INITIAL STUDY/NEGATIVE DECLARATION
[Pursuant to Public Resources Code Section 21080(c) and California Code of Regulations, Title 14, Sections 15070-15071]

LEAD AGENCY: San Joaquin County Community Development Department

PROJECT APPLICANT: Ramos Oil Company

PROJECT TITLE/FILE NUMBER(S): PA-2000048

PROJECT DESCRIPTION: A Site Approval to establish a combination gas station to include a convenience store and a fast food restaurant (Use Type: Gasoline – Combination). The project includes construction of a 4,100 square foot store/restaurant building and a 3,230 square foot canopy for 6 gas dispensers. The store and fast food restaurant will operate seven (7) days a week, from 6:00 a.m. to 11:00 p.m. The gas dispensers will operate 24 hours a day, with credit card use only after hours. The site will utilize a private on-site septic system. Water and storm water drainage will be provided by San Joaquin County Service Area 12. The project will have ingress/egress driveways off of both Walnut Grove Road and Thornton Road with an additional exit only driveway on Walnut Grove Road.

The project site is located on the northeast corner of Thornton Road and Walnut Grove Road, Thornton.

ASSESSORS PARCEL NO(S).: 001-200-84

ACRES: 2.37 acres

GENERAL PLAN: C/C

ZONING: C-C

POTENTIAL POPULATION, NUMBER OF DWELLING UNITS, OR SQUARE FOOTAGE OF USE(S):
A total of 7,330 square feet for use as a gas station, convenience store, and fast food restaurant. A total of 3,200 square feet for use as a commercial cardlock fueling station.

SURROUNDING LAND USES:

NORTH: Residential; Agricultural with scattered residences
SOUTH: Undeveloped commercially-zoned land; Residential
EAST: Residential
WEST: Commercial; Interstate 5; Agricultural with scattered residences

REFERENCES AND SOURCES FOR DETERMINING ENVIRONMENTAL IMPACTS:

Original source materials and maps on file in the Community Development Department including: all County and City general plans and community plans; assessor parcel books; various local and FEMA flood zone maps; service district maps; maps of geologic instability; maps and reports on endangered species such as the Natural Diversity Data Base; noise contour maps; specific roadway plans; maps and/or records of archeological/historic resources; soil reports and maps; etc.

Many of these original source materials have been collected from other public agencies or from previously prepared EIR's and other technical studies. Additional standard sources which should be specifically cited below include on-site visits by staff (note date); staff knowledge or experience; and independent environmental studies submitted to the County as part of the project application. Copies of these reports can be found by contacting the Community Development Department.

TRIBAL CULTURAL RESOURCES:

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?

No

GENERAL CONSIDERATIONS:

1. Does it appear that any environmental feature of the project will generate significant public concern or controversy?

   ☐ Yes ☒ No

   Nature of concern(s): Enter concern(s).

2. Will the project require approval or permits by agencies other than the County?

   ☐ Yes ☒ No

   Agency name(s): Enter agency name(s).

3. Is the project within the Sphere of Influence, or within two miles, of any city?

   ☐ Yes ☒ No

   City: Enter city name(s).

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

DETERMINATION: (To be completed by the Lead Agency) On the basis of this initial evaluation:

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

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

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

☐ I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Alisa Haulart
Signature

10-27-2022
Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

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

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

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

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

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

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

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

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

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

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

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

9) The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and

   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

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

Impact Discussion:

a) San Joaquin County is set within the greater San Joaquin Valley, with the delta and large expanses of generally flat, agricultural lands and urban development framed by the foothills of the Diablo Range to the west and the foothills of the Sierra Nevada to the east. According to the County's General Plan, scenic resources within the County include waterways, hilltops, and oak groves (County of San Joaquin 2035).

The project site is located in the unincorporated town of Thornton in the northern part of the County. The western boundary of Thornton is Interstate 5 and the town is surrounded by agricultural land. The project site is currently developed with a commercial cardlock fueling station which will remain in operation. Directly across Thornton Road to the west is an existing gas station and convenience store. The project would involve the development of 7,330 square feet of structures, on a lot that is cleared. There are no scenic resources identified by the County's General Plan (i.e., waterways, hilltops, or oak groves) located within the vicinity of the project. The project site is surrounded by commercial zoning and residences, which prevent viewing the development from the surrounding agricultural areas and from Interstate 5. Therefore, the project, a combination gas station with convenience store and fast food restaurant would have a less-than-significant impact associated with scenic vistas.

b) There are two officially designated state scenic highways in San Joaquin County: I-580 and I-5 (County of San Joaquin 2035). I-580 is located approximately 35 miles south of the project site and, due to distance, the project site is not visible from 1-580. I-5 forms the western boundary of the town of Thornton and is located approximately 500 feet from the project site. However, due to trees between the freeway and the project site, the project site is not visible from I-5.

In addition, the County has designated 26 roadways within the County as local scenic routes (County of San Joaquin 2035). The nearest locally designated scenic route is Eight Mile Road west of I-5, located approximately 12 miles south of the project site, which, due to distance, does not have a view of the project site. Therefore, the project would have a less-than-significant impact associated with scenic resources within a state- or locally designated scenic highway.

c) The project site is located in a generally flat area and is surrounded by commercial and residential uses. The project would involve the development of 7,330 square feet of structures, on a site that is currently screened by trees from viewing from Interstate-5. The project site is not likely to be visible from any surrounding vantage points nor would it affect any local scenic resources. Therefore, the project would have a less-than-significant impact associated with the existing visual quality or character of the site or its surroundings.

d) The existing lighting and glare conditions in the project area would be emitted from the existing gas station and convenience store to the west and the cardlock gasoline facility on the same parcel. New lighting for the project would include outdoor building lighting and parking lot lighting. Parking lot lighting standards stipulate that all lighting be designed to confine direct rays to the premises, with no spillover beyond the property line except onto public thoroughfares, provided that such light does not cause a hazard to motorists (Development Title Section 9-1015.5). Therefore, the project is expected to have a less than significant impact from new sources of light or glare on day or nighttime views in the area.

II. AGRICULTURE AND FORESTRY RESOURCES.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. -- Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to a nonagricultural use?	☐	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒	☐
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒	☐

Impact Discussion:

a) The project parcel is designated as Urban and Built-up Land on maps provided by the California Department of Conservation's Farmland Mapping and Monitoring Program. The designation is given to land occupied by structures with a building density of at least 1 unit to 1.5 acres. This land is used for residential, industrial, commercial, construction, institutional, public administration, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes. Therefore, the project will not convert Prime or Unique Farmland, nor Farmland of Statewide Importance to a nonagricultural use.

b) The project parcel is zoned Community Commercial (C-C) and is not under a Williamson Act contract, therefore, the project will not conflict with existing agricultural zoning nor will it conflict with a Williamson Act contract.

c-d) There are no forest resources or zoning for forestlands or timberland, as defined by Public Resources Code and

Government Code, located on or near the project site, therefore, the project will have no impact on corresponding zoning or conversion of such land.

e) The project parcel is zoned Community Commercial (C-C), therefore, the project will not conflict with existing agricultural zoning and, because there are no forest resources or zoning for forestlands or timberland, the project will have no impact on the conversion of forestland.

III. AIR QUALITY.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐	☐
d) Result in substantial emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐	☐

Impact Discussion:

a-d) The proposed project is the establishment of a combination gas station / convenience store / fast food restaurant. The project site is located within the San Joaquin Valley Air Basin which lies within the jurisdiction of the San Joaquin Valley Air Pollution Control District (APCD). APCD has been established by the State in an effort to control and minimize air pollution.

The project was referred to APCD for review on December 17, 2020 and APCD issued a response dated January 14, 2021. APCD stated that the District's initial review of the project concludes that emissions resulting from construction and/or operation emissions may exceed the following District significance thresholds: 100 tons per year of carbon monoxide (CO), 10 tons per year of oxides of nitrogen (NOx), 10 tons per year of reactive organic gases (ROG), 27 tons per year of oxides of sulfur (Sox), 15 tons per year of particulate matter of 10 microns or less in size (PM10), or 15 tons per year of particulate matter of 2.5 microns or less in size (PM2.5). The District recommended that an assessment be performed of project-related criteria pollutant emissions from both construction and operational sources, as well as an assessment of Toxic Air Contaminants (TACs) for potential health impacts.

These assessments were performed and reported on by Environmental Permitting Specialist in August 2022. The report states that calculation of the maximum annual emission rate of each criteria air pollutant identified by the APCD resulted in measured impacts to air quality from both the construction and operation of the project below all levels of significance. To assess potential health impacts, estimates of emission rates from toxic air contaminants including diesel particulate matter and volatile organic compounds were calculated based on recommendations both from APCD and from California Air Pollution Control Officers Association (CAPCOA). The resulting measurements from these assessments were found to be below significant thresholds. The report concludes that the project's impact on public health would be less than significant.

The project is subject to APCD District Rule 2010, thus the project proponent should submit an application for an "Authority to Construct" permit prior to construction to determine the estimated number of emission units produced by the project. Lastly, the APCD offered recommendations that project proponents utilize the cleanest reasonably available off-road construction fleets and practices (i.e. eliminating unnecessary idling) to further reduce impacts from construction-related exhaust emissions and activities.

With implementation of the District Rules' requirements and implementation of recommended and required mitigation measures, the project's impact on air quality is expected to be less than significant.

IV. BIOLOGICAL RESOURCES.

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐	☐

Impact Discussion:

a) The California Department of Fish and Wildlife Natural Diversity Database lists *Lilaeopsis masonii* (Mason's lilaeopsis) and *Buteo Swainsoni* (Swainson's hawk) as rare, endangered, or threatened species or habitat located on or near the site for the proposed project. Referrals have been sent to the San Joaquin Council of Governments (SJCOG), the agency responsible for verifying the correct implementation of the *San Joaquin County Multi-Species Habitat Conservation and Open Space Plan* (SJMSCP), which provides compensation for the conversion of Open Space to non-Open Space uses which affect the plant, fish and wildlife species covered by the Plan. Pursuant to the Final EIR/EIS for SJMSCP, dated November 15, 2000, and certified by SJCOG on December 7, 2000, implementation of the SJMSCP is expected to reduce impacts to biological resources resulting from the proposed project to a level of less-than-significant.

SJCOG responded to this project referral in a letter dated December 21, 2020, that the project is subject to the SJMSCP. The applicant has confirmed that he will participate in SJMSCP. With the applicant's participation, the proposed project is consistent with the SJMSCP and any impacts to biological resources resulting from the proposed project will be reduced to a level of less-than-significant.

b) The subject property has no riparian habitat located within its boundaries, therefore the proposed project, a combination gas station / convenience store / fast food restaurant, will not have an impact on riparian habitat.

c) The project site is not located in a designated wetland area nor is there a designated wetland area on the property. Therefore, the project is expected to have a less than significant impact on state or federally protected wetlands through direct removal, filling, hydrological interruption, or by other means.

d-f) As discussed under (a), the applicant's participation in the SJMSCP will result in any impacts to biological resources resulting from the proposed project being reduced to a level of less-than-significant.

V. CULTURAL RESOURCES.	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to§ 15064.5?	☐	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☐	☒	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐	☐

Impact Discussion:

a-b) The proposed project will have no impact on Cultural Resources as there are no resources on the project site that are listed or are eligible for listing on a local register, the California Register of Historic Places, or National Register of Historic Places.

c) In the event human remains are encountered during any portion of the project, California state law requires that there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county has determined manner and cause of death, and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation (California Health and Safety Code - Section 7050.5). In this way, any disturbance to human remains will be reduced to less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
VI. ENERGY.					
Would the project:					
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy, or wasteful use of energy resources, during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	☐

Impact Discussion:

a-b) The California Energy Code (also titled The Energy Efficiency Standards for Residential and Non-residential Buildings) was created by the California Building Standards Commission in response to a legislative mandate to reduce California's energy consumption. The code's purpose is to advance the state's energy policy, develop renewable energy sources and prepare for energy emergencies. The code includes energy conservation standards applicable to most buildings throughout California. These requirements will be applicable to the proposed project ensuring that any impact to the environment due to wasteful, inefficient, or unnecessary consumption of energy will be less than significant and preventing any conflict with state or local plans for energy efficiency and renewable energy.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
VII. GEOLOGY AND SOILS.					
Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil and create direct or indirect risks to life or property?	☐	☐	☒	☐	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☒	☐	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐	☐

Impact Discussion:

a) According to the California Department of Conservation, the project site is not located within an earthquake fault zone. However, similar to other areas located in seismically active Northern California, the Project area is susceptible to strong ground shaking during an earthquake, although the site would not be affected by ground shaking more than any other area in the region.

The project would be required to comply with the most recent version of the California Building Code (CBC), which contains universal standards related to seismic load requirements, and is codified within the San Joaquin County Ordinance Code under Section 8-1000. In addition, pursuant to Section 9-905.11, project implementation will require preparation of a site-specific geotechnical investigation report by a state-registered geotechnical engineer. The site-specific geotechnical investigation report includes an evaluation of on-site soils and their related potential to result in seismic hazards, and if necessary, prescribes corrective measures to ensure structural stability in the event of seismic

activity. Pursuant to the Section 9-905, the recommended actions of a geotechnical investigation must be incorporated into site preparation and construction. As a result, impacts associated with seismic ground shaking or possible ground liquefaction are expected to be less than significant.

The project site is located in an area that is relatively flat and does not contain any slopes that could result in landslides. Therefore, impacts associated with landslides are expected to be less than significant.

b) The project would involve earthwork and other construction activities that would disturb surface soils and temporarily leave exposed soil on the ground's surface. Common causes of soil erosion from construction sites include stormwater, wind, and soil being tracked off site by vehicles. To help prevent erosion, project construction activities must comply with all applicable federal, state, and local regulations for erosion control. The Project would be required to comply with standard regulations, including the provisions of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit. Construction activities subject to this permit include clearing, grading, and ground disturbances such as stockpiling and excavating. The NPDES Construction General Permit requires implementation of a stormwater pollution prevention plan (SWPPP), which would include construction features for the project (i.e., best management practices [BMPs]) designed to prevent erosion and protect the quality of stormwater runoff. Sediment-control BMPs may include stabilized construction entrances, straw wattles on earthen embankments, sediment filters on existing inlets, or the equivalent. Therefore, construction impacts associated with soil erosion are expected to be less than significant. Once developed, the project site will have paved surfaces and other on-site improvements that would stabilize and help retain on-site soils. Therefore, impacts related to soil erosion are expected to be less than significant.

c) As part of the project design process, a soils report will be required for grading and foundations and all recommendations from a soils report must be incorporated into the construction plans. As a result of these grading recommendations, which are required by the CBC, the project would not be susceptible to the effects of any potential lateral spreading, subsidence, or liquefaction. Compliance with the CBC and the engineering recommendations in the site-specific soils report would ensure structural integrity in the event that seismic-related issues are experienced at the project site. Therefore, impacts associated with unstable geologic units are expected to be less than significant.

d) Expansive soils are characterized by their potential shrink/swell behavior. The Soil Survey of San Joaquin County classifies the expansion potential of the project site soil as moderate. As a result, engineering specifications to reduce the potential for damage to the planned structures, required by the CBC specifically for expansive soil, will ensure that the effects of expansive soil on the project buildings are less than significant.

e) The project will be served by an onsite septic tank or alternative wastewater disposal system for the disposal of waste water. The sewage disposal system shall comply with the onsite wastewater treatment systems standards of San Joaquin County. A percolation test, performed under permit and inspection by the Environmental Health Department, is required. After a successful percolation test, the onsite wastewater treatment system will be evaluated prior to issuance of a building permit. With these standards in place, only soils capable of adequately supporting the use of septic tanks will be approved for the septic system and impacts associated with the underlying soils' ability to support septic systems are expected to be less than significant.

f) As a result of past grading on the project site, the project site has been subject to extensive disturbance and significant historic or prehistoric archeological artifacts have not been discovered. Therefore, damage to unique paleontological resources or sites or geologic features is anticipated to be less than significant.

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

Impact Discussion:

a-b) Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors. Therefore, the cumulative global emissions of GHGs contributing to global climate change can be attributed to every nation, region, and city, and virtually every individual on earth. An individual project's GHG emissions are at a micro-scale level relative to global emissions and effects to global climate change; however, an individual project could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. As such, impacts related to emissions of GHG are inherently considered cumulative impacts.

Implementation of the proposed project would cumulatively contribute to increases of GHG emissions. Estimated GHG emissions attributable to future development would be primarily associated with increases of carbon dioxide (CO_2) and, to a lesser extent, other GHG pollutants, such as methane (CH_4) and nitrous oxide (N_2O) associated with area sources, mobile sources or vehicles, utilities (electricity and natural gas), water usage, wastewater generation, and the generation of solid waste. The primary source of GHG emissions for the project would be mobile source emissions. The common unit of measurement for GHG is expressed in terms of annual metric tons of CO_2 equivalents ($MTCO_2e$/yr).

As noted previously, the proposed project will be subject to the rules and regulations of the SJVAPCD. The SJVAPCD has adopted the *Guidance for Valley Land- use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* and the *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.**1*** The guidance and policy rely on the use of performance-based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA. To be determined to have a less-than-significant individual and cumulative impact with regard to GHG emissions, projects must include BPS sufficient to reduce GHG emissions by 29 percent when compared to Business As Usual (BAU) GHG emissions. Per the SJVAPCD, BAU is defined as projected emissions for the 2002-2004 baseline period. Projects which do not achieve a 29 percent reduction from BAU levels with BPS alone are required to quantify additional project-specific reductions demonstrating a combined reduction of 29 percent. Potential mitigation measures may include, but not limited to: on-site renewable energy (e.g. solar photovoltaic systems), electric vehicle charging stations, the use of alternative-fueled vehicles, exceeding Title 24 energy efficiency standards, the installation of energy-efficient lighting and control systems, the installation of energy-efficient mechanical systems, the installation of drought-tolerant landscaping, efficient irrigation systems, and the use of low-flow plumbing fixtures.

It should be noted that neither the SJVAPCD nor the County provide project-level thresholds for construction-related GHG emissions. Construction GHG emissions are a one-time release and are, therefore, not typically expected to generate a significant contribution to global climate change. As such, the analysis herein is limited to discussion of long-term operational GHG emissions.

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1 San Joaquin Valley Air Pollution Control District. *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA.* December 17, 2009.San Joaquin Valley Air Pollution Control District. *District Policy Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.* December 17, 2009.

IX. HAZARDS AND HAZARDOUS MATERIALS.	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐	☐

Impact Discussion:

a-c) Pursuant to the Hazardous Materials Disclosure Survey submitted with the application, the project is expected to possess hazardous materials on site. The hazardous materials possessed by this business will be contained solely in a consumer product packaged for direct distribution to and use by the general public (fuel). Nevertheless, before any hazardous materials/waste can be stored or used onsite, the owner/operator must report the use or storage of these hazardous materials to the California Environmental Reporting System (CERS) and comply with the laws and regulations. Reportable quantities of hazardous materials are 55 gallons or more of liquids, 500 pounds for solids, or 200 cubic feet for compressed gases. Storage of at least 1,320 gallons of petroleum aboveground must comply with the Aboveground Petroleum Storage Program. If an underground storage tank (UST) system will be installed, a permit is required to be submitted to, and approved by, the San Joaquin County Environmental Health Department (EHD) before any UST installation work can begin. The project's compliance with these regulations is expected to result in less than significant chance of creating a significant hazard to the public or the environment due to the presence and transportation of hazardous materials.

d) The project site is not listed as a hazardous materials site on the California Department of Toxic Substances Control

EnviroStor database map, compiled pursuant to Government Code 65962.5 and, therefore, will not result in creating a significant hazard to the public or the environment.

e) The project site is not located within an airport land use plan. The nearest airport runway is located approximately 8 miles to the east at the Lodi Airport. Therefore, the project's likelihood of creating a safety hazard or excessive noise for people residing or working in the project area is expected to be less than significant.

f) The project site is located in the unincorporated community of Thornton, on the corner of Thornton Road and Walnut Grove Road, approximately 500 feet east of Interstate 5. According to the San Joaquin County Office of Emergency Services, the planned evacuation routes for the community of Thornton are Thornton Road and Interstate 5. The project will not result in any construction that would impede the ability of traffic to travel on Thornton Road or to reach Interstate 5. Therefore, the project's impact on an adopted emergency response plan or emergency evacuation plan is expected to be less than significant.

e) The project location is not identified as a Community at Risk from Wildfire by Cal Fire's "Fire Risk Assessment Program". Communities at Risk from Wildfire are those places within 1.5 miles of areas of High or Very High wildfire threat as determined from CDF-FRAP fuels and hazard data. Therefore, the impact of wildfires on the project are expected to be less than significant.

X. HYDROLOGY AND WATER QUALITY.

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:	☐	☐	☒	☐	☐
i) result in substantial erosion or siltation on- or off-site;	☐	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;	☐	☐	☒	☐	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☒	☐	☐
iv) impede or redirect flood flows?	☐	☐	☒	☐	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	☐

Impact Discussion:

a) The proposed project is the development of a gas station / convenience store / fast food restaurant. The project will be served by an onsite wastewater treatment system (OWTS). Construction of an OWTS is required to be under permit and inspection by the Environmental Health Department at the time of development and must comply with the onsite wastewater treatment systems standards of San Joaquin County. Additionally, the applicant must file a Notice of Intent (NOI) with the State Water Resources Control Board (SWRCB) and comply with the State "General Permit for Strom Water Discharges Associated with Construction Activity." Therefore, compliance with the rules and regulations of the Environmental Health Department and the State Water Resources Control Board will ensure any impacts to surface or groundwater quality from sewage disposal are reduced to less than significant.

b) The proposed project will receive water from the County's Service Area 12, a special district created to provide water, storm drainage, and lighting services to the community of Thornton, CA, and administered by the San Joaquin County Department of Public Works. The district's water system serves 246 residential and non-residential parcels (County Service Area 12 – Thornton, Engineer's Report, October 1, 2018), utilizing the district's two (2) wells. Based on the small size of the project (gas sales/fast food restaurant/convenience market), the project's impact on sustainable

groundwater management is expected to be less than significant.

c) The development project will result in the majority of the site being covered in pavement. The site has access to a public storm water drainage system through the County Service Area 12 (CSA12), managed by the Department of Public Works. The Department provided a letter to the project applicant stating that CSA12 will continue to serve the parcel after the proposed development. Therefore, impacts from drainage are expected to be less than significant.

d) The project site is not in a tsunami or seiche zone, however, it is located in the AE flood zone, an area subject to 1% annual chance (100-year) of flood. All new development will have to comply with Development Title Section 9-1605 regarding flood hazards.

c) The proposed project will receive water from the County's Service Area 12, a special district created to provide water, storm drainage, and lighting services to the community of Thornton, CA, and administered by the San Joaquin County Department of Public Works. The district's water system serves 246 residential and non-residential parcels (County Service Area 12 – Thornton, Engineer's Report, October 1, 2018), utilizing the district's two (2) wells. Based on the small size of the project (gas sales/fast food restaurant/convenience market), the project's ability to obstruct or conflict with implementation of a groundwater sustainability plan is expected to be less than significant.

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

Impact Discussion:

a) The proposed project is development of a gas station / convenience store / fast food restaurant. The project does not include construction of any feature that would impair mobility within an existing community nor does it include removal of a means of access between a community and outlying area. Currently, the project site is not used as a connection between established communities. Instead, connectivity with the area surrounding the project is facilitated via local roadways. Therefore, the project will not result in dividing an established community.

b) The project site is located within unincorporated San Joaquin County and is subject to the County's General Plan and Development Title. The County's General Plan Land Use map designates the project site as Community Commercial (C/C). The zoning map identifies the site as C-C (Community Commercial) which is an implementing zone for the C/C land use designations. Therefore, the project's environmental impact due to a conflict with land use is expected to be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
XII. MINERAL RESOURCES.					
Would the project:					
a) Result in the loss of availability of a known_mineral resource that would be of value to the region and the residents of the state?	☐	☐	☒	☐	☐
b) Result in the loss of availability of a locally- important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☒	☐	☐

Impact Discussion:

a-b) Pursuant to the San Joaquin County General Plan Background Report, Chapter 10-Mineral Resources, the primary extractive resource in San Joaquin County is sand and gravel, with the principal areas of sand and gravel extraction located in the southwestern part of the county and along the Mokelumne, Calaveras, and Stanislaus rivers in the eastern portion of the county. The project site is located in the northern part of the county and is 0.8 miles west of the Mokelumne River. Pursuant to information collected and categorized by the State Mining and Geology Board (SMGB), the project site is not located in an area designated for its mineral deposits of regional or statewide significance. Therefore, the project's impact on the loss of mineral resources or mineral resource recovery sites within the region is expected to be less than significant.

XIII. NOISE.	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
Would the project result in:					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐	☐
c) For a project within the vicinity of a private airstrip or an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒	☐

Impact Discussion:

a) The proposed project is development of a gas station / convenience store / fast food restaurant complex. The project site is located on the northeast corner of Thornton Road and Walnut Grove Road, in the unincorporated community of Thornton. It is 550 feet east of Interstate 5 and is located within the 65dB noise contour of the interstate. The site is currently developed with a commercial cardlock fueling station which will continue in operation in conjunction with the proposed project. Parcels to the north, east, and southeast of the project site are zoned and developed residentially. The parcels to the west and southwest are zoned commercially. The parcel to the west directly across Thornton Road from the project site is developed with a gas station / convenience store / dual fast food restaurant complex. Another commercial parcel to the west is the site of a residence and commercially-zoned parcels to the south are undeveloped. The nearest residence is located 85 feet north of the project site.

The proposed complex will operate seven (7) days per week, from 6:00 a.m. to 11:00 p.m., with the exception of the gas pumps which will be available for use with credit cards 24 hours daily. Currently, the commercial cardlock fueling station is open 24/7 as is the gas station complex across the street. The addition of the proposed project with these operations, combined with the ambient noise from Interstate 5 is not expected to generate a substantial increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance are expected to be less than significant.

b) The project does not include any operations that would result in excessive ground-borne vibrations or other noise levels. The equipment utilized in grading and paving of the site will temporarily increase the area's ambient noise levels. Restrictions on the hours of construction will reduce the noise impacts to a less than significant level, therefore, the project will not have any impact on vibrations or other noise levels.

c) The project site is not located in the vicinity of a private airstrip or an airport land use plan, therefore the project will not expose people residing or working in the project area to excessive noise levels.

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

Impact Discussion:

a-b) The proposed project will not induce substantial population growth in the area either directly or indirectly because the project is not anticipated to result in an increase in the number of jobs available. The proposed project would not displace substantial numbers of people or existing housing, necessitating the construction of replacement housing elsewhere because the project site is currently vacant and the zoning will remain the same if the project is approved. Therefore, the project's impact on population and housing is expected to be less than significant.

XV. PUBLIC SERVICES.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
Fire protection?	☐	☐	☒	☐	☐
Police protection?	☐	☐	☒	☐	☐
Schools?	☐	☐	☒	☐	☐
Parks?	☐	☐	☐	☒	☐
Other public facilities?	☐	☐	☐	☒	☐

Impact Discussion:

a) The project site is located in the unincorporated community of Thornton. The area is serviced by the Thornton Fire Protection District, the San Joaquin County Sheriff, and the New Hope Elementary School and the Galt Joint Union High School. The Thornton Fire Protection District operates one fire station and is classified as a combination department, consisting of full-time, intern, and volunteer personnel. The District protects approximately 980 structures with its boundaries and has an average call volume of 355 service calls per year. Police protection services are provided to the project site by the San Joaquin County Sheriff's Office. The Sheriff's Office employs over 800 sworn and support personnel. There are no public parks near the project site.

The public service agencies listed above were provided with the project proposal and invited to respond with any project concerns or conditions. Comments were received from the San Joaquin County Fire Prevention Bureau, which provides services on behalf of fire districts throughout the unincorporated areas of San Joaquin County. The Bureau provided a list of current California Fire Codes that will be applicable to the project. Other responses were not received, indicating there were no concerns about significant impacts resulting from the project. Therefore, the project is not expected to have a significant impact on, or will not significantly affect, the ability of these service providers to maintain current levels of service.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
XVI. RECREATION.					
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒	☐

Impact Discussion:

a-b) The proposed project will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated, because the project will not generate any new residential units and the project is not expected to result in an increased demand for recreational facilities. Therefore, the project will have no impact on recreation facilities.

XVII. TRANSPORTATION.

Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
a) Conflict with a program plan, ordinance, or policy addressing the circulation system, including transit, roadways, bicycle, and pedestrian facilities?	☐	☐	☒	☐	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☒	☐	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐	☐
d) Result in inadequate emergency access?	☐	☐	☒	☐	☐

Impact Discussion:

a) The proposed project is the development of a gas station / convenience store / fast food restaurant complex. Regional access to the site is provided by Interstate 5, a north-south highway, and Thornton Road, a north south roadway. A project referral was sent to the Department of Public Works on December 17, 2020. The Department of Public Works requires a traffic study for projects that are expected to generate in excess of fifty vehicles during any hour, and, in the Department's response letter dated February 8, 2021, a traffic study was required for this project. The resulting Traffic Impact Assessment performed by KD Anderson and Associates is dated November 9, 2021. The assessment concluded with a list of items to improve the circulation both on site and on the driveways and connecting roadways. These items will be included as conditions for the project, therefore, the projects impact on the existing circulation system is expected to be less than significant.

b) The project will provide gasoline and food products to local residents as well as motorists driving in the vicinity, including along Interstate 5. Based on the State of California Office of Planning and Research Technical Advisory on Evaluating Transportation Impacts in CEQA, local serving retail projects are presumed to have a less than significant impact on VMT. The project is locally serving retail and is expected to reduce vehicle travel from the Thornton area to outside by providing a more proximate shopping location. Therefore, the project does not conflict with CEQA Guide guidelines section 15064.3, subdivision (b).

c) The proposed project will not be making any changes to local roadways, therefore, the project's impact on transportation hazards is expected to be less than significant. Additionally, a retail use such as the proposed gas station / convenience store / fast food restaurant complex is a permitted use in the Community Commercial zone.

d) The proposed project has adequate access from Thornton Road and Walnut Grove Road to provide adequate access for emergency equipment. The Department of Public Works, in its conditions, requires that all driveway approaches be improved in accordance with the requirements of San Joaquin County Improvement Standards Drawing No. R-17. Pursuant to Development Title Section 9-1015.5(h)(1), access driveways shall have a width of no less than twenty-five (25) feet for two-way aisles and sixteen (16) feet for one-way aisles, except that in no case shall driveways designated as fire department access be less than twenty (20) feet wide. With these required improvements, the project's impact on emergency access is expected to be less than significant.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact	Analyzed In The Prior EIR
XVIII. TRIBAL CULTURAL RESOURCES.					
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:					
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☒	☐	☐

Impact Discussion:

a) The project site is located in the unincorporated community of Thornton in the northern part of the county, 0.8 miles west of the Mokelumne River. At the time development, if Human burials are found to be of Native American origin, the developer shall follow the procedures pursuant to Title 14, Division 6, Chapter 3, Article 5, Section 15064.5(e) of the California State Code of Regulations. Referrals were sent December 17, 2020 to the California Tribal TANF Partnership, the California Native American Heritage Commission, the California Valley Miwok Tribe, the North Valley Yokuts Tribe, and the United Auburn Indian Community. If human remains are encountered, all work shall halt in the vicinity and the County Coroner shall be notified immediately. At the same time, a qualified archaeologist shall be contacted to evaluate the finds. If Human burials are found to be of Native American origin, steps shall be taken pursuant to Section 15064.5(e) of Guidelines for California Environmental Quality Act.

XIX. UTILITIES AND SERVICE SYSTEMS.

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

Impact Discussion:

a) The proposed project is a gas station / convenience store / fast food restaurant complex, located in County Service Area 12 (CSA12). CSA12 will provide water and storm water drainage to the project site and a will serve letter from the County has been submitted stating that both services will continue to be supplied for the development. Therefore, the project will be served by private, onsite services and will not require relocation of existing facilities or require new facilities.

b) The project site is located in County Service Area 12 (CSA12) which provides water to the project site from two (2) wells operated by CSA 12. Water supply will presumably continue through the CSA12 and water use for this project will have a less than significant effect on water supply.

c) The project will utilize an Onsite Sewage Disposal System constructed under permit from the Environmental Health Department and subject to the onsite wastewater treatment system regulations that will comply with the standards of San Joaquin County. Therefore, there is no sewage treatment provider.

d-e) The proposed project is a gas station / convenience store / fast food restaurant complex. As proposed, the project is not anticipated to generate solid waste in excess of State and local standards and will be able to comply with all regulations related to solid waste.

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

Impact Discussion:

a-d) The project location is in the community of Thornton, CA, in the northwest corner of San Joaquin County, which is not identified as a Community at Risk from Wildfire by Cal Fire's "Fire Risk Assessment Program". Communities at Risk from Wildfire are those places within 1.5 miles of areas of High or Very High wildfire threat as determined from CDF-FRAP fuels and hazard data. Therefore, the impact of wildfires on the project are expected to be less than significant.

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

Impact Discussion:

a-c) Review of this project has not indicated any features which might significantly impact the environmental quality of the site and/or surrounding area. Mitigation measures have been identified in areas where a potentially significant impact has been identified and these measures, included as conditions of approval, will reduce these impacts to a less than significant level.

ATTACHMENT:

Analysis of Impacts to Air Quality, and Public Health from Proposed Gasoline Station and Convenience Store with Drive-Thru, Environmental Permitting Specialists, August 2022.

Traffic Impact Analysis for Ramos Oil Project PA-2000048, KD Anderson & Associates, November 2021.

Analysis of Impacts to Air Quality, and Public Health from Proposed Gasoline Station and Convenience Store with Drive Thru

Thornton, California

August 25, 2022

Prepared For:
Ramos Oil Company
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C: Detail Emission Calculations

SECTION 1: INTRODUCTION

Environmental Permitting Specialists (EPS) has been retained by Ramos Oil Company to evaluate impacts to air quality and public health from a proposed gasoline station, convenience store with a drive thru (Project) to be located in Thornton, California. This analysis has been requested by the San Joaquin Valley Air Pollution District (SJVAPCD) in a letter dated January 14, 2021.

The Project would be located on a 2.37 acre parcel at the Northeast corner of Thornton Road and West Walnut Grove Road in Thornton. It has been assigned an Assessor's Parcel Number 001-200-84. Figures 1 and 2 illustrate the project location and site map respectively. Construction is expected to begin in March 2023 and finish by June 15, 2023. Occupancy is expected in early July.

The objective of the proposed analysis is to evaluate two (2) categories of impacts associated with the construction and operational phase of this Project:

1. Air Quality Impacts
2. Impacts to Public Health

The significance of the project's impacts is determined by comparing construction and operational emissions and health risk with thresholds of significance established by the SJVAPCD. The project is considered to have potentially significant environmental impact if annual emissions exceed the thresholds.

This report is divided into 6 sections. Immediately following this Introduction, the projects metrics are described in Section 2. Next, the methodology for calculating air quality and public health risks are discussed in Section 3. The Project impacts are discussed in Section 4. The report concludes with a discussion of the significance of the project's air quality and public health impacts (Section 5). References, technical details and calculations are provided in Section 6 and in the Appendix.

Figure 1-1
Vicinity Maps

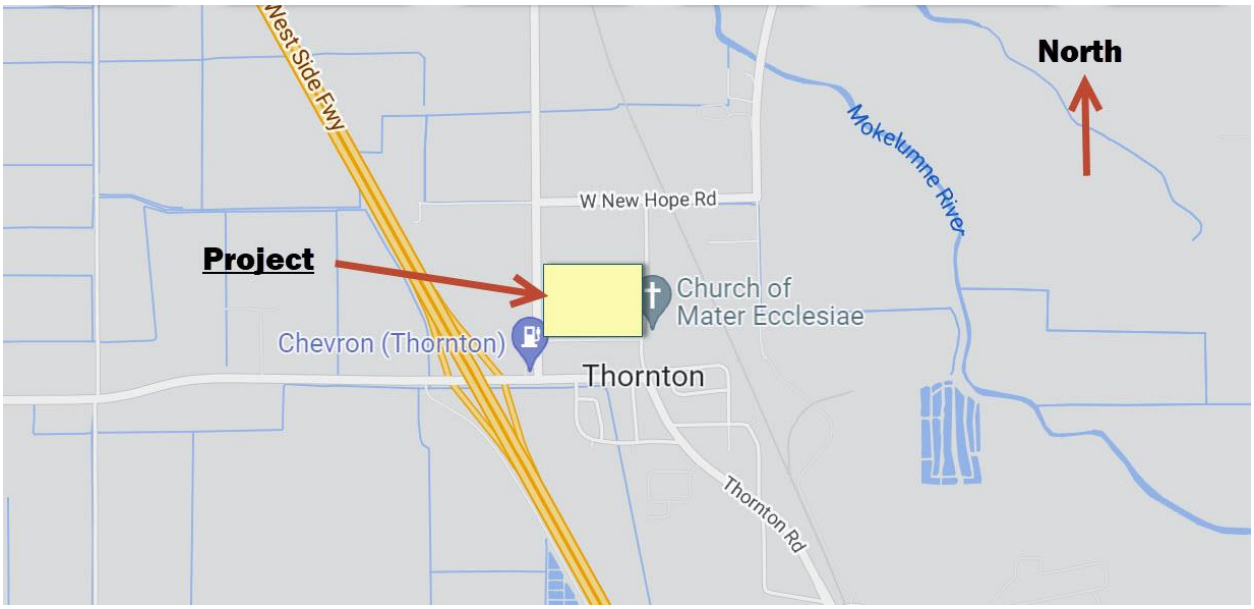
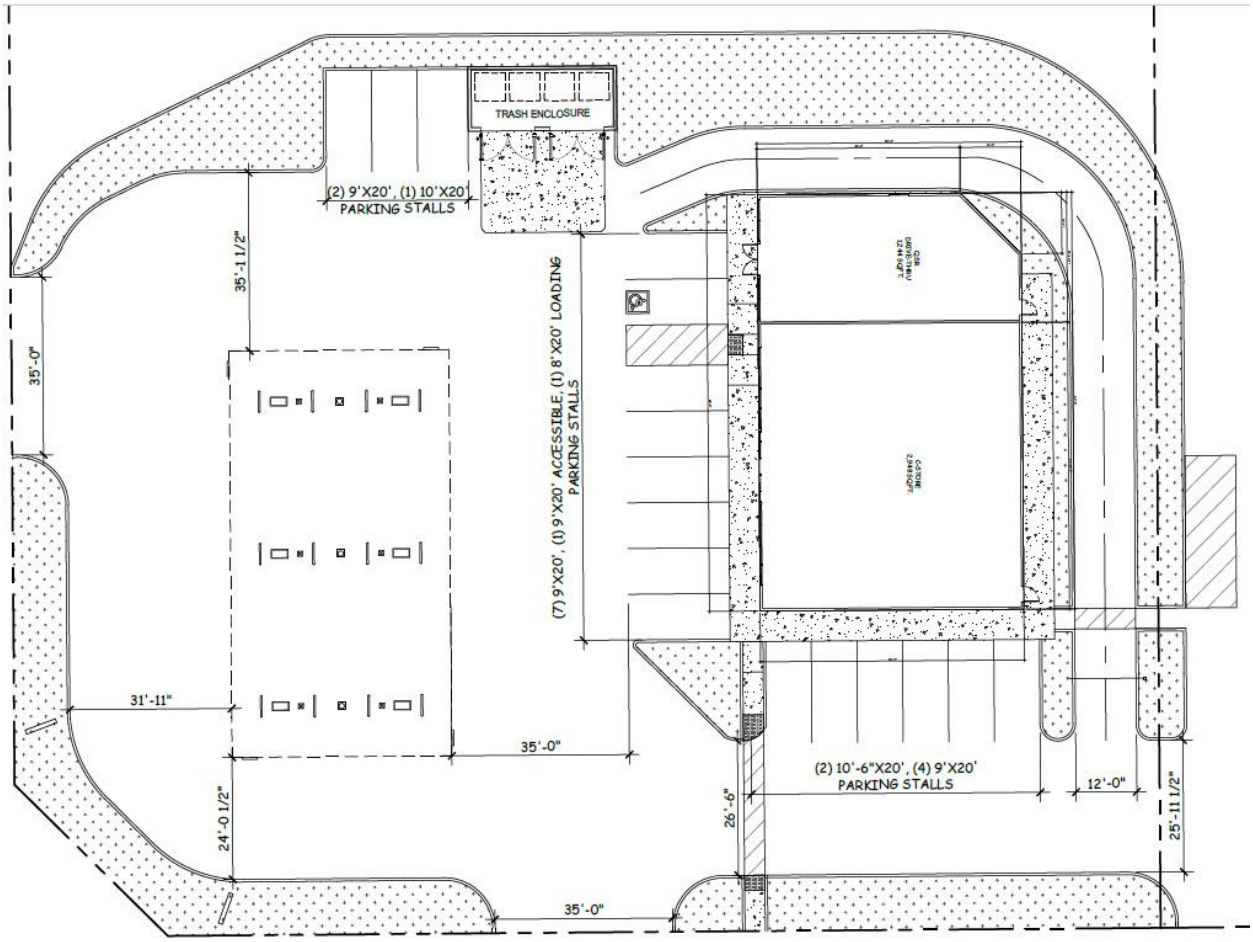




Figure 1-2
Site Map

Source: MHA Design Services



SECTION 2: PROJECT DETAILS

As noted in the Introduction, the proposed project would occupy a 2.37 acre site in Thornton. The convenience store and drive through would occupy approximately 4,100 square feet. There would be a total of six fuel dispensers dispensing 2 million gallons of gasoline annually. A total of 17 parking spaces are planned. Only half of the 2.37 acre site will be disturbed.

There are no structures at the site, therefore, no demolition would be required. The site is already graded and level (Figure 1-1), therefore no grading will be required and no soil would have to be imported or exported. Electrical, water and sewage services are available at the site, therefore, minimal infrastructure development will be needed.

The actual building would be constructed with hand tools, portable compressors, a forklift. On-site electrical power is already available at the site so there would be minimal usage of portable gasoline fueled generators. No heavy construction equipment would be used during the actual building and the canopy over the gasoline dispensing stations.

The project is subject to District Regulation XIII that requires control of fugitive dust emissions at construction sites. Due to the small size of the project, there are no access roads, trucks transporting soil, or storage piles of soil that may be subject to wind erosion. The project would use water sprays as needed on exposed/disturbed area and limit truck idling to no more than 5 minutes.

A traffic study was completed that determined the project would generate 1,408 new trips per day. Excerpts of the traffic study are provided in Appendix A.

Table 2-1 summarizes all the project metrics based on information from the Project developer. As noted in the Introduction, the construction is expected to begin in the fall of 2022 and be completed by the end of 2022. The project will be operational in early 2023.

Table 2-1

Phase		Details	Comments
	Start Date	March 1, 2023	Based on data provided by MHA Design Group.
	End Date	June 15, 2023	
	Lot Size	2.37 acres	
	Parking Spaces	17	
	Convenience Store Area	2,948 square feet	
	Drive Thru Restaurant	1,244	
	Construction Related Traffic	Default Values	Note 1.
Operational	Start Date	July 1, 2023	
	Average Daily Traffic	1,408 new trips per day	Nov 9, 2021 Traffic Study by K. D. Anderson (Attached)
	Volume of Gasoline Dispensed	2 million gallons per year Aver 5,479 gallons per day Total 6 pumps	Fuel would be delivered in 8,500 gallon tanker trucks. 235 annual fuel deliveries per year
	Trip Length	5 to 10 miles	Note 1

	Energy Usage (Electricity)	4.2 KWhr/ft2 x 4,192 ft2	Note 1
	Energy Usage (Natural Gas)	6 kBTU/ft2 x 4,182 ft2	Note 1
	Water Usage	10,457 gallons/yr per pump inside 6,409 gallons/yr per pump outside	Note 1
	Solid Waste	0.42 tons/yr per pump	Note 1
	Cooking of meat (Flat Griddle)	Hamburger: 360 lbs/week Poultry without skin: 110 lbs/week Pork: 110 lbs/week	District Default Values
Note 1. Based on recommended default value for Convenience Store with Gas Pumps located at Climate Zone 6. Ref: CalEEMod emissions model version 2020.4.0. See Appendix D "Default Data Tables" Pages D-310, D-340, D-351.Available at: http://caleemod.com/			

SECTION 3: CALCULATION METHODOLOGY

The construction and operation of the proposed gas station and convenience store would release a variety of air pollutants, including GHG emissions and emissions of toxic air pollutants (TACs). Project impacts are directly related to short-term and long-term emissions of these pollutants. This section identifies these pollutants and describes how they will be quantified.

3.1 Emissions of Criteria Air Pollutants

Criteria air pollutants refers to those pollutants for which the state and/or the federal government has established ambient (outside) air quality standards. The following criteria air pollutants will be quantified for the current project:

- Oxides of Nitrogen (NOx)
- Reactive Organic Compounds (ROG)
- Particulate Matter (PM-10)
- Fine Particulate Matter (PM-2.5)
- Carbon Monoxide
- Sulfur Dioxide (SO_2)

The maximum Annual emission rates of each of these air pollutants will be quantified using the CalEEMod emissions model. This model is recommended by the SJVAPCD. Version 2020.4.0 of this model will be used. These emissions would be released during the construction and operational phases.

Emissions from the drive thru restaurant are based on default values recommended by SJVAPCD and are based on flat griddle cooking of beef, poultry and pork of beef per year. The weekly amounts are listed in Table 2-1.

3.2 Emissions of Toxic Air Contaminants

There are two categories of TACs that would be released from the current project:

1. Diesel Particulate Matter (DPM) from use of construction equipment and idling of fuel delivery trucks.

2. BTEX Compounds (benzene, toluene, xylene) from gasoline dispensing, storage and delivery. This includes spillage of gasoline from fuel dispensing.

Toxic Air Contaminants that may be released and the calculation methodology is summarized below in Table 3-1.

Table 3-1
Sources of Toxic Air Contaminants

Toxic Air Contaminant	Construction Phase	Operational Phase	Calculation Methodology
Diesel Particulate Matter	Use of Diesel fueled Construction Equipment	Idling of Fuel Delivery Truck	For construction phase, use "Exhaust PM-10" emission rates calculated using CalEEMod Emissions Model For Operational Phase – Use idling emission factors for HD Trucks using EMFAC 2017 for CY 2021. Assume 15 minutes idle time per truck delivery
Benzene	N/A	Storage and Dispensing of Gasoline EVR Phase I and II for Underground Storage Tanks	Recommended emission factors in Appendix A in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Assessment Guidelines*.
Ethyl Benzene	N/A	Storage and Dispensing of Gasoline	Same as Benzene
Toluene	N/A	Storage and Dispensing of Gasoline	Same as Benzene
Xylene	N/A	Storage and Dispensing of Gasoline	Same as Benzene
PAHs	N/A	Cooking	Use District recommended default values
Naphthalene	N/A	Cooking	

SECTION 4: PROJECT IMPACTS

This section discusses the air quality, GHG and public health impacts associated with the Project. The significance of the impacts is discussed in Section 5.

4.1 Impacts to Air Quality (Construction Phase)

Impacts to air quality were determined by calculating the maximum annual emission rate of each criteria air pollutant identified earlier in Section 3.1.

Based on the use of the CalEEMod emissions model, the annual emission rates are summarized in Table 4-1.

Table 4-1
Summary of Maximum Annual Emissions
Construction Phase
(in Tons per year)

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Year	tons/yr									
2023	0.0349	0.0377	0.0364	8.0000e-005	2.4900e-003	1.8000e-003	4.2900e-003	6.3000e-004	1.6600e-003	2.2900e-003
Maximum	**0.0349**	**0.0377**	**0.0364**	**8.0000e-005**	**2.4900e-003**	**1.8000e-003**	**4.2900e-003**	**6.3000e-004**	**1.6600e-003**	**2.2900e-003**

4.2 Impacts to Air Quality (Operational Phase)

Impacts to air quality were determined by calculating the maximum annual emission rate of each criteria air pollutant identified in Section 3.1 Annual emissions are summarized in Table 4-2. Emissions from the drive thru are summarized in Table 4-3.

Table 4-2
Summary of Maximum Annual Emissions
Operational Phase
(in tons/year)

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total
Category	tons/yr									
Area	0.0199	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000
Energy	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000
Total	**0.5884**	**5.1685**	**4.3417**	**0.0310**	**0.0000**	**0.3928**	**0.3928**	**0.0000**	**0.3928**	**0.3928**

Table 4-3
Summary of Maximum Annual Emissions
From Drive Thru Kitchen
(in tons/year)

Pollutant	Emissions (tons/year) Based on 52 Weeks per year			
	(Hamburger)	Poultry (no skin)	Pork	Total
PM-10	0.0468	0.0143	0	0.0611
PM-2.5	0.035568	0.010868	0	0.046436
VOC	6.55E-04	2.00E-04	1.14E-03	2.00E-03
PAHs	2.53E-07	7.72E-08	6.29E-08	3.929E-07
Naphthalene	5.62E-05	1.72E-05	2.86E-06	7.618E-05

4.3 Impacts from TAC Emissions

Construction Phase

Diesel Particulate Matter (DPM)

As noted previously, there are no structures at the site, therefore, no demolition would be required. The site is already graded and level, therefore no grading will be required and no soil would have to be imported or exported. Electrical, water and sewage services are available at the site, therefore, minimal infrastructure development will be needed.

DPM emissions are limited to the site preparation and paving phases. Site preparation would require the limited use of a tractor/loader/backhoe used to prepare the foundation and trenching to install electrical, sewer and water connections. Paving would involve use of a paver and a roller.

The actual building would be constructed with hand tools, portable compressors, a forklift. On-site electrical power is available minimizing the need for electric generators. No diesel fueled heavy construction equipment would be used during the actual building of the store or drive thru.

DPM emissions for the construction phase were calculated using the CalEEMod emissions model. The annual emission rates of "Exhaust PM-10" were used as a surrogate for DPM. The specific quantity is summarized below in Table 4-4

Table 4-4
Summary of On-Site Construction DPM Emissions

	DPM Emissions (Exhaust PM-10)	
Construction Phase	**(tons/year)**	**(pounds/year)**
Site Preparation	4.00x10-5	0.08
Building Construction	1.00 x 10-3	2.00
Paving	8.00 x 10-5	0.16
TOTAL	**1.12x10-3**	**2.24**
Ref: Annual Emissions Report, CalEEMod Emissions Model. Copy provided in Appendix B.		

Operational Phase

Diesel Particulate Matter (DPM)

The main source of DPM for the operational phase is heavy duty fuel delivery trucks. It is estimated there would be 235 fuel deliveries annually based on 8,550 gallons per delivery. Each truck was assumed to idle for a maximum of 15 minutes. Based on the EMFAC 2017 emissions model, annual emissions of DPM are estimated to equal only 0.033 pounds per year. Detailed calculations are provided in Appendix C.

Toxic Organic Compounds

The dispensing, storage and delivery of gasoline will result in emissions toxic air contaminants. A two-step procedure is used to estimate maximum hourly and annual emissions rates. First, the emission rate of VOCs is calculated based on recommended emission factors by the California Air Pollution Control Officers Association (CAPCOA) *Gasoline Service Station Industrywide Risk Assessment Guidelines (1997)*. VOCs include toxic air contaminants such as benzene, acetaldehyde, etc. The VOCs are then speciated into individual toxic compounds. The speciation data have been compiled by the San Joaquin Valley Air Pollution Control District (2017). A copy of this data is provided in Appendix C.

TAC Emissions from the drive thru restaurant are limited to PAHs and naphthalene. The calculation is shown in Appendix C.

The maximum hourly and annual emissions of TACs is summarized in Table 4-5. Detailed calculations are provided in Appendix C.

Table 4-5
Summary of Maximum Hourly and Annual TAC Emissions
(Note: 1.10E-06 lbs/hr = 1.10×10^{-6} lbs/hr)

	On-Site Truck Idle	Off-Site Truck Travel	On-Site Gasoline Dispensing and Storage	Drive-Thru Kitchen	TOTAL (lbs/yr)
	Table C-4	Table C- 5	Table C-3	Table C-6	
Benzene			11.57		11.57
DPM	0.00063	0.0324			0.033
Ethyl Benzene			30.37		30.37
PAHs				0.00079	7.86E-04
Toluene			151.84		151.84
Xylene			45.55		45.55
Naphthtalene				0.15236	0.15236

These emissions were used to calculate a screening level risk score for each of the 3 types of risks. "Screening Level" refers to a rough estimate of potential risk based on conservative assumptions, such as worst-case exposure, and emissions.

Unlike a detailed health risk assessment that provides a numerical probability of cancer risk, a screening level risk analysis yields a "Risk Score". The objective in preparing a screening level risk analysis is to avoid preparing a detail HRA is the screening level risk scores are below the thresholds of significance.

Table 4-5 Types of Health Risks Evaluated	
Cancer Risk	Calculated as a Cancer Risk Score
Chronic (non-cancer) Risk	Calculated as a Chronic Score
Acute (non-cancer risk)	Calculated as an Acute Score

The screening level risk calculations are based on the Air Toxics "Hot-Spots" Emissions Potency Method under the AB-2588 regulation. The results of the evaluation are summarized in Tables 4-5 and 4-6 for the construction and operational phases respectively for distances up 2,000 meters (1.2 miles) from the Project site. Detailed calculations are provided in Appendix C.

The results of the analysis show that the cancer risk score for the construction phase range from 5.17 to less than 0.001 depending on distance from the project site. The cancer risk for the operational phase vary between 3.29 to less than 0.001 depending on distance. Non-cancer risks are below 0.2 at all locations for both construction and operational phases. The significance of the risk scores is discussed in the next section. Detailed calculation is provided in Appendix C.

Table 4-5
Summary of Screening Level Risk Evaluation
Construction Phase

Name	**Prioritization Calculator**						
Applicability	Use to provide a Prioritization score based on the emission potency method. Entries required in yellow areas, output in gray areas.						
Author or updater	Ray Kapahi		*Last Update*	August 18, 2022			
Facility:	Ramos Oil Thornton Plaza						
Location	Screening Level Cancer Risk Evaluation						
Project Phase:	Construction Phase						
Modeler:	R. Kapahi						
Operating Hours hr/yr	8,760.00						
Receptor Proximity and Proximity Factors	**Cancer Score**	**Chronic Score**	**Acute Score**	**Max Score**	Receptor proximity is in meters. Priortization scores are calculated by multiplying the total scores summed below by the proximity factors. Record the Max score for your receptor distance. If the substance list for the unit is longer than the number of rows here or if there are multiple processes use additional worksheets and sum the totals of the Max Scores.		
0< R<100 1.000	5.17E+00	7.67E-03	0.00E+00	5.17E+00			
100≤R<250 0.250	1.29E+00	1.92E-03	0.00E+00	1.29E+00			
250≤R<500 0.040	2.07E-01	3.07E-04	0.00E+00	2.07E-01			
500≤R<1000 0.011	5.69E-02	8.44E-05	0.00E+00	5.69E-02			
1000≤R<1500 0.003	1.55E-02	2.30E-05	0.00E+00	1.55E-02			
1500≤R<2000 0.002	1.03E-02	1.53E-05	0.00E+00	1.03E-02			
2000<R 0.001	5.17E-03	7.67E-06	0.00E+00	5.17E-03			
	Enter the unit's CAS# of the substances emitted and their amounts.				Prioritzation score for each substance generated below. Totals on last row.		
R. Kapahi							
Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**	**Average Hourly (lbs/hr)**	**Cancer**	**Chronic**	**Acute**
Diesel engine exhaust, particulate matter (Diesel PM)	**9901**	2.24E+00	1.88E-08	2.56E-04	5.17E+00	7.67E-03	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 4-6
Summary of Screening Level Risk Evaluation
Operational Phase

Name	**Prioritization Calculator**						
Applicability	Use to provide a Prioritization score based on the emission potency method. Entries required in yellow areas, output in gray areas.						
Author or updater	Ray Kapahi		*Last Update*	August 20, 2022			
Facility:	Ramos Oil Thornton Plaza						
Location	Operational Phase Screenng Level Risk Evaluation						
Project Phase:							
Modeler:	R. Kapahi						
Operating Hours hr/yr	8,760.00						
Receptor Proximity and Proximity Factors	**Cancer Score**	**Chronic Score**	**Acute Score**	**Max Score**	Receptor proximity is in meters. Priortization scores are calculated by multiplying the total scores summed below by the proximity factors. Record the Max score for your receptor distance. If the substance list for the unit is longer than the number of rows here or if there are multiple processes use additional worksheets and sum the totals of the Max Scores.		
0< R<100 1.000	3.29E+00	7.65E-02	1.12E-01	3.29E+00			
100≤R<250 0.250	8.23E-01	1.91E-02	2.80E-02	8.23E-01			
250≤R<500 0.040	1.32E-01	3.06E-03	4.48E-03	1.32E-01			
500≤R<1000 0.011	3.62E-02	8.41E-04	1.23E-03	3.62E-02			
1000≤R<1500 0.003	9.87E-03	2.29E-04	3.36E-04	9.87E-03			
1500≤R<2000 0.002	6.58E-03	1.53E-04	2.24E-04	6.58E-03			
2000<R 0.001	3.29E-03	7.65E-05	1.12E-04	3.29E-03			
	Enter the unit's CAS# of the substances emitted and their amounts.				Prioritzation score for each substance generated below. Totals on last row.		
R. Kapahi							
Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**	**Average Hourly (lbs/hr)**	**Cancer**	**Chronic**	**Acute**
Diesel engine exhaust, particulate matter (Diesel PM)	**9901**	3.30E-02		3.77E-06	7.62E-02	1.13E-04	0.00E+00
Benzene	**71432**	1.16E+01	1.99E-03	1.32E-03	2.58E+00	6.60E-02	1.10E-01
Ethyl benzene	**100414**	3.04E+01	5.22E-03	3.47E-03	5.85E-01	2.60E-04	0.00E+00
Toluene	**108883**	1.52E+02	2.61E-02	1.73E-02	0.00E+00	8.67E-03	1.06E-03
Xylene	**1330207**	4.56E+01	7.82E-03	5.20E-03	0.00E+00	1.11E-03	5.33E-04
Naphthalene	**91203**	1.52E-01	2.61E-05	1.74E-05	3.98E-02	2.89E-04	0.00E+00
PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	**1151**	7.90E-04	1.36E-07	9.02E-08	6.69E-03	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00

SECTION 5: SIGNIFICANCE OF PROJECT IMPACTS

The results of the current analysis for criteria air pollutants are compared with mass emission thresholds established by SJVAPCD. The significance of project impacts for the construction and operational phases is summarized in Table 5-1. These results demonstrate that impacts to air quality are less than significant.

Table 5-1
Summary of Project Level Air Quality Impacts
(tons/year)

Pollutant	Construction Phase	Operational Phase (Includes emissions from Drive Thru)	Significance Threshold	Significant?
NOx	.0377	5.1685	10	No
VOC	.0349	0.5904	10	No
PM-10	0.00429	0.4539	15	No
PM-2.5	.00229	0.4392	15	No

Table 5-2
Summary of Project Level Health Risks

Risk Metric	Construction Phase	Operational (Occupancy) Phase	Significance Threshold	Significant?
Maximum Cancer Risk Score	5.17	3.29	10	Potentially Significant for Construction Phase
Maximum Chronic Risk Score	0.00767	0.0765	1.0	No
Maximum Acute Score	N/A	0.121	1.0	No

These results indicate that the project would not pose a significant public health risk. By its very nature, a screening level health risk evaluation is very conservative that substantially overstates the actual public health risks. Given the low health risks, a detailed HRA is not necessary.

SECTION 6: REFERENCES

CAPCOA (1997) Gasoline Service Station Industrywide Risks Assessment Guidelines. Available at: https://ww2.arb.ca.gov/sites/default/files/classic//ab2588/rrap-iwra/gasiwra.pdf

CARB (2003) HARP User's Guide. Available at: http://www.arb.ca.gov/toxics/harp/harp.htm December 2003.

OEHHA (2014) Consolidated Table of Approved health Risk Values. Cal EPA, Office of Environmental Health Hazard Assessment. Available at: file:///C:/2014%20Feather%20River%20AQMD/Hollycross%20Cemetary/OEHHA%20contable.pdf. October 2, 2020.

Appendix A

Excerpts of Traffic Study

TRAFFIC IMPACT ANALYSIS

FOR

RAMOS OIL PROJECT
PA-2000048

Thornton, San Joaquin County, CA

Prepared For:

SAN JOAQUIN COUNTY
DEPARTMENT OF PUBLIC WORKS
TRANSPORTATION DIVISION
1810 East Hazelton Avenue
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November 9, 2021

6560-34

TRAFFIC IMPACT ANALYSIS FOR RAMOS OIL PROJECT (PA-2000048)
Thornton, San Joaquin County, CA

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APPENDIX 39

TRAFFIC IMPACT ANALYSIS FOR
RAMOS OIL PROJECT (PA-2000048)
THORNTON, CA

INTRODUCTION

This traffic impact study report summarizes an analysis of the traffic-related effects of the completion of the Ramos Oil Thornton Plaza (Land Development Permit #PA-2000048) in the northeast quadrant of the Walnut Grove Road / N. Thornton Road intersection in Thornton, San Joaquin County and is shown in Figure 1. This project includes 12 fueling positions and a 4,100 square foot super convenience store (C-store); the C-store includes a fast-food drive-through component at the rear of the building. The project is adjacent to the first phase of the Thornton Plaza which includes a commercial fueling facility (i.e., card lock) and includes five fueling positions. Currently, there are three driveways providing access to the card lock facility. The easterly driveway along Walnut Grove Road is exit only while the driveway along N. Thornton Road provides inbound access for semi-trailer trucks and other vehicles. A third driveway, referred here as the middle driveway, allows inbound access along Walnut Grove Road for smaller vehicles. This middle driveway is located about 120 feet centerline to centerline west of the exit driveway.

The project proposes a third driveway, the west driveway, along Walnut Grove Road about 150 feet west of the middle driveway. This driveway will provide full access to the vehicle fueling positions and the C-store. Access to the fast-food drive-through lane is offset from the middle driveway; thus, access can occur from either the west or middle driveways. Figure 2 illustrates the proposed site plan.

Analysis Approach

This analysis considers the project's traffic impacts and evaluates the adequacy of site access under both near term and long-term conditions. Analysis of traffic operating conditions under the following six scenarios is presented in this traffic impact study:

- Existing Conditions,
- Existing Proposed Project,
- Near-Term Existing Plus Approved Projects (EPAP),
- EPAP Plus Project,
- Cumulative (Year 2040), and
- Cumulative Plus Project.

Existing Conditions are based on the current circulation system and traffic volumes. Local traffic counts were developed at the study intersections. Due to Covid-19 conditions, current traffic volumes are generally lower than pre-Covid-19 conditions. Therefore, intersection turning movements were developed using *StreetLight Data* analytics for 2019 pre-Covid conditions.

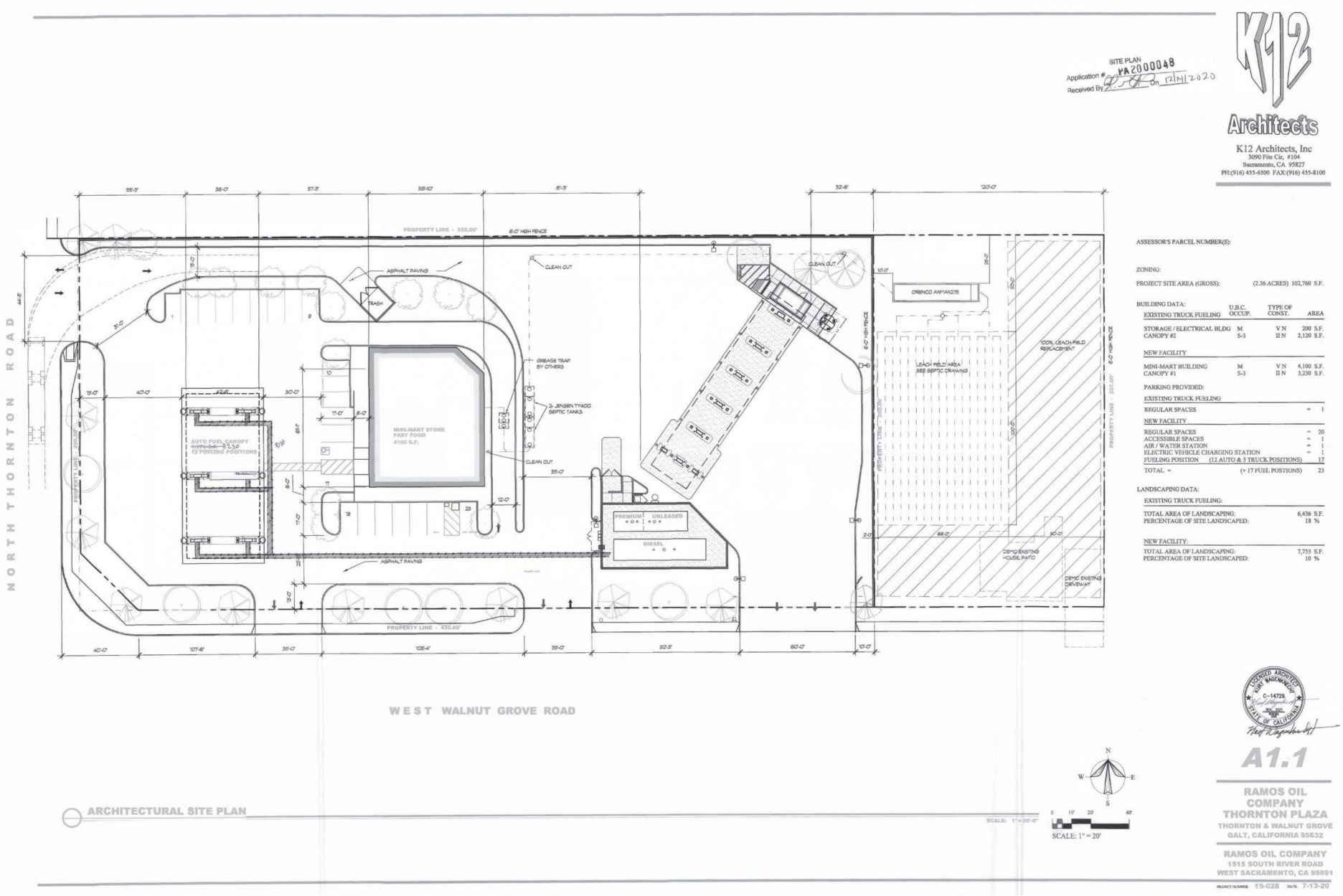


VICINITY MAP

KD Anderson & Associates, Inc.
Transportation Engineers

6560-34 RA 11/9/2021

figure 1



KD Anderson & Associates, Inc.
Transportation Engineers

6560-34 RA 11/9/2021

SITE PLAN

figure 2

Existing Plus Approved Projects (EPAP) conditions are a background condition which includes existing traffic levels plus traffic associated with approved land use development projects in the project vicinity.

Cumulative Conditions (Year 2040) are a long-term background condition which includes future year forecasts of traffic volumes based on regional development and completion of long-term circulation system improvements. The 3-County travel demand model represents one method for developing future conditions in the study area and is generally used to develop future volumes. However, Thornton is at the Sacramento County line and model results may not be as accurate at cordon zones adjacent to model limit locations. Therefore, multiple methods were considered.

The analysis follows San Joaquin County traffic study guidelines and addresses a study approach suggested by County staff. The analysis study area includes the I-5 ramp intersections, the Walnut Grove Road / N. Thornton Road intersection, the Walnut Grove Road / Mokelumne Avenue / east driveway, and two other site driveways. Synchro 11 was used to evaluate the intersections.

Summary Conclusions:

- ***Existing Conditions.*** Current traffic conditions in the area of the project are acceptable based on satisfaction of minimum San Joaquin County and Caltrans standards for intersection Levels of Service. Current peak hour queues are less than two vehicles and can be contained within available left turn lanes, where available.
- ***Project Characteristics.*** Based on information provided by the applicant, the Ramos Oil project is expected to generate roughly 3,434 daily trips, with 340 a.m. peak hour trips and 284 p.m. peak hour trips. After accounting for pass-by trips, the project is projected to generate 130 new a.m. peak hour trips and 125 new p.m. peak hour trips.
- ***Project Traffic Impacts.*** The project will provide gasoline and food products to local residents as well as motorists driving in the vicinity, including along I-5. Based on the State of California Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA*, local serving retail projects are presumed to have a less than significant impact on VMT. With regard to General Plan consistency, the study intersections will remain consistent with the San Joaquin County General Plan policies with the addition of project trips as resulting intersection Levels of Service (LOS) remain within minimum standards. Queues developed with the project will continue to be two vehicles or less.

    - The project should contribute its fair share to the cost of regional improvements by paying adopted traffic impacts fees.
    - Parking along the N. Thornton Road frontage should be prohibited as semi-trailer trucks are known to use this location to park, and their large profile will hinder sight lines to the south.

- ***Site Access / Internal Circulation.*** Project site access and internal circulation was assessed. The project is adjacent to the existing Ramos Oil card-lock fuel facility. The existing site provides three driveways onto the site, two along Walnut Grove Road and one along N.

Thornton Road. Currently, the N. Thornton Road driveway is limited to inbound only traffic while the east Walnut Grove Road driveway is limited to outbound only traffic. The project will add a full access driveway along Walnut Grove Road and convert the N. Thornton Road driveway to full access. The center driveway along Walnut Grove Road, which is the only existing driveway allowing inbound and outbound access, will continue to serve the card-lock facility, but will also serve as a convenient access to the fast-food drive-through lane. While some project traffic is expected to use this driveway, the driveways expected to see the majority of outbound traffic include the N. Thornton Road driveway and the westerly Walnut Grove Road driveway. The project analysis analyzed a worst-case scenario with the center Walnut Grove Road driveway excluded. Under this setting a single vehicle is projected to queue at the driveway.

The following on-site elements should be added to the site to improve circulation:

- As part of converting the N. Thornton Road driveway to two-way traffic, striping should be installed to delineate a center line for inbound and outbound traffic. Additionally, the striping should extend onto the roadway with a marked limit line prior to the shoulder stripe to maximize sight distance.
- Due to the angled approach for the proposed fueling area a stop sign and limit line should be installed on-site for vehicles departing this fueling area onto N. Thornton Road. Inbound traffic from N. Thornton Road may proceed to either passenger vehicle and card lock fueling facilities, and outbound motorists may assume all inbound traffic is entering the passenger vehicle fueling area they are departing. Additionally, motorists exiting onto N. Thornton Road will have to look to their left blind spot to determine whether any right-turning vehicles are entering the site.

These improvements are illustrated in Figure A1 in the appendix.

- ***Existing Plus Approved Projects (EPAP) Impacts.*** San Joaquin County staff identified one approved project, Our Lady of Fatima, in the Thornton area that would add background traffic to background roadway conditions. Minimum Level of Service (LOS) standards will continue to be satisfied under EPAP conditions with and without the proposed Ramos Oil project. 95th percentile queues will continue to be two vehicles or less.

- ***Year 2040 Long Term Cumulative Impacts.*** Multiple methods were considered to develop future roadway conditions including the 3-County travel demand model and the list approach. However, neither approach appeared to provide reasonable growth in the Thornton area, with the 3-County model showing a ten-fold increase in traffic while the list method identified a single past, present or probable future project. The County's 2014 General Plan DEIR identified an annual growth of 1.5% annually between 2010 and 2035. After discussion with County staff it was determined that the 1.5% annual growth rate would be applied between 2020 and 2040 in the project vicinity as this rate is generally consistent with the County-wide annual growth rate of 1.35% based on their ongoing Transportation Impact Mitigation Fee (TIMF) update. The LOS standards will continue to be satisfied under Cumulative conditions with and without the proposed project. 95th percentile queues will be two vehicles or less.

EXISTING SETTING

This section of the study presents a description of existing conditions in the study area. Information presented in this section of the study is based on on-site field observations, current traffic count data and other data available from local and state agencies. This section of the traffic impact study also describes analysis methods applied for this study as well as the evaluation criteria used to determine the significance of project-related effects.

Circulation System

This traffic impact study presents analyses of traffic operating conditions at intersections near the project that may be affected by the proposed project. The limits of the study area were identified through discussions with county staff.

The following is a description of roadways that provide access to the proposed project site.

Walnut Grove Road. Walnut Grove Road (County Road J11) is classified as a major collector roadway per the 2035 San Joaquin County General Plan and runs east-west from Walnut Grove, at the Sacramento River, east to the town of Thornton. It is classified as a minor collector east of N. Thornton Road. Walnut Grove Road is generally a two-lane facility with left turn lanes at the northbound and southbound I-5 on-ramps. The roadway has a speed limit of 55 miles per hour (mph) west from the northbound I-5 ramps. The roadway carries about 4,100 vehicles per day (vpd) west of N. Thornton Road. East of N. Thornton Road, the roadway is generally two lanes with a westbound right turn lane approaching the N. Thornton Road intersection. The posted speed is 25 mph east of the northbound I-5 ramps into the town of Thornton. Between N. Thornton Road and Mokelumne Avenue the roadway carries about 3,440 vpd.

N. Thornton Road. N. Thornton Road (County Road J8) is a two-lane roadway and is classified as a major collector roadway north of Walnut Grove Road. The roadway carries about 3,340 vpd north of the existing Ramos Oil driveway.

Study Area Intersections

The quality of traffic flow is typically governed by the operation of major intersections. For this study three intersections in the vicinity of the site and three driveways were evaluated.

The **I-5 Southbound Ramps / Walnut Grove Road intersection** provides access between I-5 and Walnut Grove Road. The southbound ramps are part of a tight diamond interchange and provide one-way connections to and from I-5. The southbound and eastbound approaches are single lane while the westbound approach includes a through lane and a left turn lane. Southbound off-ramp traffic is stop controlled.

The **I-5 Northbound Ramps / Walnut Grove Road intersection** also provides access between I-5 and Walnut Grove Road. The northbound ramps are the east leg of the tight diamond interchange and provide one-way connections to and from I-5. The northbound and westbound approaches are

single lane while the eastbound approach includes a through lane and a left turn lane. Northbound off-ramp traffic is stop controlled.

The **Walnut Grove Road / N. Thornton Road intersection** is a tee intersection with stop control along southbound N. Thornton Road. The eastbound Walnut Grove Road approach is a single lane while the westbound approach includes a through lane and a right turn lane. Southbound N. Thornton Road includes dedicated right and left turn lanes and is stop controlled.

The **Walnut Grove Road / Mokelumne Avenue – East Driveway intersection** is a four-leg intersection with stop control along Mokelumne Avenue and unsigned yield control at the card lock driveway. All roadway approaches are single lane and Mokelumne Avenue is also stop controlled. The Ramos Oil card lock driveway is outbound only.

Public Transportation

The San Joaquin Regional Transit District (SJRTD) is the primary provider of public transportation service in San Joaquin County. SJRTD provides fixed-route, flexible fixed-route, and dial-a-ride services in the County. SJRTD does not operate scheduled service in Thornton. In rural areas the available services are described below.

- **RTD Van Go! Service** is an on-demand rideshare service for rural communities within San Joaquin County including Thornton. RTD Van Go! allows transferring between service zones and transfers to fixed-route bus service. Weekend and holiday service is available. Advance reservations are recommended although bookings can be made on the same day of travel. The program is an on-demand rideshare service that operates between 8:00 and 5:00 every day.

- **Dial-a-Ride** provides curb-to-curb transportation to persons who qualify under the Americans with Disabilities Act. The program is specifically designed for individuals who, due to their disability, are unable to use the fixed-route services in San Joaquin County. This service is available 365 days a year by appointment only during Stockton Metropolitan Area (SMA) service hours and within ¾ mile of an SMA fixed route.

Bicycles. San Joaquin County is developing a Bicycle Master Plan Update to identify gaps in the existing bicycle network, propose ways to create a more connected network and develop supporting facilities. The SJCOG *Regional Bicycle, Pedestrian and Safe Routes to School Master Plan (2012)* notes the current status and planned improvements to facilities countywide. Caltrans bicycle facilities are generally divided into four categories:

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

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

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

- **Class IV Bikeway (Separated Bikeway):** A Class IV bikeway (separated bikeway) is a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic.

Bicycle infrastructure in the Thornton area of San Joaquin County is limited. Paved shoulders are present along some roadways in the project vicinity. No marked Class III bike routes are identified. The SJCOG Regional Master Plan identified two Class III bike route projects in the Thornton area. One project extends from the County line to Turner Road while the second route is along Walnut Grove Road from Thornton Road south, to the County line.

Sidewalks. Pedestrian infrastructure, which includes sidewalks, crosswalks, refuge islands, signs and traffic signals is present in Thornton on a limited basis, typically associated with new development. This is due to the rural nature of the community. In the project vicinity sidewalk is present along the developed north side of Walnut Grove Road – N. Thornton Road, including along the entire project frontage. The San Joaquin Council of Governments (SJCOG) *Regional Bicycle, Pedestrian and Safe Routes to School Master Plan* (September 2012) did not identify any future County-funded projects to add additional pedestrian infrastructure.

METHODOLOGY

The following is a description of the methods used in the analysis presented in this traffic impact study.

Vehicle Miles Traveled

In the *San Joaquin County Traffic Impact Study Guidelines*, the impact of a project on LOS is an important factor in determining whether a project has a significant impact. However, recent changes to CEQA have changed how lead agencies use LOS in determining whether a project has a significant impact on transportation. As noted in the California Governor's Office of Planning and Research (OPR) document *Technical Advisory on Evaluating Transportation Impacts in CEQA* (California Governor's Office of Planning and Research 2018),

> "Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. . . OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)"

Notably, the *San Joaquin County Traffic Impact Study Guidelines* was prepared before the recent changes to CEQA due to Senate Bill 743 (Steinberg 2013). As a result, the County guidelines specify use of LOS in determining whether a project has a significant impact. Consistent with the approach described in the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA*, LOS will not be used in this traffic impact study as a basis for identifying significant impacts. Rather, the methods, assumptions and significance thresholds presented in the County guidelines will be used to determine whether the project is consistent or inconsistent with General Plan policies on LOS, and whether the magnitude of inconsistency should be considered significant or less than significant.

Certain types of projects as identified in statute, the CEQA Guidelines, or in OPR's Technical Advisory are presumed to have a less than significant impact on VMT and therefore a less than significant impact on transportation. Generally, the identified projects contribute to efficient land use patterns enabling higher levels of walking, cycling, and transit as well as lower average trip length. These projects include, for example, projects in transit priority areas, projects consisting of residential infill or those located in low VMT areas.

Caltrans references OPR's December 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA*, which identifies projects and areas presumed to have a less than significant transportation impact. Those include:

1. Residential, office, or retail projects within a Transit Priority Area, where a project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high-quality transit corridor.

    a. A major transit stop is defined as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (Pub. Resources Code, § 21064.3).

    b. A high-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Pub. Resources Code, § 21155).

2. An area pre-screened by an agency as having low residential or office VMT:

    a. An area where existing residential projects exhibit VMT per capita 15 percent or more below city or regional average.

    b. An area where existing office projects exhibit VMT per capita 15 percent or more below regional average.

3. Residential projects composed of 100 percent or near-100 percent affordable housing located in any infill location. Additionally, per OPR's Technical Advisory, "Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units."

4. A locally-serving retail project (such a project typically reduces vehicle travel by providing a more proximate shopping destination, i.e., better accessibility).

5. Mixed-use projects composed entirely of the above low-VMT project types.

6. In any area of the state, absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact.

However, a land use project near transit may have a significant impact on VMT if it:

1. Has a floor area ratio less than 0.75.
2. Includes more parking than required by the local permitting agency.

3. Is inconsistent with the region's Sustainable Communities Strategy (i.e., development is outside region's development footprint, or in area specified as open space).
4. Replaces affordable residential units with a smaller number of moderate- or high-income residential units.

In very limited situations, analysis or mitigation may be appropriate in low VMT areas to address specific multimodal access management issues directly caused by the project such as issues related to line of sight caused by the placement of a driveway. These situations are to be determined based on the details of development proposals and their setting and will be addressed in future guidance.

Should a project not meet the minimum screening thresholds, a VMT analysis should be conducted. The OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (California Governor's Office of Planning and Research 2018) identifies a threshold of 15 percent below the baseline for determining the significance of VMT impacts associated with residential and office land use developments. Locally-serving retail projects, such as a project that reduces vehicle travel by providing a more proximate shopping destination, i.e., better accessibility is considered to have a less than significant transportation impact.

General Plan Policy Consistency Criteria

The significance of the proposed project's inconsistency with General Plan policies is based on a determination of whether resulting LOS is considered acceptable. A project's inconsistency with General Plan policies is considered substantial if implementation of the project would result in LOS changing from levels considered acceptable to levels considered unacceptable, or if the project would substantially worsen already unacceptable LOS.

LOS analysis provides a basis for describing existing traffic conditions and for evaluating the significance of project-related traffic impacts. LOS measures the quality of traffic flow and is represented by letter designations from A to F, with a grade of A referring to the best conditions, and F representing the worst conditions. The characteristics associated with the various LOS for intersections are presented in Table 1.

Where County roadways are designated as part of SJCOG's CMP, both the County and CMP LOS standards shall apply. (RDR/PSP). Neither Walnut Grove Road nor N. Thornton Road are identified as a route of regional significance.

The methods contained in the 6th Edition of the Highway Capacity Manual (HCM) were used with Synchro software employed to assess each intersection.

TABLE 1 INTERSECTION LEVEL OF SERVICE DEFINITIONS		
Level of Service	**Signalized Intersection**	**Unsignalized Intersection**
A	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/vehicle
B	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/vehicle and ≤ 15 sec/vehicle
C	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/vehicle and ≤ 25 sec/vehicle
D	Significant congestion of critical approaches, but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/vehicle and ≤ 35 sec/vehicle
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/vehicle and ≤ 50 sec/vehicle
F	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/vehicle
Source: HCM, 6th Edition.		

Level of Service Thresholds

The importance of the proposed project's impact on traffic operating conditions is based on a determination of whether resulting LOS is considered acceptable under applicable standards. These standards are adopted by the agencies with jurisdiction for each facility. The I-5 Northbound and Southbound Ramp intersections with Walnut Grove Road are under Caltrans jurisdiction. The remaining intersections are under San Joaquin County jurisdiction.

San Joaquin County. The importance of the project's impact on traffic operating conditions is based on a determination of whether resulting intersection LOS is considered acceptable. A project's impact on traffic conditions is considered substantial if implementation of the project would result in LOS changing from levels considered acceptable to levels considered unacceptable, or if the project would worsen already unacceptable LOS.

Policy TM-3.1, Roadway Provision, of the *San Joaquin County General Plan Policy Document* (County of San Joaquin 2016) states, in part:

> "The County shall maintain Level of Service (LOS) standards consistent with the San Joaquin Council of Governments (SJCOG) Congestion Management Program (CMP) for State highways and designated County roadways and intersections of

> regional significance. Per the CMP, all designated CMP roadways and intersections shall operate at a LOS D or better except for roadways with "grandfathered" LOS. LOS for State highways shall be maintained in cooperation with Caltrans. The County LOS standard for intersections is LOS "D" or better on Minor Arterials and roadways of higher classification and LOS "C" or better on all other non-CMP designated County roadways and intersections. The County shall also maintain the following:
>
> - on State highways, LOS D or Caltrans standards whichever is stricter.
> - within a city's sphere of influence, LOS D, or the city planned standards for that level of service.
> - on Mountain House Gateways, as defined in the Mountain House Master Plan, LOS D, on all other Mountain House roads, LOS C."

The *San Joaquin County 2035 General Plan Environmental Impact Report* (County of San Joaquin 2014) states,

> "For any Regional Congestion Management Program (RCMP) designated roadway or intersection currently operating or expected to operate at LOS D or better under No Project conditions, the project would result in a significant impact if the project-added traffic would result in LOS E or F operating conditions. For RCMP intersections or roadways currently operating or expected to operate at LOS E or F under No Project conditions, the project would result in a significant impact if it would increase:
>
> - Average delay by 4 seconds or more (intersections); or
> - The volume-to-capacity (v/c) ratio by 1.0 or more."

I-5 is a designated RCMP roadway. Therefore, based on the *San Joaquin County General Plan Policy Document* and the *San Joaquin County 2035 General Plan Environmental Impact Report*, LOS D is considered the acceptable LOS threshold level for the ramp intersections at Walnut Grove Road.

If the Ramos Oil Project would result in LOS at the study facility changing from acceptable LOS or better to unacceptable LOS or worse, the impact will be considered inconsistent with the General Plan. Recommended measures which would result in acceptable LOS at the study facility will be considered to reduce the impact to a less-than-substantial level.

Consistent with the *San Joaquin County 2035 General Plan Environmental Impact Report*, if an RCMP study facility is already operating at an unacceptable LOS E or F under Existing conditions, or under Cumulative No Project conditions, increasing delay at an intersection by four seconds or more will be considered inconsistent with the General Plan.

Travel Forecasting

For this analysis alternative sources for information regarding future traffic volumes in this area of San Joaquin County were reviewed and considered. Traffic volumes were developed for two scenarios:

- Existing Plus Approved Projects (EPAP), and
- Cumulative (Year 2040).

The EPAP scenario assumes completion of approved development projects in San Joaquin County. San Joaquin County planning staff was contacted and identified one approved project in the Thornton area that would add background traffic to the existing roadway conditions.

Long Term cumulative traffic volumes were considered using the 3-County model; however, Thornton is located at the north edge of the San Joaquin-Sacramento County line. Travel demand models (TDM) tend to be less accurate at cordon locations. When considering UC-6, the Thornton community details identified in the General Plan, the model appears to project volumes along Walnut Grove Road and N. Thornton Road ten-fold higher than baseline conditions. A second approach was considered, the list approach, and is identified in Section 15130(b) of the *State of California Environmental Quality Act (CEQA).* However, the only current project in the Thornton area was identified in the EPAP scenario. The 2014 General Plan DEIR identified an annual growth of about 1.5% between 2010 and 2035 in the Thornton area. This growth rate is generally consistent with the County-wide annual growth rate of 1.35% based on their ongoing Transportation Impact Mitigation Fee (TIMF) update. County staff concurred with applying a 1.5% annual growth rate to vicinity traffic between 2020 and 2040.

EXISTING CONDITIONS

Intersection Traffic Volumes

Figure 3 presents current a.m. and p.m. peak hour traffic volumes and geometry at study intersections. Intersection turning movements (ITM's) at the study intersections along Walnut Grove Road and N. Thornton Road were based on *StreetLight Data* traffic pattern analytics information for 2019, prior to Covid-19 altering traffic volumes.

Intersection Levels of Service

Table 2 presents existing a.m. peak hour and p.m. peak hour Level of Service at the study locations. The worksheets presenting the calculation of LOS are included in the technical appendix. As indicated, all study intersections operate with Levels of Service that satisfy the minimum LOS C/D standards. None of the intersections meet the peak hour signal warrant.

TABLE 2
EXISTING INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour		Peak Hour Warrant Met?
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	
1. Walnut Grove Rd / SB I-5 Ramps						
SB Approach	SB Stop	11.8	B	12.5	B	No
WB Left		7.7	A	8.0	A	
2. Walnut Grove Rd / NB I-5 Ramps						
NB Approach	NB Stop	11.9	B	11.0	B	No
EB Left		7.7	A	7.8	A	
3. Walnut Grove Rd / N. Thornton Rd						
SB Approach	SB Stop	9.6	A	11.7	B	No
EB Left		7.6	A	8.0	A	
4. Walnut Grove Rd / Mokelumne Ave						
NB Approach	NB/SB	10.2	B	10.5	B	No
SB Approach	Stop	9.5	A	10.0	B	
WB Left		7.5	A	7.5	A	
5. N. Thornton Rd / Project Driveway						
SB Left	WB	---	N/A	---	N/A	No
WB Approach	Stop*	---	N/A	---	N/A	

* Currently one-way inbound
N/A – not available



6

114 (173)

(133) 99

Site Dwy/ Walnut Grove Rd

1

(63) 50
(0) 0
(33) 43

138 (123)
76 (89)

R1-1

(88) 41
(129) 60

I-5 SB Ramps/ Walnut Grove Rd

2

69 (79)
93 (122)

R1-1

(38) 10
(113) 91

38 (105)
0 (0)
121 (71)

I-5 NB Ramps/ Walnut Grove Rd

3

(76) 49
(92) 82

54 (78)
60 (95)

R1-1

(147) 59
(57) 50

Walnut Grove Rd/ N Thornton Rd

4

(5) 5
(0) 0
(5) 5

78 (153)
5 (5)

R1-1

(137) 109
(14) 10

5 (6)
31 (15)

Mokelumne Ave/ Walnut Grove Rd

5

(0) 0
(142) 111

10 (10)
88 (185)

N Thornton Rd/ Site Dwy

EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

6560-34 RA 11/9/2021

figure 3

95th Percentile Queues

The length of left turn lane queues was determined from the Synchro LOS results. Table 3 indicates that the longest current left turn queue is 33 feet along the northbound I-5 off-ramp at Walnut Grove Road.

TABLE 3
EXISTING PEAK HOUR QUEUES

Intersection	Lane	Storage (feet)	AM Peak Hour		PM Peak Hour	
			Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)
1. Walnut Grove Rd / SB I-5 Ramps	SB[1]	950	93	<25	96	<25
	WB left	180	76	<25	89	<25
2. Walnut Grove Rd / NB I-5 Ramps	NB[1]	950	159	33	176	<25
	EB left	180	10	<25	38	<25
3. Walnut Grove Rd / N. Thornton Rd	SB left	n/a	49	<25	76	<25
	SB right	325	82	<25	92	<25
	EB left[2]	n/a	59	<25	147	<25
4. Walnut Grove Rd / Mokelumne Ave	NB[1]	n/a	36	<25	21	<25
	WB left[2]	n/a	5	<25	5	<25
5. N. Thornton Rd / Project Driveway	SB left[2]	n/a	0	<25	0	<25

[1] volume is sum of all movements on minor approach

[2] volume is left turn movements in through lane

n/a – not applicable

PROJECT CHARACTERISTICS

The development of the project would result in vehicle traffic to and from the project site. The amount of additional traffic on a particular section of the street network is dependent upon three factors:

- Trip Generation, the number of new trips generated by the project,
- Trip Distribution, the direction of travel for the new traffic, and
- Trip Assignment, the specific routes used by the new traffic.

Trip Generation

Trip generation is determined by identifying the type and size of land use being developed. Recognized sources of trip generation data may then be used to calculate the total number of trip ends resulting from the day-to-day operation of the businesses in the project.

The trip generation for this project was calculated using trip generation rates published in the *Trip Generation Manual* (Institute of Transportation Engineers, 10th Edition, 2017). The project includes a 12-fueling position gas station with a 4,100 square foot convenience store with fast-food drive-through lane on the back side of the convenience store. Land uses where the convenience store is greater than 3,000 square feet with at least 10 fueling positions is categorized as Land Use 960, Super Convenience Market / Gas Station where a significant business exists for to-go food and drink and groceries. A search of the ITE database including research, publications and library yielded no information on how to address a fast-food drive-through only component of a multi-use retail use. The inclusion of a fast-food drive-through restaurant is likely to overestimate total trips as this rate includes both drive-through and walk-in customers. Due to the super convenience store facility size and the secondary nature of the drive-through component, it was concluded that the drive-through element would not add enough traffic to affect the study intersections. Table 4 presents the trip generation for the project.

Trips generated by retail commercial projects fit into two categories. Some trips will be made by patrons who would not otherwise be on the local street system and who go out of their way to reach the site. These are "new" trips. Other trips will be made by patrons who are already in the roadway network and stop by the site as part of a trip made for another purpose. These “pass-by” trips do not add traffic to the overall system. ITE research has suggested typical "pass-by" percentages for various retail land uses and are reflected in Table 4.

The project is projected to generate 3,434 daily trips with 340 a.m. peak hour trips and 284 p.m. peak hour trips. After accounting for pass-by trips the site is expected to generate 130 new a.m. peak hour trips and 124 new p.m. peak hour trips.

Trip Distribution and Assignment. The distribution of project trips was estimated based on existing traffic patterns in the Thornton area. The assignment of project trips to the local roadways will reflect the least time path between origin and destination along alternative routes, and the quickest path may vary over the course of the day. Trips heading south toward Stockton and north toward Sacramento are generally expected to use I-5 with traffic heading east toward Galt using New Hope Road. Figure 4 presents the projected trip distribution and project trip assignment.

TABLE 4
TRIP GENERATION

Land Use	Unit Quantity	Size	Trips Per Unit						
				AM Peak Hour			PM Peak Hour		
			Daily	In	Out	Total	In	Out	Total
Super Convenience Market / Gas Station (LU 960)	KSF	4.10	837.58	50%	50%	83.14	50%	50%	69.28
Super Convenience Market / Gas Station (LU 960)			3,434	170	170	340	142	142	284
Sub-Total Trips			**3,434**	170	170	**340**	142	142	**284**
Pass-By Trips									
Super Convenience Market / Gas Station (LU 960) *(59% Daily, 62% AM, 56% PM)*			(2,026)	(106)	(106)	(211)	(80)	(80)	(160)
Total Pass-by Trips			**(2,026)**	(106)	(106)	**(211)**	(80)	(80)	**(160)**
Net New Trips			**1,408**	**65**	**65**	**130**	**62**	**62**	**124**

KSF – thousand square feet

Numbers may not match due to rounding

Appendix B

Construction and Operating Emissions

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Ramos Oil Thornton Plaza

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	1.00	User Defined Unit	0.07	4,192.00	0
Parking Lot	17.00	Space	0.15	6,800.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	2			**Operational Year**	2023
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	452.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Per project design specs

Construction Phase - No demolition or grading required. Minimal site work as utilities are already in place.

Off-road Equipment - Air compressors will be electric

Off-road Equipment - All comstruction using hand tools and electric compressors

Off-road Equipment - No demolition required

Off-road Equipment - Per project specs

Off-road Equipment - Per project site characteristics

Grading - No grading, minimal site prep required.

Vehicle Trips - For gas station with conveneince market

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Energy Use - Default values per Appendix D, CalEEMod Users Guide.

Water And Wastewater - CalEEMod Defaul values Appendix D, CalEEMod Users Guide.

Solid Waste - Default value 0.42 tons/yr per pump x 6 pumps

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	1.00
tblConstructionPhase	NumDays	100.00	67.00
tblConstructionPhase	NumDays	5.00	1.00
tblConstructionPhase	NumDays	1.00	2.00
tblEnergyUse	T24E	0.00	17,606.00
tblEnergyUse	T24NG	0.00	25,152.00
tblGrading	AcresOfGrading	0.00	0.50
tblLandUse	LandUseSquareFeet	0.00	4,192.00
tblLandUse	LotAcreage	0.00	0.07
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	8.00	4.00
tblOffRoadEquipment	UsageHours	4.00	1.00
tblOffRoadEquipment	UsageHours	6.00	4.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblOffRoadEquipment	UsageHours	7.00	2.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblSolidWaste	SolidWasteGenerationRate	0.00	2.52
tblWater	IndoorWaterUseRate	0.00	62,741.00
tblWater	OutdoorWaterUseRate	0.00	38,454.00

2.0 Emissions Summary

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0349	0.0377	0.0364	8.0000e-005	2.4900e-003	1.8000e-003	4.2900e-003	6.3000e-004	1.6600e-003	2.2900e-003	0.0000	7.4016	7.4016	1.5700e-003	2.2000e-004	7.5053
Maximum	**0.0349**	**0.0377**	**0.0364**	**8.0000e-005**	**2.4900e-003**	**1.8000e-003**	**4.2900e-003**	**6.3000e-004**	**1.6600e-003**	**2.2900e-003**	**0.0000**	**7.4016**	**7.4016**	**1.5700e-003**	**2.2000e-004**	**7.5053**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0349	0.0377	0.0364	8.0000e-005	2.4900e-003	1.8000e-003	4.2900e-003	6.3000e-004	1.6600e-003	2.2900e-003	0.0000	7.4016	7.4016	1.5700e-003	2.2000e-004	7.5053
Maximum	**0.0349**	**0.0377**	**0.0364**	**8.0000e-005**	**2.4900e-003**	**1.8000e-003**	**4.2900e-003**	**6.3000e-004**	**1.6600e-003**	**2.2900e-003**	**0.0000**	**7.4016**	**7.4016**	**1.5700e-003**	**2.2000e-004**	**7.5053**

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
3	2-1-2023	4-30-2023	0.0202	0.0202
4	5-1-2023	7-31-2023	0.0425	0.0425
		Highest	0.0425	0.0425

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0199	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004
Energy	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	20,791.4713	20,791.4713	1.2126	0.2371	20,892.4325
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.5115	0.0000	0.5115	0.0302	0.0000	1.2673
Water						0.0000	0.0000		0.0000	0.0000	0.0199	0.0974	0.1173	2.0500e-003	5.0000e-005	0.1832
Total	**0.5884**	**5.1685**	**4.3417**	**0.0310**	**0.0000**	**0.3928**	**0.3928**	**0.0000**	**0.3928**	**0.3928**	**0.5314**	**20,791.5691**	**20,792.1005**	**1.2449**	**0.2371**	**20,893.8834**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0199	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004
Energy	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	20,791.4713	20,791.4713	1.2126	0.2371	20,892.4325
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.5115	0.0000	0.5115	0.0302	0.0000	1.2673
Water						0.0000	0.0000		0.0000	0.0000	0.0199	0.0974	0.1173	2.0500e-003	5.0000e-005	0.1832
Total	**0.5884**	**5.1685**	**4.3417**	**0.0310**	**0.0000**	**0.3928**	**0.3928**	**0.0000**	**0.3928**	**0.3928**	**0.5314**	**20,791.5691**	**20,792.1005**	**1.2449**	**0.2371**	**20,893.8834**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	3/1/2023	3/2/2023	5	2	
2	Building Construction	Building Construction	3/15/2023	6/15/2023	5	67	
3	Paving	Paving	6/15/2023	6/15/2023	5	1	

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4	Architectural Coating	Architectural Coating	6/15/2023	6/15/2023	5	1	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0.15

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,288; Non-Residential Outdoor: 2,096; Striped Parking Area: 408 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Graders	0	8.00	187	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Building Construction	Cranes	1	1.00	231	0.29
Building Construction	Forklifts	1	4.00	89	0.20
Architectural Coating	Air Compressors	1	0.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	2.00	130	0.42
Paving	Rollers	1	2.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	1	3.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	2	4.00	2.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-005	7.7000e-004	1.1200e-003	0.0000		4.0000e-005	4.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1368	0.1368	4.0000e-005	0.0000	0.1379
Total	**8.0000e-005**	**7.7000e-004**	**1.1200e-003**	**0.0000**	**2.7000e-004**	**4.0000e-005**	**3.1000e-004**	**3.0000e-005**	**3.0000e-005**	**6.0000e-005**	**0.0000**	**0.1368**	**0.1368**	**4.0000e-005**	**0.0000**	**0.1379**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0297	0.0297	0.0000	0.0000	0.0300
Total	**1.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0297**	**0.0297**	**0.0000**	**0.0000**	**0.0300**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					2.7000e-004	0.0000	2.7000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.0000e-005	7.7000e-004	1.1200e-003	0.0000		4.0000e-005	4.0000e-005		3.0000e-005	3.0000e-005	0.0000	0.1368	0.1368	4.0000e-005	0.0000	0.1379
Total	**8.0000e-005**	**7.7000e-004**	**1.1200e-003**	**0.0000**	**2.7000e-004**	**4.0000e-005**	**3.1000e-004**	**3.0000e-005**	**3.0000e-005**	**6.0000e-005**	**0.0000**	**0.1368**	**0.1368**	**4.0000e-005**	**0.0000**	**0.1379**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0297	0.0297	0.0000	0.0000	0.0300
Total	**1.0000e-005**	**1.0000e-005**	**1.1000e-004**	**0.0000**	**4.0000e-005**	**0.0000**	**4.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0297**	**0.0297**	**0.0000**	**0.0000**	**0.0300**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.1900e-003	0.0321	0.0269	5.0000e-005		1.6600e-003	1.6600e-003		1.5300e-003	1.5300e-003	0.0000	4.3722	4.3722	1.4100e-003	0.0000	4.4076
Total	**3.1900e-003**	**0.0321**	**0.0269**	**5.0000e-005**		**1.6600e-003**	**1.6600e-003**		**1.5300e-003**	**1.5300e-003**	**0.0000**	**4.3722**	**4.3722**	**1.4100e-003**	**0.0000**	**4.4076**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.7500e-003	8.4000e-004	1.0000e-005	4.0000e-004	2.0000e-005	4.2000e-004	1.2000e-004	2.0000e-005	1.3000e-004	0.0000	1.1725	1.1725	1.0000e-005	1.8000e-004	1.2254
Worker	5.8000e-004	4.0000e-004	5.0500e-003	1.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3274	1.3274	3.0000e-005	4.0000e-005	1.3388
Total	**6.5000e-004**	**3.1500e-003**	**5.8900e-003**	**2.0000e-005**	**2.0600e-003**	**3.0000e-005**	**2.0900e-003**	**5.6000e-004**	**3.0000e-005**	**5.8000e-004**	**0.0000**	**2.4999**	**2.4999**	**4.0000e-005**	**2.2000e-004**	**2.5642**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Building Construction - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.1900e-003	0.0321	0.0269	5.0000e-005		1.6600e-003	1.6600e-003		1.5300e-003	1.5300e-003	0.0000	4.3722	4.3722	1.4100e-003	0.0000	4.4076
Total	**3.1900e-003**	**0.0321**	**0.0269**	**5.0000e-005**		**1.6600e-003**	**1.6600e-003**		**1.5300e-003**	**1.5300e-003**	**0.0000**	**4.3722**	**4.3722**	**1.4100e-003**	**0.0000**	**4.4076**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.0000e-005	2.7500e-003	8.4000e-004	1.0000e-005	4.0000e-004	2.0000e-005	4.2000e-004	1.2000e-004	2.0000e-005	1.3000e-004	0.0000	1.1725	1.1725	1.0000e-005	1.8000e-004	1.2254
Worker	5.8000e-004	4.0000e-004	5.0500e-003	1.0000e-005	1.6600e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3274	1.3274	3.0000e-005	4.0000e-005	1.3388
Total	**6.5000e-004**	**3.1500e-003**	**5.8900e-003**	**2.0000e-005**	**2.0600e-003**	**3.0000e-005**	**2.0900e-003**	**5.6000e-004**	**3.0000e-005**	**5.8000e-004**	**0.0000**	**2.4999**	**2.4999**	**4.0000e-005**	**2.2000e-004**	**2.5642**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0000e-004	1.6600e-003	2.0300e-003	0.0000		8.0000e-005	8.0000e-005		7.0000e-005	7.0000e-005	0.0000	0.2689	0.2689	7.0000e-005	0.0000	0.2707
Paving	2.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.0000e-004**	**1.6600e-003**	**2.0300e-003**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**0.2689**	**0.2689**	**7.0000e-005**	**0.0000**	**0.2707**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0892	0.0892	0.0000	0.0000	0.0899
Total	**4.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0892**	**0.0892**	**0.0000**	**0.0000**	**0.0899**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.0000e-004	1.6600e-003	2.0300e-003	0.0000		8.0000e-005	8.0000e-005		7.0000e-005	7.0000e-005	0.0000	0.2689	0.2689	7.0000e-005	0.0000	0.2707
Paving	2.0000e-004					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**4.0000e-004**	**1.6600e-003**	**2.0300e-003**	**0.0000**		**8.0000e-005**	**8.0000e-005**		**7.0000e-005**	**7.0000e-005**	**0.0000**	**0.2689**	**0.2689**	**7.0000e-005**	**0.0000**	**0.2707**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.1000e-004	0.0000	1.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0892	0.0892	0.0000	0.0000	0.0899
Total	**4.0000e-005**	**3.0000e-005**	**3.4000e-004**	**0.0000**	**1.1000e-004**	**0.0000**	**1.1000e-004**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0892**	**0.0892**	**0.0000**	**0.0000**	**0.0899**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0306					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0306**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	4.9500e-003	4.9500e-003	0.0000	0.0000	5.0000e-003
Total	**0.0000**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.9500e-003**	**4.9500e-003**	**0.0000**	**0.0000**	**5.0000e-003**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Architectural Coating - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0306					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0306**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	2.0000e-005	0.0000	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	4.9500e-003	4.9500e-003	0.0000	0.0000	5.0000e-003
Total	**0.0000**	**0.0000**	**2.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**4.9500e-003**	**4.9500e-003**	**0.0000**	**0.0000**	**5.0000e-003**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Parking Lot	0.515394	0.052058	0.166327	0.163679	0.033750	0.008148	0.012972	0.015736	0.000860	0.000305	0.025297	0.001401	0.004072
User Defined Commercial	0.515394	0.052058	0.166327	0.163679	0.033750	0.008148	0.012972	0.015736	0.000860	0.000305	0.025297	0.001401	0.004072

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	15,164.9417	15,164.9417	1.1048	0.1339	15,232.4671
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	15,164.9417	15,164.9417	1.1048	0.1339	15,232.4671
NaturalGas Mitigated	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	5,626.5297	5,626.5297	0.1078	0.1032	5,659.9653
NaturalGas Unmitigated	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	5,626.5297	5,626.5297	0.1078	0.1032	5,659.9653

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	1.05437e+008	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	5,626.5297	5,626.5297	0.1078	0.1032	5,659.9653
Total		**0.5685**	**5.1685**	**4.3415**	**0.0310**		**0.3928**	**0.3928**		**0.3928**	**0.3928**	**0.0000**	**5,626.5297**	**5,626.5297**	**0.1078**	**0.1032**	**5,659.9653**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	1.05437e+008	0.5685	5.1685	4.3415	0.0310		0.3928	0.3928		0.3928	0.3928	0.0000	5,626.5297	5,626.5297	0.1078	0.1032	5,659.9653
Total		**0.5685**	**5.1685**	**4.3415**	**0.0310**		**0.3928**	**0.3928**		**0.3928**	**0.3928**	**0.0000**	**5,626.5297**	**5,626.5297**	**0.1078**	**0.1032**	**5,659.9653**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	2380	0.4890	4.0000e-005	0.0000	0.4912
User Defined Commercial	7.38044e+007	15,164.4527	1.1047	0.1339	15,231.9760
Total		**15,164.9417**	**1.1048**	**0.1339**	**15,232.4671**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Parking Lot	2380	0.4890	4.0000e-005	0.0000	0.4912
User Defined Commercial	7.38044e+007	15,164.4527	1.1047	0.1339	15,231.9760
Total		**15,164.9417**	**1.1048**	**0.1339**	**15,232.4671**

6.0 Area Detail

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0199	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004
Unmitigated	0.0199	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0168					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004
Total	**0.0199**	**0.0000**	**1.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.2000e-004**	**3.2000e-004**	**0.0000**	**0.0000**	**3.4000e-004**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.0600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0168					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.0000e-005	0.0000	1.7000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	3.2000e-004	3.2000e-004	0.0000	0.0000	3.4000e-004
Total	**0.0199**	**0.0000**	**1.7000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**3.2000e-004**	**3.2000e-004**	**0.0000**	**0.0000**	**3.4000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.1173	2.0500e-003	5.0000e-005	0.1832
Unmitigated	0.1173	2.0500e-003	5.0000e-005	0.1832

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0.062741 / 0.038454	0.1173	2.0500e-003	5.0000e-005	0.1832
Total		**0.1173**	**2.0500e-003**	**5.0000e-005**	**0.1832**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0.062741 / 0.038454	0.1173	2.0500e-003	5.0000e-005	0.1832
Total		**0.1173**	**2.0500e-003**	**5.0000e-005**	**0.1832**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.5115	0.0302	0.0000	1.2673
Unmitigated	0.5115	0.0302	0.0000	1.2673

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	2.52	0.5115	0.0302	0.0000	1.2673
Total		**0.5115**	**0.0302**	**0.0000**	**1.2673**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	2.52	0.5115	0.0302	0.0000	1.2673
Total		**0.5115**	**0.0302**	**0.0000**	**1.2673**

9.0 Operational Offroad

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix C

Detailed Emission Calculations

Table C-1
Summary of TAC Emissions Operational Phase

	On-Site Truck Idle	Off-Site Truck Travel	On-Site Gasoline Dispensing and Storage	Drive-Thru Kitchen	TOTAL (lbs/yr)
	Table C-4	Table C- 5	Table C-3	Table C-6	
Benzene			11.57		11.57
DPM	0.00063	0.0324			0.033
Ethyl Benzene			30.37		30.37
PAHs				0.00079	7.86E-04
Toluene			151.84		151.84
Xylene			45.55		45.55
Naphthtalene				0.15236	0.15236

Table C-2
Calculation of VOC Emissions

Gasoline Dispensing Operations VOC Calculator

Applicability	Use this spreadsheet to calculate VOC emissions from gasoline dispensing operations. Entries required in yellow areas, output in grey areas.		
Author or updater	Ray Kapahi	*Last Update*	August 18, 2022
Facility: **ID#:** **Project #:**	Kamir Inc. Gas Station KeThorntonyes, CA		

Inputs	gal/day	gal/yr	**Formula**
	5.00E+03	2.00E+06	
	1,000 gal /hr	1,000 gal /yr	
Gasoline Throughput	2.08E-01	2.00E+03	Enter the **change** in gas station throughput in units of gallons/day and gallons/yr. Select the Phase I and Phase II type using the drop down provided. VOC emissions are calculated by the multiplication of Throughput Rates and Emission Factors.
Application Type	Type #		
EVR Phase I and EVR Phase II Installed Underground Tank	9		

Substances	**lb VOC/ 1,000 gal**	**LB/HR**	**LB/YR**
Vapor Tank Filling Loss VOC	0.08	1.75E-02	1.68E+02
Vehicle Refueling VOC	0.42	8.75E-02	8.40E+02
Breathing Loss VOC	0.03	5.21E-03	5.00E+01
Spillage VOC	0.42	8.75E-02	8.40E+02
Total VOC	0.95	1.98E-01	1.90E+03

References:

* The emission factors are derived from Appendix A in the 1997 CAPCOA Air Toxics "Hot Spots" Program document, *Gasoline Service Station Industrywide Risk Asessment Guidelines* .

Table C-2
Calculation of VOC Emissions

	1	2	3	4	5	6	**7**	**8**	**9**
	Phase 1 and Phase II Exempt Aboveground tank	Non-EVR Phase I and Phase II Exempt Aboveground tank	EVR Phase I and Phase II Exempt Aboveground tank	Non-EVR Phase I and Non-EVR Phase II Installed Aboveground tank	EVR Phase I and Non-EVR Phase II Installed (or Phase II Exempt Due to ORVR) Aboveground tank	EVR Phase I and EVR Phase II (VR-501 only) Installed Aboveground tank	**Phase I and Phase II Exempt Underground Tank**	**EVR Phase I and Phase II Exempt Underground Tank**	**EVR Phase I and EVR Phase II Installed Underground Tank**
Process	lb VOC/1,000 gal								
Tank Filling Loss	8.4	0.42	0.17	0.42	0.17	0.17	8.4	0.084	0.084
Vehicle Refueling	8.4	8.4	8.4	0.42	0.42	0.38	8.4	8.4	0.42
Breathing Loss	2.1	0.053	0.053	0.053	0.053	0.053	0.84	0.025	0.025
Vapor VOC EF	18.90	8.87	8.62	0.89	0.64	0.60	17.64	8.51	0.53
Spillage	0.61	0.42	0.42	0.42	0.42	0.42	0.61	0.61	0.42
Total VOC	19.51	9.29	9.04	1.31	1.06	1.02	18.25	9.12	0.95

Table C-3
Calculation of TACs from Gasoline Storage Tank Filling

	lbs/hr	lbs/yr	
Total Vapor VOCs (Re-Fuel) Less Spillage	1.10E-01	1.06E+03	*(From Table 2)*
Total Liquid VOCs (Spillage)	8.75E-02	8.40E+02	*(From Table 2)*
TOTAL VOCs	0.198	1898	

	Benzene	**Ethyl Benzene**	**Toluene**	**Xylenes**
EF Vapor (lbs/lb VOC)	3.00E-03	1.60E-02	8.00E-02	2.40E-02
Emissions (lbs/hr)	3.31E-04	1.76E-03	8.82E-03	2.65E-03
Emissions (lbs/yr)	3.17E+00	1.69E+01	8.46E+01	2.54E+01
EF Liquid (lb/lb VOC)	1.00E-02	1.60E-02	8.00E-02	2.40E-02
Emissions (lbs/hr)	8.75E-04	1.40E-03	7.00E-03	2.10E-03
Emissions (lbs/yr)	8.40E+00	1.34E+01	6.72E+01	2.02E+01
Total (lbs/hr)	1.21E-03	3.16E-03	1.58E-02	4.75E-03
Total (lbs/yr)	1.16E+01	3.04E+01	1.52E+02	4.56E+01

EFs from SJVAPCD Speciation Guidance March 27, 2017.

Table C-4
Calculation of DPM Emissions from
Idling of Diesel Fuelled Trucks

IDLING EMISSIONS FUEL DELIVERY	Units	
Deliveries per year (45 deliveried/month)		235
Idle Time per Truck (min)	*min*	15
Total Annual Idle Time	*min*	3525
	`	58.8
Emission Factor for Truck Idling (Note 1)	*(grams/hr)*	0.00486
Idling Emissions All Trucks	*(grams/yr)*	0.2857
	(lbs/yr)	0.0006
Total (Idling)	*(lbs/yr)*	0.0006

Note 1. From EMFAC 2021 Idle EFs for HD Trucks

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	
1	Source: EMFAC2021 (v1.0.2) Emission Rates														
2	Region Type: Air District														
3	Region: San Joaquin Valley Unified APCD														
4	Calendar Year: 2022														
5	Season: Annual														
6	Vehicle Classification: EMFAC2007 Categories														
7	Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for ID														
8															
9	Region	Calendar	Vehicle Ca	Model Yea	Speed	Fuel	NOx_RUNEX	NOx_IDLE	NOx_STRE	PM2.5_RUNEX	PM2.5_IDL	PM2.5_STI	PM2.5_PM	PM2.5_PM	PM1
10															
11	San Joaqu	2022	HHDT	Aggregate	Aggregate	Diesel	2.15350955	88.67053	2.514084	0.029376441	0.037223	0	0.008923	0.027026	0.0
12	San Joaqu	2022	LHDT1	Aggregate	Aggregate	Gasoline	0.27201771	0.039607	0.705737	0.001750369	0	0.000382	0.002	0.0273	0.0
13															
14															
15															
16															
17			HD Trck												
18			*g/mile*												

Table C-5
Calculation of DPM Emissions from
Truck Travel within 0.25 Miles of Truck Stop

Annual Vehicle Count	*(trucks/year)*	235
Emission Factor EMFAC 2021 (Note 1)	*(grams/mile)*	0.0307
Distance Travelled	*(mile/truck)* *(total miles)*	0.25 59
Emissions of DPM	*(grams/yr)* *(lbs/yr)*	14.69 0.0324

Note 1:
Emissions based on EMFAC 2021 for SJ Valley for CY 2022

Table C-6
Calculation of Hourly and Annual Amount of Meat Cooking

Pollutant	Emission Factors (lbs/ton of Meat)			Emissions (lbs/week)				Emissions (tons/year) Based on 52 Weeks per year				Emissions (lbs/hr) Based on 112 Hrs per week			
	(Hamburger)	Poultry (no skin)	Pork	(Hamburger)	Poultry (no skin)	Pork	Total	(Hamburger)	Poultry (no skin)	Pork	Total	(Hamburger)	Poultry (no skin)	Pork	Total
PM-10	10.00	0	0	1.8	0.55	0	2.35	0.0468	0.0143	0	0.0611	1.61E-02	4.91E-03	0.00E+00	2.10E-02
PM-2.5	7.60	0	0	1.368	0.418	0	1.786	0.035568	0.010868	0	0.046436	1.22E-02	3.73E-03	0.00E+00	1.59E-02
VOC	0.14	0.8	0.8	2.52E-02	7.70E-03	4.40E-02	0.0769	6.55E-04	2.00E-04	1.14E-03	2.00E-03	2.25E-04	6.88E-05	3.93E-04	6.87E-04
PAHs	5.40E-05	4.40E-05	4.40E-05	9.72E-06	2.97E-06	2.42E-06	1.51E-05	2.53E-07	7.72E-08	6.29E-08	3.93E-07	8.68E-08	2.65E-08	2.16E-08	1.35E-07
Naphthalene	1.20E-02	4.40E-05	2.00E-03	2.16E-03	6.60E-04	1.10E-04	0.00293	5.62E-05	1.72E-05	2.86E-06	7.62E-05	1.93E-05	5.89E-06	9.82E-07	2.62E-05

Default Meat Consumption Rates in lbs/week	
Beef/Hamburger	360
Poultry No Skin	110
Pork	110

Table C-7
Construction Phase Health Risk Evaluation

Name **Prioritizatio**

Applicability	Use to provide a Prioritization score based on t in yellow areas, ou
Author or updater	Ray Kapahi *Last Update*
Facility:	Ramos Oil Thornton Plaza
Location	Screening Level Cancer Risk Evaluation
Project Phase:	Construction Phase
Modeler:	R. Kapahi

Operating Hours hr/yr		8,760.00		
Receptor Proximity and Proximity Factors		**Cancer Score**	**Chronic Score**	**Acute Score**
0< R<100	**1.000**	5.17E+00	7.67E-03	0.00E+00
100≤R<250	**0.250**	1.29E+00	1.92E-03	0.00E+00
250≤R<500	**0.040**	2.07E-01	3.07E-04	0.00E+00
500≤R<1000	**0.011**	5.69E-02	8.44E-05	0.00E+00
1000≤R<1500	**0.003**	1.55E-02	2.30E-05	0.00E+00
1500≤R<2000	**0.002**	1.03E-02	1.53E-05	0.00E+00
2000<R	**0.001**	5.17E-03	7.67E-06	0.00E+00

R. Kapahi

Enter the unit's CAS# of the substances emit amounts.

Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**
Diesel engine exhaust, particulate matter (Diesel PM)	**9901**	2.24E+00	1.88E-08

Table C-4
Operation Health Risk Evaluation

Name **Prioritizatio**

Applicability	Use to provide a Prioritization score based on t in yellow areas, ou
Author or updater	Ray Kapahi *Last Update*
Facility:	Ramos Oil Thornton Plaza
Location	Operational Phase Screenng Level Risk Evalua
Project Phase:	
Modeler:	R. Kapahi

Operating Hours hr/yr		8,760.00		
Receptor Proximity and Proximity Factors		**Cancer Score**	**Chronic Score**	**Acute Score**
0< R<100	**1.000**	3.29E+00	7.65E-02	1.12E-01
100≤R<250	**0.250**	8.23E-01	1.91E-02	2.80E-02
250≤R<500	**0.040**	1.32E-01	3.06E-03	4.48E-03
500≤R<1000	**0.011**	3.62E-02	8.41E-04	1.23E-03
1000≤R<1500	**0.003**	9.87E-03	2.29E-04	3.36E-04
1500≤R<2000	**0.002**	6.58E-03	1.53E-04	2.24E-04
2000<R	**0.001**	3.29E-03	7.65E-05	1.12E-04

R. Kapahi

Enter the unit's CAS# of the substances emit amounts.

Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**
Diesel engine exhaust, particulate matter (Diesel PM)	**9901**	3.30E-02	
Benzene	**71432**	1.16E+01	1.99E-03
Ethyl benzene	**100414**	3.04E+01	5.22E-03
Toluene	**108883**	1.52E+02	2.61E-02
Xylene	**1330207**	4.56E+01	7.82E-03
Naphthalene	**91203**	1.52E-01	2.61E-05
PAHs, total, w/o individ. components reported [Treated as B(a)P for HRA]	**1151**	7.90E-04	1.36E-07

Table C-4
Operation Health Risk Evaluation

n Calculator

he emission potency method. Entries required
tput in gray areas.

August 20, 2022

ation

Max Score
3.29E+00
8.23E-01
1.32E-01
3.62E-02
9.87E-03
6.58E-03
3.29E-03

Receptor proximity is in meters. Priortization scores are calculated by multiplying the total scores summed below by the proximity factors. Record the Max score for your receptor distance. If the substance list for the unit is longer than the number of rows here or if there are multiple processes use additional worksheets and sum the totals of the Max Scores.

tted and their

Use the subs

Prioritzation score for each substance generated below. Totals on last row.

Average Hourly (lbs/hr)	Cancer	Chronic	Acute
3.77E-06	7.62E-02	1.13E-04	0.00E+00
1.32E-03	2.58E+00	6.60E-02	1.10E-01
3.47E-03	5.85E-01	2.60E-04	0.00E+00
1.73E-02	0.00E+00	8.67E-03	1.06E-03
5.20E-03	0.00E+00	1.11E-03	5.33E-04
1.74E-05	3.98E-02	2.89E-04	0.00E+00
9.02E-08	6.69E-03	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
0.00E+00	0.00E+00	0.00E+00	0.00E+00
Totals	**3.29E+00**	**7.65E-02**	**1.12E-01**

TRAFFIC IMPACT ANALYSIS

FOR

RAMOS OIL PROJECT
PA-2000048

Thornton, San Joaquin County, CA

Prepared For:

SAN JOAQUIN COUNTY
DEPARTMENT OF PUBLIC WORKS
TRANSPORTATION DIVISION
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November 9, 2021

6560-34

TRAFFIC IMPACT ANALYSIS FOR RAMOS OIL PROJECT (PA-2000048)
Thornton, San Joaquin County, CA

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TRAFFIC IMPACT ANALYSIS FOR
RAMOS OIL PROJECT (PA-2000048)
THORNTON, CA

INTRODUCTION

This traffic impact study report summarizes an analysis of the traffic-related effects of the completion of the Ramos Oil Thornton Plaza (Land Development Permit #PA-2000048) in the northeast quadrant of the Walnut Grove Road / N. Thornton Road intersection in Thornton, San Joaquin County and is shown in Figure 1. This project includes 12 fueling positions and a 4,100 square foot super convenience store (C-store); the C-store includes a fast-food drive-through component at the rear of the building. The project is adjacent to the first phase of the Thornton Plaza which includes a commercial fueling facility (i.e., card lock) and includes five fueling positions. Currently, there are three driveways providing access to the card lock facility. The easterly driveway along Walnut Grove Road is exit only while the driveway along N. Thornton Road provides inbound access for semi-trailer trucks and other vehicles. A third driveway, referred here as the middle driveway, allows inbound access along Walnut Grove Road for smaller vehicles. This middle driveway is located about 120 feet centerline to centerline west of the exit driveway.

The project proposes a third driveway, the west driveway, along Walnut Grove Road about 150 feet west of the middle driveway. This driveway will provide full access to the vehicle fueling positions and the C-store. Access to the fast-food drive-through lane is offset from the middle driveway; thus, access can occur from either the west or middle driveways. Figure 2 illustrates the proposed site plan.

Analysis Approach

This analysis considers the project's traffic impacts and evaluates the adequacy of site access under both near term and long-term conditions. Analysis of traffic operating conditions under the following six scenarios is presented in this traffic impact study:

- Existing Conditions,
- Existing Proposed Project,
- Near-Term Existing Plus Approved Projects (EPAP),
- EPAP Plus Project,
- Cumulative (Year 2040), and
- Cumulative Plus Project.

Existing Conditions are based on the current circulation system and traffic volumes. Local traffic counts were developed at the study intersections. Due to Covid-19 conditions, current traffic volumes are generally lower than pre-Covid-19 conditions. Therefore, intersection turning movements were developed using *StreetLight Data* analytics for 2019 pre-Covid conditions.

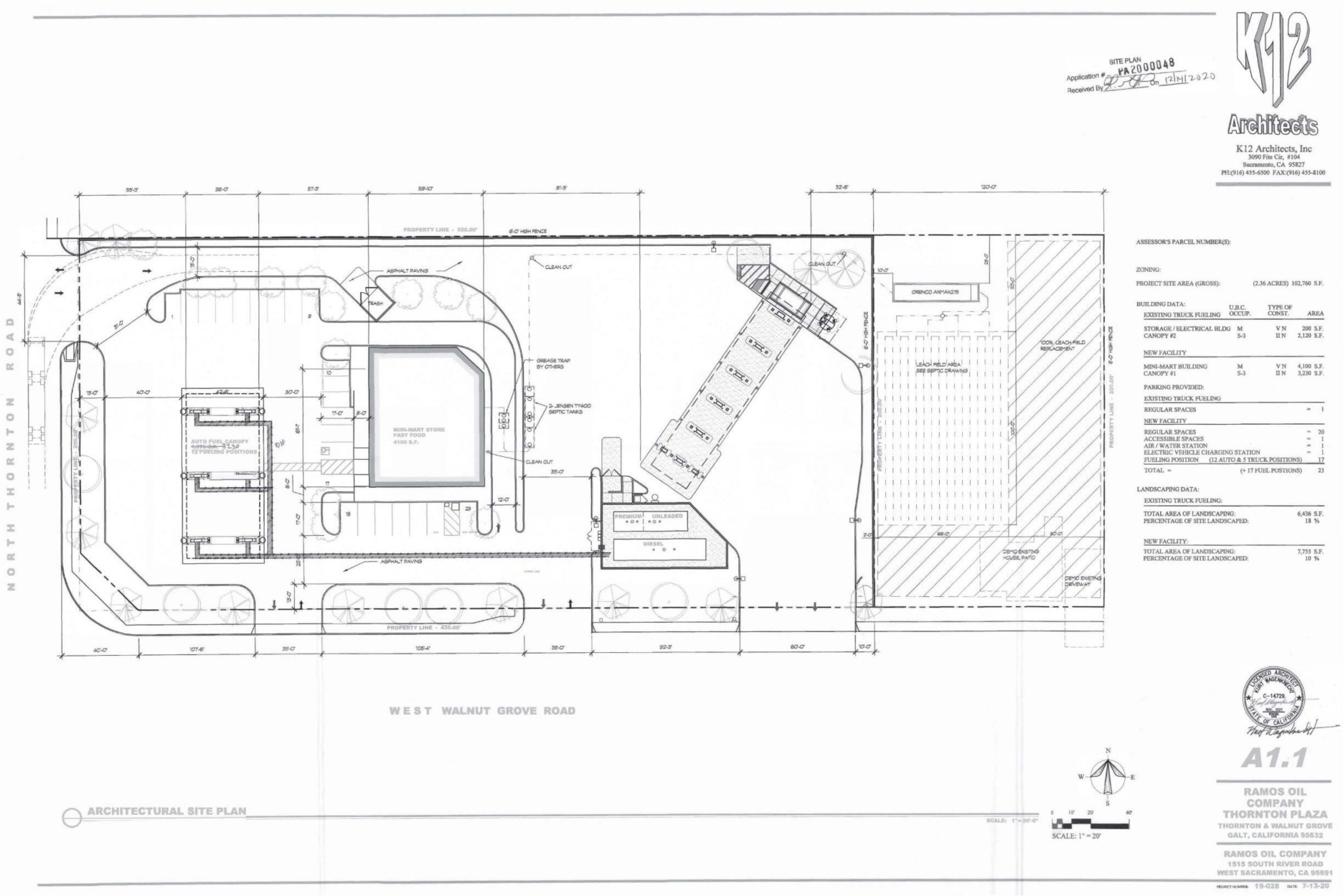


VICINITY MAP

KD Anderson & Associates, Inc.
Transportation Engineers

6560-34 RA 11/9/2021

figure 1



KD Anderson & Associates, Inc.
Transportation Engineers

6560-34 RA 11/9/2021

SITE PLAN

figure 2

Existing Plus Approved Projects (EPAP) conditions are a background condition which includes existing traffic levels plus traffic associated with approved land use development projects in the project vicinity.

Cumulative Conditions (Year 2040) are a long-term background condition which includes future year forecasts of traffic volumes based on regional development and completion of long-term circulation system improvements. The 3-County travel demand model represents one method for developing future conditions in the study area and is generally used to develop future volumes. However, Thornton is at the Sacramento County line and model results may not be as accurate at cordon zones adjacent to model limit locations. Therefore, multiple methods were considered.

The analysis follows San Joaquin County traffic study guidelines and addresses a study approach suggested by County staff. The analysis study area includes the I-5 ramp intersections, the Walnut Grove Road / N. Thornton Road intersection, the Walnut Grove Road / Mokelumne Avenue / east driveway, and two other site driveways. Synchro 11 was used to evaluate the intersections.

Summary Conclusions:

- ***Existing Conditions.*** Current traffic conditions in the area of the project are acceptable based on satisfaction of minimum San Joaquin County and Caltrans standards for intersection Levels of Service. Current peak hour queues are less than two vehicles and can be contained within available left turn lanes, where available.
- ***Project Characteristics.*** Based on information provided by the applicant, the Ramos Oil project is expected to generate roughly 3,434 daily trips, with 340 a.m. peak hour trips and 284 p.m. peak hour trips. After accounting for pass-by trips, the project is projected to generate 130 new a.m. peak hour trips and 125 new p.m. peak hour trips.
- ***Project Traffic Impacts.*** The project will provide gasoline and food products to local residents as well as motorists driving in the vicinity, including along I-5. Based on the State of California Office of Planning and Research (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA*, local serving retail projects are presumed to have a less than significant impact on VMT. With regard to General Plan consistency, the study intersections will remain consistent with the San Joaquin County General Plan policies with the addition of project trips as resulting intersection Levels of Service (LOS) remain within minimum standards. Queues developed with the project will continue to be two vehicles or less.

    - The project should contribute its fair share to the cost of regional improvements by paying adopted traffic impacts fees.
    - Parking along the N. Thornton Road frontage should be prohibited as semi-trailer trucks are known to use this location to park, and their large profile will hinder sight lines to the south.

- ***Site Access / Internal Circulation.*** Project site access and internal circulation was assessed. The project is adjacent to the existing Ramos Oil card-lock fuel facility. The existing site provides three driveways onto the site, two along Walnut Grove Road and one along N.

Thornton Road. Currently, the N. Thornton Road driveway is limited to inbound only traffic while the east Walnut Grove Road driveway is limited to outbound only traffic. The project will add a full access driveway along Walnut Grove Road and convert the N. Thornton Road driveway to full access. The center driveway along Walnut Grove Road, which is the only existing driveway allowing inbound and outbound access, will continue to serve the card-lock facility, but will also serve as a convenient access to the fast-food drive-through lane. While some project traffic is expected to use this driveway, the driveways expected to see the majority of outbound traffic include the N. Thornton Road driveway and the westerly Walnut Grove Road driveway. The project analysis analyzed a worst-case scenario with the center Walnut Grove Road driveway excluded. Under this setting a single vehicle is projected to queue at the driveway.

The following on-site elements should be added to the site to improve circulation:

- As part of converting the N. Thornton Road driveway to two-way traffic, striping should be installed to delineate a center line for inbound and outbound traffic. Additionally, the striping should extend onto the roadway with a marked limit line prior to the shoulder stripe to maximize sight distance.
- Due to the angled approach for the proposed fueling area a stop sign and limit line should be installed on-site for vehicles departing this fueling area onto N. Thornton Road. Inbound traffic from N. Thornton Road may proceed to either passenger vehicle and card lock fueling facilities, and outbound motorists may assume all inbound traffic is entering the passenger vehicle fueling area they are departing. Additionally, motorists exiting onto N. Thornton Road will have to look to their left blind spot to determine whether any right-turning vehicles are entering the site.

These improvements are illustrated in Figure A1 in the appendix.

- ***Existing Plus Approved Projects (EPAP) Impacts.*** San Joaquin County staff identified one approved project, Our Lady of Fatima, in the Thornton area that would add background traffic to background roadway conditions. Minimum Level of Service (LOS) standards will continue to be satisfied under EPAP conditions with and without the proposed Ramos Oil project. 95th percentile queues will continue to be two vehicles or less.

- ***Year 2040 Long Term Cumulative Impacts.*** Multiple methods were considered to develop future roadway conditions including the 3-County travel demand model and the list approach. However, neither approach appeared to provide reasonable growth in the Thornton area, with the 3-County model showing a ten-fold increase in traffic while the list method identified a single past, present or probable future project. The County's 2014 General Plan DEIR identified an annual growth of 1.5% annually between 2010 and 2035. After discussion with County staff it was determined that the 1.5% annual growth rate would be applied between 2020 and 2040 in the project vicinity as this rate is generally consistent with the County-wide annual growth rate of 1.35% based on their ongoing Transportation Impact Mitigation Fee (TIMF) update. The LOS standards will continue to be satisfied under Cumulative conditions with and without the proposed project. 95th percentile queues will be two vehicles or less.

EXISTING SETTING

This section of the study presents a description of existing conditions in the study area. Information presented in this section of the study is based on on-site field observations, current traffic count data and other data available from local and state agencies. This section of the traffic impact study also describes analysis methods applied for this study as well as the evaluation criteria used to determine the significance of project-related effects.

Circulation System

This traffic impact study presents analyses of traffic operating conditions at intersections near the project that may be affected by the proposed project. The limits of the study area were identified through discussions with county staff.

The following is a description of roadways that provide access to the proposed project site.

Walnut Grove Road. Walnut Grove Road (County Road J11) is classified as a major collector roadway per the 2035 San Joaquin County General Plan and runs east-west from Walnut Grove, at the Sacramento River, east to the town of Thornton. It is classified as a minor collector east of N. Thornton Road. Walnut Grove Road is generally a two-lane facility with left turn lanes at the northbound and southbound I-5 on-ramps. The roadway has a speed limit of 55 miles per hour (mph) west from the northbound I-5 ramps. The roadway carries about 4,100 vehicles per day (vpd) west of N. Thornton Road. East of N. Thornton Road, the roadway is generally two lanes with a westbound right turn lane approaching the N. Thornton Road intersection. The posted speed is 25 mph east of the northbound I-5 ramps into the town of Thornton. Between N. Thornton Road and Mokelumne Avenue the roadway carries about 3,440 vpd.

N. Thornton Road. N. Thornton Road (County Road J8) is a two-lane roadway and is classified as a major collector roadway north of Walnut Grove Road. The roadway carries about 3,340 vpd north of the existing Ramos Oil driveway.

Study Area Intersections

The quality of traffic flow is typically governed by the operation of major intersections. For this study three intersections in the vicinity of the site and three driveways were evaluated.

The **I-5 Southbound Ramps / Walnut Grove Road intersection** provides access between I-5 and Walnut Grove Road. The southbound ramps are part of a tight diamond interchange and provide one-way connections to and from I-5. The southbound and eastbound approaches are single lane while the westbound approach includes a through lane and a left turn lane. Southbound off-ramp traffic is stop controlled.

The **I-5 Northbound Ramps / Walnut Grove Road intersection** also provides access between I-5 and Walnut Grove Road. The northbound ramps are the east leg of the tight diamond interchange and provide one-way connections to and from I-5. The northbound and westbound approaches are

single lane while the eastbound approach includes a through lane and a left turn lane. Northbound off-ramp traffic is stop controlled.

The **Walnut Grove Road / N. Thornton Road intersection** is a tee intersection with stop control along southbound N. Thornton Road. The eastbound Walnut Grove Road approach is a single lane while the westbound approach includes a through lane and a right turn lane. Southbound N. Thornton Road includes dedicated right and left turn lanes and is stop controlled.

The **Walnut Grove Road / Mokelumne Avenue – East Driveway intersection** is a four-leg intersection with stop control along Mokelumne Avenue and unsigned yield control at the card lock driveway. All roadway approaches are single lane and Mokelumne Avenue is also stop controlled. The Ramos Oil card lock driveway is outbound only.

Public Transportation

The San Joaquin Regional Transit District (SJRTD) is the primary provider of public transportation service in San Joaquin County. SJRTD provides fixed-route, flexible fixed-route, and dial-a-ride services in the County. SJRTD does not operate scheduled service in Thornton. In rural areas the available services are described below.

- **RTD Van Go! Service** is an on-demand rideshare service for rural communities within San Joaquin County including Thornton. RTD Van Go! allows transferring between service zones and transfers to fixed-route bus service. Weekend and holiday service is available. Advance reservations are recommended although bookings can be made on the same day of travel. The program is an on-demand rideshare service that operates between 8:00 and 5:00 every day.

- **Dial-a-Ride** provides curb-to-curb transportation to persons who qualify under the Americans with Disabilities Act. The program is specifically designed for individuals who, due to their disability, are unable to use the fixed-route services in San Joaquin County. This service is available 365 days a year by appointment only during Stockton Metropolitan Area (SMA) service hours and within ¾ mile of an SMA fixed route.

Bicycles. San Joaquin County is developing a Bicycle Master Plan Update to identify gaps in the existing bicycle network, propose ways to create a more connected network and develop supporting facilities. The SJCOG *Regional Bicycle, Pedestrian and Safe Routes to School Master Plan (2012)* notes the current status and planned improvements to facilities countywide. Caltrans bicycle facilities are generally divided into four categories:

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

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

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

- **Class IV Bikeway (Separated Bikeway):** A Class IV bikeway (separated bikeway) is a bikeway for the exclusive use of bicycles and includes a separation required between the separated bikeway and the through vehicular traffic.

Bicycle infrastructure in the Thornton area of San Joaquin County is limited. Paved shoulders are present along some roadways in the project vicinity. No marked Class III bike routes are identified. The SJCOG Regional Master Plan identified two Class III bike route projects in the Thornton area. One project extends from the County line to Turner Road while the second route is along Walnut Grove Road from Thornton Road south, to the County line.

Sidewalks. Pedestrian infrastructure, which includes sidewalks, crosswalks, refuge islands, signs and traffic signals is present in Thornton on a limited basis, typically associated with new development. This is due to the rural nature of the community. In the project vicinity sidewalk is present along the developed north side of Walnut Grove Road – N. Thornton Road, including along the entire project frontage. The San Joaquin Council of Governments (SJCOG) *Regional Bicycle, Pedestrian and Safe Routes to School Master Plan* (September 2012) did not identify any future County-funded projects to add additional pedestrian infrastructure.

METHODOLOGY

The following is a description of the methods used in the analysis presented in this traffic impact study.

Vehicle Miles Traveled

In the *San Joaquin County Traffic Impact Study Guidelines*, the impact of a project on LOS is an important factor in determining whether a project has a significant impact. However, recent changes to CEQA have changed how lead agencies use LOS in determining whether a project has a significant impact on transportation. As noted in the California Governor's Office of Planning and Research (OPR) document *Technical Advisory on Evaluating Transportation Impacts in CEQA* (California Governor's Office of Planning and Research 2018),

> "Senate Bill 743 (Steinberg, 2013), which was codified in Public Resources Code section 21099, required changes to the guidelines implementing CEQA (CEQA Guidelines) (Cal. Code Regs., Title 14, Div. 6, Ch. 3, § 15000 et seq.) regarding the analysis of transportation impacts. . . OPR has proposed, and the California Natural Resources Agency (Agency) has certified and adopted, changes to the CEQA Guidelines that identify vehicle miles traveled (VMT) as the most appropriate metric to evaluate a project's transportation impacts. With the California Natural Resources Agency's certification and adoption of the changes to the CEQA Guidelines, automobile delay, as measured by "level of service" and other similar metrics, generally no longer constitutes a significant environmental effect under CEQA. (Pub. Resources Code, § 21099, subd. (b)(3).)"

Notably, the *San Joaquin County Traffic Impact Study Guidelines* was prepared before the recent changes to CEQA due to Senate Bill 743 (Steinberg 2013). As a result, the County guidelines specify use of LOS in determining whether a project has a significant impact. Consistent with the approach described in the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA*, LOS will not be used in this traffic impact study as a basis for identifying significant impacts. Rather, the methods, assumptions and significance thresholds presented in the County guidelines will be used to determine whether the project is consistent or inconsistent with General Plan policies on LOS, and whether the magnitude of inconsistency should be considered significant or less than significant.

Certain types of projects as identified in statute, the CEQA Guidelines, or in OPR's Technical Advisory are presumed to have a less than significant impact on VMT and therefore a less than significant impact on transportation. Generally, the identified projects contribute to efficient land use patterns enabling higher levels of walking, cycling, and transit as well as lower average trip length. These projects include, for example, projects in transit priority areas, projects consisting of residential infill or those located in low VMT areas.

Caltrans references OPR's December 2018 *Technical Advisory on Evaluating Transportation Impacts in CEQA*, which identifies projects and areas presumed to have a less than significant transportation impact. Those include:

1. Residential, office, or retail projects within a Transit Priority Area, where a project is within a ½ mile of an existing or planned major transit stop or an existing stop along a high-quality transit corridor.

    a. A major transit stop is defined as a site containing an existing rail transit station, a ferry terminal served by either a bus or rail transit service, or the intersection of two or more major bus routes with a frequency of service interval of 15 minutes or less during the morning and afternoon peak commute periods (Pub. Resources Code, § 21064.3).

    b. A high-quality transit corridor is defined as a corridor with fixed route bus service with service intervals no longer than 15 minutes during peak commute hours (Pub. Resources Code, § 21155).

2. An area pre-screened by an agency as having low residential or office VMT:

    a. An area where existing residential projects exhibit VMT per capita 15 percent or more below city or regional average.

    b. An area where existing office projects exhibit VMT per capita 15 percent or more below regional average.

3. Residential projects composed of 100 percent or near-100 percent affordable housing located in any infill location. Additionally, per OPR's Technical Advisory, "Lead agencies may develop their own presumption of less than significant impact for residential projects (or residential portions of mixed use projects) containing a particular amount of affordable housing, based on local circumstances and evidence. Furthermore, a project which includes any affordable residential units may factor the effect of the affordability on VMT into the assessment of VMT generated by those units."

4. A locally-serving retail project (such a project typically reduces vehicle travel by providing a more proximate shopping destination, i.e., better accessibility).

5. Mixed-use projects composed entirely of the above low-VMT project types.

6. In any area of the state, absent substantial evidence indicating that a project would generate a potentially significant level of VMT, or inconsistency with a Sustainable Communities Strategy (SCS) or general plan, projects that generate or attract fewer than 110 trips per day generally may be assumed to cause a less-than significant transportation impact.

However, a land use project near transit may have a significant impact on VMT if it:

1. Has a floor area ratio less than 0.75.
2. Includes more parking than required by the local permitting agency.

3. Is inconsistent with the region's Sustainable Communities Strategy (i.e., development is outside region's development footprint, or in area specified as open space).
4. Replaces affordable residential units with a smaller number of moderate- or high-income residential units.

In very limited situations, analysis or mitigation may be appropriate in low VMT areas to address specific multimodal access management issues directly caused by the project such as issues related to line of sight caused by the placement of a driveway. These situations are to be determined based on the details of development proposals and their setting and will be addressed in future guidance.

Should a project not meet the minimum screening thresholds, a VMT analysis should be conducted. The OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* (California Governor's Office of Planning and Research 2018) identifies a threshold of 15 percent below the baseline for determining the significance of VMT impacts associated with residential and office land use developments. Locally-serving retail projects, such as a project that reduces vehicle travel by providing a more proximate shopping destination, i.e., better accessibility is considered to have a less than significant transportation impact.

General Plan Policy Consistency Criteria

The significance of the proposed project's inconsistency with General Plan policies is based on a determination of whether resulting LOS is considered acceptable. A project's inconsistency with General Plan policies is considered substantial if implementation of the project would result in LOS changing from levels considered acceptable to levels considered unacceptable, or if the project would substantially worsen already unacceptable LOS.

LOS analysis provides a basis for describing existing traffic conditions and for evaluating the significance of project-related traffic impacts. LOS measures the quality of traffic flow and is represented by letter designations from A to F, with a grade of A referring to the best conditions, and F representing the worst conditions. The characteristics associated with the various LOS for intersections are presented in Table 1.

Where County roadways are designated as part of SJCOG's CMP, both the County and CMP LOS standards shall apply. (RDR/PSP). Neither Walnut Grove Road nor N. Thornton Road are identified as a route of regional significance.

The methods contained in the 6th Edition of the Highway Capacity Manual (HCM) were used with Synchro software employed to assess each intersection.

TABLE 1 INTERSECTION LEVEL OF SERVICE DEFINITIONS		
Level of Service	**Signalized Intersection**	**Unsignalized Intersection**
A	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/vehicle
B	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/vehicle and ≤ 15 sec/vehicle
C	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/vehicle and ≤ 25 sec/vehicle
D	Significant congestion of critical approaches, but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/vehicle and ≤ 35 sec/vehicle
E	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/vehicle and ≤ 50 sec/vehicle
F	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/vehicle
Source: HCM, 6th Edition.		

Level of Service Thresholds

The importance of the proposed project's impact on traffic operating conditions is based on a determination of whether resulting LOS is considered acceptable under applicable standards. These standards are adopted by the agencies with jurisdiction for each facility. The I-5 Northbound and Southbound Ramp intersections with Walnut Grove Road are under Caltrans jurisdiction. The remaining intersections are under San Joaquin County jurisdiction.

San Joaquin County. The importance of the project's impact on traffic operating conditions is based on a determination of whether resulting intersection LOS is considered acceptable. A project's impact on traffic conditions is considered substantial if implementation of the project would result in LOS changing from levels considered acceptable to levels considered unacceptable, or if the project would worsen already unacceptable LOS.

Policy TM-3.1, Roadway Provision, of the *San Joaquin County General Plan Policy Document* (County of San Joaquin 2016) states, in part:

> "The County shall maintain Level of Service (LOS) standards consistent with the San Joaquin Council of Governments (SJCOG) Congestion Management Program (CMP) for State highways and designated County roadways and intersections of

> regional significance. Per the CMP, all designated CMP roadways and intersections shall operate at a LOS D or better except for roadways with "grandfathered" LOS. LOS for State highways shall be maintained in cooperation with Caltrans. The County LOS standard for intersections is LOS "D" or better on Minor Arterials and roadways of higher classification and LOS "C" or better on all other non-CMP designated County roadways and intersections. The County shall also maintain the following:
>
> - on State highways, LOS D or Caltrans standards whichever is stricter.
> - within a city's sphere of influence, LOS D, or the city planned standards for that level of service.
> - on Mountain House Gateways, as defined in the Mountain House Master Plan, LOS D, on all other Mountain House roads, LOS C."

The *San Joaquin County 2035 General Plan Environmental Impact Report* (County of San Joaquin 2014) states,

> "For any Regional Congestion Management Program (RCMP) designated roadway or intersection currently operating or expected to operate at LOS D or better under No Project conditions, the project would result in a significant impact if the project-added traffic would result in LOS E or F operating conditions. For RCMP intersections or roadways currently operating or expected to operate at LOS E or F under No Project conditions, the project would result in a significant impact if it would increase:
>
> - Average delay by 4 seconds or more (intersections); or
> - The volume-to-capacity (v/c) ratio by 1.0 or more."

I-5 is a designated RCMP roadway. Therefore, based on the *San Joaquin County General Plan Policy Document* and the *San Joaquin County 2035 General Plan Environmental Impact Report*, LOS D is considered the acceptable LOS threshold level for the ramp intersections at Walnut Grove Road.

If the Ramos Oil Project would result in LOS at the study facility changing from acceptable LOS or better to unacceptable LOS or worse, the impact will be considered inconsistent with the General Plan. Recommended measures which would result in acceptable LOS at the study facility will be considered to reduce the impact to a less-than-substantial level.

Consistent with the *San Joaquin County 2035 General Plan Environmental Impact Report*, if an RCMP study facility is already operating at an unacceptable LOS E or F under Existing conditions, or under Cumulative No Project conditions, increasing delay at an intersection by four seconds or more will be considered inconsistent with the General Plan.

Travel Forecasting

For this analysis alternative sources for information regarding future traffic volumes in this area of San Joaquin County were reviewed and considered. Traffic volumes were developed for two scenarios:

- Existing Plus Approved Projects (EPAP), and
- Cumulative (Year 2040).

The EPAP scenario assumes completion of approved development projects in San Joaquin County. San Joaquin County planning staff was contacted and identified one approved project in the Thornton area that would add background traffic to the existing roadway conditions.

Long Term cumulative traffic volumes were considered using the 3-County model; however, Thornton is located at the north edge of the San Joaquin-Sacramento County line. Travel demand models (TDM) tend to be less accurate at cordon locations. When considering UC-6, the Thornton community details identified in the General Plan, the model appears to project volumes along Walnut Grove Road and N. Thornton Road ten-fold higher than baseline conditions. A second approach was considered, the list approach, and is identified in Section 15130(b) of the *State of California Environmental Quality Act (CEQA).* However, the only current project in the Thornton area was identified in the EPAP scenario. The 2014 General Plan DEIR identified an annual growth of about 1.5% between 2010 and 2035 in the Thornton area. This growth rate is generally consistent with the County-wide annual growth rate of 1.35% based on their ongoing Transportation Impact Mitigation Fee (TIMF) update. County staff concurred with applying a 1.5% annual growth rate to vicinity traffic between 2020 and 2040.

EXISTING CONDITIONS

Intersection Traffic Volumes

Figure 3 presents current a.m. and p.m. peak hour traffic volumes and geometry at study intersections. Intersection turning movements (ITM's) at the study intersections along Walnut Grove Road and N. Thornton Road were based on *StreetLight Data* traffic pattern analytics information for 2019, prior to Covid-19 altering traffic volumes.

Intersection Levels of Service

Table 2 presents existing a.m. peak hour and p.m. peak hour Level of Service at the study locations. The worksheets presenting the calculation of LOS are included in the technical appendix. As indicated, all study intersections operate with Levels of Service that satisfy the minimum LOS C/D standards. None of the intersections meet the peak hour signal warrant.

TABLE 2
EXISTING INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour		PM Peak Hour		Peak Hour Warrant Met?
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	
1. Walnut Grove Rd / SB I-5 Ramps						
SB Approach	SB Stop	11.8	B	12.5	B	No
WB Left		7.7	A	8.0	A	
2. Walnut Grove Rd / NB I-5 Ramps						
NB Approach	NB Stop	11.9	B	11.0	B	No
EB Left		7.7	A	7.8	A	
3. Walnut Grove Rd / N. Thornton Rd						
SB Approach	SB Stop	9.6	A	11.7	B	No
EB Left		7.6	A	8.0	A	
4. Walnut Grove Rd / Mokelumne Ave						
NB Approach	NB/SB	10.2	B	10.5	B	No
SB Approach	Stop	9.5	A	10.0	B	
WB Left		7.5	A	7.5	A	
5. N. Thornton Rd / Project Driveway						
SB Left	WB	---	N/A	---	N/A	No
WB Approach	Stop*	---	N/A	---	N/A	

* Currently one-way inbound
N/A – not available



6

114 (173)

(133) 99

Site Dwy/ Walnut Grove Rd

1

(63) 50
(0) 0
(33) 43

138 (123)
76 (89)

R1-1

(88) 41
(129) 60

I-5 SB Ramps/ Walnut Grove Rd

2

69 (79)
93 (122)

R1-1

(38) 10
(113) 91

38 (105)
0 (0)
121 (71)

I-5 NB Ramps/ Walnut Grove Rd

3

(76) 49
(92) 82

54 (78)
60 (95)

R1-1

(147) 59
(57) 50

Walnut Grove Rd/ N Thornton Rd

4

(5) 5
(0) 0
(5) 5

78 (153)
5 (5)

R1-1

(137) 109
(14) 10

5 (6)
31 (15)

Mokelumne Ave/ Walnut Grove Rd

5

(0) 0
(142) 111

10 (10)
88 (185)

N Thornton Rd/ Site Dwy

EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 3

95th Percentile Queues

The length of left turn lane queues was determined from the Synchro LOS results. Table 3 indicates that the longest current left turn queue is 33 feet along the northbound I-5 off-ramp at Walnut Grove Road.

TABLE 3
EXISTING PEAK HOUR QUEUES

Intersection	Lane	Storage (feet)	AM Peak Hour		PM Peak Hour	
			Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)
1. Walnut Grove Rd / SB I-5 Ramps	SB[1]	950	93	<25	96	<25
	WB left	180	76	<25	89	<25
2. Walnut Grove Rd / NB I-5 Ramps	NB[1]	950	159	33	176	<25
	EB left	180	10	<25	38	<25
3. Walnut Grove Rd / N. Thornton Rd	SB left	n/a	49	<25	76	<25
	SB right	325	82	<25	92	<25
	EB left[2]	n/a	59	<25	147	<25
4. Walnut Grove Rd / Mokelumne Ave	NB[1]	n/a	36	<25	21	<25
	WB left[2]	n/a	5	<25	5	<25
5. N. Thornton Rd / Project Driveway	SB left[2]	n/a	0	<25	0	<25

[1] volume is sum of all movements on minor approach

[2] volume is left turn movements in through lane

n/a – not applicable

PROJECT CHARACTERISTICS

The development of the project would result in vehicle traffic to and from the project site. The amount of additional traffic on a particular section of the street network is dependent upon three factors:

- Trip Generation, the number of new trips generated by the project,
- Trip Distribution, the direction of travel for the new traffic, and
- Trip Assignment, the specific routes used by the new traffic.

Trip Generation

Trip generation is determined by identifying the type and size of land use being developed. Recognized sources of trip generation data may then be used to calculate the total number of trip ends resulting from the day-to-day operation of the businesses in the project.

The trip generation for this project was calculated using trip generation rates published in the *Trip Generation Manual* (Institute of Transportation Engineers, 10th Edition, 2017). The project includes a 12-fueling position gas station with a 4,100 square foot convenience store with fast-food drive-through lane on the back side of the convenience store. Land uses where the convenience store is greater than 3,000 square feet with at least 10 fueling positions is categorized as Land Use 960, Super Convenience Market / Gas Station where a significant business exists for to-go food and drink and groceries. A search of the ITE database including research, publications and library yielded no information on how to address a fast-food drive-through only component of a multi-use retail use. The inclusion of a fast-food drive-through restaurant is likely to overestimate total trips as this rate includes both drive-through and walk-in customers. Due to the super convenience store facility size and the secondary nature of the drive-through component, it was concluded that the drive-through element would not add enough traffic to affect the study intersections. Table 4 presents the trip generation for the project.

Trips generated by retail commercial projects fit into two categories. Some trips will be made by patrons who would not otherwise be on the local street system and who go out of their way to reach the site. These are "new" trips. Other trips will be made by patrons who are already in the roadway network and stop by the site as part of a trip made for another purpose. These “pass-by” trips do not add traffic to the overall system. ITE research has suggested typical "pass-by" percentages for various retail land uses and are reflected in Table 4.

The project is projected to generate 3,434 daily trips with 340 a.m. peak hour trips and 284 p.m. peak hour trips. After accounting for pass-by trips the site is expected to generate 130 new a.m. peak hour trips and 124 new p.m. peak hour trips.

Trip Distribution and Assignment. The distribution of project trips was estimated based on existing traffic patterns in the Thornton area. The assignment of project trips to the local roadways will reflect the least time path between origin and destination along alternative routes, and the quickest path may vary over the course of the day. Trips heading south toward Stockton and north toward Sacramento are generally expected to use I-5 with traffic heading east toward Galt using New Hope Road. Figure 4 presents the projected trip distribution and project trip assignment.

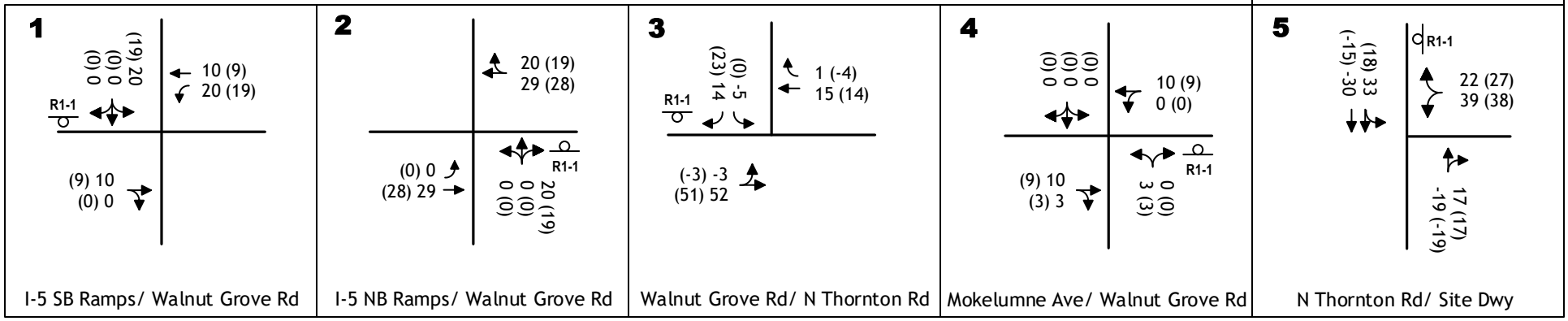
TABLE 4
TRIP GENERATION

Land Use	Unit Quantity	Size	Trips Per Unit						
				AM Peak Hour			PM Peak Hour		
			Daily	In	Out	Total	In	Out	Total
Super Convenience Market / Gas Station (LU 960)	KSF	4.10	837.58	50%	50%	83.14	50%	50%	69.28
Super Convenience Market / Gas Station (LU 960)			3,434	170	170	340	142	142	284
Sub-Total Trips			**3,434**	170	170	**340**	142	142	**284**
Pass-By Trips									
Super Convenience Market / Gas Station (LU 960) *(59% Daily, 62% AM, 56% PM)*			(2,026)	(106)	(106)	(211)	(80)	(80)	(160)
Total Pass-by Trips			**(2,026)**	(106)	(106)	**(211)**	(80)	(80)	**(160)**
Net New Trips			**1,408**	**65**	**65**	**130**	**62**	**62**	**124**

KSF – thousand square feet

Numbers may not match due to rounding





TRIP DISTRIBUTION PERCENTAGES AND PROJECT ONLY TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 4

EXISTING PLUS PROJECT IMPACTS

Vehicle Miles Traveled

The project serves as a local use to the Thornton area as well as providing traffic along I-5 with refueling and convenience options. The County's *Draft VMT Thresholds Study* (July 2020 by GHD) is consistent with the OPR *Technical Advisory on Evaluating Transportation Impacts in CEQA* and notes that retail projects less than 50,000 square feet shall be presumed to have less than significant VMT effects. The project is locally serving retail and would be expected to reduce vehicle travel from the Thornton area to outside by providing a more proximate shopping location. It is considered to have less than significant VMT effects.

Intersection Levels of Service

Figure 5 displays the resulting a.m. peak hour and p.m. peak hour Existing Plus Project traffic volumes and intersection lane geometrics for each study intersection. Table 5 compares current and Plus Project Levels of Service. All LOS will continue to satisfy the County's minimum LOS C/D standard. None of the intersections will meet the peak hour signal warrant.

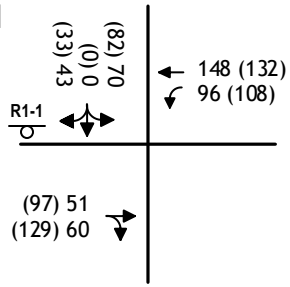
95th Percentile Queues

The length of left turn lane 95th percentile queues was determined from the Synchro analysis. The longest queue occurs along the northbound I-5 off-ramp with a queue of 28 feet, as indicated in Table 6.

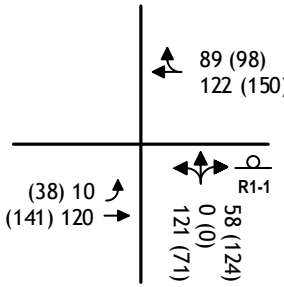


6 — Site Dwy/ Walnut Grove Rd

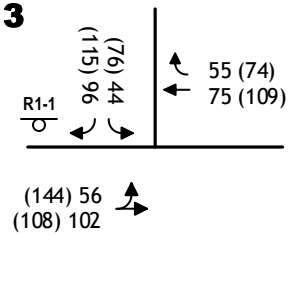
1 — I-5 SB Ramps/ Walnut Grove Rd



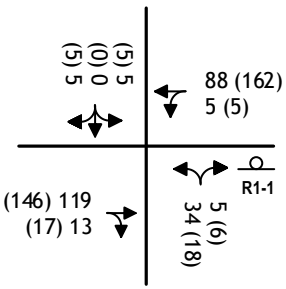
2 — I-5 NB Ramps/ Walnut Grove Rd



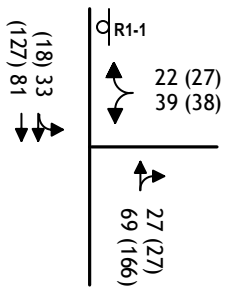
3 — Walnut Grove Rd/ N Thornton Rd



4 — Mokelumne Ave/ Walnut Grove Rd



5 — N Thornton Rd/ Site Dwy



EXISTING PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 5

TABLE 5
EXISTING PLUS PROJECT INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour				Peak Hour Warrant Met?
		Existing		Existing Plus Project		Existing		Existing Plus Project		
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	
1. Walnut Grove Rd / SB I-5 Ramps										
SB Approach	SB Stop	11.8	B	13.4	B	12.5	B	14.1	B	No
WB Left		7.7	A	7.8	A	8.0	A	8.1	A	
2. Walnut Grove Rd / NB I-5 Ramps										
NB Approach	NB Stop	11.9	B	13.2	B	11.0	B	11.6	B	No
EB Left		7.7	A	7.9	A	7.8	A	7.9	A	
3. Walnut Grove Rd / N. Thornton Rd										
SB Approach	SB Stop	9.6	A	9.9	A	11.7	B	12.0	B	No
EB Left		7.6	A	7.6	A	8.0	A	8.0	A	
4. Walnut Grove Rd / Mokelumne Ave										
NB Approach	NB/SB	10.2	B	10.4	B	10.5	B	10.7	B	No
SB Approach	Stop	9.5	A	9.6	A	10.0	B	10.1	B	
WB Left		7.5	A	7.5	A	7.5	A	7.6	A	
5. N. Thornton Rd / Project Driveway										
SB Left	WB Stop	---	N/A	7.5	A	---	N/A	10.5	B	No
WB Approach		---	N/A	10.2	B	---	N/A	7.7	A	
6. Walnut Grove Rd / Project Driveway										
SB	SB Stop	---	N/A	10.5	B	---	N/A	10.8	B	No
EB Left		---	N/A	7.7	A	---	N/A	7.8	A	

N/A – not available

TABLE 6
EXISTING PLUS PROJECT PEAK HOUR QUEUES

Intersection	Lane	Storage (feet)	AM Peak Hour					PM Peak Hour				
			Existing		Ex Plus Project			Existing		Ex Plus Project		
			Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)
					Project	Total				Project	Total	
1. Walnut Grove Rd / SB I-5 Ramps	SB[1]	950	93	<25	20	113	28	96	<25	19	115	25
	WB left	180	76	<25	20	96	<25	89	<25	19	108	<25
2. Walnut Grove Rd / NB I-5 Ramps	NB[1]	950	159	33	20	179	40	176	<25	19	195	28
	EB left	180	10	<25	0	10	<25	38	<25	0	38	<25
3. Walnut Grove Rd / N. Thornton Rd	SB left	n/a	49	<25	-5	44	<25	76	<25	0	76	<25
	SB right	325	82	<25	14	96	<25	92	<25	23	115	<25
	EB left[2]	n/a	59	<25	-3	56	<25	147	<25	-3	144	<25
4. Walnut Grove Rd / Mokelumne Ave	NB[1]	n/a	36	<25	3	39	<25	21	<25	3	24	<25
	WB left[2]	n/a	5	<25	0	5	<25	5	<25	0	5	<25
5. N. Thornton Rd / Project Driveway	SB left[2]	n/a	0	<25	33	33	<25	0	<25	18	18	<25
	WB[1]	n/a	n/a	n/a	61	61	<25	n/a	n/a	65	65	<25
6. Walnut Grove Rd / Project Driveway	SB[1]	n/a	n/a	n/a	111	111	<25	n/a	n/a	78	78	<25
	EB left[2]	n/a	n/a	n/a	68	68	<25	n/a	n/a	71	71	<25

[1] volume is sum of all movements on minor approach
[2] volume is left turn movements in through lane
negative volume indicates reduction from pass-by trip.
n/a – not applicable

Site Access and Internal Circulation

The project site plan was reviewed with regards to key issues such as proximity to other driveways and driveway throat depth.

Driveway Access. There are three existing driveways for the Thornton Plaza site, all currently used for the card-lock fueling station. This includes one inbound only driveway along N. Thornton Road and a full access driveway and an exit only driveway along Walnut Grove Road; the full access driveway is used by non-semi-trailer trucks due to the approximate 135° right turn all vehicles must complete prior to entering the fueling positions. The site is arranged to have oversized vehicles enter from N. Thornton Road with all vehicles exiting onto Walnut Grove Road, at Mokelumne Avenue.

The project will construct a third driveway along Walnut Grove Road about midway (150± feet) between the Walnut Grove Road / N. Thornton Road intersection and the full access driveway. This driveway will be used for access to the general use fueling positions and the convenience market. The proposed fast-food drive-through entrance will be accessed from either of the two full access driveways along Walnut Grove Road. The driveway at the N. Thornton Road driveway, currently one-way inbound, is proposed to allow full access for the gas station / convenience store.

Internal Circulation. The current circulation of the site provides inbound access from the N. Thornton Road driveway, outbound departures onto Walnut Grove Road, opposite Mokelumne Avenue and a full access driveway about 120 feet west of the outbound only driveway; as noted earlier, any vehicles using the card-lock fueling positions must make a right turn of about 135° prior to entering the fueling positions.

The proposed project will construct 12 fueling positions for public use adjacent to the Walnut Grove Road / N. Thornton Road intersection. Vehicles entering from Walnut Grove Road will enter the drive aisle directly adjacent to the front of the convenience store, about 150 feet east of the N. Thornton Road intersection. Vehicles will be able to approach and depart the fueling positions from either direction. Vehicles exiting onto Walnut Grove Road will have about 25 feet between the roadway and the internal drive aisle to queue. Vehicles entering the site from N. Thornton Road will enter the driveway and make a 45° turn to the right to access the fueling pumps or convenience store. Vehicles departing via N. Thornton Road will need to stop prior to entering the driveway area and proceed to the driveway.

Vehicles accessing the fast-food drive-through lane will enter from the south side of the site, adjacent to Walnut Grove Road. Vehicles can enter the drive-through directly from either driveway along Walnut Grove Road while vehicles entering from N. Thornton Road will have to circulate around the perimeter of the fueling positions or along the convenience market frontage. Vehicles exiting the drive-through lane can access the N. Thornton Road driveway directly or drive past the market to Walnut Grove Road.

Sight Distance. Sight distance at the existing project driveway on N. Thornton Road and the future project driveway along Walnut Grove Road was evaluated based on the requirements of the Caltrans Highway Design Manual (HDM), Chapters 2 and 4. Both roadways are level and straight.

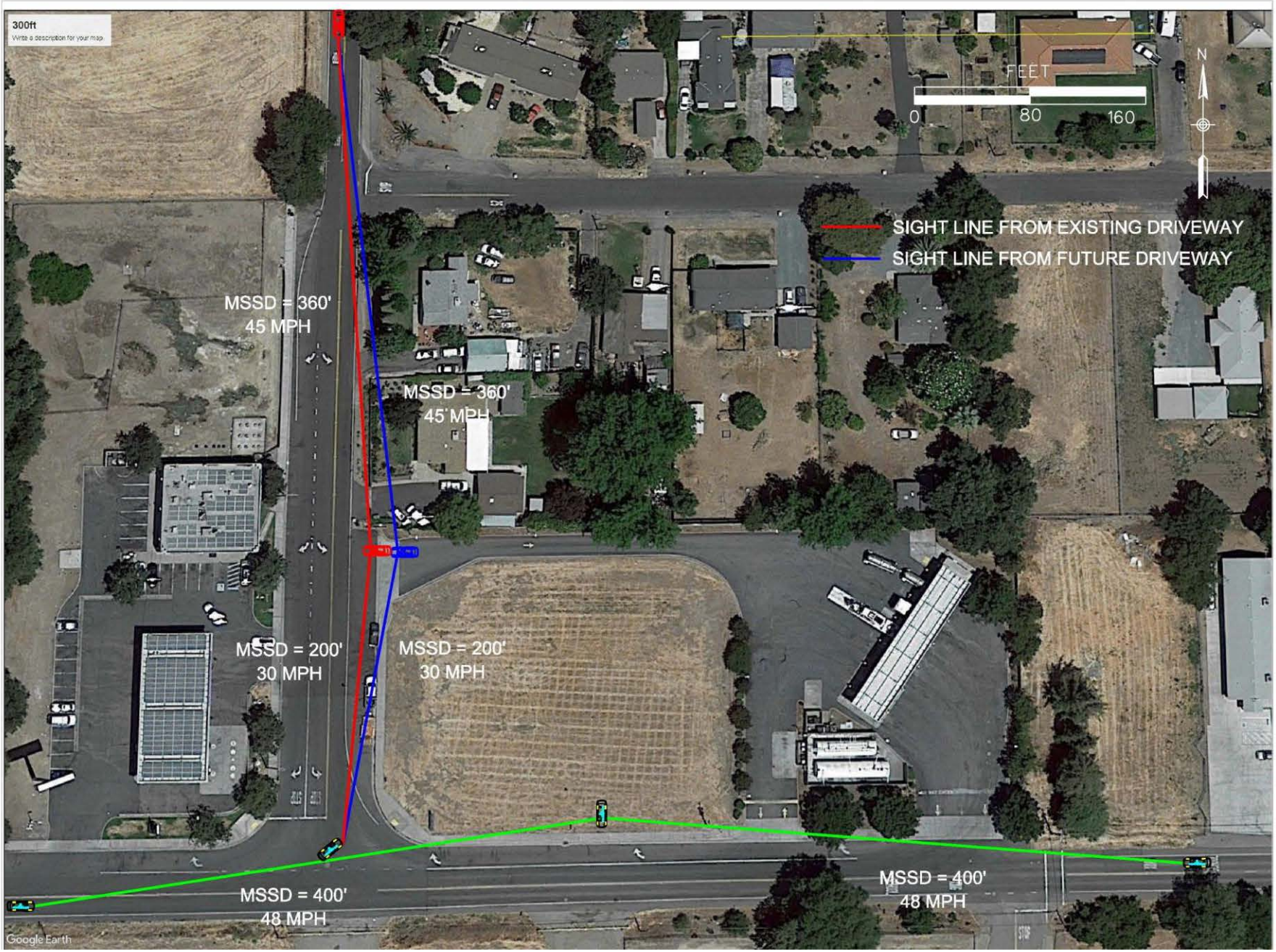
The posted speed limit on Walnut Grove Road is 25 mph while the speed limit along N. Thornton Road is unposted but should be a prima facie 25 mph in the residential and business area. The driveways are considered urban driveways as defined in the HDM, as the surrounding development includes urban type development, including curbs, gutters and sidewalks. Therefore, Minimum Stopping Sight Distance standards (MSSD) was used. For 25 mph speeds the MSSD is 150 feet.

Sight distance at the driveway along Walnut Grove Road is unconstrained to both east and west. Figure 6 illustrates the sight lines from the approximate location of an outbound vehicle 15 feet behind the edge of travel way. The sight distance, assuming clear lines of sight, appears to be at least 350 feet in both directions. This equals about a 45-mph approach.

Sight distance at the N. Thornton Road driveway becomes relevant once the project is constructed as the driveway is proposed to be converted from one-way inbound to two-way for the passenger car portion of the gas station, i.e., card lock users will continue to exit via the outbound only driveway along Walnut Grove Road. At the time the card lock facility was built the entire frontage of Thornton Plaza was constructed. The curb line of the N. Thornton Road driveway is set back about 20 feet from the existing shoulder stripe with Type N-1 and SW44 signs and a metal beam guard rail identifying the edge of an obstruction in the roadway; in this location, the full future roadway width ends. Figure 6 illustrates the sight line to the south under existing roadway conditions and under future conditions where a motorist will be stopped based on the prolongation of the existing curb line. It is assumed that currently motorists use the shoulder stripe as a limit line while in the future outbound vehicles will stop at the driveway edge. Truck parking was observed along the N. Thornton Road frontage. With a vehicle stopped at the shoulder stripe the sight line to the south allows visibility to the Walnut Grove Road / N. Thornton Road intersection, about 200 feet, beyond the parked truck. The associated design speed is 30 mph. However, parking between Walnut Grove Road and the driveway should be prohibited as motorists leaving the gas station / convenience store area have to look in their left blind spot (i.e., 135±° to the left and behind) to see oncoming vehicles. Vehicles parked along the frontage will not allow adequate visibility while inbound cars could enter at a higher rate of speed due to the large footprint required to allow semi-trailers to enter the driveway.

Figure 6 also illustrates sight lines looking to the north from the N. Thornton Road driveway. The widened roadway is about 6 inches above the shoulder to the north which allows a motorist to have a slightly higher line of sight. With a car stopped at the shoulder line the sight line to the north is at least 350 feet; however, a vehicle parked along the adjacent property's frontage could impede visibility. With a vehicle set back behind the driveway the sight line crosses the property frontage where landscaping currently hinders visibility.

Semi-trailer trucks are known to use this location to park, and their large profile will hinder sight lines to the south. Therefore, parking along the N. Thornton Road frontage should be prohibited.



SIGHT DISTANCE

EXISTING PLUS APPROVED PROJECTS (EPAP) CONDITIONS

Existing Plus Approved Project (EPAP) conditions represent San Joaquin County's estimate of future background conditions with development of land uses that can proceed without additional entitlement. San Joaquin County Planning staff was contacted for a list of approved projects to include in the EPAP analysis. County planning identified one project that has been approved that would add traffic to any of the local roadways. The Our Lady of Fatima Event Hall (PA-0900179) is an existing multipurpose assembly hall for public and community events. The event hall is operated by the Our Lady of Fatima Society. The event hall is approximately 12,000 square feet in size. The posted dining capacity of the event hall is 605 people. The proposed use of the event hall would include mid-week and mid-day activities. Based on a review of historical use of the event hall, and information provided by the applicant (San Joaquin County Department of Public Works 2009), the majority of events and the largest events would occur on Friday and Saturday evenings.

Intersection Traffic Volumes

The trips associated with the Our Lady of Fatima project were obtained from the traffic impact analysis prepared by KD Anderson & Associates. Traffic from the project was assigned to the study area intersections. As noted above, the majority and largest events would occur on Friday and Saturday evenings, therefore, the p.m. scenario represents a worst-case analysis. Approved project traffic for the a.m. peak hour and p.m. peak hour were superimposed onto the existing background volumes to create the EPAP baseline volumes and are illustrated in Figure 7 while EPAP plus Project traffic is presented in Figure 8.

Intersection Levels of Service

Table 7 presents the a.m. peak hour and p.m. peak hour LOS at the study locations under EPAP conditions. Under this scenario all project study intersections will continue meet the LOS C/D standard. None of the intersections will meet the peak hour signal warrant.

Intersection Queue Lengths

Table 8 presents a summary of the peak hour volume resulting 95th percentile queues at the study intersections for either left turns or along minor leg stop controlled approaches. The longest queue occurs in the I-5 northbound off-ramp where a queue of 33 feet is projected in the a.m. peak hour.

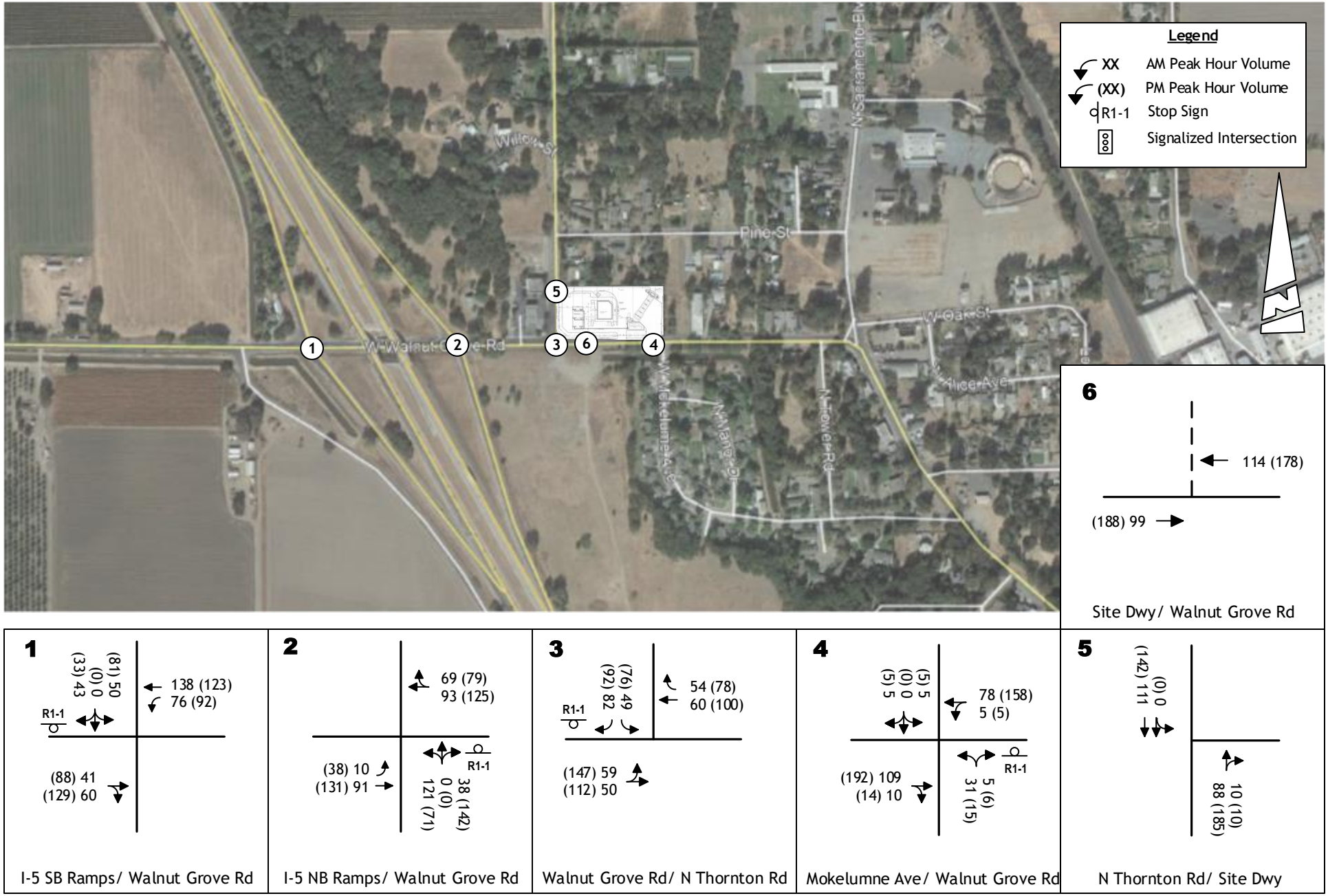
EPAP PLUS PROJECT CONDITIONS

Intersection Levels of Service

The addition of project trips will increase the length of delays at study intersections slightly. Table 7 presents the EPAP plus Project LOS conditions. The resulting Levels of Service will continue to meet the LOS C/D standard. None of the intersections will meet the peak hour signal warrant.

95th Percentile Queues

Table 8 presents the resulting 95th percentile queues at the study intersections for either left turns or along minor leg stop controlled approaches. The longest queue occurs in the I-5 northbound off-ramp where a queue of 40 feet is projected in the a.m. peak hour.



EXISTING PLUS APPROVED PROJECTS TRAFFIC VOLUMES AND LANE CONFIGURATIONS

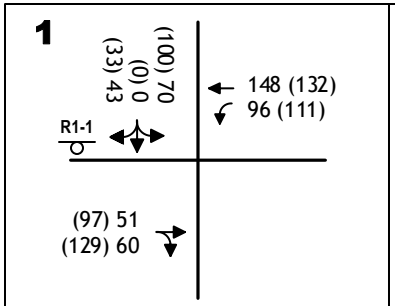
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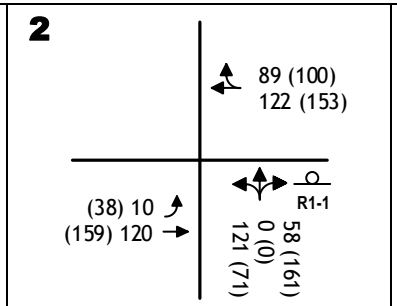
figure 7



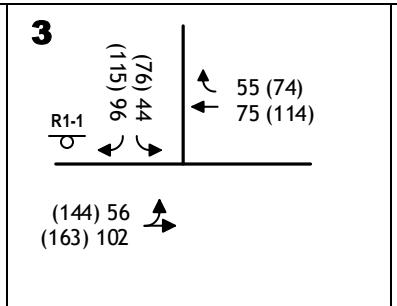
Site Dwy/ Walnut Grove Rd



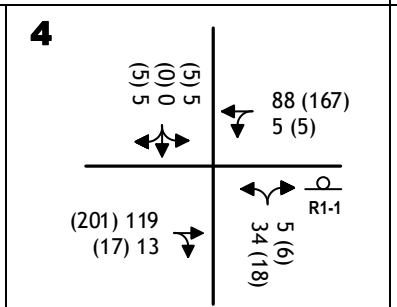
I-5 SB Ramps/ Walnut Grove Rd



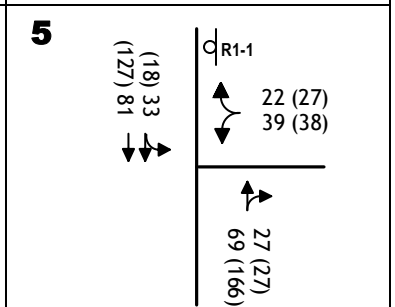
I-5 NB Ramps/ Walnut Grove Rd



Walnut Grove Rd/ N Thornton Rd



Mokelumne Ave/ Walnut Grove Rd



N Thornton Rd/ Site Dwy

EPAP PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 8

TABLE 7
EPAP PLUS PROJECT INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour				Peak Hour Warrant Met?
		EPAP		EPAP Plus Project		EPAP		EPAP Plus Project		
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	
1. Walnut Grove Rd / SB I-5 Ramps										
SB Approach	SB Stop	11.8	B	13.4	B	13.2	B	15.0	C	No
WB Left		7.7	A	7.8	A	8.0	A	8.1	A	
2. Walnut Grove Rd / NB I-5 Ramps										
NB Approach	NB Stop	11.9	B	13.2	B	11.4	B	12.1	B	No
EB Left		7.7	A	7.9	A	7.8	A	7.9	A	
3. Walnut Grove Rd / N. Thornton Rd										
SB Approach	SB Stop	9.6	A	9.9	A	12.2	B	12.5	B	No
EB Left		7.6	A	7.6	A	8.0	A	8.0	A	
4. Walnut Grove Rd / Mokelumne Ave										
NB Approach	NB/SB	10.2	B	10.4	B	11.0	B	11.3	B	No
SB Approach	Stop	9.5	A	9.6	A	10.4	B	10.5	B	
WB Left		7.5	A	7.5	A	7.7	A	7.7	A	
5. N. Thornton Rd / Project Driveway										
SB Left	WB Stop	---	N/A	7.5	A	---	N/A	10.5	B	No
WB Approach		---	N/A	10.2	B	---	N/A	7.7	A	
6. Walnut Grove Rd / Project Driveway										
SB	SB Stop	---	N/A	10.5	B	---	N/A	11.2	B	No
EB Left		---	N/A	7.7	A	---	N/A	7.8	A	

N/A – not available

TABLE 8
EPAP PLUS PROJECT PEAK HOUR QUEUES

Intersection	Lane	Storage (feet)	AM Peak Hour					PM Peak Hour				
			EPAP		EPAP Plus Project			EPAP		EPAP Plus Project		
			Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)
					Project	Total				Project	Total	
1. Walnut Grove Rd / SB I-5 Ramps	SB[1]	950	93	<25	20	113	28	114	<25	19	133	33
	WB left	180	76	<25	20	96	<25	92	<25	19	111	<25
2. Walnut Grove Rd / NB I-5 Ramps	NB[1]	950	159	33	20	179	40	213	30	19	232	38
	EB left	180	10	<25	0	10	<25	38	<25	0	38	<25
3. Walnut Grove Rd / N. Thornton Rd	SB left	n/a	49	<25	-5	44	<25	76	<25	0	76	<25
	SB right	325	82	<25	14	96	<25	92	<25	23	115	<25
	EB left[2]	n/a	59	<25	-3	56	<25	147	<25	-3	144	<25
4. Walnut Grove Rd / Mokelumne Ave	NB[1]	n/a	36	<25	3	39	<25	21	<25	3	24	<25
	WB left[2]	n/a	5	<25	0	5	<25	5	<25	0	5	<25
5. N. Thornton Rd / Project Driveway	SB left[2]	n/a	0	<25	33	33	<25	0	<25	18	18	<25
	WB[1]	n/a	n/a	n/a	61	61	<25	n/a	n/a	65	65	<25
6. Walnut Grove Rd / Project Driveway	SB[1]	n/a	n/a	n/a	111	111	<25	n/a	n/a	78	78	<25
	EB left[2]	n/a	n/a	n/a	68	68	<25	n/a	n/a	71	71	<25

[1] volume is sum of all movements on minor approach
[2] volume is left turn movements in through lane
negative volume indicates reduction from pass-by trip.
n/a – not applicable

CUMULATIVE YEAR 2040 CONDITIONS

The traffic impacts associated with the Ramos Oil project were also evaluated within the context of future traffic conditions occurring in this area of San Joaquin County. Based on projected growth identified in the County General Plan a 1.5% annual increase was used to generate future intersection volumes. Figure 9 presents the projected turning movements during both a.m. and p.m. peak hours under the Cumulative No Project conditions.

Future Roadway Improvements

The SJCOG administers Measure K, providing transportation improvements throughout San Joaquin County. No improvements are identified in the project vicinity based on the latest SJCOG 2017 RTP update.

Intersection Levels of Service

Table 9 presents the a.m. peak hour and p.m. peak hour LOS at each study intersection under 2040 conditions. All intersections are projected to operate within the LOS C/D threshold. The peak hour signal warrant is expected to be satisfied for the p.m. peak hour at the Walnut Grove Road / NB I-5 Ramps intersection and the Walnut Grove Road / N. Thornton Road intersection. The meeting of a warrant does not necessitate installation of a traffic signal but rather, identifies a location that should be monitored.

Queue Lengths

Table 10 presents 95th percentile queues at study area intersections under Year 2040 conditions. All forecasted queue lengths remain within available storage areas, with the longest queue of 45 feet occurring along the I-5 northbound off-ramp in the p.m. peak hour.

CUMULATIVE YEAR 2040 PLUS PROJECT CONDITIONS

Intersection Levels of Service

The addition of project trips will increase the length of delays at study intersections slightly. Figure 10 presents the projected turning movements during both a.m. and p.m. peak hours under the Cumulative Plus Project conditions. Table 9 presents the LOS results. All intersections will continue to operate above the LOS C/D threshold. The peak hour signal warrant will continue to be satisfied for the p.m. peak hour at the Walnut Grove Road / NB I-5 Ramps intersection and the Walnut Grove Road / N. Thornton Road intersection.

95th Percentile Queues

Table 10 presents 95th percentile queues at study area intersections under Year 2040 plus Project conditions. All forecasted queue lengths will continue to remain within available storage areas, with the longest queue of 50 feet occurring along the I-5 northbound off-ramp in the p.m. peak hour.



6

150 (230)

(180) 135

Site Dwy/ Walnut Grove Rd

1

185 (165)
100 (120)
(85) 65
(0) 0
(45) 60
R1-1
(120) 55
(175) 80

I-5 SB Ramps/ Walnut Grove Rd

2

90 (105)
125 (165)
R1-1
(50) 15
(150) 120
50 (140)
0 (0)
160 (95)

I-5 NB Ramps/ Walnut Grove Rd

3

70 (105)
80 (125)
(100) 65
(125) 110
R1-1
(195) 80
(75) 65

Walnut Grove Rd/ N Thornton Rd

4

105 (205)
5 (5)
(5) 5
(0) 0
(5) 5
R1-1
(185) 145
(20) 15
5 (10)
40 (20)

Mokelumne Ave/ Walnut Grove Rd

5

(190) 150
(0) 0
15 (15)
120 (250)

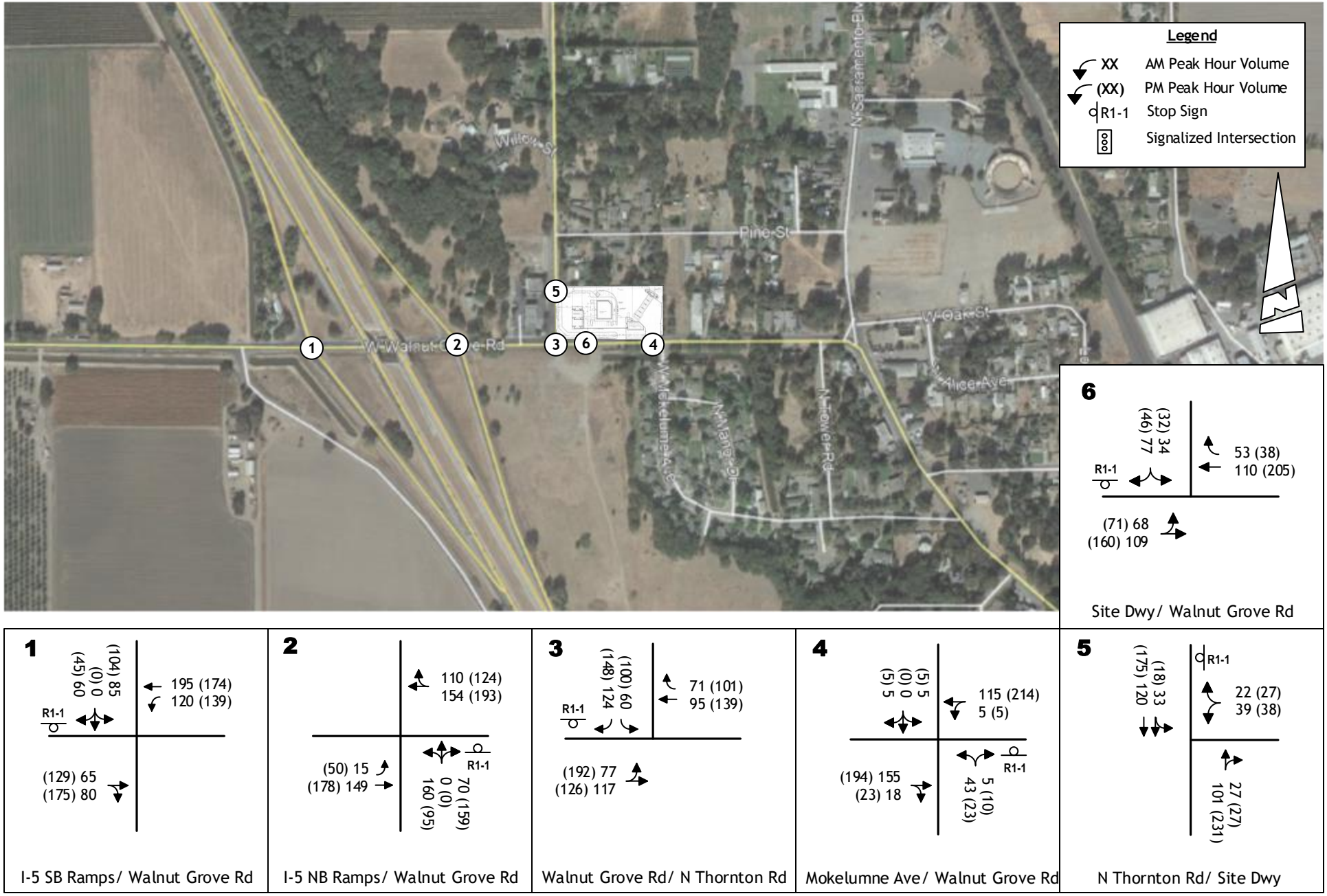
N Thornton Rd/ Site Dwy

CUMULATIVE TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 9



CUM PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 10

TABLE 9
CUMULATIVE PLUS PROJECT INTERSECTION LEVEL OF SERVICE

Intersection	Control	AM Peak Hour				PM Peak Hour				Peak Hour Warrant Met?
		Cumulative		Cumulative Plus Project		Cumulative		Cumulative Plus Project		
		Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	Average Delay (sec/veh)	Level of Service	
1. Walnut Grove Rd / SB I-5 Ramps										
SB Approach	SB Stop	12.1	B	13.5	B	14.6	B	16.8	C	No
WB Left		7.7	A	7.8	A	8.2	A	8.3	A	
2. Walnut Grove Rd / NB I-5 Ramps										
NB Approach	NB Stop	12.2	B	13.2	B	12.9	B	13.9	B	Yes*
EB Left		7.7	A	7.9	A	8.0	A	8.0	A	
3. Walnut Grove Rd / N. Thornton Rd										
SB Approach	SB Stop	10.1	B	10.3	B	13.8	B	14.4	B	Yes*
EB Left		7.7	A	7.7	A	8.3	A	8.3	A	
4. Walnut Grove Rd / Mokelumne Ave										
NB Approach	NB/SB	10.8	B	11.0	B	11.5	B	11.8	B	No
SB Approach	Stop	9.7	A	9.9	A	10.8	B	11.0	B	
WB Left		7.6	A	7.6	A	7.7	A	7.7	A	
5. N. Thornton Rd / Project Driveway										
SB Left	WB Stop	---	N/A	7.6	A	---	N/A	11.2	B	No
WB Approach		---	N/A	10.2	B	---	N/A	7.9	A	
6. Walnut Grove Rd / Project Driveway										
SB	SB Stop	---	N/A	10.4	B	---	N/A	11.7	B	No
EB Left		---	N/A	7.7	A	---	N/A	7.9	A	

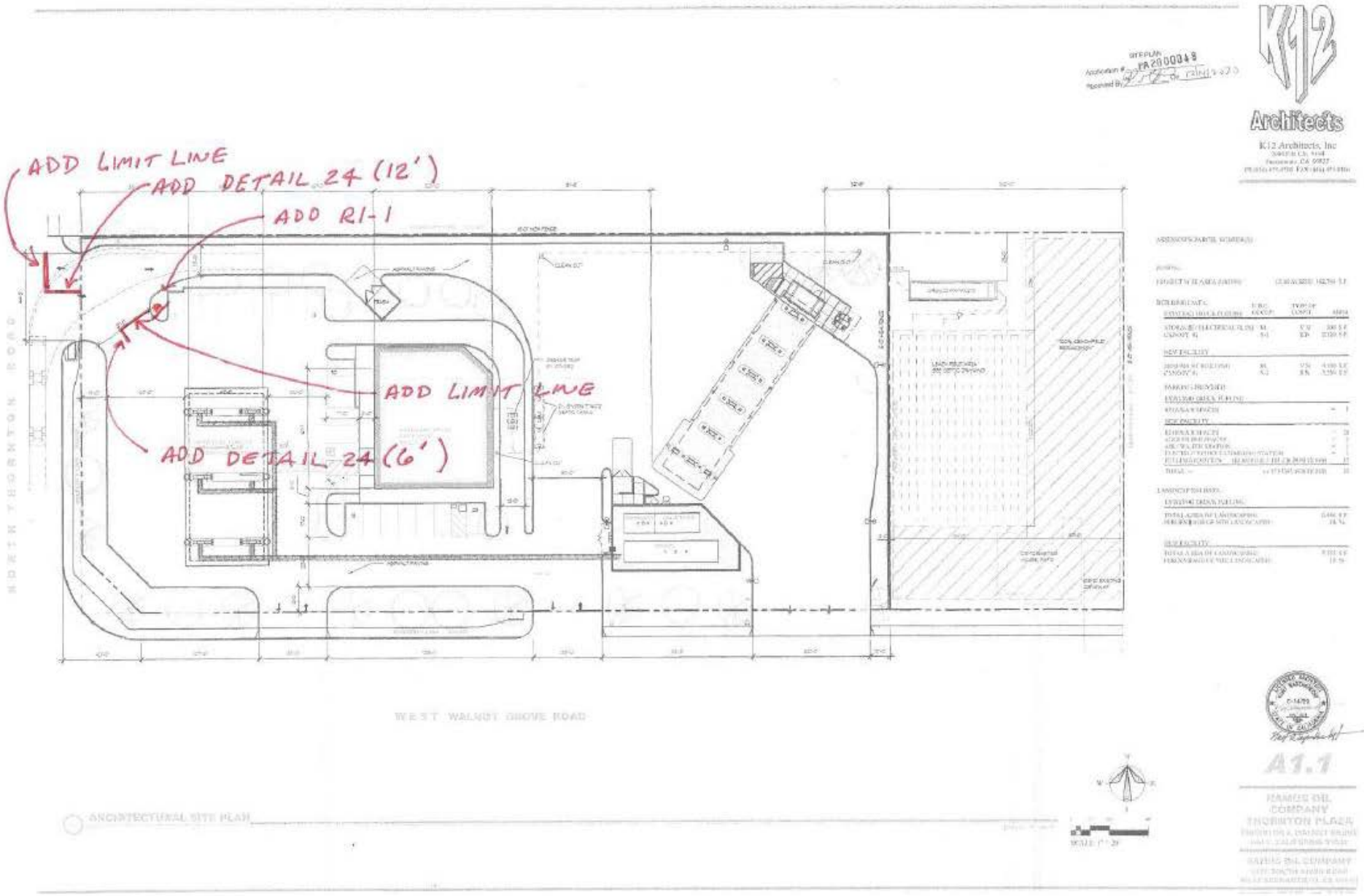
N/A – not available
* - meets peak hour signal warrant p.m. peak hour.

TABLE 10
CUMULATIVE PLUS PROJECT PEAK HOUR QUEUES

Intersection	Lane	Storage (feet)	AM Peak Hour					PM Peak Hour				
			Cumulative		Cumulative Plus Project			Cumulative		Cumulative Plus Project		
			Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)		95th % Queue (feet)
					Project	Total				Project	Total	
1. Walnut Grove Rd / SB I-5 Ramps	SB[1]	950	125	<25	20	145	28	130	28	19	149	38
	WB left	180	100	<25	20	120	<25	120	<25	19	139	<25
2. Walnut Grove Rd / NB I-5 Ramps	NB[1]	950	210	33	20	230	43	235	45	19	254	50
	EB left	180	15	<25	0	15	<25	50	<25	0	50	<25
3. Walnut Grove Rd / N. Thornton Rd	SB left	n/a	65	<25	-5	60	<25	100	30	0	100	35
	SB right	325	110	<25	14	124	<25	125	<25	23	148	<25
	EB left[2]	n/a	80	<25	-3	77	<25	195	<25	-3	192	<25
4. Walnut Grove Rd / Mokelumne Ave	NB[1]	n/a	45	<25	3	48	<25	30	<25	3	33	<25
	WB left[2]	n/a	5	<25	0	5	<25	5	<25	0	5	<25
5. N. Thornton Rd / Project Driveway	SB left[2]	n/a	0	<25	33	33	<25	0	<25	18	18	<25
	WB[1]	n/a	n/a	n/a	61	61	<25	n/a	n/a	65	65	<25
6. Walnut Grove Rd / Project Driveway	SB[1]	n/a	n/a	n/a	111	111	<25	n/a	n/a	78	78	<25
	EB left[2]	n/a	n/a	n/a	68	68	<25	n/a	n/a	71	71	<25

[1] volume is sum of all movements on minor approach
[2] volume is left turn movements in through lane
negative volume indicates reduction from pass-by trip.
n/a – not applicable

APPENDICES



ON SITE IMPROVEMENTS

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	41	60	76	138	0	0	0	0	50	0	43
Future Vol, veh/h	0	41	60	76	138	0	0	0	0	50	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	74	74	74	74	92	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	55	81	103	186	0	0	0	0	68	0	58

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	136	0	0	488	528	186
Stage 1	-	-	-	-	-	-	392	392	-
Stage 2	-	-	-	-	-	-	96	136	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1448	-	0	585	498	870
Stage 1	0	-	-	-	-	0	729	647	-
Stage 2	0	-	-	-	-	0	943	802	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1448	-	-	543	0	870
Mov Cap-2 Maneuver	-	-	-	-	-	-	543	0	-
Stage 1	-	-	-	-	-	-	729	0	-
Stage 2	-	-	-	-	-	-	876	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.7	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1448	-	657
HCM Lane V/C Ratio	-	-	0.071	-	0.191
HCM Control Delay (s)	-	-	7.7	-	11.8
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.7

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	91	0	0	93	69	121	0	38	0	0	0
Future Vol, veh/h	10	91	0	0	93	69	121	0	38	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	72	72	92	92	72	72	72	72	72	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	126	0	0	129	96	168	0	53	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	225	0	-	-	-	0	331	379	126
Stage 1	-	-	-	-	-	-	154	154	-
Stage 2	-	-	-	-	-	-	177	225	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1344	-	0	0	-	-	701	589	934
Stage 1	-	-	0	0	-	-	897	790	-
Stage 2	-	-	0	0	-	-	879	745	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1344	-	-	-	-	-	694	0	934
Mov Cap-2 Maneuver	-	-	-	-	-	-	694	0	-
Stage 1	-	-	-	-	-	-	888	0	-
Stage 2	-	-	-	-	-	-	879	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	739	1344	-	-	-
HCM Lane V/C Ratio	0.299	0.01	-	-	-
HCM Control Delay (s)	11.9	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.3	0	-	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	59	50	60	54	49	82
Future Vol, veh/h	59	50	60	54	49	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	59	71	64	58	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	135	0	-	0	268	71
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1449	-	-	-	721	991
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	686	991
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1449	-	-	-	686	991
HCM Lane V/C Ratio	0.048	-	-	-	0.084	0.097
HCM Control Delay (s)	7.6	0	-	-	10.7	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3	0.3

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	109	10	5	78	0	31	0	5	5	0	5
Future Vol, veh/h	0	109	10	5	78	0	31	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	92	87	92	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	125	11	6	90	0	36	0	6	6	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	136	0	0	236	233	131	236	238	90
Stage 1	-	-	-	-	-	-	131	131	-	102	102	-
Stage 2	-	-	-	-	-	-	105	102	-	134	136	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1448	-	0	718	667	919	718	663	968
Stage 1	0	-	-	-	-	0	873	788	-	904	811	-
Stage 2	0	-	-	-	-	0	901	811	-	869	784	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1448	-	-	712	664	919	712	660	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	712	664	-	712	660	-
Stage 1	-	-	-	-	-	-	873	788	-	904	808	-
Stage 2	-	-	-	-	-	-	892	808	-	864	784	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	10.2	9.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	735	-	-	1448	-	820
HCM Lane V/C Ratio	0.056	-	-	0.004	-	0.014
HCM Control Delay (s)	10.2	-	-	7.5	0	9.5
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	88	10	0	111
Future Vol, veh/h	0	0	88	10	0	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	117	13	0	148

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	198	124	0	0	-	-
Stage 1	124	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	781	926	-	-	0	-
Stage 1	901	-	-	-	0	-
Stage 2	941	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	781	926	-	-	-	-
Mov Cap-2 Maneuver	781	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	88	129	89	123	0	0	0	0	63	0	33
Future Vol, veh/h	0	88	129	89	123	0	0	0	0	63	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	84	84	84	84	92	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	105	154	106	146	0	0	0	0	75	0	39

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	259	0	0	540	617	146
Stage 1	-	-	-	-	-	-	358	358	-
Stage 2	-	-	-	-	-	-	182	259	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1306	-	0	550	449	912
Stage 1	0	-	-	-	-	0	751	666	-
Stage 2	0	-	-	-	-	0	875	724	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1306	-	-	505	0	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	505	0	-
Stage 1	-	-	-	-	-	-	751	0	-
Stage 2	-	-	-	-	-	-	804	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.4	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1306	-	597
HCM Lane V/C Ratio	-	-	0.081	-	0.191
HCM Control Delay (s)	-	-	8	-	12.5
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	0.7

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	113	0	0	122	79	71	0	105	0	0	0
Future Vol, veh/h	38	113	0	0	122	79	71	0	105	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	123	0	0	133	86	77	0	114	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	219	0	-	-	-	0	381	424	123
Stage 1	-	-	-	-	-	-	205	205	-
Stage 2	-	-	-	-	-	-	176	219	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1350	-	0	0	-	-	662	560	937
Stage 1	-	-	0	0	-	-	858	757	-
Stage 2	-	-	0	0	-	-	880	749	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1350	-	-	-	-	-	642	0	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	642	0	-
Stage 1	-	-	-	-	-	-	832	0	-
Stage 2	-	-	-	-	-	-	880	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	11
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	790	1350	-	-	-
HCM Lane V/C Ratio	0.242	0.031	-	-	-
HCM Control Delay (s)	11	7.8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	0.9	0.1	-	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	57	95	78	76	92
Future Vol, veh/h	147	57	95	78	76	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	165	64	107	88	85	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	195	0	-	0	501	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	394	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1378	-	-	-	530	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	681	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1378	-	-	-	464	947
Mov Cap-2 Maneuver	-	-	-	-	464	-
Stage 1	-	-	-	-	803	-
Stage 2	-	-	-	-	681	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1378	-	-	-	464	947
HCM Lane V/C Ratio	0.12	-	-	-	0.184	0.109
HCM Control Delay (s)	8	0	-	-	14.5	9.3
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7	0.4

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	137	14	5	153	0	15	0	6	5	0	5
Future Vol, veh/h	0	137	14	5	153	0	15	0	6	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	146	15	5	163	0	16	0	6	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	161	0	0	330	327	154	330	334	163
Stage 1	-	-	-	-	-	-	154	154	-	173	173	-
Stage 2	-	-	-	-	-	-	176	173	-	157	161	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0	623	591	892	623	586	882
Stage 1	0	-	-	-	-	0	848	770	-	829	756	-
Stage 2	0	-	-	-	-	0	826	756	-	845	765	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1418	-	-	617	589	892	617	584	882
Mov Cap-2 Maneuver	-	-	-	-	-	-	617	589	-	617	584	-
Stage 1	-	-	-	-	-	-	848	770	-	829	753	-
Stage 2	-	-	-	-	-	-	818	753	-	839	765	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10.5	10
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	677	-	-	1418	-	726
HCM Lane V/C Ratio	0.033	-	-	0.004	-	0.015
HCM Control Delay (s)	10.5	-	-	7.5	0	10
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	185	10	0	142
Future Vol, veh/h	0	0	185	10	0	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	201	11	0	154

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	284	207	0	0	-	-
Stage 1	207	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	694	833	-	-	0	-
Stage 1	827	-	-	-	0	-
Stage 2	937	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	694	833	-	-	-	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	827	-	-	-	-	-
Stage 2	937	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	51	60	96	148	0	0	0	0	70	0	43
Future Vol, veh/h	0	51	60	96	148	0	0	0	0	70	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	74	74	74	74	92	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	69	81	130	200	0	0	0	0	95	0	58

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	150	0	0	570	610	200
Stage 1	-	-	-	-	-	-	460	460	-
Stage 2	-	-	-	-	-	-	110	150	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1431	-	0	531	453	855
Stage 1	0	-	-	-	-	0	686	611	-
Stage 2	0	-	-	-	-	0	931	793	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1431	-	-	483	0	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	483	0	-
Stage 1	-	-	-	-	-	-	686	0	-
Stage 2	-	-	-	-	-	-	846	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.1	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1431	-	579
HCM Lane V/C Ratio	-	-	0.091	-	0.264
HCM Control Delay (s)	-	-	7.8	-	13.4
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	1.1

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	120	0	0	122	89	121	0	58	0	0	0
Future Vol, veh/h	10	120	0	0	122	89	121	0	58	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	72	72	92	92	72	72	72	72	72	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	167	0	0	169	124	168	0	81	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	293	0	-	-	-	0	426	488	167
Stage 1	-	-	-	-	-	-	195	195	-
Stage 2	-	-	-	-	-	-	231	293	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1269	-	0	0	-	-	628	521	890
Stage 1	-	-	0	0	-	-	866	764	-
Stage 2	-	-	0	0	-	-	839	704	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1269	-	-	-	-	-	621	0	890
Mov Cap-2 Maneuver	-	-	-	-	-	-	621	0	-
Stage 1	-	-	-	-	-	-	856	0	-
Stage 2	-	-	-	-	-	-	839	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.6	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	688	1269	-	-	-
HCM Lane V/C Ratio	0.361	0.011	-	-	-
HCM Control Delay (s)	13.2	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.6	0	-	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	102	75	55	44	96
Future Vol, veh/h	56	102	75	55	44	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	120	88	65	52	113

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	153	0	-	0	340	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1428	-	-	-	656	970
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1428	-	-	-	623	970
Mov Cap-2 Maneuver	-	-	-	-	623	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1428	-	-	-	623	970
HCM Lane V/C Ratio	0.046	-	-	-	0.083	0.116
HCM Control Delay (s)	7.6	0	-	-	11.3	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0.4

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	73	74	53	34	77
Future Vol, veh/h	68	73	74	53	34	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	97	99	71	45	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	170	0	-	0	378	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1407	-	-	-	624	957
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1407	-	-	-	582	957
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1407	-	-	-	799
HCM Lane V/C Ratio	0.064	-	-	-	0.185
HCM Control Delay (s)	7.7	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	119	13	5	88	0	34	0	5	5	0	5
Future Vol, veh/h	0	119	13	5	88	0	34	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	92	87	92	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	137	15	6	101	0	39	0	6	6	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	152	0	0	261	258	145	261	265	101
Stage 1	-	-	-	-	-	-	145	145	-	113	113	-
Stage 2	-	-	-	-	-	-	116	113	-	148	152	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1429	-	0	692	646	902	692	640	954
Stage 1	0	-	-	-	-	0	858	777	-	892	802	-
Stage 2	0	-	-	-	-	0	889	802	-	855	772	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1429	-	-	686	643	902	686	637	954
Mov Cap-2 Maneuver	-	-	-	-	-	-	686	643	-	686	637	-
Stage 1	-	-	-	-	-	-	858	777	-	892	799	-
Stage 2	-	-	-	-	-	-	880	799	-	850	772	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	10.4	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	708	-	-	1429	-	798
HCM Lane V/C Ratio	0.063	-	-	0.004	-	0.014
HCM Control Delay (s)	10.4	-	-	7.5	0	9.6
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	22	69	27	33	81
Future Vol, veh/h	39	22	69	27	33	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	29	92	36	44	108

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	252	110	0	0	128	0
Stage 1	110	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	726	943	-	-	1457	-
Stage 1	914	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	703	943	-	-	1457	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	774	1457	-
HCM Lane V/C Ratio	-	-	0.105	0.03	-
HCM Control Delay (s)	-	-	10.2	7.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	97	129	108	132	0	0	0	0	82	0	33
Future Vol, veh/h	0	97	129	108	132	0	0	0	0	82	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	84	84	84	84	92	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	115	154	129	157	0	0	0	0	98	0	39

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	269	0	0	607	684	157
Stage 1	-	-	-	-	-	-	415	415	-
Stage 2	-	-	-	-	-	-	192	269	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1295	-	0	508	416	900
Stage 1	0	-	-	-	-	0	714	635	-
Stage 2	0	-	-	-	-	0	868	718	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1295	-	-	457	0	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	457	0	-
Stage 1	-	-	-	-	-	-	714	0	-
Stage 2	-	-	-	-	-	-	781	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.6	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1295	-	532
HCM Lane V/C Ratio	-	-	0.099	-	0.257
HCM Control Delay (s)	-	-	8.1	-	14.1
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	1

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	141	0	0	150	98	71	0	124	0	0	0
Future Vol, veh/h	38	141	0	0	150	98	71	0	124	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	153	0	0	163	107	77	0	135	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	270	0	-	-	-	0	452	505	153
Stage 1	-	-	-	-	-	-	235	235	-
Stage 2	-	-	-	-	-	-	217	270	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1293	-	0	0	-	-	610	511	905
Stage 1	-	-	0	0	-	-	836	739	-
Stage 2	-	-	0	0	-	-	849	718	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1293	-	-	-	-	-	590	0	905
Mov Cap-2 Maneuver	-	-	-	-	-	-	590	0	-
Stage 1	-	-	-	-	-	-	809	0	-
Stage 2	-	-	-	-	-	-	849	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	758	1293	-	-	-
HCM Lane V/C Ratio	0.28	0.032	-	-	-
HCM Control Delay (s)	11.6	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.1	0.1	-	-	-

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	144	108	109	74	76	115
Future Vol, veh/h	144	108	109	74	76	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	162	121	122	83	85	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	205	0	-	0	567	122
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1366	-	-	-	485	929
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	646	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1366	-	-	-	423	929
Mov Cap-2 Maneuver	-	-	-	-	423	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	646	-

Approach	EB	WB	SB
HCM Control Delay, s	4.6	0	12
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1366	-	-	-	423	929
HCM Lane V/C Ratio	0.118	-	-	-	0.202	0.139
HCM Control Delay (s)	8	0	-	-	15.7	9.5
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7	0.5

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	71	113	148	38	32	46
Future Vol, veh/h	71	113	148	38	32	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	123	161	41	35	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	202	0	-	0	438	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	277	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1370	-	-	-	576	884
Stage 1	-	-	-	-	868	-
Stage 2	-	-	-	-	770	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1370	-	-	-	541	884
Mov Cap-2 Maneuver	-	-	-	-	541	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	770	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1370	-	-	-	702
HCM Lane V/C Ratio	0.056	-	-	-	0.121
HCM Control Delay (s)	7.8	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	146	17	5	162	0	18	0	6	5	0	5
Future Vol, veh/h	0	146	17	5	162	0	18	0	6	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	155	18	5	172	0	19	0	6	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	173	0	0	349	346	164	349	355	172
Stage 1	-	-	-	-	-	-	164	164	-	182	182	-
Stage 2	-	-	-	-	-	-	185	182	-	167	173	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1404	-	0	606	577	881	606	571	872
Stage 1	0	-	-	-	-	0	838	762	-	820	749	-
Stage 2	0	-	-	-	-	0	817	749	-	835	756	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1404	-	-	601	575	881	600	569	872
Mov Cap-2 Maneuver	-	-	-	-	-	-	601	575	-	600	569	-
Stage 1	-	-	-	-	-	-	838	762	-	820	746	-
Stage 2	-	-	-	-	-	-	809	746	-	829	756	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	10.7	10.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	653	-	-	1404	-	711
HCM Lane V/C Ratio	0.039	-	-	0.004	-	0.015
HCM Control Delay (s)	10.7	-	-	7.6	0	10.1
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	27	166	27	18	127
Future Vol, veh/h	38	27	166	27	18	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	29	180	29	20	138

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	304	195	0	0	209	0
Stage 1	195	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	676	846	-	-	1360	-
Stage 1	837	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	665	846	-	-	1360	-
Mov Cap-2 Maneuver	665	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	730	1360	-
HCM Lane V/C Ratio	-	-	0.097	0.014	-
HCM Control Delay (s)	-	-	10.5	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	41	60	76	138	0	0	0	0	50	0	43
Future Vol, veh/h	0	41	60	76	138	0	0	0	0	50	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	74	74	74	74	92	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	55	81	103	186	0	0	0	0	68	0	58

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	136	0	0	488	528	186
Stage 1	-	-	-	-	-	-	392	392	-
Stage 2	-	-	-	-	-	-	96	136	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1448	-	0	585	498	870
Stage 1	0	-	-	-	-	0	729	647	-
Stage 2	0	-	-	-	-	0	943	802	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1448	-	-	543	0	870
Mov Cap-2 Maneuver	-	-	-	-	-	-	543	0	-
Stage 1	-	-	-	-	-	-	729	0	-
Stage 2	-	-	-	-	-	-	876	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.7	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1448	-	657
HCM Lane V/C Ratio	-	-	0.071	-	0.191
HCM Control Delay (s)	-	-	7.7	-	11.8
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.7

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	91	0	0	93	69	121	0	38	0	0	0
Future Vol, veh/h	10	91	0	0	93	69	121	0	38	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	72	72	92	92	72	72	72	72	72	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	126	0	0	129	96	168	0	53	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	225	0	-	-	-	0	331	379	126
Stage 1	-	-	-	-	-	-	154	154	-
Stage 2	-	-	-	-	-	-	177	225	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1344	-	0	0	-	-	701	589	934
Stage 1	-	-	0	0	-	-	897	790	-
Stage 2	-	-	0	0	-	-	879	745	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1344	-	-	-	-	-	694	0	934
Mov Cap-2 Maneuver	-	-	-	-	-	-	694	0	-
Stage 1	-	-	-	-	-	-	888	0	-
Stage 2	-	-	-	-	-	-	879	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.8	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	739	1344	-	-	-
HCM Lane V/C Ratio	0.299	0.01	-	-	-
HCM Control Delay (s)	11.9	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.3	0	-	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	59	50	60	54	49	82
Future Vol, veh/h	59	50	60	54	49	82
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	59	71	64	58	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	135	0	-	0	268	71
Stage 1	-	-	-	-	71	-
Stage 2	-	-	-	-	197	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1449	-	-	-	721	991
Stage 1	-	-	-	-	952	-
Stage 2	-	-	-	-	836	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1449	-	-	-	686	991
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	836	-

Approach	EB	WB	SB
HCM Control Delay, s	4.1	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1449	-	-	-	686	991
HCM Lane V/C Ratio	0.048	-	-	-	0.084	0.097
HCM Control Delay (s)	7.6	0	-	-	10.7	9
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3	0.3

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	109	10	5	78	0	31	0	5	5	0	5
Future Vol, veh/h	0	109	10	5	78	0	31	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	92	87	92	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	125	11	6	90	0	36	0	6	6	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	136	0	0	236	233	131	236	238	90
Stage 1	-	-	-	-	-	-	131	131	-	102	102	-
Stage 2	-	-	-	-	-	-	105	102	-	134	136	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1448	-	0	718	667	919	718	663	968
Stage 1	0	-	-	-	-	0	873	788	-	904	811	-
Stage 2	0	-	-	-	-	0	901	811	-	869	784	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1448	-	-	712	664	919	712	660	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	712	664	-	712	660	-
Stage 1	-	-	-	-	-	-	873	788	-	904	808	-
Stage 2	-	-	-	-	-	-	892	808	-	864	784	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.5	10.2	9.5
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	735	-	-	1448	-	820
HCM Lane V/C Ratio	0.056	-	-	0.004	-	0.014
HCM Control Delay (s)	10.2	-	-	7.5	0	9.5
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	88	10	0	111
Future Vol, veh/h	0	0	88	10	0	111
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	117	13	0	148

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	198	124	0	0	-	-
Stage 1	124	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	781	926	-	-	0	-
Stage 1	901	-	-	-	0	-
Stage 2	941	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	781	926	-	-	-	-
Mov Cap-2 Maneuver	781	-	-	-	-	-
Stage 1	901	-	-	-	-	-
Stage 2	941	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	88	129	92	123	0	0	0	0	81	0	33
Future Vol, veh/h	0	88	129	92	123	0	0	0	0	81	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	84	84	84	84	92	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	105	154	110	146	0	0	0	0	96	0	39

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	259	0	0	548	625	146
Stage 1	-	-	-	-	-	-	366	366	-
Stage 2	-	-	-	-	-	-	182	259	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1306	-	0	545	445	912
Stage 1	0	-	-	-	-	0	746	662	-
Stage 2	0	-	-	-	-	0	875	724	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1306	-	-	499	0	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	499	0	-
Stage 1	-	-	-	-	-	-	746	0	-
Stage 2	-	-	-	-	-	-	802	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.4	13.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1306	-	574
HCM Lane V/C Ratio	-	-	0.084	-	0.236
HCM Control Delay (s)	-	-	8	-	13.2
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	0.9

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	131	0	0	125	81	71	0	142	0	0	0
Future Vol, veh/h	38	131	0	0	125	81	71	0	142	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	142	0	0	136	88	77	0	154	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	224	0	-	-	-	0	404	448	142
Stage 1	-	-	-	-	-	-	224	224	-
Stage 2	-	-	-	-	-	-	180	224	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1345	-	0	0	-	-	645	545	916
Stage 1	-	-	0	0	-	-	844	746	-
Stage 2	-	-	0	0	-	-	877	746	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1345	-	-	-	-	-	626	0	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	626	0	-
Stage 1	-	-	-	-	-	-	819	0	-
Stage 2	-	-	-	-	-	-	877	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.7	0	11.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	793	1345	-	-	-
HCM Lane V/C Ratio	0.292	0.031	-	-	-
HCM Control Delay (s)	11.4	7.8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.2	0.1	-	-	-

Intersection	
Int Delay, s/veh	5.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	147	112	100	78	76	92
Future Vol, veh/h	147	112	100	78	76	92
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	165	126	112	88	85	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	200	0	-	0	568	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1372	-	-	-	484	941
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1372	-	-	-	422	941
Mov Cap-2 Maneuver	-	-	-	-	422	-
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	638	-

Approach	EB	WB	SB
HCM Control Delay, s	4.5	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1372	-	-	-	422	941
HCM Lane V/C Ratio	0.12	-	-	-	0.202	0.11
HCM Control Delay (s)	8	0	-	-	15.7	9.3
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.7	0.4

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	192	14	5	158	0	15	0	6	5	0	5
Future Vol, veh/h	0	192	14	5	158	0	15	0	6	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	204	15	5	168	0	16	0	6	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	219	0	0	393	390	212	393	397	168
Stage 1	-	-	-	-	-	-	212	212	-	178	178	-
Stage 2	-	-	-	-	-	-	181	178	-	215	219	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1350	-	0	566	545	828	566	540	876
Stage 1	0	-	-	-	-	0	790	727	-	824	752	-
Stage 2	0	-	-	-	-	0	821	752	-	787	722	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1350	-	-	561	543	828	560	538	876
Mov Cap-2 Maneuver	-	-	-	-	-	-	561	543	-	560	538	-
Stage 1	-	-	-	-	-	-	790	727	-	824	749	-
Stage 2	-	-	-	-	-	-	813	749	-	781	722	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	618	-	-	1350	-	683
HCM Lane V/C Ratio	0.036	-	-	0.004	-	0.016
HCM Control Delay (s)	11	-	-	7.7	0	10.4
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	185	10	0	142
Future Vol, veh/h	0	0	185	10	0	142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	201	11	0	154

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	284	207	0	0	-	-
Stage 1	207	-	-	-	-	-
Stage 2	77	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	694	833	-	-	0	-
Stage 1	827	-	-	-	0	-
Stage 2	937	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	694	833	-	-	-	-
Mov Cap-2 Maneuver	694	-	-	-	-	-
Stage 1	827	-	-	-	-	-
Stage 2	937	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	51	60	96	148	0	0	0	0	70	0	43
Future Vol, veh/h	0	51	60	96	148	0	0	0	0	70	0	43
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	74	74	74	74	92	92	92	92	74	74	74
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	69	81	130	200	0	0	0	0	95	0	58

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	150	0	0	570	610	200
Stage 1	-	-	-	-	-	-	460	460	-
Stage 2	-	-	-	-	-	-	110	150	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1431	-	0	531	453	855
Stage 1	0	-	-	-	-	0	686	611	-
Stage 2	0	-	-	-	-	0	931	793	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1431	-	-	483	0	855
Mov Cap-2 Maneuver	-	-	-	-	-	-	483	0	-
Stage 1	-	-	-	-	-	-	686	0	-
Stage 2	-	-	-	-	-	-	846	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.1	13.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1431	-	579
HCM Lane V/C Ratio	-	-	0.091	-	0.264
HCM Control Delay (s)	-	-	7.8	-	13.4
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	1.1

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	120	0	0	122	89	121	0	58	0	0	0
Future Vol, veh/h	10	120	0	0	122	89	121	0	58	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	72	72	92	92	72	72	72	72	72	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	167	0	0	169	124	168	0	81	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	293	0	-	-	-	0	426	488	167
Stage 1	-	-	-	-	-	-	195	195	-
Stage 2	-	-	-	-	-	-	231	293	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1269	-	0	0	-	-	628	521	890
Stage 1	-	-	0	0	-	-	866	764	-
Stage 2	-	-	0	0	-	-	839	704	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1269	-	-	-	-	-	621	0	890
Mov Cap-2 Maneuver	-	-	-	-	-	-	621	0	-
Stage 1	-	-	-	-	-	-	856	0	-
Stage 2	-	-	-	-	-	-	839	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.6	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	688	1269	-	-	-
HCM Lane V/C Ratio	0.361	0.011	-	-	-
HCM Control Delay (s)	13.2	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.6	0	-	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	56	102	75	55	44	96
Future Vol, veh/h	56	102	75	55	44	96
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	120	88	65	52	113

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	153	0	-	0	340	88
Stage 1	-	-	-	-	88	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1428	-	-	-	656	970
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1428	-	-	-	623	970
Mov Cap-2 Maneuver	-	-	-	-	623	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	790	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1428	-	-	-	623	970
HCM Lane V/C Ratio	0.046	-	-	-	0.083	0.116
HCM Control Delay (s)	7.6	0	-	-	11.3	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3	0.4

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	73	74	53	34	77
Future Vol, veh/h	68	73	74	53	34	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	97	99	71	45	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	170	0	-	0	378	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	279	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1407	-	-	-	624	957
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1407	-	-	-	582	957
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	768	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1407	-	-	-	799
HCM Lane V/C Ratio	0.064	-	-	-	0.185
HCM Control Delay (s)	7.7	0	-	-	10.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	119	13	5	88	0	34	0	5	5	0	5
Future Vol, veh/h	0	119	13	5	88	0	34	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	92	87	92	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	137	15	6	101	0	39	0	6	6	0	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	152	0	0	261	258	145	261	265	101
Stage 1	-	-	-	-	-	-	145	145	-	113	113	-
Stage 2	-	-	-	-	-	-	116	113	-	148	152	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1429	-	0	692	646	902	692	640	954
Stage 1	0	-	-	-	-	0	858	777	-	892	802	-
Stage 2	0	-	-	-	-	0	889	802	-	855	772	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1429	-	-	686	643	902	686	637	954
Mov Cap-2 Maneuver	-	-	-	-	-	-	686	643	-	686	637	-
Stage 1	-	-	-	-	-	-	858	777	-	892	799	-
Stage 2	-	-	-	-	-	-	880	799	-	850	772	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.4	10.4	9.6
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	708	-	-	1429	-	798
HCM Lane V/C Ratio	0.063	-	-	0.004	-	0.014
HCM Control Delay (s)	10.4	-	-	7.5	0	9.6
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	22	69	27	33	81
Future Vol, veh/h	39	22	69	27	33	81
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	29	92	36	44	108

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	252	110	0	0	128	0
Stage 1	110	-	-	-	-	-
Stage 2	142	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	726	943	-	-	1457	-
Stage 1	914	-	-	-	-	-
Stage 2	871	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	703	943	-	-	1457	-
Mov Cap-2 Maneuver	703	-	-	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	843	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	2.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	774	1457	-
HCM Lane V/C Ratio	-	-	0.105	0.03	-
HCM Control Delay (s)	-	-	10.2	7.5	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	97	129	111	132	0	0	0	0	100	0	33
Future Vol, veh/h	0	97	129	111	132	0	0	0	0	100	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	84	84	84	84	92	92	92	92	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	115	154	132	157	0	0	0	0	119	0	39

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	269	0	0	613	690	157
Stage 1	-	-	-	-	-	-	421	421	-
Stage 2	-	-	-	-	-	-	192	269	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1295	-	0	505	413	900
Stage 1	0	-	-	-	-	0	710	632	-
Stage 2	0	-	-	-	-	0	868	718	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1295	-	-	453	0	900
Mov Cap-2 Maneuver	-	-	-	-	-	-	453	0	-
Stage 1	-	-	-	-	-	-	710	0	-
Stage 2	-	-	-	-	-	-	779	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.7	15
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1295	-	517
HCM Lane V/C Ratio	-	-	0.102	-	0.306
HCM Control Delay (s)	-	-	8.1	-	15
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.3	-	1.3

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	38	159	0	0	153	100	71	0	161	0	0	0
Future Vol, veh/h	38	159	0	0	153	100	71	0	161	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	41	173	0	0	166	109	77	0	175	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	275	0	-	-	-	0	476	530	173
Stage 1	-	-	-	-	-	-	255	255	-
Stage 2	-	-	-	-	-	-	221	275	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1288	-	0	0	-	-	593	496	883
Stage 1	-	-	0	0	-	-	822	727	-
Stage 2	-	-	0	0	-	-	846	715	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1288	-	-	-	-	-	574	0	883
Mov Cap-2 Maneuver	-	-	-	-	-	-	574	0	-
Stage 1	-	-	-	-	-	-	796	0	-
Stage 2	-	-	-	-	-	-	846	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.5	0	12.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	758	1288	-	-	-
HCM Lane V/C Ratio	0.333	0.032	-	-	-
HCM Control Delay (s)	12.1	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.5	0.1	-	-	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	144	163	114	74	76	115
Future Vol, veh/h	144	163	114	74	76	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	162	183	128	83	85	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	211	0	-	0	635	128
Stage 1	-	-	-	-	128	-
Stage 2	-	-	-	-	507	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1360	-	-	-	443	922
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	605	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1360	-	-	-	384	922
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	779	-
Stage 2	-	-	-	-	605	-

Approach	EB	WB	SB
HCM Control Delay, s	3.8	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1360	-	-	-	384	922
HCM Lane V/C Ratio	0.119	-	-	-	0.222	0.14
HCM Control Delay (s)	8	0	-	-	17	9.5
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.4	-	-	-	0.8	0.5

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	71	168	153	38	32	46
Future Vol, veh/h	71	168	153	38	32	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	183	166	41	35	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	207	0	-	0	503	166
Stage 1	-	-	-	-	166	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1364	-	-	-	528	878
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %			-	-	-	
Mov Cap-1 Maneuver	1364	-	-	-	495	878
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	723	-

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	11.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1364	-	-	-	666
HCM Lane V/C Ratio	0.057	-	-	-	0.127
HCM Control Delay (s)	7.8	0	-	-	11.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	201	17	5	167	0	18	0	6	5	0	5
Future Vol, veh/h	0	201	17	5	167	0	18	0	6	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	214	18	5	178	0	19	0	6	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	232	0	0	414	411	223	414	420	178
Stage 1	-	-	-	-	-	-	223	223	-	188	188	-
Stage 2	-	-	-	-	-	-	191	188	-	226	232	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1336	-	0	549	531	817	549	525	865
Stage 1	0	-	-	-	-	0	780	719	-	814	745	-
Stage 2	0	-	-	-	-	0	811	745	-	777	713	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1336	-	-	544	529	817	543	523	865
Mov Cap-2 Maneuver	-	-	-	-	-	-	544	529	-	543	523	-
Stage 1	-	-	-	-	-	-	780	719	-	814	742	-
Stage 2	-	-	-	-	-	-	803	742	-	771	713	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11.3	10.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	594	-	-	1336	-	667
HCM Lane V/C Ratio	0.043	-	-	0.004	-	0.016
HCM Control Delay (s)	11.3	-	-	7.7	0	10.5
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.1	-	-	0	-	0

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	27	166	27	18	127
Future Vol, veh/h	38	27	166	27	18	127
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	29	180	29	20	138

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	304	195	0	0	209	0
Stage 1	195	-	-	-	-	-
Stage 2	109	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	676	846	-	-	1360	-
Stage 1	837	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	665	846	-	-	1360	-
Mov Cap-2 Maneuver	665	-	-	-	-	-
Stage 1	837	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	730	1360	-
HCM Lane V/C Ratio	-	-	0.097	0.014	-
HCM Control Delay (s)	-	-	10.5	7.7	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	55	80	100	185	0	0	0	0	65	0	60
Future Vol, veh/h	0	55	80	100	185	0	0	0	0	65	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	87	109	201	0	0	0	0	71	0	65

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	147	0	0	523	566	201
Stage 1	-	-	-	-	-	-	419	419	-
Stage 2	-	-	-	-	-	-	104	147	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1435	-	0	561	476	854
Stage 1	0	-	-	-	-	0	712	633	-
Stage 2	0	-	-	-	-	0	936	795	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1435	-	-	518	0	854
Mov Cap-2 Maneuver	-	-	-	-	-	-	518	0	-
Stage 1	-	-	-	-	-	-	712	0	-
Stage 2	-	-	-	-	-	-	865	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.7	12.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1435	-	639
HCM Lane V/C Ratio	-	-	0.076	-	0.213
HCM Control Delay (s)	-	-	7.7	-	12.1
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.2	-	0.8

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	120	0	0	125	90	160	0	50	0	0	0
Future Vol, veh/h	15	120	0	0	125	90	160	0	50	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	130	0	0	136	98	174	0	54	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	234	0	-	-	-	0	347	396	130
Stage 1	-	-	-	-	-	-	162	162	-
Stage 2	-	-	-	-	-	-	185	234	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1333	-	0	0	-	-	689	578	930
Stage 1	-	-	0	0	-	-	891	785	-
Stage 2	-	-	0	0	-	-	873	739	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1333	-	-	-	-	-	681	0	930
Mov Cap-2 Maneuver	-	-	-	-	-	-	681	0	-
Stage 1	-	-	-	-	-	-	880	0	-
Stage 2	-	-	-	-	-	-	873	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.9	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	727	1333	-	-	-
HCM Lane V/C Ratio	0.314	0.012	-	-	-
HCM Control Delay (s)	12.2	7.7	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.3	0	-	-	-

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	80	65	80	70	65	110
Future Vol, veh/h	80	65	80	70	65	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	87	71	87	76	71	120

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	163	0	-	0	332	87
Stage 1	-	-	-	-	87	-
Stage 2	-	-	-	-	245	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1416	-	-	-	663	971
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	796	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1416	-	-	-	621	971
Mov Cap-2 Maneuver	-	-	-	-	621	-
Stage 1	-	-	-	-	876	-
Stage 2	-	-	-	-	796	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1416	-	-	-	621	971
HCM Lane V/C Ratio	0.061	-	-	-	0.114	0.123
HCM Control Delay (s)	7.7	0	-	-	11.5	9.2
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	0.4

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	145	15	5	105	0	40	0	5	5	0	5
Future Vol, veh/h	0	145	15	5	105	0	40	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	158	16	5	114	0	43	0	5	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	174	0	0	293	290	166	293	298	114
Stage 1	-	-	-	-	-	-	166	166	-	124	124	-
Stage 2	-	-	-	-	-	-	127	124	-	169	174	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1403	-	0	659	620	878	659	614	939
Stage 1	0	-	-	-	-	0	836	761	-	880	793	-
Stage 2	0	-	-	-	-	0	877	793	-	833	755	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1403	-	-	653	618	878	653	612	939
Mov Cap-2 Maneuver	-	-	-	-	-	-	653	618	-	653	612	-
Stage 1	-	-	-	-	-	-	836	761	-	880	790	-
Stage 2	-	-	-	-	-	-	868	790	-	828	755	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	10.8	9.7
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	672	-	-	1403	-	770
HCM Lane V/C Ratio	0.073	-	-	0.004	-	0.014
HCM Control Delay (s)	10.8	-	-	7.6	0	9.7
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	120	10	0	150
Future Vol, veh/h	0	0	120	10	0	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	130	11	0	163

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	218	136	0	0	-	-
Stage 1	136	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	760	912	-	-	0	-
Stage 1	890	-	-	-	0	-
Stage 2	932	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	760	912	-	-	-	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	932	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	120	175	120	165	0	0	0	0	85	0	45
Future Vol, veh/h	0	120	175	120	165	0	0	0	0	85	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	130	190	130	179	0	0	0	0	92	0	49

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	320	0	0	664	759	179
Stage 1	-	-	-	-	-	-	439	439	-
Stage 2	-	-	-	-	-	-	225	320	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1240	-	0	475	381	877
Stage 1	0	-	-	-	-	0	699	622	-
Stage 2	0	-	-	-	-	0	843	688	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1240	-	-	425	0	877
Mov Cap-2 Maneuver	-	-	-	-	-	-	425	0	-
Stage 1	-	-	-	-	-	-	699	0	-
Stage 2	-	-	-	-	-	-	754	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.5	14.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1240	-	517
HCM Lane V/C Ratio	-	-	0.105	-	0.273
HCM Control Delay (s)	-	-	8.2	-	14.6
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.4	-	1.1

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	150	0	0	165	105	95	0	140	0	0	0
Future Vol, veh/h	50	150	0	0	165	105	95	0	140	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	163	0	0	179	114	103	0	152	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	293	0	-	-	-	0	507	564	163
Stage 1	-	-	-	-	-	-	271	271	-
Stage 2	-	-	-	-	-	-	236	293	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1269	-	0	0	-	-	572	478	894
Stage 1	-	-	0	0	-	-	810	717	-
Stage 2	-	-	0	0	-	-	835	704	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1269	-	-	-	-	-	547	0	894
Mov Cap-2 Maneuver	-	-	-	-	-	-	547	0	-
Stage 1	-	-	-	-	-	-	775	0	-
Stage 2	-	-	-	-	-	-	835	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	12.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	712	1269	-	-	-
HCM Lane V/C Ratio	0.359	0.043	-	-	-
HCM Control Delay (s)	12.9	8	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.6	0.1	-	-	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	195	75	125	105	100	125
Future Vol, veh/h	195	75	125	105	100	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	212	82	136	114	109	136

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	250	0	-	0	642	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	506	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1316	-	-	-	438	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	606	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1316	-	-	-	364	913
Mov Cap-2 Maneuver	-	-	-	-	364	-
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	SB
HCM Control Delay, s	6	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1316	-	-	-	364	913
HCM Lane V/C Ratio	0.161	-	-	-	0.299	0.149
HCM Control Delay (s)	8.3	0	-	-	19	9.6
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	1.2	0.5

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	185	20	5	205	0	20	0	10	5	0	5
Future Vol, veh/h	0	185	20	5	205	0	20	0	10	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	201	22	5	223	0	22	0	11	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	223	0	0	448	445	212	451	456	223
Stage 1	-	-	-	-	-	-	212	212	-	233	233	-
Stage 2	-	-	-	-	-	-	236	233	-	218	223	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1346	-	0	521	508	828	519	501	817
Stage 1	0	-	-	-	-	0	790	727	-	770	712	-
Stage 2	0	-	-	-	-	0	767	712	-	784	719	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1346	-	-	516	506	828	511	499	817
Mov Cap-2 Maneuver	-	-	-	-	-	-	516	506	-	511	499	-
Stage 1	-	-	-	-	-	-	790	727	-	770	709	-
Stage 2	-	-	-	-	-	-	759	709	-	774	719	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11.5	10.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	590	-	-	1346	-	629
HCM Lane V/C Ratio	0.055	-	-	0.004	-	0.017
HCM Control Delay (s)	11.5	-	-	7.7	0	10.8
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0.1

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	250	10	0	190
Future Vol, veh/h	0	0	250	10	0	190
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	272	11	0	207

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	382	278	0	0	-	-
Stage 1	278	-	-	-	-	-
Stage 2	104	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	-	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	-	-
Pot Cap-1 Maneuver	607	760	-	-	0	-
Stage 1	768	-	-	-	0	-
Stage 2	909	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	607	760	-	-	-	-
Mov Cap-2 Maneuver	607	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	909	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	-
HCM Lane LOS	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	65	80	120	195	0	0	0	0	85	0	60
Future Vol, veh/h	0	65	80	120	195	0	0	0	0	85	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	71	87	130	212	0	0	0	0	92	0	65

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	158	0	0	587	630	212
Stage 1	-	-	-	-	-	-	472	472	-
Stage 2	-	-	-	-	-	-	115	158	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1422	-	0	521	443	843
Stage 1	0	-	-	-	-	0	679	605	-
Stage 2	0	-	-	-	-	0	927	787	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1422	-	-	474	0	843
Mov Cap-2 Maneuver	-	-	-	-	-	-	474	0	-
Stage 1	-	-	-	-	-	-	679	0	-
Stage 2	-	-	-	-	-	-	843	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1422	-	579
HCM Lane V/C Ratio	-	-	0.092	-	0.272
HCM Control Delay (s)	-	-	7.8	-	13.5
HCM Lane LOS	-	-	A	-	B
HCM 95th %tile Q(veh)	-	-	0.3	-	1.1

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	149	0	0	154	110	160	0	70	0	0	0
Future Vol, veh/h	15	149	0	0	154	110	160	0	70	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	162	0	0	167	120	174	0	76	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	287	0	-	-	-	0	421	481	162
Stage 1	-	-	-	-	-	-	194	194	-
Stage 2	-	-	-	-	-	-	227	287	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1275	-	0	0	-	-	632	525	895
Stage 1	-	-	0	0	-	-	866	764	-
Stage 2	-	-	0	0	-	-	842	707	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1275	-	-	-	-	-	624	0	895
Mov Cap-2 Maneuver	-	-	-	-	-	-	624	0	-
Stage 1	-	-	-	-	-	-	855	0	-
Stage 2	-	-	-	-	-	-	842	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.7	0	13.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	687	1275	-	-	-
HCM Lane V/C Ratio	0.364	0.013	-	-	-
HCM Control Delay (s)	13.2	7.9	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	1.7	0	-	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	77	117	95	71	60	124
Future Vol, veh/h	77	117	95	71	60	124
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	127	103	77	65	135

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	180	0	-	0	398	103
Stage 1	-	-	-	-	103	-
Stage 2	-	-	-	-	295	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1396	-	-	-	607	952
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	755	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1396	-	-	-	568	952
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	861	-
Stage 2	-	-	-	-	755	-

Approach	EB	WB	SB
HCM Control Delay, s	3.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1396	-	-	-	568	952
HCM Lane V/C Ratio	0.06	-	-	-	0.115	0.142
HCM Control Delay (s)	7.7	0	-	-	12.2	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4	0.5

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	68	109	110	53	34	77
Future Vol, veh/h	68	109	110	53	34	77
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	74	118	120	58	37	84

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	178	0	-	0	386	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	266	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1398	-	-	-	617	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	779	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1398	-	-	-	582	931
Mov Cap-2 Maneuver	-	-	-	-	582	-
Stage 1	-	-	-	-	853	-
Stage 2	-	-	-	-	779	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1398	-	-	-	787
HCM Lane V/C Ratio	0.053	-	-	-	0.153
HCM Control Delay (s)	7.7	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	155	18	5	115	0	43	0	5	5	0	5
Future Vol, veh/h	0	155	18	5	115	0	43	0	5	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	168	20	5	125	0	47	0	5	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	188	0	0	316	313	178	316	323	125
Stage 1	-	-	-	-	-	-	178	178	-	135	135	-
Stage 2	-	-	-	-	-	-	138	135	-	181	188	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1386	-	0	637	602	865	637	595	926
Stage 1	0	-	-	-	-	0	824	752	-	868	785	-
Stage 2	0	-	-	-	-	0	865	785	-	821	745	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1386	-	-	631	600	865	631	593	926
Mov Cap-2 Maneuver	-	-	-	-	-	-	631	600	-	631	593	-
Stage 1	-	-	-	-	-	-	824	752	-	868	782	-
Stage 2	-	-	-	-	-	-	856	782	-	816	745	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	11	9.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	649	-	-	1386	-	751
HCM Lane V/C Ratio	0.08	-	-	0.004	-	0.014
HCM Control Delay (s)	11	-	-	7.6	0	9.9
HCM Lane LOS	B	-	-	A	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-	0

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	39	22	101	27	33	120
Future Vol, veh/h	39	22	101	27	33	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	42	24	110	29	36	130

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	262	125	0	0	139	0
Stage 1	125	-	-	-	-	-
Stage 2	137	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	716	925	-	-	1443	-
Stage 1	900	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	697	925	-	-	1443	-
Mov Cap-2 Maneuver	697	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	852	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.2	0	1.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	765	1443	-
HCM Lane V/C Ratio	-	-	0.087	0.025	-
HCM Control Delay (s)	-	-	10.2	7.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.3	0.1	-

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	129	175	139	174	0	0	0	0	104	0	45
Future Vol, veh/h	0	129	175	139	174	0	0	0	0	104	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	175	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	-3	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	140	190	151	189	0	0	0	0	113	0	49

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	330	0	0	726	821	189
Stage 1	-	-	-	-	-	-	491	491	-
Stage 2	-	-	-	-	-	-	235	330	-
Critical Hdwy	-	-	-	4.12	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1229	-	0	442	355	866
Stage 1	0	-	-	-	-	0	668	595	-
Stage 2	0	-	-	-	-	0	836	682	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	1229	-	-	388	0	866
Mov Cap-2 Maneuver	-	-	-	-	-	-	388	0	-
Stage 1	-	-	-	-	-	-	668	0	-
Stage 2	-	-	-	-	-	-	733	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	3.7	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	-	-	1229	-	466
HCM Lane V/C Ratio	-	-	0.123	-	0.348
HCM Control Delay (s)	-	-	8.3	-	16.8
HCM Lane LOS	-	-	A	-	C
HCM 95th %tile Q(veh)	-	-	0.4	-	1.5

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	178	0	0	193	124	95	0	159	0	0	0
Future Vol, veh/h	50	178	0	0	193	124	95	0	159	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	175	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	-3	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	54	193	0	0	210	135	103	0	173	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	345	0	-	-	-	0	579	646	193
Stage 1	-	-	-	-	-	-	301	301	-
Stage 2	-	-	-	-	-	-	278	345	-
Critical Hdwy	4.12	-	-	-	-	-	5.82	5.92	5.92
Critical Hdwy Stg 1	-	-	-	-	-	-	4.82	4.92	-
Critical Hdwy Stg 2	-	-	-	-	-	-	4.82	4.92	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	1214	-	0	0	-	-	525	435	862
Stage 1	-	-	0	0	-	-	789	699	-
Stage 2	-	-	0	0	-	-	805	674	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1214	-	-	-	-	-	502	0	862
Mov Cap-2 Maneuver	-	-	-	-	-	-	502	0	-
Stage 1	-	-	-	-	-	-	754	0	-
Stage 2	-	-	-	-	-	-	805	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.8	0	13.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	680	1214	-	-	-
HCM Lane V/C Ratio	0.406	0.045	-	-	-
HCM Control Delay (s)	13.9	8.1	-	-	-
HCM Lane LOS	B	A	-	-	-
HCM 95th %tile Q(veh)	2	0.1	-	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	192	126	139	101	100	148
Future Vol, veh/h	192	126	139	101	100	148
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	209	137	151	110	109	161

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	261	0	-	0	706	151
Stage 1	-	-	-	-	151	-
Stage 2	-	-	-	-	555	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1303	-	-	-	402	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1303	-	-	-	332	895
Mov Cap-2 Maneuver	-	-	-	-	332	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	575	-

Approach	EB	WB	SB
HCM Control Delay, s	5	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1303	-	-	-	332	895
HCM Lane V/C Ratio	0.16	-	-	-	0.327	0.18
HCM Control Delay (s)	8.3	0	-	-	21	9.9
HCM Lane LOS	A	A	-	-	C	A
HCM 95th %tile Q(veh)	0.6	-	-	-	1.4	0.7

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	71	160	205	38	32	46
Future Vol, veh/h	71	160	205	38	32	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	0	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	174	223	41	35	50

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	264	0	-	0	551	223
Stage 1	-	-	-	-	223	-
Stage 2	-	-	-	-	328	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1300	-	-	-	495	817
Stage 1	-	-	-	-	814	-
Stage 2	-	-	-	-	730	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1300	-	-	-	462	817
Mov Cap-2 Maneuver	-	-	-	-	462	-
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	730	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1300	-	-	-	621
HCM Lane V/C Ratio	0.059	-	-	-	0.137
HCM Control Delay (s)	7.9	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.2	-	-	-	0.5

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	194	23	5	214	0	23	0	10	5	0	5
Future Vol, veh/h	0	194	23	5	214	0	23	0	10	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	211	25	5	233	0	25	0	11	5	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	236	0	0	470	467	224	472	479	233
Stage 1	-	-	-	-	-	-	224	224	-	243	243	-
Stage 2	-	-	-	-	-	-	246	243	-	229	236	-
Critical Hdwy	-	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1331	-	0	504	493	815	502	486	806
Stage 1	0	-	-	-	-	0	779	718	-	761	705	-
Stage 2	0	-	-	-	-	0	758	705	-	774	710	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1331	-	-	499	491	815	494	484	806
Mov Cap-2 Maneuver	-	-	-	-	-	-	499	491	-	494	484	-
Stage 1	-	-	-	-	-	-	779	718	-	761	702	-
Stage 2	-	-	-	-	-	-	750	702	-	764	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	11.8	11
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	565	-	-	1331	-	613
HCM Lane V/C Ratio	0.063	-	-	0.004	-	0.018
HCM Control Delay (s)	11.8	-	-	7.7	0	11
HCM Lane LOS	B	-	-	A	A	B
HCM 95th %tile Q(veh)	0.2	-	-	0	-	0.1

Intersection	
Int Delay, s/veh	1.7

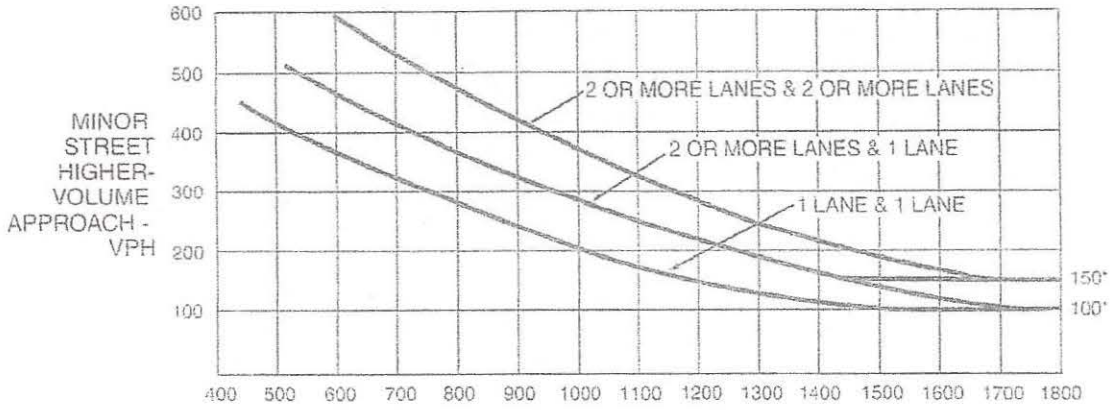
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	38	27	231	27	18	175
Future Vol, veh/h	38	27	231	27	18	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	29	251	29	20	190

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	401	266	0	0	280	0
Stage 1	266	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	591	772	-	-	1281	-
Stage 1	778	-	-	-	-	-
Stage 2	878	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	581	772	-	-	1281	-
Mov Cap-2 Maneuver	581	-	-	-	-	-
Stage 1	778	-	-	-	-	-
Stage 2	863	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	648	1281	-
HCM Lane V/C Ratio	-	-	0.109	0.015	-
HCM Control Delay (s)	-	-	11.2	7.9	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Figure 4C-3. Warrant 3, Peak Hour



*Note: 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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



*Note: 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 approach with one lane.

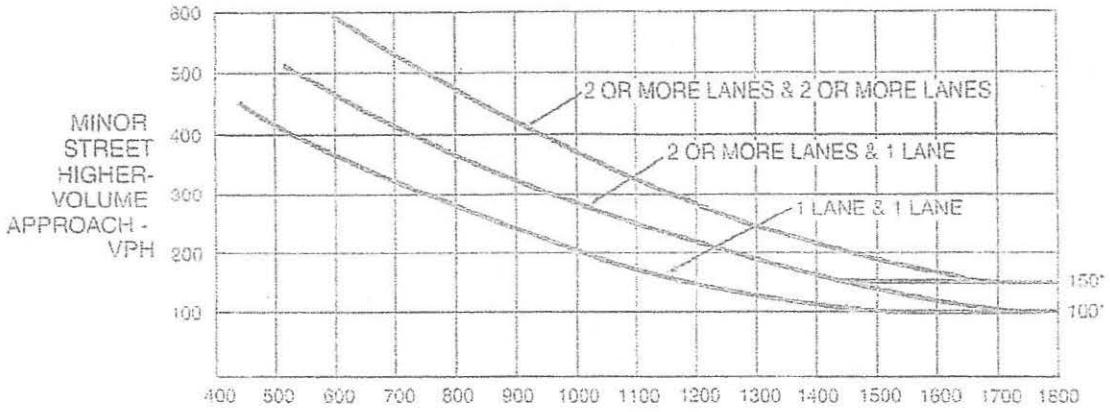
• EXIST AM
o EXIST PM
+ EXIST + PROJ AM
Δ EXIST + PROJ PM

• EPAP AM
o EPAP PM
+ EPAP + PROJ AM
Δ EPAP + PROJ PM

• CUM AM
o CUM PM
+ CUM + PROJ AM
Δ CUM + PROJ PM

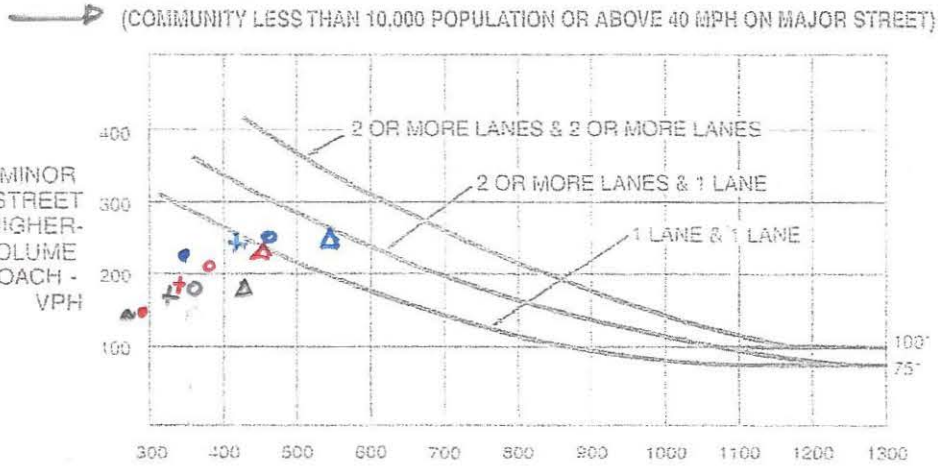
I-5 SB RAMPS/
WALNUT GROVE RD

Figure 4C-3. Warrant 3, Peak Hour



*Note: 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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



*Note: 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 approach with one lane.

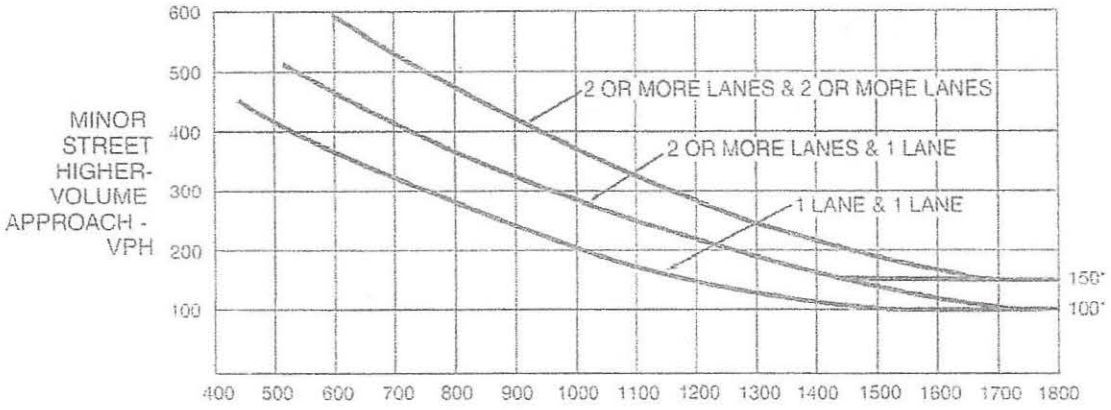
- • EXIST AM
- o EXIST PM
- \+ EX + PROJ AM
- Δ EX + PROJ PM

- • EPAP AM
- o EPAP PM
- \+ EPAP + PROJ AM
- Δ EPAP + PROJ PM

- • CUM AM
- o CUM PM
- \+ CUM + PROJ AM
- Δ CUM + PROJ PM

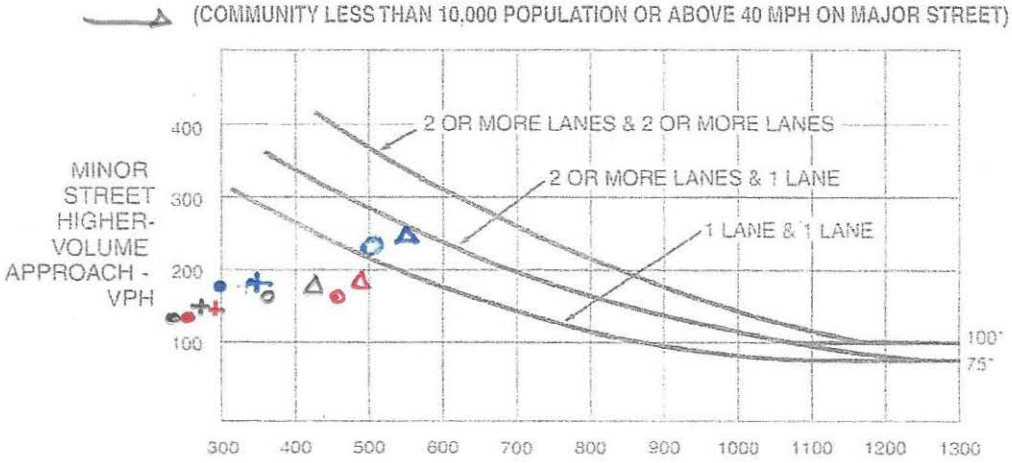
I-5 NB RAMPS / WALNUT GROVE RD

Figure 4C-3. Warrant 3, Peak Hour



*Note: 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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)



*Note: 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 approach with one lane.

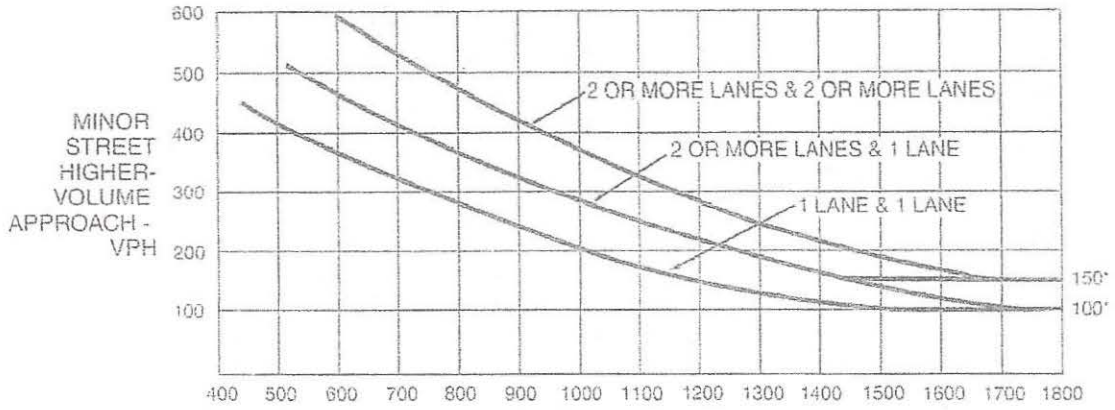
• EX AM
O EX PM
+ EX + PROJ AM
Δ EX + PROJ PM

• EPAP AM
O EPAP PM
+ EPAP + PROJ AM
Δ EPAP + PROJ PM

• CUM AM
O CUM PM
+ CUM + PROJ AM
Δ CUM + PROJ PM

WALNUT GROVE RD / THORNTON RD

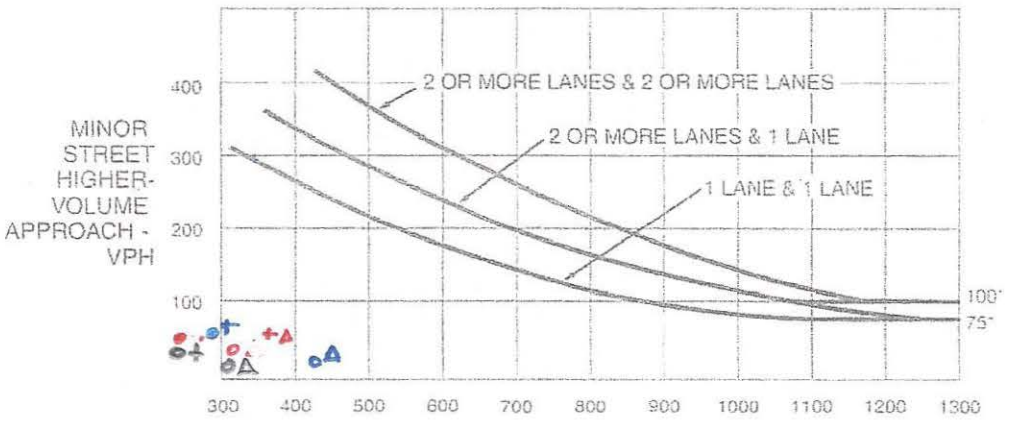
Figure 4C-3. Warrant 3, Peak Hour



*Note: 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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 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 approach with one lane.

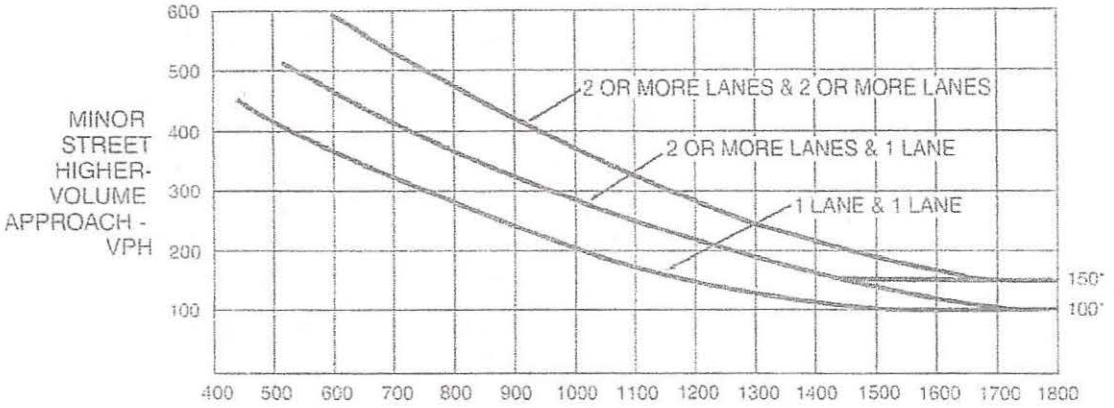
• EXIST AM
o EXIST PM
+ EX + PROJ AM
Δ EX + PROJ PM

• EPAP AM
o EPAP PM
+ EPAP + PROJ AM
Δ EPAP + PROJ PM

• CUM AM
o CUM PM
+ CUM + PROJ AM
Δ CUM + PROJ PM

THORNTON RD / MOKELUMNE AVE

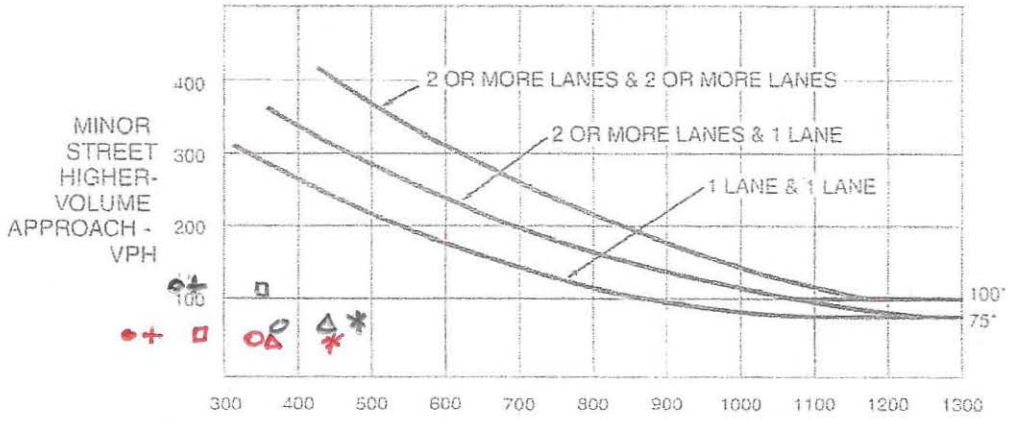
Figure 4C-3. Warrant 3, Peak Hour



*Note: 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 approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 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 approach with one lane.

THORNTON AVE

- ● EX + PROJ AM
- ○ EX + PROJ PM
- \+ EPAP + PROJ AM
- △ EPAP + PROJ PM
- □ CUM + PROJ AM
- ✱ CUM + PROJ PM

N. THORNTON AVE

● ○ + △ □ ✱

PROJECT DRIVEWAYS

Day Type

1: Weekday (Tu-Th)

NB I-5 RAMPS / WALNUT GROVE TURNING MOVEMENT COUNTS 2019

	Walnut Grove West Leg EB IN			Walnut Grove East Leg WB In			I-5 NB Ramps South Leg NB In			0			
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
Day Part													Total
00: All Day (12:00am-12:00am)	422	1,303	-	-	1,151	631	999	1,033	1,009	-	-	-	6,548
01: 7:00am-7:15am	2	14	-	-	18	17	15	6	4	-	-	-	76
02: 7:15am-7:30am	2	16	-	-	15	15	15	12	6	-	-	-	81
03: 7:30am-7:45am	2	33	-	-	19	8	14	14	11	-	-	-	101
04: 7:45am-8:00am	2	31	-	-	23	9	54	11	12	-	-	-	142
05: 8:00am-8:15am	4	11	-	-	18	8	24	11	9	-	-	-	85
06: 8:15am-8:30am	3	15	-	-	17	5	17	10	9	-	-	-	76
07: 8:30am-8:45am	3	16	-	-	21	10	19	10	8	-	-	-	87
08: 8:45am-9:00am	4	12	-	-	15	7	24	14	11	-	-	-	87
09: 4:00pm-4:15pm	9	30	-	-	14	18	19	17	27	-	-	-	134
10: 4:15pm-4:30pm	9	27	-	-	19	14	21	22	26	-	-	-	138
11: 4:30pm-4:45pm	12	26	-	-	40	12	16	21	26	-	-	-	153
12: 4:45pm-5:00pm	8	28	-	-	25	15	15	20	26	-	-	-	137
13: 5:00pm-5:15pm	8	34	-	-	17	17	12	17	23	-	-	-	128
14: 5:15pm-5:30pm	7	31	-	-	23	13	17	20	30	-	-	-	141
15: 5:30pm-5:45pm	11	18	-	-	14	9	19	19	22	-	-	-	112
16: 5:45pm-6:00pm	9	25	-	-	17	6	14	15	27	-	-	-	113
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TURNING MOVEMENT PERCENTAGE

	Walnut Grove West Leg EB IN			Walnut Grove East Leg WB In			I-5 NB Ramps South Leg NB In			0		
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right
Day Part												
00: All Day (12:00am-12:00am)	24%	76%	0%	0%	65%	35%	33%	34%	33%	-	-	-
01: 7:00am-7:15am	13%	88%	0%	0%	51%	49%	60%	24%	16%	-	-	-
02: 7:15am-7:30am	11%	89%	0%	0%	50%	50%	45%	36%	18%	-	-	-
03: 7:30am-7:45am	6%	94%	0%	0%	70%	30%	36%	36%	28%	-	-	-
04: 7:45am-8:00am	6%	94%	0%	0%	72%	28%	70%	14%	16%	-	-	-
05: 8:00am-8:15am	27%	73%	0%	0%	69%	31%	55%	25%	20%	-	-	-
06: 8:15am-8:30am	17%	83%	0%	0%	77%	23%	47%	28%	25%	-	-	-
07: 8:30am-8:45am	16%	84%	0%	0%	68%	32%	51%	27%	22%	-	-	-
08: 8:45am-9:00am	25%	75%	0%	0%	68%	32%	49%	29%	22%	-	-	-
09: 4:00pm-4:15pm	23%	77%	0%	0%	44%	56%	30%	27%	43%	-	-	-
10: 4:15pm-4:30pm	25%	75%	0%	0%	58%	42%	30%	32%	38%	-	-	-
11: 4:30pm-4:45pm	32%	68%	0%	0%	77%	23%	25%	33%	41%	-	-	-
12: 4:45pm-5:00pm	22%	78%	0%	0%	63%	38%	25%	33%	43%	-	-	-
13: 5:00pm-5:15pm	19%	81%	0%	0%	50%	50%	23%	33%	44%	-	-	-
14: 5:15pm-5:30pm	18%	82%	0%	0%	64%	36%	25%	30%	45%	-	-	-
15: 5:30pm-5:45pm	38%	62%	0%	0%	61%	39%	32%	32%	37%	-	-	-
16: 5:45pm-6:00pm	26%	74%	0%	0%	74%	26%	25%	27%	48%	-	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-

Day Type

1: Weekday (Tu-Th)

SB I-5 RAMPS / WALNUT GROVE RD TURNING MOVEMENT COUNTS 2019

	Walnut Grove West Leg EB In			Walnut Grove East Leg WB IN						I-5 SB Ramp North Leg SB In			
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
Day Part													Total
00: All Day (12:00am-12:00am)	-	842	1,100	939	1,544	-	-	-	-	852	907	560	6,744
01: 7:00am-7:15am	-	4	6	14	22	-	-	-	-	14	12	5	77
02: 7:15am-7:30am	-	5	9	17	17	-	-	-	-	14	18	7	87
03: 7:30am-7:45am	-	14	12	17	20	-	-	-	-	22	13	7	105
04: 7:45am-8:00am	-	18	12	20	63	-	-	-	-	13	9	12	147
05: 8:00am-8:15am	-	8	15	17	32	-	-	-	-	5	6	10	93
06: 8:15am-8:30am	-	7	11	17	22	-	-	-	-	11	11	8	87
07: 8:30am-8:45am	-	8	22	22	21	-	-	-	-	11	14	13	111
08: 8:45am-9:00am	-	6	32	15	32	-	-	-	-	11	16	9	121
09: 4:00pm-4:15pm	-	22	21	16	22	-	-	-	-	18	20	9	128
10: 4:15pm-4:30pm	-	18	26	14	31	-	-	-	-	18	18	8	133
11: 4:30pm-4:45pm	-	21	40	33	39	-	-	-	-	14	20	8	175
12: 4:45pm-5:00pm	-	19	37	19	33	-	-	-	-	17	17	8	150
13: 5:00pm-5:15pm	-	25	30	16	22	-	-	-	-	17	13	6	129
14: 5:15pm-5:30pm	-	23	22	19	29	-	-	-	-	15	18	11	137
15: 5:30pm-5:45pm	-	19	19	12	28	-	-	-	-	11	15	6	110
16: 5:45pm-6:00pm	-	18	16	15	23	-	-	-	-	15	15	6	108
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TURNING MOVEMENT PERCENTAGE

	Walnut Grove West Leg EB In			Walnut Grove East Leg WB IN						I-5 SB Ramp North Leg SB In		
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right
Day Part												
00: All Day (12:00am-12:00am)	0%	43%	57%	38%	62%	0%	-	-	-	37%	39%	24%
01: 7:00am-7:15am	0%	40%	60%	39%	61%	0%	-	-	-	45%	39%	16%
02: 7:15am-7:30am	0%	36%	64%	50%	50%	0%	-	-	-	36%	46%	18%
03: 7:30am-7:45am	0%	54%	46%	46%	54%	0%	-	-	-	52%	31%	17%
04: 7:45am-8:00am	0%	60%	40%	24%	76%	0%	-	-	-	38%	26%	35%
05: 8:00am-8:15am	0%	35%	65%	35%	65%	0%	-	-	-	24%	29%	48%
06: 8:15am-8:30am	0%	39%	61%	44%	56%	0%	-	-	-	37%	37%	27%
07: 8:30am-8:45am	0%	27%	73%	51%	49%	0%	-	-	-	29%	37%	34%
08: 8:45am-9:00am	0%	16%	84%	32%	68%	0%	-	-	-	31%	44%	25%
09: 4:00pm-4:15pm	0%	51%	49%	42%	58%	0%	-	-	-	38%	43%	19%
10: 4:15pm-4:30pm	0%	41%	59%	31%	69%	0%	-	-	-	41%	41%	18%
11: 4:30pm-4:45pm	0%	34%	66%	46%	54%	0%	-	-	-	33%	48%	19%
12: 4:45pm-5:00pm	0%	34%	66%	37%	63%	0%	-	-	-	40%	40%	19%
13: 5:00pm-5:15pm	0%	45%	55%	42%	58%	0%	-	-	-	47%	36%	17%
14: 5:15pm-5:30pm	0%	51%	49%	40%	60%	0%	-	-	-	34%	41%	25%
15: 5:30pm-5:45pm	0%	50%	50%	30%	70%	0%	-	-	-	34%	47%	19%
16: 5:45pm-6:00pm	0%	53%	47%	39%	61%	0%	-	-	-	42%	42%	17%
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Day Type

1: Weekday (Tu-Th)

TURNING MOVEMENT COUNTS - N. THORNTON RD / DRIVEWAY 2019

				Driveway East Leg WB In			Thornton / Driveway South Leg NB			Thornton North Leg SB In			
Day Part	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	Total
00: All Day (12:00am-12:00am)	-	-	-	-	-	-	-	1,568	129	-	1,640	-	3,337
01: 6:00am-6:15am	-	-	-	-	-	-	-	3	-	-	93	-	96
02: 6:15am-6:30am	-	-	-	-	-	-	-	11	-	-	64	-	75
03: 6:30am-6:45am	-	-	-	-	-	-	-	13	-	-	57	-	70
04: 6:45am-7:00am	-	-	-	-	-	-	-	14	-	-	28	-	42
05: 7:00am-7:15am	-	-	-	-	-	-	-	11	-	-	28	-	39
06: 7:15am-7:30am	-	-	-	-	-	-	-	17	-	-	30	-	47
07: 7:30am-7:45am	-	-	-	-	-	-	-	31	-	-	29	-	60
08: 7:45am-8:00am	-	-	-	-	-	-	-	34	-	-	40	-	74
09: 8:00am-8:15am	-	-	-	-	-	-	-	12	-	-	28	-	40
10: 8:15am-8:30am	-	-	-	-	-	-	-	16	-	-	17	-	33
11: 8:30am-8:45am	-	-	-	-	-	-	-	14	-	-	17	-	31
12: 8:45am-9:00am	-	-	-	-	-	-	-	11	-	-	18	-	29
13: 4:00pm-4:15pm	-	-	-	-	-	-	-	33	-	-	19	-	52
14: 4:15pm-4:30pm	-	-	-	-	-	-	-	49	-	-	30	-	79
15: 4:30pm-4:45pm	-	-	-	-	-	-	-	47	-	-	54	-	101
16: 4:45pm-5:00pm	-	-	-	-	-	-	-	51	-	-	40	-	91
17: 5:00pm-5:15pm	-	-	-	-	-	-	-	54	-	-	25	-	79
18: 5:15pm-5:30pm	-	-	-	-	-	-	-	55	-	-	46	-	101
19: 5:30pm-5:45pm	-	-	-	-	-	-	-	44	-	-	31	-	75
20: 5:45pm-6:00pm	-	-	-	-	-	-	-	47	-	-	25	-	72
21: 6:00pm-6:15pm	-	-	-	-	-	-	-	37	-	-	27	-	64
22: 6:15pm-6:30pm	-	-	-	-	-	-	-	56	-	-	22	-	78
23: 6:30pm-6:45pm	-	-	-	-	-	-	-	37	-	-	20	-	57
24: 6:45pm-7:00pm	-	-	-	-	-	-	-	28	-	-	16	-	44
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TURNING MOVEMENT PERCENTAGE

				Driveway East Leg WB In			Thornton / Driveway South Leg NB			Thornton North Leg SB In		
Day Part	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right
00: All Day (12:00am-12:00am)	-	-	-	-	-	-	0%	92%	8%	0%	100%	0%
01: 6:00am-6:15am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
02: 6:15am-6:30am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
03: 6:30am-6:45am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
04: 6:45am-7:00am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
05: 7:00am-7:15am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
06: 7:15am-7:30am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
07: 7:30am-7:45am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
08: 7:45am-8:00am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
09: 8:00am-8:15am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
10: 8:15am-8:30am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
11: 8:30am-8:45am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
12: 8:45am-9:00am	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
13: 4:00pm-4:15pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
14: 4:15pm-4:30pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
15: 4:30pm-4:45pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
16: 4:45pm-5:00pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
17: 5:00pm-5:15pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
18: 5:15pm-5:30pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
19: 5:30pm-5:45pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
20: 5:45pm-6:00pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
21: 6:00pm-6:15pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
22: 6:15pm-6:30pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
23: 6:30pm-6:45pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%
24: 6:45pm-7:00pm	-	-	-	-	-	-	0%	100%	0%	0%	100%	0%

Day Type

1: Weekday (Tu-Th)

WALNUT GROVE / MOKELUMNE - PROJ DRIVEWAY TURNING MOVEMENT COUNTS 2019

	Thornton West Leg EB In			Thornton Rd East Leg WB In			Mokelumne Ave South Leg NB In			Truck Gas North Leg SB In			
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
Day Part													Total
00: All Day (12:00am-12:00am)	12	1,556	70	58	1,477	-	326	308	121	-	217	21	4,166
01: 7:00am-7:15am	-	13	5	-	28	-	4	-	-	-	-	-	50
02: 7:15am-7:30am	-	13	-	-	32	-	-	-	-	-	-	-	45
03: 7:30am-7:45am	-	33	3	-	21	-	5	-	-	-	-	-	62
04: 7:45am-8:00am	-	33	4	-	19	-	7	-	-	-	-	-	63
05: 8:00am-8:15am	-	17	4	-	18	-	5	-	-	-	-	-	44
06: 8:15am-8:30am	-	16	9	-	12	-	14	-	-	-	-	-	51
07: 8:30am-8:45am	-	13	8	-	11	-	26	-	-	-	-	-	58
08: 8:45am-9:00am	-	17	8	-	11	-	11	-	-	-	-	-	47
09: 4:00pm-4:15pm	-	33	8	-	32	-	12	-	6	-	-	-	91
10: 4:15pm-4:30pm	-	37	-	-	33	-	12	-	-	-	-	-	82
11: 4:30pm-4:45pm	-	31	-	-	48	-	9	-	-	-	-	-	88
12: 4:45pm-5:00pm	-	36	6	-	40	-	13	-	-	-	-	-	95
13: 5:00pm-5:15pm	-	33	-	-	35	-	10	-	-	-	-	-	78
14: 5:15pm-5:30pm	-	36	-	-	19	-	12	-	-	-	-	-	67
15: 5:30pm-5:45pm	-	28	3	-	19	-	1	17	-	-	-	-	68
16: 5:45pm-6:00pm	-	31	4	-	11	-	11	-	-	-	-	-	57
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NOTE - SB thru counts adjusted to SB Rt _traffic to I-5 SB / Peltier IC

TURNING MOVEMENT PERCENTAGE

	Thornton West Leg EB In			Thornton Rd East Leg WB In			Mokelumne Ave South Leg NB In			Truck Gas North Leg SB In		
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right
Day Part												
00: All Day (12:00am-12:00am)	1%	95%	4%	4%	96%	0%	43%	41%	16%	0%	91%	9%
01: 7:00am-7:15am	0%	72%	28%	0%	100%	0%	100%	0%	0%	-	-	-
02: 7:15am-7:30am	0%	100%	0%	0%	100%	0%	-	-	-	-	-	-
03: 7:30am-7:45am	0%	92%	8%	0%	100%	0%	100%	0%	0%	-	-	-
04: 7:45am-8:00am	0%	89%	11%	0%	100%	0%	100%	0%	0%	-	-	-
05: 8:00am-8:15am	0%	81%	19%	0%	100%	0%	100%	0%	0%	-	-	-
06: 8:15am-8:30am	0%	64%	36%	0%	100%	0%	100%	0%	0%	-	-	-
07: 8:30am-8:45am	0%	62%	38%	0%	100%	0%	100%	0%	0%	-	-	-
08: 8:45am-9:00am	0%	68%	32%	0%	100%	0%	100%	0%	0%	-	-	-
09: 4:00pm-4:15pm	0%	80%	20%	0%	100%	0%	67%	0%	33%	-	-	-
10: 4:15pm-4:30pm	0%	100%	0%	0%	100%	0%	100%	0%	0%	-	-	-
11: 4:30pm-4:45pm	0%	100%	0%	0%	100%	0%	100%	0%	0%	-	-	-
12: 4:45pm-5:00pm	0%	86%	14%	0%	100%	0%	100%	0%	0%	-	-	-
13: 5:00pm-5:15pm	0%	100%	0%	0%	100%	0%	100%	0%	0%	-	-	-
14: 5:15pm-5:30pm	0%	100%	0%	0%	100%	0%	100%	0%	0%	-	-	-
15: 5:30pm-5:45pm	0%	90%	10%	0%	100%	0%	6%	94%	0%	-	-	-
16: 5:45pm-6:00pm	0%	89%	11%	0%	100%	0%	100%	0%	0%	-	-	-
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Day Type

1: Weekday (Tu-Th)

WALNUT GROVE/THORNTON TURNING MOVEMENT COUNTS 2019

	Walnut Grove Rd West leg EB In			Walnut Grove Rd East Leg WB In			0			Thornton Rd North Leg SB In			
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right	
Day Part													Total
00: All Day (12:00am-12:00am)	963	965	-	-	989	744	-	-	-	863	-	880	5,404
01: 7:00am-7:15am	2	10	-	-	20	12	-	-	-	8	-	19	71
02: 7:15am-7:30am	10	8	-	-	14	16	-	-	-	8	-	21	77
03: 7:30am-7:45am	22	19	-	-	14	13	-	-	-	15	-	19	102
04: 7:45am-8:00am	25	13	-	-	12	13	-	-	-	18	-	23	104
05: 8:00am-8:15am	8	6	-	-	16	7	-	-	-	11	-	16	64
06: 8:15am-8:30am	6	11	-	-	10	11	-	-	-	9	-	12	59
07: 8:30am-8:45am	8	9	-	-	26	10	-	-	-	8	-	8	69
08: 8:45am-9:00am	7	11	-	-	15	7	-	-	-	11	-	8	59
09: 4:00pm-4:15pm	25	24	-	-	20	19	-	-	-	14	-	12	114
10: 4:15pm-4:30pm	26	17	-	-	21	21	-	-	-	19	-	13	117
11: 4:30pm-4:45pm	29	14	-	-	30	21	-	-	-	19	-	38	151
12: 4:45pm-5:00pm	34	12	-	-	27	21	-	-	-	22	-	19	135
13: 5:00pm-5:15pm	36	15	-	-	25	19	-	-	-	16	-	9	120
14: 5:15pm-5:30pm	38	16	-	-	13	17	-	-	-	19	-	26	129
15: 5:30pm-5:45pm	27	8	-	-	7	13	-	-	-	15	-	14	84
16: 5:45pm-6:00pm	37	13	-	-	12	11	-	-	-	15	-	14	102
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TURNING MOVEMENT PERCENTAGE

	Walnut Grove Rd West leg EB In			Walnut Grove Rd East Leg WB In			0			Thornton Rd North Leg SB In		
	EB Left	EB Thru	EB Right	WB Left	WB Thru	WB Right	NB Left	NB Thru	NB Right	SB Left	SB Thru	SB Right
Day Part												
00: All Day (12:00am-12:00am)	50%	50%	0%	0%	57%	43%	-	-	-	50%	0%	50%
01: 7:00am-7:15am	17%	83%	0%	0%	63%	38%	-	-	-	30%	0%	70%
02: 7:15am-7:30am	56%	44%	0%	0%	47%	53%	-	-	-	28%	0%	72%
03: 7:30am-7:45am	54%	46%	0%	0%	52%	48%	-	-	-	44%	0%	56%
04: 7:45am-8:00am	66%	34%	0%	0%	48%	52%	-	-	-	44%	0%	56%
05: 8:00am-8:15am	57%	43%	0%	0%	70%	30%	-	-	-	41%	0%	59%
06: 8:15am-8:30am	35%	65%	0%	0%	48%	52%	-	-	-	43%	0%	57%
07: 8:30am-8:45am	47%	53%	0%	0%	72%	28%	-	-	-	50%	0%	50%
08: 8:45am-9:00am	39%	61%	0%	0%	68%	32%	-	-	-	58%	0%	42%
09: 4:00pm-4:15pm	51%	49%	0%	0%	51%	49%	-	-	-	54%	0%	46%
10: 4:15pm-4:30pm	60%	40%	0%	0%	50%	50%	-	-	-	59%	0%	41%
11: 4:30pm-4:45pm	67%	33%	0%	0%	59%	41%	-	-	-	33%	0%	67%
12: 4:45pm-5:00pm	74%	26%	0%	0%	56%	44%	-	-	-	54%	0%	46%
13: 5:00pm-5:15pm	71%	29%	0%	0%	57%	43%	-	-	-	64%	0%	36%
14: 5:15pm-5:30pm	70%	30%	0%	0%	43%	57%	-	-	-	42%	0%	58%
15: 5:30pm-5:45pm	77%	23%	0%	0%	35%	65%	-	-	-	52%	0%	48%
16: 5:45pm-6:00pm	74%	26%	0%	0%	52%	48%	-	-	-	52%	0%	48%
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