, and then taking the square root of the product.

While construction noise will vary, it is expected that composite noise levels during construction at the nearest off-site sensitive residential use to the south would reach an average noise level of 64 dBA L_{eq} during daytime hours. While construction-related, short-term noise levels have the potential to be higher than quieter daytime ambient noise levels in the project area under existing conditions, the construction noise impacts would be approximately 1.7 dBA greater than the existing average daytime noise level of 64.7 dBA L_{eq} during the allowable hour of construction. When logarithmically combined with the existing average ambient noise level, the total noise level would be 66.2 dBA L_{eq} resulting in an increase of 3.9 dBA L_{eq}. Because the increase would be less than 5 dBA, construction noise would be considered less than significant.

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 take place on Sundays.

Although the project's potential construction-related noise level increase would be less than 5 dBA, project construction noise would result in a potentially significant impact at the nearest off-site sensitive residential use. As such, Mitigation Measure NOI-1 would be required to ensure that all construction equipment, fixed or mobile, is equipped 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.

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.

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 during construction.

Short-Term Construction Vibration Impacts

This construction vibration impact analysis assesses the potential for building damages using vibration levels in PPV (in/sec). This is because vibration levels calculated in RMS are best for characterizing human response to building vibration, while vibration level in PPV is best for characterizing potential for damage.

Table L shows the PPV and VdB values at 25 ft from the construction vibration source. As shown in Table L, bulldozers and other heavy-tracked construction equipment (expected to be used for this project) generate 0.089 PPV in/sec or 87 VdB of ground-borne vibration when measured at 25 ft, based on the FTA Manual. The distance to the nearest buildings for vibration impact analysis is measured between the nearest off-site buildings and the project construction boundary (assuming the construction equipment would be used at or near the project setback line).

The formulae for vibration transmission are provided below, and Table M, provides a summary of off-site construction vibration levels.

$$L_v dB (D) = L_v dB (25 ft) – 30 \text{ Log } (D/25)$$

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

Table L: Vibration Source Amplitudes for Construction Equipment

Equipment	Reference PPV/L_V at 25 ft	
	PPV (in/sec)	L_V (VdB)[1]
Pile Driver (Impact), Typical	0.644	104
Pile Driver (Sonic), Typical	0.170	93
Vibratory Roller	0.210	94
Hoe Ram	0.089	87
Large Bulldozer[2]	**0.089**	**87**
Caisson Drilling	0.089	87
Loaded Trucks[2]	**0.076**	**86**
Jackhammer	0.035	79
Small Bulldozer	0.003	58

Source: Transit Noise and Vibration Impact Assessment Manual (FTA 2018).

[1] RMS vibration velocity in decibels (VdB) is 1 µin/sec.

[2] Equipment shown in **bold** is expected to be used on site.

µin/sec = microinches per second
ft = foot/feet
FTA = Federal Transit Administration
in/sec = inch/inches per second
L_V = velocity in decibels
PPV = peak particle velocity
RMS = root-mean-square
VdB = vibration velocity decibels

Table M: Potential Construction Vibration Damage Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (PPV) at 25 feet[1]	Distance (feet)[2]	Vibration Level (PPV)
Residential Uses (South)	0.089	110	0.010
Industrial Uses (North)		30	0.068
Industrial Uses / Cemetery (East)		120	0.009
Industrial Uses (West)		300	0.002

Source: Compiled by LSA (2022).

[1] The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.

[2] The reference distance is associated with the peak condition, identified by the distance from the perimeter of construction activities to surrounding structures

ft = foot/feet

in/sec = inch/inches per second

PPV = peak particle velocity

Based on the information provided in Table M, vibration levels are expected to approach 0.068 PPV in/sec at the surrounding structures and would be below the 0.2 PPV in/sec damage threshold.

Based on the information provided in Table N, vibration levels are expected to approach 85 VdB at the closest industrial uses north of the project site and 68 VdB at the closest residential use to the south, which are below the 90 VdB and 78 VdB annoyance threshold for workshop or industrial types uses and for daytime residential uses, respectively.

Table N: Potential Construction Vibration Annoyance Impacts at Nearest Receptor

Receptor (Location)	Reference Vibration Level (VdB) at 25 feet[1]	Distance (feet)[2]	Vibration Level (VdB)
Residential Uses (South)	87	110	68
Industrial Uses (North)		30	85
Industrial Uses / Cemetery (East)		120	67
Industrial Uses (West)		300	55

Source: Compiled by LSA (2022).

[1] The reference vibration level is associated with a large bulldozer, which is expected to be representative of the heavy equipment used during construction.

[2] The reference distance is associated with the average condition, identified by the distance from the center of construction activities to surrounding uses

ft = foot/feet

VdB = vibration velocity decibels

Because construction activities are regulated by the City's Code of Ordinance that states temporary construction, maintenance, or demolition activities are not allowed between the 7:00 p.m. on one day and 7:00 a.m. of the following day, vibration impacts would not occur during the more sensitive nighttime hours.

Other building structures surrounding the project site are farther away and would experience further reduced vibration. Therefore, no construction vibration impacts would occur.

Long Term Noise Impacts

Traffic Noise Impacts to Off-Site Receivers

The guidelines included in the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108) were used to evaluate highway traffic-related noise conditions along roadway segments in the project vicinity. This model requires various parameters, including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The resultant noise levels are weighted and summed over 24-hour periods to determine the CNEL values. Table O provides the traffic noise levels for the existing with and without project, and opening year with and without project scenarios. These noise levels represent the worst-case scenario, which assumes no shielding is provided between the traffic and the location where the noise contours are drawn.

The without and with project scenario traffic volumes were obtained from the *Traffic Impact Analysis* (LSA 2021).

Table O shows that the increase in project-related traffic noise would be no greater than 2.1 dBA. Noise level increases less than 3.0 dBA are not considered perceptible to most people in an outdoor environment. Because this is also consistent with General Plan Policy NS-1-j: Significance Threshold which states that an increase of 3 dBA CNEL or more is considered significant, traffic noise impacts from project-related traffic on off-site sensitive receptors would be less than significant.

Table O: Traffic Noise Levels Without and With Proposed Project

Roadway Segment	Existing		Existing With Project			Opening Year		Opening Year with Project			Year 2035		Year 2035 With Project		
	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	Increase from Existing Conditions	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	Increase from Near-Term Conditions	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	ADT	CNEL (dBA) 50 feet from Centerline of Nearest Lane	Increase from Year 2035 Conditions
Marks Avenue between Belmont Avenue and Nielsen Avenue	10,190	72.8	11,228	73.9	1.1	10,938	73.1	11,976	74.1	1.0	11,651	73.4	12,689	74.4	1.0
Marks Avenue between Nielsen Avenue and Ray Johnson Drive	11,554	73.3	12,146	74.2	0.9	12,408	73.6	13,000	74.5	0.9	13,244	73.9	13,836	74.8	0.9
Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps	12,019	73.5	12,611	74.4	0.9	12,933	73.8	13,525	74.7	0.9	13,706	74.1	14,298	74.9	0.8
Belmont Avenue between Marks Avenue and Hughes Avenue	7,240	71.0	7,550	71.8	0.8	7,905	71.3	8,215	72.1	0.8	8,846	71.8	9,156	72.6	0.8
Nielsen Avenue between Marks Avenue and Hughes Avenue	1,614	64.0	2,230	66.1	2.1	1,767	64.4	2,383	66.4	2.0	1,772	64.4	2,388	66.4	2.0
Hughes Avenue between Nielsen Avenue and Belmont Avenue	2,604	66.3	3,060	67.6	1.3	2,796	66.6	3,252	67.9	1.3	3,531	67.6	3,987	68.8	1.2

Source: Compiled by LSA (October 2022).
Note: Traffic noise within 50 feet of the roadway centerline should be evaluated with site-specific information.
Shaded cells indicate roadway segments adjacent to the project site.
ADT = average daily traffic
CNEL= Community Noise Equivalent Level
dBA = A-weighted decibels
SR = State Route

Stationary Operational Noise Impacts to Off-Site Receivers

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 the Municipal Code, as described above. Adjacent off-site land uses would be potentially exposed to stationary-source noise impacts from the proposed HVAC equipment, truck deliveries, and loading and unloading activities. The potential noise impacts to off-site sensitive land uses from the proposed operations are discussed below. To provide a conservative analysis, it is assumed that operations would occur equally during all hours of the day and that half the 192 loading docks would be active at all times. Additionally, the analysis assumed that within any given hour, 48 heavy trucks would maneuver to park near or back into one of the proposed trailer parking stalls. HVAC equipment is expected to run continuously for the duration of a 24-hour period. To determine the future noise impacts from project operations to the noise sensitive uses, the 3-D noise model, SoundPLAN, was used for the evaluation. The model incorporates the site topography as well as the shielding from the proposed building on-site. The model output, which includes a graphic representation of the operational noise impacts is presented in Attachment D. Results from the model analysis for each of the anticipated stationary sources are summarized below.

Heating, Ventilation, and Air Conditioning Equipment. it is estimated that the project would have four rooftop HVAC units on each of the proposed buildings to provide ventilation to the proposed office and warehouse spaces. The analysis assumes that the HVAC equipment would operate 24 hours per day and would generate sound power levels (SPL) of up to 87 dBA SPL or 72 dBA L_{eq} at 5 feet, based on manufacturer data (Trane).

Truck Deliveries and Truck Loading and Unloading Activities. Noise levels generated by delivery trucks would be similar to noise readings from truck loading and unloading activities, which generate a noise level of 75 dBA L_{eq} at 20 ft based on measurements taken by LSA (*Operational Noise Impact Analysis for Richmond Wholesale Meat Distribution Center* [LSA 2016]). Delivery trucks would arrive on site and maneuver their trailers so that trailers would be parked within the loading docks. During this process, noise would be associated with the truck engine, air brakes, and back-up alarms while the truck is backing into the dock. These noise sources would occur for a short period of time (less than 5 minutes). After a truck enters the loading dock, the doors would be closed, and the remainder of the truck loading activities would be enclosed and therefore much less perceptible. To present a conservative assessment, the model analysis assumes that unloading activities would occur at half of the 192 docks simultaneously for a period of more than 30 minutes in a given hour. Maximum noise levels that occur during the docking process were measured to be 86 dBA L_{max} at a distance of 20 feet.

Tables P shows the combined hourly noise levels generated by the proposed project at the closest off-site land uses. The project-related hourly noise level impacts would be 58.2 dBA L_{eq} at the outdoor activity area of the residence south of Building 1. When propagated to the outdoor activity area of the residential property south of Building 1, the average daytime noise level is 56.8 dBA L_{eq} and the average nighttime noise level is 53.6 dBA L_{eq}. As specified in the City's Noise Element, if existing ambient noise level exceed the City's noise standards, a project impact would occur when project related noise levels cause a 5 dBA or more increase. When compared to existing noise levels, project operations would not create an impact during daytime hours, but would generate an increase of greater than 5 dBA during nighttime hours, resulting in a potentially significant impact.

Table P: Hourly Exterior Noise Level Impacts

Receptor	Direction	Existing Daytime Noise Level (dBA L_{eq})	Existing Nighttime Noise Level (dBA L_{eq})	Project Noise Level (dBA L_{eq})	Daytime Noise Level Increase (dBA L_{eq})	Nighttime Noise Level Increase (dBA L_{eq})	Potential Operational Noise Impact? (Daytime / Nighttime)[1]
Residential	South	56.8	53.6	58.2	3.8	5.9	No / Yes

Source: Compiled by LSA (2022).

[1] Because ambient noise levels exceed the City of Fresno's stationary noise criteria, a potential operational noise impact would occur if operational noise would increase ambient noise by 5 dBA or more.

dBA = A-weighted decibels

L_{eq} = equivalent noise level

Table Q shows the modeled maximum exterior noise levels. The maximum noise levels generated would approach 66.5 dBA L_{max} at the surrounding sensitive receptors. This noise level would be below the City's exterior maximum daytime noise standard of 70 dBA L_{max} but would exceed the 60 dBA L_{max} for nighttime hours. Similar to the hourly noise impacts, project operations would not generate a significant impact related to maximum noise levels during daytime hours but would generate a significant impact during nighttime hours.

Table Q: Maximum Exterior Noise Level Impacts

Receptor	Direction	Project Maximum Noise Level (dBA L_{max})	Daytime Maximum Noise Level Standard (dBA L_{max})	Nighttime Maximum Noise Level Standard (dBA L_{max})	Potential Operational Noise Impact? (Daytime / Nighttime)[1]
Residential	South	66.5	70	60	No / Yes

Source: Compiled by LSA (2022).

dBA = A-weighted decibels

L_{max} = maximum noise level

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 and trailer parking activities south of Building 1 during nighttime hours. Loading dock and parking activities at all other locations would be shielded by the proposed buildings and would not exceed the City's nighttime noise standards.

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, the project proponent shall 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.

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.

Long-Term Vibration Impacts

Once operational, the proposed project would not generate vibration levels related to on-site operations. In addition, vibration levels generated from project-related traffic on the adjacent roadways are unusual for on-road vehicles because the rubber tires and suspension systems of on-road vehicles provide vibration isolation. Vibration levels generated from project-related traffic on the adjacent roadways would be less than significant.

CONCLUSION

Project-related impacts associated with short-term construction vibration, long-term off-site traffic increases, and long-term vibration impacts would be less than significant. The following presents a summary of the potentially significant impacts and associated mitigation measures for short-term construction and long-term operational noise impacts.

Short-term Construction Noise Impacts

As stated above, the closest off-site sensitive receptors may be subject to short-term construction noise reaching 81 dBA L_{max} during construction. However, construction equipment would operate at various locations within the 48.03-acre project site and would only generate maximum noise levels when operations take place 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.

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.

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.

Long-term Operational Noise Impacts

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.

As specified in the City's Noise Element, if existing ambient noise level exceed the City's noise standards, a project impact would occur when project-related noise levels cause a 5 dBA or more increase. When compared to existing hourly noise levels, project operations would not create an impact during daytime hours, but would generate an increase of greater than 5 dBA during nighttime hours, resulting in a significant impact. Similar to the hourly noise impacts, project operations would not generate a significant maximum noise level impact during daytime hours but would generate a significant impact during nighttime hours.

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 and trailer parking activities south of Building 1 during the nighttime hours. Loading dock and parking activities at all other locations would be shielded by the proposed buildings and would not exceed the City's nighttime noise standards.

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, the project proponent would 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.

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.

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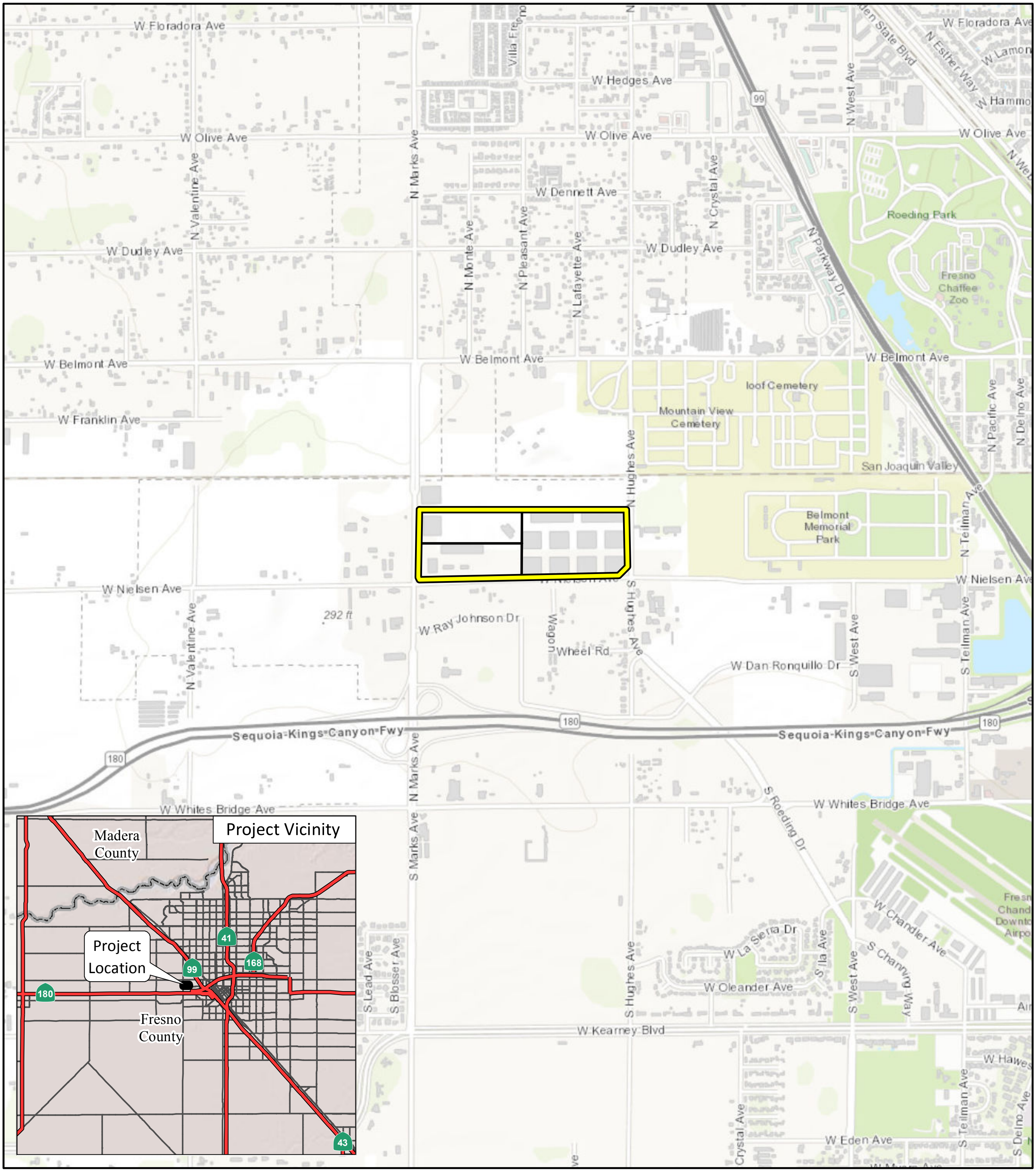
Attachments: A: Figures 1-3
B: Noise Measurement Sheets
C: FHWA Traffic Noise Model Printouts
D: Soundplan Noise Model Printouts

ATTACHMENT A

FIGURES 1–3



LEGEND

Project Location

Proposed Parcels

FIGURE 1

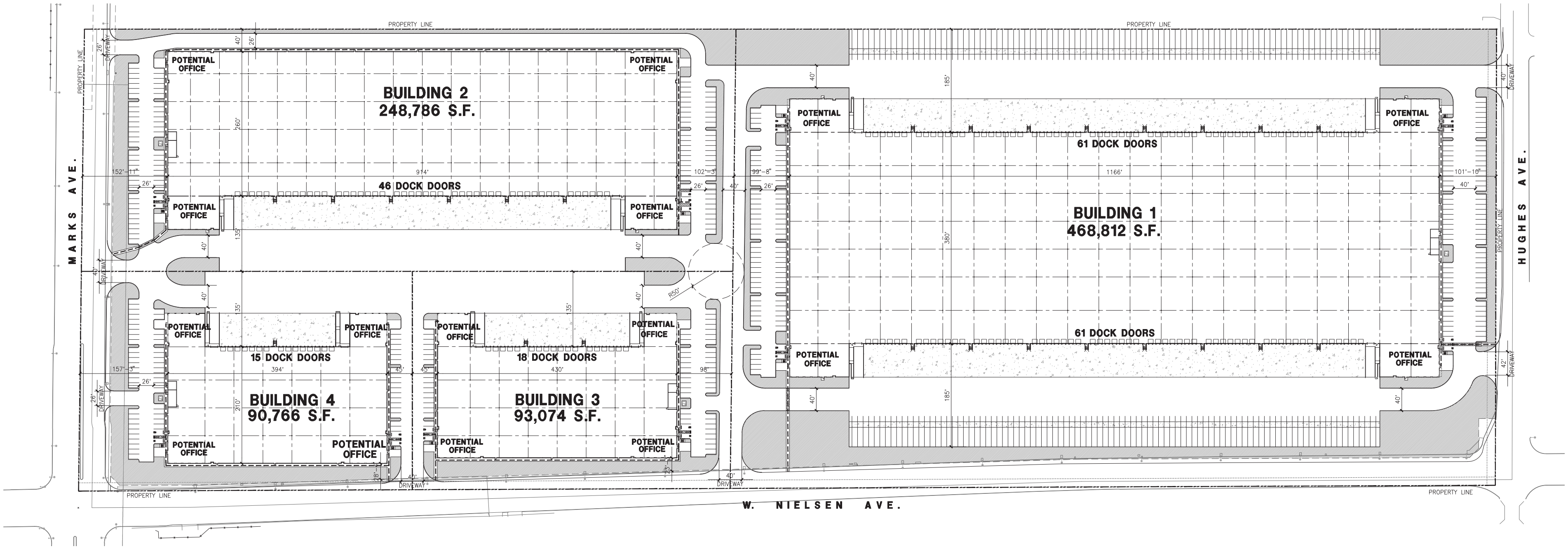
0 1000 2000
FEET

SOURCE: Esri Topographic Map (2021)

2740 West Nielsen Avenue Office/Warehouse Project

Regional Project Location

I:\SNN2102\GIS\MXD\Project_Location.mxd (6/7/2021)



LSA

FIGURE 2

0 150 300
FEET

SOURCE: HPA Architecture, Inc., 2021

2740 West Nielsen Avenue Warehouse

Site Plan

I:\SNN2102\G\Site_Plan.ai (10/6/2022)

LSA

FIGURE 3

LEGEND

- Project Site Boundary
- ST-1 - Short-term Noise Monitoring Location
- LT-1 - Long-term Noise Monitoring Location

0 500 1000

FEET

SOURCES: Google Earth, 2019

2740 West Nielsen Avenue Warehouse

Noise Monitoring Locations

I:\SNN2102\G\Noise_Monitor_Locs.ai (10/6/2022)

ATTACHMENT B

NOISE MEASUREMENT SHEETS

Noise Measurement Survey – 24 HR

Project Number: SNN2101
Test Personnel: Moe Abushanab
Project Name: 2740 West Nielson
Equipment: Spark 706RC (SN:903)

Site Number: LT-1 Date: 9/28/2022
Time: From 1:00 p.m. To 1:00 p.m.

Site Location: West of 2625 W Nielson Avenue. On a tree, approximately 40 ft away from W Neilson centerline

Primary Noise Sources: Regular traffic noise on W Nielson Ave.
Occasional aircraft noise
Occasional dog barking

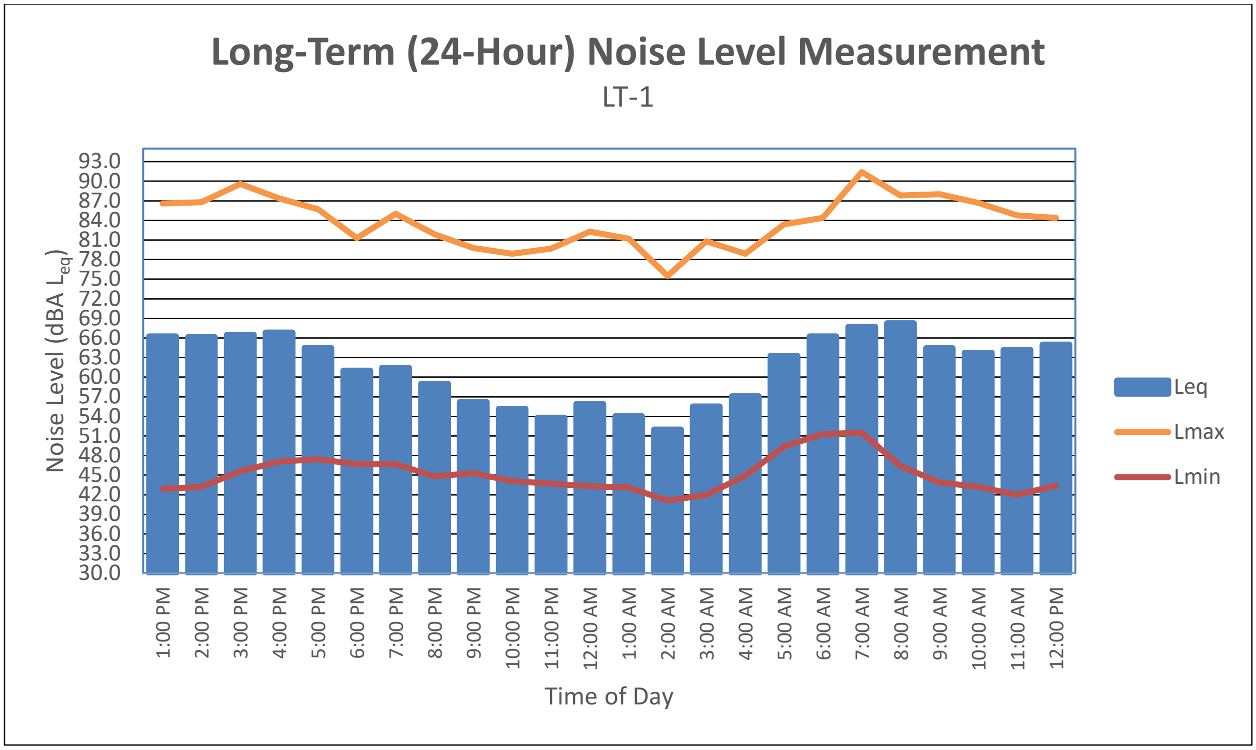
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-1

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
1:00 PM	9/28/22	66.3	86.6	42.9
2:00 PM	9/28/22	66.2	86.8	43.2
3:00 PM	9/28/22	66.5	89.6	45.6
4:00 PM	9/28/22	66.8	87.4	47.1
5:00 PM	9/28/22	64.5	85.7	47.4
6:00 PM	9/28/22	61.0	81.3	46.7
7:00 PM	9/28/22	61.4	85.0	46.7
8:00 PM	9/28/22	59.0	81.9	44.8
9:00 PM	9/28/22	56.2	79.8	45.3
10:00 PM	9/28/22	55.2	78.9	44.1
11:00 PM	9/28/22	53.8	79.7	43.7
12:00 AM	9/29/22	55.9	82.3	43.3
1:00 AM	9/29/22	54.0	81.2	43.1
2:00 AM	9/29/22	52.0	75.5	41.1
3:00 AM	9/29/22	55.5	80.8	42.0
4:00 AM	9/29/22	57.1	78.9	44.9
5:00 AM	9/29/22	63.2	83.4	49.4
6:00 AM	9/29/22	66.2	84.4	51.3
7:00 AM	9/29/22	67.7	91.4	51.5
8:00 AM	9/29/22	68.3	87.8	46.4
9:00 AM	9/29/22	64.4	88.0	43.9
10:00 AM	9/29/22	63.7	86.7	43.2
11:00 AM	9/29/22	64.2	84.8	42.0
12:00 PM	9/29/22	65.0	84.4	43.4

Source: Compiled by LSA Associates, Inc. (2022).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level


Long-Term (24-Hour) Noise Level Measurement
LT-1
Noise Level (dBA Leq)
93.0
90.0
87.0
84.0
81.0
78.0
75.0
72.0
69.0
66.0
63.0
60.0
57.0
54.0
51.0
48.0
45.0
42.0
39.0
36.0
33.0
30.0
1:00 PM
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
Time of Day
Leq
Lmax
Lmin

Noise Measurement Survey – 24 HR

Project Number: SNN2101

Project Name: 2740 West Nielson

Test Personnel: Moe Abushanab

Equipment: Spark 706RC (SN:904)

Site Number: LT-2 Date: 9/28/2022

Time: From 2:00 p.m. To 2:00 p.m.

Site Location: North of site, near rail tracks, approximately 30 feet from track closest to site . On a blue painted pole

Primary Noise Sources: Rail activity (idling, moving into adjacent site)
Occasional aircraft
Faint road traffic

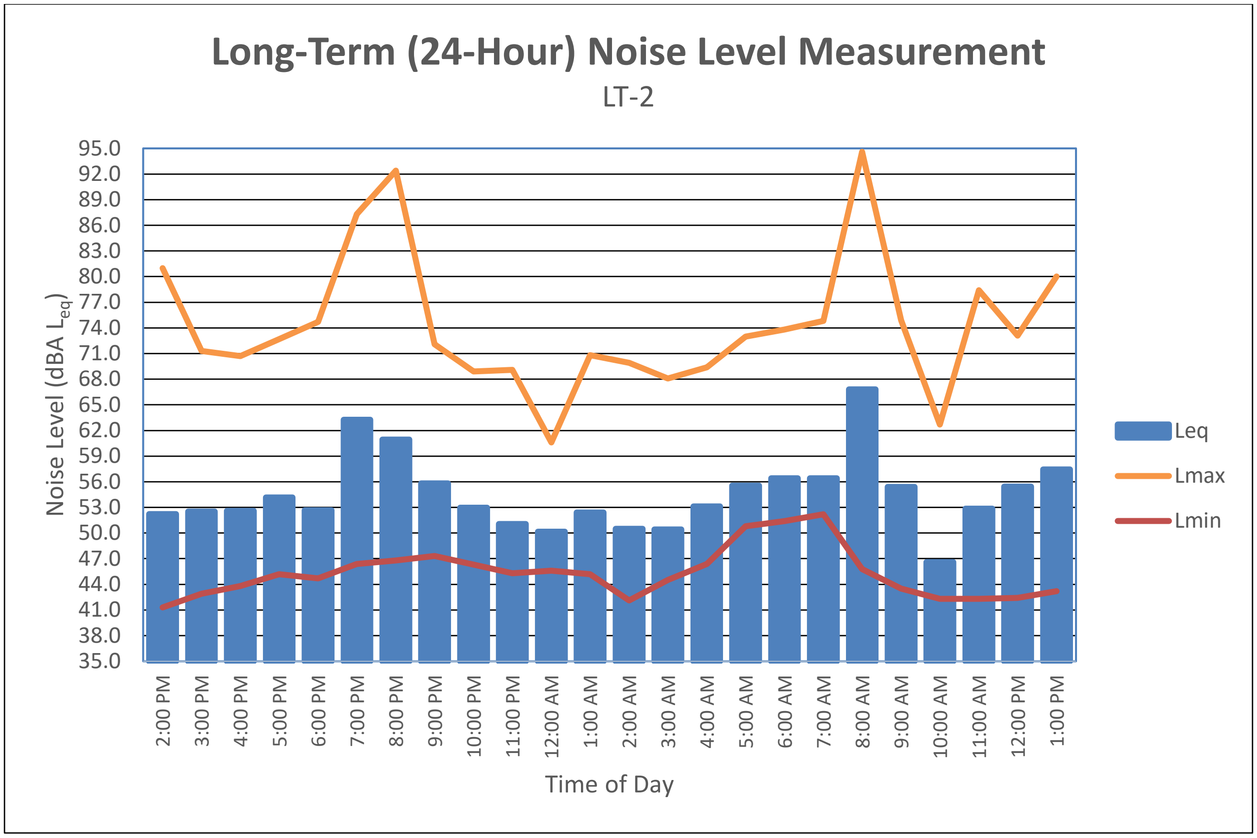
Comments:

Photo:

Long-Term (24-Hour) Noise Level Measurement Results at LT-2

Start Time	Date	Noise Level (dBA)		
		L_{eq}	L_{max}	L_{min}
2:00 PM	9/28/22	52.2	81.0	41.3
3:00 PM	9/28/22	52.5	71.3	42.9
4:00 PM	9/28/22	52.6	70.7	43.8
5:00 PM	9/28/22	54.2	72.7	45.2
6:00 PM	9/28/22	52.7	74.7	44.7
7:00 PM	9/28/22	63.3	87.3	46.4
8:00 PM	9/28/22	60.9	92.4	46.8
9:00 PM	9/28/22	55.8	72.1	47.3
10:00 PM	9/28/22	53.0	68.9	46.3
11:00 PM	9/28/22	51.1	69.1	45.3
12:00 AM	9/29/22	50.2	60.6	45.6
1:00 AM	9/29/22	52.4	70.8	45.2
2:00 AM	9/29/22	50.5	69.9	42.1
3:00 AM	9/29/22	50.4	68.1	44.5
4:00 AM	9/29/22	53.1	69.4	46.4
5:00 AM	9/29/22	55.5	73.0	50.8
6:00 AM	9/29/22	56.4	73.8	51.4
7:00 AM	9/29/22	56.4	74.8	52.2
8:00 AM	9/29/22	66.8	94.6	45.8
9:00 AM	9/29/22	55.4	74.9	43.5
10:00 AM	9/29/22	46.6	62.7	42.3
11:00 AM	9/29/22	52.8	78.4	42.3
12:00 PM	9/29/22	55.4	73.1	42.4
1:00 PM	9/29/22	57.4	80.0	43.2

Source: Compiled by LSA Associates, Inc. (2022).
dBA = A-weighted decibel
L_{eq} = equivalent continuous sound level
L_{max} = maximum instantaneous noise level
L_{min} = minimum measured sound level


Long-Term (24-Hour) Noise Level Measurement
LT-2
Noise Level (dBA Leq)
95.0
92.0
89.0
86.0
83.0
80.0
77.0
74.0
71.0
68.0
65.0
62.0
59.0
56.0
53.0
50.0
47.0
44.0
41.0
38.0
35.0
2:00 PM
3:00 PM
4:00 PM
5:00 PM
6:00 PM
7:00 PM
8:00 PM
9:00 PM
10:00 PM
11:00 PM
12:00 AM
1:00 AM
2:00 AM
3:00 AM
4:00 AM
5:00 AM
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
Time of Day
Leq
Lmax
Lmin

Noise Measurement Survey

Project Number: SNN2101
Test Personnel: Moe Abushanab
Project Name: 2740 West Nielson
Equipment: Larson Davis LxT

Site Number: ST-1 Date: 9/28/2022
Time: From 1:30 p.m. To 1:50 p.m.

Site Location: Between 2nd and 3rd tree north of cemetery entrance. Approximately 35 feet away from N Hughes centerline

Primary Noise Sources: traffic noise on N Hughes Ave
Rail crossing gate at 1:35 pm w/ train passby
Faint operations noise from adjacent site (forklift)

Measurement Results

	dBA
L_{eq}	63.5
L_{max}	77.6
L_{min}	43.1
L_{peak}	95.4
L_2	72.0
L_8	69.0
L_{25}	63.6
L_{50}	57.4
SEL	

Atmospheric Conditions:

Maximum Wind Velocity (mph)	3.6
Average Wind Velocity (mph)	2.3
Temperature (F)	92
Relative Humidity (%)	30
Comments:	

Comments: File # 1

Location Photo:

Noise Measurement Survey

Project Number: SNN2101
Project Name: 2740 West Nielson

Test Personnel: Moe Abushanab
Equipment: Larson Davis LxT

Site Number: ST-2 Date: 9/28/2022

Time: From 1:56 p.m. To 2:16 p.m.

Site Location: North of Belmont Avenue. Approximately 40 feet away from centerline. By 2560 Belmont avenue entrance (AAA Welding)

Primary Noise Sources: traffic noise on Belmont Avenue
Occasional aircraft

Measurement Results

	dBA
L_{eq}	66.7
L_{max}	80.2
L_{min}	45.6
L_{peak}	98.0
L_2	75.3
L_8	71.9
L_{25}	67.1
L_{50}	60.7
SEL	

Atmospheric Conditions:

Maximum Wind Velocity (mph)	3.6
Average Wind Velocity (mph)	2.3
Temperature (F)	92
Relative Humidity (%)	30
Comments:	

Comments: File # 2

Location Photo:

Noise Measurement Survey

Project Number: SNN2101
Project Name: 2740 West Nielson

Test Personnel: Moe Abushanab
Equipment: Larson Davis LxT

Site Number: ST-3 Date: 9/28/2022

Time: From 2:25 p.m. To 2:45 p.m.

Site Location: West of N Marks Avenue, south of overpass entrance, by powerline pole. Approximately 50 feet away from Marks Ave. centerline

Primary Noise Sources: traffic noise on Marks
Faint operational noise from adjacent site, trucks leaving/entering site.

Measurement Results

	dBA
L_{eq}	68.9
L_{max}	83.9
L_{min}	43.3
L_{peak}	98.6
L_2	77.2
L_8	73.9
L_{25}	69.0
L_{50}	63.8
SEL	

Atmospheric Conditions:

Maximum Wind Velocity (mph)	3.6
Average Wind Velocity (mph)	2.3
Temperature (F)	92
Relative Humidity (%)	30
Comments:	

Comments: File # 3

Location Photo:

Noise Measurement Survey

Project Number: SNN2101
Project Name: 2740 West Nielson

Test Personnel: Moe Abushanab
Equipment: Larson Davis LxT

Site Number: ST-4 Date: 9/28/2022

Time: From 2:50 p.m. To 3:10 p.m.

Site Location: South of Nielson Avenue, approximately 40 feet away from centerline. East of 2307 W Nielson Ave entrance.

Primary Noise Sources: traffic noise on Nielson
Occasional aircraft

Measurement Results

	dBA
L_{eq}	66.7
L_{max}	80.2
L_{min}	45.6
L_{peak}	98.0
L_2	75.3
L_8	71.9
L_{25}	67.1
L_{50}	60.7
SEL	

Atmospheric Conditions:

Maximum Wind Velocity (mph)	3.6
Average Wind Velocity (mph)	2.3
Temperature (F)	92
Relative Humidity (%)	30
Comments:	

Comments: File # 4
Generally quiet without traffic

Location Photo:

ATTACHMENT C

FHWA TRAFFIC NOISE MODEL PRINTOUTS

TABLE Existing -01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10190   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
158.3	486.1	1532.3	4843.5

TABLE Existing -02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive

NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11554 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.33

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
178.3	550.7	1737.2	5491.8

TABLE Existing -03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps
NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12019   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.51

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
185.1	572.8	1807.1	5712.8

TABLE Existing -04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7240   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 25   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 70.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
91.6	279.7	881.2	2785.5

TABLE Existing -05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1614   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.04

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	71.2	199.2	621.2

TABLE Existing -06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue
NOTES: 2740 West Nielson Warehouse Project - Existing

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2604   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.31

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	104.5	318.1	1001.7

TABLE Existing - With Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11228   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.85

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
199.7	619.9	1956.4	6184.9

TABLE Existing - With Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive
NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12146 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.19

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
215.4	670.3	2116.2	6690.5

TABLE Existing - With Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps
NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12611   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
223.3	695.9	2197.2	6946.6

TABLE Existing - With Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7550   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 25   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.77

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
109.2	337.2	1063.6	3362.3

TABLE Existing - With Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2230   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.08

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	105.2	315.6	992.5

TABLE Existing - With Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue

NOTES: 2740 West Nielson Warehouse Project - Existing - With Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3060   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	139.5	431.8	1362.3

TABLE Opening Year - No Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 10938   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.10

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
169.2	521.5	1644.7	5199.1

TABLE Opening Year - No Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive
NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12408   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
190.8	591.2	1865.6	5897.7

TABLE Opening Year - No Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps

NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

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* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12933   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.82

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
198.5	616.1	1944.5	6147.2

TABLE Opening Year - No Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 7905   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS			
	58.45	7.80	11.70
M-TRUCKS			
	8.24	1.11	1.67
H-TRUCKS			
	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 25   SITE CHARACTERISTICS: HARD

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.34

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
99.4	305.2	962.1	3041.3

TABLE Opening Year - No Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue
NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1767   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.43

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	76.4	217.6	679.9

TABLE Opening Year - No Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue
NOTES: 2740 West Nielson Warehouse Project - Opening Year - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2796   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	111.6	341.3	1075.5

TABLE Opening Year - With Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11976   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.13

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
212.5	661.0	2086.6	6596.8

TABLE Opening Year - With Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive
NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13000 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.49

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
230.0	717.3	2265.0	7160.9

TABLE Opening Year - With Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps
NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13525   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.66

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
239.0	746.2	2356.4	7450.0

TABLE Opening Year - With Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8215 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 25 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.14

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
118.4	366.7	1157.2	3658.4

TABLE Opening Year - With Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue
NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2383   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	111.6	337.0	1060.5

TABLE Opening Year - With Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue

NOTES: 2740 West Nielson Warehouse Project - Opening Year - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3252   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.91

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	147.8	458.7	1447.7

TABLE Year 2035 - No Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 11651 SPEED (MPH): 45 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
179.7	555.3	1751.8	5537.9

TABLE Year 2035 - No Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive

NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13244   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 73.93

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
203.1	630.9	1991.2	6295.0

TABLE Year 2035 - No Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13706   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.08

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
209.9	652.8	2060.6	6514.6

TABLE Year 2035 - No Project-04

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 8846   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 25   SITE CHARACTERISTICS: HARD

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 71.83

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
110.5	341.3	1076.6	3403.3

TABLE Year 2035 - No Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1772   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 35   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 64.44

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	76.6	218.2	681.8

TABLE Year 2035 - No Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3531   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	58.45	7.80	11.70
M-TRUCKS	8.24	1.11	1.67
H-TRUCKS	8.25	1.11	1.67

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	139.1	430.4	1358.0

TABLE Year 2035 - With Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Marks Avenue between Belmont Avenue and Nielson Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 12689   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.38

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
224.7	700.2	2210.8	6989.6

TABLE Year 2035 - With Project-02

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Marks Avenue between Nielsen Avenue and Ray Johnson Drive

NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 13836   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.76

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
244.4	763.3	2410.6	7621.3

TABLE Year 2035 - With Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Marks Avenue between Ray Johnson Drive and SR-180 Westbound Ramps

NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 14298   SPEED (MPH): 45   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 40   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 74.90

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
252.3	788.7	2491.1	7875.8

TABLE Year 2035 - With Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Belmont Avenue between Marks Avenue and Hughes Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 9156   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 25   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 72.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
131.4	408.6	1289.7	4077.4

TABLE Year 2035 - With Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022

ROADWAY SEGMENT: Nielson Avenue between Marks Avenue and Hughes Avenue

NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2388 SPEED (MPH): 40 GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 35 SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.37

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
0.0	111.8	337.7	1062.7

TABLE Year 2035 - With Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 10/07/2022
ROADWAY SEGMENT: Hughes Avenue between Nielson Avenue and Belmont Avenue
NOTES: 2740 West Nielson Warehouse Project - Year 2035 - With Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3987   SPEED (MPH): 40   GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

	DAY	EVENING	NIGHT
AUTOS	49.84	13.18	16.00
M-TRUCKS	6.77	1.61	2.06
H-TRUCKS	6.82	1.66	2.06

ACTIVE HALF-WIDTH (FT): 30   SITE CHARACTERISTICS: HARD

---

* * CALCULATED NOISE LEVELS * *

CNEL AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO CNEL

70 CNEL	65 CNEL	60 CNEL	55 CNEL
63.6	180.0	561.9	1774.6

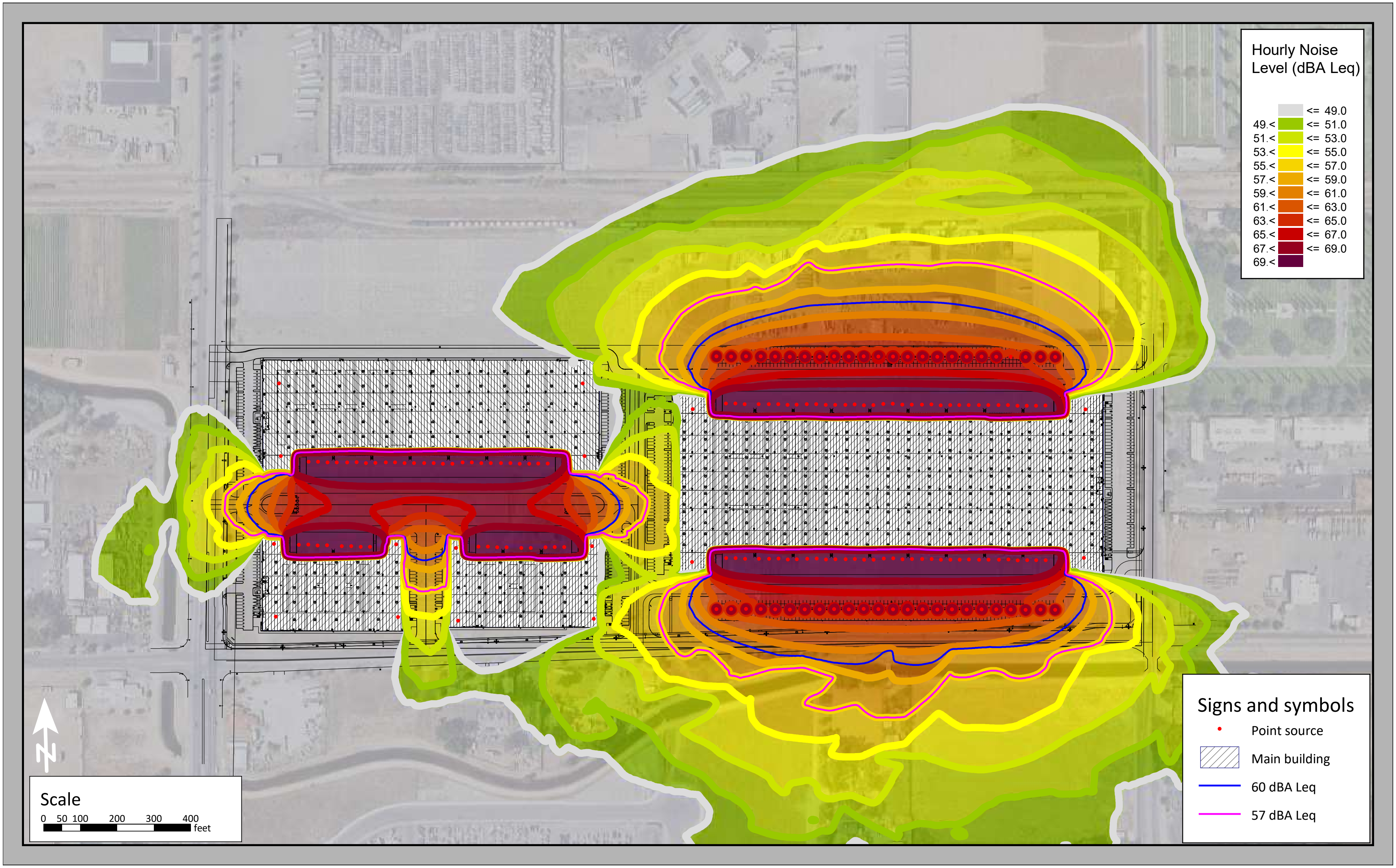
ATTACHMENT D

SOUNDPLAN NOISE MODEL PRINTOUTS

2740 W Nielsen

Project No. SNN2102

Project Operational Noise Levels



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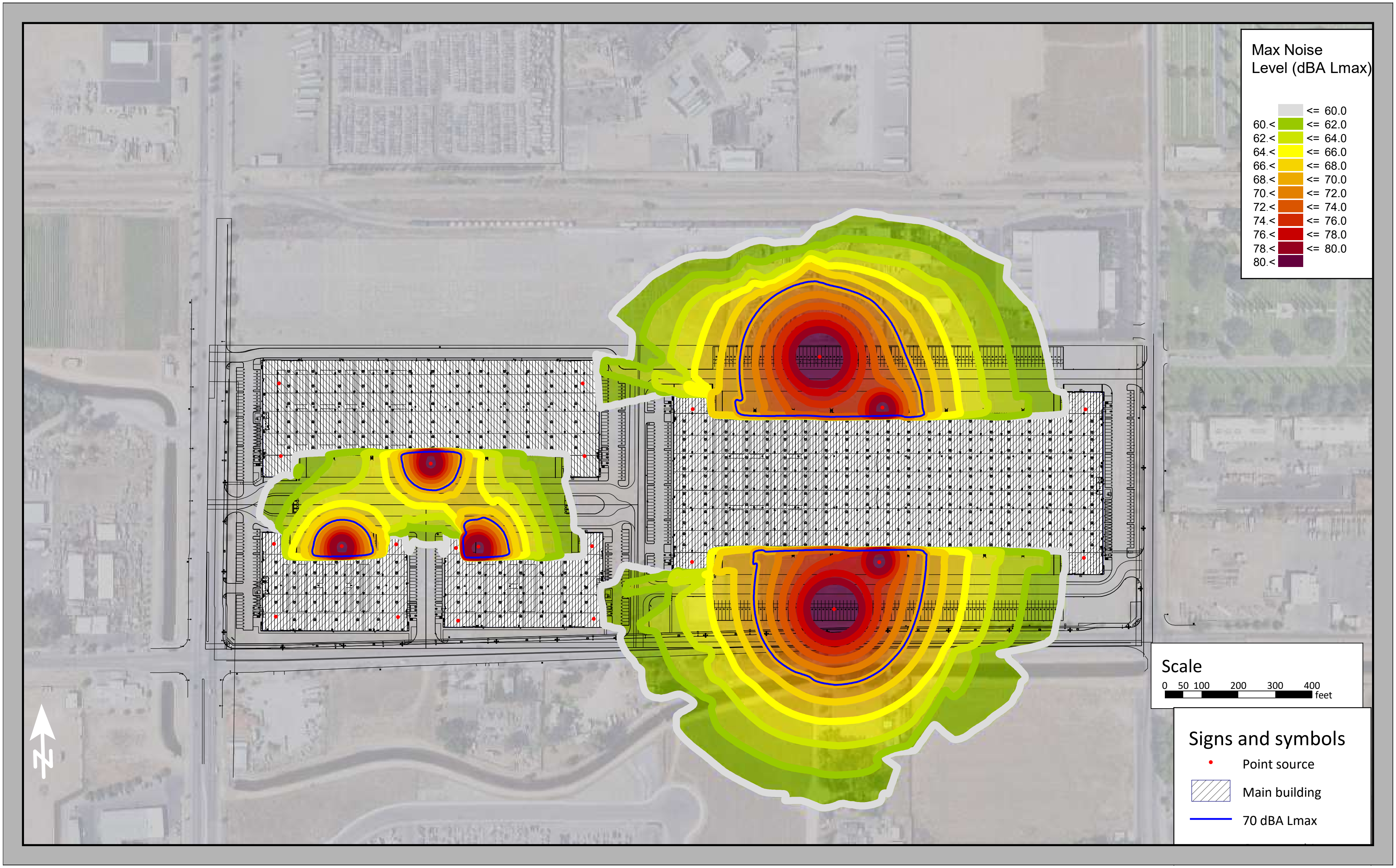
2740 W Nielsen

Project No. SNN2102

Project Operational Noise Levels - Max



APPENDIX M

TRAFFIC IMPACT STUDY

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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.

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

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(951) 781-9310

Project No. SNN2101

LSA

December 2021

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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

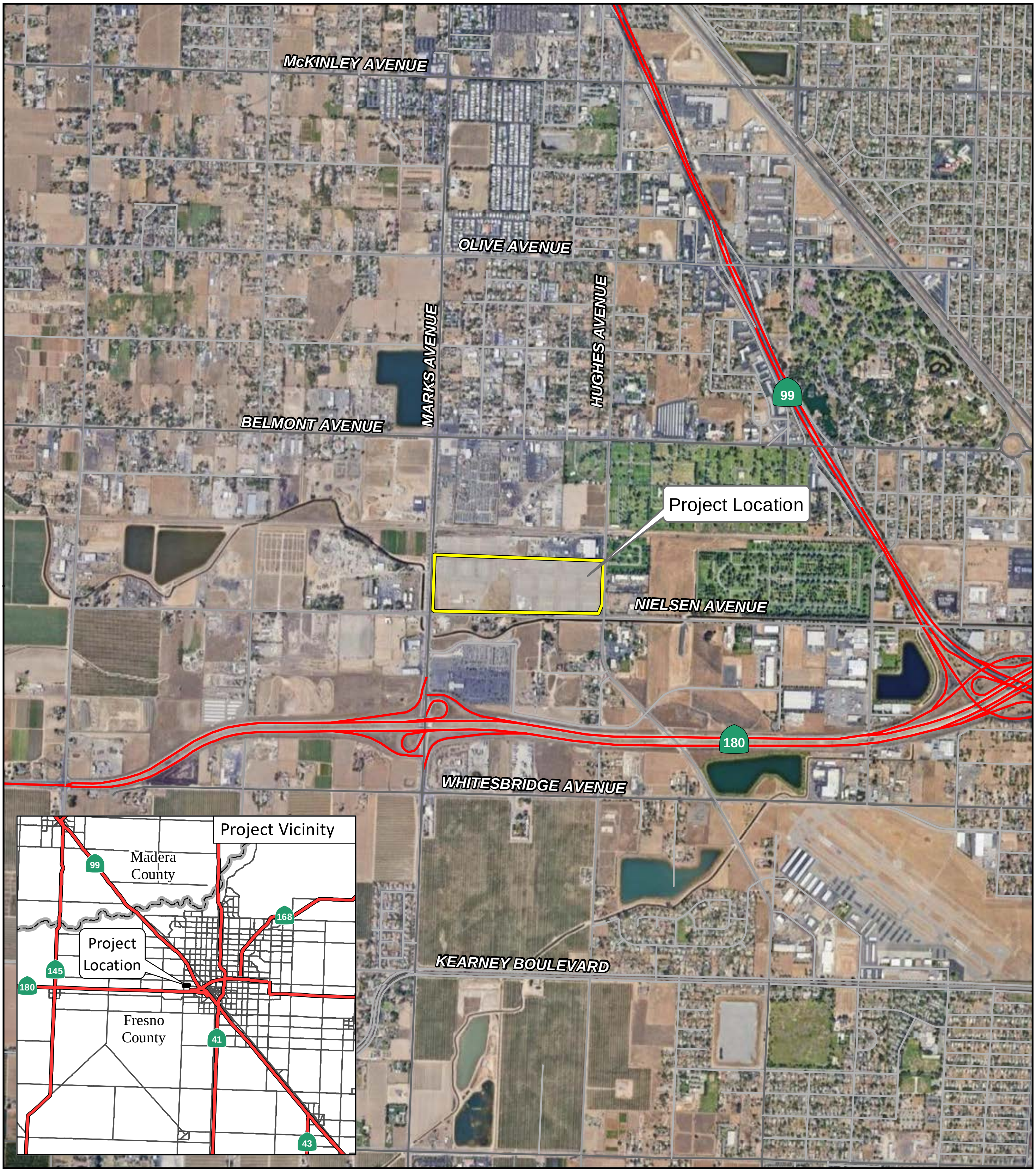
1. West of Marks Avenue Off-Ramp (Basic);
2. Marks Avenue Off-Ramp (Diverge);
3. Between Marks Avenue Off-Ramp and Marks Avenue Loop-On Ramp (Basic);
4. Marks Avenue Loop-On Ramp (Merge);
5. Between Marks Avenue Loop-On Ramp and Marks Avenue Slip-On Ramp (Basic);
6. Marks Avenue Slip-On Ramp(Merge);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



LSA

FIGURE 1-1

0 1000 2000
FEET

2740 West Nielsen Warehouse Project
Traffic Impact Study

Regional and Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

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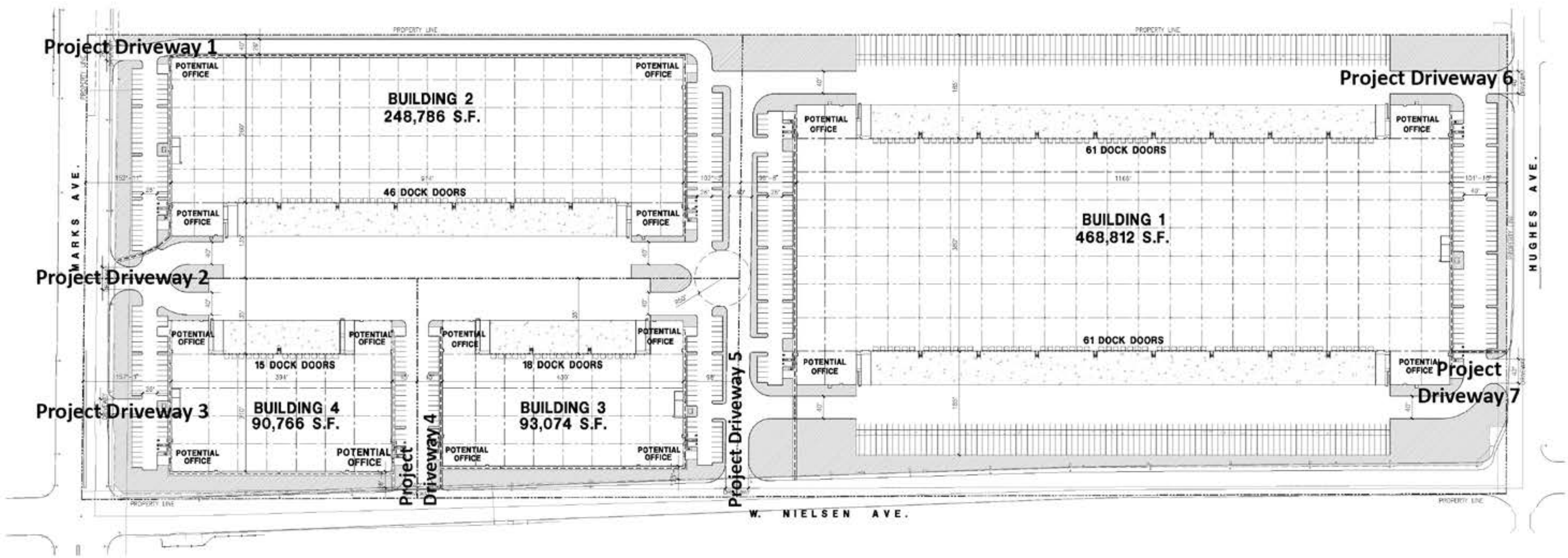
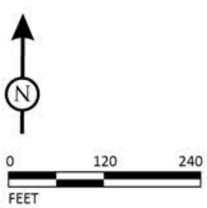


LSA

FIGURE 1-2



2740 West Nielsen Warehouse Project
Traffic Impact Study

Conceptual Site Plan

SOURCE: HPA architecture; April 2021

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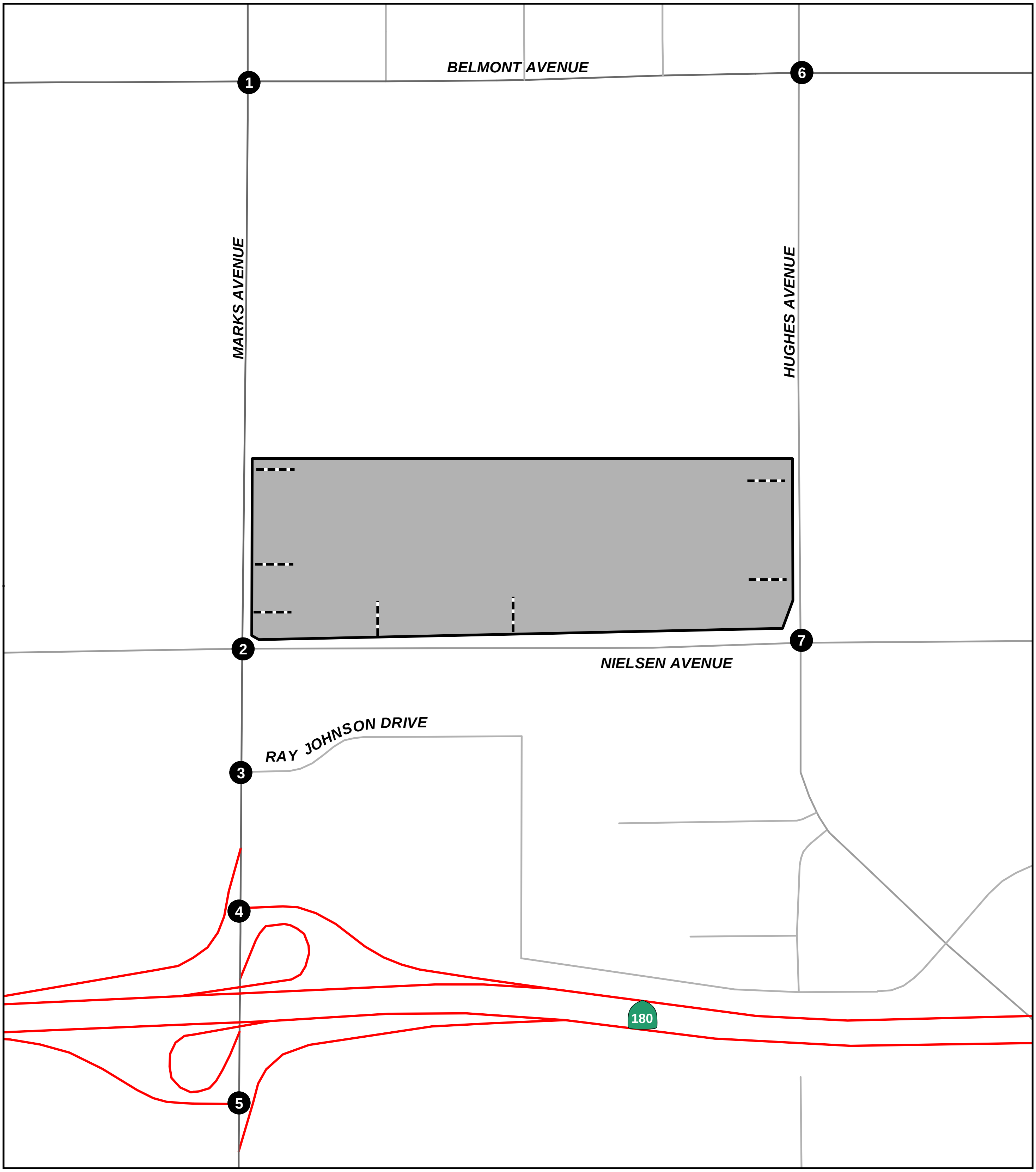

LSA

LEGEND

Project Site

Study Intersection

Project Driveway

0 300 600

FEET

FIGURE 1-3

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

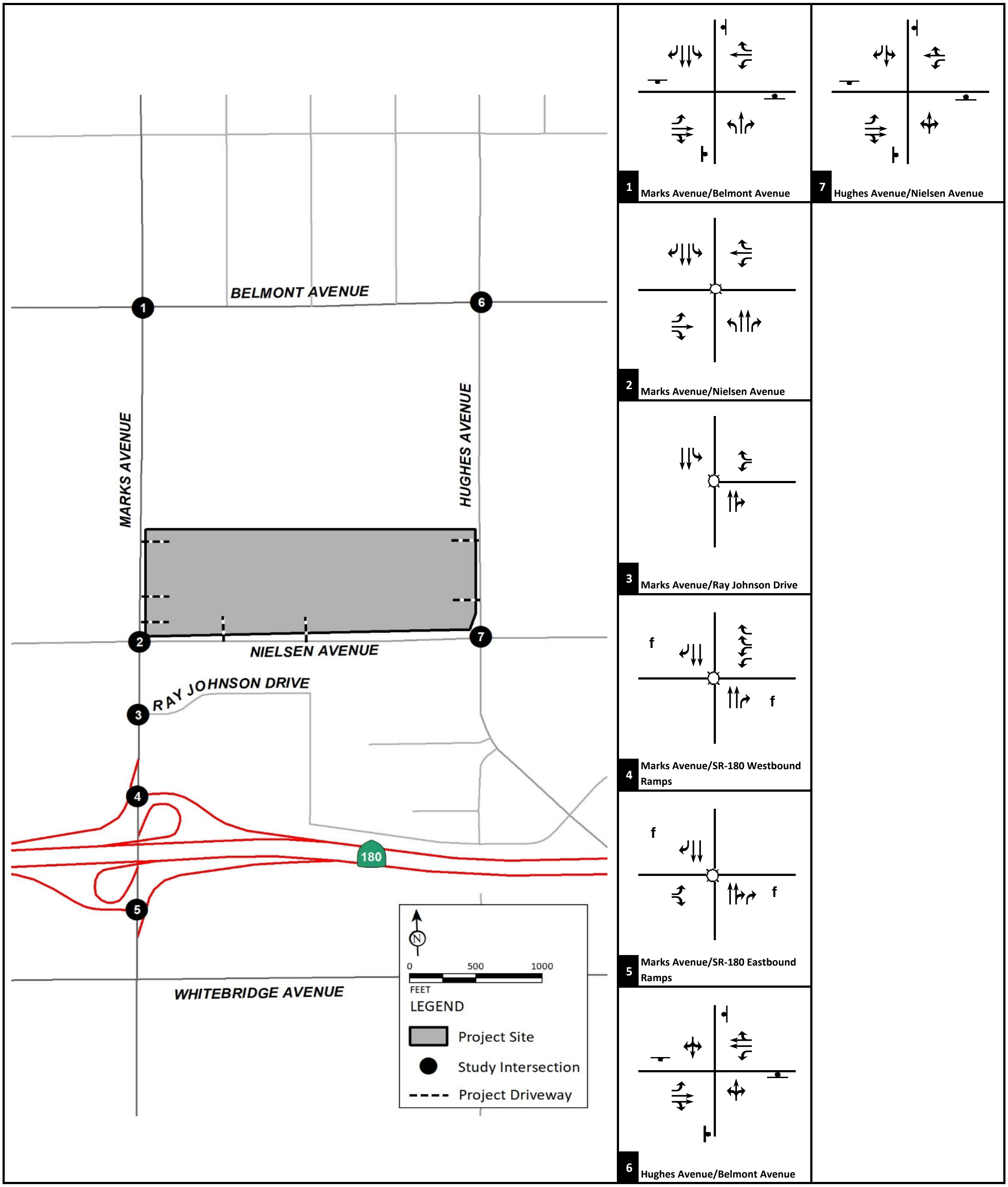

FIGURE 3-1

LSA

Legend

Signal

f Free Right Turn

Stop Sign

2740 West Nielsen Warehouse Project

Traffic Impact Study

Existing Study Intersection Geometrics and Traffic Control

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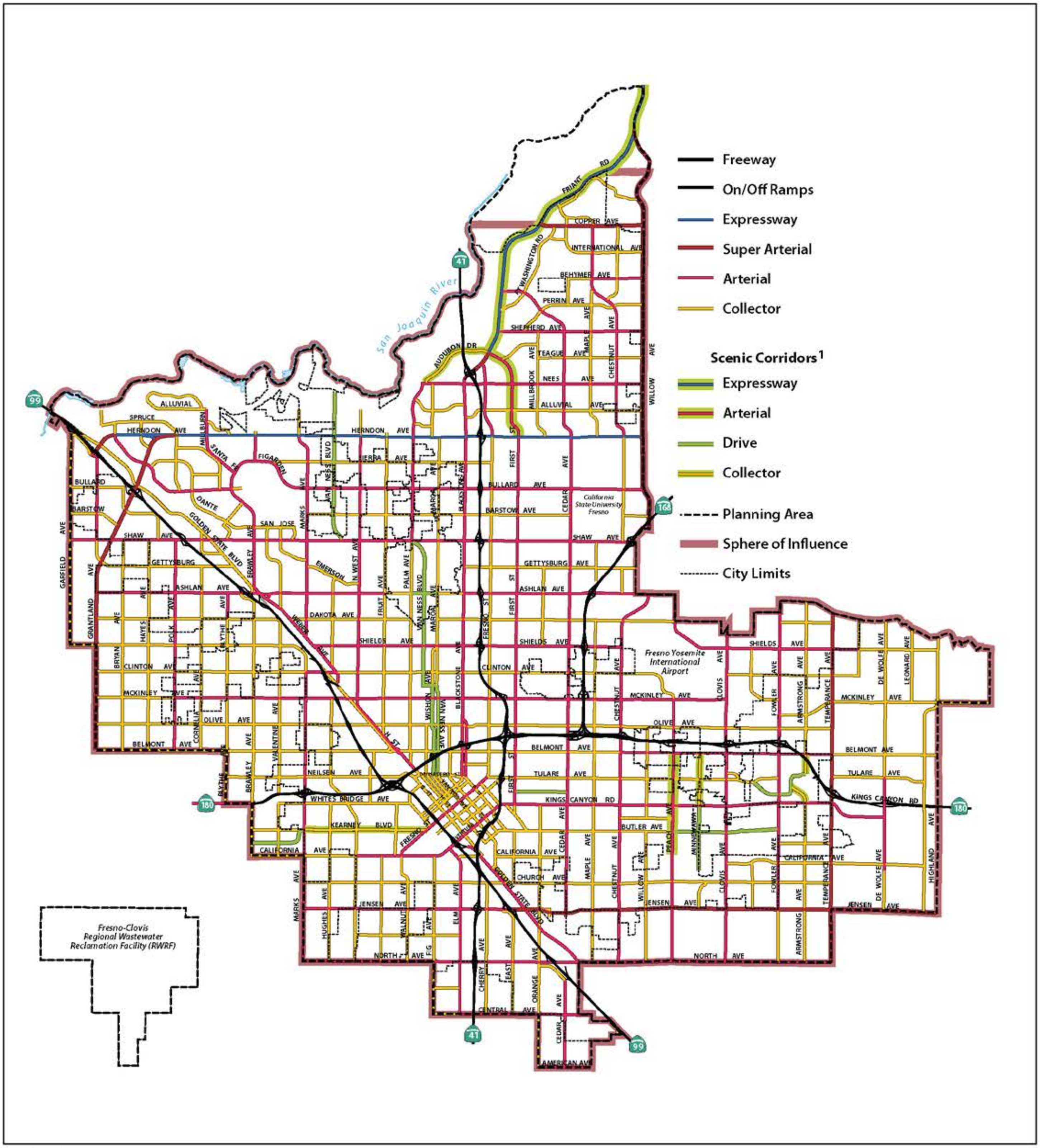

LSA

FIGURE 3-2

0 1 2
MILE

2740 West Nielsen Warehouse Project
Traffic Impact Study

City of Fresno Roadway Classification

SOURCE: City of Fresno General Plan, 2014

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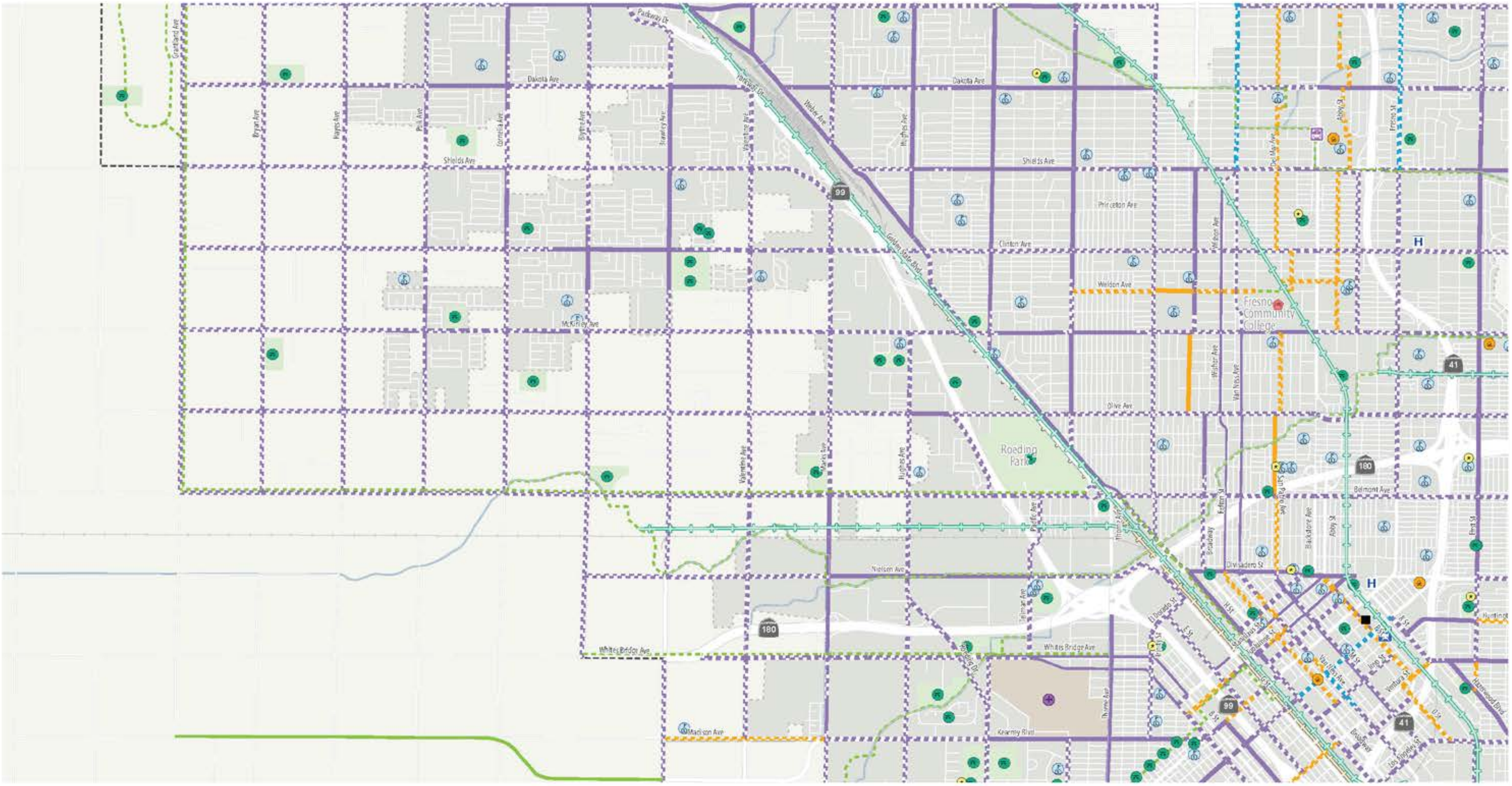

LSA

FIGURE 3-3

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

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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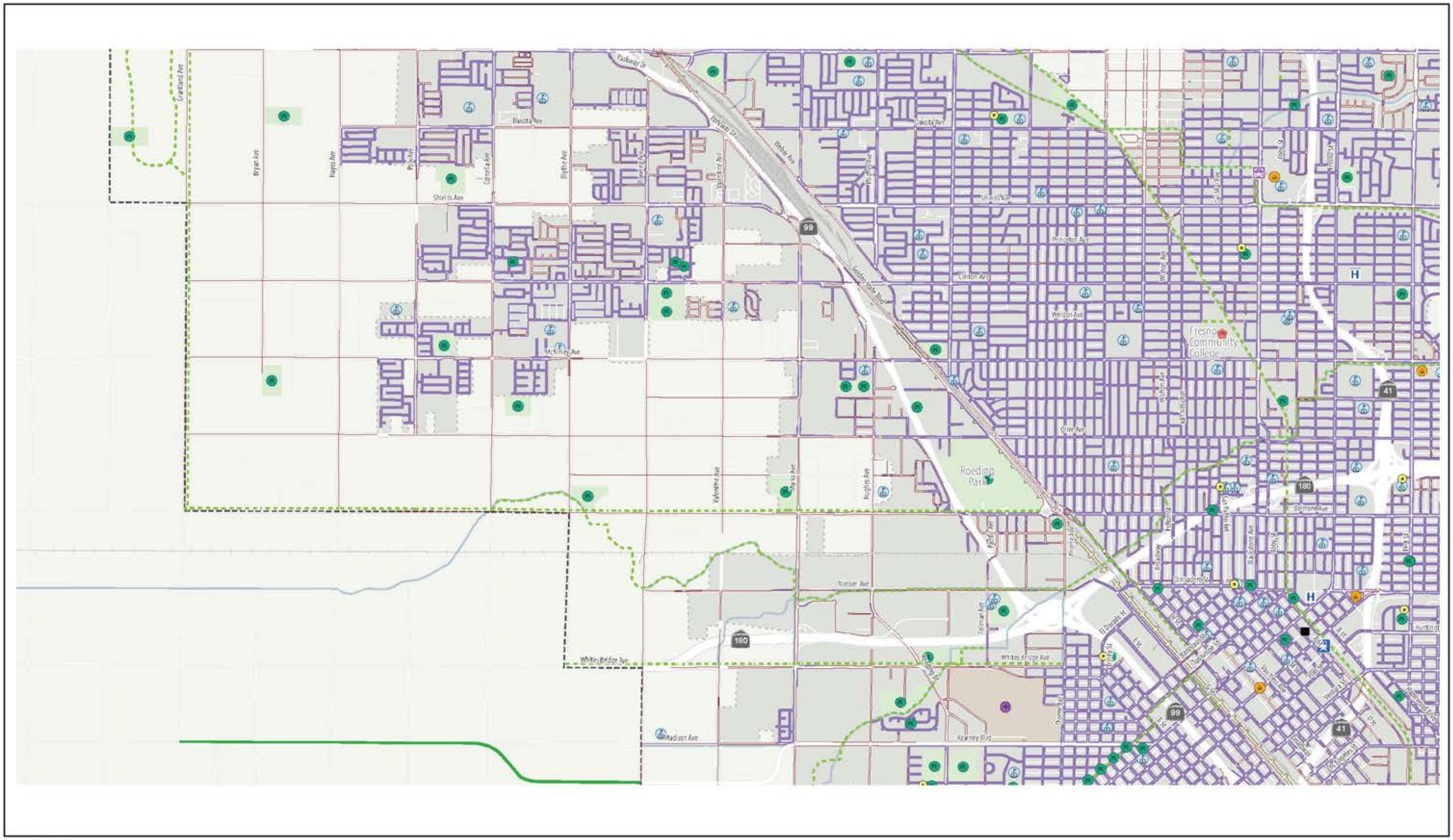

LSA

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* (10^{th} 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

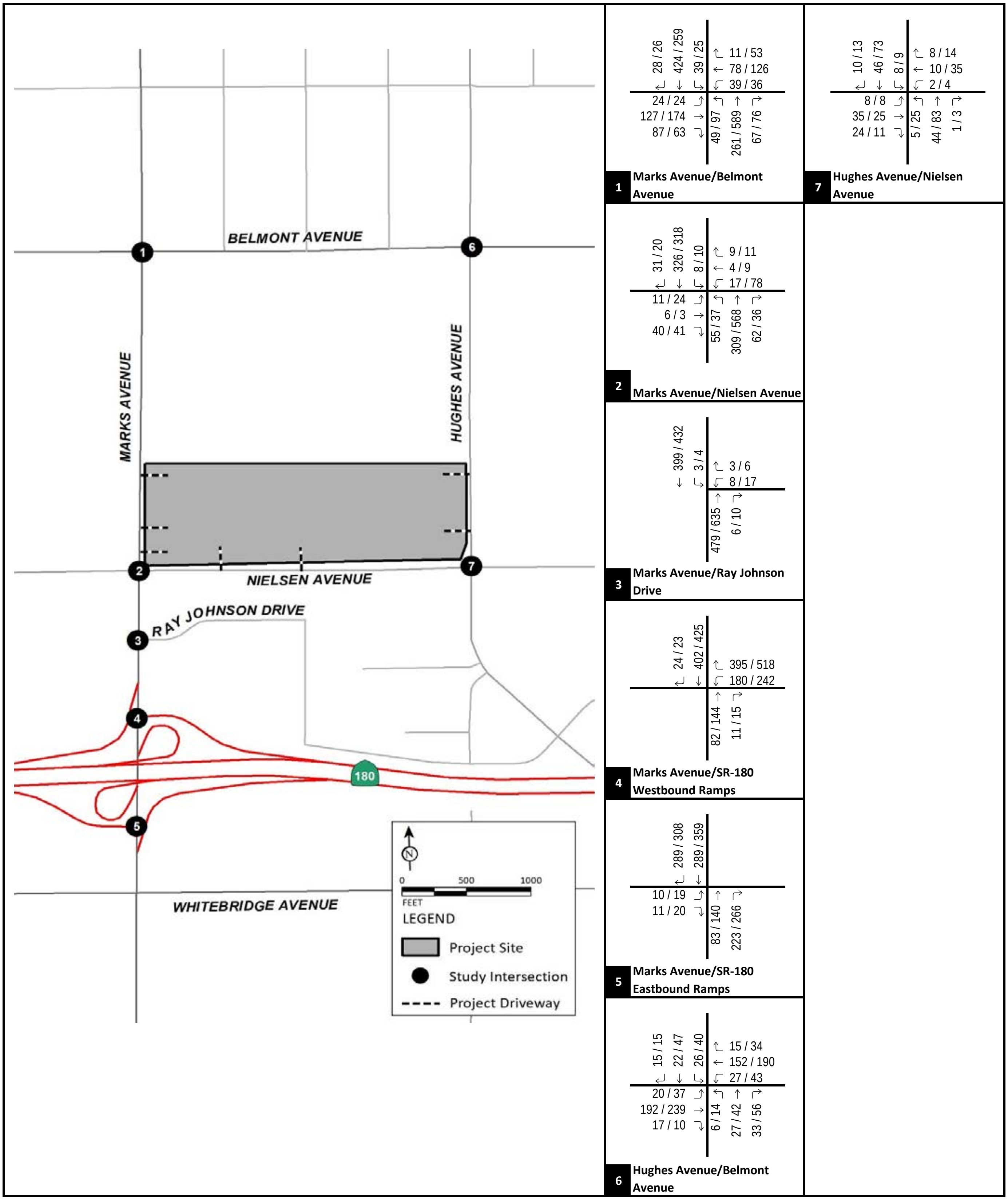


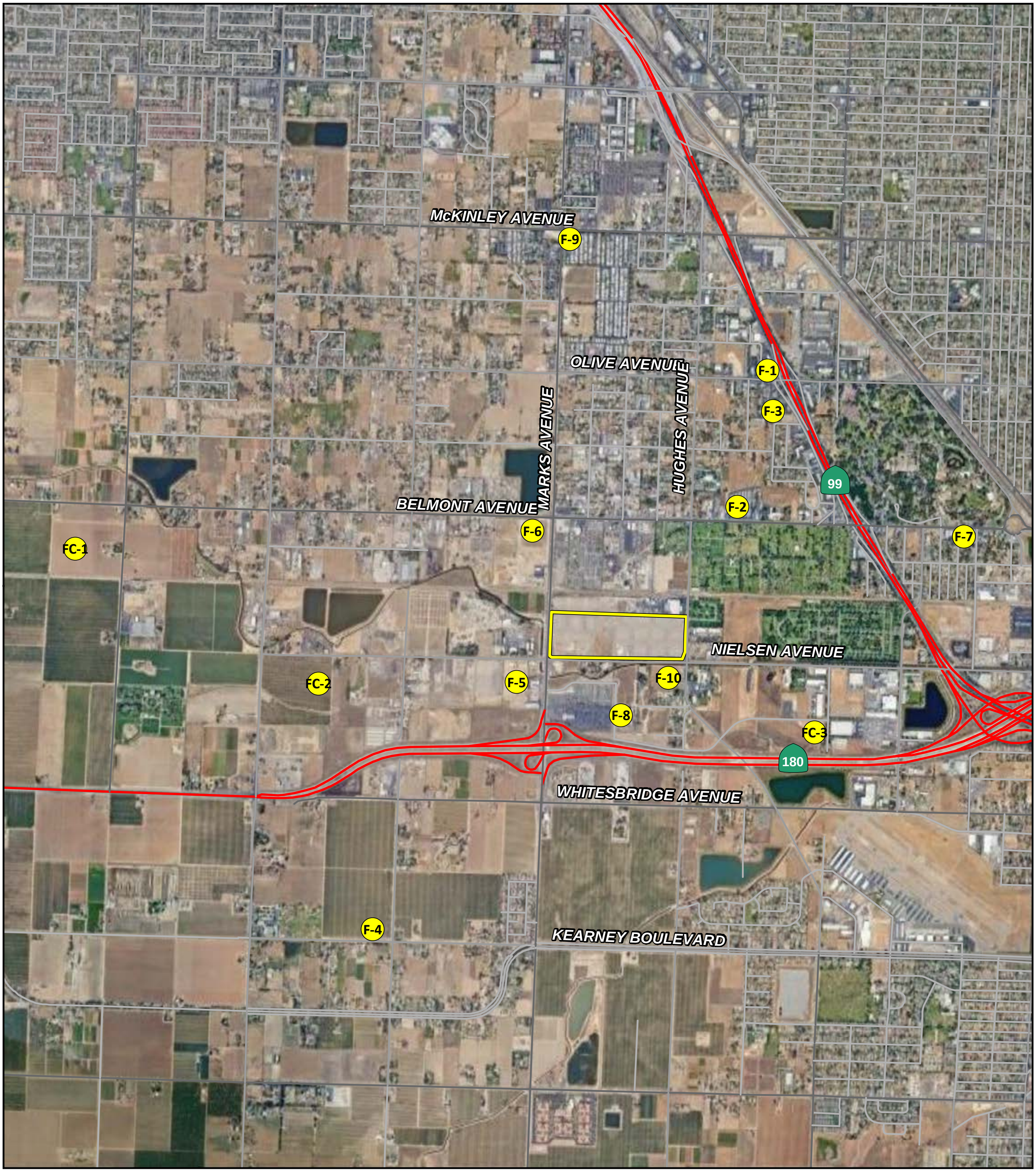
FIGURE 4-1

LSA

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Existing Peak Hour Traffic Volumes



LSA

LEGEND

Project Location

Cumulative Project Location

FIGURE 4-2

N

0 1250 2500

FEET

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

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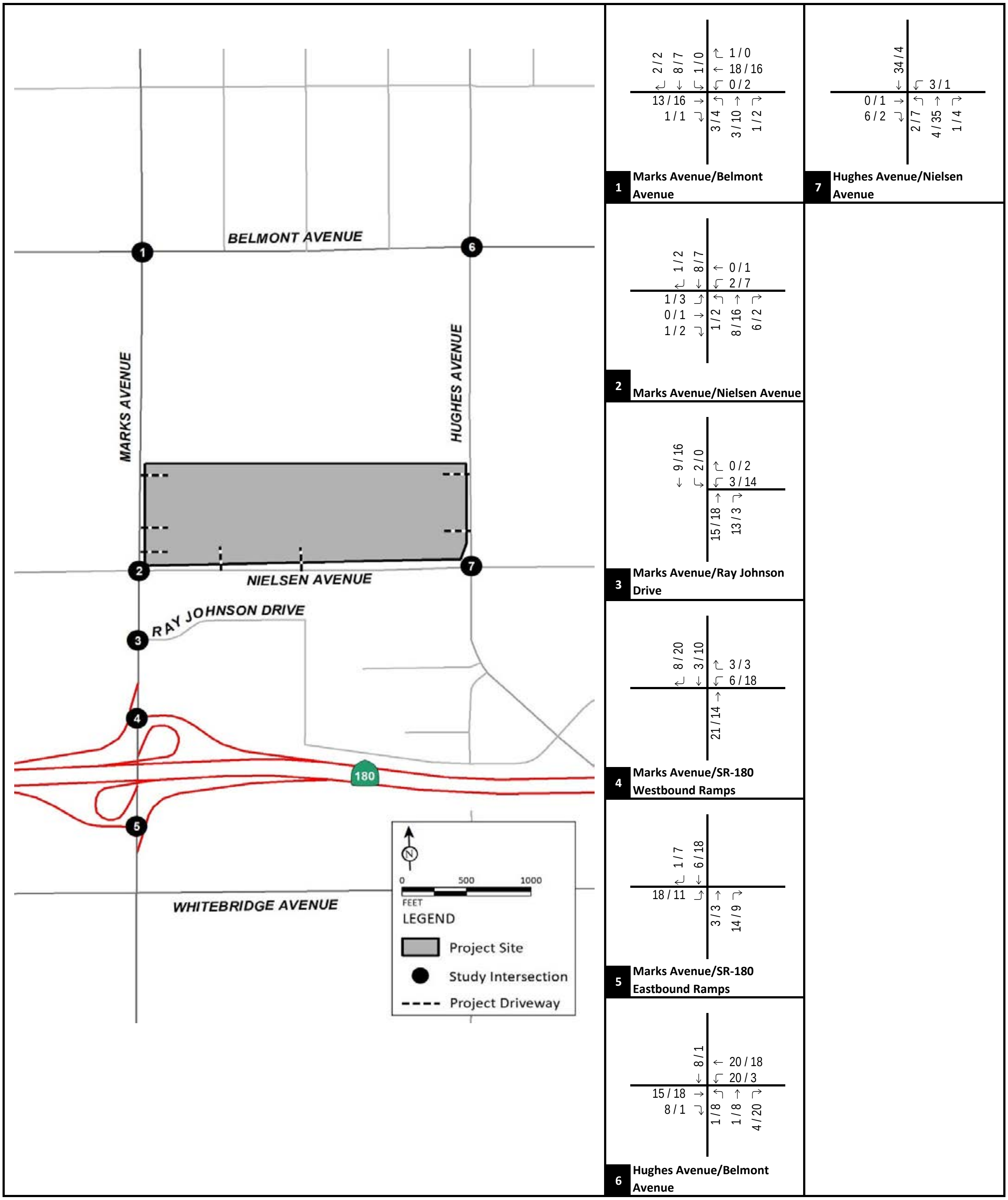

FIGURE 4-3

LSA

XXX / YYY
AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse Project
Traffic Impact Study

Cumulative Project Trip Assignment

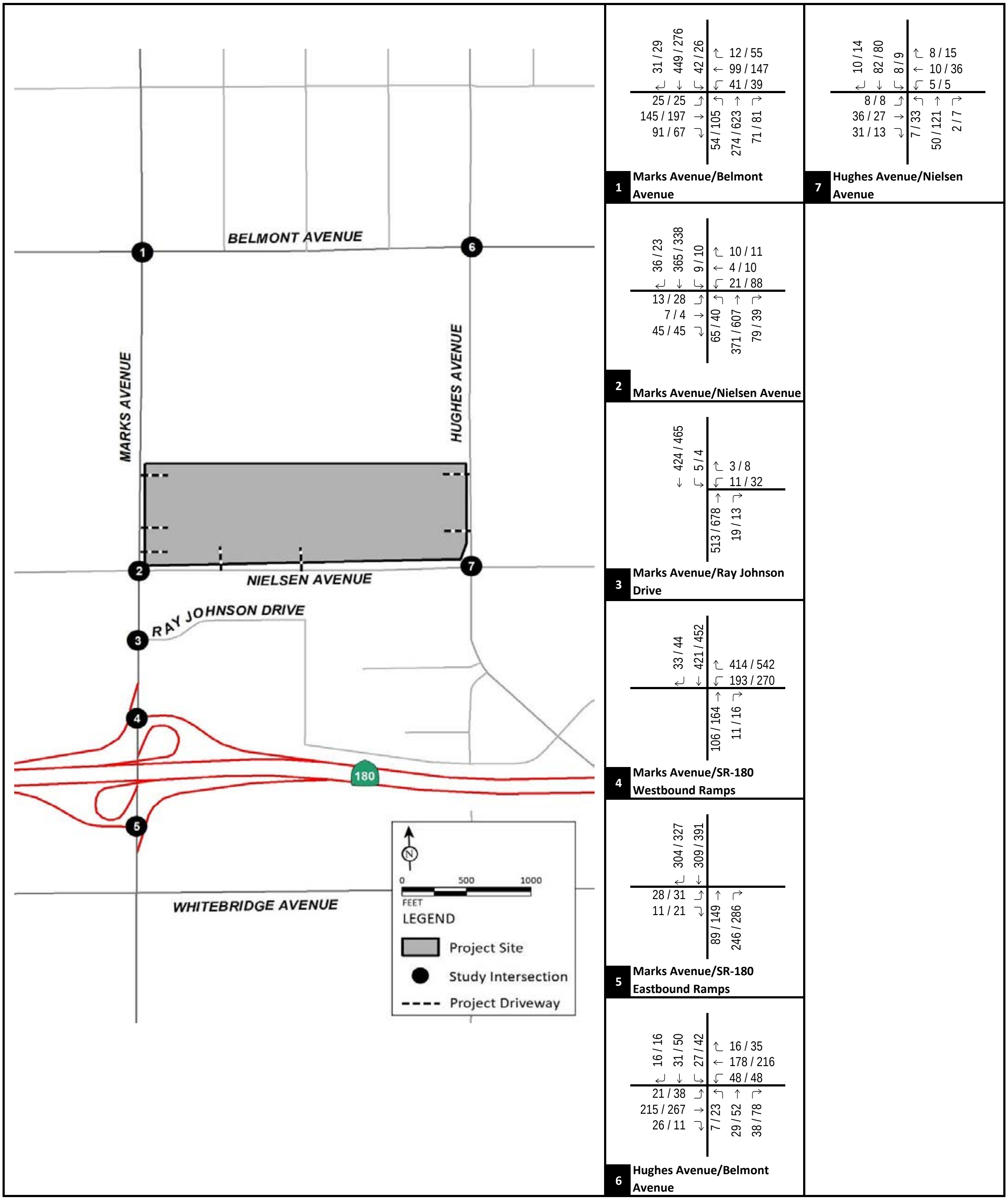

FIGURE 4-4

LSA

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

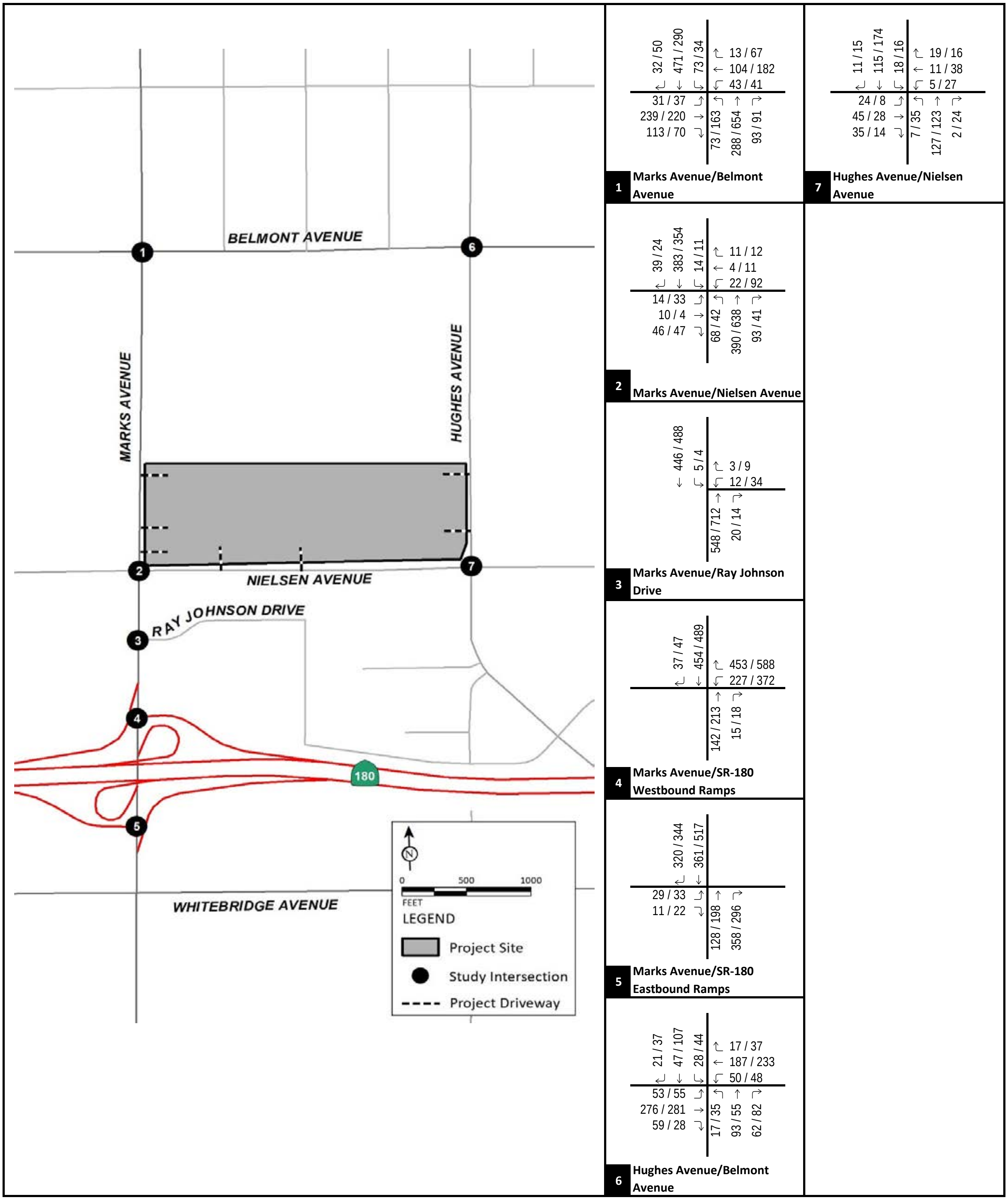

FIGURE 4-5

LSA

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

LSA

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

LSA

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
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**

LSA

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
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**

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Table 4-B - Cumulative Projects Trip Generation

Project No.	Project Name/Land Use/Builder/Applicant	Units	A.M. Peak Hour			P.M. Peak Hour			Daily
			In	Out	Total	In	Out	Total	
		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.

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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

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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

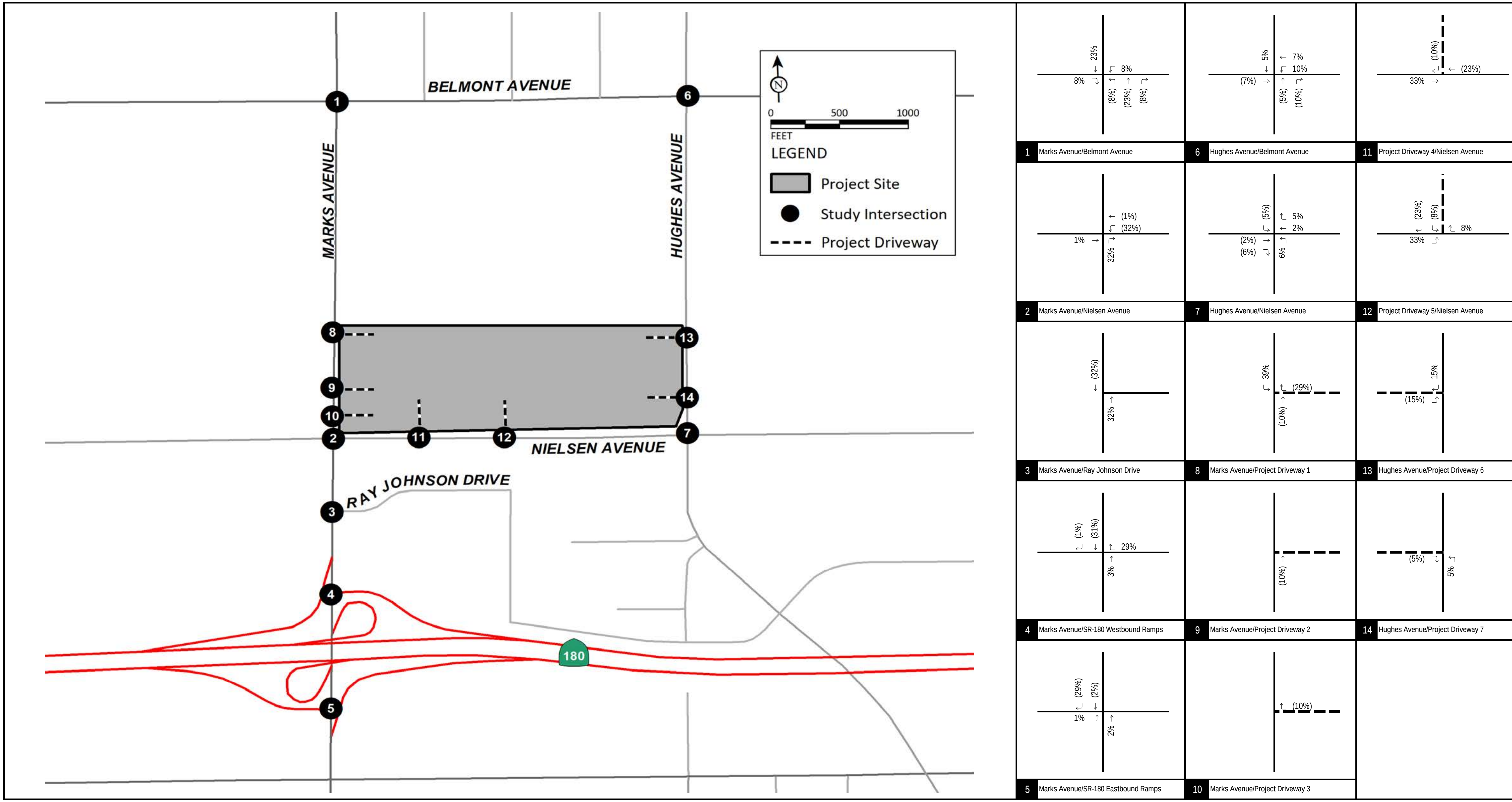
Trip distribution patterns were obtained from select zone model runs of the Fresno COG ABM, which take into account the location of the proposed project in relation to surrounding land uses and the regional roadway network. Separate select zone trip distributions for passenger car and truck trips were 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 5-1: Project Trip Distribution – Passenger Car
- Figure 5-2: Project Trip Distribution – Truck
- Figure 5-3: Project Trip Assignment – Passenger Car
- Figure 5-4: Project Trip Assignment – Truck

- Figure 5-5: Total Project PCE Trip Assignment
- Table 5-A: Project Trip Generation



LSA

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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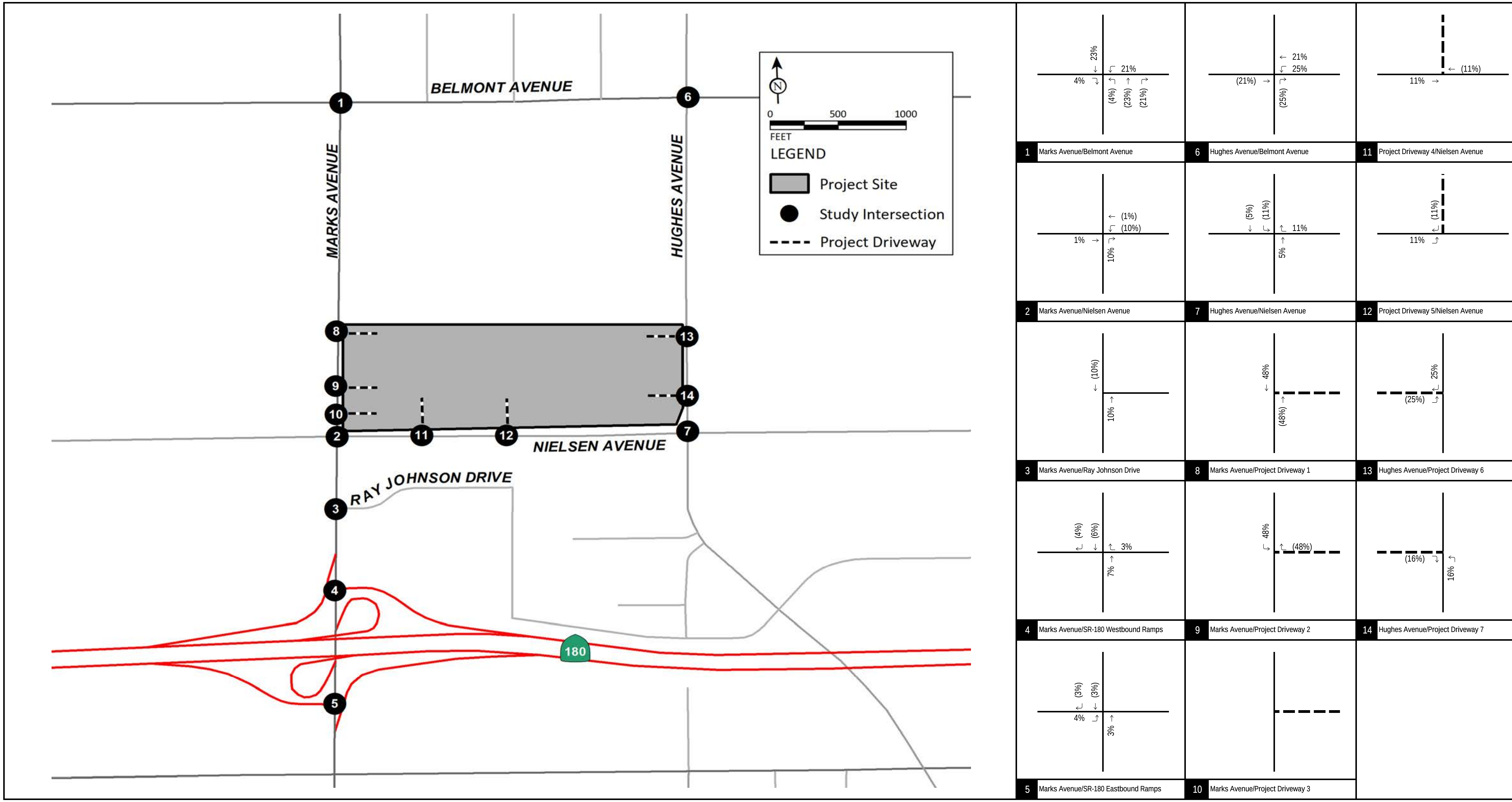
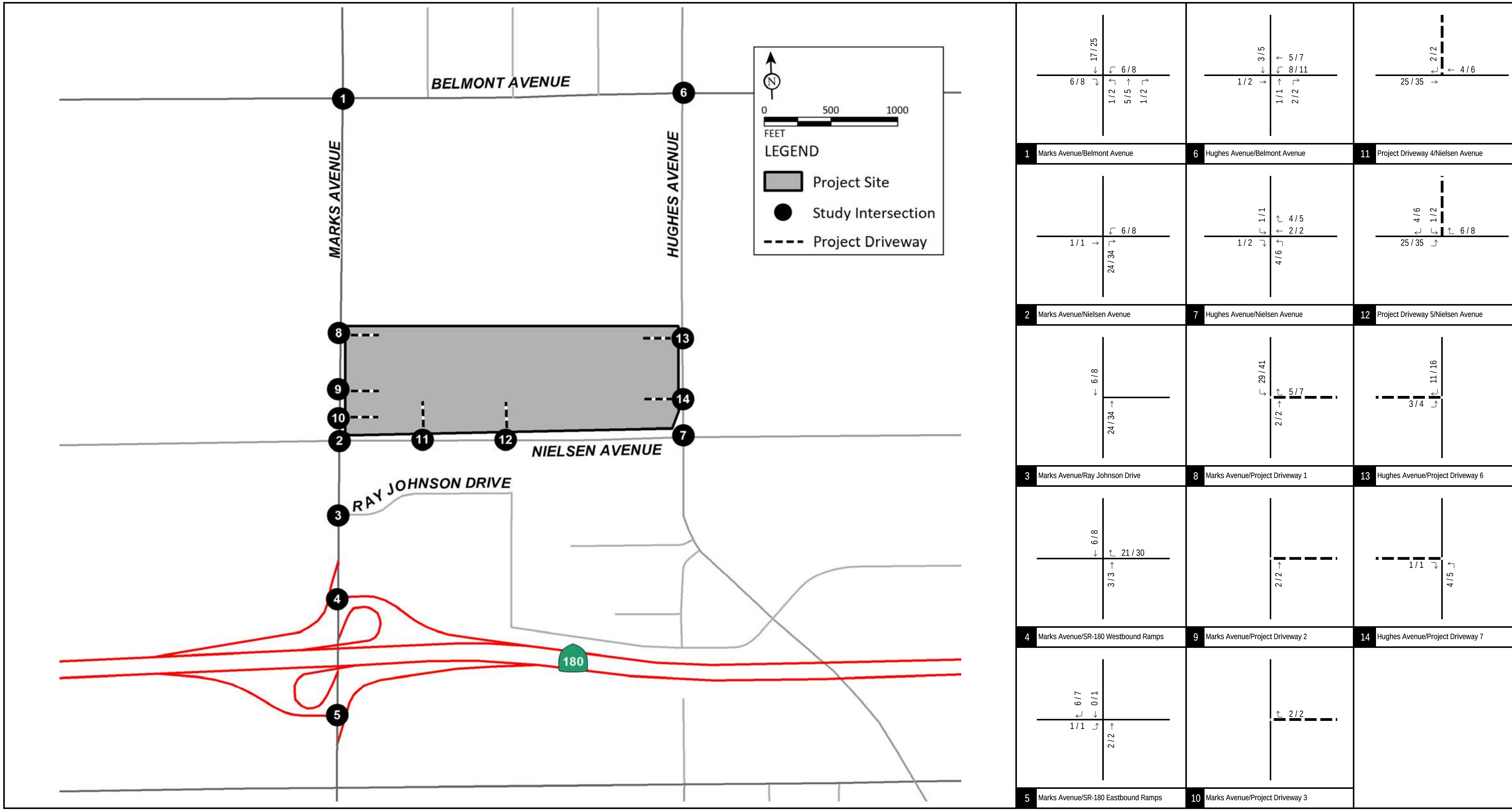


LSA

FIGURE 5-2

XX% (YY%)
Inbound (Outbound) Distribution
- - - - Project Driveway

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Distribution - Trucks



LSA

FIGURE 5-3

XX / YY
AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse Project
Traffic Impact Study
Project Trip Assignment - Passenger Vehicles

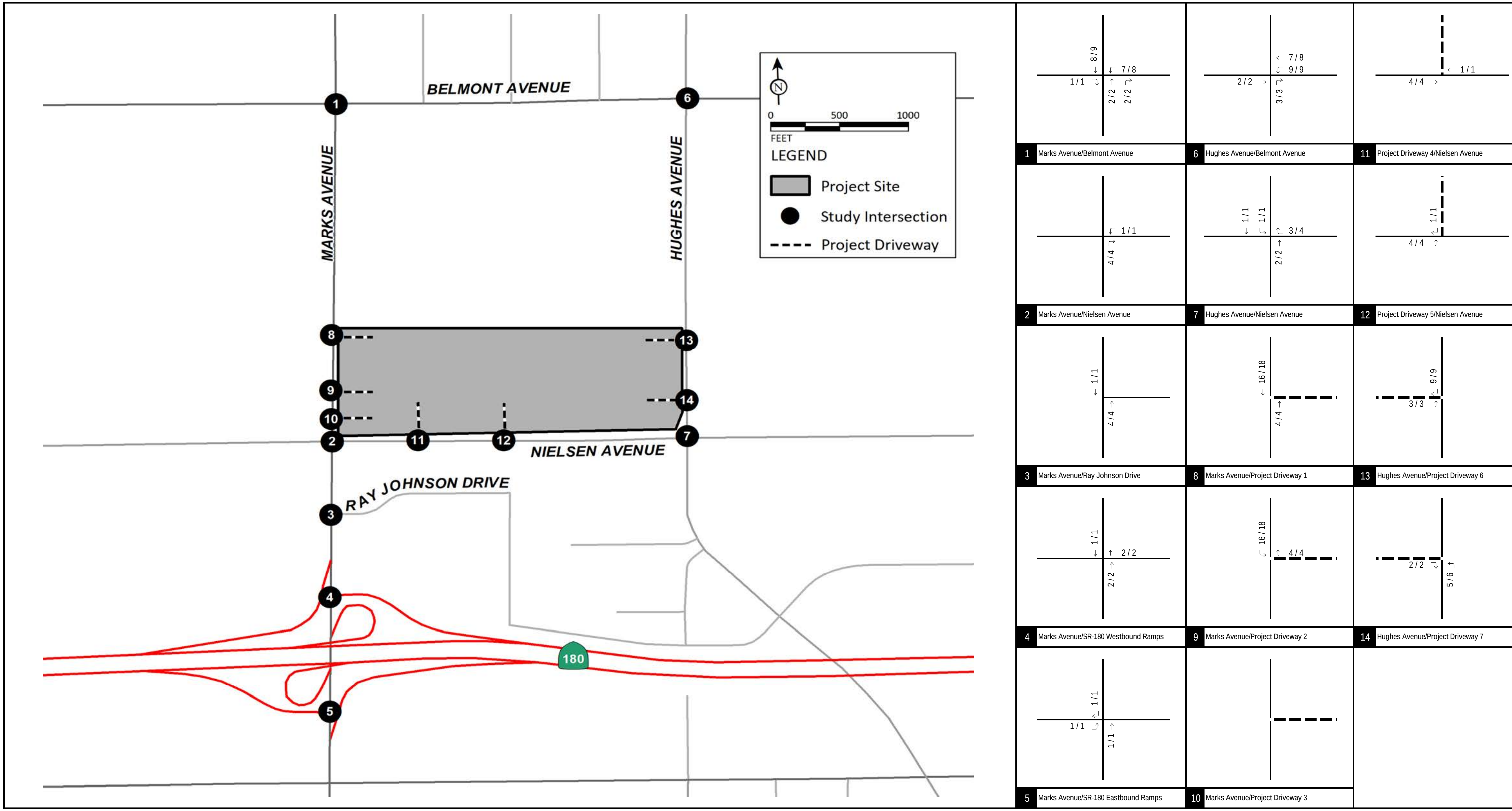


FIGURE 5-4

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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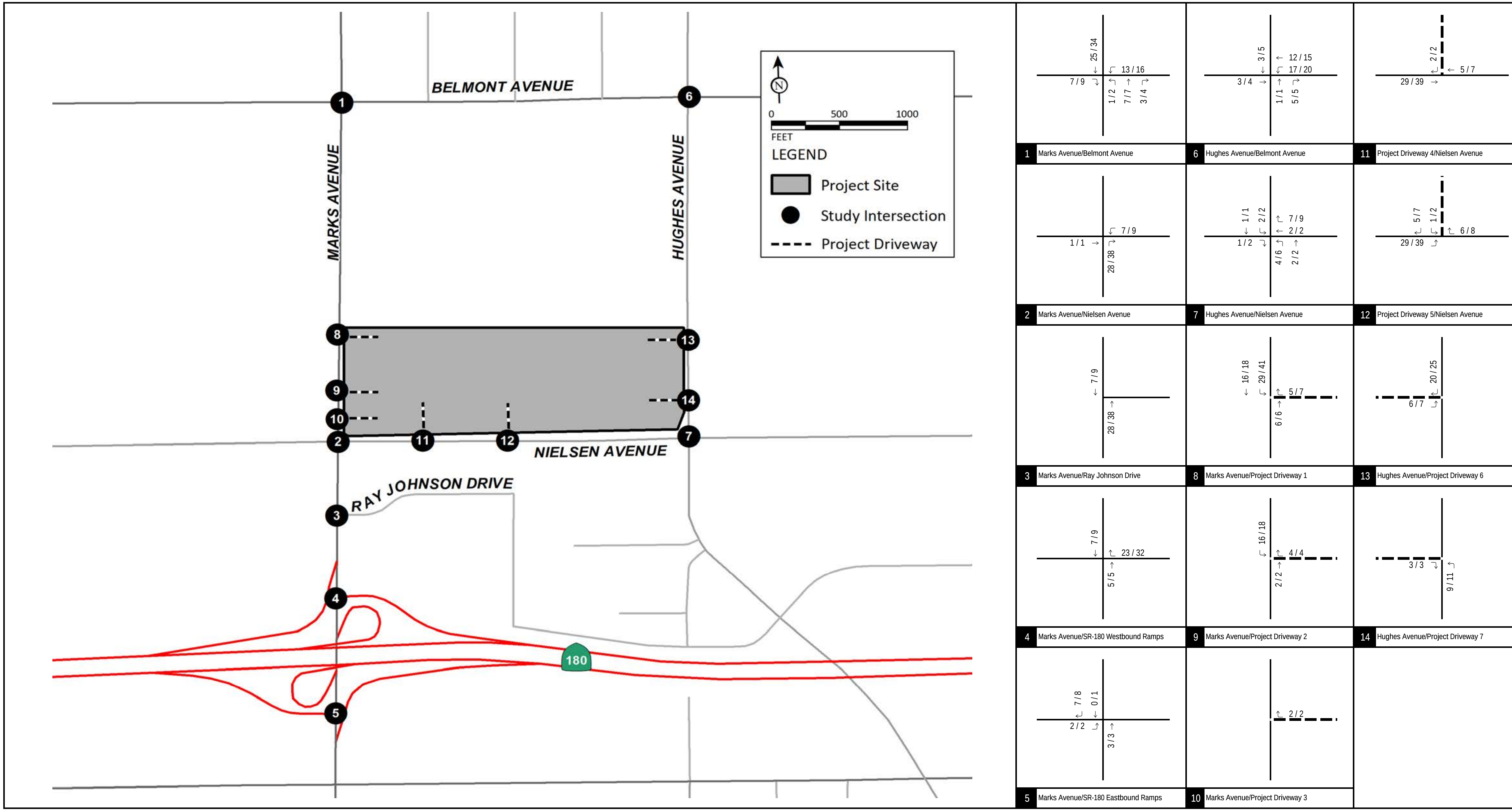

LSA

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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LSA

Table 5-A - Project Trip Generation

Land Use		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
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

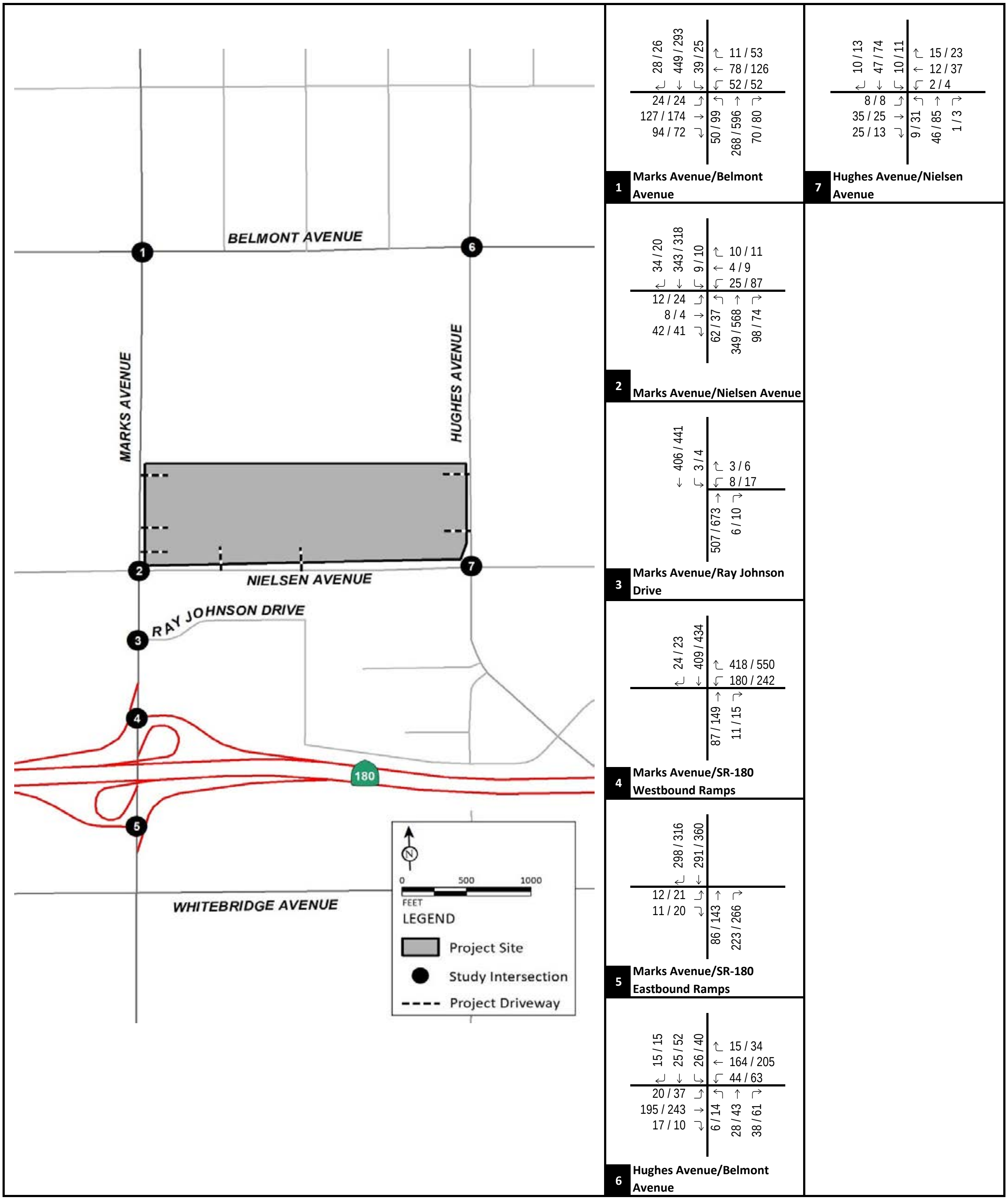


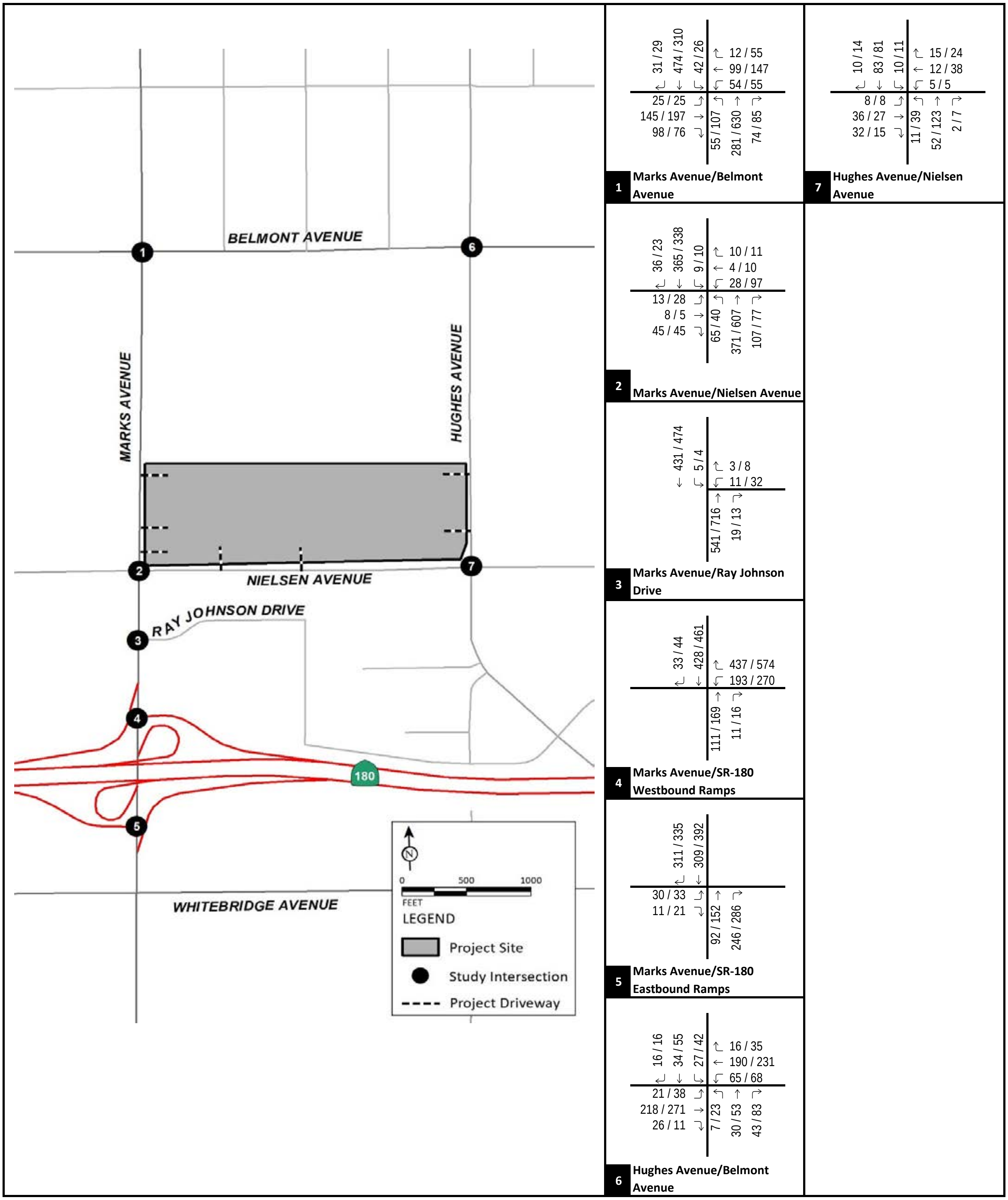
FIGURE 6-1

LSA

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



LSA

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

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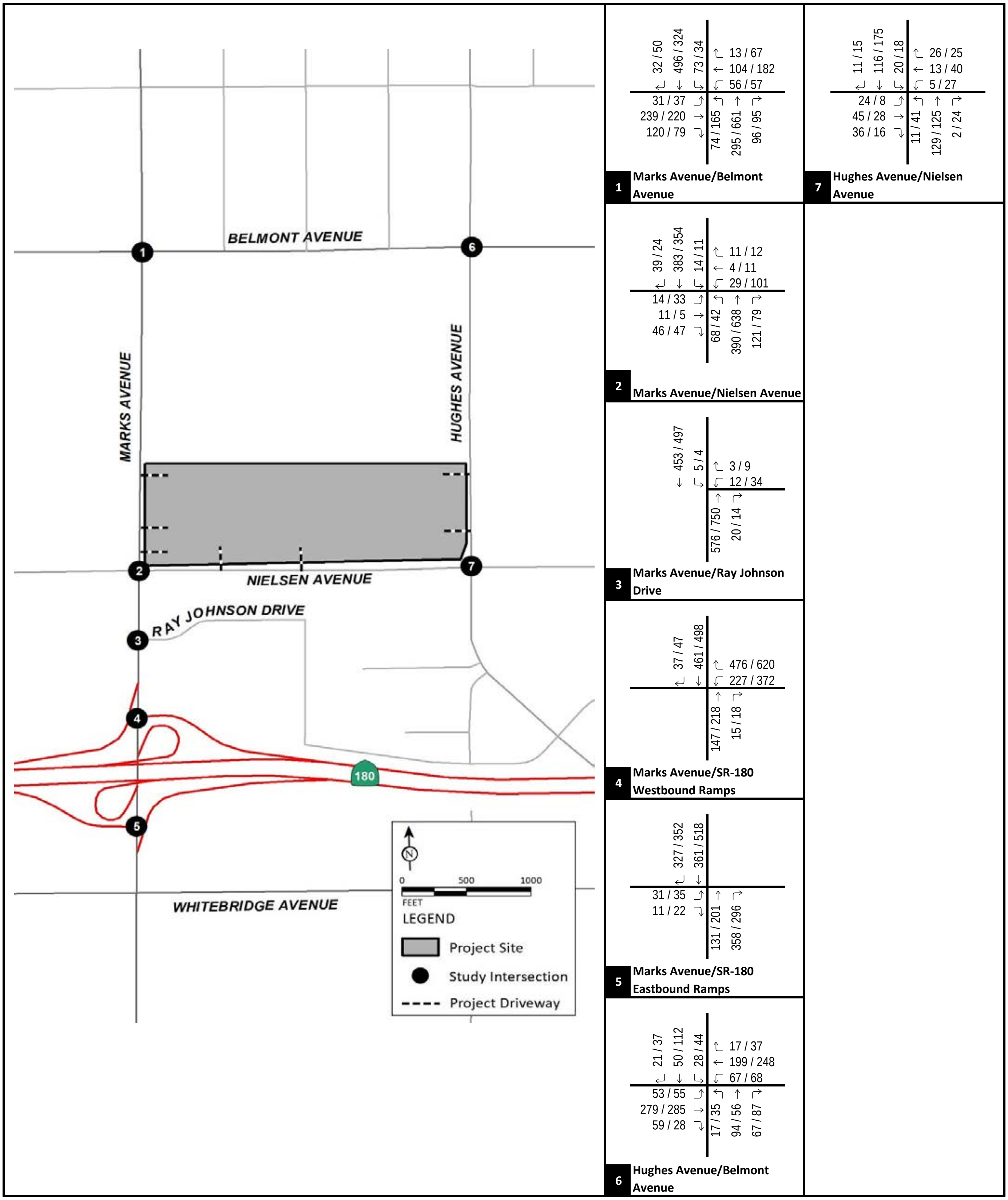

FIGURE 6-3

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

LSA

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.

LSA

Table 7-C - Near-Term approved and pending with Project Intersection Levels of Service

Intersection	Jurisdiction	Control	With Project AM Peak Hour Delay (sec.)	With Project AM Peak Hour LOS	With Project PM Peak Hour Delay (sec.)	With Project PM Peak Hour 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 Volues for Florida's Urbanized Areas. Since the facilities ate Non-State, a 10% reduction factor was applied for the roadway capacities.

LSA

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

LSA

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: Project Trip Distribution – Passenger Car
- Figure 9-2: Project Trip Distribution – Truck
- Figure 9-3: Project Trip Assignment – Passenger Car
- Figure 9-4: Project Trip Assignment – Truck
- Figure 9-5: Total Project PCE Trip Assignment
- Figure 9-6: Near-term approved and pending (2023) with Project Peak Hour Traffic Volumes
- Figure 9-7: Cumulative year (2035) with Project Peak Hour Traffic Volumes
- Table 9-A: Near-term approved and pending (2023) with Project Freeway Peak Hour Traffic Volumes
- Table 9-B: Cumulative year (2035) with Project Freeway Peak Hour Traffic Volumes
- Table 9-C: Near-term approved and pending (2023) with project Intersection Levels of Service
- Table 9-D: Near-term approved and pending (2023) with project Freeway Segment Levels of Service
- Table 9-E: Cumulative Year (2035) Intersection Levels of Service
- Table 9-F: Cumulative Year (2035) Freeway Segment Levels of Service

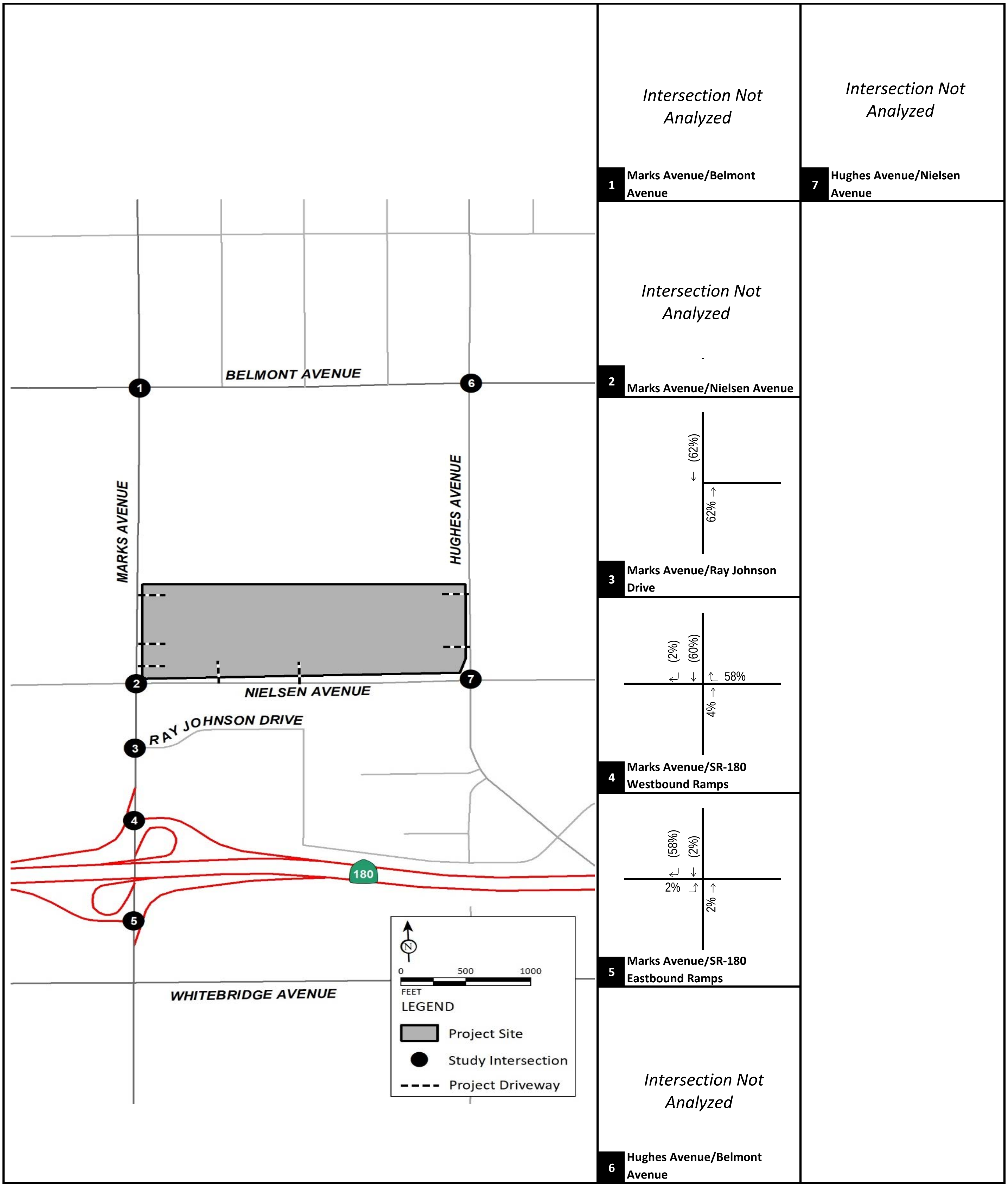

FIGURE 9-1

LSA

XX% (YY%)
Inbound (Outbound) Trip Distribution

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Distribution – Passenger Car

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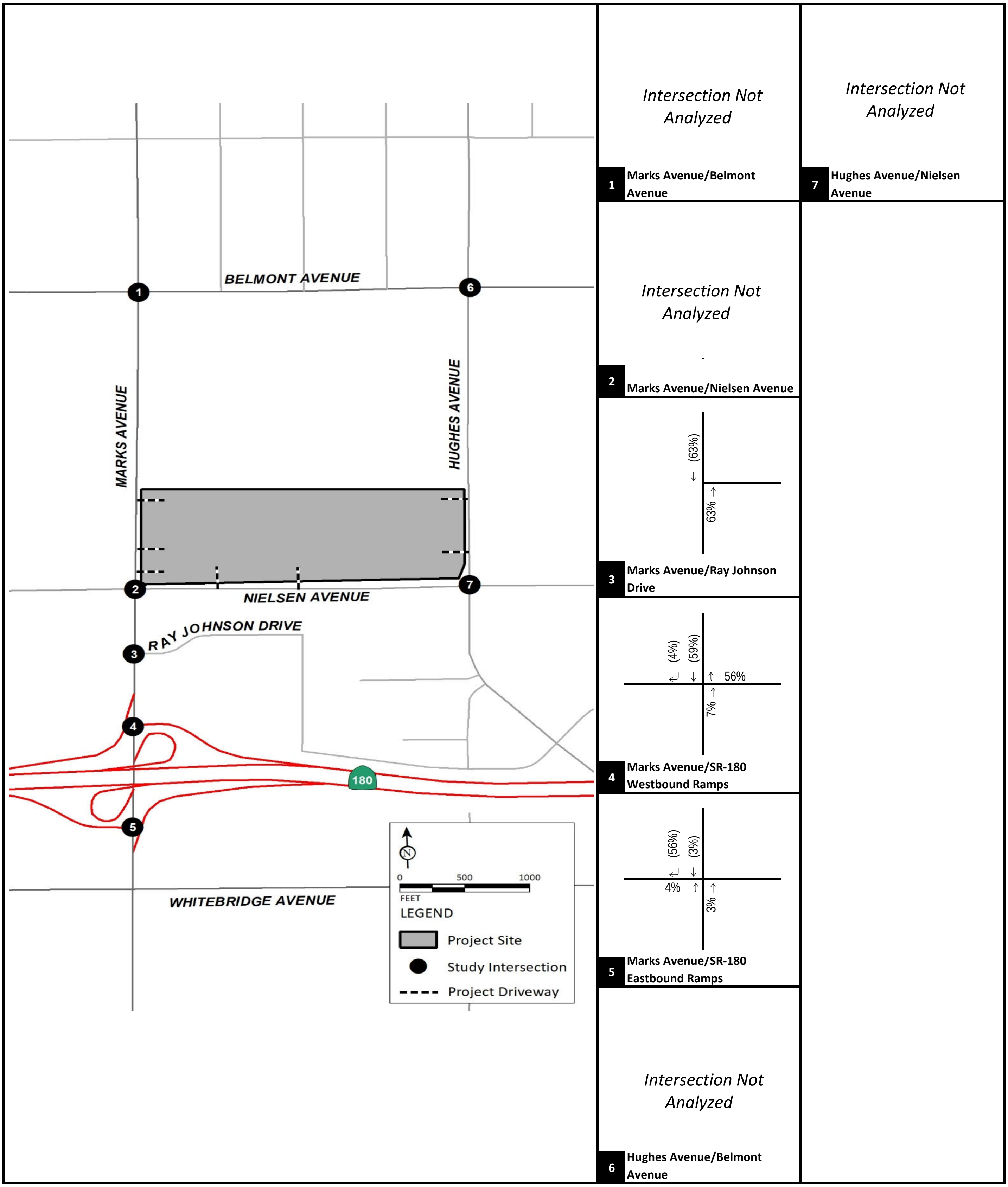

LSA

FIGURE 9-2

XX% (YY%)
Inbound (Outbound) Trip Distribution

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Distribution – Truck

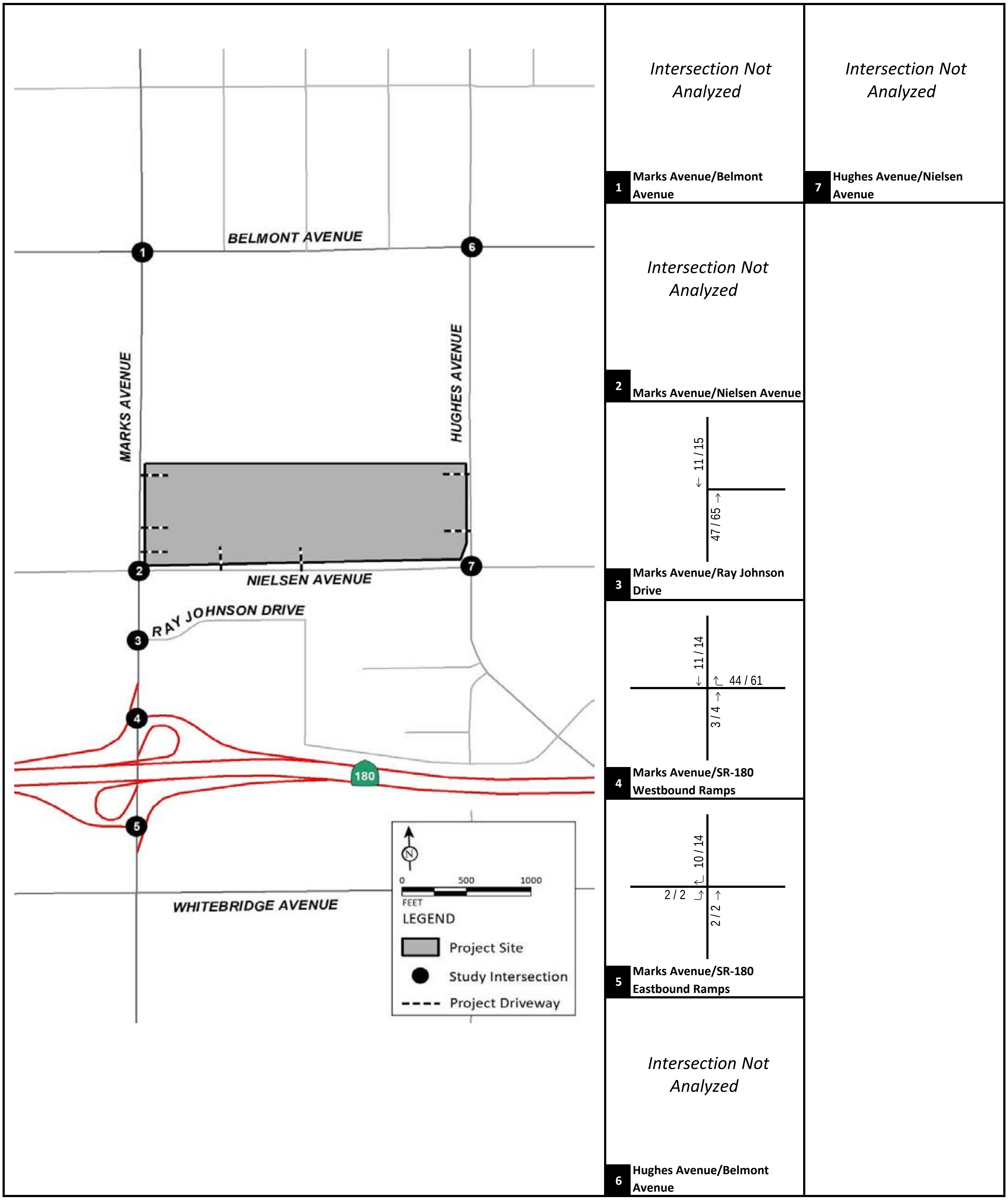

FIGURE 9-3

LSA

XX / YY

AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse Project
Traffic Impact Study

Project Trip Assignment – Passenger Car

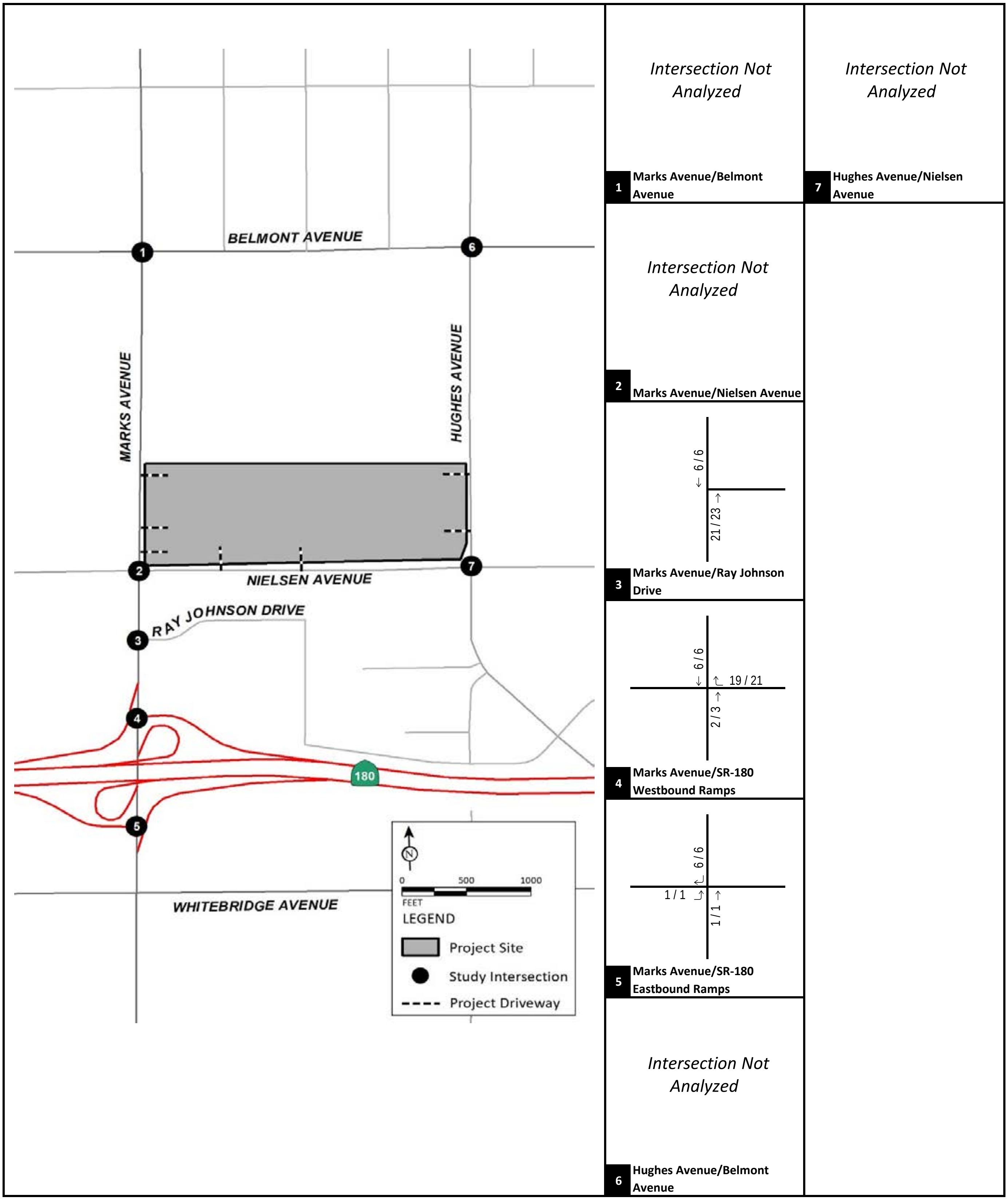

FIGURE 9-4

LSA

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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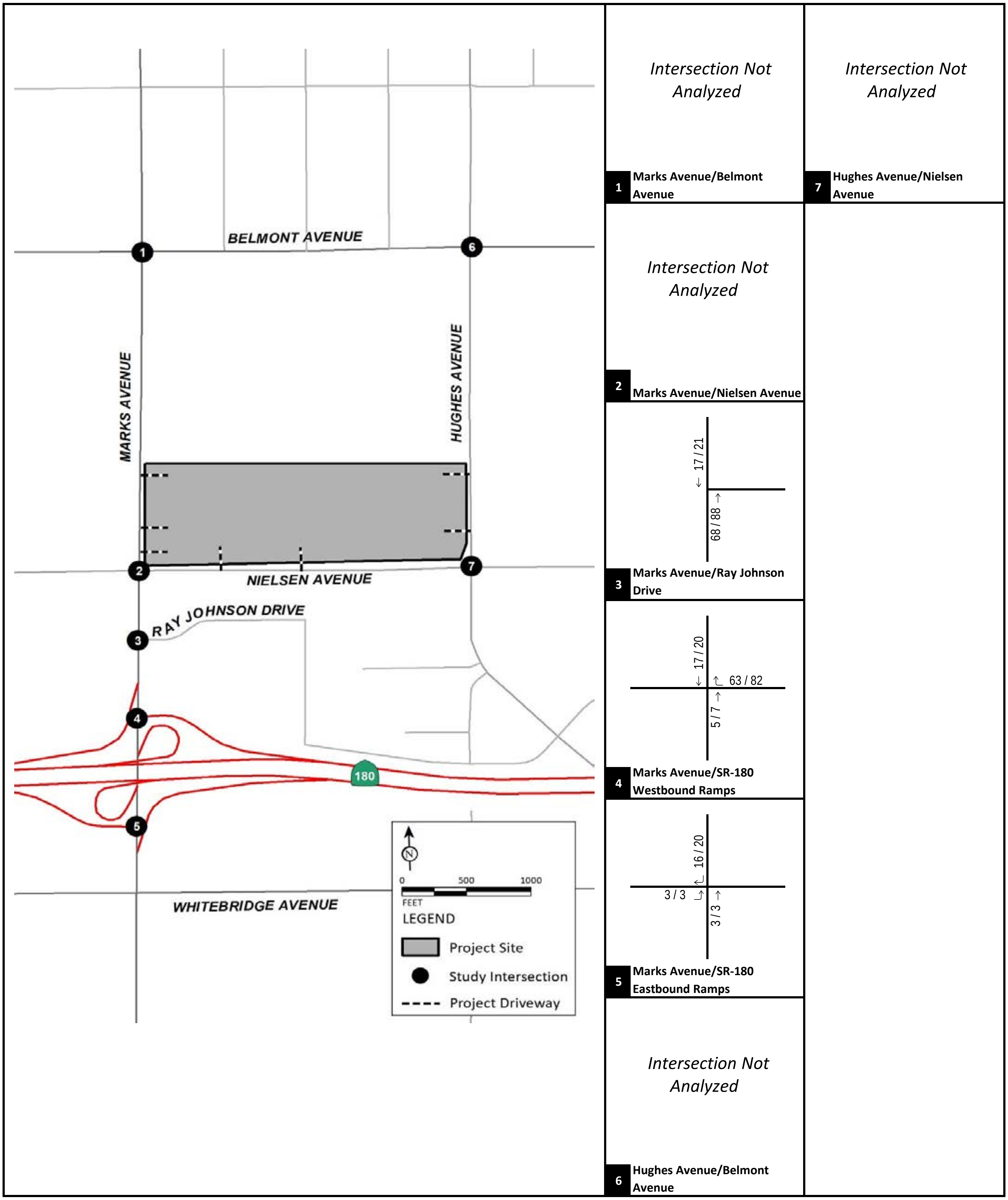

LSA

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

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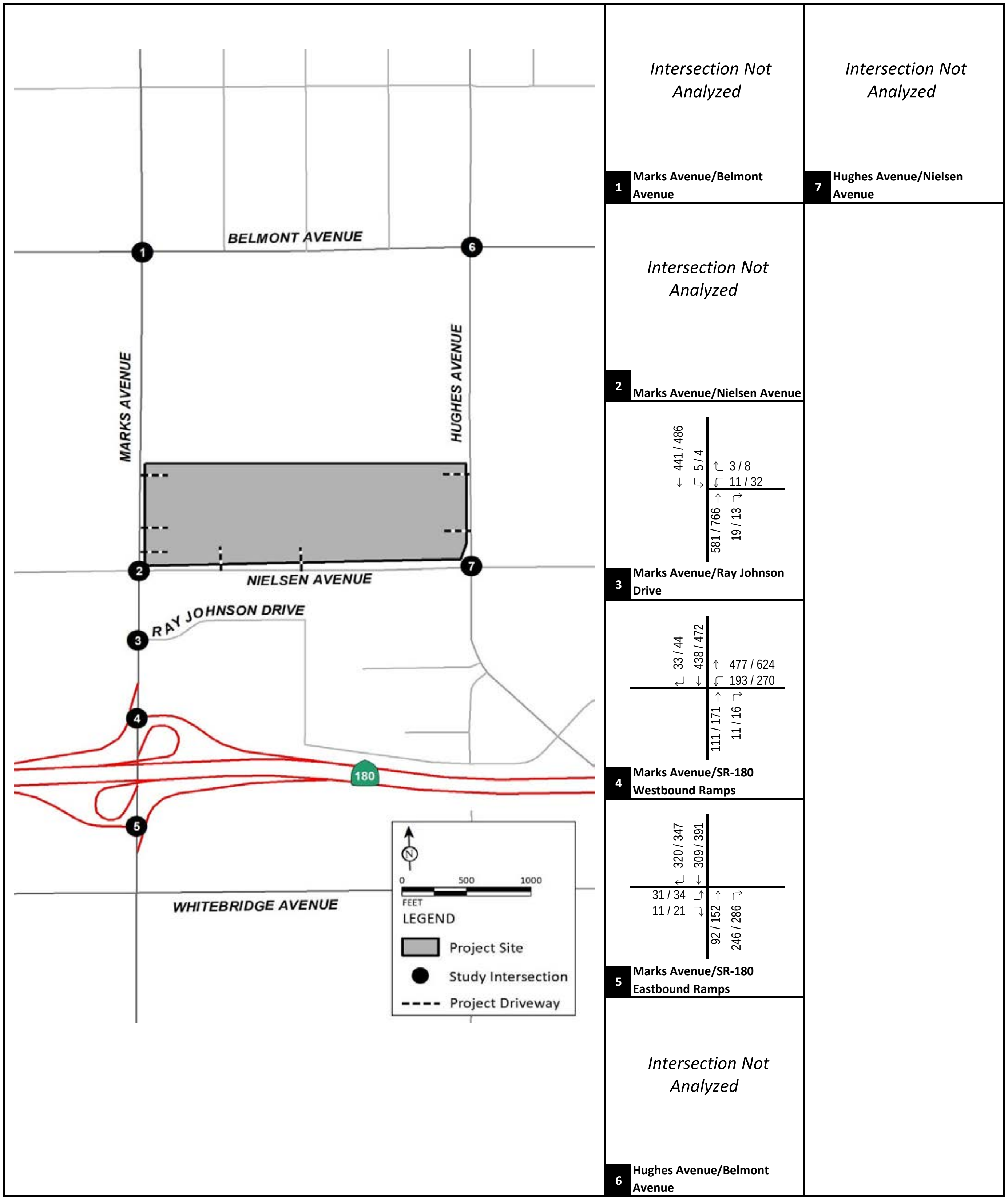

FIGURE 9-6

LSA

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

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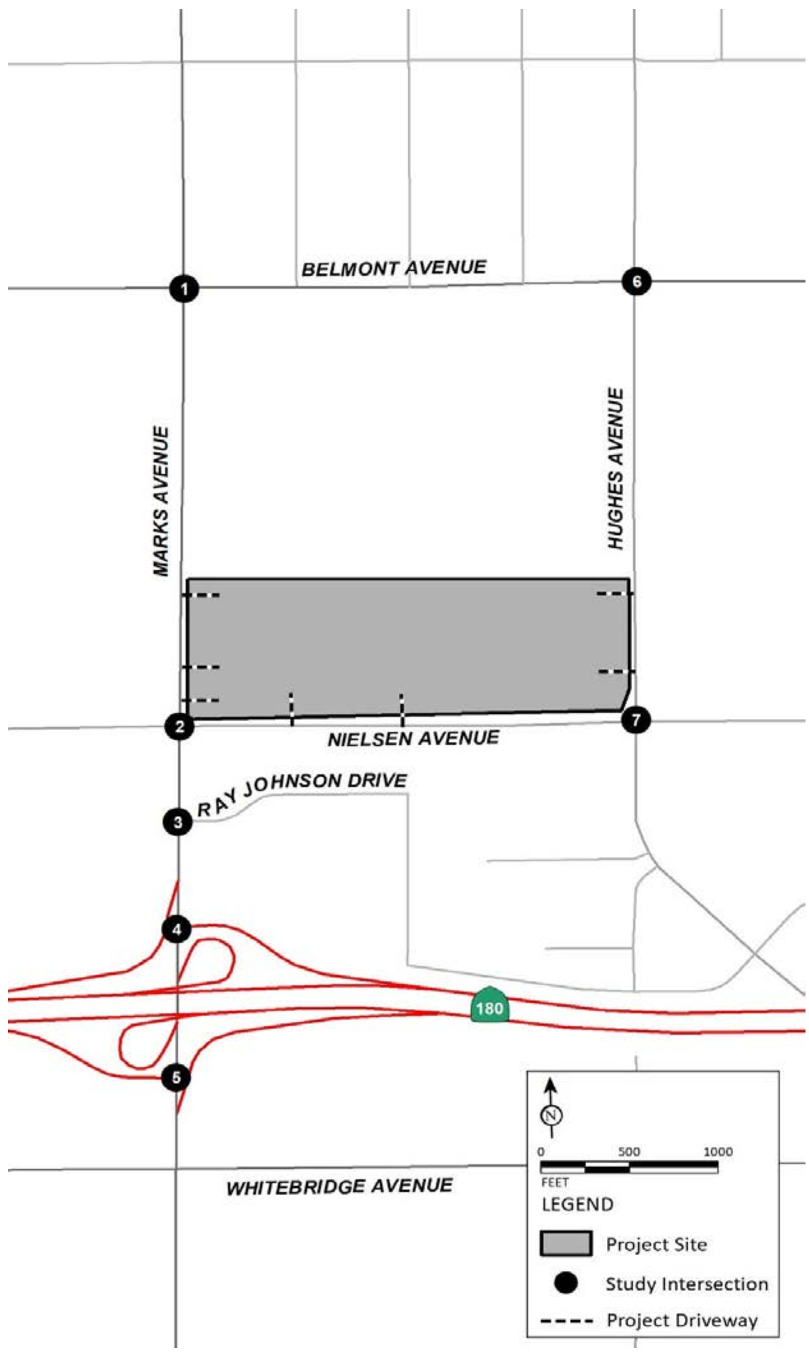


Intersection Not Analyzed

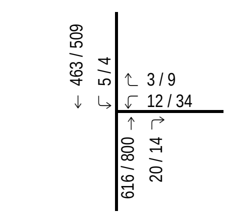
1 Marks Avenue/Belmont Avenue

Intersection Not Analyzed

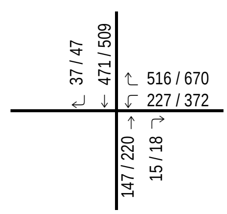
7 Hughes Avenue/Nielsen Avenue

Intersection Not Analyzed

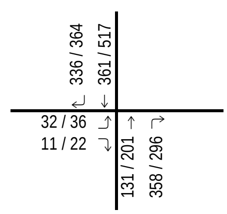
2 Marks Avenue/Nielsen Avenue



3 Marks Avenue/Ray Johnson Drive



4 Marks Avenue/SR-180 Westbound Ramps



5 Marks Avenue/SR-180 Eastbound Ramps

Intersection Not Analyzed

6 Hughes Avenue/Belmont Avenue

LSA

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%				

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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

LSA

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 Speed (mi/hr)	Density (pc/mi/ln)	LOS	With Project PM Peak Hour 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

LSA

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

SR-180 Freeway		Type	Mainline Lanes	With Project AM Peak Hour Speed (mi/hr)	With Project AM Peak Hour Density (pc/mi/ln)	AM LOS	With Project PM Peak Hour Speed (mi/hr)	With Project PM Peak Hour Density (pc/mi/ln)	PM 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.

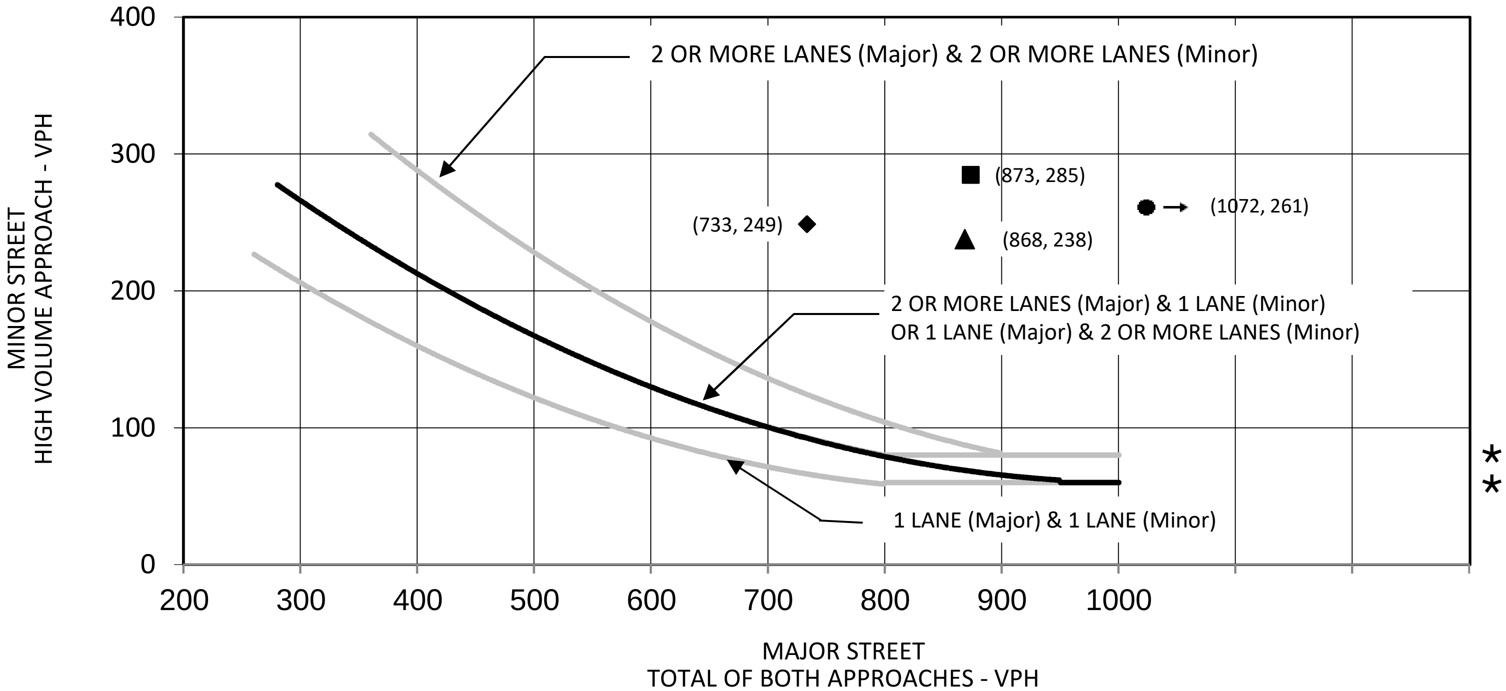
Figures 11-10, 11-11, and 11-12 illustrates the Warrant 3- peak hour signal warrant for this intersection under existing, Near-term Approved and pending with project and Cumulative Year (2035) scenario. As shown in these figures, the intersection does not meet the signal warrant under any scenarios.

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

LSA

- ● 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)

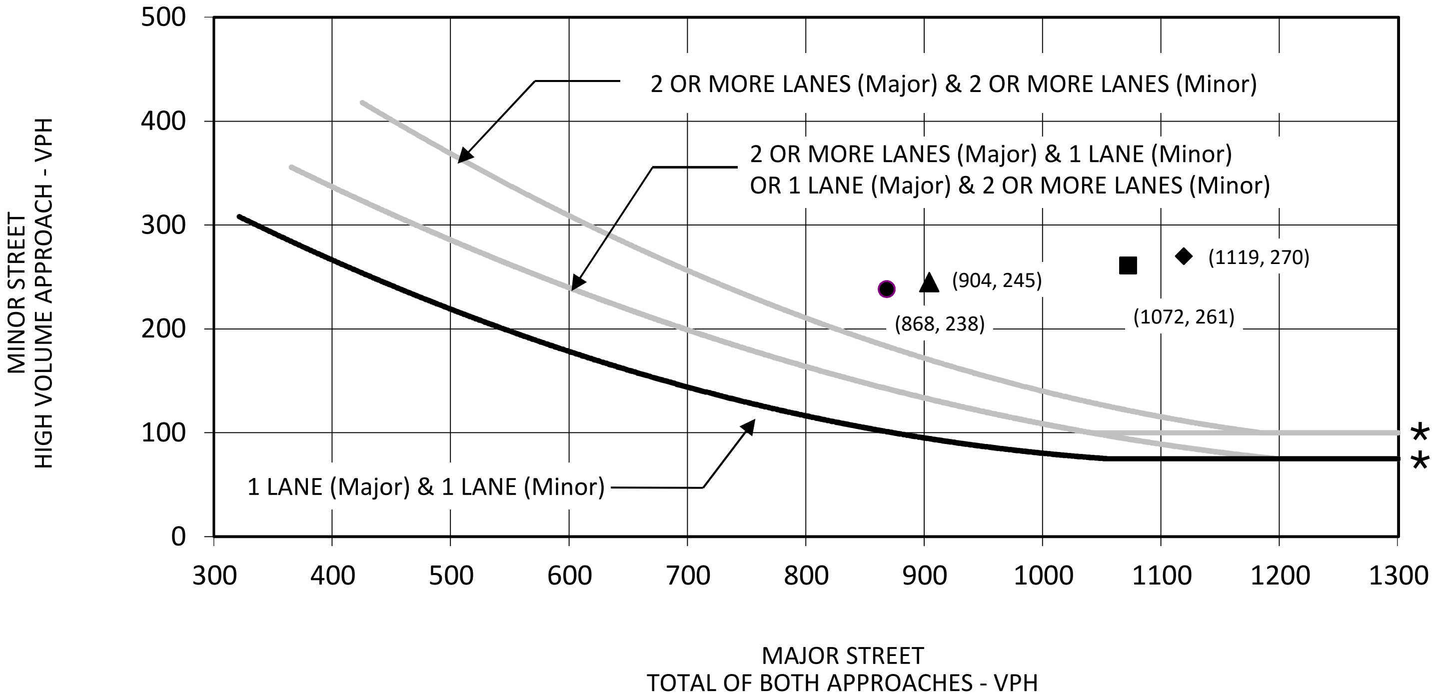
2740 West Nielsen Warehouse Project
Traffic Impact Study

SOURCE: MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, FIGURE 4C-2

Warrant 2: 4 Hour - Marks Avenue/Belmont Avenue– Existing Conditions

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	▲ With Project AM Peak Hour
■ No Project PM 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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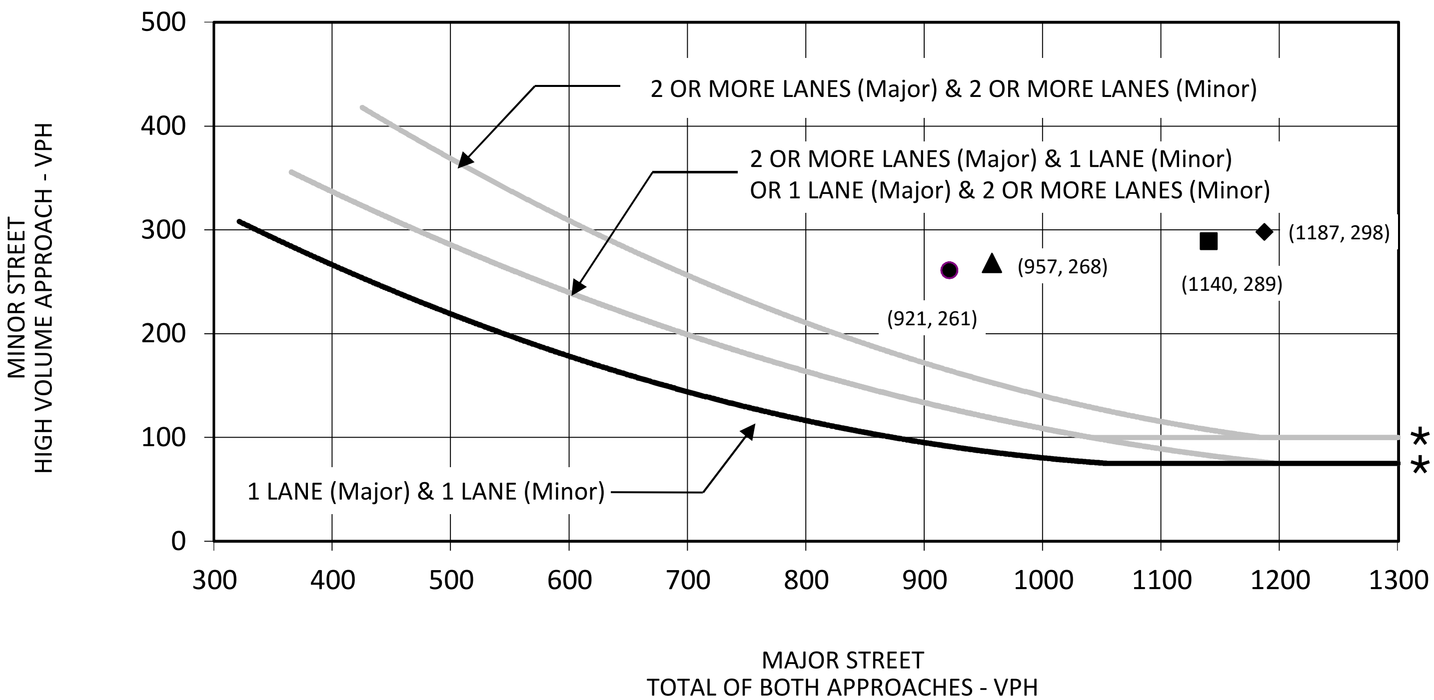
WARRANT 3, PEAK HOUR (70% FACTOR)

(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.

LSA

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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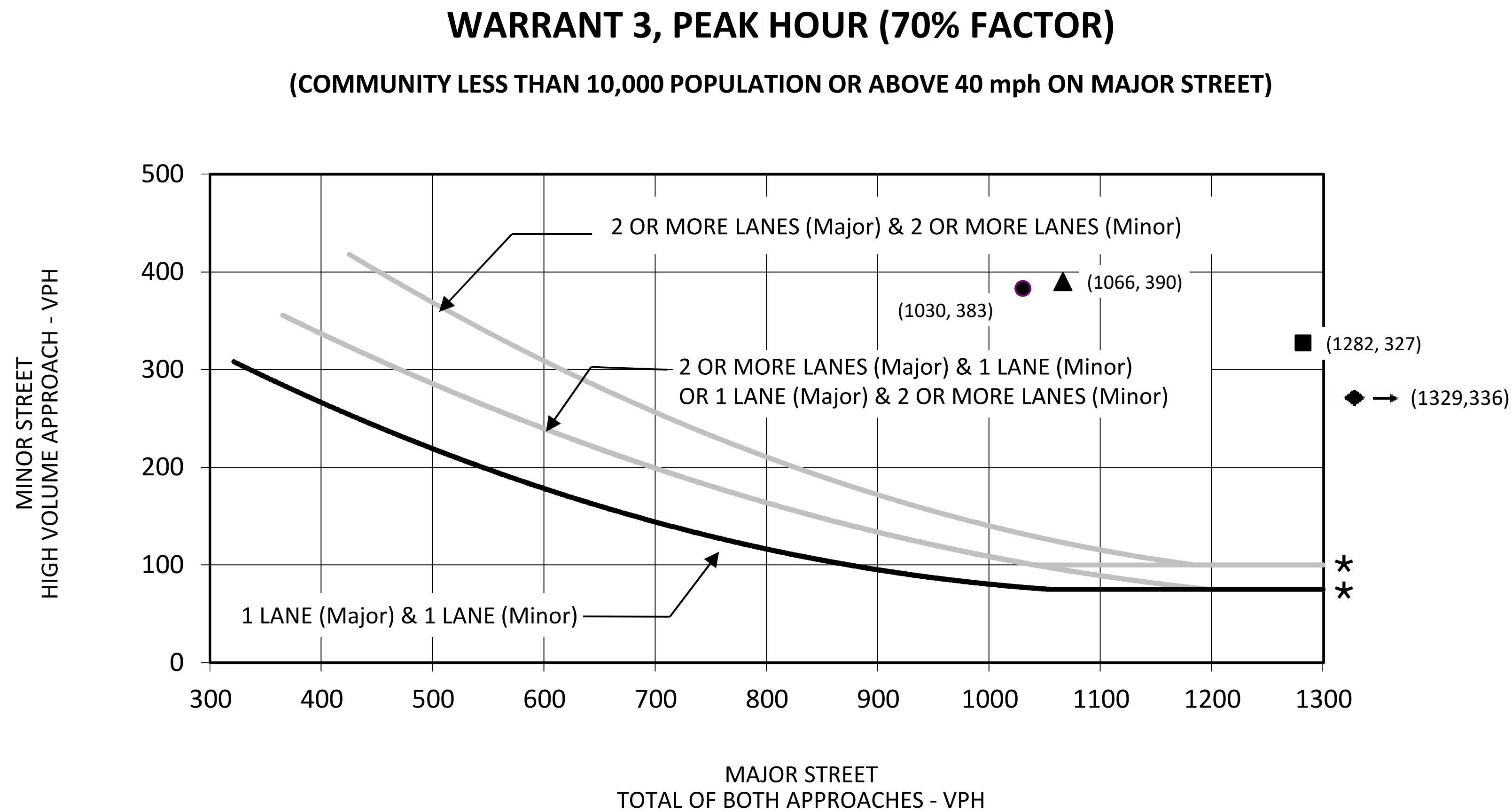

* 100 VPH applies as the lower threshold volume for a minor street approach with two or more lanes and 75 VPH applies as the lower threshold volume for a minor street approaching with one lane.

FIGURE 11-4

LSA

● 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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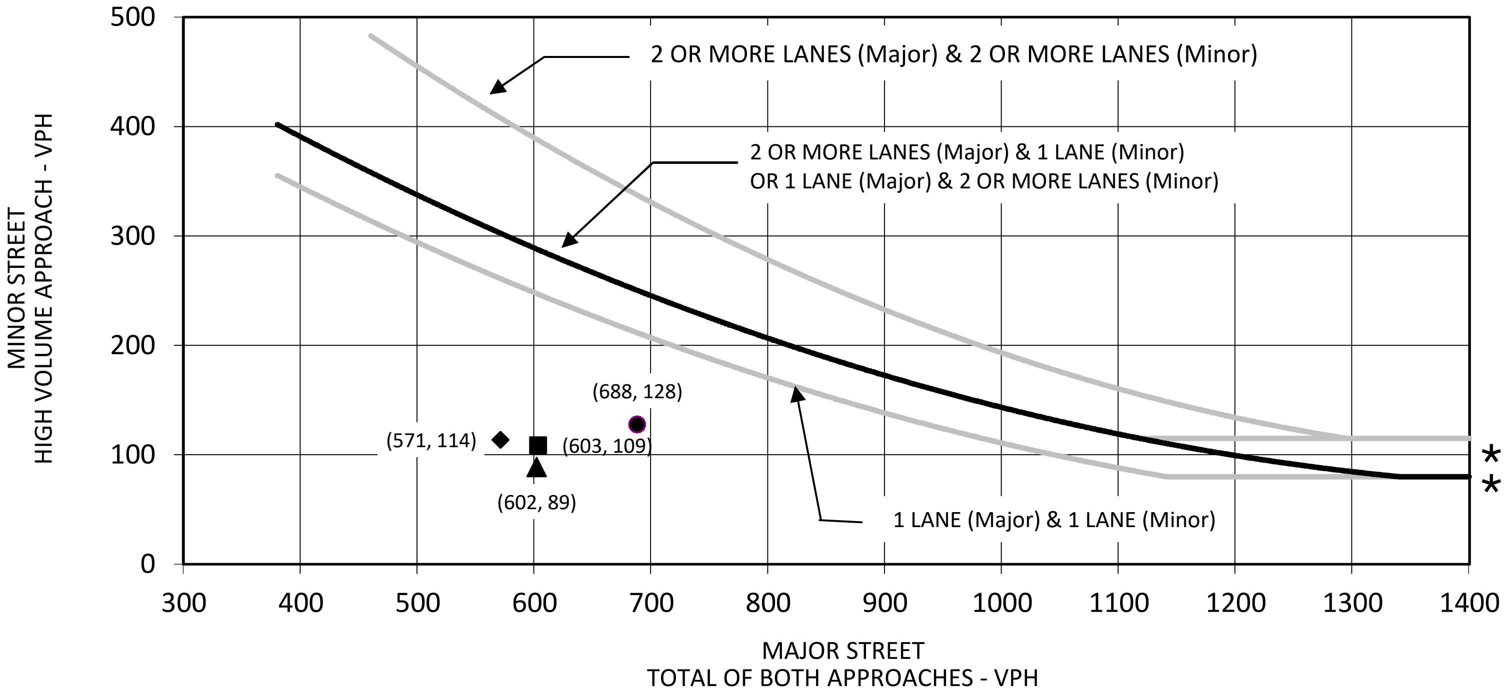
WARRANT 2, FOUR-HOUR VEHICULAR VOLUME



* 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

●	Highest Hour Volumes (15:00-16:00)	▲	Third Highest Hourly Volumes (13:00-14:00)
■	Second Highest Hourly Volumes (14:00-15:00)	◆	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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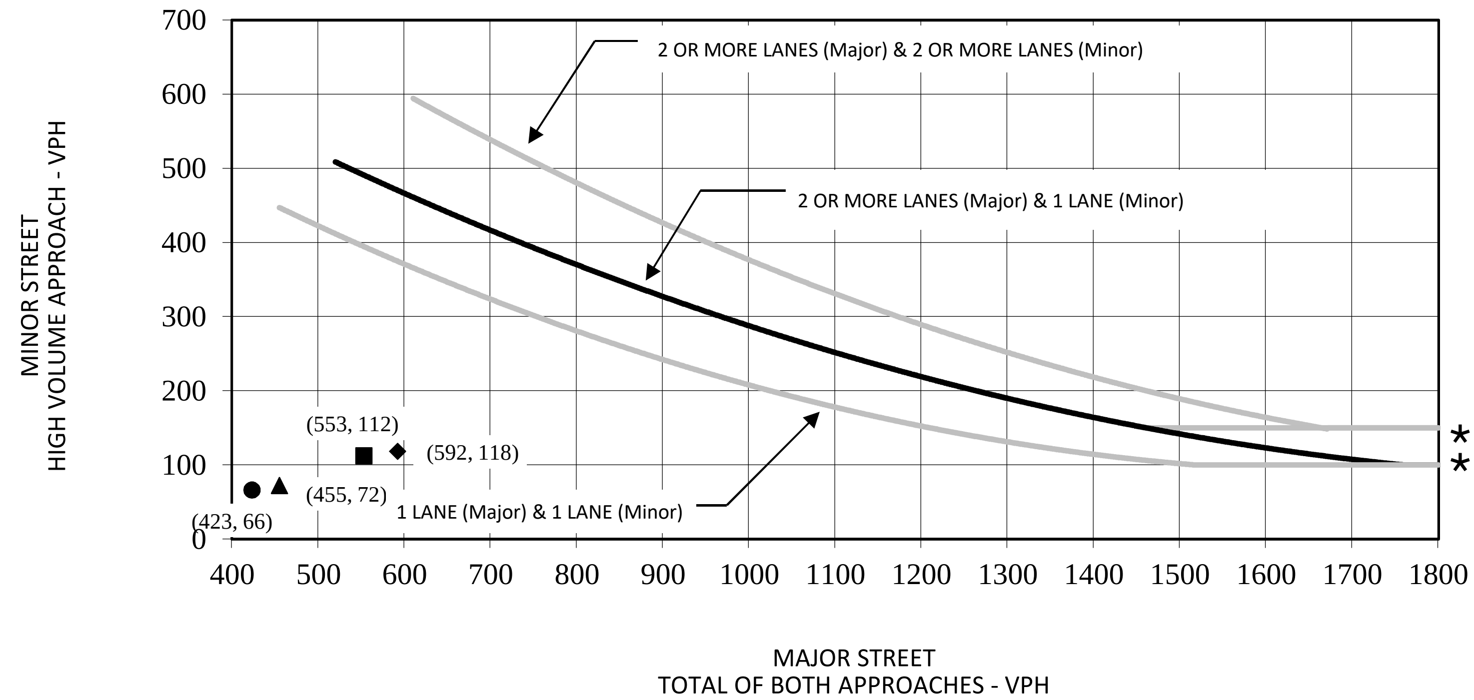
WARRANT 3, PEAK HOUR



* 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

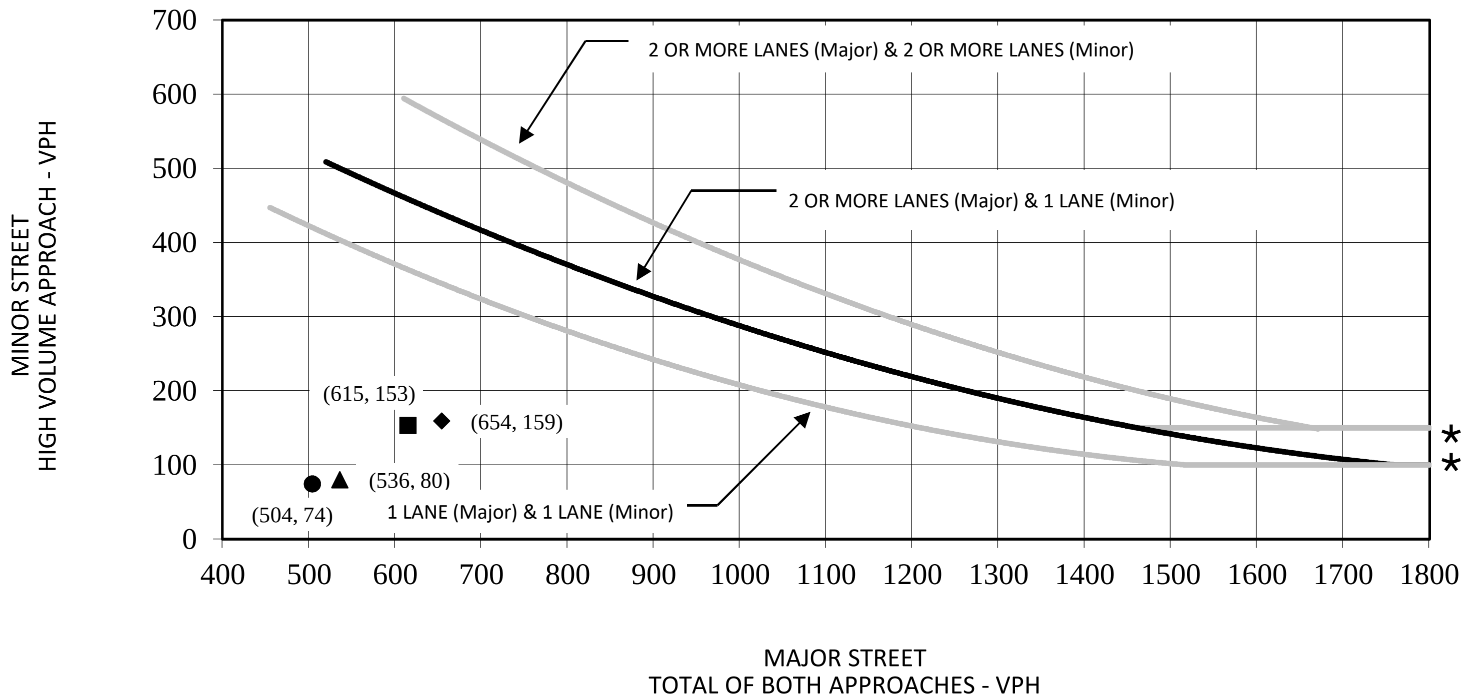
- ● No Project AM Peak Hour
- ■ No Project PM Peak Hour
- ▲ With Project AM Peak Hour
- ◆ With Project PM Peak Hour

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

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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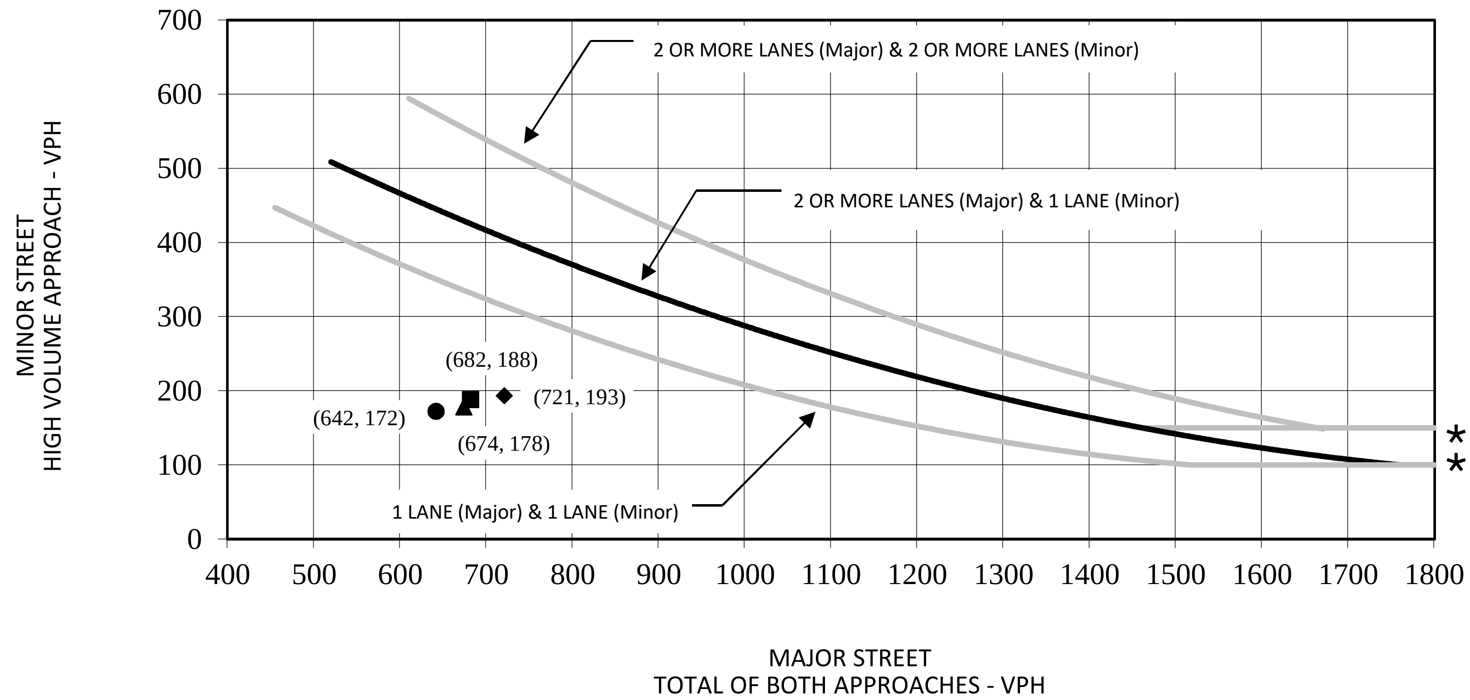
WARRANT 3, PEAK HOUR



* 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.

LSA

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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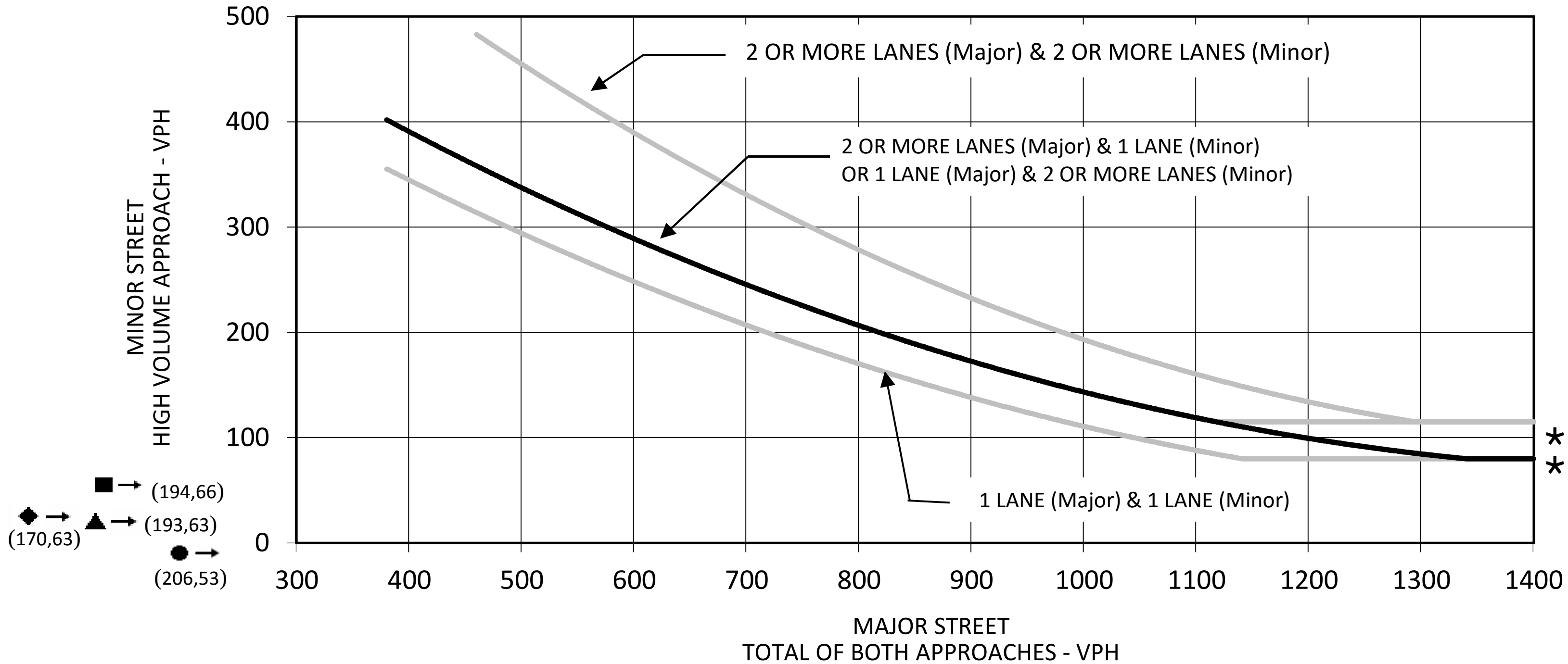
WARRANT 2, FOUR-HOUR VEHICULAR VOLUME



* 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.

LSA

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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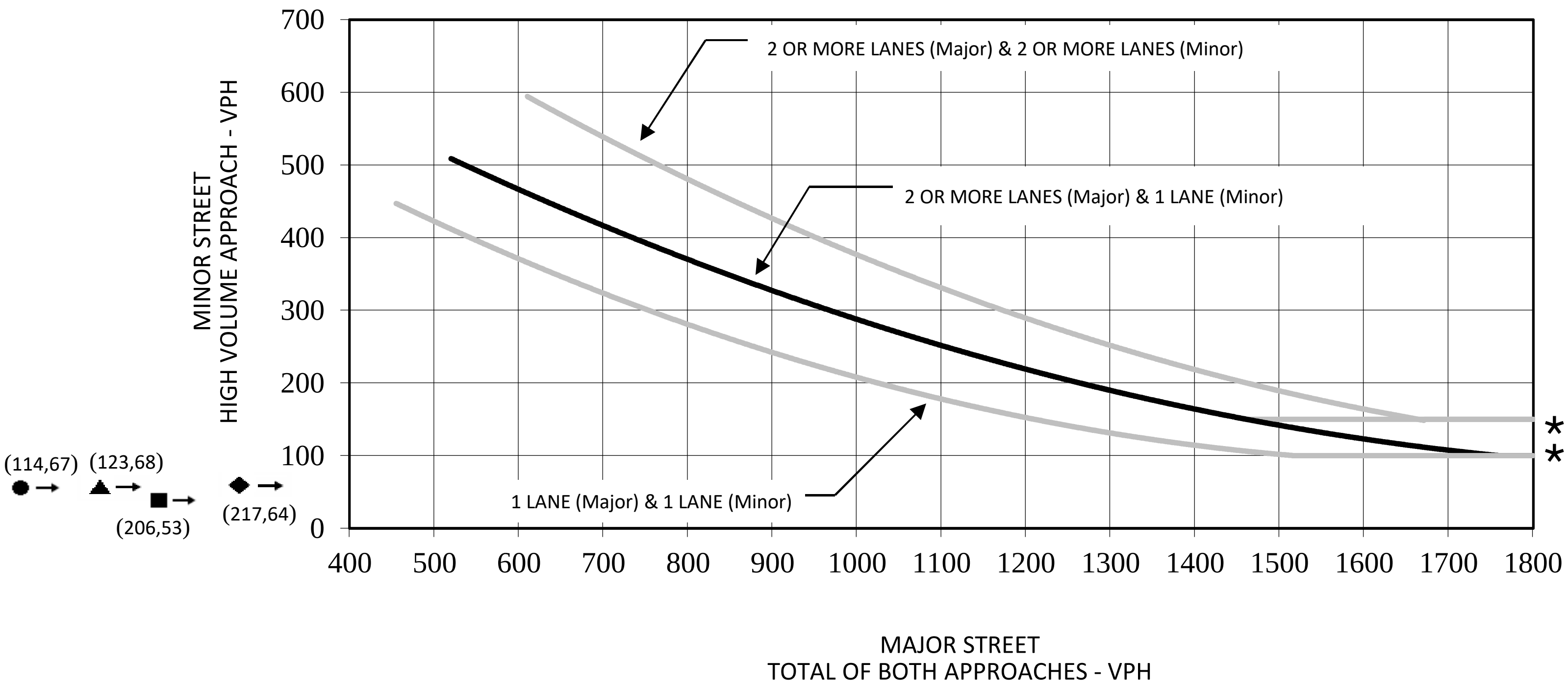
WARRANT 3, PEAK HOUR



* 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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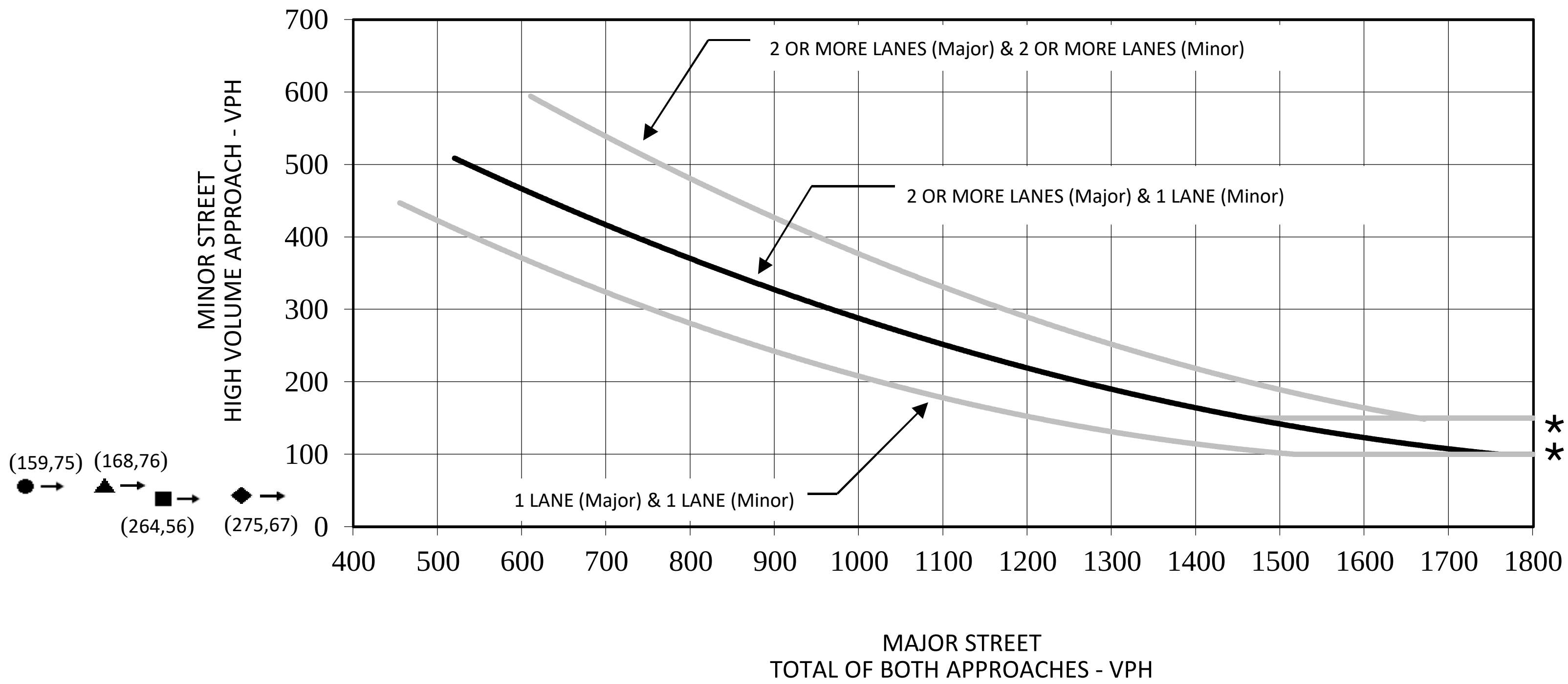
WARRANT 3, PEAK HOUR



* 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.

LSA

FIGURE 11-11

● No Project AM Peak Hour	▲ With Project AM Peak Hour
■ No Project PM Peak Hour	◆ With Project PM Peak Hour

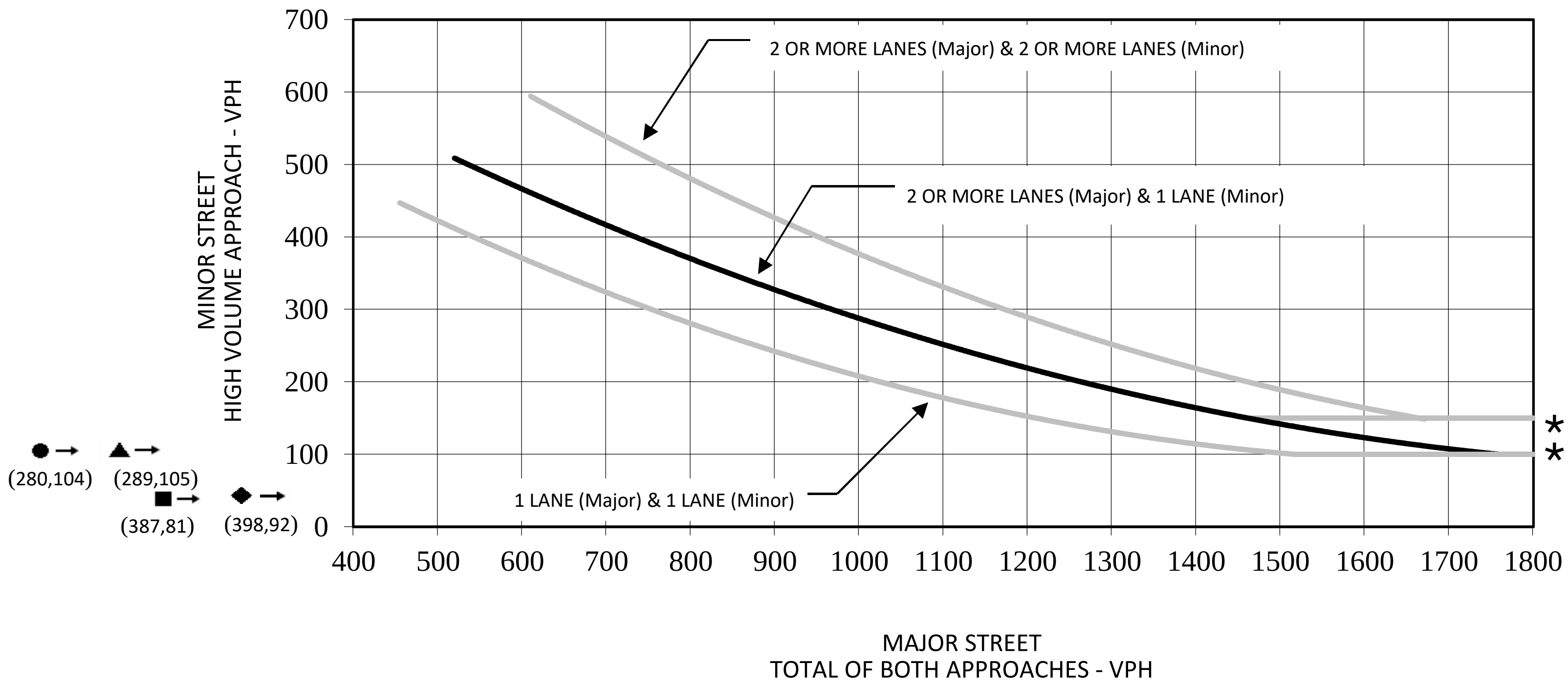
2740 West Nielsen Warehouse Project
Traffic Impact Study

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

R:\SNN2101\TIS\Warrants\SW_OY_Int 7.xlsx (11/22/2021)

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 11-12

● 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

R:\SNN2101\TIS\Warrants\SW_BO_Int 7.xlsx (11/22/2021)

Table 11-A - Eight-Hour Warrant Analysis - Condition A (70%)

Marks Avenue/Belmont Avenue

Time	24-Hour Counts (Veh/hr) EB	WB	NB	SB	Total Major Approaches (≥ 420 Veh/hr)	Higher Minor Approaches (≥ 140 Veh/hr)	Warrant Met
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 (shaded)

LSA

Table 11-B - Eight-Hour Warrant Analysis - Condition A (80%)

Hughes Avenue/Belmont Avenue

Time	24-Hour Counts (Veh/hr) EB	WB	NB	SB	Total Major Approaches (≥ 480 Veh/hr)	Higher Minor Approaches (≥ 120 Veh/hr)	Warrant Met
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

Time	24-Hour Counts (Veh/hr) EB	WB	NB	SB	Total Major Approaches (≥ 720 Veh/hr)	Higher Minor Approaches (≥ 60 Veh/hr)	Warrant Met
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 (shaded)

LSA

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	24-Hour Counts (Veh/hr) EB	WB	NB	SB	Total Major Approaches (≥ 600 Veh/hr)	Higher Minor Approaches (≥ 60 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 (shaded cells: 61 at 7:00 - 8:00; 63, 62, 66, 63 at 12:00 - 16:00; 64 at 19:00 - 20:00)

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

LSA

Table 12-A - Existing with Project with Recommended Improvements Intersection Levels of Service

Intersection	With Project Without Improvements						With Project With Improvements				
	Control	A.M. Peak Hour		P.M. Peak Hour			Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec.)	LOS	Delay (sec.)	LOS			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

Intersection	With Project Without Improvements						With Project With Improvements				
	Control	A.M. Peak Hour		P.M. Peak Hour			Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec.)	LOS	Delay (sec.)	LOS			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

Intersection	With Project Without Improvements						With Project With Improvements				
	Control	A.M. Peak Hour		P.M. Peak Hour			Control	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec.)	LOS	Delay (sec.)	LOS			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

LSA

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

LSA

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.

1500 Iowa Avenue, Suite 200, Riverside, California 92507 951.781.9310 www.lsa.net

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.

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

LSA

Table A - Project Trip Generation

Land Use		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
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.

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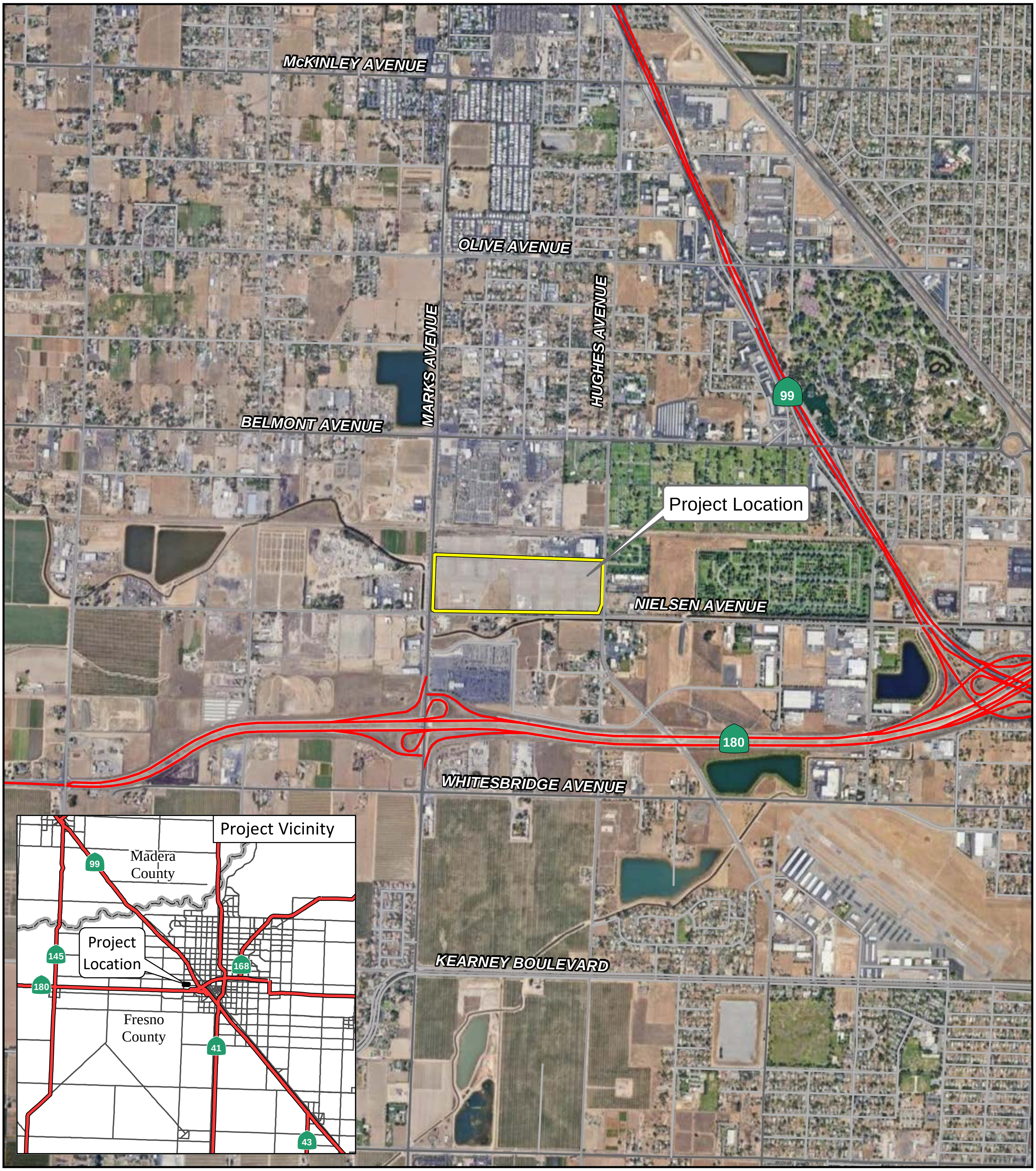
Table B - Cumulative Projects

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

2740 West Nielsen Warehouse
Traffic Impact Study

Regional and Project Location

SOURCE: ESRI Streetmap, 2021; Google Earth, 2019.

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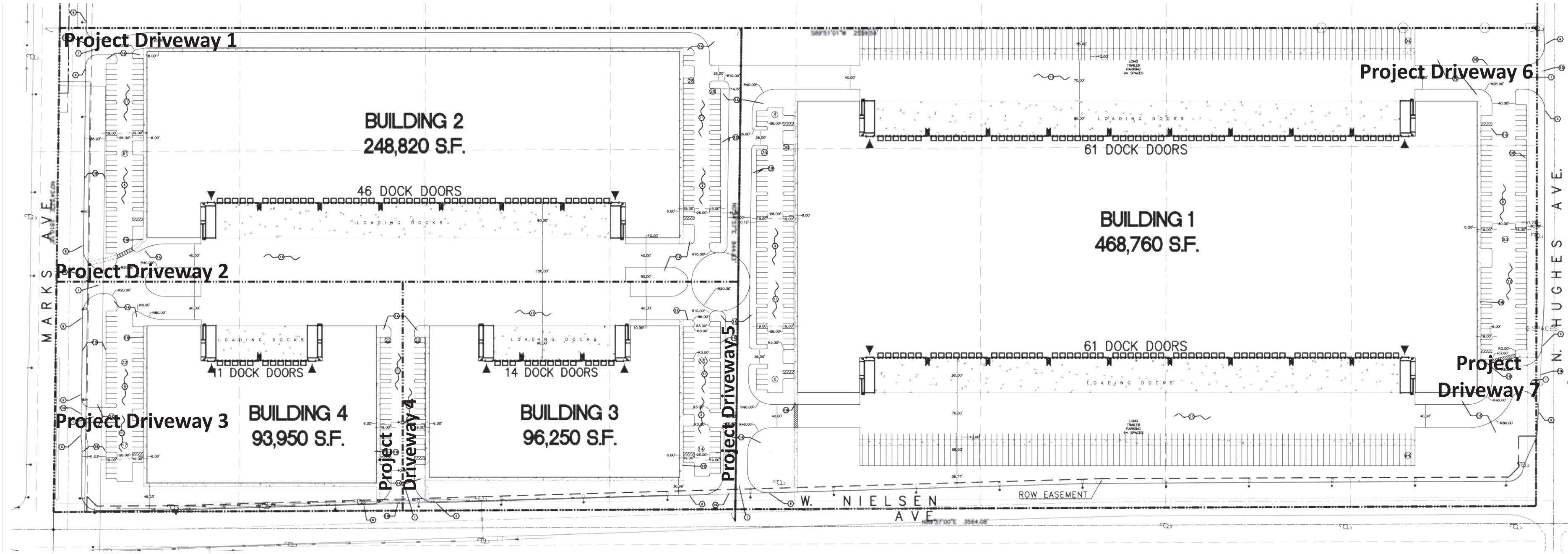
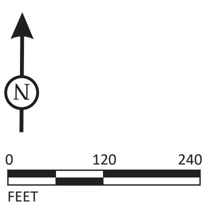


LSA

FIGURE 2



2740 West Nielsen Warehouse
Traffic Impact Study

Conceptual Site Plan

SOURCE: Lars Anderson and Associates, Inc.; April 2021
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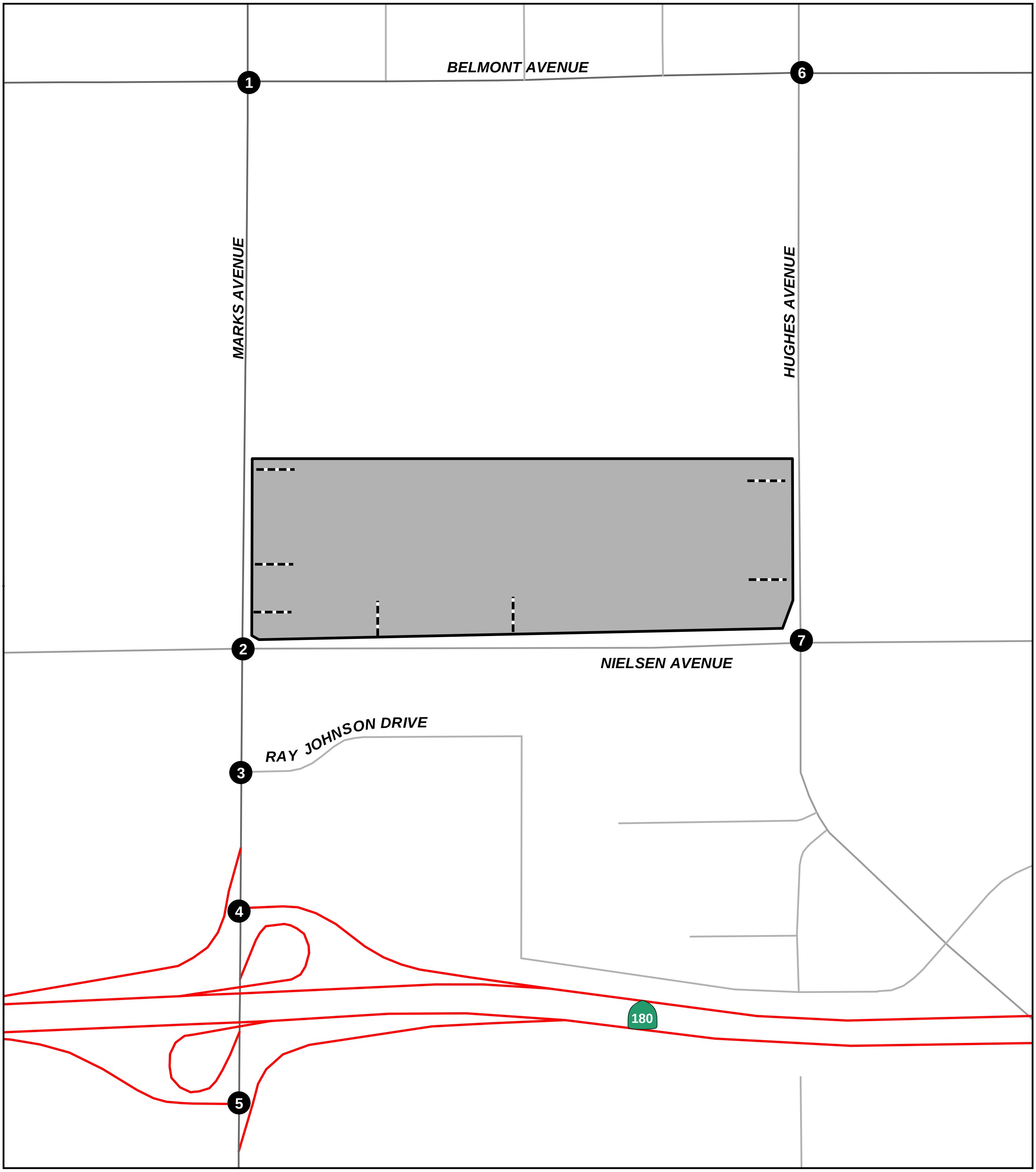

LSA

LEGEND

Project Site

Study Intersection

Project Driveway

0 300 600
FEET

FIGURE 3

2740 West Nielsen Warehouse
Traffic Impact Study

Study Area Intersections

SOURCE: County of Fresno Streets Data, 2021.

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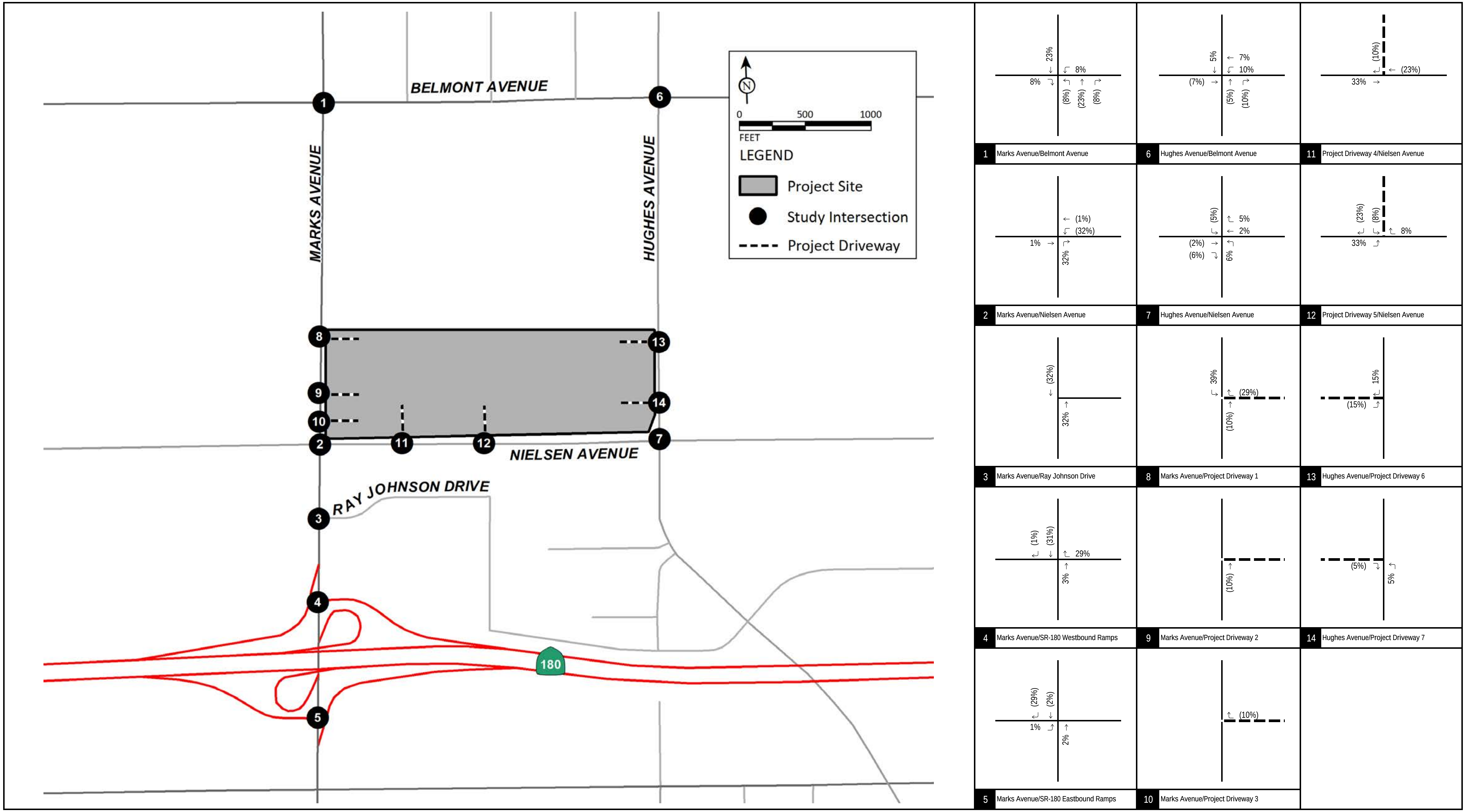

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FIGURE 4-A

XX% (YY%)
Inbound (Outbound) Distribution
- - - - Project Driveway

2740 West Nielsen Warehouse
Traffic Impact Study

Project Trip Distribution - Passenger Vehicles

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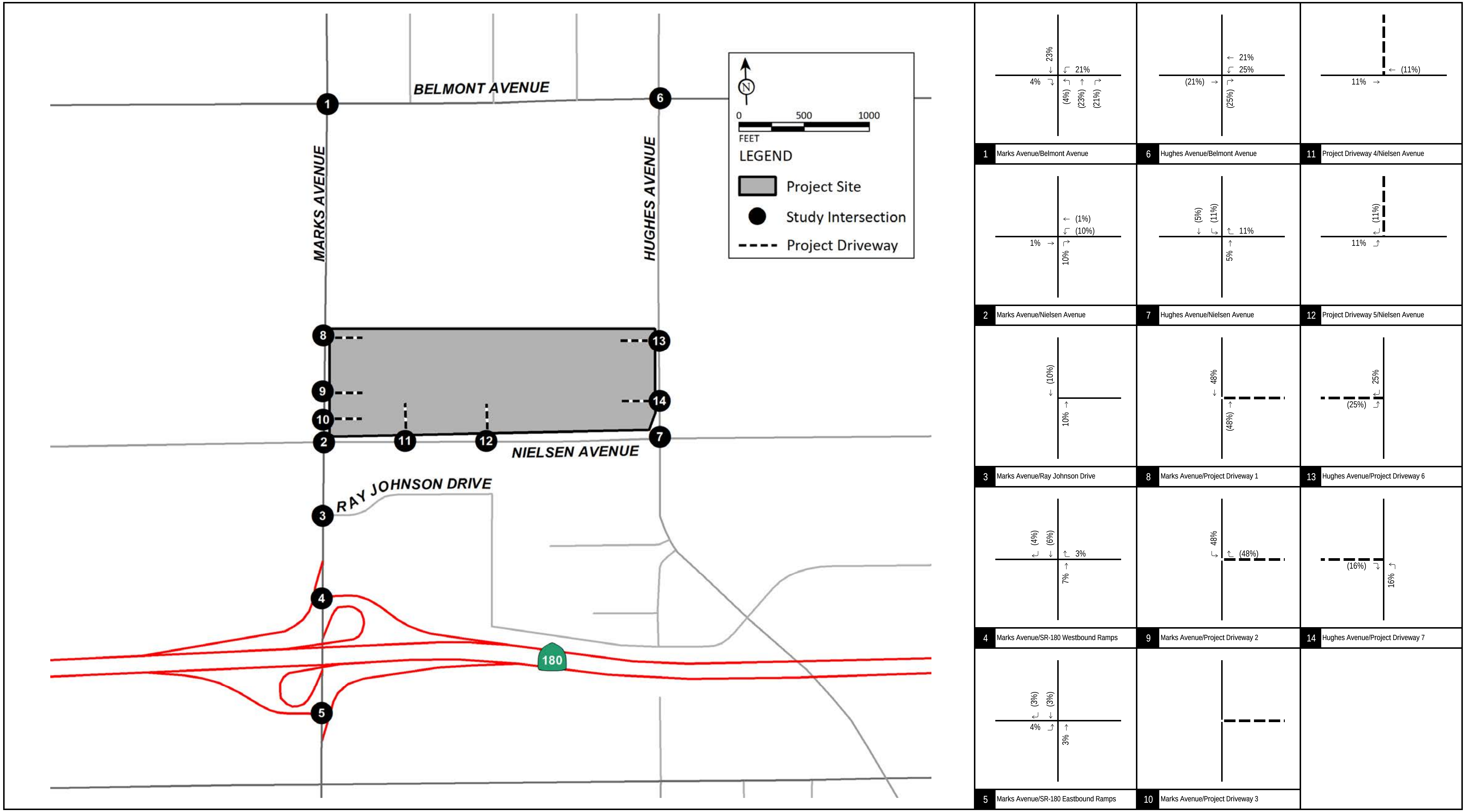

LSA

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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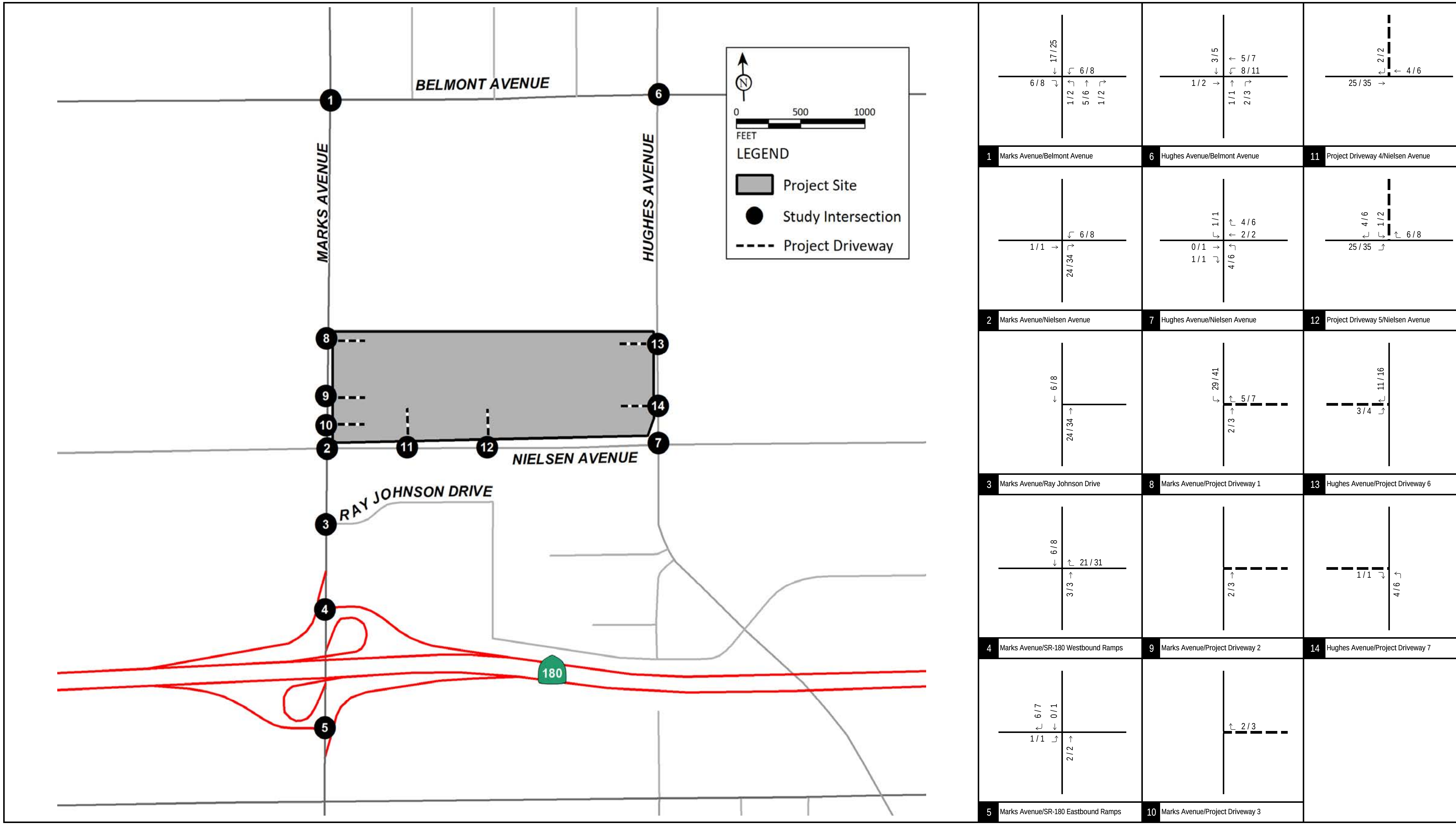

FIGURE 5-A

XX / YY

AM / PM Peak Hour Traffic Volumes

2740 West Nielsen Warehouse

Traffic Impact Study

Project Trip Assignment - Passenger Vehicles

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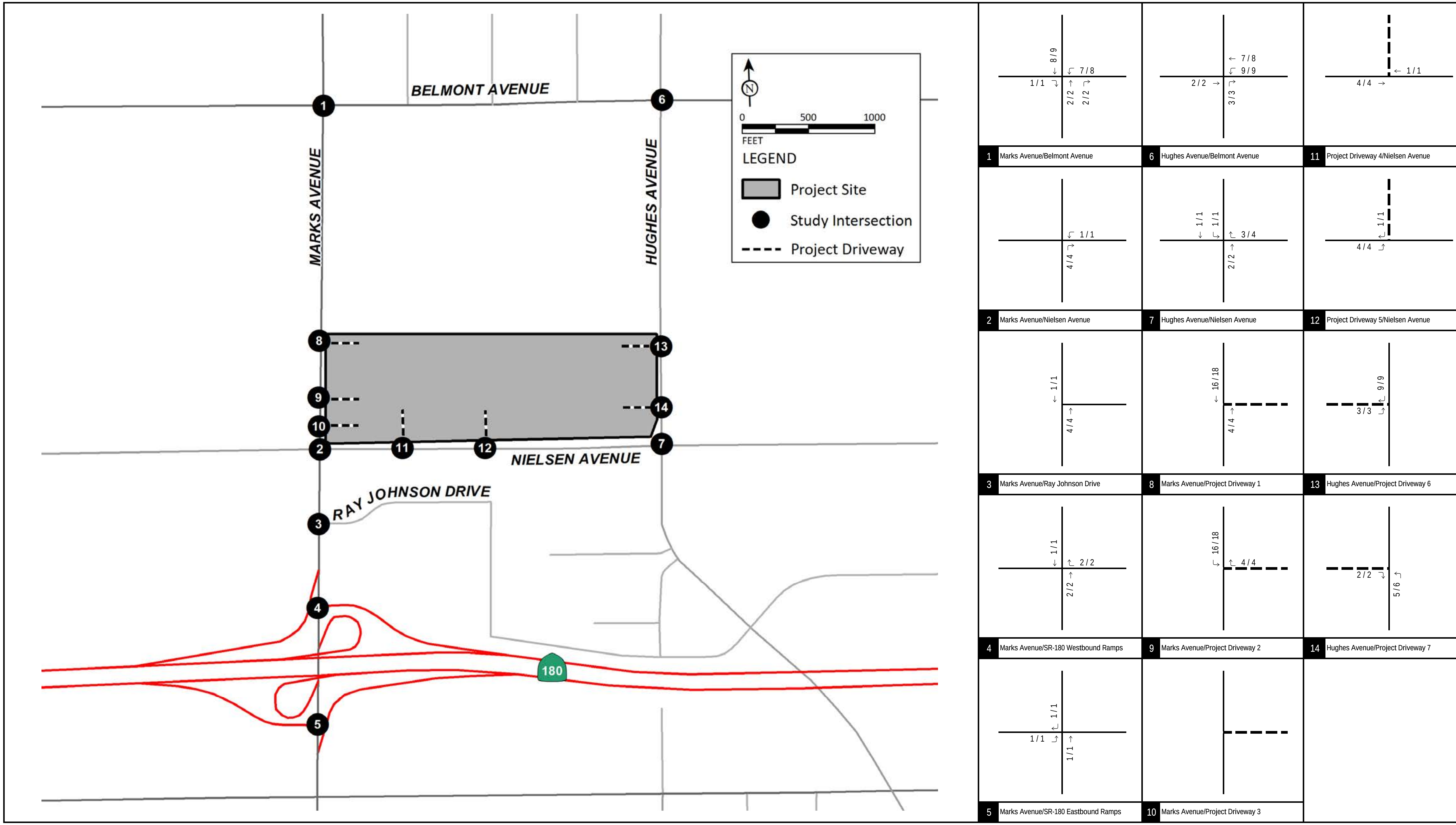

FIGURE 5-B

XX / YY

AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse

Traffic Impact Study

Project Trip Assignment - Trucks

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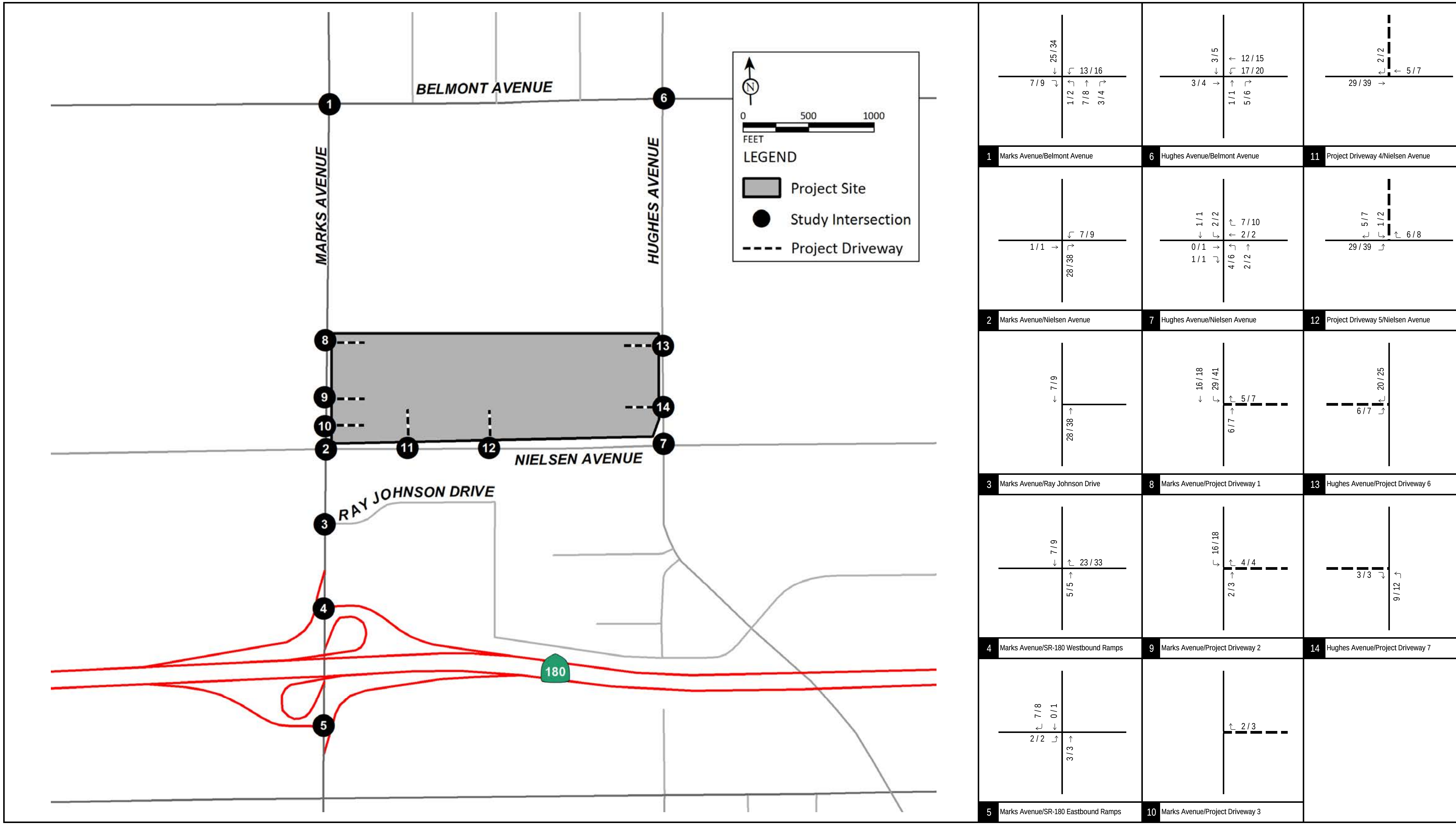


LSA

FIGURE 6

XX / YY

AM / PM Peak Hour Traffic Volumes (In PCE)

2740 West Nielsen Warehouse

Traffic Impact Study

Total Project Trip Assignment

R:\SNN2101\TIS\z45_Asgn_Total.xlsx (7/6/2021)

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*

[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.

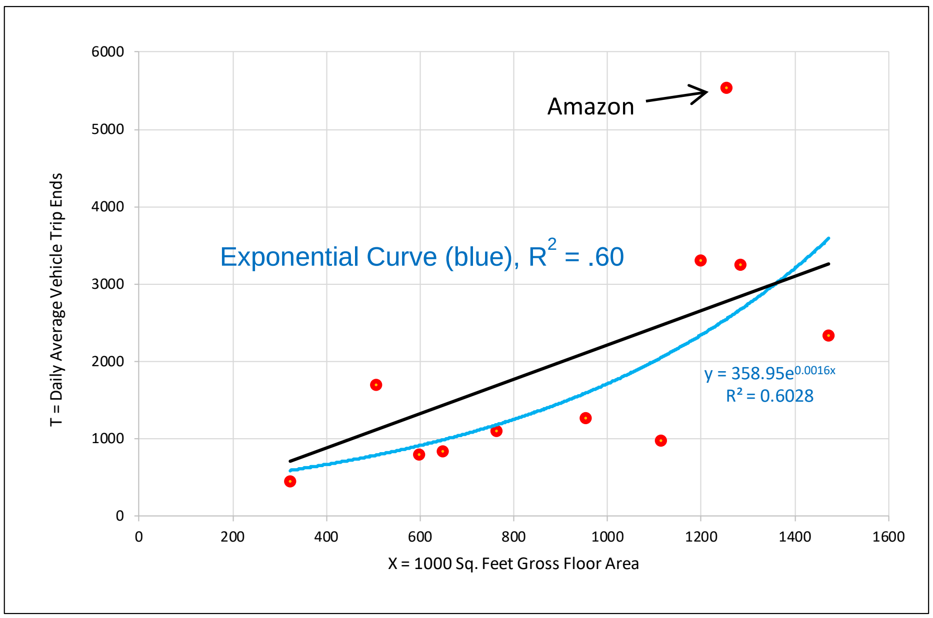
Fulfillment Centers

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

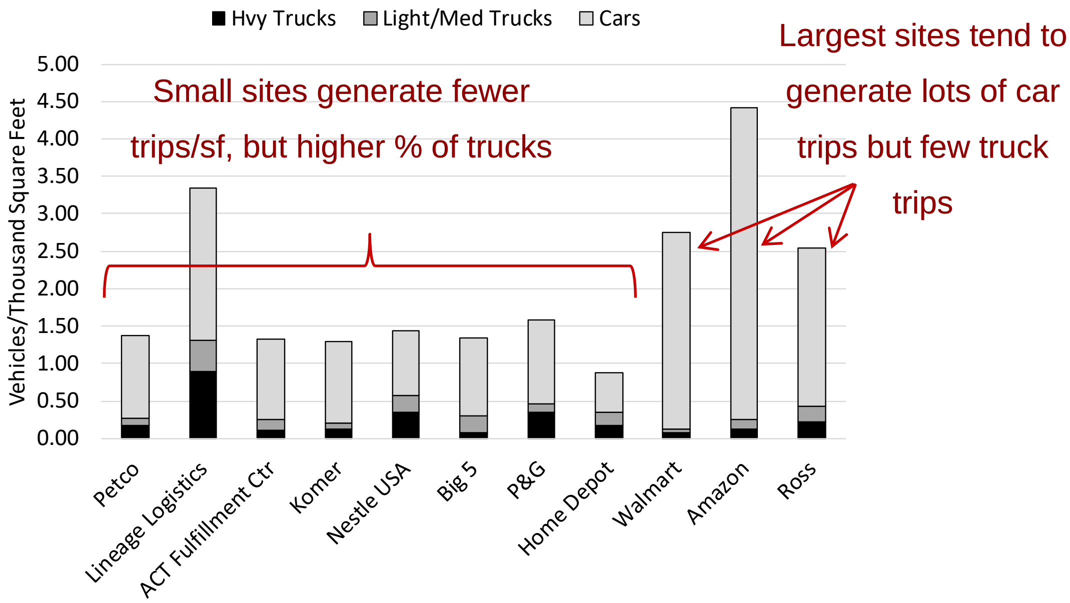


Exhibit 3 and Exhibit 4 show data plots for AM and PM peak hour vehicle trip ends against building size (respectively). The fitted curves had a low R^2, and so we recommend using the average rate.

Exhibit 3: Data Plot for AM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

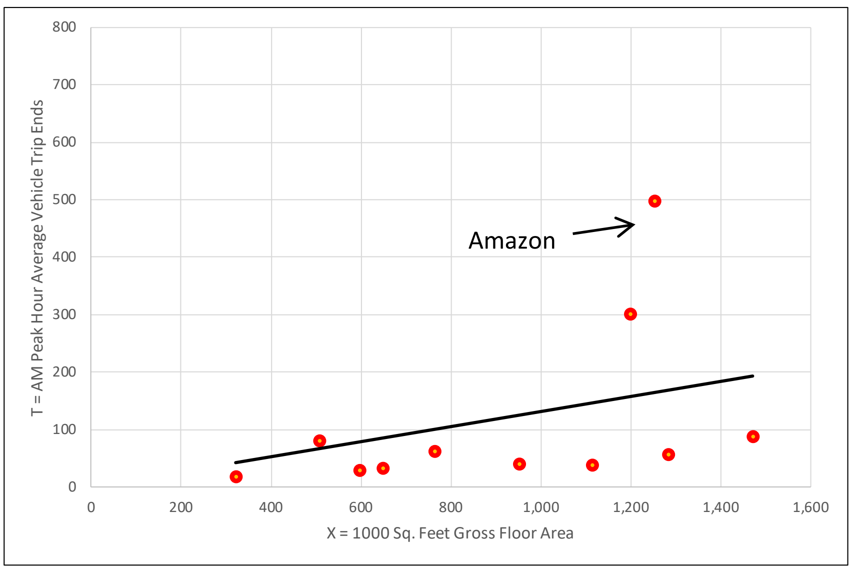


Exhibit 4: Data Plot for PM Peak Hour Vehicle Trip Ends against Building Size (Fulfillment Center)

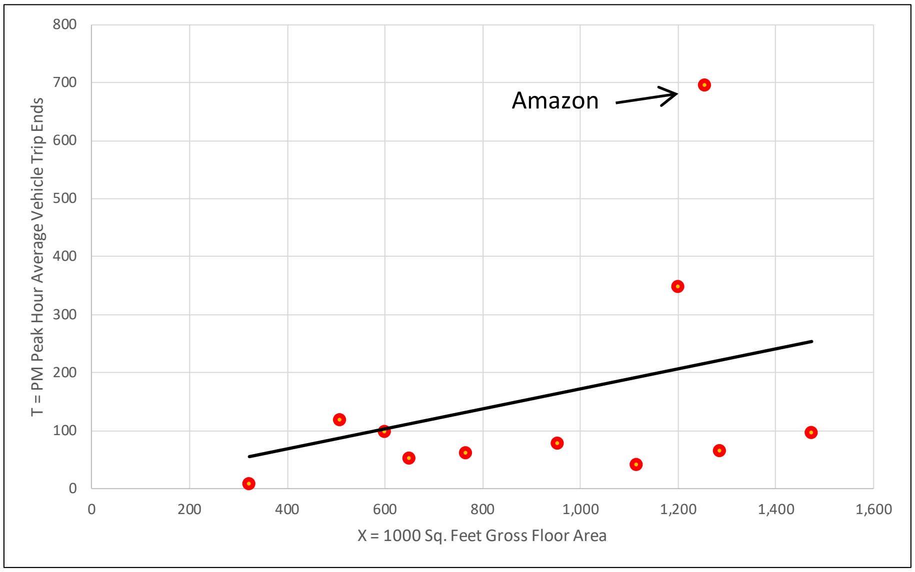
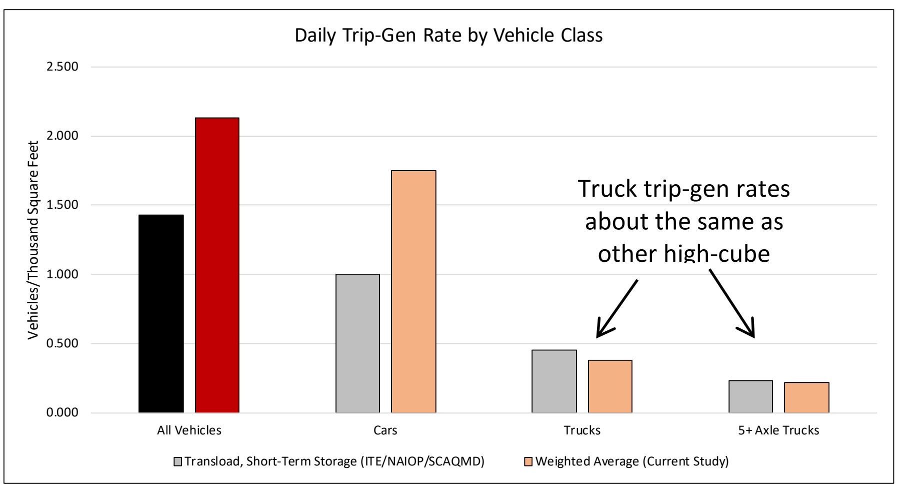


Exhibit 5 compares the average trip generation rates of 11 fulfillment centers with the rates found for conventional transload and short-term storage warehouses in the 2016 high-cube warehouse trip generation study[3] by SCAQMD/NAIOP/ITE. As shown, the fulfillment centers generate more daily vehicle 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.

[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%

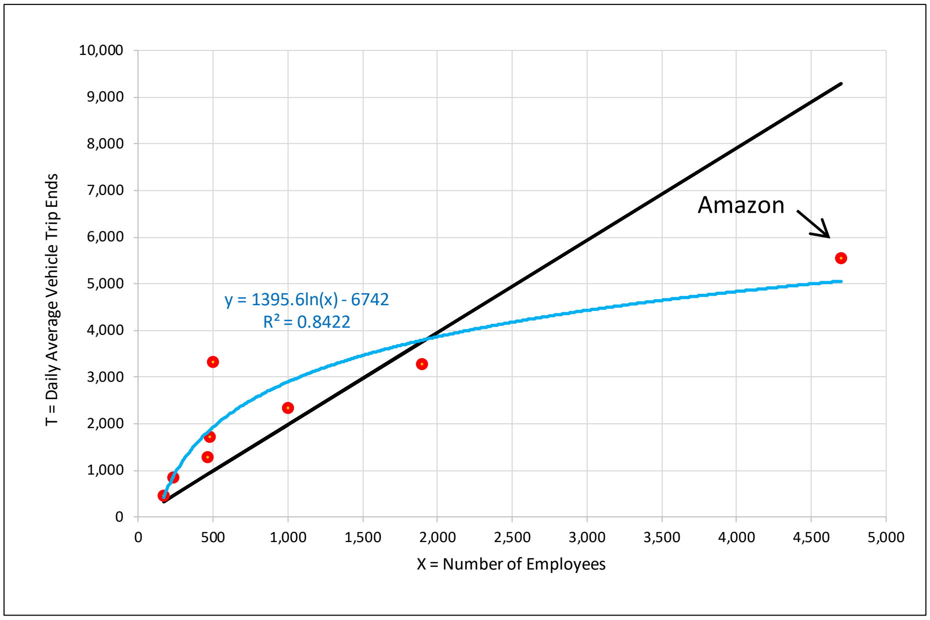
* Transload, Short-Term Storage category in 2016 TIE/NAIOP/SCAQMD study

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)

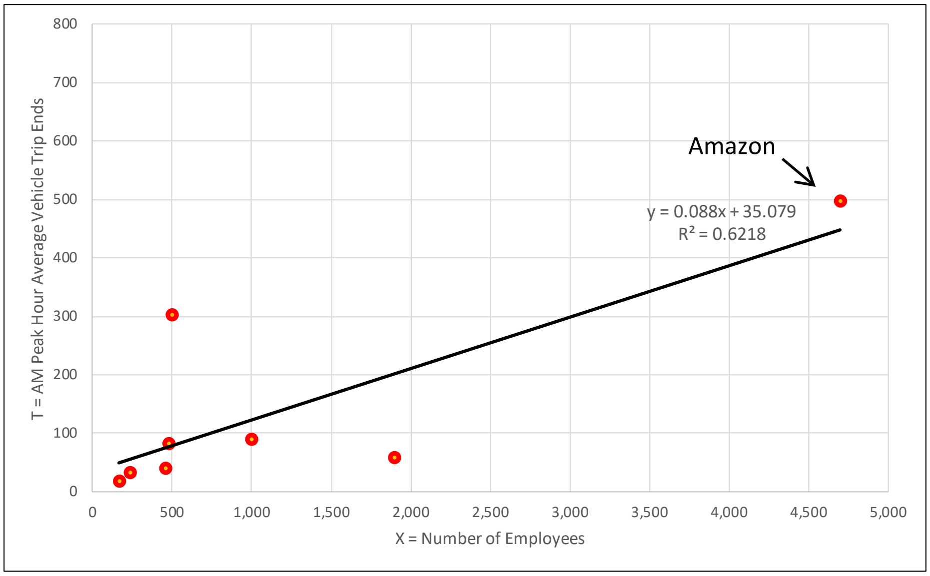


Exhibit 9: Data Plot for PM Peak Hour Total Vehicle Trip Ends against Employee (Fulfillment Center)

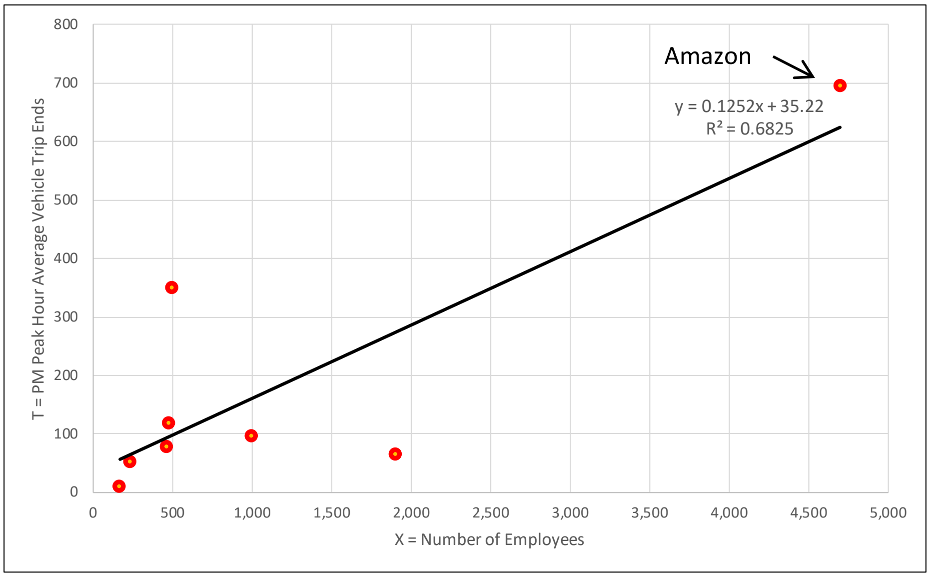


Exhibit 10 summarizes the AM and PM peak hour trip rates and the daily rates for trip generation per employee at fulfillment centers based on the findings of this study.

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

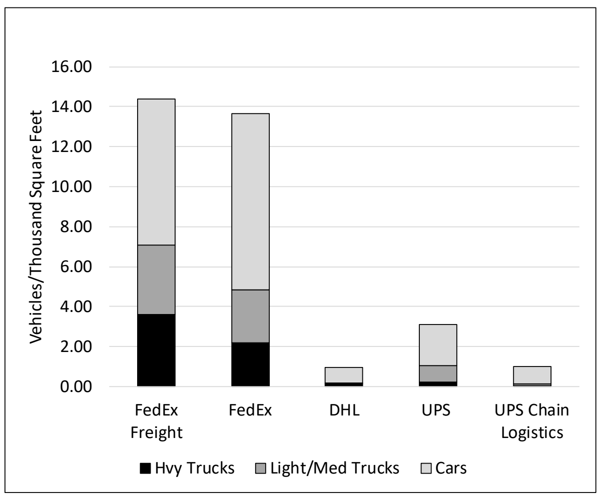


Exhibit 12 shows a data plot of daily vehicle trips of five parcel hubs against building size. As shown, a linear best fit was negative. During the collection of traffic data, construction activity was observed at the FedEx site potentially tainting the validity of these data to represent typical trip 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)

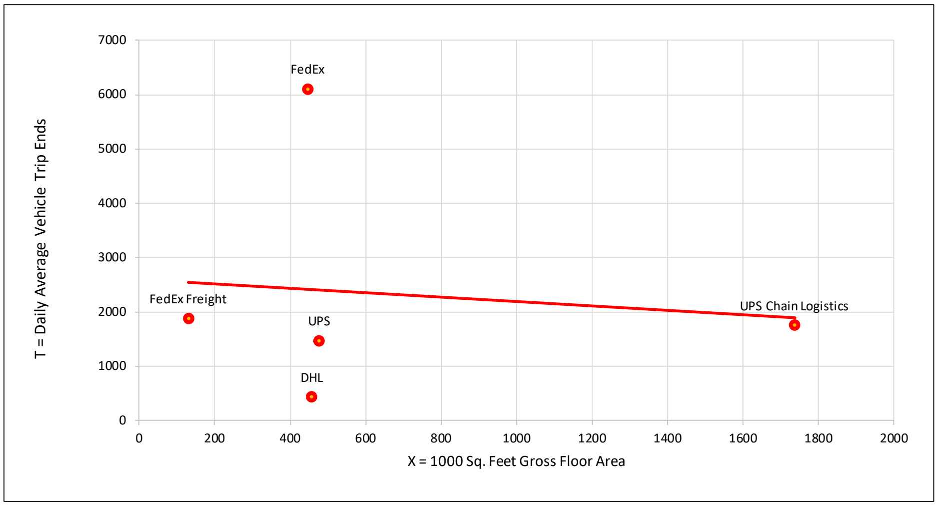
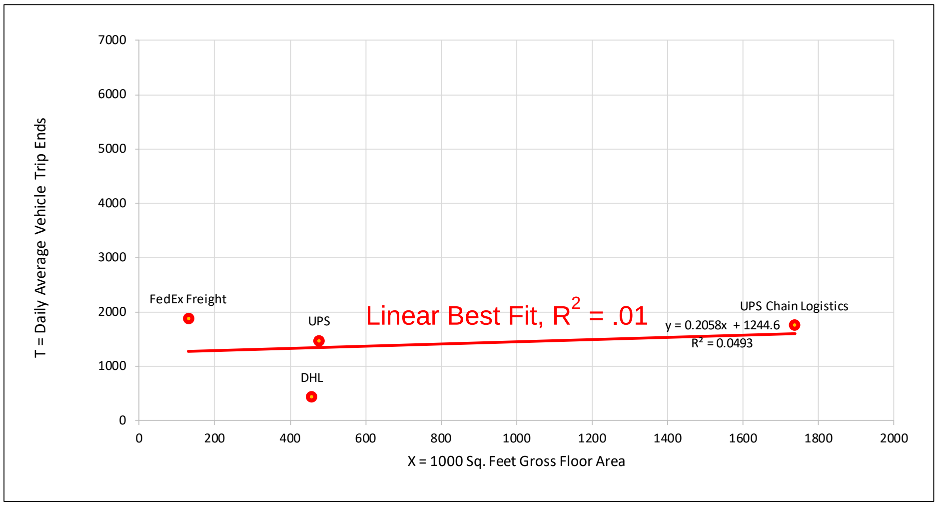


Exhibit 13: Data Plot for Daily Vehicle Trip Ends against Building Size without Construction Site



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.

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Item 7.D
High-Cube Warehouse Calculation

Attachment 2
TUMF Calculation Handbook – High Cube Warehouse

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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

[ ] **Enter Gross Floor Area of Qualifying Building(s) (in square feet)**	**– 200,000 =**	[ ]	◄ **Total A**
[ ] **Enter Total A**	**x 0.36 =**	[ ]	◄ **Total B**
[ ] **Enter Total B**	**+ 200,000 =**	[ ] **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

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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
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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

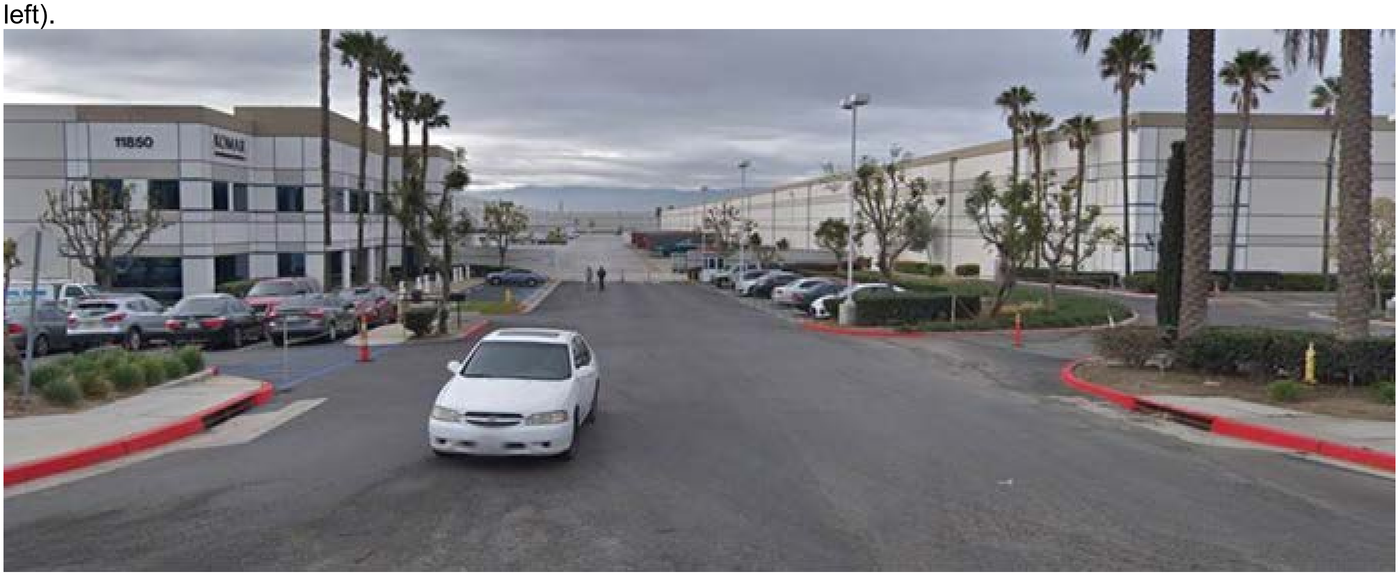
Good morning Frank,

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
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"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
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"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
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"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
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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

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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)

Fresno COG 2019 Travel Model -Truck Select Zone Distribution (West Neilsen Industrial)

caliper

(Licensed to LSA Associates Inc)

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

	Right	Thru	Left	U-Turn	Total (NB exit)
AM	14	112	38	0	134
NOON	0	0	0	0	0
PM	22	110	24	0	289
Lanes	0	3	1	0	

W Belmont Ave — EASTBOUND

	AM	NOON	PM	Lanes
Total (WB exit)	122	0	222	
U-Turn	0	0	0	0
Left	18	0	19	1
Thru	115	0	163	2
Right	68	0	44	0

W Belmont Ave — WESTBOUND

	Lanes	PM	NOON	AM
Right	1	53	0	11
Thru	1	115	0	66
Left	1	35	0	32
U-Turn	0	0	0	1
Total (EB exit)		258	0	211

N Marks Ave — NORTHBOUND

	Total (SB exit)	U-Turn	Left	Thru	Right
Lanes		0	1	1	1
PM	191	2	85	217	71
NOON	0	0	0	0	0
AM	213	1	42	105	57

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	680	0	960
PHF	0.83		0.88

Cars (AM)

Approach	Left	Thru	Right
SB	37	93	12
EB	12	103	51
WB	27	54	11
NB	37	86	47

HT (AM)

Approach	Left	Thru	Right
SB	1	19	2
EB	6	12	17
WB	5	12	0
NB	5	19	10

Cars (NOON)

Approach	Left	Thru	Right
SB	0	0	0
EB	0	0	0
WB	0	0	0
NB	0	0	0

HT (NOON)

Approach	Left	Thru	Right
SB	0	0	0
EB	0	0	0
WB	0	0	0
NB	0	0	0

Cars (PM)

Approach	Left	Thru	Right
SB	23	97	18
EB	14	152	40
WB	34	104	53
NB	77	209	66

HT (PM)

Approach	Left	Thru	Right
SB	1	13	4
EB	5	11	4
WB	1	11	0
NB	8	8	5

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (eastbound)	0	0	0
North leg (westbound)	0	0	0
South leg (eastbound)	0	0	0
South leg (westbound)	0	0	0
West leg (southbound)	0	0	0
West leg (northbound)	0	0	0
East leg (southbound)	0	0	0
East leg (northbound)	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

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

	↲	↓	↳	U	⇧ (departing)
Lanes	1	2	1	0	
AM	27	176	8	0	213
NOON	0	0	0	0	0
PM	13	182	2	3	388

W Nielsen Ave — EASTBOUND

	Lanes	AM	NOON	PM
⇦ (departing)		82	0	47
U	0	0	0	0
↱	1	10	0	22
→	1	6	0	2
↴	1	30	0	33

W Nielsen Ave — WESTBOUND

	Lanes	PM	NOON	AM
↰	1	10	0	8
←	1	7	0	4
↲	1	64	0	14
U	0	0	0	0
⇨ (departing)		29	0	74

N Marks Ave — NORTHBOUND

	⇩ (departing)	U	↰	↑	↱
Lanes		0	1	2	1
PM	280	1	27	353	25
NOON	0	0	0	0	0
AM	221	1	51	195	60

CONTROL

Signalized

	AM	NOON	PM
TEV	590	0	744
PHF	0.81		0.96

Cars and HT by approach (three movements each, in the order printed)

	Southbound	Eastbound	Westbound	Northbound
Cars (AM)	23, 140, 8	9, 6, 20	7, 4, 11	49, 163, 58
Cars (NOON)	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
Cars (PM)	8, 172, 1	22, 1, 31	10, 6, 61	20, 335, 15
HT (AM)	4, 36, 0	1, 0, 10	1, 0, 3	2, 32, 2
HT (NOON)	0, 0, 0	0, 0, 0	0, 0, 0	0, 0, 0
HT (PM)	5, 10, 1	0, 1, 2	0, 1, 3	7, 18, 10

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North (each direction)	0	0	0
South (each direction)	0	0	0
East (each direction)	0	0	0
West (each direction)	0	0	0
Diagonals (each corner)	0	0	0

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
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

SOUTHBOUND (N Marks Ave)

	Right	Through	Left	U-Turn	Departing
AM	0	223	1	1	305
NOON	0	0	0	0	0
PM	0	281	4	0	404
Bikes	0	2	1	0	

WESTBOUND (W Ray Johnson Dr)

	Bikes	PM	NOON	AM
Right	1	6	0	3
Through	0	0	0	0
Left	1	17	0	8
U-Turn	0	0	0	0
Departing		14	0	7

EASTBOUND (W Ray Johnson Dr)

	AM	NOON	PM	Bikes
Departing	0	0	0	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

NORTHBOUND (N Marks Ave)

	Departing	U-Turn	Left	Through	Right
Bikes		0	0	3	0
PM	298	0	0	398	10
NOON	0	0	0	0	0
AM	231	0	0	301	6

CONTROL

Signalized

	AM	NOON	PM
TEV	543	0	716
PHF	0.80		0.92

Totals (AM)

SB: U-Turn 0, Through 223, Left 1; EB: U-Turn/Left 0, Through 0, Right 0; WB: Right 3, Through 0, Left 8; NB: U-Turn 0, Through 301, Right 6

Totals (NOON)

SB: 0, 0, 0; EB: 0, 0, 0; WB: 0, 0, 0; NB: 0, 0, 0

Totals (PM)

SB: U-Turn 0, Through 281, Left 4; EB: 0, 0, 0; WB: Right 6, Through 0, Left 17; NB: U-Turn 0, Through 398, Right 10

Totals (AM)
Totals (NOON)
Totals (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North	0	0	0
South	0	0	0
East	0	0	0
West	0	0	0
Diagonals	0	0	0

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
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

SOUTHBOUND (N Marks Ave)

	Col 1	Col 2	Col 3	Col 4	Exit
AM	19	212	0	0	314
NOON	0	0	0	0	0
PM	20	286	0	0	413
Red	1	2	0	0	

EASTBOUND (SR-180 WB Ramps)

	AM	NOON	PM	Red
Exit	19	0	20	
U-turn	0	0	0	0
Left	0	0	0	0
Through	0	0	0	0
Right	0	0	0	0

WESTBOUND (SR-180 WB Ramps)

	Red	PM	NOON	AM
Right	2	273	0	238
Through	0	0	0	0
Left	2	219	0	173
U-turn	0	0	0	0
Exit		15	0	11

NORTHBOUND (N Marks Ave)

	Exit	U-turn	Left	Through	Right
Red		0	0	2	1
PM	505	0	0	140	15
NOON	0	0	0	0	0
AM	385	0	0	76	11

CONTROL

Signalized

	AM	NOON	PM
TEV	729	0	953
PHF	0.84		0.98

Cars (AM)

Approach	Movements
Southbound	14, 161, 0
Eastbound	0, 0, 0
Westbound	209, 0, 166
Northbound	0, 70, 11

Cars (NOON)

Approach	Movements
Southbound	0, 0, 0
Eastbound	0, 0, 0
Westbound	0, 0, 0
Northbound	0, 0, 0

Cars (PM)

Approach	Movements
Southbound	17, 275, 0
Eastbound	0, 0, 0
Westbound	233, 0, 196
Northbound	0, 136, 15

HT (AM)

Approach	Movements
Southbound	5, 51, 0
Eastbound	0, 0, 0
Westbound	29, 0, 7
Northbound	0, 6, 0

HT (NOON)

Approach	Movements
Southbound	0, 0, 0
Eastbound	0, 0, 0
Westbound	0, 0, 0
Northbound	0, 0, 0

HT (PM)

Approach	Movements
Southbound	3, 11, 0
Eastbound	0, 0, 0
Westbound	40, 0, 23
Northbound	0, 4, 0

Pedestrians (Crosswalks)

All crosswalks: AM 0, NOON 0, PM 0.

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

SOUTHBOUND (N Marks Ave)

	Right	Thru	Left	U-Turn	Out
AM	122	261	0	0	87
NOON	0	0	0	0	0
PM	171	336	0	0	155
	1	2	0	0	

EASTBOUND (SR-180 EB Ramps)

	AM	NOON	PM	
Out	122	0	171	
U-Turn	0	0	0	0
Left	10	0	17	1
Thru	0	0	0	0
Right	11	0	18	1

WESTBOUND (SR-180 EB Ramps)

		PM	NOON	AM
Right	0	0	0	0
Thru	0	0	0	0
Left	0	0	0	0
U-Turn	0	0	0	0
Out		264	0	215

NORTHBOUND (N Marks Ave)

	Out	U-Turn	Left	Thru	Right
		0	0	2	2
PM	354	0	0	138	264
NOON	0	0	0	0	0
AM	272	0	0	77	215

CONTROL

Signalized

	AM	NOON	PM
TEV	696	0	944
PHF	0.92		0.92

Cars (AM)

Approach	Left/U	Thru	Right
Southbound	0	233	94
Eastbound	10	0	11
Westbound	0	0	0
Northbound	0	71	207

HT (AM)

Approach	Left/U	Thru	Right
Southbound	0	28	28
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	6	8

Cars (NOON)

Approach	Left/U	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

HT (NOON)

Approach	Left/U	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Cars (PM)

Approach	Left/U	Thru	Right
Southbound	0	312	161
Eastbound	15	0	16
Westbound	0	0	0
Northbound	0	136	262

HT (PM)

Approach	Left/U	Thru	Right
Southbound	0	24	10
Eastbound	2	0	2
Westbound	0	0	0
Northbound	0	2	2

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North	0	0	0
South	0	0	0
East	0	0	0
West	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

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

	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

SOUTHBOUND (N Hughes Ave)

	Right	Thru	Left	U-Turn	Exit
AM	15	22	26	0	62
NOON	0	0	0	0	0
PM	15	47	40	0	113
Lanes	0	1	0	0	

EASTBOUND (W Belmont Ave)

	AM	NOON	PM	Lanes
Exit	156	0	208	
U-Turn	0	0	0	0
Left	20	0	37	1
Thru	171	0	225	2
Right	17	0	10	0

WESTBOUND (W Belmont Ave)

	Lanes	PM	NOON	AM
Right	0	34	0	15
Thru	2	179	0	135
Left	1	39	0	27
U-Turn	0	2	0	0
Exit		323	0	230

NORTHBOUND (N Hughes Ave)

	Exit	U-Turn	Left	Thru	Right
Lanes		0	0	1	0
PM	96	0	14	42	56
NOON	0	0	0	0	0
AM	66	0	6	27	33

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	514	0	740
PHF	0.91		0.82

Totals (AM)

	U-Turn	Left	Thru	Right
Southbound		26	22	15
Eastbound		20	171	17
Westbound		27	135	15
Northbound		6	27	33

Totals (NOON)

	U-Turn	Left	Thru	Right
Southbound		0	0	0
Eastbound		0	0	0
Westbound		0	0	0
Northbound		0	0	0

Totals (PM)

	U-Turn	Left	Thru	Right
Southbound		40	47	15
Eastbound		37	225	10
Westbound		39	179	34
Northbound		14	42	56

Totals (AM)

Totals (NOON)

Totals (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg (eastbound)	0	0	0
North leg (westbound)	0	0	0
South leg (eastbound)	0	0	0
South leg (westbound)	0	0	0
West leg (southbound)	0	0	0
West leg (northbound)	0	0	0
East leg (southbound)	0	0	0
East leg (northbound)	0	0	0
NW diagonal	0	0	0
NE diagonal	0	0	0
SW diagonal	0	0	0
SE diagonal	0	0	0

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
AM	07:45 AM - 08:45 AM	7:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:00 PM - 05:00 PM	4:00 PM - 06:00 PM

SOUTHBOUND (N Hughes Ave)

	Right	Thru	Left	U-Turn	Out (NB)
AM	10	46	8	0	60
NOON	0	0	0	0	0
PM	13	73	9	0	105
Lanes	1	1	0	0	

EASTBOUND (W Nielsen Ave)

	AM	NOON	PM	Lanes
Out (WB)	24	0	69	
U-Turn	0	0	0	0
Left	8	0	8	1
Thru	33	0	22	1
Right	24	0	11	0

WESTBOUND (W Nielsen Ave)

	Lanes	PM	NOON	AM
Right	0	14	0	8
Thru	1	31	0	9
Left	1	4	0	2
U-Turn	0	0	0	0
Out (EB)		34	0	42

NORTHBOUND (N Hughes Ave)

	Out (SB)	U-Turn	Left	Thru	Right
Lanes		0	0	1	0
PM	88	0	25	83	3
NOON	0	0	0	0	0
AM	72	0	5	44	1

CONTROL

4-Way Stop

	AM	NOON	PM
TEV	198	0	296
PHF	0.84		0.82

Totals (AM)

	Left	Thru	Right
Southbound	8	46	10
Eastbound	8	33	24
Westbound	2	9	8
Northbound	5	44	1

Totals (NOON)

	Left	Thru	Right
Southbound	0	0	0
Eastbound	0	0	0
Westbound	0	0	0
Northbound	0	0	0

Totals (PM)

	Left	Thru	Right
Southbound	9	73	13
Eastbound	8	22	11
Westbound	4	31	14
Northbound	25	83	3

Totals (AM)
Totals (NOON)
Totals (PM)

Pedestrians (Crosswalks)

Crosswalk	AM	NOON	PM
North leg	0	0	0
South leg	0	0	0
East leg	0	0	0
West leg	0	0	0
NW corner	0	0	0
NE corner	0	0	0
SW corner	0	0	0
SE corner	0	0	0

ITM Peak Hour Summary

Prepared by:

NDS

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

N Marks Ave

W Belmont Ave

Peak Hour Summary

CONTROL: 4-Way Stop

Southbound Approach

	Right	Through	Left	Outbound
Lanes	0	3	1	
AM	22	329	22	212
NOON	0	0	0	0
PM	6	210	8	539

Westbound Approach

	AM	NOON	PM	Lanes
Left	1	0	7	1
Through	2	0	7	1
Right	7	0	13	1
Outbound	53	0	92	

Eastbound Approach

	Lanes	AM	NOON	PM
Outbound		48	0	51
Left	1	10	0	16
Through	2	15	0	34
Right	0	63	0	52

Northbound Approach

	Outbound	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

Leg	Period	In	Out
North Leg	AM	373	212
North Leg	NOON	0	0
North Leg	PM	224	539
South Leg	AM	399	241
South Leg	NOON	0	0
South Leg	PM	275	604

West Leg	AM	NOON	PM
	48	0	51
	88	0	102

East Leg	AM	NOON	PM
	10	0	27
	53	0	92

Total Volume Per Leg

	AM	NOON	PM
North Leg	585	0	763
South Leg	640	0	879
West Leg	136	0	153
East Leg	63	0	119

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%	
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

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

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			
	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	
4:00 PM	10	121	11	2	58	5	2	5	14	1	2	1	232
4:15 PM	5	110	14	0	49	6	4	10	15	5	0	2	220
4:30 PM	6	104	8	0	63	1	3	8	12	8	3	4	220
4:45 PM	4	134	10	4	46	1	4	13	17	3	2	0	238
5:00 PM	9	131	17	4	50	1	6	5	13	2	2	2	242
5:15 PM	13	147	13	0	50	2	3	8	4	0	0	1	241
5:30 PM	3	147	11	1	38	3	0	2	12	2	0	0	219
5:45 PM	2	114	7	2	27	3	1	6	9	1	1	1	174
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	52	1008	91	13	381	22	23	57	96	22	10	11	1786
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

UTURNS			
NB	SB	EB	WB
1	2	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
NB	SB	EB	WB
1	2	0	0

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: Historical

City: Fresno

HT

AM

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					
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
7:15 AM	0	0	0	1	0	0	0	1	1	1	0	0	4	0	0	0	0
7:30 AM	1	0	0	1	0	1	0	0	0	0	0	0	3	0	2	0	0
7:45 AM	0	1	0	0	1	0	0	0	1	0	0	0	3	0	3	0	0
8:00 AM	1	1	0	0	1	0	0	1	2	1	0	0	7	1	1	0	0
8:15 AM	0	0	0	2	2	0	0	0	0	1	0	0	5	0	0	0	0
8:30 AM	0	0	1	0	0	0	1	0	0	1	0	0	3	0	2	0	0
8:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	4	0	0	0	0
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	2	3	2	4	5	1	1	3	4	5	0	0	30	1	8	0	0
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%					

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 | **Day:** Thursday

City: Fresno | **Date:** 12/1/2016

HT

PM

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	
4:00 PM	2	1	0	0	0	0	0	0	0	0	0	0	3
4:15 PM	0	0	0	0	1	0	1	0	0	0	0	0	2
4:30 PM	2	0	0	0	0	0	0	0	1	0	0	0	3
4:45 PM	1	0	0	0	0	1	0	0	4	0	0	0	6
5:00 PM	1	0	1	0	1	0	0	0	0	0	0	0	3
5:15 PM	2	0	1	0	0	0	0	0	1	0	0	0	4
5:30 PM	0	0	0	0	1	0	0	0	2	0	0	0	3
5:45 PM	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
TOTAL VOLUMES :	8	1	2	0	3	1	1	0	8	0	0	0	24
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

UTURNS

	NB	SB	EB	WB
4:00 PM	1	2	0	0
4:15 PM	0	0	0	0
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
TOTAL	1	2	0	0

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

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
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	
00:00	14		21				35	
00:15	11		11				22	
00:30	7		8				15	
00:45	6	38	5	45			11	83
01:00	8		5				13	
01:15	8		9				17	
01:30	3		5				8	
01:45	9	28	8	27			17	55
02:00	3		1				4	
02:15	9		3				12	
02:30	5		3				8	
02:45	16	33	6	13			22	46
03:00	9		6				15	
03:15	10		17				27	
03:30	10		14				24	
03:45	12	41	17	54			29	95
04:00	8		16				24	
04:15	10		19				29	
04:30	17		26				43	
04:45	34	69	26	87			60	156
05:00	33		34				67	
05:15	32		41				73	
05:30	38		51				89	
05:45	48	151	40	166			88	317
06:00	52		48				100	
06:15	43		36				79	
06:30	34		51				85	
06:45	68	197	72	207			140	404
07:00	57		50				107	
07:15	54		65				119	
07:30	72		60				132	
07:45	100	283	73	248			173	531
08:00	103		55				158	
08:15	61		59				120	
08:30	73		52				125	
08:45	82	319	40	206			122	525
09:00	77		75				152	
09:15	92		40				132	
09:30	66		73				139	
09:45	78	313	66	254			144	567
10:00	68		58				126	
10:15	55		73				128	
10:30	71		52				123	
10:45	89	283	57	240			146	523
11:00	63		63				126	
11:15	54		69				123	
11:30	78		59				137	
11:45	100	295	65	256			165	551
TOTALS		2050		1803				**3853**
SPLIT %		53.2%		46.8%				**41.1%**

PM Period	NB		SB		EB	WB	TOTAL	
12:00	95		64				159	
12:15	84		56				140	
12:30	93		75				168	
12:45	76	348	82	277			158	625
13:00	99		75				174	
13:15	104		70				174	
13:30	84		89				173	
13:45	98	385	65	299			163	684
14:00	90		72				162	
14:15	84		69				153	
14:30	126		79				205	
14:45	157	457	53	273			210	730
15:00	146		78				224	
15:15	131		83				214	
15:30	129		87				216	
15:45	125	531	81	329			206	860
16:00	91		85				176	
16:15	84		71				155	
16:30	115		93				208	
16:45	114	404	61	310			175	714
17:00	92		104				196	
17:15	107		70				177	
17:30	81		58				139	
17:45	60	340	57	289			117	629
18:00	49		37				86	
18:15	63		43				106	
18:30	71		47				118	
18:45	49	232	36	163			85	395
19:00	41		26				67	
19:15	51		15				66	
19:30	46		25				71	
19:45	37	175	29	95			66	270
20:00	50		21				71	
20:15	34		18				52	
20:30	36		24				60	
20:45	30	150	22	85			52	235
21:00	27		26				53	
21:15	27		21				48	
21:30	33		17				50	
21:45	27	114	17	81			44	195
22:00	19		10				29	
22:15	16		7				23	
22:30	18		10				28	
22:45	17	70	13	40			30	110
23:00	15		4				19	
23:15	11		7				18	
23:30	12		12				24	
23:45	7	45	12	35			19	80
TOTALS		3251		2276				**5527**
SPLIT %		58.8%		41.2%				**58.9%**

DAILY TOTALS	NB	SB	EB	WB	Total
	5,301	4,079	0	0	9,380

	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			**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

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
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	
00:00			9		12		21	
00:15			6		4		10	
00:30			5		11		16	
00:45			7	27	12	39	19	66
01:00			1		0		1	
01:15			0		0		0	
01:30			0		0		0	
01:45			0	1	0		0	1
02:00			0		0		0	
02:15			0		0		0	
02:30			1		1		2	
02:45			12	13	5	6	17	19
03:00			10		2		12	
03:15			10		4		14	
03:30			5		3		8	
03:45			7	32	9	18	16	50
04:00			6		6		12	
04:15			14		16		30	
04:30			14		12		26	
04:45			21	55	28	62	49	117
05:00			41		17		58	
05:15			53		16		69	
05:30			26		23		49	
05:45			35	155	29	85	64	240
06:00			27		23		50	
06:15			46		26		72	
06:30			42		26		68	
06:45			50	165	30	105	80	270
07:00			27		26		53	
07:15			47		22		69	
07:30			56		37		93	
07:45			70	200	45	130	115	330
08:00			55		34		89	
08:15			47		47		94	
08:30			49		40		89	
08:45			63	214	41	162	104	376
09:00			36		44		80	
09:15			53		39		92	
09:30			65		39		104	
09:45			59	213	51	173	110	386
10:00			48		59		107	
10:15			64		53		117	
10:30			72		51		123	
10:45			73	257	58	221	131	478
11:00			56		59		115	
11:15			66		63		129	
11:30			75		54		129	
11:45			69	266	63	239	132	505
TOTALS				1598		1240		2838
SPLIT %				56.3%		43.7%		39.2%

PM Period	NB	SB	EB		WB		TOTAL	
12:00			73		59		132	
12:15			58		63		121	
12:30			90		51		141	
12:45			75	296	61	234	136	530
13:00			76		56		132	
13:15			70		62		132	
13:30			82		64		146	
13:45			63	291	60	242	123	533
14:00			77		59		136	
14:15			72		49		121	
14:30			67		81		148	
14:45			77	293	60	249	137	542
15:00			76		65		141	
15:15			92		79		171	
15:30			106		71		177	
15:45			79	353	70	285	149	638
16:00			91		72		163	
16:15			68		62		130	
16:30			71		56		127	
16:45			69	299	46	236	115	535
17:00			56		40		96	
17:15			46		57		103	
17:30			53		50		103	
17:45			61	216	44	191	105	407
18:00			55		38		93	
18:15			44		26		70	
18:30			40		34		74	
18:45			42	181	38	136	80	317
19:00			37		42		79	
19:15			52		39		91	
19:30			39		27		66	
19:45			29	157	38	146	67	303
20:00			29		31		60	
20:15			31		30		61	
20:30			29		15		44	
20:45			21	110	15	91	36	201
21:00			21		21		42	
21:15			13		26		39	
21:30			33		26		59	
21:45			12	79	13	86	25	165
22:00			15		26		41	
22:15			19		9		28	
22:30			11		16		27	
22:45			18	63	16	67	34	130
23:00			18		15		33	
23:15			12		11		23	
23:30			18		9		27	
23:45			7	55	11	46	18	101
TOTALS				2393		2009		4402
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
AM Peak Hour			11:45	11:00	11:45
AM Pk Volume			290	239	526
Pk Hr Factor			0.806	0.948	0.933
7 - 9 Volume	0	0	414	292	706
7 - 9 Peak Hour			07:15	07:45	07:30
7 - 9 Pk Volume	0	0	228	166	391
Pk Hr Factor	0.000	0.000	0.814	0.883	0.850

	NB	SB	EB	WB	TOTAL
PM Peak Hour			15:15	15:15	15:15
PM Pk Volume			368	292	660
Pk Hr Factor			0.868	0.924	0.932
4 - 6 Volume	0	0	515	427	942
4 - 6 Peak Hour			16:00	16:00	16:00
4 - 6 Pk Volume	0	0	299	236	535
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

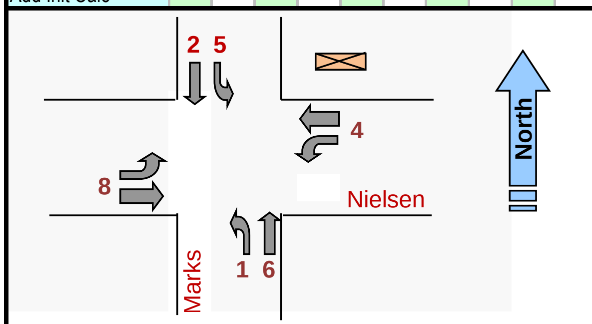
DAILY TOTALS	NB	SB	EB	WB	Total
	1,421	1,183	0	0	2,604

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

	NB	SB	EB	WB	TOTAL		NB	SB	EB	WB	TOTAL
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:	Date Printed: 12/4/20
Checked by:	PG	Date Superseded:	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 Split	OFF
Easy Float	OFF
Auto Reset	ON
NTCIP Yield	+ 0

Leave Walk

Before	TIMED
After	TIMED

Marks & Nielsen

City of FRESNO

Intersection Name:

ID: 1342

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 Splt	OFF
Easy Float	OFF
Auto Reset	ON
NTCIP Yield	+ 0

Leave Walk

Before	TIMED
After	TIMED

Intersection Name: Marks & Nielsen

City of FRESNO

ID: 1342

Date Printed: 12/4/2020

[2.4] Patterns / [2.7.1-24] Splits

Pat#	Cyc	Off	Split	Seq	Split	[2.7]	1	2	3	4	5	6	7	8	9	10
20	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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	0	0	0	1	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						

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						

[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

Overlap 1-8 Program Parms & Parm+ [1.5.2.1] [1.5.2.8]

Olap	Row												
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	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

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										

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: 1342 **Name:** Marks & Nielsen

Date Printed: 12/4/2020

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]

Row#	Result I/O	Result Fcn	=	Operand_1 Inv	Operand_1 Src	Operand_1 I/0	Operand_1 Fun	Operand_1 Logic Func	Operand_2 Inv	Operand_2 Src	Operand_2 I/0	Operand_2 Fun	Operand_2 Logic Func	Operand_3 Inv	Operand_3 Src	Operand_3 I/0	Operand_3 Fun	Operand_3 Logic Func	Timer Dly	Timer 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

Prt Date: 12/4/2020

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 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 G	Occupancy Y	Occupancy R	Delay 1	Delay 2	Type	Src	Dir	#
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 1	2	3	4	5	6	7	8	ASC	CNA1	Max2	Dia
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**

NAME: Marks & Nielsen

ID No. 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

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

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

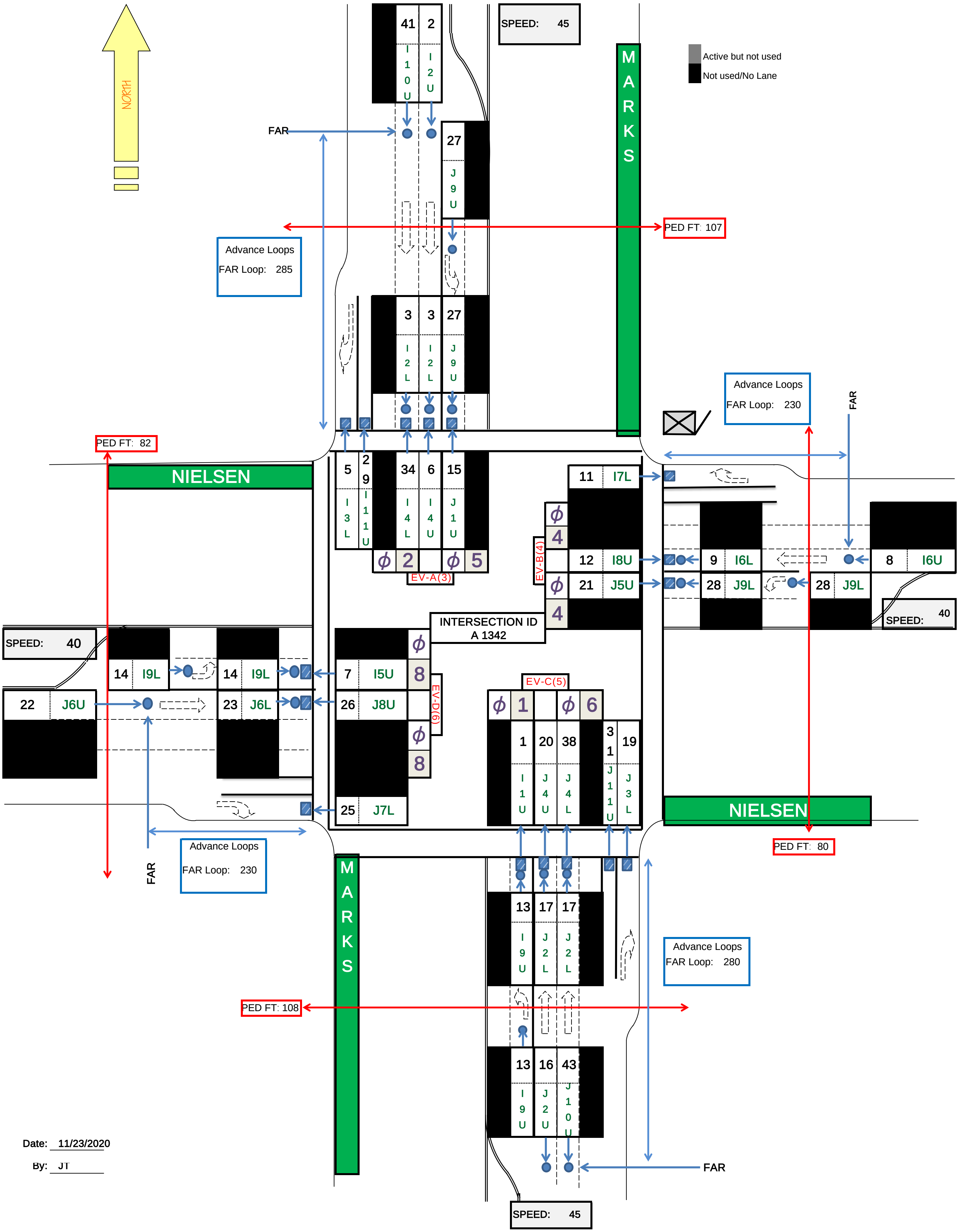
"I"	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14
UPPER	Ph 1 Call&Ext T2-1&2 C1-56 Det 1 NBL1	Ph 2 Ext T2-5&6 C1-39 Det 2 SB Far	Ph 2 Call&TP3 T2-9&10 C1-63 Det 4 SB Mid	Ph 2 Call&TP3 T4-1&2 C1-47 Det 6 SBT1	Ph 3 Call&Ext T4-5&6 C1-58 Det 7 EBL1	Ph 4 Ext T4-9&10 C1-41 Det 8 WB Far	Ph 4 Call&TP3 T6-1&2 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

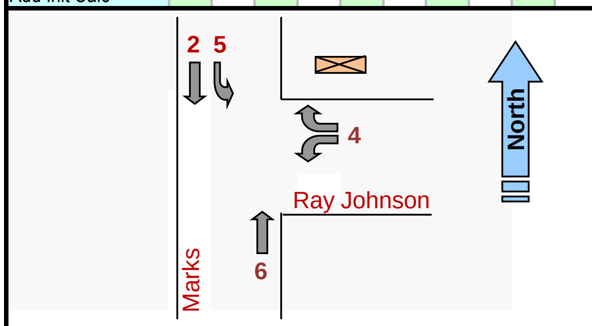
By: JT

Detector Layout for the intersection of: MARKS & NIELSEN

City of FRESNO

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

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

Intersection Name: **Marks @ Ray Johnson**

ID: **1337**

City of FRESNO

[2.1] Coord Modes+

Setting	Value
Test OpMode	0
Correction	SHRT/LNG
Maximum	MAX INH
Force Mode	FIXED
Flash Mode	CHANNEL

Coord Modes+ (Page 2)

Setting	Value
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

[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

Date Printed: 2/23/2021

[2.1] Coord Modes+

Setting	Value
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

Date Printed: 2/23/2021

[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]

#		Parameter	Phases	Setting	Value
1	A	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
2	B	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
3	C	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
4	D	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
5	E	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
6	F	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
7	G	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		Conflict Olap		Red	1
		Conflict Ped			
8	H	Included Ø		NORMAL	
		Modifier Ø		Grn	
		Conflict Ø		Yel	3
		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		

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 I/O	Result Fcn	=	Operand_1 Inv	Operand_1 Src	Operand_1 I/0	Operand_1 Fun	Operand_1 Logic Func	Operand_2 Inv	Operand_2 Src	Operand_2 I/0	Operand_2 Fun	Operand_2 Logic Func	Operand_3 Inv	Operand_3 Src	Operand_3 I/0	Operand_3 Fun	Operand_3 Logic Func	Timer Dly	Timer 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 G	Occupancy Y	Occupancy R	Delay 1	Delay 2	Type	Src	Dir	Det #
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 1	2	3	4	5	6	7	8	ASC	CNA1	Max2	Dia
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						
	J	F	M	A	M	J	J	A	S	O	N	D	S	M	T	W	T	F	S
1	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	
2	X	X	X	X	X	X	X	X	X	X	X	X							X
3	X	X	X	X	X	X	X	X	X	X	X	X	X						
4											X						X		
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			
14																			
15																			
16																			
17																			
18																			

	Date																															Day Plan
	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	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	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	3
4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	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 @ 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

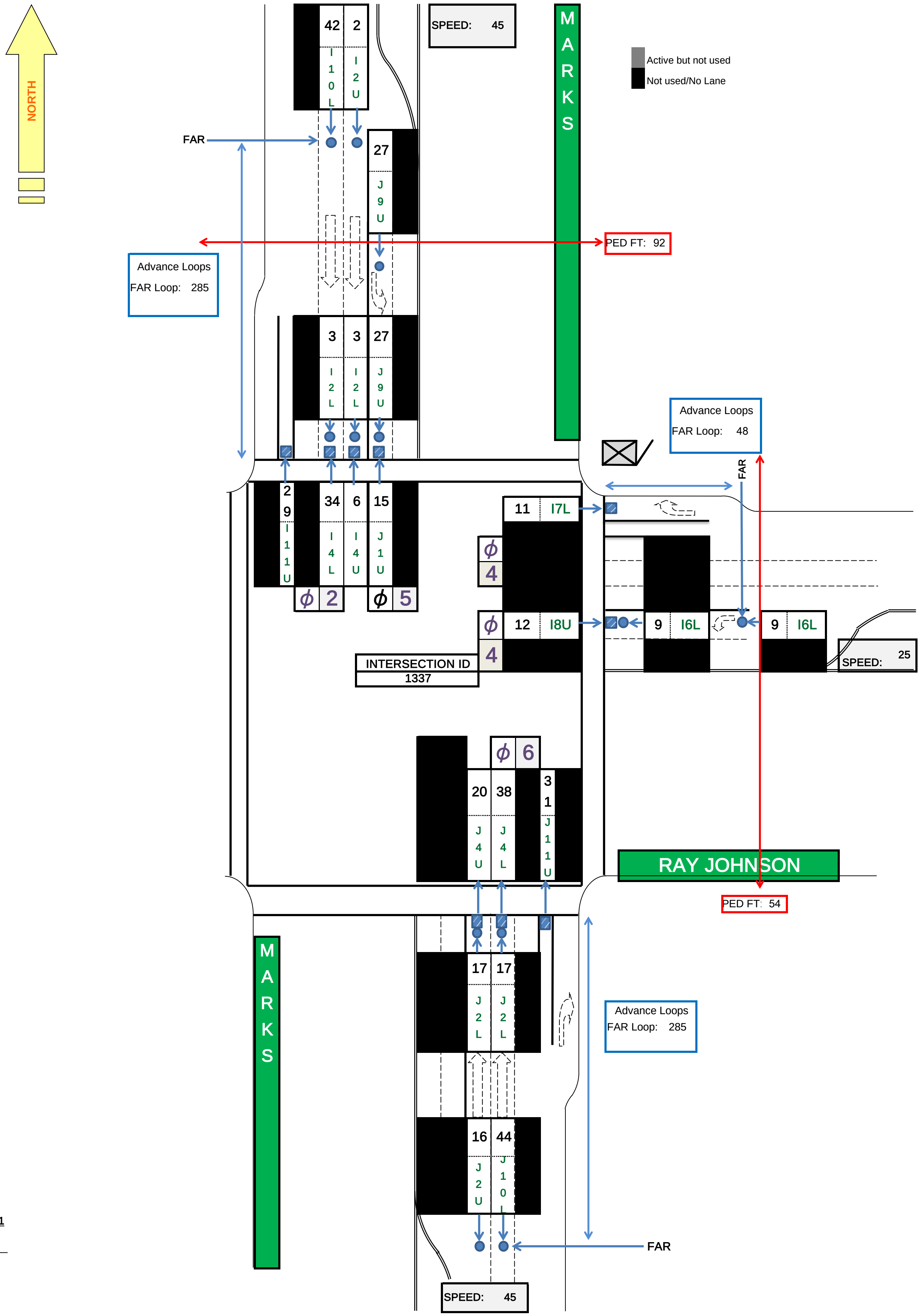
	DETECTOR ASSIGNMENTS											ISOLATORS		
"I"	I1	I2	I3	I4	I5	I6	I7	I8	I9	I10	I11	I12	I13	I14
UPPER	Ph 1 Call&Ext T2-1&2 C1-56 Det 1 NBL1	Ph 2 Ext T2-5&6 C1-39 Det 2 SB Far	Ph 2 Call&TP3 T2-9&10 C1-63 Det 4 SB Mid	Ph 2 Call&TP3 T4-1&2 C1-47 Det 6 SBT1	Ph 3 Call&Ext T4-5&6 C1-58 Det 7 EBL1	Ph 4 Ext T4-9&10 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)	[ ]
O		
V	A)	[ ]
E	B)	[ ]
R	C)	[ ]
L	D)	[ ]
A	E)	[ ]
P	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

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

 CHECKSUM: B2AB

DETECTORS

Det	Type	Phases	Lock	Slot	Det	Delay	Extend	Recall	Port
	Detector Attributes (5-1)				**Detector Configuration (5-2)**				
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

 CHECKSUM: 0D5D

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

 CHECKSUM: FEC4

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

RAILROAD PREEMPTION

RR 1	(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
			Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Delay	0									
	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)		
			Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Delay	0									
	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

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

YELLOW YIELD COORDINATION

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs 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

2070 Controller Timing Chart

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	Action	Phases
			1 2 3 4 5 6 7		
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

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

RAILROAD PREEMPTION

RR 1	(3-1-1)	Timing	Phase Flags (3-1-2)			Pedestrian Flags (3-1-3)			Overlap Flags (3-1-4)		
			Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Delay	0									
	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)		
			Grn Hold	Yel Flash	Red Flash	Walk	Flash DW	Solid DW	Grn Hold	Yel Flash	Red Flash
	Delay	0									
	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

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

Y-Coord Plans (7-C,D)	Long Grn	No Grn	Offset	Perm	Force-Offs 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

LSA

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

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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 Year 2,021 Counts	COVID Non-COVID Adjustments	Adjusted 2,021 Volumes	Balanced 2,021 Volumes	Net Project Trips	Existing With Project	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
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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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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

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

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 Right	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

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.

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

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									

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.

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.

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

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

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			

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.

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									

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			

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.

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

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

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

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									

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.

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

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

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

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

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.

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									

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

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

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			

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.

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

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			

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

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.

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			

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.

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.

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

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.

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

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

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

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

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

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

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

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)							

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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 (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)	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 (f_{HV})	0.892	1.000
Flow Rate (v_i),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 (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	2483	Ramp Junction Speed (S), mi/h	65.3
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	-	Average Density (D), pc/mi/ln	19.0
Level of Service (LOS)	C	Density in Ramp Influence Area (D_R), 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 (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)	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 (f_{HV})	0.890	0.945
Flow Rate (v_i),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 (L_{EQ}), ft	-	Number of Outer Lanes on Freeway (N_O)	0
Distance to Upstream Ramp (L_{UP}), ft	-	Speed Index (M_S)	0.306
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	65.2
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	1733	Ramp Junction Speed (S), mi/h	65.2
Flow Entering Ramp-Infl. Area (v_{R12}), pc/h	2102	Average Density (D), pc/mi/ln	16.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D_R), 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

LSA

Table H-A - Non-Freeway Collision Summary

Collision Date	1/15/2019	12/19/2018
Collision 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 CRASHES TOTAL PER MVM	2018 CRASHES FATAL+ INJURY PER MVM	2018 VICTIMS FATALITIES PER 100 MVM	3-YR Rates (2016, 2017, 2018) CRASHES TOTAL PER MVM	3-YR Rates (2016, 2017, 2018) CRASHES FATAL + INJURY PER MVM	3-YR Rates (2016, 2017, 2018) VICTIMS 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

LANE TYPE	ROAD MILES	TRAVEL (MVM)	CRASHES TOTAL	CRASHES PDO	CRASHES INJURY	CRASHES FATAL	VICTIMS KILLED	VICTIMS 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 GROUP		BASE RATE	+ ADT FACTOR	PCT FAT	PCT INJ	PCT F+I	HIGHWAY TYPE	TERRAIN OR ADT	DESIGN SPEED	AREA	CRASH COSTS ($1,000) F+I	CRASH COSTS ($1,000) 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

BASIC AVERAGE CRASH RATE TABLE FOR INTERSECTIONS

RATE GROUP		BASE RATE	+ ADT FACTOR	PCT FAT	PCT INJ	PCT F+ I	INTERSECTION TYPE*	CONTROL TYPE	AREA	CRASH COST ($1000) 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