



INITIAL STUDY – MITIGATED NEGATIVE DECLARATION

FOR THE FARRAR SUBDIVISION
PROJECT

November 2019

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City of Tulare

Planning and Building Department
411 East Kern Avenue
Tulare, CA 93274

Executive Summary

Project Title: Farrar Subdivision Project

Project Location

The project site is located within Tulare County in the eastern area of the City of Tulare (City). The project area is composed of four neighboring parcels (APN 172-130-020, 172-090-029, 172-110-001, and 172-070-005). The four parcels total approximately 76.5 acres.

The four parcels are designated by the City as Rural Residential, Residential Estate, and Low Density Residential under the General Plan and RA (Rural Residential), R-1-20, R-1-12.5, and R-1-7 under the current zoning code. The current parcels are currently being used for agricultural row crops.

Project Overview

The proposed project is a single-family residential subdivision consisting of 360 lots constructed in four phases. The development of the subdivision would result in on-site infrastructure improvements, including new local residential streets, new and relocated utilities, and a ponding basin to treat storm water flows.

Summary of IS/MND Findings

The analysis in Section 3 of this Initial Study and Proposed Mitigated Negative Declaration (IS/MND) evaluates the potential environmental impacts associated with project implementation. It was found that implementation of the proposed project would not result in potentially significant impacts on the environment, as detailed in Section 3.

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Mitigation Monitoring and Reporting Program

Mitigation Measure	Responsible Party for Implementation	Implementation Timing	Responsible Party for Monitoring	Verification
AQ-1: The proposed project is subject to Rule 9510, as required by the SJVAPCD. The project applicant shall pay the Indirect Source Review Rule fee for any required reductions that have not been accomplished through project mitigation commitments, prior to issuance of building permits. The fee calculations will be conducted by the SJVAPCD.	Project Proponent	Prior to Issuance of Building Permits for Phase I or the equivalent first phase of project development	City of Tulare; SJVAPCD	
BIO-1a: In order to avoid impacts to nesting raptors and migratory birds, the project shall be constructed, if feasible, outside the nesting season, or between September 1st and January 31st.	Project Applicant & Construction Contractor	Prior to issuance of grading permits or any ground-disturbing and construction activities	City of Tulare	

BIO-1b: If project activities must occur during the nesting season (February 1-August 31), a qualified biologist shall conduct preconstruction surveys for active raptor and migratory bird nests within 14 days prior to the start of these activities. The survey shall include the proposed work area(s) and surrounding lands within 500 feet, where accessible, for all nesting raptors and migratory birds save Swainson's hawk; the Swainson's hawk survey shall extend to 0.5 mile outside of work area boundaries. Nesting surveys for the Swainson's hawks shall be conducted in accordance with the protocol outlined in the "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley" (Swainson's Hawk Technical Advisory Committee, 2000). If potential Swainson's hawk nests or nesting substrates are located within 0.5 miles of the Project site, then those nests or substrates must be monitored for activity on a routine and repeating basis throughout the breeding season, or until Swainson's hawks or other raptor species are verified to be using them. The protocol recommends that 10 visits be made to each nest or nesting site: one during January 1-March 20 to identify potential nest sites, three during March 20-April 5, three during April 5-April 20, and three during June 10-July 30. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to Project-related ground	Project Applicant & Construction Contractor	Within 14 days prior to the start of any ground-disturbing and construction activities proposed during the nesting season (February 1-August 31)	City of Tulare	

disturbance activities. If Swainson's hawks are not found to nest within the survey area, then no further action is warranted.				
BIO-1c: Should any active Swainson's hawk nests be discovered near proposed work areas, Swainson's hawk nests shall be avoided by 0.5 miles unless this avoidance buffer is reduced through consultation with the CDFW and/or USFWS. If a construction area falls within this nesting site, construction-free buffers shall be identified on the ground with flagging, fencing, or by other easily visible means, and shall be maintained until the biologist has determined that the young have fledged (left the nest).	Construction Contractor & Qualified Biologist	Prior to the start of any ground-disturbing and construction activities proposed during the nesting season (February 1-August 31)	City of Tulare; CDFW and/or USFWS	
BIO-2a: (Take Avoidance Survey). A take avoidance survey for burrowing owls shall be conducted by a qualified biologist knowledgeable of the species within 14 days prior to the start of construction. This take avoidance survey shall be conducted according to methods described in the Staff Report on Burrowing Owl Mitigation (CDFG 2012). The survey area shall include all suitable habitat on and within 200 meters of project impact areas, where accessible.	Project Applicant; Construction Contractor; Qualified Biologist	Within 14 days prior to the issuance of grading permits and prior to the start of ground-disturbing and construction activities	City of Tulare	

BIO-2b: (Avoidance of Active Nests and Roosts). If project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are identified within or near project impact areas, a 200-meter disturbance-free buffer shall be established around these burrows, unless a qualified biologist approved by CDFW verifies through noninvasive methods either that the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Owls present on site after February 1 will be assumed to be nesting unless evidence indicates otherwise. The protected exclusion zone established for the breeding season shall remain in effect until August 31 or, as determined based on monitoring evidence, until the young owl(s) is foraging independently or the nest is no longer active.	Project Applicant, Construction Contractor, & Qualified Biologist	Prior to, and during, ground-disturbing and construction activities	City of Tulare; CDFW	

BIO-2c: (Passive Relocation of Resident Owls). During the nonbreeding season (September 1-January 31), resident owls occupying burrows in project impact areas may be passively relocated to alternative habitat after consulting with the CDFW. Prior to passively relocating burrowing owls, a Burrowing Owl Exclusion Plan shall be prepared by a qualified biologist in accordance with Appendix E of the Staff Report on Burrowing Owl Mitigation (CDFW, 2012). The Burrowing Owl Exclusion Plan shall be submitted to the CDFW for review prior to implementation. Relocation of any owls during the nonbreeding season shall be performed by a qualified biologist using one-way doors, which shall be installed in all burrows in the impact area and left in place for at least two nights. The doors shall be removed and the burrows backfilled immediately before the initiation of grading or, if no grading would occur, left in place until the end of construction. To avoid the potential for owls evicted from a burrow to occupy other burrows in the project site, one-way doors shall be placed in all potentially suitable burrows within the impact area when eviction occurs.	Construction Contractor & Qualified Biologist	Prior to, and during, grading and other ground-disturbing and construction activities	City of Tulare; CDFW	

BIO-3a: Preconstruction surveys for the San Joaquin kit fox shall be conducted on and within 200 feet of the project site, no more than 30 days prior to the start of ground disturbance activities on the site. The primary objective is to identify kit fox habitat features (e.g., potential dens and refugia) on and adjacent to the site and evaluate their use by kit foxes. Protection provided by dens for shelter, escape, cover, and reproduction is vital to the survival of San Joaquin kit foxes. For San Joaquin kit foxes, the ecological value of potential, known, and natal/pupping dens differs; therefore, each den type requires the appropriate level of protection. The following text describes the different steps involved with implementing this mitigation measure: Determine Den Status. When a suitable den or burrow is discovered, a qualified biologist shall determine whether the hole is occupied by a San Joaquin kit fox. Den entrances at least 4 inches in diameter (but not greater than 20 inches) qualify as suitable for San Joaquin kit fox use. Some dens can be immediately identified as recently used by kit fox; qualifying signs include kit fox tracks, scats, and a fresh soil apron extending up to 6 feet from the den entrance. Dens with proper dimensions, but no obvious sign will require further investigation. A remote motion-sensing camera with tracking medium shall be deployed for at least 5 days in an attempt to document a San Joaquin kit fox using the den. If, after 5 days, no San Joaquin kit foxes are detected and the	Project Applicant, Construction Contractor, & Qualified Biologist	Within 30 days of any ground-disturbing activities; Preconstruction surveys shall be repeated following any lapses in construction of 30 days or more.	City of Tulare; CDFW; USFW	

hole has remained unchanged (no new tracks or excavations are observed), and there is no historic record of an active kit fox den at that location, the den will be deemed a “potential den” and unoccupied. The den will be considered occupied if a kit fox is photographed using the den or if a recent sign is found. The biologist shall contact CDFW and the USFWS upon the confirmation of any occupied den. Preconstruction surveys shall be repeated following any lapses in construction of 30 days or more.				

BIO-3b: Should active kit fox dens be detected during preconstruction surveys, the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be notified. A disturbance-free buffer shall be established around the burrows in consultation with the USFWS and CDFW, to prevent access to the occupied den by construction equipment and personnel who are not biologists, and to be maintained until an agency-approved biologist has determined that the burrows have been abandoned. After construction activities would no longer affect the den, all fencing and flagging shall be removed to avoid attracting attention to the den by other animals or humans. All onsite flagging and buffer delineations shall be kept in good working order for the duration of activity near the den or until the den is determined to be unoccupied, whichever occurs first. The following radii are standard San Joaquin kit fox buffer distances: • Known occupied den—100 feet • Occupied natal/pupping den—500 feet • Occupied atypical den—50 feet In the exclusion zones, only essential vehicle and foot traffic shall be permitted. No activity that would destroy the den may occur, and no activity that may harm a San Joaquin kit fox will proceed until the individual is out of harm's way, without harassment. No activity that may cause strong ground vibrations may occur in the exclusion zone until the den is no longer occupied. Essential vehicle traffic shall include any emergency vehicles. If San Joaquin kit foxes are	Construction Contractor & Qualified Biologist	Prior to, and during, grading and other ground-disturbing and construction activities	City of Tulare; CDFW; USFWS	

not observed above ground, essential foot traffic also may be allowed. The USFWS and CDFW shall be notified of any reductions in the standard radii or allowance for additional activity in the restrictive exclusion zones based on individual circumstances to provide USFWS and CDFW an opportunity to offer technical guidance. If a known or occupied den cannot be avoided, consultation with the USFWS and CDFW shall be required.				

BIO-3c: Construction activities shall be carried out in a manner that minimizes disturbance to kit foxes in accordance with the USFWS Standardized Recommendations. The applicant shall implement all minimization measures presented in the Construction and On-going Operational Requirements section of the Standardized Recommendations, including, but not limited to: • Project-related vehicles shall observe a daytime speed limit of 15-mph throughout the site in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited. • To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is	Construction Contractor & Qualified Biologist	During all ground-disturbing and construction activities	City of Tulare; CDFW; USFWS	

discovered, the USFWS and CDFW shall be contacted. • Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped. • All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from a construction or project site. • No firearms shall be allowed on the project site. • No pets, such as dogs or cats, shall be permitted on the project site, to prevent harassment, mortality of kit foxes, or destruction of dens.				

• Use of rodenticides and herbicides in project areas shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by USFWS. If rodent control must be conducted, zinc phosphide shall be used because of a proven lower risk to kit fox. • An employee education program shall be conducted for the project. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and protection to explain endangered species concerns to contractors, their employees, and agency personnel involved in the project. This training will include a description of the kit fox and its habitat needs; a report of the occurrence of kit fox in the project vicinity; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of the measures being taken to reduce impacts to the species during project construction and implementation. The training will include a handout with all of the training information included in it. The applicant will use this handout to train any construction personnel that were not				

in attendance at the first meeting, prior to those personnel starting work on the site. • A representative shall be appointed by the Applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to USFWS. • Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas shall be determined on a site-specific basis in consultation with USFWS, CDFW, or revegetation experts. • Any contractor, employee, or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the Sacramento Field				

Office of the USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in case of the accidental death or injury of a San Joaquin kit fox during project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal, and any other pertinent information. The CDFW contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530) 934-9309. • New sightings of kit fox shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to USFWS.				
CUL-1: If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of Interior's Professional Qualifications Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation and Native American consultation may be warranted to mitigate any potential significant impacts.	Construction Contractor & Qualified Archaeologist	During ground-disturbing activities	City of Tulare	

CUL-2: The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.	Construction Contractor	During ground-disturbing activities	City of Tulare; County Coroner; NAHC	

HYD-1: Prior to the issuance of any grading and/or construction permit, and or the commencement of any clearing, grading, or excavation, the project proponent or construction contractor shall submit a Notice of Intent (NOI) for discharge from the Project site to the California SWRCB Storm Water Permit Unit. Prior to the issuance of grading permits for Phase I, the applicant or construction contractor shall submit a copy of the NOI to the City. The City shall review noticing documentation prior to approval of the grading permit. City monitoring staff will inspect the site during construction for compliance.	Project Applicant; Construction Contractor	Prior to the issuance of a grading permit or to commencement of any ground clearing, grading, or excavation	City of Tulare	

HYD-2: The Applicant shall require the building contractor to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) to the City 45 days prior to the start of work for approval. The contractor is responsible for understanding the State General Permit and instituting the SWPPP during construction. A SWPPP for site construction shall be developed prior to the initiation of grading and implemented for all construction activity on the Project site in excess of one (1) acre, or where the area of disturbance is less than one acre but is part of the Project's plan of development that in total disturbs one or more acres. The SWPPP shall identify potential pollutant sources that may affect the quality of discharges to storm water and shall include specific BMPs to control the discharge of material from the site. The following BMP methods shall include, but would not be limited to: • Dust control measures will be implemented to ensure success of all onsite activities to control fugitive dust; • A routine monitoring plan will be implemented to ensure success of all onsite erosion and sedimentation control measures; • Provisional detention basins, straw bales, erosion control blankets, mulching, silt fencing, sand bagging, and soil stabilizers will be used; • Soil stockpiles and graded slopes will be covered after two weeks of inactivity and 24 hours prior to and during extreme weather conditions; and,	Applicant; Construction Contractor	45 Days Prior to Starting Work and or Grading; Prior to Issuance of Grading Permit	City of Tulare	

• BMPs will be strictly followed to prevent spills and discharges of pollutants onsite, such as material storage, trash disposal, construction entrances, etc.				
HYD-3: A Development Maintenance Manual for the Project shall include comprehensive procedures for maintenance and operations of any stormwater facilities to ensure long-term operation and maintenance of post-construction stormwater controls. The maintenance manual shall require that stormwater BMP devices be inspected, cleaned and maintained in accordance with the manufacturer's maintenance conditions. The manual shall require that devices be cleaned prior to the onset of the rainy season (i.e., mid-October) and immediately after the end of the rainy season (i.e., mid-May). The manual shall also require that all devices be checked after major storm events. The Development Maintenance Manual shall include the following: • Runoff shall be directed away from trash and loading dock areas; • Bins shall be lined or otherwise constructed to reduce leaking of liquid wastes; • Trash and loading dock areas shall be screened or walled to minimize offsite transport of trash; and, • Impervious berms, trench catch basin, drop inlets, or overflow containment structures nearby docks and trash areas shall be installed to minimize the potential for leaks, spills or wash down water to enter the drainage system.	Project Proponent & Project Engineer; Construction Contractor	Prior to issuance of building permits, and if not master planned, prior to issuance of building permits for each phase	City of Tulare	

TRA-1: Prior to issuance of building permits for Phase I of the proposed project, the project proponent must complete the following required improvements at the Morrison Street/Tulare Avenue Intersection: ▪ Add a southbound left-turn lane; ▪ Modify the southbound left-through-right lane to a through-right lane; ▪ Signalize the intersection with protective left-turn phasing in all directions; and ▪ Modify the intersection to accommodate the added lane.	Project Applicant/ Project Proponent	Prior to issuance of building permits for Phase I of the Project	City of Tulare; Caltrans	
TRA-2: Prior to issuance of building permits for Phase II of the proposed project, the project proponent must complete the following required improvements at the Morrison Street/Prosperity Avenue Intersection: ▪ Modify the northbound left-right lane to a left-turn lane; and ▪ Add a northbound right-turn lane.	Project Applicant/ Project Proponent	Prior to issuance of building permits for Phase II of the Project	City of Tulare	
TRA-3: Prior to issuance of building permits for Phase IV of the proposed project, the project proponent must complete the following required improvements at the Mooney Boulevard/Seminole Avenue Intersection: ▪ Modify the westbound left-right lane to a left-turn lane; ▪ Add a westbound right-turn lane; and ▪ Signalize the intersection with protective left-turn phasing in all directions.	Project Applicant/ Project Proponent	Prior to issuance of building permits for Phase IV of the Project	City of Tulare; Caltrans	

TRA-4: Prior to issuance of building permits for Phase IV of the proposed project, the project proponent shall pay their equitable fair share, agreed upon by the responsible agencies (City of Tulare and Caltrans), towards the cost of the following improvements at the intersections of Mooney Boulevard/Prosperity Avenue and Mooney Boulevard/Tulare Avenue: O <u>Mooney Boulevard/Prosperity Avenue</u> ▪ Modify the southbound through-right lane to a through lane; ▪ Add a southbound right-turn lane; and ▪ Modify the traffic signal to accommodate the added lane. O <u>Mooney Boulevard/Tulare Avenue</u> ▪ Add a second eastbound left-turn lane; and ▪ Modify the traffic signal to accommodate the added lane. Fair share contributions shall only be made for those facilities, or portion thereof, currently not funded by the responsible agencies' roadway impact fee program(s) or grant funding, as appropriate. Payment of the Project's equitable fair share, in addition to the local and regional impact fee programs, would satisfy the Project's traffic mitigation measures for its contribution to Near Term plus Project Buildout Traffic Conditions. The traffic impact analysis conducted for the proposed project does not provide construction costs for the recommended mitigation measures; therefore, the project proponent must continue to work with the City of	Project Applicant/ Project Proponent	Prior to issuance of building permits for Phase IV of the Project	City of Tulare; Caltrans	

Tulare, and/or Caltrans, to develop the estimated construction costs.				

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City of Tulare

Planning and Building Department
411 East Kern Avenue
Tulare, CA 93274

Introduction

Project Title: Farrar Subdivision Project

This Initial Study/Mitigated Negative Declaration has been prepared for the City of Tulare to address the environmental effects of the construction of a single family residential subdivision consisting of 360 lots on approximately 76.5 acres within the City of Tulare, California. This document has been prepared in accordance with the California Environmental Quality Act (CEQA) Guidelines. The City of Tulare is the CEQA lead agency for this project.

The project site is located within Tulare County in the eastern area of the City of Tulare, north of Tulare Avenue, west of Morrison Street and rural residential properties, south of agricultural land, and east of a single-family residential subdivision.

This Initial Study document for the **Farrar Subdivision Project**, is organized as follows:

Section 1: Environmental Review Process

The Environmental Review Process covers the procedures, under the California Environmental Quality Act (CEQA), for evaluating the environmental effects of the proposed project including the CEQA guidelines, Initial Study, Environmental Checklist, Notice of Intent to adopt a Mitigated Negative Declaration, Mitigated Negative Declaration, and the Notice of Determination.

Section 2: Project Description

The Project Description identifies the project location, provides a background to the project, and describes the project.

Section 3: Evaluation of Environmental Impacts

Evaluation of Environmental Impacts contains the CEQA Environmental Checklist, Environmental Factors Potentially Affected, Evaluation of Environmental Impacts, Draft Notice of Intent to Adopt Initial Study/Mitigated Negative Declaration, Draft Mitigated Negative Declaration, Notice of Completion and Environmental Document Transmittal form, Draft Notice of Determination, and a Schedule of Compliance with CEQA for a Mitigated Negative Declaration.

Section 4: References

References provides a list of reference material used during the preparation of the Initial Study.

Section 5: List of Report Preparers

The List of Report Preparers provides a list of key personnel involved in the preparation of the Environmental Assessment/Initial Study.

Appendices

The Appendices consist of Appendix A and Appendix B. Appendix A includes the modeling output sheets from the California Emissions Estimator Model (CalEEMod) run for estimating construction and operational emissions summarized in the air quality and greenhouse gas sections of this Initial Study/Mitigated Negative Declaration. Appendix B is the Traffic Impact Analysis for the Project.



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Tulare, CA 93274

SECTION 1

CEQA Environmental Review Process

Project Title: Farrar Subdivision Project

1.1 California Environmental Quality Act Guidelines

Section 15063 of the California Environmental Quality Act (CEQA) Guidelines requires that the Lead Agency prepare an Initial Study to determine whether a discretionary project will have a significant effect on the environment. All phases of the project planning, implementation, and operation must be considered in the Initial Study. The purposes of an Initial Study, as listed under Section 15063(c) of the CEQA Guidelines, include:

(1) Provide the lead agency with information to use as the basis for deciding whether to prepare an EIR or negative declaration;

(2) Enable an applicant or lead agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a mitigated negative declaration;

(3) Assist the preparation of an EIR, if one is required, by:

(A) Focusing the EIR on the effects determined to be significant,

(B) Identifying the effects determined not to be significant,

(C) Explaining the reasons for determining that potentially significant effects would not be significant, and

(D) Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects.

(4) Facilitate environmental assessment early in the design of a project;

(5) Provide documentation of the factual basis for the finding in a mitigated negative declaration that a project will not have a significant effect on the environment;

(6) Eliminate unnecessary EIRs;

(7) Determine whether a previously prepared EIR could be used with the project.

1.2 Initial Study

The Initial Study provided herein covers the potential environmental effects of the construction of a five building medical complex on approximately 10.4 acres within the City of Tulare, California.

The City of Tulare will act as the Lead Agency for processing the Initial Study/Mitigated Negative Declaration pursuant to the CEQA and the CEQA Guidelines.

1.3 Environmental Checklist

The Lead Agency may use the CEQA Environmental Checklist Form [CEQA Guidelines, Section 15063(d)(3) and (f)] in preparation of an Initial Study to provide information for determination if there are significant effects of the project on the environment. A copy of the completed Environmental Checklist is set forth in Section Three.

1.4 Notice of Intent to Adopt a Mitigated Negative Declaration

The Lead Agency shall provide a Notice of Intent to Adopt a Mitigated Negative Declaration (CEQA Guidelines, Section 15072) to the public, responsible agencies, trustee agencies and the County Clerk within which the project is located, sufficiently prior to adoption by the Lead Agency of the Negative Declaration to allow the public and agencies the review period. The public review period (CEQA Guidelines, Section 15105) shall not be less than 20 days. When the Initial Study/Mitigated Negative Declaration is submitted to the State Clearinghouse for review by state agencies, the public review period shall not be less than 30 days, unless a shorter period, not less than 20 days, is approved by the State Clearinghouse.

Prior to approving the project, the Lead Agency shall consider the proposed Mitigated Negative Declaration together with any comments received during the public review process, and shall adopt the proposed Mitigated Negative Declaration only if it finds on the basis of the whole record before it, that there is no substantial evidence that the project will have a significant effect on the environment and that the Mitigated Negative Declaration reflects the Lead Agency's independent judgment and analysis.

The written and oral comments received during the public review period will be considered by the City of Tulare prior to adopting the Mitigated Negative Declaration.

Regardless of the type of CEQA document that must be prepared, the overall purpose of the CEQA process is to:

- 1) Assure that the environment and public health and safety are protected in the face of discretionary projects initiated by public agencies or private concerns;

- 2) Provide for full disclosure of the project's environmental effects to the public, the agency decision-makers who will approve or deny the project, and the responsible trustee agencies charged with managing resources (e.g. wildlife, air quality) that may be affected by the project; and
- 3) Provide a forum for public participation in the decision-making process pertaining to potential environmental effects.

According to Section 15070(a) a public agency shall prepare or have prepared a proposed mitigated negative declaration for a project subject to CEQA when:

The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment. Less than significant impacts have been identified, with implementation of mitigation measures.

The Environmental Checklist Discussion contained in Section Three of this document has determined that the environmental impacts of the project are less than significant with mitigation measures and that a Mitigated Negative Declaration is adequate for adoption by the Lead Agency.

1.5 Negative Declaration or Mitigated Negative Declaration

The Lead Agency shall prepare or have prepared a proposed Negative Declaration or Mitigated Negative Declaration (CEQA Guidelines Section 15070) for a project subject to CEQA when the Initial Study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment.

The proposed Negative Declaration or Mitigated Negative Declaration circulated for public review shall include the following:

- (a) A brief description of the project, including a commonly used name for the project.
- (b) The location of the project, preferably shown on a map.
- (c) A proposed finding that the project will not have a significant effect on the environment.
- (d) An attached copy of the Initial Study documenting reasons to support the finding.
- (e) Mitigation measures, if any.

1.6 Intended Uses of Initial Study/Mitigated Negative Declaration Documents

The Initial Study/Mitigated Negative Declaration document is an informational document that is intended to inform decision-makers, other responsible or interested agencies, and the general public of potential environmental effects of the proposed project. The environmental review process has been established to enable the public agencies to evaluate environmental consequences and to examine and implement methods of eliminating or reducing any adverse impacts. While CEQA requires that consideration be given to avoiding environmental damage, the Lead Agency must balance any potential environmental effects against other public objectives, including economic and social goals.

The City of Tulare, as Lead Agency, will make a determination, based on the environmental review for the Initial Study and comments from the general public, if there are less than significant impacts from the proposed project and the requirements of CEQA can be met by adoption of a Mitigated Negative Declaration.

1.7 Notice of Determination (NOD)

The Lead Agency shall file a Notice of Determination within five working days after deciding to approve the project. The Notice of Determination (CEQA Guidelines, Section 15075) shall include the following:

- (1) An identification of the project including the project title as identified on the proposed negative declaration, its location, and the State Clearinghouse identification number for the proposed negative declaration if the notice of determination is filed with the State Clearinghouse.*
- (2) A brief description of the project.*
- (3) The agency's name and the date on which the agency approved the project.*
- (4) The determination of the agency that the project will not have a significant effect on the environment.*
- (5) A statement that a negative declaration or a mitigated negative declaration was adopted pursuant to the provisions of CEQA.*
- (6) A statement indicating whether mitigation measures were made a condition of the approval of the project, and whether a mitigation monitoring plan/program was adopted.*
- (7) The address where a copy of the negative declaration or mitigated negative declaration may be examined.*
- (8) The Notice of Determination filed with the County Clerk shall be available for public inspection and shall be posted by the County Clerk within 24 hours of receipt*

for a period of at least 30 days. Thereafter, the clerk shall return the Notice to the Lead Agency with a notation of the period posted.



City of Tulare

Planning and Building Department
411 East Kern Avenue
Tulare, CA 93274

SECTION 2

Project Description

Project Title: Farrar Subdivision Project

2.1 Project Location

The project site is located within Tulare County in the eastern area of the City of Tulare (City), north of Tulare Avenue, west of Morrison Street and rural residential properties, south of agricultural lands, and east of a single-family residential subdivision. The project area is composed of four neighboring parcels (APN 172-130-020, 172-090-029, 172-110-001, and 172-070-005) totaling approximately 76.5 acres. Figure 2-1 shows the regional location of the proposed project, while Figure 2-2 shows the projected site plan.

The four parcels are designated by the City as Rural Residential, Residential Estate, and Low Density Residential under the General Plan and RA (Rural Residential), R-1-20, R-1-12.5, and R-1-7 under the current zoning code. The current parcels are currently being used for agricultural row crops.

2.2 Project Description

The proposed project is a single-family residential subdivision consisting of 360 lots, to be constructed in four phases. The development of the subdivision would result in on-site infrastructure improvements, including new local residential streets, new and relocated utilities, and a ponding basin to treat storm water flows. The project would also require build out and frontage improvements on Morrison Street, Tulare Avenue, and Seminole Avenue.

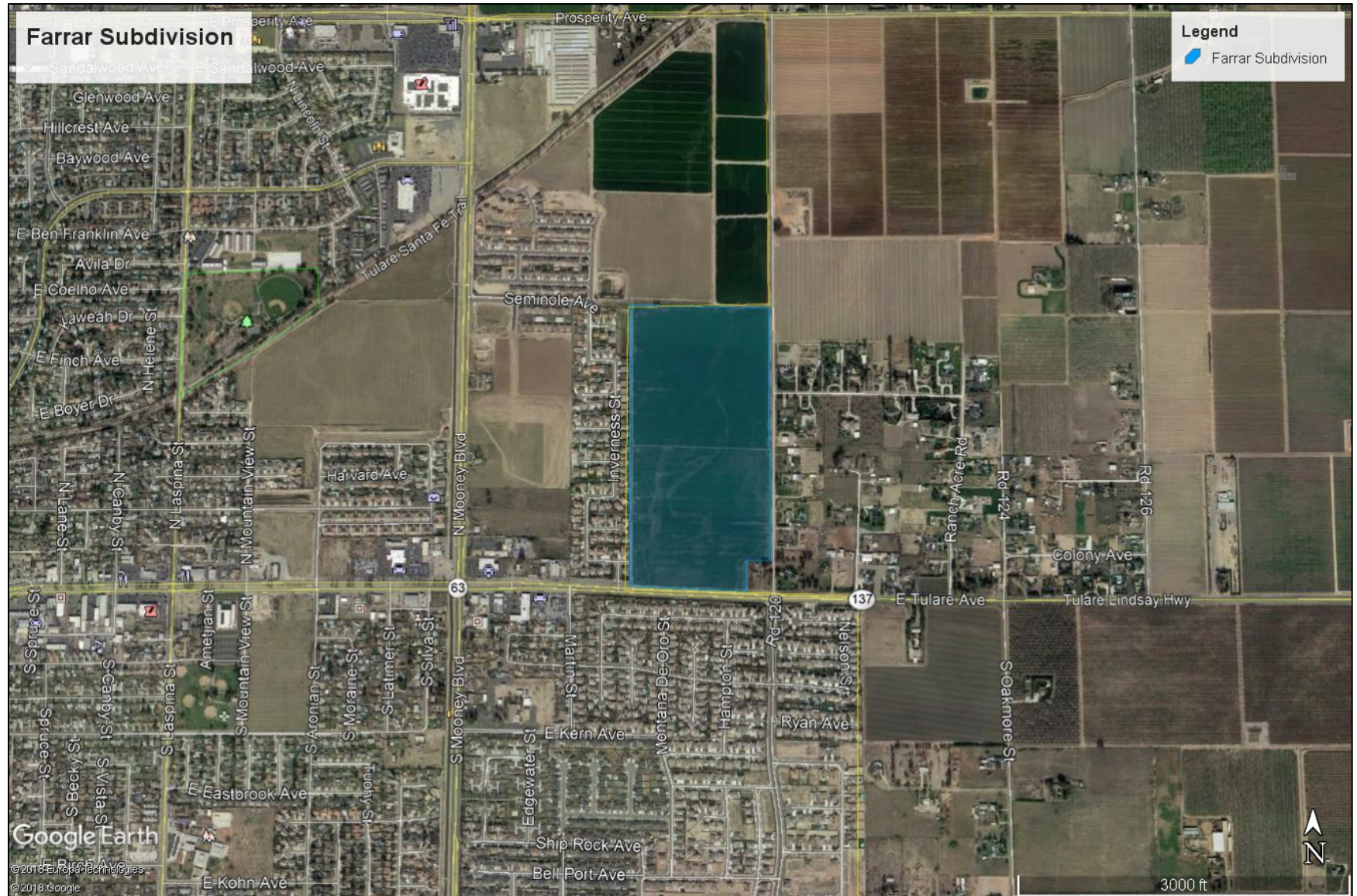
Other Permits and Approvals

Other permits and approvals required for the Farrar Subdivision Project are listed below. It should be noted that this list is not exhaustive and additional permits and approvals may also be required.

- *City of Tulare Tentative Subdivision Map*
- *City of Tulare General Plan Amendment*
- *City of Tulare Zone Amendment*
- *City of Tulare Conditional Use Permit*
- *City of Tulare Landscape and Maintenance District*
- *City of Tulare Building and Encroachment Permits*

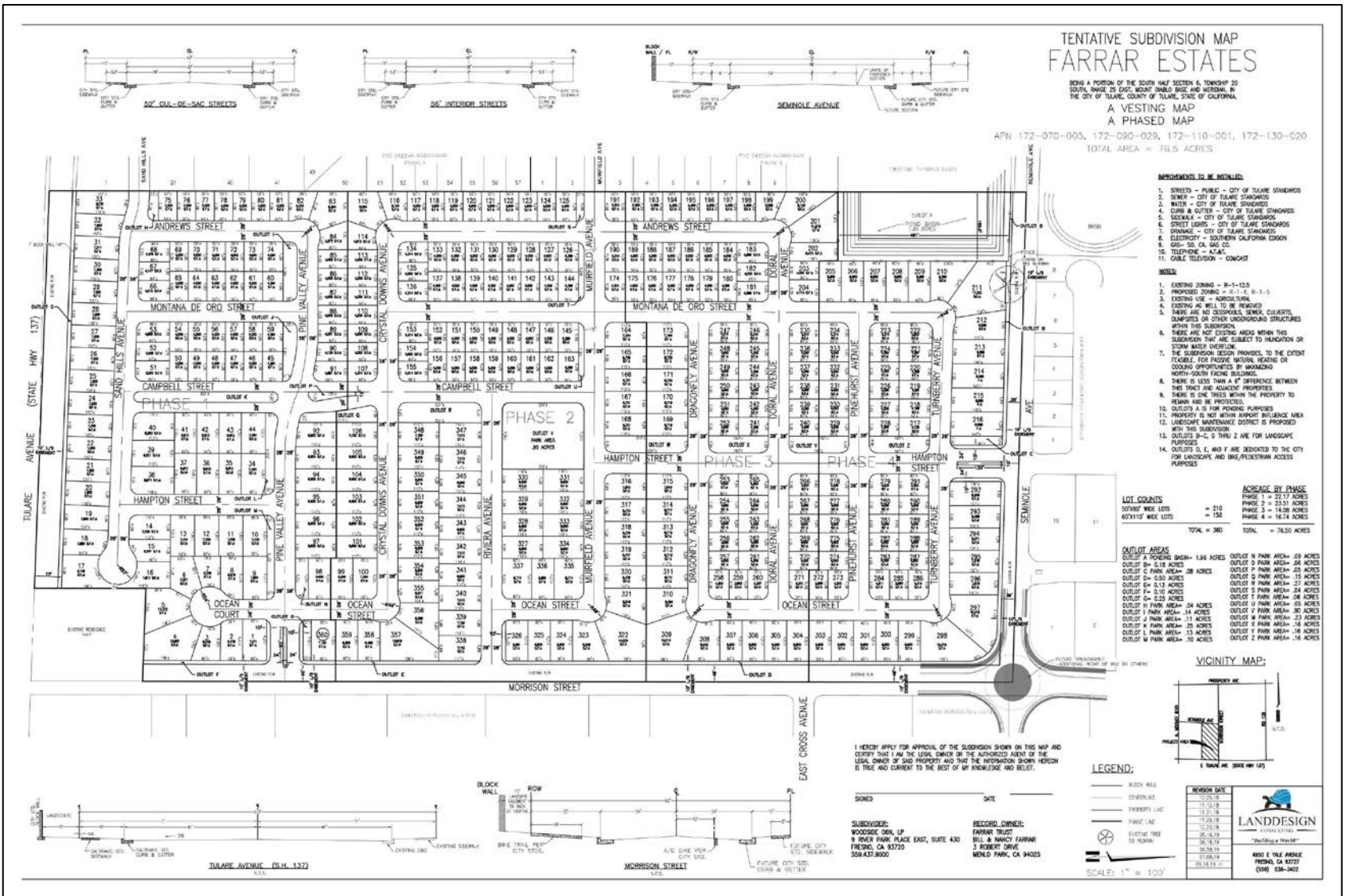
- *San Joaquin Valley Air Pollution Control District (SJVAPCD)*. The proposed project is within the jurisdiction of the SJVAPCD and will be required to comply with Rule VIII, 3135, 4101, and 9510.
- *Central Valley Regional Water Quality Control Board, SWPPP*. The proposed project site is within the jurisdiction of the Central Valley Regional Water Quality Control Board (CVRWQCB). The CVRWQCB will require a Storm Water Pollution Prevention Plan (SWPPP) to prevent impacts related to stormwater as a result of project construction.

Figure 2-1 Regional Location



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Figure 2-2 Project Site Plan



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Aerial Photo of Project Site



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City of Tulare
Planning and Building Department
411 East Kern Avenue
Tulare, CA 93274

SECTION 3

Evaluation of Environmental Impacts

Project Title: Farrar Subdivision Project

This document is the Initial Study/Mitigated Negative Declaration for a proposed single-family residential subdivision consisting of 360 lots on approximately 76.5 acres within the City of Tulare, California. The City of Tulare will act as the Lead Agency for this project pursuant to the California Environmental Quality Act (CEQA) and the CEQA Guidelines.

3.1 PROJECT PURPOSE

The purpose of this environmental document is to implement the California Environmental Quality Act (CEQA). Section 15002(a) of the CEQA Guidelines describes the basic purposes of CEQA as follows.

- (1) Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- (2) Identify the ways that environmental damage can be avoided or significantly reduced.
- (3) Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.
- (4) Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

This Initial Study of environmental impacts has been prepared to conform to the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations Section 15000 et seq.).

According to Section 15070(b), a Mitigated Negative Declaration is appropriate if it is determined that: (1) Revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and (2) The initial study shows that there is no substantial evidence, in light of the whole record before the agency, that the project may have a significant effect on the environment.

INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

1. **Project Title:** Farrar Subdivision Project
2. **Lead Agency:** City of Tulare
411 E. Kern Avenue
Tulare, Ca 93274
(559) 684-4217 FAX 685-2339
3. **Applicant:** Woodside 06N LP
9 River Park Pl. E.
Suite 430
Fresno, CA 93720
4. **Contact Person:** Mario Anaya, Principal Planner
City of Tulare
411 E. Kern Avenue
Tulare, CA 93274
(559)684-4223
5. **Project Location:**

The project site is located within Tulare County in the eastern area of the City of Tulare (City), north of Tulare Avenue, west of Morrison Street and rural residential properties, south of agricultural lands, and east of a single-family residential subdivision. The project area is composed of four neighboring parcels (APN 172-130-020, 172-090-029, 172-110-001, and 172-070-005) totaling approximately 76.5 acres.
6. **General Plan Designation:**

Tulare General Plan designates the four parcels on the site as Rural Residential, Residential Estate, and Low Density Residential.
7. **Zoning Designation:**

Tulare Zoning Map designates the four parcels on the site as RA (rural residential), R-1-20, R-1-12.5, and R-1-7.
8. **Surrounding Land Use Designations and Existing Land Use:**

North	LDR	agricultural land (row crops)
South	LDR	Tulare Avenue & low density single-family residential
East	County	rural residential, residential estate, & orchard
West	LDR	low density single-family residential

9. **Project Description:** The proposed project is a single-family residential subdivision consisting of 360 lots, to be constructed in four (4) phases. The proposed project would result in on-site infrastructure improvements, including local residential streets, widening of Morrison Street, as well as new and relocated utilities.
10. **Parking and access:** Access to and from the proposed subdivision would be available via Morrison Street and via the extension of Seminole Avenue. At full buildout, one access point would be located on Seminole Avenue, two would be located on Morrison Street, and the remaining two access points are proposed along the west side of the proposed project site boundary, connecting through the existing subdivision to the west. The proposed residential development will provide both covered (garage) and uncovered driveway and street parking, which complies with the City of Tulare Code of Ordinances § 10.192.040 requiring two covered parking spaces per dwelling unit. During construction, workers will utilize on-site temporary construction staging and parking areas for parking of vehicles and equipment.
11. **Landscaping and Design:** All landscaping and design components will comply with the City of Tulare Code of Ordinances §8.24 for Subdivisions, §10.24 for Single-family Residential, and §10.33 for Small Lot Residential. The landscape and design plans will be required at time the project submits for a building permit on the project and will also be subject to water efficient landscape ordinance (WELO).
12. **Utilities and Electrical Services:** The proposed project would be installed into the City's water supply, wastewater, and storm water infrastructure systems and would be served by the City for solid waste disposal. In addition, electrical service would be provided by the local energy utility company, Southern California Edison.
13. **Project Components:** The discretionary approvals required from the City of Tulare for the proposed project include:
 - General Plan Amendment
 - Zone Amendment
 - Conditional Use Permit
 - Tentative Subdivision Map

Acronyms

AFY	Acre-feet Per Year
APN	Assessor's Parcel Number
ARB	Air Resources Board
BMP	Best Management Practices
CAA	Clean Air Act
CARB	California Air Resources Board
CC	Community Commercial
CCR	California Code of Regulation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CO	Carbon Monoxide
CWA	California Water Act
DHS	Department of Health Services
DWR	Department of Water Resources
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
EV	Electric Vehicles
FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FMBTA	Federal Migratory Bird Treaty Act
FMMP	Farmland Mapping and Monitoring Program
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IS/MND	Initial Study Mitigated Negative Declaration
ISR	Indirect Source Review
IT	Information Technology
LDR	Low Density Residential
LOS	Level of Service
MCL	Maximum Contaminant Level
MGD	Million Gallons a Day
MKJPA	Mid-Kaweah Joint Powers Authority
MLD	Most Likely Descendant
MND	Mitigated Negative Declaration
MT	Metric Tons
NAC	Noise Abatement Criteria
NAAQS	National Ambient Air Quality Standards

NAHC	Native American Heritage Commission
NDIR	Non-Dispersive Infrared Photometry
NOD	Notice of Determination
NO _x	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
OB/GYN	Obstetrics/Gynecology
OSHPD	Office of Statewide Health Planning and Development
PM	Particulate Matter
RCRA	Resource Conservation and Recovery Act of 1976
ROG	Reactive Organic Gases
RWQCB	Regional Water Quality Control Board
SCH	State Clearinghouse
SGMA	Sustainable Groundwater Management Act
SHPO	State Historic Preservation Office
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO ₂	Sulfur Dioxide
SO _x	Sulfur Oxides
SPAL	Small Project Analysis Level
SWPPP	Storm Water Pollution Prevention Plan
TID	Tulare Irrigation District
UBSC	Uniform Building and Safety Code (UBSC)
USC	United States Code
USFWS	United States Fish & Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UWMP	Urban Water Management Plan
VOC	Volatile Organic Compound
WDR	Waste Discharge Requirements
WELO	Water Efficient Landscape Ordinance
WWTP	Wastewater Treatment Facility
WWTT	Wastewater Treatment Train

Figure 3-1: Project Site Vicinity Map



Farrar Subdivision Project
October 2019

[illegible]

3.2 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 reference 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 if 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 and 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.

3.3 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

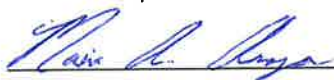
The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

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

DETERMINATION: (To be completed by the Lead Agency) Where potential impacts are anticipated to be significant, mitigation measures will be required, so that impacts may be avoided or reduced to insignificant levels.

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. A Negative Declaration 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 requested.



SIGNATURE

Mario A. Anaya, Principal Planner

PRINTED NAME

DATE

11/20/2019
City of Tulare

Agency

3.4 ENVIRONMENTAL ANALYSIS

The following section provides an evaluation of the impact categories and questions contained in the checklist and identify mitigation measures, if applicable.

I. AESTHETICS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within 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 point). 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?	☐	☐	☒	☐

DISCUSSION:

- a) **No Impact:** A scenic vista is defined as a viewpoint that provides expansive views of highly valued landscape for the benefit of the general public. In the project vicinity the Sierra Nevada Mountains in the background as well as the flat rural agricultural landscape with Valley Oak trees rising from the valley floor are the two primary scenic vistas. Due to the distance between the project site and the Sierra Nevada Mountains, in conjunction with the poor air quality of the valley, the Sierra Nevada Mountains can rarely be seen from this location. In addition, although there is one mature Valley Oak tree located in the northwest portion of the project property, along Seminole Avenue, the Project would not remove the tree and will incorporate it into a landscape lot of the subdivision. The project would not have an adverse effect on a scenic vista due to the proposed development at the project site. For these reasons, this project would have *no impact* on scenic vistas.
- b) **No Impact:** The site does not contain any rock outcropping or historic buildings, nor would it remove any trees. After review of the state route “scenic highways” in Tulare

County, it was determined that there are no highways designated by State or local agencies as “Scenic highways” near the project site. Therefore, the proposed project would have *no impact* to any scenic resources.

- c) **Less Than Significant Impact:** The proposed project site is surrounded by agricultural lands and residential subdivisions, therefore the City does not anticipate that the development of the proposed project will create a visually degraded character or quality to the project site or to the properties near and around the project site. Additionally, all of the development will be required to comply with the site plan review and design limitations required by the General Plan and the City’s adopted design guidelines and zoning regulations which require setbacks, landscaping and designs to limit impact to neighboring properties. Therefore, the proposed project would have a *less than significant impact* on the visual character of the area.
- d) **Less Than Significant Impact:** The proposed project would not create a new source of light or glare so substantial that it would affect day or nighttime views in the area. Any proposed overhead or perimeter lighting would be designed using best practices to avoid spillover light to adjacent or nearby residential properties. The design and orientation of the proposed project lighting for this project would prevent substantial increases in light or glare in the vicinity of the project site. Therefore, the proposed project would have a *less than significant impact* with regard to existing day or nighttime views in the area of the project site.

II. AGRICULTURE AND FOREST RESOURCES:

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department 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:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

DISCUSSION:

- a) **Less than Significant Impact:** Agriculture is a vital component of the City of Tulare's economy and is a significant source of the City's cultural identity. As such, preserving the productivity of agricultural lands is integral to maintaining the City's culture and economic viability. The proposed project site is not under Williamson Act Contract, but is designated as Prime Farmland by the 2016 California Department of Conservation Map of State Important Farmland Mapping and Monitoring Program (FMMP). The project site is currently and has been operated recently as an alfalfa field and is bounded by agricultural land to the north and northeast.

Even though the project would be converting actively farmed Prime Farmland to residential uses, the proposed project site is within the City limits and is already designated for single-family residential development in the City's adopted General Plan. Therefore, impacts will be *less than significant*.

- b) **No Impact:** The project site is located within Tulare city limits and is zoned for residential land uses. The project site is not under Williamson Act contract and therefore would create *no impacts*.
- c) **No Impact:** The project site is not zoned for forest land or timberland and there is no forest land or timberland zone change proposed for the site, therefore *no impacts* would occur.
- d) **No Impact:** No conversion of forestland, as defined under Public Resource Code or General Code, will occur as a result of the project and would create *no impacts*.
- e) **Less than Significant Impact:** As discussed above, the proposed project would convert agricultural land to residential uses. However, while the project site is currently being farmed, the site is designated for single family residential development in the City's General Plan and Zoning Ordinance (Title 10 of the Tulare Municipal Code). Adjacent farmland will not be converted to non-agricultural use as a result of the proposed project. Therefore, the proposed project would result in a *less than significant impact*.

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
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 other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

CURRENT POLICIES AND REGULATIONS

Federal Clean Air Act - The 1977 Federal Clean Air Act (CAA) authorized the establishment of the National Ambient Air Quality Standards (NAAQS) and set deadlines for their attainment. The Clean Air Act identifies specific emission reduction goals, requires both a demonstration of reasonable further progress and an attainment demonstration, and incorporates more stringent sanctions for failure to meet interim milestones. The U.S. EPA is the federal agency charged with administering the Act and other air quality-related legislation. EPA's principal function include setting NAAQS; establishing minimum national emission limits for major sources of pollution; and promulgating regulations.

California Clean Air Act - California Air Resources Board coordinates and oversees both state and federal air pollution control programs in California. As part of this responsibility, California Air Resources Board monitors existing air quality, establishes California Ambient Air Quality Standards, and limits allowable emissions from vehicular sources. Regulatory authority within established air basins is provided by air pollution control and management districts, which control stationary-source and most categories of area-source emissions and develop regional air quality plans. The project is located within the jurisdiction of the San Joaquin Valley Air Pollution Control District.

The state and federal standards for the criteria pollutants are presented in (see Table 1). These standards are designed to protect public health and welfare. The "primary" standards have been established to protect the public health. The "secondary" standards are intended

to protect the nation's welfare and account for air pollutant effects on soils, water, visibility, materials, vegetation and other aspects of general welfare. The U.S. EPA revoked the national 1-hour ozone standard on June 15, 2005, and the annual PM₁₀ standard on September 21, 2006, when a new PM_{2.5} 24-hour standard was established.

Air quality is described in terms of emissions rate and concentration of emissions. An emissions rate is the amount of pollutant released into the atmosphere by a given source over a specified time period. Emissions rates are generally expressed in units such as pounds per hour (1lbs/hr) or tons per year. Concentrations of emissions, on the other hand, represent the amount of pollutant in a given space at any time. Concentration is usually expressed in units such as micrograms per cubic meter, kilograms per metric ton, or parts per million. There are 4 primary sources of air pollution within the SJVAB: motor vehicles, stationary sources, agricultural activities, and construction activities.

Criteria air pollutants are classified in each air basin, county, or, in some cases, within a specific urbanized area. The classification is determined by comparing actual monitoring data with state and federal standards. If a pollutant concentration is lower than the standard, the pollutant is classified as "attainment" in that area. If an area exceeds the standard, the pollutant is classified as "non-attainment." If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated "unclassified."

Air quality in the vicinity of the proposed project is regulated by several jurisdictions including the State and Federal Environmental Protection Agency (EPA), California Air Resources Board (CARB), and the San Joaquin Valley Air Pollution Control District (SJVAPCD). Each jurisdiction develops rules, regulations, policies, and/or goals to attain the directives imposed upon them through Federal and State legislation.

The Clean Air Act (CAA) of 1990 requires emission controls on factories, businesses, and automobiles by:

- Lowering the limits on hydrochloric acid and nitrogen oxides (NO_x) emissions, requiring the increased use of alternative-fuel cars, on-board canisters to capture vapors during refueling, and extending emission-control warranties.
- Reducing airborne toxins by requiring factories to install "maximum achievable control technology" and installing urban pollution control programs.
- Reducing Acid rain production by cutting sulfur dioxide emissions for coal-burning power plants.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards ¹		National Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Ozone (O ₃)	1 Hour	0.09 ppm (180 µg/m ³)	Ultraviolet Photometry	-	Same as Primary Standard	Ultraviolet 8 Hour Photometry
	8 Hour	0.070 ppm (137 µg/m ³)		0.075 ppm (147 µg/m ³)		
Respirable Particulate Matter (PM ₁₀)	24 Hour	50 µg/m ³	Gravimetric or Beta Attenuation	150 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Annual Analysis
	Annual Arithmetic Mean	20 µg/m ³		-		
Fine Particulate Matter (PM _{2.5})	24 Hour	-	Gravimetric or Beta Attenuation	35 µg/m ³	Same as Primary Standard	Inertial Separation and Gravimetric Annual Analysis
	Annual Arithmetic Mean	12 µg/m ³		12 µg/m ³		
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m ³)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m ³)	None	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9 ppm (10 mg/m ³)		9 ppm (10 mg/m ³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m ³)		-		
Nitrogen Dioxide (NO ₂) ⁸	1 Hour	0.18 ppm (339 µg/m ³)	Gas Phase Chemiluminescence	100 ppb (188 µg/m ³)	-	Gas Phase Chemiluminescence
		0.030 ppm		53 ppb		

Pollutant	Averaging Time	California Standards ¹		National Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
	Arithmetic Mean	(57 µg/m ³)		(100 µg/m ³)	Same as Primary Standard	
Sulfur Dioxide	1 Hour	0.25 ppm	Ultraviolet Fluorescence	75 ppb	-	Ultraviolet Fluorescence; Spectrophotometry (Pararosaniline Method)
		(655 µg/m ³)		(196 µg/m ³)		
	3 Hour	-		-	0.5 ppm (1300 µg/m ³)	
	24 Hour	0.04 ppm (105 µg/m ³)		0.14 ppm (for certain areas) ⁹	-	
	Annual Arithmetic Mean	-		0.030 ppm (for certain areas) ⁹	-	
Lead ^{10,11}	30 Day Average	1.5 µg/m ³	Atomic Absorption	-	-	High Volume Sampler and Atomic Absorption
	Calendar Quarter	-		1.5 µg/m ³ (for certain areas) ¹¹	Same as Primary Standard	
	Rolling 3-month Average	-		0.15 µg/m ³		
Visibility Reducing Particles ¹²	8 Hour	See footnote 12	Beta Attenuation and Transmittance through Filter Tape	No National Standard		

Pollutant	Averaging Time	California Standards ¹		National Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
Sulfates	24 Hour	25 µg/m ³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m ³)	Ultraviolet Flourescence			
Vinyl Chloride ¹⁰	24 Hour	0.01 ppm (26 µg/m ³)	Gas Chromatography			
Notes: 1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations. 2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies. 3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas. 4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used. 5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. 6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. 7. Reference method as described by the U.S. EPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the U.S. EPA. 8. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national standards are in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively. 9. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved. Note that the 1-hour national standard is in units of parts per						

Pollutant	Averaging Time	California Standards ¹		National Standards ²		
		Concentration ³	Method ⁴	Primary ^{3,5}	Secondary ^{3,6}	Method ⁷
billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.						
10. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.						
11. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.						
12. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.						

In July of 1997, the EPA adopted a PM_{2.5} standard in recognition of increased concern over particulate matter 2.5 microns in diameter (PM_{2.5}). Ending several years of litigation, EPA's PM_{2.5} regulations were upheld by the U.S. Supreme Court on February 27, 2001. According to information provided by the EPA, designations for the new PM_{2.5} standards began in the year 2002 with attainment plans submitted by 2005 for regions that violate the standard. In October 2006, EPA revised the PM_{2.5} standard to 35 µg/m³. The most recent revision to the PM_{2.5} standard was in 2012 when the EPA revised the annual PM_{2.5} standard to 12 µg/m³. The San Joaquin Valley was classified as a moderate nonattainment area for the 2012 PM_{2.5} standard effective April 15, 2015.

The following rules and regulations have been adopted by the Air District to reduce PM_{2.5} emissions throughout the San Joaquin Valley and verification by the City of compliance with these rules and regulations will be required, as applicable, to construct and operation of the project.

- Rule 4002 – National Emission Standards for Hazardous Air Pollutants. There are no existing structures located on the proposed site.
- Rule 4102 – Nuisance
This rule applies to any source operation that emits or may emit air contaminants or other materials. In the event that the project or construction of the project creates a public nuisance, it could be in violation and be subject to district enforcement action.
- Rule 4601 – Architectural coatings. The purpose of this rule is to limit volatile organic compound (VOC) emissions from architectural coatings. Emission are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling
- Rule 4641- Cutback, slow cure, and emulsified asphalt, paving and maintenance operations. The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641.
- Rule 9510 – Indirect Source Review (ISR) This rule reduces the impact PM₁₀ and NO_x emissions from growth on the SJVB. This rule places application and emission reduction requirements on applicable development projects in order to reduce emissions through onsite mitigation, offsite SJVAPCD-administered projects, or a combination of the two. This project will submit an Air Impact Assessment (AIA) application in accordance with Rule 9510's requirements.
- Compliance with SJVAPCD Rule 9510 (ISR) reduces the emissions impact of the project through incorporation of onsite measures as well as payment of an offsite fee that funds emissions reduction projects in the SJVAB. A number of

“optional”/Above and Beyond” mitigation measures included in this project can be created as Rule 9510 – onsite mitigation measures.

- Regulation VIII – fugitive PM10 Prohibitions Rules 8011 – 8081 are designed to reduce PM10 emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track-out etc. Among the Regulation VIII Rules applicable to the project are the following:
- Rule 8011 – Fugitive Dust Administrative Requirements for Control of Fine Particulate Matter (PM10)
- Rule 8021 – Fugitive Dust Requirements for Control of fine Particulate Matter (PM10) from Construction, Excavation, and Extraction Activities
- Rule 8030 – Fugitive dust Requirements for Control of Fine Particulate Matter (PM10) from Handling and Storage of Fine Bulk Materials.
- Rule 8060 – Fugitive dust Requirements for Control of fine Particulate Matter (PM10) from Paved and Unpaved Roads.

DISCUSSION:

- a) **Less Than Significant Impact With Mitigation Incorporated:** The proposed project is located within the boundaries of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The SJVAPCD is responsible for bringing air quality in the City of Tulare into compliance with federal and state air quality standards. The air district has Particulate Matter (PM) plans, Ozone Plans, and Carbon Monoxide Plans that serve as the clean air plans for the basin. Together, these plans quantify the required emission reductions to meet federal and state air quality standards and provide strategies to meet these standards.

Construction Phase. Project construction would generate pollution emissions from the following construction activities: site preparation, grading, building construction, grading, trenching, and application of architectural coatings. The construction related emissions from these activities were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2. The full CalEEMod Modeling output sheets can be found in Appendix A. As shown in Table 2 below, project construction related emissions do not exceed the thresholds established by the SJVAPCD.

Table 2: Estimated Project Construction Emissions in Tons Per Year

	CO	ROG	SO _x	NO _x	PM10	PM2.5
Maximum Annual Emissions Generated from Project Construction	3.5813	6.3553	0.0079	4.1952	0.3987	0.2171
SJVAPCD Air Quality Thresholds of Significance	100	10	27	10	15	15
*Threshold established by SJVAPCD for SO _x , however emissions are reported as SO ₂ by CalEEMod.						

Source: SJVAPCD, CalEEMod (Appendix A)

Operation Phase. Implementation of the proposed project would result in long-term emissions associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, as well as mobile emissions. Operational emissions from these factors were calculated using CalEEMod. The full CalEEMod Modeling output sheets can be found in Appendix A. As shown in Table 3 below, annual emissions of NO_x exceed the SJVAPCD thresholds of significance.

Table 3: Estimated Project Operational Emissions in Tons Per Year

	CO	ROG	SO _x	NO _x	PM10	PM2.5
Maximum Annual Emissions Generated from Project Operations	12.6525	4.1813	0.0063	10.0452	4.1956	1.1942
SJVAPCD Air Quality Thresholds of Significance	100	10	27	10	15	15
*Threshold established by SJVAPCD for SO _x , however emissions are reported as SO ₂ by CalEEMod.						

Source: SJVAPCD, CalEEMod (Appendix A)

However, the proposed project would be subject to SJVAPCD Rule 9510, since it contains more than 250 residential units at buildout. Rule 9510 requires a reduction in the growth of operational NO_x emissions by 33.3% when compared to the unmitigated project. These reductions are accomplished by the incorporation of mitigation measures into projects and/or by the payment of an Indirect Source Review (ISR) fee for any

required reductions that have not been accomplished through project mitigation commitments. The current fees are \$9,350 per ton of NO_x. The actual calculations will be accomplished by the SJVAPCD and Project applicant under Rule 9510. With implementation of Mitigation Measure AQ-1, the project would be mitigating impacts resulting from operational NO_x emissions, and therefore, impacts relative to this topic would be *less than significant with mitigation incorporated*.

Mitigation Measure AQ-1: The proposed project is subject to Rule 9510, as required by the SJVAPCD. The project applicant shall pay the Indirect Source Review Rule fee for any required reductions that have not been accomplished through project mitigation commitments, prior to issuance of building permits. The fee calculations will be conducted by the SJVAPCD.

- b) **Less Than Significant Impact With Mitigation Incorporated:** The SJVAPCD accounts for cumulative impacts to air quality in Section 1.8 “Thresholds of Significance – Cumulative Impacts” in its 2015 Guide for Assessing and Mitigating Air Quality Impacts. The SJVAPCD considered basin-wide cumulative impacts to air quality when developing its significance thresholds. Construction emissions are relatively insignificant and can be mitigated with implementation of air district control measures. During project operation, annual emissions of NO_x slightly exceed SJVAPCD thresholds, however with implementation of Mitigation Measure AQ-1, impacts would be mitigated to less than significant. Therefore, impacts regarding cumulative emissions would be *less than significant with mitigation incorporated*.
- c) **Less Than Significant Impact With Mitigation Incorporated:** During construction, pollution concentrations will temporarily increase, however construction activities will remain below the thresholds of significance established by the San Joaquin Valley Unified Air Pollution Control District. During operations, annual NO_x emissions resulting from the project would slightly exceed significance thresholds established by SJVAPCD, however with implementation of Mitigation Measure AQ-1, impacts would be mitigated to *less than significant with mitigation incorporated*.
- d) **Less Than Significant Impact:** The project would create temporary typical construction odors during the construction phase. Since any odors from project construction would be temporary and common to any construction activity, and the project would not create objectionable odors during facility operations, impacts are *less than significant*.

IV. BIOLOGICAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish & 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 director 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?	☐	☐	☐	☒

The Project site is situated within a combination of agricultural lands and suburban development. It is bordered to the north and northeast by agricultural land uses, and to the south, west, and east by suburban residential land uses. Argonaut Ecological, Inc. conducted a biological review of the project site. The biological study focused on mapping existing habitat types based on four separate field visits, aerial photographs, and other published reports and available data. The study included assessment of the types of habitats present and sensitive species that may be associated with those habitats. The study found that the Study Area has been used and managed for decades as agricultural land.

A field review was conducted on July 1, 2019 to identify wetlands and assess habitat conditions and land use in order to evaluate site suitability for species of concern. During the site investigation field review the entire Study Area was walked. There are two habitat types present: intensive row crops and ruderal (disturbed weedy habitat) habitat along the edges. It appears the Study Area is planted annually (with normally cropping patterns). Along the edge of the site, there are non-native weedy species along the roadway shoulders. At the northern edge of the Study Area is a 50-foot wide band of ruderal habitat. This area supports little to no habitat value. There is one large, mature tree (oak) located in the northwestern corner portion of the Study Area. This tree is actively being used for nesting by a pair of red-tailed hawk. There is no other bird nesting habitat within the Study Area. There are no improvements on the site (other than a pump and other farm related irrigation equipment). The perimeter of the farm field is bare ground and used for vehicle/equipment access.

A search of the California Natural Diversity Database (CNDDDB) and the U.S. Fish and Wildlife Information for Planning and Consultation (IPAC database) were reviewed to determine which special status species could be present within the Study Area. There is no critical habitat for any listed species within or near the Study Area. The table below provides a summary of the species identified in the CNDDDB and by the U.S. Fish and Wildlife Service that would have the highest likelihood of being present based on habitat requirements. There is one potential nesting habitat (a single tree) within the Study Area.

Table 4: Special Status Animal Species

Common Name	Scientific Name	Status
Swainson's hawk	<i>Buteo swainsoni</i>	CT
burrowing owl	<i>Athene cunicularia</i>	CSC
An andrenid bee	<i>Andrena macswaini</i>	-
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, CT
Blunt nosed leopard lizard	<i>Gambelia silus</i>	CE
Status Codes		
FE	Federally Endangered	CE California Endangered
		CT California Threatened
		CSC California Species of Special Concern

Source: CNDDDB Quickview Tool

Table 5: Special Status Plant Species

Common Name	Scientific Name	Status
San Joaquin adobe sunburst	Pseudobahia peirsonii	FT, CE, 1B
California jewelflower	Caulanthus californicus	FE, CE
Status Codes		
FE	Federally Endangered	CE California Endangered
FT	Federally Threatened	
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere	

Source: CNDDDB Quickview Tool

Federal Endangered Species Act (FESA) - defines an *endangered species* as “any species or subspecies that is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species or subspecies that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.”

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

Although the United States Fish & Wildlife Service (USFWS) and its parent administration, the U.S. Department of the Interior, have traditionally interpreted the FMBTA as prohibiting incidental as well as intentional “take” of birds, a January 2018 legal opinion issued by the Department of the Interior now states that incidental take of migratory birds while engaging in otherwise lawful activities is permissible under the FMBTA. However, California Fish and Game Code makes it unlawful to take or possess any non-game bird covered by the FMBTA (Section 3513), as well as any other native non-game bird (Section 3800), even if incidental to lawful activities.

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

California Endangered Species Act (CESA) – prohibits the take of any state-listed threatened and endangered species. CESA defines *take* as “any action or attempt to hunt, pursue, catch,

capture, or kill any listed species.” If the proposed project results in a take of a listed species, a permit pursuant to Section 2080 of CESA is required from the CDFW.

DISCUSSION:

a) Less Than Significant Impact with Mitigation Incorporated: Based on the existing conditions of the project site and vicinity (row crop agricultural uses to the north and northeast, and suburban residential uses to the south, east, and west), there is low potential for candidate, sensitive, or special-status species to occur on the project site. No candidate, sensitive, or special-status species were observed on the project site during the reconnaissance-level survey, but some special-status species could occur on the project site because they are occasionally found to travel through or forage in row crop agricultural fields. These species include the Swainson’s hawk, burrowing owl, and San Joaquin kit fox, and are discussed in further detail below:

Swainson’s hawk: Swainson’s hawk (*Buteo swainsonii*) is listed as threatened under CESA. Swainson’s hawks inhabit grasslands, sage-steppe plains, and agricultural regions of western North America during breeding season, and winter in grassland and agricultural regions from central Mexico to southern South America. In California, the nesting distribution includes the Sacramento and San Joaquin Valleys, the Great Basin sage-steppe communities and associated agricultural valleys in extreme northeastern California, isolated valleys in the Sierra Nevada in Mono and Inyo Counties, and limited areas of the Mojave Desert region (California Department of Fish and Game 2005). In California, Swainson’s hawk habitat generally consists of large, flat, open, undeveloped landscapes that include suitable grassland or agricultural foraging habitat and sparsely distributed trees for nesting (England et al. 2010). Foraging habitat includes open fields and pastures. Preferred foraging habitats for Swainson’s hawk include alfalfa fields, fallow fields, low-growing row or field crops, rice fields during the non-flooded period, and cereal grain crops (California Department of Fish and Game 2005). Prey species include ground squirrels, California voles, pocket gophers, deer mice, reptiles, and insects (California Department of Fish and Game 2005; England et al. 2010). Swainson’s hawks usually nest in large native trees such as valley oak (*Quercus lobata*), Fremont cottonwood, and willows, although nonnative trees such as eucalyptus (*Eucalyptus* spp.) occasionally are used. Nests occur in riparian woodlands, roadside trees, trees along field borders, isolated trees and small groves, trees in windbreaks, and edges of remnant oak woodlands. In some locales, urban nest sites have been recorded. The breeding season is typically February through August (CDFW 2005).

The Study Area supports one large tree that is currently being used for nesting by a pair of red-tailed hawk. It is unlikely the nest would be used by Swainson’s hawk, but the site may occasionally be used by Swainson’s hawk for occasional foraging, but not likely given the presence of the red-tailed hawk. The project site and adjacent agricultural fields could be used as foraging or nesting habitat for this species. The following mitigation measures will

be implemented to prevent significant impacts from occurring to the Swainson's hawk and other nesting raptors.

Mitigation Measure BIO-1a: In order to avoid impacts to nesting raptors and migratory birds, the project shall be constructed, if feasible, outside the nesting season, or between September 1st and January 31st.

Mitigation Measure BIO-1b: If project activities must occur during the nesting season (February 1-August 31), a qualified biologist shall conduct preconstruction surveys for active raptor and migratory bird nests within 14 days prior to the start of these activities. The survey shall include the proposed work area(s) and surrounding lands within 500 feet, where accessible, for all nesting raptors and migratory birds save Swainson's hawk; the Swainson's hawk survey shall extend to 0.5 mile outside of work area boundaries. Nesting surveys for the Swainson's hawks shall be conducted in accordance with the protocol outlined in the "Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley" (Swainson's Hawk Technical Advisory Committee, 2000). If potential Swainson's hawk nests or nesting substrates are located within 0.5 miles of the Project site, then those nests or substrates must be monitored for activity on a routine and repeating basis throughout the breeding season, or until Swainson's hawks or other raptor species are verified to be using them. The protocol recommends that 10 visits be made to each nest or nesting site: one during January 1-March 20 to identify potential nest sites, three during March 20-April 5, three during April 5-April 20, and three during June 10-July 30. To meet the minimum level of protection for the species, surveys shall be completed for at least the two survey periods immediately prior to Project-related ground disturbance activities. If Swainson's hawks are not found to nest within the survey area, then no further action is warranted.

Mitigation Measure BIO-1c: Should any active nests be discovered near proposed work areas, Swainson's hawk nests shall be avoided by 0.5 miles unless this avoidance buffer is reduced through consultation with the CDFW and/or USFWS. If a construction area falls within this nesting site, construction-free buffers shall be identified on the ground with flagging, fencing, or by other easily visible means, and shall be maintained until the biologist has determined that the young have fledged (left the nest).

Burrowing Owl: Burrowing owl is a species of concern in California. It is a small owl that lives in grassland habitats of the Central Valley region that also supports California ground squirrels. The owl seeks shelter in the ground squirrel burrows (or other structures such as culverts or pipes) from roughly February to July. Although the numbers of owls have declined in some parts of California over the past 20 years, their numbers have increased greatly in some agricultural areas. In the San Joaquin Valley the species mostly occurs on the valley floor. No evidence of ground squirrel occupation or evidence of owl occupation within the Study Area was found during the site review. Given the site is annually disturbed likely prevents occupation. The only potentially suitable habitat is the ruderal habitat at the

north edge of the Study Area; however, this area was walked, and no evidence of occupation or ground burrowing mammals was present. The recurring agricultural production likely precludes owl occupation on the remainder of the site since the species nests on the ground and there are no available underground burrows present. However, it is conceivable that burrowing owls could nest or roost in California ground squirrel burrows in open areas of the site during periods of less active cultivation of crops on the project site. The following mitigation measures will be implemented to prevent significant impacts from occurring to the burrowing owl.

Mitigation Measure BIO-2a: (Take Avoidance Survey). A take avoidance survey for burrowing owls shall be conducted by a qualified biologist knowledgeable of the species within 14 days prior to the start of construction. This take avoidance survey shall be conducted according to methods described in the *Staff Report on Burrowing Owl Mitigation* (CDFG 2012). The survey area shall include all suitable habitat on and within 200 meters of project impact areas, where accessible.

Mitigation Measure BIO-2b: (Avoidance of Active Nests and Roosts). If project activities are undertaken during the breeding season (February 1-August 31) and active nest burrows are identified within or near project impact areas, a 200-meter disturbance-free buffer shall be established around these burrows, unless a qualified biologist approved by CDFW verifies through noninvasive methods either that the birds have not begun egg laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Owls present on site after February 1 will be assumed to be nesting unless evidence indicates otherwise. The protected exclusion zone established for the breeding season shall remain in effect until August 31 or, as determined based on monitoring evidence, until the young owl(s) is foraging independently or the nest is no longer active.

Mitigation Measure BIO-2c: (Passive Relocation of Resident Owls). During the nonbreeding season (September 1-January 31), resident owls occupying burrows in project impact areas may be passively relocated to alternative habitat after consulting with the CDFW. Prior to passively relocating burrowing owls, a Burrowing Owl Exclusion Plan shall be prepared by a qualified biologist in accordance with Appendix E of the *Staff Report on Burrowing Owl Mitigation* (CDFW, 2012). The Burrowing Owl Exclusion Plan shall be submitted to the CDFW for review prior to implementation. Relocation of any owls during the nonbreeding season shall be performed by a qualified biologist using one-way doors, which shall be installed in all burrows in the impact area and left in place for at least two nights. The doors shall be removed and the burrows backfilled immediately before the initiation of grading or, if no grading would occur, left in place until the end of construction. To avoid the potential for owls evicted from a burrow to occupy other burrows in the project site, one-way doors shall be placed in all potentially suitable burrows within the impact area when eviction occurs.

San Joaquin kit fox : The San Joaquin kit fox (*Vulpes macrotis mutica*) is federally listed as endangered under ESA and is state-listed as threatened. Federal critical habitat for this species has not been designated. The historical range of San Joaquin kit fox included most of the San Joaquin Valley as well as low elevation basins and ranges along the eastern side of the central Coast Ranges. By 1930, this range had been reduced by more than half, with the largest populations occurring in the southern and western portions of the San Joaquin Valley. Today, the San Joaquin kit fox occurs in the remaining native valley and foothill grasslands and chenopod scrub communities of the valley floor and surrounding foothills, from southern Kern County north to Los Banos, Merced County. Smaller, less dense populations may be found farther north and in the narrow corridor between I-5 and the Interior Coast Ranges from Los Banos to Contra Costa County. The San Joaquin kit fox's range also includes portions of Monterey, Santa Clara, and San Benito Counties (U.S. Fish and Wildlife Service 1998). The kit fox inhabits a variety of habitats, including grasslands; scrublands; vernal pool areas; alkali meadows and playas; and agricultural irrigated pastures, orchards, and vineyards. They prefer habitats with loose-textured soils and are found primarily in arid grasslands and open scrublands that are suitable for digging, but they occur on virtually every soil type (U.S. Fish and Wildlife Service 1998). Dens generally are located in open areas with grass or grass and scattered brush, and seldom occur in areas with thick brush. Preferred sites are relatively flat, well-drained terrain.

The only potential habitat that could be used for denning habitat is the ruderal habitat at the north end of the Study Area. This entire area was walked and there are no dens present nor is there any suitable prey base to support the species within the Study Area. No evidence of kit fox was observed (tracks or scat). The highly disturbed nature of the project site and adjacent lands make it unlikely habitat for the species, however it is possible that the project site and adjacent agricultural fields could be used as foraging or burrowing habitat for the species. The following measures adapted from the *U.S. Fish and Wildlife Service 2011 Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance* will be implemented:

Mitigation Measure BIO-3a: Preconstruction surveys for the San Joaquin kit fox shall be conducted on and within 200 feet of the project site, no more than 30 days prior to the start of ground disturbance activities on the site. The primary objective is to identify kit fox habitat features (e.g., potential dens and refugia) on and adjacent to the site and evaluate their use by kit foxes. Protection provided by dens for shelter, escape, cover, and reproduction is vital to the survival of San Joaquin kit foxes. For San Joaquin kit foxes, the ecological value of potential, known, and natal/pupping dens differs; therefore, each den type requires the appropriate level of protection. The following text describes the different steps involved with implementing this mitigation measure:

Determine Den Status. When a suitable den or burrow is discovered, a qualified biologist shall determine whether the hole is occupied by a San Joaquin kit fox. Den entrances at least 4 inches in diameter (but not greater than 20 inches) qualify as

suitable for San Joaquin kit fox use. Some dens can be immediately identified as recently used by kit fox; qualifying signs include kit fox tracks, scats, and a fresh soil apron extending up to 6 feet from the den entrance. Dens with proper dimensions, but no obvious sign will require further investigation. A remote motion-sensing camera with tracking medium shall be deployed for at least 5 days in an attempt to document a San Joaquin kit fox using the den. If, after 5 days, no San Joaquin kit foxes are detected and the hole has remained unchanged (no new tracks or excavations are observed), and there is no historic record of an active kit fox den at that location, the den will be deemed a “potential den” and unoccupied. The den will be considered occupied if a kit fox is photographed using the den or if a recent sign is found. The biologist shall contact CDFW and the USFWS upon the confirmation of any occupied den.

Preconstruction surveys shall be repeated following any lapses in construction of 30 days or more.

Mitigation Measure BIO-3b: Should active kit fox dens be detected during preconstruction surveys, the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW shall be notified. A disturbance-free buffer shall be established around the burrows in consultation with the USFWS and CDFW, to prevent access to the occupied den by construction equipment and personnel who are not biologists, and to be maintained until an agency-approved biologist has determined that the burrows have been abandoned. After construction activities would no longer affect the den, all fencing and flagging shall be removed to avoid attracting attention to the den by other animals or humans. All onsite flagging and buffer delineations shall be kept in good working order for the duration of activity near the den or until the den is determined to be unoccupied, whichever occurs first. The following radii are standard San Joaquin kit fox buffer distances:

- Known occupied den—100 feet
- Occupied natal/pupping den—500 feet
- Occupied atypical den—50 feet

In the exclusion zones, only essential vehicle and foot traffic shall be permitted. No activity that would destroy the den may occur, and no activity that may harm a San Joaquin kit fox will proceed until the individual is out of harm’s way, without harassment. No activity that may cause strong ground vibrations may occur in the exclusion zone until the den is no longer occupied. Essential vehicle traffic shall include any emergency vehicles. If San Joaquin kit foxes are not observed above ground, essential foot traffic also may be allowed. The USFWS and CDFW shall be notified of any reductions in the standard radii or allowance for additional activity in the restrictive exclusion zones based on individual circumstances to provide USFWS and CDFW an opportunity to offer technical guidance. If a known or occupied den cannot be avoided, consultation with the USFWS and CDFW shall be required.

Mitigation Measure BIO-3c: Construction activities shall be carried out in a manner that minimizes disturbance to kit foxes in accordance with the USFWS Standardized

Recommendations. The applicant shall implement all minimization measures presented in the Construction and On-going Operational Requirements section of the Standardized Recommendations, including, but not limited to:

- Project-related vehicles shall observe a daytime speed limit of 15-mph throughout the site in all project areas, except on county roads and State and Federal highways; this is particularly important at night when kit foxes are most active. Night-time construction should be minimized to the extent possible. However if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of designated project areas shall be prohibited.

- To prevent inadvertent entrapment of kit foxes or other animals during the construction phase of a project, all excavated, steep-walled holes or trenches more than 2-feet deep shall be covered at the close of each working day by plywood or similar materials. If the trenches cannot be closed, one or more escape ramps constructed of earthen-fill or wooden planks shall be installed. Before such holes or trenches are filled, they shall be thoroughly inspected for trapped animals. If at any time a trapped or injured kit fox is discovered, the USFWS and CDFW shall be contacted.

- Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until USFWS has been consulted. If necessary, and under the direct supervision of the biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.

- All food-related trash items such as wrappers, cans, bottles, and food scraps shall be disposed of in securely closed containers and removed at least once a week from a construction or project site.

- No firearms shall be allowed on the project site.

- No pets, such as dogs or cats, shall be permitted on the project site, to prevent harassment, mortality of kit foxes, or destruction of dens.

- Use of rodenticides and herbicides in project areas shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation, as well as additional project-related restrictions deemed necessary by USFWS. If rodent control must be conducted, zinc phosphide shall be used because of a proven lower risk to kit fox.

- An employee education program shall be conducted for the project. The program shall consist of a brief presentation by persons knowledgeable in kit fox biology and protection to explain endangered species concerns to contractors, their employees, and agency personnel involved in the project. This training will include a description of the kit fox and its habitat needs; a report of the occurrence of kit fox in the project vicinity; an explanation of the status of the species and its protection under the Endangered Species Act; and a list of the measures being taken to reduce impacts to the species during project construction and implementation. The training will include a handout with all of the training information included in it. The applicant will use this handout to train any construction personnel that were not in attendance at the first meeting, prior to those personnel starting work on the site.
- A representative shall be appointed by the Applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a kit fox or who finds a dead, injured or entrapped kit fox. The representative shall be identified during the employee education program and their name and telephone number shall be provided to USFWS.
- Upon completion of the project, all areas subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, etc. shall be re-contoured if necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to "temporary" disturbance means any area that is disturbed during the project, but after project completion will not be subject to further disturbance and has the potential to be revegetated. Appropriate methods and plant species used to revegetate such areas shall be determined on a site-specific basis in consultation with USFWS, CDFW, or revegetation experts.
- Any contractor, employee, or agency personnel who are responsible for inadvertently killing or injuring a San Joaquin kit fox shall immediately report the incident to their representative. This representative shall contact the Sacramento Field Office of the USFWS and the Fresno Field Office of CDFW will be notified in writing within three working days in case of the accidental death or injury of a San Joaquin kit fox during project-related activities. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal, and any other pertinent information. The CDFW contact for immediate assistance is State Dispatch at (916) 445-0045. They will contact the local warden or Mr. Paul Hoffman, the wildlife biologist, at (530) 934-9309.
- New sightings of kit fox shall be reported to the CNDDDB. A copy of the reporting form and a topographic map clearly marked with the location of where the kit fox was observed shall also be provided to USFWS.

Implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-2a, BIO-2b, BIO-2c, BIO-3a, BIO-3b, and BIO-3c, will ensure that impacts to species identified as a candidate, sensitive, or special status will be *less than significant with mitigation incorporated*.

- b) **No Impact:** As identified in the City's General Plan EIR, the project site is not located within or adjacent to an identified sensitive riparian habitat or other natural community. Therefore, the proposed project would have *no impact* to riparian habitat.
- c) **No Impact:** As identified in the City's General Plan EIR, there are no known wetlands located in or around the Project site as reviewed on the U.S. Fish and Wildlife Service National Wetlands Inventory map, and in addition, there are no state protected wetlands at or in the vicinity of the Project site. A query of the U.S. Fish and Wildlife Service's National Wetland Inventory Map shows no waters, wetlands, ponds, or rivers within the Study Area. The nearest mapped waters are located northeast of the Study Area (the Tulare Colony Ditch feature). This ditch feature does not flow onto or through the Study Area. Based on the 1919 topographic map it appears the Tulare Colony Ditch crossed through the Study Area. However, the portion of the ditch appears to have been rerouted or eliminated and no evidence of the old ditch is present within the Study Area. The field review confirmed that there are no waters and/or wetlands present within the Study Area. Therefore, the project will have *no impact* on federal or state protected wetlands.
- d) **No Impact:** As identified in the City's General Plan EIR, there are no identified migratory corridors on or near the site. Therefore, the proposed project would have *no impacts*.
- e) **No Impact:** The City of Tulare has an oak tree preservation policy according to Tulare Municipal Code 8.52.100 (Preservation of Heritage Trees). There is one oak tree in the northwest portion of the project site. This oak tree would be preserved in place and made part of a landscape lot for the subdivision. Therefore, there would be *no impacts*.
- f) **No Impact:** There are no local or regional habitat conservation plans for the area and *no impacts* would occur.

V. CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Discussion:

- a) **Less Than Significant Impact with Mitigation Incorporated:** Table 4.5-1 in the City's General Plan EIR lists previously recorded historical resources within the City, however none of those resources are located in the vicinity of the proposed project site. A record search and review of historic maps was conducted by Peak & Associates, Inc. for the proposed development. Based on a review of the records and historic maps, there are no known historical resources located within the project area and the soils in the project area have been previously disturbed and were most recently disturbed in the cultivation of agricultural row crops. There would be no excavation in undisturbed soils or in areas with known historical resources. However, the presence of remains or unanticipated cultural resources under the ground surface is possible. Implementation of Mitigation Measure CUL-1 would ensure that impacts due to discovery of cultural resources during excavation would be *less than significant with mitigation incorporated*.

Mitigation Measure CUL-1: If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of Interior's Professional Qualifications Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation and Native American consultation may be warranted to mitigate any potential significant impacts.

- b) **Less Than Significant Impact with Mitigation Incorporated:** There are no known archaeological resources located within the project area. Implementation of Mitigation Measure CUL-1 will ensure that potential impacts will be *less than significant with mitigation incorporated*.

- c) **Less Than Significant Impact with Mitigation Incorporated:** There are no known human remains buried in the project vicinity and the soils in the project area have been previously disturbed. No excavation in undisturbed soils is proposed, however if human remains are unearthed during development, there is a potential for a significant impact. As such, implementation of Mitigation Measure CUL-2 would ensure that impacts remain *less than significant with mitigation incorporated*.

Mitigation Measure CUL-2: The discovery of human remains is always a possibility during ground disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the County Coroner has made a determination of origin and disposition pursuant to Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the County Coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission (NAHC), which will determine and notify a most likely descendant (MLD). The MLD shall complete the inspection of the site within 48 hours of notification and may recommend scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

VI. ENERGY

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

- a) **Less Than Significant Impact:** While construction of the proposed project will result in additional energy consumption, this energy use is not unnecessary or inefficient. During project construction there would be an increase in energy consumption related to worker trips and operation of construction equipment. This energy use is justified by the energy-efficient nature of the proposed project and would be limited to the greatest extent possible through compliance with local, state, and federal regulations.

Once construction is complete, the project is expected to achieve net zero energy consumption. The proposed project is subject to the California New Residential Zero Net Energy Action Plan 2015-2020. This plan establishes a goal for all residential buildings built after January 1, 2020 to be zero net energy. The California Energy Commission is responsible for the development and enforcement of specific strategies to achieve this goal. These strategies are implemented through Title 24, Part 6 of the California Building Code, which requires developers to include certain measures (including solar panels on all new residential buildings) to achieve required building efficiency standards.

Since the proposed project will comply with all energy efficiency standards required under Title 24, Section 6, and these standards were specifically developed to achieve net zero energy for residential projects, it can be presumed that the project will achieve net zero energy. Therefore, project impacts related to energy consumption would be considered *less than significant*.

- b) **No Impact:** The proposed project will not conflict with or obstruct any state or local plans for renewable energy or energy efficiency. The project will be designed to meet Title 24 and CALGreen requirements. Compliance with these standards will be enforced by the City of Tulare Building Division. There would be *no impact*.

VII. GEOLOGY AND SOILS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporation	Less than Significant Impact	No Impact
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, as defined in Table 18- 1-B of the Uniform Building Code (1994), creating substantial 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?	☐	☐	☒	☐

Discussion:

a-i and ii) **Less Than Significant Impact:** According to the state Regulatory Earthquake maps, no active faults underlay the project site, nor are any active faults located in the surrounding project vicinity. Although the project is located in an area of low seismic activity, the project could be affected by groundshaking from nearby faults. The

potential for strong seismic ground shaking on the project site is not a significant environmental concern due to the infrequent seismic activity of the area and distance to the faults. Furthermore, the proposed project would not expose people to seismic ground shaking beyond the conditions that currently exist throughout the project area. The project would be constructed to the standards of the most recent seismic Uniform Building and Safety Code (UBSC). Compliance with these design standards will ensure potential impacts related to strong seismic ground shaking would be *less than significant*.

- a-iii) **Less Than Significant Impact:** Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. The 2017 Tulare Multi-Jurisdictional Local Hazard Mitigation Plan identifies the risk of liquefaction within the county as low because the soil types in the area either too coarse or too high in clay content to be suitable for liquefaction. According to state soils maps, the project site consists mostly of Nord fine sandy loam and does not contain soils suitable for liquefaction. The impact would be *less than significant*.
- a-iv) **No Impact:** The project site is generally flat and previously disturbed. There are no hill slopes in the area and no potential for landslides. No geologic landforms exist on or near the site that would result in a landslide event. There would be *no impact*.
- b) **Less Than Significant Impact:** Because the project site is relatively flat, the potential for erosion is low. However, construction-related activities and increased impermeable surfaces can increase the probability for erosion to occur. Construction-related impacts to erosion will be temporary and subject to best management practices (BMPs) required by stormwater pollution prevention plans (SWPPP), which are developed to prevent significant impacts related to erosion from construction. After construction, stormwater will be directed to an on-site stormwater basin to prevent erosion from occurring on- or off-site. Because impacts related to erosion would be temporary and limited to construction and required best management practices would prevent significant impacts related to erosion, the impact will remain *less than significant*.
- c) **Less Than Significant Impact:** Substantial grade change would not occur in the topography to the point where the project would expose people or structures to potential adverse effects on-, or off-site, such as landslides, lateral spreading, subsidence, liquefaction or collapse. The impact would be *less than significant*.
- d) **No Impact:** Expansive soils contain large amounts of clay, which absorb water and cause the soil to increase in volume. Conversely, the soils associated with the proposed project site are granular, well-draining, and therefore have a limited ability to absorb water or exhibit expansive behavior. Nevertheless, the project would be designed to

comply with applicable building codes and structural improvement requirements to withstand the effects of expansive soils. Therefore there would be *no impact*.

- e) **No Impact:** The proposed project will have access to existing City wastewater infrastructure and would not require the use of septic tanks or alternative wastewater disposal systems. There is *no impact*.
- f) **Less Than Significant Impact:** There are no known paleontological resources located within the project area and no excavation proposed in undisturbed soils, particularly to a depth with a potential to unearth paleontological resources. Potential impacts would be *less than significant*.

VIII. GREENHOUSE GAS EMISSIONS

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

Climate Change - (also referred to as Global Climate change) is sometimes used to refer to all forms of climatic inconsistency, but because the earth's climate is never static, the term is more properly used to imply a significant change from one climatic condition to another. In some cases, climate change has been used synonymously with the term "global warming." Scientists however, tend to use the term in the wider sense to address uneven patterns of predicted global warming and cooling and include natural changes in climate.

Global Warming - refers to an increase in the near surface temperature of the earth. Global warming has occurred in the distant past as the result of natural influences, but the term is commonly used to refer to the warming predicted to occur because of increased emissions of greenhouse gases. Scientists generally agree that the earth's surface has warmed by about 1° F in the past 140 years, but warming is not predicted evenly around the globe. Due to predicted changes in the ocean currents, some places that are currently moderated by warm ocean currents are predicted to fall into deep freeze as the pattern changes.

Greenhouse Effect - is the warming of the earth's atmosphere attributed to a buildup of carbon dioxide (CO₂) or other gases; some scientists think that this build-up allows the sun's

rays to heat the earth, while making the infrared radiation atmosphere opaque to infrared radiation, thereby preventing a counterbalancing loss of heat.

Greenhouse Gases - are those that absorb infrared radiation in the atmosphere. GHG include water vapor, CO₂, methane, nitrous oxide (N₂O), halogenated fluorocarbons, ozone, per fluorinated carbons PFCs), and hydrofluorocarbons.

Discussion:

- a) **Less Than Significant Impact:** 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. A project's GHG emissions are at a micro-scale relative to global emissions, but could result in a cumulatively considerable incremental contribution to a significant cumulative macro-scale impact. Implementation of the proposed project would contribute to increases of GHG emissions that are associated with global climate change. Estimated GHG emissions attributable to future development would be primarily associated with increases of CO₂ and other GHG pollutants, such as methane (CH₄) and nitrous oxide (N₂O), from mobile sources and utility usage.

The proposed project's short-term construction-related and long-term operational GHG emissions were estimated using CalEEMod Version 2016.3.2. See Appendix A of this IS-MND for complete CalEEMod inputs and results. CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO₂ equivalent units of measure (i.e., MTCO₂e), based on the global warming potential of the individual pollutants.

Short-Term Construction GHG Emissions: Estimated increases in GHG emissions associated with construction of the proposed project are summarized in Table 6. As presented in the table, the total short-term construction emissions of GHG associated with the Project are estimated to be approximately 3,429 metric tons (MT) of CO₂e. This represents a low of approximately 256 and a high of 708 MT of CO₂e emitted during each of the construction years (2020 through 2026). These construction GHG emissions are a one-time release and are comparatively much lower than emissions associated with operational phases of a project. Cumulatively, these construction emissions would not generate a significant contribution to global climate change, as they would not continue to occur into the future.

Table 6: Estimated Project Construction GHG Emissions (Unmitigated Metric Tons Per Year)

	Bio-CO ₂	NBio-CO ₂	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
2020	0.0	254.1477	254.1477	0.08	0.0	256.1483
2021	0.0	704.5698	704.5698	0.1376	0.0	708.0102
2022	0.0	466.1569	466.1569	0.0887	0.0	468.3754
2023	0.0	499.3367	499.3367	0.0788	0.0	501.3065
2024	0.0	457.7288	457.7288	0.0904	0.0	459.9895
2025	0.0	474.6122	474.6122	0.1019	0.0	477.1601
2026	0.0	555.4335	555.4335	0.088	0.0	557.6325
Total	0.0	3,411.9856	3,411.9856	0.6654	0.0	3,428.6225

Source: SJVAPCD, CalEEMod (Appendix A)

Long-Term Operational GHG Emissions: Implementation of the proposed project would result in long-term greenhouse gas emissions associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, as well as mobile emissions.

The U.S. Environmental Protection Agency (EPA) published a rule for the mandatory reporting of greenhouse gases (GHG) from sources that in general emit 25,000 MT or more of CO₂e per year. Project GHG emissions were calculated using CalEEMod (emissions output results found in Appendix A) based on development of 360 dwelling units located on 76.5 acres at full buildout. The proposed project is estimated to produce 7,340.44 MT of CO₂e per year, which is well below the 25,000 MT threshold for GHG emissions.

Therefore, because the GHG emissions related to construction and operation of the proposed project are below accepted thresholds of significance, the potential impacts are considered *less than significant*.

- b) **No Impact:** The proposed project would comply with all federal, state, and local rules pertaining to the regulation of greenhouse gas emissions. In addition, the project would implement Best Performance Standards developed by the SJVAPCD. Projects implementing Best Performance Standards are determined to have a less than significant impact on global climate change. The project would not conflict with any plan, policy, or regulation developed to reduce GHG emissions. There would be *no impact*.

IX. HAZARDS AND HAZARDOUS MATERIALS

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

Discussion:

- a) **Less Than Significant Impact:** Project construction activities may involve the use and transport of hazardous materials. The use of such materials would be considered minimal and would not require these materials to be stored in bulk form. The project is a residential subdivision and does not involve the use or storage of hazardous substances other than the small amounts of pesticides, fertilizers, and cleaning agents required for normal maintenance of structures and landscaping. The project must adhere to applicable zoning and fire regulations regarding the use and storage of any

hazardous substances. Further, there is no evidence that the site has been used for underground storage of hazardous materials. Therefore, the proposed project will have *less than significant impacts* to hazardous materials.

- b) **Less Than Significant Impact:** There is no reasonably foreseeable condition or incident involving the project that could result in release of hazardous materials into the environment. The proposed project is a residential subdivision. There are *less than significant impacts*.
- c) **No Impact:** The project is not located within ¼ mile of an existing or proposed school, and there is no reasonably foreseeable condition or incident involving the emission, handling, or disposal of hazardous materials, substances, or waste that would affect areas within ¼ miles of existing or proposed school sites. The closest schools are Live Oak Middle School and Alpine Vista School, both located approximately 0.6 miles from the project site. The project does not involve the use or storage of hazardous substances and is a residential subdivision, therefore, there is *no impact*.
- d) **No Impact:** The project site is not listed as a hazardous materials site pursuant to Government Code Section 65962.5 and is not included on a list compiled by the Department of Toxic Substances Control. There would be *no impact*.
- e) **No Impact:** The proposed project site is not located within the boundary of an airport land use plan and is not within two miles of a public airport or public use airport. Mefford Field Airport is located over three miles south of the project site and Visalia Municipal Airport is located over seven miles northwest of the project site. Therefore, there is *no impact*.
- f) **No Impact:** The proposed project does not include any characteristics (e.g., permanent road closures) that would physically impair or otherwise interfere with emergency response or evacuation in the project vicinity. Therefore, the proposed project would have *no impact* on emergency evacuation.
- g) **No Impact:** The land surrounding the project site is developed with urban, suburban, and agricultural uses and are not considered to be wildlands. Additionally, the 2017 Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan finds that fire hazards within the City of Tulare, including the proposed project site, have low frequency, limited extent, limited magnitude, and low significance. The proposed project would not expose people or structures to significant risk of loss, injury or death involving wildland fires and there is *no impact*.

X. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements 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 offsite;	☐	☐	☒	☐
(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?	☐	☐	☒	☐

Discussion:

- a) **Less Than Significant with Mitigation Incorporated:** The project will result in less than significant impacts to water quality due to potentially polluted runoff generated during construction activities. Construction would include excavation, grading, and other earthwork that may occur across most of the 76.5-acre project site. During storm events, exposed construction areas across the project site may cause runoff to carry pollutants, such as chemicals, oils, sediment, and debris. In addition, possible soil

erosion will require implementation of a Stormwater Pollution Prevention Plan (SWPPP) for the project. A SWPPP identifies all potential sources of pollution that could affect stormwater discharges from the project site and identifies best management practices (BMPs) related to stormwater runoff. There may be chemicals or surfactants used during project maintenance or operations, so discharge could impact water quality standards. Therefore, the impacts are *less than significant with mitigation incorporated*.

Mitigation Measure HYD-1: Prior to the issuance of any construction/grading permit and/or the commencement of any clearing, grading, or excavation, the Applicant shall submit a Notice of Intent (NOI) for discharge from the Project site to the California SWRCB Storm Water Permit Unit.

- Prior to issuance of grading permits for Phase 1 the Applicant shall submit a copy of the NOI to the City.
- The City shall review noticing documentation prior to approval of the grading permit. City monitoring staff will inspect the site during construction for compliance.

Mitigation Measure HYD-2: The Applicant shall require the building contractor to prepare and submit a Storm Water Pollution Prevention Plan (SWPPP) to the City 45 days prior to the start of work for approval. The contractor is responsible for understanding the State General Permit and instituting the SWPPP during construction. A SWPPP for site construction shall be developed prior to the initiation of grading and implemented for all construction activity on the Project site in excess of one (1) acre, or where the area of disturbance is less than one acre but is part of the Project's plan of development that in total disturbs one or more acres. The SWPPP shall identify potential pollutant sources that may affect the quality of discharges to storm water and shall include specific BMPs to control the discharge of material from the site. The following BMP methods shall include, but would not be limited to:

- Dust control measures will be implemented to ensure success of all onsite activities to control fugitive dust;
- A routine monitoring plan will be implemented to ensure success of all onsite erosion and sedimentation control measures;
- Provisional detention basins, straw bales, erosion control blankets, mulching, silt fencing, sand bagging, and soil stabilizers will be used;
- Soil stockpiles and graded slopes will be covered after two weeks of inactivity and 24 hours prior to and during extreme weather conditions; and,

- BMPs will be strictly followed to prevent spills and discharges of pollutants onsite, such as material storage, trash disposal, construction entrances, etc.

- b) **Less Than Significant Impact:** The project would result in a reduction in percolation to the groundwater basin, because the project would create an increase in the amount of paved and impervious surfaces. However, this impact would be greatly reduced by the stormwater basin included in the project. The project has been reviewed by the City of Tulare Public Works Director and Engineer who have determined that the Project will not have a significant impact on the existing water system, and would tie in to the existing water infrastructure for this part of the City. Therefore, the project would have a *less than significant impact* on groundwater resources.
- c) **Less Than Significant with Mitigation Incorporated:**
- (i) The proposed project includes the construction and operation of 360 single-family residential units on approximately 76.5 acres. The construction of these units may be considered an alteration in drainage patterns, however this would not result in substantial erosion or siltation on- or off-site. A Stormwater Pollution Prevention Plan (SWPPP) will be implemented during project construction. SWPPPs include mandated erosion control measures, which are developed to prevent significant impacts related to erosion caused by runoff during construction. The impact is *less than significant*.
 - (ii) Since the project would result in an increase of impervious surfaces within the project site, an increase in surface runoff may occur. However, this impact would be greatly reduced by the temporary storm basin included in the project. The project will ultimately tie into the City's stormwater system, which is designed to direct runoff water to groundwater recharge areas. The project has been reviewed by the city's engineers who have determined that the implementation of the proposed project will not result in substantial flooding on-or-off site. As such, the potential for flooding on or off-site as a result of the project is considered a *less than significant impact*.
 - (iii) The proposed project would include the construction and operation of 360 single-family residential units on approximately 76.5 acres of land currently being used for agricultural production. Existing agricultural operations consist of plowing of the soil and using fertilizers and pesticides. These activities contribute to polluted runoff, however most of the agricultural runoff is naturally cleaned through soil percolation. Replacing agricultural uses with urban residential uses would change the quality and volume of runoff with the addition of oil, grease, and other urban pollutants. New impervious surfaces, such as the roads and driveways, collect automobile derived pollutants such as oils, greases, rubber

and heavy metals. During storms, pollutants would be transported into the drainage systems by surface runoff. Due to the increase in population and impervious surfaces within the site, there would be an increase in pollutants in surface runoff. As a result, an increase in point source and non-point source pollution may result from increases in urban development. The project is not a source which would otherwise create substantial degradation of water quality. Upon compliance with the City's SWMP, Engineering Standards, General Plan, and City Ordinance requirements, as well as mitigation measures, impacts related to water quality would be *less than significant with mitigation incorporation*.

Mitigation Measure HYD-3: A Development Maintenance Manual for the Project shall include comprehensive procedures for maintenance and operations of any stormwater facilities to ensure long-term operation and maintenance of post-construction stormwater controls. The maintenance manual shall require that stormwater BMP devices be inspected, cleaned and maintained in accordance with the manufacturer's maintenance conditions. The manual shall require that devices be cleaned prior to the onset of the rainy season (i.e., mid-October) and immediately after the end of the rainy season (i.e., mid-May). The manual shall also require that all devices be checked after major storm events. The Development Maintenance Manual shall include the following:

- Runoff shall be directed away from trash and loading dock areas;
 - Bins shall be lined or otherwise constructed to reduce leaking of liquid wastes;
 - Trash and loading dock areas shall be screened or walled to minimize offsite transport of trash; and,
 - Impervious berms, trench catch basin, drop inlets, or overflow containment structures nearby docks and trash areas shall be installed to minimize the potential for leaks, spills or wash down water to enter the drainage system.
- (iv) The Project site is generally flat and no significant grading or leveling will be required. The proposed project site is not in proximity to a stream or river and will not alter the course of a stream or river. According to National Flood Hazard mapping by the Federal Emergency Management Agency, the site is not within a 100-year flood hazard zone. The site is located in Flood Zone X, an Area of Minimal Flood Hazard. There would be *no impact* in regard to impeding or redirecting flood flows.

- d) **No Impact:** The proposed project is located inland and not near an ocean or large body of water, and therefore, would not be affected by a tsunami. The proposed project is located in a relatively flat area and would not be impacted by inundation related to mudflow. Therefore, the proposed project would have *no impact* due to seiche, tsunami, or mudflow.
- e) **Less Than Significant Impact:** The proposed project will not conflict with or obstruct implementation of a water quality control plan. The proposed project will be subject to the requirements of the NPDES Stormwater Program and will be required to comply with a SWPPP which will identify all potential sources of pollution that could affect stormwater discharges from the project site and identify Best Management Practices (BMPs) related to stormwater runoff for the project to use.

The proposed project is located within the Kaweah Groundwater Subbasin and is included within the Mid-Kaweah Groundwater Sustainability Agency (GSA). The California Department of Water Resources (DWR) in its Bulletin 118 – Interim Update, classified the Kaweah Subbasin as a High-Priority Groundwater Subbasin. Under the requirements for the Sustainable Ground Water Management Act (SGMA), a high-priority basin shall develop and implement a groundwater sustainability plan (GSP) to meet the sustainability goal established by the SGMA. All basins designated as high-priority by DWR are required to be managed under a GSP or coordinated GSP by January 31, 2020. On September 21, 2017 the Mid-Kaweah GSA submitted a Notice of Intent to initiate development of a GSP to DWR. Preparation of a GSP for the Mid-Kaweah GSA is ongoing. It is the intent of the Mid-Kaweah GSA to submit a completed GSP to DWR for review shortly prior to January 31, 2020. Therefore, the proposed project would have *a less than significant impact* on implementation of a water quality control plan or sustainable groundwater management plan.

XI. LAND USE AND PLANNING

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) 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?	☐	☐	☐	☒

Discussion:

- a) **No Impact:** The project proposes the development of 360 single-family residential units on approximately 76.5 acres within the City of Tulare on land used for agricultural production, but designated for low density residential development in the City's latest General Plan. The project site is surrounded on most sites by existing suburban residential development and the proposed project would not physically divide an established community. There is *no impact*.
- b) **No Impact:** The proposed project does not conflict with any applicable land use plan, policy, or regulation, adopted for the purpose of avoiding or mitigating an environmental effect. There is *no impact*.

XII. MINERAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally - important mineral resource recovery site delineated on a local general plan, specific plan or other lands use plan?	☐	☐	☐	☒

Discussion:

- a,b) **No Impact:** There are no known mineral resources of value to the region and the project site is not designated under the City's General Plan as an important mineral resource recovery site. Therefore, the proposed project would not result in the loss or impede the mining of regionally or locally important mineral resources. There is *no impact*.

XIII. NOISE

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

The City of Tulare's Noise Element was adopted in 2013 to protect the citizens of the City of Tulare from the harmful effects of exposure to excessive noise pollution and to protect the economic base of the City by preventing the encroachment of incompatible land uses near known noise-producing industries, railroads, airports and other sources. Noise pollution is defined as unwanted or excessive sound. Sound is a variation in air pressure that the human ear can detect. This pressure is measured within the human hearing range as decibels on the A scale (dBA). As the pressure of sound waves increases, the sound appears louder and the dBA level increases logarithmically. A noise level of 120 dB represents a million fold increases in sound pressure above the 0 dB level.

Discussion:

- a) **Less Than Significant Impact:** Construction of the proposed project would occur in phases through the year 2026 and will involve temporary noise sources. The average noise levels generated by construction equipment that will be used in the proposed project are shown below in Table 7.

The City of Tulare General Plan and Noise Ordinance does not identify noise thresholds for noise sources related to construction, however the General Plan does require the implementation of noise reduction measures for all construction equipment and limits noise generating activities related to construction to daytime hours Monday through Saturday. The project will comply with these regulations and construction will only occur Monday through Saturday between the hours of 6:00 a.m. and 10:00 p.m.

Table 7: Noise Levels of Noise-Generating Construction Equipment.

Type of Equipment	dBA (A-weighted decibel) at 50 feet
Air Compressors	81
Excavators	81
Concrete/Industrial Saws	76
Cranes	83
Forklifts	75
Generators	81
Pavers	89
Rollers	74
Dozers	85
Tractors	84
Loaders	85
Backhoes	80
Graders	85
Scrapers	89
Welders	74

Source: Federal Highway Administration Construction Noise Handbook.

Long term noise levels resulting from the project would include low-density, single-family homes, which are not normally associated with high operational noise levels. There would be additional vehicle trips that would generate noise on local roadways as well. However, these noise levels would be intermittent and short term, and would be considered *less than significant*.

- b) **Less Than Significant Impact:** Construction vibration impacts include human annoyance and building structural damage. Human annoyance occurs when construction vibration rises significantly above the threshold of perception. Building damage can take the form of cosmetic or structural. Table 8, below, shows the typical vibration levels produced by construction equipment.

Table 8: Vibration Levels for Various Construction Equipment

Type of Equipment	Peak Particle Velocity @ 25 feet (inches/second)	Peak Particle Velocity @ 100 feet (inches/second)
Large Bulldozer	0.089	0.011
Loaded Trucks	0.076	0.010
Pile Driving (Impact)	1.518	0.190
Pile Driving (Sonic)	0.734	0.092
Small Bulldozer	0.003	0.000
Auger/drill Rigs	0.089	0.011
Jackhammer	0.035	0.004
Vibratory Hammer	0.070	0.009
Vibratory Compactor/roller	0.210	0.026

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment Guidelines, May 2017

The primary vibration-generating activities associated with the proposed project would occur when the infrastructure such as grading, utilities, and foundations are constructed. Operating cycles for the types of construction equipment used during construction may involve one or two minutes of full power operation followed by three or four minutes at lower power settings. Other primary sources of acoustical disturbance would be due to random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). These estimations of noise levels take into account the distance to the receptor, attenuation from molecular absorption and anomalous excess attenuation.

The most significant source of groundborne vibrations during the project's construction would occur from the use of vibratory compactors. Table 8, above, indicates that vibratory compactors would generate typical vibration levels of 0.210 inches per second at a distance of 25 feet. The threshold for architectural damage to buildings is 0.20 inches per second. The closest residential buildings to the project site are located southeast of the project site at a distance of approximately 60 feet. Table 8 data also indicates vibratory compactors would not generate vibration levels exceeding safe levels at these distances; therefore, this would be considered a *less than significant impact*.

- c) **No Impact:** The project site is not located in an airport land use plan. Mefford Field is the nearest public airport and is located over three miles away from the proposed project site. Therefore, there would be *no impact*.

XIV. POPULATION AND HOUSING

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Induce substantial unplanned population growth in an area, either directly (for example, by 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?	☐	☐	☐	☒

Discussion:

- a) **Less Than Significant Impact:** The project proposes to construct 360 single-family residential units, as well as internal access roads, landscaped grounds, and off-site improvements subject to the City standards. The City of Tulare General Plan states that the City's average household size is 3.35 persons. Based on this average household size, the anticipated population increase as a result of the proposed project is 1,206 persons.

Although implementation of the proposed project would result in a population increase, this increase is not unplanned. The project sites is located within the city limits in an area designated for residential development and the total population increase of the proposed project would represent close to the annual rate of growth in the City, however the project would be developed in phases over six years and thus would be consistent with the City's planned population growth projections. Therefore, there *impacts would be less than significant*.

- b) **No Impact:** The proposed project would be developed on land zoned for residential use within the City limits. There are no existing residences that would be removed and no individuals would be displaced because of the project. Therefore, there would be *no impact*.

XV. PUBLIC SERVICES

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

Discussion:

- a. **Less Than Significant Impact:** The City of Tulare Fire Department already provides fire protection services to the project site and will provide services for the proposed development. The closest fire station is Tulare Fire Department Station 61, located at 800 S. Blackstone Street, approximately 1 ½ miles southwest from the project site. The addition of 360 single-family residential units will increase the demand for fire protection services. However, as analyzed in the City's General Plan EIR, the need for new fire service facilities is assessed as the City continues to grow and develop within the growth boundary in the City's latest General Plan. The development of 360 single-family residential units alone will not require the alteration of existing or construction of new fire services facilities, but would contribute to the cumulative need for increased fire protection services. The increase in service demand will be compensated by the development impact fee of \$246 per dwelling unit, which is consistent with City Resolution Number 03-4988. Therefore, the total development fee would be \$88,560. The development impact fee of \$246 per dwelling unit is the proposed project's fair share contribution towards cumulative increases in demand for fire protection services.

The timing of when new fire service facilities would be required or details about size and location cannot be known until such facilities are planned and proposed, and any attempt to analyze impacts to a potential future facility would be speculative. As new or expanded fire service facilities become necessary, construction or expansion projects would be subject to their own separate CEQA review in order to identify and mitigate any potential environmental impacts. Therefore, impacts resulting from the proposed project would be *less than significant*.

- b. **Less Than Significant Impact:** The City of Tulare Police Department already provides police protection services to the project site and will provide services for the proposed development. The Tulare Police Department is located at 260 South M Street, approximately 2 miles southwest from the project site. The addition of 360 single-family residential units will increase the demand for police protection services. However, as analyzed in the City's General Plan EIR, the need for new police service facilities is assessed as the City continues to grow and develop within the growth boundary in the City's latest General Plan. The development of 360 single-family residential units alone will not require the alteration of existing or construction of new police service facilities, but would contribute to the cumulative need for increased police protection services. The increase in service demand will be compensated by the development impact fee of \$38 per dwelling unit, which is consistent with City Resolution Number 03-4988. Therefore, the total development fee would be \$13,680. The development impact fee of \$246 per dwelling unit is the proposed project's fair share contribution towards cumulative increases in demand for police protection services.

The timing of when new police service facilities would be required or details about size and location cannot be known until such facilities are planned and proposed, and any

attempt to analyze impacts to a potential future facility would be speculative. As new or expanded police service facilities become necessary, construction or expansion projects would be subject to their own separate CEQA review in order to identify and mitigate any potential environmental impacts. Therefore, impacts resulting from the proposed project would be *less than significant*.

- c. **Less Than Significant Impact:** The proposed project is within the Tulare City School District and Tulare Joint Union High School District. Students from the development would be able to attend neighboring schools, including Live Oak Middle School, Mission Oak High School, and Alpine Vista School. Since the proposed project includes the addition of 360 single-family residential units, the number of students in the school district will increase. The proposed project site is located within the existing City limits and was anticipated for development of single-family residential units in the City's General Plan. Therefore, growth associated with the Project has been planned and expected. In addition to the goals and policies of the City's General Plan, future development is required by state law to pay development impact fees to the school districts at the time of building permit issuance. These impact fees are used by the school districts to maintain existing and develop new facilities, as needed.

While development of 360 single-family residential units alone will not require the alteration of existing or construction of new school facilities, the development will contribute to the cumulative need for increased school facilities. It is known that the school district has purchased land for a future school north of the proposed project site, across from Seminole Avenue. However, the timing of when new school facilities would be required or details about size and location cannot be known until such facilities are planned and proposed, and any attempt to analyze impacts to a potential future facility would be speculative. As the future new school facilities are further planned and developed, they would be subject to their own separate CEQA review in order to identify and mitigate any potential environmental impacts. Therefore, the *impact is less than significant*.

- d. **Less Than Significant Impact:** The addition of 360 new residential units would result in more use at existing parks. Parks within a half-mile to one-mile radius that would service the proposed development include Live Oak Park and Tulare Youth Softball Park. The City's 2035 General Plan Policy states that new residential development may be required to provide additional parkland or in-lieu fees. The proposed residential subdivision will include a small (0.9 acre) park within the subdivision, as well as wide, landscaped paths connecting through the subdivision, and a bike and pedestrian path developed along Morrison Street, along the length of the subdivision. These park and open space improvements would be credited towards the total development impact fees for parks facilities, and the remaining would be paid via in-lieu fees of \$3,129 per dwelling unit, which is consistent with City Resolution Number 03-4988. Since the proposed project would contribute its fair share to parks facilities through a

combination of park and open space development, as well as in-lieu fees, the impact is *less than significant*.

- e. **Less Than Significant Impact:** Water and wastewater services for the proposed development would be serviced by existing infrastructure beneath neighboring streets. The proposed project would increase the demand for water and wastewater service. However, according to Tulare’s 2035 General Plan Land Use Element, new development must be responsible for expanding existing water and sewage systems. Therefore, the project applicant shall pay the required development impact fees to accommodate the expansion of existing systems. Therefore, the impact would be *less than significant*.

XVI. RECREATION

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

Discussion:

- a) **Less Than Significant Impact:** Implementation of the proposed project would result in increased use of existing parks and other recreational facilities, however the project would develop a small park within the proposed subdivision and include pedestrian and bike paths to provide recreational facilities as well as connectivity for the new residents of the proposed subdivision. In addition to the recreational facilities being developed as part of the subdivision, the developer will also be required to pay fees in-lieu of parkland dedication, which will be used to support the maintenance of existing parks and other recreational facilities. Therefore, the impact is *less than significant*.
- b) **Less Than Significant Impact:** The proposed residential subdivision will include a small (0.9 acre) park within the subdivision, as well as wide, landscaped paths connecting through the subdivision, and a bike and pedestrian path developed along Morrison Street, along the length of the subdivision. The construction of these recreational

facilities as part of the proposed project would not have a significant impact on the environment due to soil compaction, damage to vegetation and wildlife, or decreased water quality, due to the disturbed state of the site and lack of biological resources. For more information regarding these specific impacts, refer to the Agriculture and Forestry Resources, Biological Resources, and Geology, Soils, and Seismicity sections of this IS-MND document. Impacts would be *less than significant*.

XVII. TRANSPORTATION

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, 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?	☐	☐	☒	☐

Discussion:

a,b) **Less Than Significant Impact With Mitigation Incorporated:** The project would not conflict with any transportation policies plans or programs regarding public transit, bicycle, or pedestrian facilities. The proposed project would include frontage improvements, including sidewalks, which would be an improvement to pedestrian accessibility over existing conditions. The project would also install bicycle lanes along the Morrison Street frontage. Any congestion during construction would be temporary. Vehicular access to the project site would be available primarily on Morrison Street, and also via Tulare Avenue and Seminole Avenue. The following discussion is summarized from the project's *Traffic Impact Analysis* (JLB Engineering Inc., November 2019), with the full Traffic Impact Analysis included as Appendix B to this Initial Study-Mitigated Negative Declaration document.

The proposed project would develop 76.5 acres with 360 single-family residential units, constructed in four phases. Development of the phases will begin along the north side of Tulare Avenue and continue north until reaching Seminole Avenue. Phase I will

develop 99 units estimated to be completed by September 2022, Phase II will develop 117 units estimated to be completed by January 2024, Phase III will develop 82 units estimated to be completed by May 2025, and Phase IV will develop the remaining 62 units estimated to be completed by December 2026.

Existing Conditions

At present, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue exceed their acceptable level of service (LOS)¹ threshold, per the City's General Plan standards, during one or both AM and PM peak periods.

To improve the LOS at the intersection of Mooney Boulevard and Cross Avenue, the City is already working on programming the following necessary improvements as part of a City Capital Improvement Project:

- Modify the eastbound left-right lane to a left-turn lane;
- Add an eastbound right-turn lane; and
- Signalize the intersection with protective left-turn phasing in all directions.

In addition, the project proponent would have to implement Mitigation Measure TRA-1 to address existing LOS deficiencies at the intersection of Morrison Street and Tulare Avenue.

Mitigation Measure TRA-1: Prior to issuance of building permits for Phase I of the proposed project, the project proponent must complete the following required improvements at the Morrison Street/Tulare Avenue Intersection:

- Add a southbound left-turn lane;
- Modify the southbound left-through-right lane to a through-right lane;
- Signalize the intersection with protective left-turn phasing in all directions; and
- Modify the intersection to accommodate the added lane.

Projected Phase I Conditions

Phase I would develop 99 units along the north side of Tulare Avenue and is estimated to be completed by September 2022. Based on the latest Project Site Plan, access to and from the Project site under Phase I will be from two (2) points located along Tulare Avenue and Morrison Street. Access to Tulare Avenue will be from Sand Hills Avenue to Hazeltine Street located along the southwestern end of the Project site. Access to Tulare Avenue is currently a full access. The other access point is proposed to be located approximately 675 feet north of Tulare Avenue via Pine Valley Avenue. Access to Morrison Street from Pine Valley Avenue is proposed to be a full access. JLB analyzed

¹ Level of service (LOS) is a qualitative measure used to relate the quality of motor vehicle traffic service. LOS is used to analyze roadways and intersections by categorizing traffic flow and assigning quality levels of traffic based on performance measure like vehicle speed, density, congestion, etc. and assigning a letter grade of acceptability as follows: A=free flow; B=reasonably free flow; C=stable flow, at or near free flow; D=approaching unstable flow; E=unstable flow operating at capacity; F=forced or breakdown flow

the location of the proposed access point to be constructed under Phase I relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access point to be constructed under Phase I indicates that it is located at a point that minimizes traffic operational impacts to the existing roadway network.

The Project under Phase 1 is estimated to generate a maximum of 935 daily trips, 73 AM peak hour trips, and 98 PM peak hour trips. The Existing plus Project (Phase I) Traffic Conditions scenario assumes that the raised median worm currently placed along the center of Mooney Boulevard at Seminole Avenue will be removed allowing for left-turn movements from Seminole Avenue onto Mooney Boulevard. Under this scenario, and with implementation of Mitigation Measure TRA-1 as well as the City's Capital Improvement Project at Mooney and Cross, all study intersections are projected to operate at an acceptable LOS during both peak periods.

Projected Phase II Conditions

Phase II would develop 117 units immediately north of Phase I. Phase II is estimated to be completed by January 2024. Based on the latest Project Site Plan, access to and from the Project site under Phase II will be from four (4) points located along Mooney Boulevard, Tulare Avenue and Morrison Street. Access to Mooney Boulevard will be from Muirfield Avenue located near the center of the Project site. Muirfield Avenue connects to an existing residential subdivision to the west that has access to Seminole Avenue which then connects to Mooney Boulevard. Access to Tulare Avenue will be from Sand Hills Avenue which connects to an existing residential subdivision to the west that has access to Tulare Avenue. Sand Hills Avenue is located along the southern end of the Project site. Access to Tulare Avenue is currently a full access. Two access points to Morrison Street are proposed to be located approximately 675 feet and 1,225 feet north of Tulare Avenue via Pine Valley Avenue (675 feet) and Copperhead Avenue (1,225 feet). Access to Morrison Street from Pine Valley Avenue and Copperhead Avenue is proposed to be a full access. JLB analyzed the location of the proposed access points to be constructed under Phase I and II relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I and II indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

The proposed project under Phase I and Phase II is estimated to generate a maximum of 2,039 daily trips, 160 AM peak hour trips, and 214 PM peak hour trips. Upon build out of Phase II, with its associated trip generation combined with projected ambient growth, the intersection of Morrison Street and Prosperity Avenue is projected to exceed its acceptable LOS threshold during one or both peak periods. To mitigate the LOS deficiency at this intersection, implementation of Mitigation Measure TRA-2 would be necessary.

Mitigation Measure TRA-2: Prior to issuance of building permits for Phase II of the proposed project, the project proponent must complete the following required improvements at the Morrison Street/Prosperity Avenue Intersection:

- Modify the northbound left-right lane to a left-turn lane; and
- Add a northbound right-turn lane.

Projected Phase III Conditions

Phase III would develop 82 units immediately north of Phase II. Phase III is estimated to be completed by May 2025. Based on the latest Project Site Plan, access to and from the Project site under Phase III will be from the same four (4) points located along Mooney Boulevard, Tulare Avenue and Morrison Street to be in existence after completion of Phase II. JLB analyzed the location of the proposed access points to be constructed under Phase I, II and III relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I, II and III indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

The proposed project under Phase I, II, and III is estimated to generate a maximum of 2,813 daily trips, 221 AM peak hour trips, and 295 PM peak hour trips. Under this scenario, and with implementation of Mitigation Measures TRA-1 and TRA-2 during prior phase, as well as the City's Capital Improvement Project at Mooney and Cross, all study intersections are projected to operate at an acceptable LOS during both peak periods.

Projected Phase IV (Project Buildout) Conditions

Phase IV would develop the remaining 62 units immediately north of Phase III and south of Seminole Avenue. Phase IV is estimated to be completed by December 2026. Based on the latest Project Site Plan, access to and from the Project site under Phase IV (Project Buildout) will be from five (5) points located along Seminole Avenue, Mooney Boulevard, Tulare Avenue and Morrison Street. By Phase IV, the Project will construct Seminole Avenue on its frontage. Access to Seminole Avenue is proposed to be located approximately 550 feet west of Morrison Street via Campbell Street and is proposed as a full access. Access to Mooney Boulevard will be from Seminole Avenue and Muirfield Avenue located near the center of the Project site. Muirfield Avenue connects to an existing residential subdivision to the west that has access to Seminole Avenue which then connects to Mooney Boulevard. Access to Tulare Avenue will be from Sand Hills Avenue which connects to an existing residential subdivision to the west that has access to Tulare Avenue. Sand Hills Avenue is located along the southern end of the Project site. Access to Tulare Avenue is currently a full access. The other access points are proposed to be located approximately 675 feet and 1,225 feet north of Tulare Avenue via Pine Valley Avenue (675 feet) and Copperhead Avenue (1,225 feet). Access at to Morrison Street from Pine Valley Avenue and Copperhead Avenue is proposed to be a full access.

JLB analyzed the location of the proposed access points to be constructed under Buildout relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Buildout indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

The proposed project at Full Buildout is estimated to generate a maximum of 3,398 daily trips, 266 AM peak hour trips, and 356 PM peak hour trips. Upon build out of Phase IV, with its associated trip generation combined with projected ambient growth, the intersection of Mooney Boulevard and Seminole Avenue is projected to exceed its acceptable LOS threshold during one or both peak periods. To mitigate the LOS deficiency at this intersection, implementation of Mitigation Measure TRA-3 would be necessary.

Mitigation Measure TRA-3: Prior to issuance of building permits for Phase IV of the proposed project, the project proponent must complete the following required improvements at the Mooney Boulevard/Seminole Avenue Intersection:

- Modify the westbound left-right lane to a left-turn lane;
- Add a westbound right-turn lane; and
- Signalize the intersection with protective left-turn phasing in all directions.

Near Term plus Project Buildout Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project Buildout Traffic Conditions. The Near Term plus Project Buildout traffic volumes were obtained by adding the Near Term related trips to the Existing plus Project Buildout Traffic Conditions scenario. The Near Term scenario is assumed to take place approximately two (2) years after the completion of all phases of the proposed project. Therefore, analysis of the Near Term scenario is assumed to take place by year 2028. By 2028, trip generation from Project Buildout combined with projected ambient growth, the intersections of Mooney Boulevard and Prosperity Avenue as well as Mooney Boulevard and Tulare Avenue, are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS at these intersections, the project proponent would contribute their equitable fair share towards improvements at these intersections, as detailed in Mitigation Measure TRA-4.

Mitigation Measure TRA-4: Prior to issuance of building permits for Phase IV of the proposed project, the project proponent shall pay their equitable fair share, agreed upon by the responsible agencies (City of Tulare and Caltrans), towards the cost of the following improvements at the intersections of Mooney Boulevard/Prosperity Avenue and Mooney Boulevard/Tulare Avenue:

- o Mooney Boulevard/Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and

- Modify the traffic signal to accommodate the added lane.
- o Mooney Boulevard/Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.

Fair share contributions shall only be made for those facilities, or portion thereof, currently not funded by the responsible agencies' roadway impact fee program(s) or grant funding, as appropriate. Payment of the Project's equitable fair share, in addition to the local and regional impact fee programs, would satisfy the Project's traffic mitigation measures for its contribution to Near Term plus Project Buildout Traffic Conditions. The traffic impact analysis conducted for the proposed project does not provide construction costs for the recommended mitigation measures; therefore, the project proponent must continue to work with the City of Tulare, and/or Caltrans, to develop the estimated construction costs.

Cumulative Year 2035 plus Project Buildout Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 plus Project Buildout Traffic Conditions. The Cumulative Year 2035 plus Project (Buildout) traffic volumes were obtained from the TCAG traffic model runs (Base Year 2019 and Cumulative Year 2035) and existing traffic counts. For those locations where the TCAG model showed little to no growth, JLB expanded the existing traffic volumes by a minimum average annual growth rate. Based on a review of the Annual Average Daily Traffic (AADT) volumes obtained from Caltrans, the 20-year average annual growth rate of State Route 63 (Mooney Boulevard) and State Route 137 (Tulare Avenue) was determined to be 1.26 percent and 1.18 percent, respectively. Thus, JLB utilized an average annual growth rate of 1.26 percent to expand the existing traffic volumes by 16 years for intersections along State Route 63 and an average annual growth rate of 1.18 percent to expand the existing traffic volumes by 16 years for intersections along Tulare Avenue. For intersections not along either of the State Routes, the 1.18 percent average annual growth rate was utilized. Under this scenario, the higher of the increment method and the expansion of the existing traffic counts by an average annual growth rate of 1.26 or 1.18 percent was utilized to determine the Cumulative Year 2035 traffic volumes. Finally, JLB added the Project Only Trips under Buildout to the expanded existing traffic volumes to arrive at the Cumulative Year 2035 plus Project (Buildout) traffic volumes.

Under this scenario, and with implementation of Mitigation Measures TRA-1 through TRA-4 during prior phases, as well as the City's Capital Improvement Project at Mooney and Cross, all study intersections are projected to operate at an acceptable LOS during both peak periods in the Cumulative Year, 2035.

Therefore, with implementation of Mitigation Measures TRA-1 through TRA-4 to improve the LOS at the project's affected intersections, the project shall result in a *less than significant impact with mitigation incorporated*.

- c) **No Impact:** No geometric design feature associated with the project would pose a hazard to the public and there would be no incompatible uses. There would be *no impact*.
- d) **Less Than Significant Impact:** This project would not result in inadequate emergency access. Emergency access to the site would be via Morrison Street, Tulare Avenue, and Seminole Avenue. A network of local roads within the proposed project property provides full access onto and off of the project site. Any impacts related to emergency access would be *less than significant*.

XVIII. TRIBAL CULTURAL RESOURCES

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
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, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Discussion:

a)

(i) No Impact: The proposed project is located on a site that has been previously disturbed and most recently used for row crop agriculture. The Project site is within the limits of the City of Tulare and is not 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). Therefore, there is *no impact*.

(ii) Less Than Significant with Mitigation Incorporated: The proposed project site has been previously disturbed to use for agriculture, has no record of listing in any register of historical resources, and is located entirely within the City of Tulare limits. No tribal cultural resources were identified through the Sacred Lands File search conducted by the Native American Heritage Commission, nor as part of the City's government-to-government notification and consultation efforts with interested Native American groups, conducted pursuant to SB 18 and AB 52.

Given that no tribal cultural resources have been identified within or immediately adjacent to the project site, the project would not cause a substantial adverse change in the significance of a tribal cultural resource and no mitigation is required. Nonetheless, the presence of remains or unanticipated cultural resources under the ground surface is possible. Implementation of Mitigation Measure CUL-1 would ensure that impacts due to discovery of unanticipated cultural resources during excavation would be *less than significant with mitigation incorporated*.

Mitigation Measure CUL-1: If cultural resources are encountered during ground-disturbing activities, work in the immediate area must halt and an archaeologist meeting the Secretary of Interior's Professional Qualifications Standards for archaeology (NPS 1983) shall be contacted immediately to evaluate the find. If the discovery proves to be significant under CEQA, additional work such as data recovery excavation and Native American consultation may be warranted to mitigate any potential significant impacts.

XIX. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental 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?	☐	☐	☐	☒

According to the Tulare Municipal Service Review (2013), the City would be able to provide the necessary infrastructure services and utility systems required for new development within the General Plan projections for growth within the City limits. Utilities and service systems include wastewater treatment, storm water drainage facilities, water supply, landfill capacity, and solid waste disposal. Wastewater will be collected and treated at the City's wastewater treatment facility, which is located at the intersection Paige Avenue and West Street. Solid waste disposal will be provided by the Tulare County Solid Waste Department, which operates two landfills and six transfer stations within the county. Combined, these landfills receive approximately 300,000 tons of solid waste per day. Water for the proposed development will be provided by the City of Tulare. The City's primary water source is groundwater. Tulare is currently in an agreement with Tulare Irrigation District (TID). The City pumps storm water into canals owned by TID. Storm water is also disposed and detained in storm drainage detention and retention basins throughout the City. Tulare actively improves its storm drainage system to accommodate new urban development.

Discussion:

- a) **Less Than Significant Impact:** The City's wastewater treatment facility (WWTF) has two wastewater treatment trains, domestic and industrial WWTF. Both operate in accordance to the Central Valley Regional Water Quality Control Board *Waste Discharge Requirements (WDR) Order NO. R5-2002-0186*. The City's Municipal Service Review (2013) indicates that Tulare's WWTF is at sufficient capacity to accommodate new development, including the proposed residential subdivision, which would tie into existing City sewage lines in the project vicinity. Based on calculations from the City of Tulare Sewer System Master Plan Table 3.7, a total of 99,450 gallons per day (gpd) of wastewater is estimated to be generated by the proposed project. This equates to approximately 0.10 million gallons per day (mgd). The Tulare Water Pollution Control Facility (TWPCF) has an estimated capacity of 6.0 mgd. The proposed project would contribute approximately 1.6% of the total remaining capacity of the TWPCF. Furthermore, the proposed project site was analyzed for service to be provided in the City's Sewer System Master Plan and development here has been accounted for in this document.

The proposed project would increase the amount of paved and impervious surface coverage, contributing to additional stormwater runoff. However, the proposed project will construct a stormwater drainage basin in the northwest corner of the property and direct stormwater flows there to allow filtration and percolation into the groundwater basin. Water, electric, natural gas, and telecommunications infrastructure would also be installed as part of the project and tie into the existing systems surrounding the property. The extension of utility infrastructure onto the project site is not anticipated to cause a significant environmental effect because extension would occur within the right-of-way prior to street construction to minimize environmental impacts. The construction of these facilities has been planned as part of the various utility system master plans in the City, as well as in the City's General Plan and General Plan EIR. Therefore, the impact would be *less than significant*.

- b) **Less Than Significant Impact:** The City's urban water supply is comprised entirely of groundwater pumped from the underground aquifer by wells located throughout the City. Water service to the agricultural site has been provided by pumping groundwater and future water demand has been planned for through the City's General Plan and Urban Water Management Plan for growth within the city limits. Water will be brought in using water trucks during construction. After construction, operation of the residential subdivision would generate demand for water that would not exceed the City's water supply sources, and the project would tie into the existing water lines adjacent to the property.

The projected water demand for the proposed project is based on the City's standard water demand factors, which were applied in the City's Water System Master Plan to

calculate projected water demands summarized in Table 3.7 of the Water System Master Plan (2009). The projected water demand for the proposed project is shown in Table 9.

Table 9: Projected Water Demand for the Farrar Residential Subdivision Project

Land Use Type	Units	Quantity	Water Demand Factor ^(A)	Average Day Demand, GPD	Annual Water Demand, AFY ^(B)
Low Density Residential	Acres	76.5	2,400 gpd/AC ^(C)	183,600	205.6
Note: (A) Water Demand Factors are Provided from Table 3.8 of the City of Tulare Water System Master Plan, July 2009. (B) AFY=Acre-feet Per Year (C) GPD/AC = Gallons Per Day Per Acre					

Source: City of Tulare Water System Master Plan, 2009.

As shown in the table, the total projected annual water demand for the proposed Project is 205.6 AFY. The proposed use is consistent with the Low Density Residential land use and therefore, the Low Density Residential demand coefficient (2,400 gpd/acre) has been utilized to calculate the projected annual and daily water demand for the Project.

As described in the City's 2015 UWMP, the City will continue to periodically drill new supply wells in the future. The City continues to examine supply enhancement options, including surface water supply, urban recycled water use, etc., and additional supplies from Tulare Irrigation District (TID).

A comparison of the City's projected water supply and demand is shown in Table 10 for Normal, Single-Dry, and Multiple-Dry Years. The water supply and demand projections are based on the City's projected drought supply conditions as described in the City's 2015 UWMP. The supply-demand comparison in Table 10 indicates that the City will have sufficient water to meet its customers' needs through 2040. Current and ongoing management of these supplies is achieved through both voluntary and state-mandated consumption conservation efforts, and the Sustainable Groundwater Management Act (SGMA). The City has adopted outdoor water use conservation strategies as outlined in the UWMP and Chapter 7.32 of the Tulare Municipal Code.

Tulare General Plan Policy LU-P11.5 requires developers to assure that there is sufficient available water supply to meet projected demand for all new development. The proposed Project is planned to be consistent with the 2015 UWMP, which demonstrates adequate water supply to serve development in the City. Additionally, Tulare General Plan Policy LU-P11.3 requires all new development to be responsible for expansion of existing facilities, such as water systems, made necessary to serve the new development.

Table 10: Projected Water Supply (2020-2040)

Water Supply Source	2020		2025		2030		2035		2040	
	RAV ¹	TR/SY ²	RAV ¹	TR/SY ²	RAV ¹	TR/SY ²	RAV ¹	TR/SY ²	RAV ¹	TR/SY ²
Groundwater	6,241.4	6,241.4	7,130.8	7,130.8	8,146.8	8,146.8	9,307.6	9,307.6	10,284.9	10,284.9
Surface Water	--	0	--	0	--	0	--	0	--	0
Recycled Water	4,864.4	0	5,837.3	0	7,004.8	0	8,405.7	0	10,086.9	0
Total	11,105.8	6,241.4	12,968.1	7,130.8	15,151.6	8,146.8	17,713.3	9,307.6	20,371.8	10,284.9
Notes: Unit of measurement is million gallons ¹ RAV=Reasonably Available Volume ² TR/SY = Total Right or Safe Yield										

Source: City of Tulare Urban Water Management Plan, Table 6-9, 2015.

The Project would extend the existing public water line located in the vicinity into the property in accordance with City standards.

As described above, the proposed project would be expected to generate an annual water demand of 205.6 AFY. The City of Tulare 2015 UWMP describes that the City would have available water supply for normal year, single-year, and multi-dry year scenarios. The proposed project would generate an annual water demand that would be well within the limits of water demand, as described in the UWMP.

However, as noted previously, the Kaweah Sub basin is one of many in the San Joaquin Valley that is critically over-drafted. The City has developed strategies to assure that this source of supply remains available and viable in future years. For example, the City maintains the Water Conservation Ordinance to eliminate waste of water and will continue to periodically drill new supply wells in the future. Additionally, the City has joined the City of Visalia and the TID to form the Mid-Kaweah Joint Powers Authority (MKJPA) in an attempt to create a coordinated plan for the Sub basin. The City has also invested significantly in their detention basins to increase their recharge capacity.

The project would change uses on the site from agricultural row crops to a single-family 360 lot residential subdivision, and would result in a reduction in percolation to the groundwater basin, because the project would create an increase in the amount of paved and impervious surfaces. However, this impact would be greatly reduced by the stormwater basin that will be constructed on the project site. The Project has been reviewed by the City of Tulare Engineer who has determined that the Project will not have a significant impact on the existing water system, and would tie in to the existing water infrastructure for this part of the City. Therefore, the Project would have a *less than significant impact* on groundwater resources.

- c) **Less Than Significant Impact:** The City of Tulare's existing sewer pipes and lines on in the project vicinity would be extended to the project site. The wastewater generated from the proposed development would not exceed the City's wastewater treatment facility of 6.0 MGD, and would not require the construction of new or expansion of existing facilities to treat wastewater. The impact would *be less than significant*.
- d) **Less Than Significant Impact:** The proposed project is a residential project. Based on CalRecycle waste generation estimates, the proposed project is estimated to generate up to 12.23 pounds of solid waste per household feet per day. The proposed project would include the development of up to 360 single family residential lots on a 76.5 acre site. Based on the generation estimate rate of 12.23 pounds of solid waste per household per day, the project would generate a maximum of 4,402.8 pounds per day or 2.2 tons per day. The project would be required to comply with state and local requirements including those pertaining to solid waste, construction waste diversion, and recycling. For example, a minimum of 50% diversion of construction waste materials are required to be diverted from landfills. The City of Tulare disposes of its solid waste at the Visalia and

Teapot Dome landfills within the County. These landfills have sufficient permitted capacity to accommodate the project's solid waste disposal needs. Any impacts would be *less than significant*.

- e) **No Impact:** During construction, all solid waste generated by the project would be disposed of at the Visalia landfill or the Teapot Dome landfill. These facilities conform to all applicable statutes and regulations related to solid waste disposal. The proposed project would comply with the adopted policies related to solid waste, including recycling. Therefore, the proposed project would have *no impact* on solid waste regulations.

XX. WILDFIRE

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

- a,b, c, d) **No Impact:** The proposed project site is not within or near a state responsibility area or area classified as very high fire hazard severity zone. The proposed project would not impair an adopted emergency response plan or evacuation plan. The proposed project site would not exacerbate wildfire risks, and expose occupants to

pollutant concentrations from wildfire. The proposed project would not require the installation or maintenance of associated infrastructure that may exacerbate fire risk. The proposed project site is generally flat and is not near any streams or waterways and would not 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. Therefore, there would be *no impacts* related to wildfire.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less than Significant Impact	No Impact
a) Does the project have the potential to 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?	☐	☐	☒	☐

Discussion:

- a) **Less Than Significant Impact with Mitigation Incorporated:** There are several special status species with a potential to occur on the project site, including Swainson's hawk, Burrowing Owl, and San Joaquin kit fox. Implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, BIO-2a, BIO-2b, BIO-2c, BIO-3a, BIO-3b, and BIO-3c, will ensure that impacts to species identified as a candidate, sensitive, or special status will be *less than*

significant with mitigation incorporated. There are no known historical resources located within the project area and the soils in the project area have been previously disturbed and were most recently disturbed in the cultivation of agricultural row crops. There would be no excavation in undisturbed soils or in areas with known historical resources. However, the presence of remains or unanticipated cultural resources under the ground surface is possible. Implementation of Mitigation Measure CUL-1 would ensure that impacts due to discovery of cultural resources during excavation would be *less than significant with mitigation incorporated.*

- b) **Less Than Significant Impact with Mitigation Incorporated:** CEQA Guidelines Section 15064(i) states that a Lead Agency shall consider whether the cumulative impact of a project is significant and whether the effects of the project are cumulatively considerable. The assessment of the significance of the cumulative effects of a project must, therefore, be conducted in connection with the effects of past projects, other current projects, and probable future projects. Due to the nature of the project and consistency with environmental policies, as well as implementation of mitigation measures TRA-1 through TRA-4 to mitigate impacts to the local transportation system, incremental contributions to impacts are considered less than cumulatively considerable. The proposed project would not contribute substantially to adverse cumulative conditions, or create any substantial indirect impacts (i.e., increase in population could lead to an increased need for housing, increase in traffic, air pollutants, etc). Impacts would be *less than significant with mitigation incorporated.*
- c) **Less Than Significant Impact:** The analyses of environmental issues contained in this Initial Study indicate that the project is not expected to have a substantial impact on human beings, either directly or indirectly. All potential impacts of the project have been found to be *less than significant.*

SECTION 4:

Supporting Information and Sources

- 1) *Tulare General Plan, Land Use Element (2014)*
- 2) *City of Tulare Zoning Ordinance*
- 3) *Final Program EIR Land Use and Circulation Element Update (SCH 89062606)*
- 4) *SJVAPCD Regulations and Guidelines*
- 5) *Tulare General Plan, Housing Element (April 2016)*
- 6) *Tulare General Plan Seismic-Safety Element*
- 7) *Tulare County Seismic Element, Volume I and II*
- 8) *FEMA National Flood Hazard Layers & Mapping Tool*
- 9) *Tulare General Plan, Circulation Element*
- 10) *Tulare General Plan, Noise Element*
- 11) *City of Tulare Sewer Systems Master Plan (July 1991)*
- 12) *City of Tulare Sewer Systems Master Plan (2009)*
- 13) *Engineering Standards, City of Tulare*
- 14) *City of Tulare's Municipal Code*
- 15) *Tulare Heritage Tree Ordinance*
- 16) *Tulare County Environmental Resources Management Element*
- 17) *Source Reduction and Recycling Element*
- 18) *City of Tulare Urban Water Management Plan (2015)*
- 19) *City of Tulare Water System Master Plan (2008)*
- 20) *City of Tulare Emergency Response Plan*
- 21) *Tulare Municipal Airport-Mefford Field Master Plan, (February 2005)*
- 22) *Tulare County Airport Land Use Compatibility Plan*
- 23) *California Air Resources Board's (CARB's) Air Quality and Land Use Handbook*
- 24) *2019 California Environmental Quality Act CEQA Guidelines*
- 25) *The Five County Seismic Safety Element*
- 26) *California Building Code*
- 27) *California Stormwater Pollution Prevention Program (SWPPP)*
- 28) *Government Code Section 65962.5*
- 29) *California Environmental Protection Agency (CEPA)*
- 30) *California Department of Conservation*
- 31) *Tulare County Multi-Jurisdictional Local Hazard Mitigation Plan (2017)*
- 32) *California Natural Diversity Database Search Tool*
- 33) *Natural Resource Conservation Service SoilWeb Tool*



City of Tulare
Planning and Building Department
411 East Kern Avenue
Tulare, CA 93274

SECTION 5

List of Preparers

Project Title: Farrar Subdivision Project

City of Tulare
Mario A. Anaya, Principal Planner

Appendix A

California Emissions Estimator Model (CalEEMod) Input and Output Sheets for the Farrar Subdivision Project

Farrar Subdivision Project - San Joaquin Valley Unified APCD Air District, Annual

Farrar Subdivision Project

San Joaquin Valley Unified APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	360.00	Dwelling Unit	76.50	648,000.00	1142

1.2 Other Project Characteristics

Urbanization	Urban	Wind Speed (m/s)	2.7	Precipitation Freq (Days)	45
Climate Zone	7			Operational Year	2026
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Farrar Subdivision Project - San Joaquin Valley Unified APCD Air District, Annual

Project Characteristics -

Land Use - Acreage and unit amount provided by applicant

Construction Phase - Schedule per applicant projected timeframes/schedule

Off-road Equipment -

Construction Off-road Equipment Mitigation -

Mobile Land Use Mitigation -

Area Mitigation -

Water Mitigation -

Waste Mitigation - per State Law

Vehicle Trips - Revised Trip rates per project TIA

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	1,550.00	228.00
tblConstructionPhase	NumDays	1,550.00	228.00
tblConstructionPhase	NumDays	1,550.00	330.00
tblConstructionPhase	NumDays	1,550.00	420.00
tblConstructionPhase	NumDays	155.00	36.00
tblConstructionPhase	NumDays	155.00	36.00
tblConstructionPhase	NumDays	155.00	36.00
tblConstructionPhase	NumDays	155.00	18.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	24.00
tblConstructionPhase	NumDays	110.00	24.00

Farrar Subdivision Project - San Joaquin Valley Unified APCD Air District, Annual

[illegible]

Farrar Subdivision Project - San Joaquin Valley Unified APCD Air District, Annual

tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblGrading	AcresOfGrading	90.00	0.00
tblLandUse	LotAcreage	116.88	76.50
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	4.00
tblVehicleTrips	ST_TR	9.91	9.83
tblVehicleTrips	SU_TR	8.62	8.54
tblVehicleTrips	WD_TR	9.52	9.44
tblWoodstoves	NumberCatalytic	76.50	0.00
tblWoodstoves	NumberNoncatalytic	76.50	0.00

2.0 Emissions Summary

Farrar Subdivision Project - San Joaquin Valley Unified APCD Air District, Annual

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					
2020	0.2267	2.4379	1.5281	2.8900e-003	0.4418	0.1123	0.5541	0.2405	0.1034	0.3439	0.0000	254.1480	254.1480	0.0800	0.0000	256.1486
2021	0.4498	4.1952	3.5813	7.9400e-003	0.1670	0.1843	0.3513	0.0451	0.1720	0.2171	0.0000	704.5704	704.5704	0.1376	0.0000	708.0107
2022	6.3553	2.4796	2.3625	5.2600e-003	0.3564	0.1069	0.4633	0.1530	0.0999	0.2529	0.0000	466.1572	466.1572	0.0887	0.0000	468.3758
2023	3.2936	2.1503	2.4369	5.6200e-003	0.1499	0.0875	0.2373	0.0405	0.0822	0.1227	0.0000	499.3371	499.3371	0.0788	0.0000	501.3069
2024	3.2805	2.1570	2.2173	5.1700e-003	0.4261	0.0847	0.5109	0.1831	0.0790	0.2621	0.0000	457.7292	457.7292	0.0904	0.0000	459.9899
2025	6.3220	2.1670	2.3377	5.3600e-003	0.5805	0.0829	0.6634	0.2703	0.0771	0.3474	0.0000	474.6126	474.6126	0.1019	0.0000	477.1605
2026	6.3314	2.1605	2.6648	6.2600e-003	0.1724	0.0757	0.2482	0.0466	0.0711	0.1177	0.0000	555.4339	555.4339	0.0880	0.0000	557.6329
Maximum	6.3553	4.1952	3.5813	7.9400e-003	0.5805	0.1843	0.6634	0.2703	0.1720	0.3474	0.0000	704.5704	704.5704	0.1376	0.0000	708.0107

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2.1 Overall Construction**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					
2020	0.2267	2.4379	1.5281	2.8900e-003	0.2033	0.1123	0.3157	0.1094	0.1034	0.2128	0.0000	254.1477	254.1477	0.0800	0.0000	256.1483
2021	0.4498	4.1952	3.5813	7.9400e-003	0.1670	0.1843	0.3513	0.0451	0.1720	0.2171	0.0000	704.5698	704.5698	0.1376	0.0000	708.0102
2022	6.3553	2.4796	2.3625	5.2600e-003	0.2241	0.1069	0.3310	0.0861	0.0999	0.1859	0.0000	466.1569	466.1569	0.0887	0.0000	468.3754
2023	3.2936	2.1503	2.4369	5.6200e-003	0.1499	0.0875	0.2373	0.0405	0.0822	0.1227	0.0000	499.3367	499.3367	0.0788	0.0000	501.3065
2024	3.2805	2.1570	2.2173	5.1700e-003	0.2509	0.0847	0.3356	0.0984	0.0790	0.1773	0.0000	457.7288	457.7288	0.0904	0.0000	459.9895
2025	6.3220	2.1670	2.3377	5.3600e-003	0.3157	0.0829	0.3987	0.1363	0.0771	0.2134	0.0000	474.6122	474.6122	0.1019	0.0000	477.1601
2026	6.3314	2.1605	2.6648	6.2600e-003	0.1724	0.0757	0.2482	0.0466	0.0711	0.1177	0.0000	555.4335	555.4335	0.0880	0.0000	557.6325
Maximum	6.3553	4.1952	3.5813	7.9400e-003	0.3157	0.1843	0.3987	0.1363	0.1720	0.2171	0.0000	704.5698	704.5698	0.1376	0.0000	708.0102

	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
Percent Reduction	0.00	0.00	0.00	0.00	35.34	0.00	26.77	42.56	0.00	25.05	0.00	0.00	0.00	0.00	0.00	0.00

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	9-28-2020	12-27-2020	2.5014	2.5014
2	12-28-2020	3-27-2021	1.7960	1.7960
3	3-28-2021	6-27-2021	0.9650	0.9650
4	6-28-2021	9-27-2021	0.9649	0.9649

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5	9-28-2021	12-27-2021	0.9570	0.9570
6	12-28-2021	3-27-2022	0.8610	0.8610
7	3-28-2022	6-27-2022	0.8739	0.8739
8	6-28-2022	9-27-2022	6.2084	6.2084
9	9-28-2022	12-27-2022	0.6768	0.6768
10	12-28-2022	3-27-2023	0.2467	0.2467
11	3-28-2023	6-27-2023	0.7813	0.7813
12	6-28-2023	9-27-2023	0.7812	0.7812
13	9-28-2023	12-27-2023	2.7524	2.7524
14	12-28-2023	3-27-2024	4.4350	4.4350
15	3-28-2024	6-27-2024	0.1530	0.1530
16	6-28-2024	9-27-2024	0.7128	0.7128
17	9-28-2024	12-27-2024	0.7300	0.7300
18	12-28-2024	3-27-2025	0.6582	0.6582
19	3-28-2025	6-27-2025	6.9946	6.9946
20	6-28-2025	9-27-2025	0.0133	0.0133
21	9-28-2025	12-27-2025	0.5720	0.5720
22	12-28-2025	3-27-2026	0.6748	0.6748
23	3-28-2026	6-27-2026	0.6885	0.6885
24	6-28-2026	9-27-2026	0.6885	0.6885
25	9-28-2026	9-30-2026	0.0225	0.0225
		Highest	6.9946	6.9946

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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	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523
Energy	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	1,480.1400	1,480.1400	0.0502	0.0175	1,486.6044
Mobile	0.8603	9.1316	9.0225	0.0543	3.7211	0.0312	3.7522	0.9999	0.0292	1.0291	0.0000	5,055.7599	5,055.7599	0.2667	0.0000	5,062.4272
Waste						0.0000	0.0000		0.0000	0.0000	87.2212	0.0000	87.2212	5.1546	0.0000	216.0867
Water						0.0000	0.0000		0.0000	0.0000	7.4413	56.9289	64.3702	0.7667	0.0185	89.0592
Total	4.1452	9.7239	11.9320	0.0581	3.7211	0.0914	3.8125	0.9999	0.0894	1.0893	94.6625	6,753.1497	6,847.8122	6.2453	0.0389	7,015.5297

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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	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523
Energy	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	1,480.1400	1,480.1400	0.0502	0.0175	1,486.6044
Mobile	0.8965	9.4529	9.7430	0.0590	4.1014	0.0340	4.1354	1.1021	0.0319	1.1340	0.0000	5,489.5149	5,489.5149	0.2752	0.0000	5,496.3951
Waste						0.0000	0.0000		0.0000	0.0000	43.6106	0.0000	43.6106	2.5773	0.0000	108.0434
Water						0.0000	0.0000		0.0000	0.0000	7.4413	55.9230	63.3643	0.7666	0.0185	88.0497
Total	4.1813	10.0452	12.6525	0.0627	4.1014	0.0943	4.1956	1.1021	0.0921	1.1942	51.0519	7,185.8989	7,236.9508	3.6765	0.0389	7,340.4448

	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
Percent Reduction	-0.87	-3.30	-6.04	-8.04	-10.22	-3.13	-10.05	-10.22	-3.00	-9.63	46.07	-6.41	-5.68	41.13	0.03	-4.63

3.0 Construction Detail**Construction Phase**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation (Phase 1)	Site Preparation	9/28/2020	10/17/2020	6	18	
2	Grading (Phase 1)	Grading	10/19/2020	11/28/2020	6	36	
3	Trenching (Phase 1)	Trenching	11/30/2020	3/13/2021	6	90	
4	Building Construction (Phase 1)	Building Construction	3/15/2021	7/16/2022	6	420	
5	Paving (Phase 1)	Paving	7/18/2022	8/13/2022	6	24	
6	Architectural Coating (Phase 1)	Architectural Coating	8/15/2022	9/10/2022	6	24	
7	Site Preparation (Phase 2)	Site Preparation	10/3/2022	10/22/2022	6	18	
8	Grading (Phase 2)	Grading	10/24/2022	11/12/2022	6	18	
9	Trenching (Phase 2)	Trenching	11/14/2022	2/25/2023	6	90	
10	Building Construction (Phase 2)	Building Construction	2/27/2023	11/18/2023	6	228	
11	Paving (Phase 2)	Paving	11/20/2023	12/16/2023	6	24	
12	Architectural Coating (Phase 2)	Architectural Coating	12/18/2023	1/13/2024	6	24	
13	Site Preparation (Phase 3)	Site Preparation	2/5/2024	2/24/2024	6	18	
14	Grading (Phase 3)	Grading	2/26/2024	4/6/2024	6	36	
15	Trenching (Phase 3)	Trenching	4/8/2024	6/29/2024	6	72	
16	Building Construction (Phase 3)	Building Construction	7/1/2024	3/22/2025	6	228	
17	Paving (Phase 3)	Paving	3/24/2025	4/19/2025	6	24	
18	Site Preparation (Phase 4)	Site Preparation	4/7/2025	5/17/2025	6	36	
19	Architectural Coating (Phase 3)	Architectural Coating	4/21/2025	5/17/2025	6	24	
20	Grading (Phase 4)	Grading	5/19/2025	6/28/2025	6	36	
21	Trenching (Phase 4)	Trenching	6/30/2025	10/11/2025	6	90	
22	Building Construction (Phase 4)	Building Construction	10/13/2025	10/31/2026	6	330	
23	Paving (Phase 4)	Paving	11/2/2026	11/28/2026	6	24	
24	Architectural Coating (Phase 4)	Architectural Coating	11/30/2026	12/26/2026	6	24	

Acres of Grading (Site Preparation Phase): 0

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Acres of Grading (Grading Phase): 0**Acres of Paving: 0****Residential Indoor: 1,312,200; Residential Outdoor: 437,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)****OffRoad Equipment**

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

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

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

Trips and VMT

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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 (Phase 1)	9	23.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading (Phase 1)	12	30.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching (Phase 1)	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction (Phase 1)	9	130.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving (Phase 1)	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating (Phase 1)	1	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation (Phase 2)	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading (Phase 2)	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching (Phase 3)			0.00	0.00	10.80	7.30				
Building Construction (Phase 2)	9	130.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving (Phase 2)	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating (Phase 2)	1	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation (Phase 3)	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading (Phase 3)	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching (Phase 4)			0.00	0.00	10.80	7.30				
Building Construction (Phase 3)	9	130.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving (Phase 3)	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating (Phase 3)	1	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation (Phase 4)	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading (Phase 4)	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching (Phase 2)			0.00	0.00	10.80	7.30				
Building Construction (Phase 4)	9	130.00	38.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving (Phase 4)	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating (Phase 4)	1	26.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

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Water Exposed Area

3.2 Site Preparation (Phase 1) - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1084	0.0000	0.1084	0.0596	0.0000	0.0596	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0336	0.3449	0.2447	4.0000e-004		0.0179	0.0179		0.0165	0.0165	0.0000	35.5825	35.5825	0.0115	0.0000	35.8702
Total	0.0336	0.3449	0.2447	4.0000e-004	0.1084	0.0179	0.1263	0.0596	0.0165	0.0761	0.0000	35.5825	35.5825	0.0115	0.0000	35.8702

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	8.7000e-004	5.9000e-004	6.0400e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4861	1.4861	4.0000e-005	0.0000	1.4872
Total	8.7000e-004	5.9000e-004	6.0400e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4861	1.4861	4.0000e-005	0.0000	1.4872

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3.2 Site Preparation (Phase 1) - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0488	0.0000	0.0488	0.0268	0.0000	0.0268	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0336	0.3449	0.2447	4.0000e-004		0.0179	0.0179		0.0165	0.0165	0.0000	35.5825	35.5825	0.0115	0.0000	35.8702
Total	0.0336	0.3449	0.2447	4.0000e-004	0.0488	0.0179	0.0667	0.0268	0.0165	0.0433	0.0000	35.5825	35.5825	0.0115	0.0000	35.8702

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	8.7000e-004	5.9000e-004	6.0400e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4861	1.4861	4.0000e-005	0.0000	1.4872
Total	8.7000e-004	5.9000e-004	6.0400e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6700e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.4861	1.4861	4.0000e-005	0.0000	1.4872

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3.3 Grading (Phase 1) - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3252	0.0000	0.3252	0.1788	0.0000	0.1788	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1265	1.3873	0.8061	1.5300e-003		0.0639	0.0639		0.0588	0.0588	0.0000	134.9143	134.9143	0.0436	0.0000	136.0052
Total	0.1265	1.3873	0.8061	1.5300e-003	0.3252	0.0639	0.3891	0.1788	0.0588	0.2375	0.0000	134.9143	134.9143	0.0436	0.0000	136.0052

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2800e-003	1.5500e-003	0.0158	4.0000e-005	4.3200e-003	3.0000e-005	4.3500e-003	1.1500e-003	3.0000e-005	1.1800e-003	0.0000	3.8768	3.8768	1.1000e-004	0.0000	3.8796
Total	2.2800e-003	1.5500e-003	0.0158	4.0000e-005	4.3200e-003	3.0000e-005	4.3500e-003	1.1500e-003	3.0000e-005	1.1800e-003	0.0000	3.8768	3.8768	1.1000e-004	0.0000	3.8796

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3.3 Grading (Phase 1) - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1463	0.0000	0.1463	0.0804	0.0000	0.0804	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1265	1.3873	0.8061	1.5300e-003		0.0639	0.0639		0.0588	0.0588	0.0000	134.9142	134.9142	0.0436	0.0000	136.0050
Total	0.1265	1.3873	0.8061	1.5300e-003	0.1463	0.0639	0.2102	0.0804	0.0588	0.1392	0.0000	134.9142	134.9142	0.0436	0.0000	136.0050

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2800e-003	1.5500e-003	0.0158	4.0000e-005	4.3200e-003	3.0000e-005	4.3500e-003	1.1500e-003	3.0000e-005	1.1800e-003	0.0000	3.8768	3.8768	1.1000e-004	0.0000	3.8796
Total	2.2800e-003	1.5500e-003	0.0158	4.0000e-005	4.3200e-003	3.0000e-005	4.3500e-003	1.1500e-003	3.0000e-005	1.1800e-003	0.0000	3.8768	3.8768	1.1000e-004	0.0000	3.8796

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3.4 Trenching (Phase 1) - 2020**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0623	0.7028	0.4474	8.7000e-004		0.0304	0.0304		0.0280	0.0280	0.0000	76.2780	76.2780	0.0247	0.0000	76.8948
Total	0.0623	0.7028	0.4474	8.7000e-004		0.0304	0.0304		0.0280	0.0280	0.0000	76.2780	76.2780	0.0247	0.0000	76.8948

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	1.1800e-003	8.0000e-004	8.1600e-003	2.0000e-005	2.2400e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	2.0102	2.0102	6.0000e-005	0.0000	2.0117
Total	1.1800e-003	8.0000e-004	8.1600e-003	2.0000e-005	2.2400e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	2.0102	2.0102	6.0000e-005	0.0000	2.0117

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3.4 Trenching (Phase 1) - 2020**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0623	0.7028	0.4474	8.7000e-004		0.0304	0.0304		0.0280	0.0280	0.0000	76.2779	76.2779	0.0247	0.0000	76.8947
Total	0.0623	0.7028	0.4474	8.7000e-004		0.0304	0.0304		0.0280	0.0280	0.0000	76.2779	76.2779	0.0247	0.0000	76.8947

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	1.1800e-003	8.0000e-004	8.1600e-003	2.0000e-005	2.2400e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	2.0102	2.0102	6.0000e-005	0.0000	2.0117
Total	1.1800e-003	8.0000e-004	8.1600e-003	2.0000e-005	2.2400e-003	2.0000e-005	2.2500e-003	5.9000e-004	1.0000e-005	6.1000e-004	0.0000	2.0102	2.0102	6.0000e-005	0.0000	2.0117

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3.4 Trenching (Phase 1) - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1299	1.4384	0.9572	1.9200e-003		0.0616	0.0616		0.0566	0.0566	0.0000	168.9344	168.9344	0.0546	0.0000	170.3004
Total	0.1299	1.4384	0.9572	1.9200e-003		0.0616	0.0616		0.0566	0.0566	0.0000	168.9344	168.9344	0.0546	0.0000	170.3004

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4100e-003	1.5800e-003	0.0164	5.0000e-005	4.9600e-003	3.0000e-005	4.9900e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.2964	4.2964	1.1000e-004	0.0000	4.2993
Total	2.4100e-003	1.5800e-003	0.0164	5.0000e-005	4.9600e-003	3.0000e-005	4.9900e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.2964	4.2964	1.1000e-004	0.0000	4.2993

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3.4 Trenching (Phase 1) - 2021**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1299	1.4384	0.9572	1.9200e-003		0.0616	0.0616		0.0566	0.0566	0.0000	168.9342	168.9342	0.0546	0.0000	170.3002
Total	0.1299	1.4384	0.9572	1.9200e-003		0.0616	0.0616		0.0566	0.0566	0.0000	168.9342	168.9342	0.0546	0.0000	170.3002

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.4100e-003	1.5800e-003	0.0164	5.0000e-005	4.9600e-003	3.0000e-005	4.9900e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.2964	4.2964	1.1000e-004	0.0000	4.2993
Total	2.4100e-003	1.5800e-003	0.0164	5.0000e-005	4.9600e-003	3.0000e-005	4.9900e-003	1.3200e-003	3.0000e-005	1.3500e-003	0.0000	4.2964	4.2964	1.1000e-004	0.0000	4.2993

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3.5 Building Construction (Phase 1) - 2021**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2386	2.1877	2.0802	3.3800e-003		0.1203	0.1203		0.1131	0.1131	0.0000	290.7048	290.7048	0.0701	0.0000	292.4581
Total	0.2386	2.1877	2.0802	3.3800e-003		0.1203	0.1203		0.1131	0.1131	0.0000	290.7048	290.7048	0.0701	0.0000	292.4581

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	0.0154	0.5258	0.0959	1.3400e-003	0.0316	1.4800e-003	0.0331	9.1300e-003	1.4200e-003	0.0106	0.0000	127.5761	127.5761	9.7400e-003	0.0000	127.8196
Worker	0.0635	0.0416	0.4315	1.2500e-003	0.1304	9.0000e-004	0.1313	0.0347	8.3000e-004	0.0355	0.0000	113.0587	113.0587	2.9900e-003	0.0000	113.1334
Total	0.0789	0.5675	0.5275	2.5900e-003	0.1620	2.3800e-003	0.1644	0.0438	2.2500e-003	0.0460	0.0000	240.6347	240.6347	0.0127	0.0000	240.9529

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3.5 Building Construction (Phase 1) - 2021**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2386	2.1877	2.0802	3.3800e-003		0.1203	0.1203		0.1131	0.1131	0.0000	290.7044	290.7044	0.0701	0.0000	292.4578
Total	0.2386	2.1877	2.0802	3.3800e-003		0.1203	0.1203		0.1131	0.1131	0.0000	290.7044	290.7044	0.0701	0.0000	292.4578

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	0.0154	0.5258	0.0959	1.3400e-003	0.0316	1.4800e-003	0.0331	9.1300e-003	1.4200e-003	0.0106	0.0000	127.5761	127.5761	9.7400e-003	0.0000	127.8196
Worker	0.0635	0.0416	0.4315	1.2500e-003	0.1304	9.0000e-004	0.1313	0.0347	8.3000e-004	0.0355	0.0000	113.0587	113.0587	2.9900e-003	0.0000	113.1334
Total	0.0789	0.5675	0.5275	2.5900e-003	0.1620	2.3800e-003	0.1644	0.0438	2.2500e-003	0.0460	0.0000	240.6347	240.6347	0.0127	0.0000	240.9529

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3.5 Building Construction (Phase 1) - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1442	1.3195	1.3827	2.2800e-003		0.0684	0.0684		0.0643	0.0643	0.0000	195.8078	195.8078	0.0469	0.0000	196.9806
Total	0.1442	1.3195	1.3827	2.2800e-003		0.0684	0.0684		0.0643	0.0643	0.0000	195.8078	195.8078	0.0469	0.0000	196.9806

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	9.6200e-003	0.3354	0.0596	9.0000e-004	0.0213	8.6000e-004	0.0222	6.1500e-003	8.3000e-004	6.9700e-003	0.0000	85.1001	85.1001	6.3200e-003	0.0000	85.2582
Worker	0.0396	0.0250	0.2648	8.1000e-004	0.0878	5.9000e-004	0.0884	0.0233	5.4000e-004	0.0239	0.0000	73.4028	73.4028	1.7900e-003	0.0000	73.4477
Total	0.0492	0.3604	0.3243	1.7100e-003	0.1091	1.4500e-003	0.1106	0.0295	1.3700e-003	0.0309	0.0000	158.5029	158.5029	8.1100e-003	0.0000	158.7059

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3.5 Building Construction (Phase 1) - 2022**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1442	1.3195	1.3827	2.2800e-003		0.0684	0.0684		0.0643	0.0643	0.0000	195.8076	195.8076	0.0469	0.0000	196.9804
Total	0.1442	1.3195	1.3827	2.2800e-003		0.0684	0.0684		0.0643	0.0643	0.0000	195.8076	195.8076	0.0469	0.0000	196.9804

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	9.6200e-003	0.3354	0.0596	9.0000e-004	0.0213	8.6000e-004	0.0222	6.1500e-003	8.3000e-004	6.9700e-003	0.0000	85.1001	85.1001	6.3200e-003	0.0000	85.2582
Worker	0.0396	0.0250	0.2648	8.1000e-004	0.0878	5.9000e-004	0.0884	0.0233	5.4000e-004	0.0239	0.0000	73.4028	73.4028	1.7900e-003	0.0000	73.4477
Total	0.0492	0.3604	0.3243	1.7100e-003	0.1091	1.4500e-003	0.1106	0.0295	1.3700e-003	0.0309	0.0000	158.5029	158.5029	8.1100e-003	0.0000	158.7059

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3.6 Paving (Phase 1) - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0132	0.1335	0.1750	2.7000e-004		6.8100e-003	6.8100e-003		6.2700e-003	6.2700e-003	0.0000	24.0331	24.0331	7.7700e-003	0.0000	24.2274
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0132	0.1335	0.1750	2.7000e-004		6.8100e-003	6.8100e-003		6.2700e-003	6.2700e-003	0.0000	24.0331	24.0331	7.7700e-003	0.0000	24.2274

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	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035
Total	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035

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3.6 Paving (Phase 1) - 2022**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0132	0.1335	0.1750	2.7000e-004		6.8100e-003	6.8100e-003		6.2700e-003	6.2700e-003	0.0000	24.0330	24.0330	7.7700e-003	0.0000	24.2274
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0132	0.1335	0.1750	2.7000e-004		6.8100e-003	6.8100e-003		6.2700e-003	6.2700e-003	0.0000	24.0330	24.0330	7.7700e-003	0.0000	24.2274

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	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035
Total	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035

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3.7 Architectural Coating (Phase 1) - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4500e-003	0.0169	0.0218	4.0000e-005		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	3.0639	3.0639	2.0000e-004	0.0000	3.0689
Total	6.0845	0.0169	0.0218	4.0000e-005		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	3.0639	3.0639	2.0000e-004	0.0000	3.0689

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	1.1300e-003	7.1000e-004	7.5200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0848	2.0848	5.0000e-005	0.0000	2.0861
Total	1.1300e-003	7.1000e-004	7.5200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0848	2.0848	5.0000e-005	0.0000	2.0861

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3.7 Architectural Coating (Phase 1) - 2022**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.4500e-003	0.0169	0.0218	4.0000e-005		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	3.0639	3.0639	2.0000e-004	0.0000	3.0689
Total	6.0845	0.0169	0.0218	4.0000e-005		9.8000e-004	9.8000e-004		9.8000e-004	9.8000e-004	0.0000	3.0639	3.0639	2.0000e-004	0.0000	3.0689

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	1.1300e-003	7.1000e-004	7.5200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0848	2.0848	5.0000e-005	0.0000	2.0861
Total	1.1300e-003	7.1000e-004	7.5200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	2.0000e-005	6.8000e-004	0.0000	2.0848	2.0848	5.0000e-005	0.0000	2.0861

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3.8 Site Preparation (Phase 2) - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1626	0.0000	0.1626	0.0894	0.0000	0.0894	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.2978	0.1773	3.4000e-004		0.0145	0.0145		0.0134	0.0134	0.0000	30.0955	30.0955	9.7300e-003	0.0000	30.3388
Total	0.0285	0.2978	0.1773	3.4000e-004	0.1626	0.0145	0.1771	0.0894	0.0134	0.1027	0.0000	30.0955	30.0955	9.7300e-003	0.0000	30.3388

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	5.8000e-004	3.7000e-004	3.9000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0825	1.0825	3.0000e-005	0.0000	1.0832
Total	5.8000e-004	3.7000e-004	3.9000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0825	1.0825	3.0000e-005	0.0000	1.0832

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3.8 Site Preparation (Phase 2) - 2022**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0732	0.0000	0.0732	0.0402	0.0000	0.0402	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0285	0.2978	0.1773	3.4000e-004		0.0145	0.0145		0.0134	0.0134	0.0000	30.0954	30.0954	9.7300e-003	0.0000	30.3388
Total	0.0285	0.2978	0.1773	3.4000e-004	0.0732	0.0145	0.0877	0.0402	0.0134	0.0536	0.0000	30.0954	30.0954	9.7300e-003	0.0000	30.3388

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	5.8000e-004	3.7000e-004	3.9000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0825	1.0825	3.0000e-005	0.0000	1.0832
Total	5.8000e-004	3.7000e-004	3.9000e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0825	1.0825	3.0000e-005	0.0000	1.0832

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3.9 Grading (Phase 2) - 2022**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0781	0.0000	0.0781	0.0324	0.0000	0.0324	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0326	0.3496	0.2614	5.6000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	49.0811	49.0811	0.0159	0.0000	49.4780
Total	0.0326	0.3496	0.2614	5.6000e-004	0.0781	0.0147	0.0928	0.0324	0.0135	0.0459	0.0000	49.0811	49.0811	0.0159	0.0000	49.4780

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	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035
Total	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035

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3.9 Grading (Phase 2) - 2022**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0351	0.0000	0.0351	0.0146	0.0000	0.0146	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0326	0.3496	0.2614	5.6000e-004		0.0147	0.0147		0.0135	0.0135	0.0000	49.0811	49.0811	0.0159	0.0000	49.4779
Total	0.0326	0.3496	0.2614	5.6000e-004	0.0351	0.0147	0.0498	0.0146	0.0135	0.0281	0.0000	49.0811	49.0811	0.0159	0.0000	49.4779

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	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035
Total	6.5000e-004	4.1000e-004	4.3400e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.2028	1.2028	3.0000e-005	0.0000	1.2035

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3.10 Trenching (Phase 2) - 2022

Unmitigated Construction Off-Site

[illegible]

Mitigated Construction Off-Site

[illegible]

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3.10 Trenching (Phase 2) - 2023

Unmitigated Construction Off-Site

[illegible]

Mitigated Construction Off-Site

[illegible]

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3.11 Building Construction (Phase 2) - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1793	1.6399	1.8518	3.0700e-003		0.0798	0.0798		0.0751	0.0751	0.0000	264.2574	264.2574	0.0629	0.0000	265.8290
Total	0.1793	1.6399	1.8518	3.0700e-003		0.0798	0.0798		0.0751	0.0751	0.0000	264.2574	264.2574	0.0629	0.0000	265.8290

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	9.0100e-003	0.3495	0.0664	1.1800e-003	0.0287	3.5000e-004	0.0291	8.3000e-003	3.3000e-004	8.6300e-003	0.0000	112.0185	112.0185	5.8600e-003	0.0000	112.1649
Worker	0.0497	0.0302	0.3254	1.0500e-003	0.1185	7.7000e-004	0.1193	0.0315	7.1000e-004	0.0322	0.0000	95.3356	95.3356	2.1600e-003	0.0000	95.3895
Total	0.0587	0.3797	0.3918	2.2300e-003	0.1472	1.1200e-003	0.1483	0.0398	1.0400e-003	0.0408	0.0000	207.3540	207.3540	8.0200e-003	0.0000	207.5544

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3.11 Building Construction (Phase 2) - 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	0.1793	1.6399	1.8518	3.0700e-003		0.0798	0.0798		0.0751	0.0751	0.0000	264.2571	264.2571	0.0629	0.0000	265.8287
Total	0.1793	1.6399	1.8518	3.0700e-003		0.0798	0.0798		0.0751	0.0751	0.0000	264.2571	264.2571	0.0629	0.0000	265.8287

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	9.0100e-003	0.3495	0.0664	1.1800e-003	0.0287	3.5000e-004	0.0291	8.3000e-003	3.3000e-004	8.6300e-003	0.0000	112.0185	112.0185	5.8600e-003	0.0000	112.1649
Worker	0.0497	0.0302	0.3254	1.0500e-003	0.1185	7.7000e-004	0.1193	0.0315	7.1000e-004	0.0322	0.0000	95.3356	95.3356	2.1600e-003	0.0000	95.3895
Total	0.0587	0.3797	0.3918	2.2300e-003	0.1472	1.1200e-003	0.1483	0.0398	1.0400e-003	0.0408	0.0000	207.3540	207.3540	8.0200e-003	0.0000	207.5544

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3.12 Paving (Phase 2) - 2023**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0124	0.1223	0.1750	2.7000e-004		6.1200e-003	6.1200e-003		5.6300e-003	5.6300e-003	0.0000	24.0322	24.0322	7.7700e-003	0.0000	24.2266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0124	0.1223	0.1750	2.7000e-004		6.1200e-003	6.1200e-003		5.6300e-003	5.6300e-003	0.0000	24.0322	24.0322	7.7700e-003	0.0000	24.2266

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	6.0000e-004	3.7000e-004	3.9500e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1579	1.1579	3.0000e-005	0.0000	1.1586
Total	6.0000e-004	3.7000e-004	3.9500e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1579	1.1579	3.0000e-005	0.0000	1.1586

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3.12 Paving (Phase 2) - 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	0.0124	0.1223	0.1750	2.7000e-004		6.1200e-003	6.1200e-003		5.6300e-003	5.6300e-003	0.0000	24.0322	24.0322	7.7700e-003	0.0000	24.2265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0124	0.1223	0.1750	2.7000e-004		6.1200e-003	6.1200e-003		5.6300e-003	5.6300e-003	0.0000	24.0322	24.0322	7.7700e-003	0.0000	24.2265

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	6.0000e-004	3.7000e-004	3.9500e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1579	1.1579	3.0000e-005	0.0000	1.1586
Total	6.0000e-004	3.7000e-004	3.9500e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.1579	1.1579	3.0000e-005	0.0000	1.1586

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3.13 Architectural Coating (Phase 2) - 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	3.0410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1500e-003	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342
Total	3.0422	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342

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	5.2000e-004	3.2000e-004	3.4300e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0035	1.0035	2.0000e-005	0.0000	1.0041
Total	5.2000e-004	3.2000e-004	3.4300e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0035	1.0035	2.0000e-005	0.0000	1.0041

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3.13 Architectural Coating (Phase 2) - 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	3.0410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1500e-003	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342
Total	3.0422	7.8200e-003	0.0109	2.0000e-005		4.2000e-004	4.2000e-004		4.2000e-004	4.2000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5342

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	5.2000e-004	3.2000e-004	3.4300e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0035	1.0035	2.0000e-005	0.0000	1.0041
Total	5.2000e-004	3.2000e-004	3.4300e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0035	1.0035	2.0000e-005	0.0000	1.0041

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3.13 Architectural Coating (Phase 2) - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	3.0410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0800e-003	7.3100e-003	0.0109	2.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5341
Total	3.0421	7.3100e-003	0.0109	2.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5341

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	4.9000e-004	2.9000e-004	3.1600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9654	0.9654	2.0000e-005	0.0000	0.9659
Total	4.9000e-004	2.9000e-004	3.1600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9654	0.9654	2.0000e-005	0.0000	0.9659

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3.13 Architectural Coating (Phase 2) - 2024**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	3.0410					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0800e-003	7.3100e-003	0.0109	2.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5341
Total	3.0421	7.3100e-003	0.0109	2.0000e-005		3.7000e-004	3.7000e-004		3.7000e-004	3.7000e-004	0.0000	1.5320	1.5320	9.0000e-005	0.0000	1.5341

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	4.9000e-004	2.9000e-004	3.1600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9654	0.9654	2.0000e-005	0.0000	0.9659
Total	4.9000e-004	2.9000e-004	3.1600e-003	1.0000e-005	1.2500e-003	1.0000e-005	1.2600e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	0.9654	0.9654	2.0000e-005	0.0000	0.9659

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3.14 Site Preparation (Phase 3) - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1626	0.0000	0.1626	0.0894	0.0000	0.0894	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0240	0.2446	0.1650	3.4000e-004		0.0111	0.0111		0.0102	0.0102	0.0000	30.1114	30.1114	9.7400e-003	0.0000	30.3548
Total	0.0240	0.2446	0.1650	3.4000e-004	0.1626	0.0111	0.1737	0.0894	0.0102	0.0996	0.0000	30.1114	30.1114	9.7400e-003	0.0000	30.3548

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	5.1000e-004	3.0000e-004	3.2800e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0025	1.0025	2.0000e-005	0.0000	1.0030
Total	5.1000e-004	3.0000e-004	3.2800e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0025	1.0025	2.0000e-005	0.0000	1.0030

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3.14 Site Preparation (Phase 3) - 2024**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0732	0.0000	0.0732	0.0402	0.0000	0.0402	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0240	0.2446	0.1650	3.4000e-004		0.0111	0.0111		0.0102	0.0102	0.0000	30.1113	30.1113	9.7400e-003	0.0000	30.3548
Total	0.0240	0.2446	0.1650	3.4000e-004	0.0732	0.0111	0.0842	0.0402	0.0102	0.0504	0.0000	30.1113	30.1113	9.7400e-003	0.0000	30.3548

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	5.1000e-004	3.0000e-004	3.2800e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0025	1.0025	2.0000e-005	0.0000	1.0030
Total	5.1000e-004	3.0000e-004	3.2800e-003	1.0000e-005	1.3000e-003	1.0000e-005	1.3000e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.0025	1.0025	2.0000e-005	0.0000	1.0030

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3.15 Grading (Phase 3) - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1561	0.0000	0.1561	0.0647	0.0000	0.0647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0579	0.5828	0.4990	1.1200e-003		0.0240	0.0240		0.0221	0.0221	0.0000	98.1351	98.1351	0.0317	0.0000	98.9286
Total	0.0579	0.5828	0.4990	1.1200e-003	0.1561	0.0240	0.1802	0.0647	0.0221	0.0869	0.0000	98.1351	98.1351	0.0317	0.0000	98.9286

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	1.1300e-003	6.6000e-004	7.2900e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.2278	2.2278	5.0000e-005	0.0000	2.2290
Total	1.1300e-003	6.6000e-004	7.2900e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.2278	2.2278	5.0000e-005	0.0000	2.2290

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3.15 Grading (Phase 3) - 2024**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0703	0.0000	0.0703	0.0291	0.0000	0.0291	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0579	0.5828	0.4990	1.1200e-003		0.0240	0.0240		0.0221	0.0221	0.0000	98.1350	98.1350	0.0317	0.0000	98.9285
Total	0.0579	0.5828	0.4990	1.1200e-003	0.0703	0.0240	0.0943	0.0291	0.0221	0.0512	0.0000	98.1350	98.1350	0.0317	0.0000	98.9285

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	1.1300e-003	6.6000e-004	7.2900e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.2278	2.2278	5.0000e-005	0.0000	2.2290
Total	1.1300e-003	6.6000e-004	7.2900e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.2278	2.2278	5.0000e-005	0.0000	2.2290

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3.16 Trenching (Phase 3) - 2024

Unmitigated Construction Off-Site

[illegible]

Mitigated Construction Off-Site

[illegible]

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3.17 Building Construction (Phase 3) - 2024**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1163	1.0621	1.2772	2.1300e-003		0.0485	0.0485		0.0456	0.0456	0.0000	183.1608	183.1608	0.0433	0.0000	184.2436
Total	0.1163	1.0621	1.2772	2.1300e-003		0.0485	0.0485		0.0456	0.0456	0.0000	183.1608	183.1608	0.0433	0.0000	184.2436

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	6.0500e-003	0.2402	0.0434	8.1000e-004	0.0199	2.4000e-004	0.0201	5.7500e-003	2.3000e-004	5.9800e-003	0.0000	77.0399	77.0399	4.1200e-003	0.0000	77.1428
Worker	0.0321	0.0188	0.2081	7.0000e-004	0.0821	5.2000e-004	0.0826	0.0218	4.8000e-004	0.0223	0.0000	63.5543	63.5543	1.3500e-003	0.0000	63.5880
Total	0.0382	0.2590	0.2515	1.5100e-003	0.1020	7.6000e-004	0.1028	0.0276	7.1000e-004	0.0283	0.0000	140.5943	140.5943	5.4700e-003	0.0000	140.7308

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3.17 Building Construction (Phase 3) - 2024**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1163	1.0621	1.2772	2.1300e-003		0.0485	0.0485		0.0456	0.0456	0.0000	183.1606	183.1606	0.0433	0.0000	184.2434
Total	0.1163	1.0621	1.2772	2.1300e-003		0.0485	0.0485		0.0456	0.0456	0.0000	183.1606	183.1606	0.0433	0.0000	184.2434

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	6.0500e-003	0.2402	0.0434	8.1000e-004	0.0199	2.4000e-004	0.0201	5.7500e-003	2.3000e-004	5.9800e-003	0.0000	77.0399	77.0399	4.1200e-003	0.0000	77.1428
Worker	0.0321	0.0188	0.2081	7.0000e-004	0.0821	5.2000e-004	0.0826	0.0218	4.8000e-004	0.0223	0.0000	63.5543	63.5543	1.3500e-003	0.0000	63.5880
Total	0.0382	0.2590	0.2515	1.5100e-003	0.1020	7.6000e-004	0.1028	0.0276	7.1000e-004	0.0283	0.0000	140.5943	140.5943	5.4700e-003	0.0000	140.7308

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3.17 Building Construction (Phase 3) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0479	0.4364	0.5630	9.4000e-004		0.0185	0.0185		0.0174	0.0174	0.0000	81.1718	81.1718	0.0191	0.0000	81.6488
Total	0.0479	0.4364	0.5630	9.4000e-004		0.0185	0.0185		0.0174	0.0174	0.0000	81.1718	81.1718	0.0191	0.0000	81.6488

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	2.6100e-003	0.1055	0.0183	3.6000e-004	8.8200e-003	1.0000e-004	8.9200e-003	2.5500e-003	1.0000e-004	2.6500e-003	0.0000	33.8907	33.8907	1.8500e-003	0.0000	33.9369
Worker	0.0134	7.5300e-003	0.0849	3.0000e-004	0.0364	2.3000e-004	0.0366	9.6700e-003	2.1000e-004	9.8800e-003	0.0000	27.0445	27.0445	5.4000e-004	0.0000	27.0579
Total	0.0160	0.1131	0.1032	6.6000e-004	0.0452	3.3000e-004	0.0455	0.0122	3.1000e-004	0.0125	0.0000	60.9352	60.9352	2.3900e-003	0.0000	60.9948

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3.17 Building Construction (Phase 3) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0479	0.4364	0.5630	9.4000e-004		0.0185	0.0185		0.0174	0.0174	0.0000	81.1717	81.1717	0.0191	0.0000	81.6487
Total	0.0479	0.4364	0.5630	9.4000e-004		0.0185	0.0185		0.0174	0.0174	0.0000	81.1717	81.1717	0.0191	0.0000	81.6487

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	2.6100e-003	0.1055	0.0183	3.6000e-004	8.8200e-003	1.0000e-004	8.9200e-003	2.5500e-003	1.0000e-004	2.6500e-003	0.0000	33.8907	33.8907	1.8500e-003	0.0000	33.9369
Worker	0.0134	7.5300e-003	0.0849	3.0000e-004	0.0364	2.3000e-004	0.0366	9.6700e-003	2.1000e-004	9.8800e-003	0.0000	27.0445	27.0445	5.4000e-004	0.0000	27.0579
Total	0.0160	0.1131	0.1032	6.6000e-004	0.0452	3.3000e-004	0.0455	0.0122	3.1000e-004	0.0125	0.0000	60.9352	60.9352	2.3900e-003	0.0000	60.9948

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3.18 Paving (Phase 3) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2174
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2174

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	5.3000e-004	3.0000e-004	3.3600e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0699	1.0699	2.0000e-005	0.0000	1.0704
Total	5.3000e-004	3.0000e-004	3.3600e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0699	1.0699	2.0000e-005	0.0000	1.0704

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3.18 Paving (Phase 3) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2173
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2173

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	5.3000e-004	3.0000e-004	3.3600e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0699	1.0699	2.0000e-005	0.0000	1.0704
Total	5.3000e-004	3.0000e-004	3.3600e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0699	1.0699	2.0000e-005	0.0000	1.0704

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3.19 Site Preparation (Phase 4) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.3252	0.0000	0.3252	0.1788	0.0000	0.1788	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0445	0.4542	0.3224	6.9000e-004		0.0196	0.0196		0.0180	0.0180	0.0000	60.2406	60.2406	0.0195	0.0000	60.7277
Total	0.0445	0.4542	0.3224	6.9000e-004	0.3252	0.0196	0.3448	0.1788	0.0180	0.1968	0.0000	60.2406	60.2406	0.0195	0.0000	60.7277

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	9.5000e-004	5.4000e-004	6.0400e-003	2.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	1.0000e-005	7.0000e-004	0.0000	1.9258	1.9258	4.0000e-005	0.0000	1.9268
Total	9.5000e-004	5.4000e-004	6.0400e-003	2.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	1.0000e-005	7.0000e-004	0.0000	1.9258	1.9258	4.0000e-005	0.0000	1.9268

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3.19 Site Preparation (Phase 4) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1463	0.0000	0.1463	0.0804	0.0000	0.0804	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0445	0.4542	0.3224	6.9000e-004		0.0196	0.0196		0.0180	0.0180	0.0000	60.2405	60.2405	0.0195	0.0000	60.7276
Total	0.0445	0.4542	0.3224	6.9000e-004	0.1463	0.0196	0.1659	0.0804	0.0180	0.0984	0.0000	60.2405	60.2405	0.0195	0.0000	60.7276

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	9.5000e-004	5.4000e-004	6.0400e-003	2.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	1.0000e-005	7.0000e-004	0.0000	1.9258	1.9258	4.0000e-005	0.0000	1.9268
Total	9.5000e-004	5.4000e-004	6.0400e-003	2.0000e-005	2.5900e-003	2.0000e-005	2.6100e-003	6.9000e-004	1.0000e-005	7.0000e-004	0.0000	1.9258	1.9258	4.0000e-005	0.0000	1.9268

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3.20 Architectural Coating (Phase 3) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681
Total	6.0841	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681

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	9.2000e-004	5.2000e-004	5.8200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.8545	1.8545	4.0000e-005	0.0000	1.8554
Total	9.2000e-004	5.2000e-004	5.8200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.8545	1.8545	4.0000e-005	0.0000	1.8554

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3.20 Architectural Coating (Phase 3) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681
Total	6.0841	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681

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	9.2000e-004	5.2000e-004	5.8200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.8545	1.8545	4.0000e-005	0.0000	1.8554
Total	9.2000e-004	5.2000e-004	5.8200e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.8545	1.8545	4.0000e-005	0.0000	1.8554

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3.21 Grading (Phase 4) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1561	0.0000	0.1561	0.0647	0.0000	0.0647	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0522	0.5030	0.4740	1.1200e-003		0.0204	0.0204		0.0187	0.0187	0.0000	98.1112	98.1112	0.0317	0.0000	98.9045
Total	0.0522	0.5030	0.4740	1.1200e-003	0.1561	0.0204	0.1765	0.0647	0.0187	0.0835	0.0000	98.1112	98.1112	0.0317	0.0000	98.9045

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	1.0600e-003	6.0000e-004	6.7200e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.1398	2.1398	4.0000e-005	0.0000	2.1408
Total	1.0600e-003	6.0000e-004	6.7200e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.1398	2.1398	4.0000e-005	0.0000	2.1408

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3.21 Grading (Phase 4) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0703	0.0000	0.0703	0.0291	0.0000	0.0291	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0522	0.5030	0.4740	1.1200e-003		0.0204	0.0204		0.0187	0.0187	0.0000	98.1111	98.1111	0.0317	0.0000	98.9043
Total	0.0522	0.5030	0.4740	1.1200e-003	0.0703	0.0204	0.0906	0.0291	0.0187	0.0479	0.0000	98.1111	98.1111	0.0317	0.0000	98.9043

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	1.0600e-003	6.0000e-004	6.7200e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.1398	2.1398	4.0000e-005	0.0000	2.1408
Total	1.0600e-003	6.0000e-004	6.7200e-003	2.0000e-005	2.8800e-003	2.0000e-005	2.9000e-003	7.6000e-004	2.0000e-005	7.8000e-004	0.0000	2.1398	2.1398	4.0000e-005	0.0000	2.1408

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3.22 Trenching (Phase 4) - 2025

Unmitigated Construction Off-Site

[illegible]

Mitigated Construction Off-Site

[illegible]

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3.23 Building Construction (Phase 4) - 2025**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.4302	0.5549	9.3000e-004		0.0182	0.0182		0.0171	0.0171	0.0000	80.0122	80.0122	0.0188	0.0000	80.4824
Total	0.0472	0.4302	0.5549	9.3000e-004		0.0182	0.0182		0.0171	0.0171	0.0000	80.0122	80.0122	0.0188	0.0000	80.4824

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	2.5700e-003	0.1040	0.0180	3.5000e-004	8.6900e-003	1.0000e-004	8.7900e-003	2.5100e-003	1.0000e-004	2.6100e-003	0.0000	33.4066	33.4066	1.8200e-003	0.0000	33.4521
Worker	0.0132	7.4200e-003	0.0837	2.9000e-004	0.0359	2.2000e-004	0.0361	9.5300e-003	2.0000e-004	9.7400e-003	0.0000	26.6581	26.6581	5.3000e-004	0.0000	26.6714
Total	0.0157	0.1115	0.1017	6.4000e-004	0.0446	3.2000e-004	0.0449	0.0120	3.0000e-004	0.0124	0.0000	60.0647	60.0647	2.3500e-003	0.0000	60.1235

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3.23 Building Construction (Phase 4) - 2025**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0472	0.4302	0.5549	9.3000e-004		0.0182	0.0182		0.0171	0.0171	0.0000	80.0121	80.0121	0.0188	0.0000	80.4823
Total	0.0472	0.4302	0.5549	9.3000e-004		0.0182	0.0182		0.0171	0.0171	0.0000	80.0121	80.0121	0.0188	0.0000	80.4823

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	2.5700e-003	0.1040	0.0180	3.5000e-004	8.6900e-003	1.0000e-004	8.7900e-003	2.5100e-003	1.0000e-004	2.6100e-003	0.0000	33.4066	33.4066	1.8200e-003	0.0000	33.4521
Worker	0.0132	7.4200e-003	0.0837	2.9000e-004	0.0359	2.2000e-004	0.0361	9.5300e-003	2.0000e-004	9.7400e-003	0.0000	26.6581	26.6581	5.3000e-004	0.0000	26.6714
Total	0.0157	0.1115	0.1017	6.4000e-004	0.0446	3.2000e-004	0.0449	0.0120	3.0000e-004	0.0124	0.0000	60.0647	60.0647	2.3500e-003	0.0000	60.1235

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3.23 Building Construction (Phase 4) - 2026**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335
Total	0.1785	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6549	302.6549	0.0711	0.0000	304.4335

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	9.5100e-003	0.3901	0.0655	1.3200e-003	0.0329	3.8000e-004	0.0333	9.5000e-003	3.7000e-004	9.8600e-003	0.0000	125.5591	125.5591	7.0000e-003	0.0000	125.7341
Worker	0.0470	0.0256	0.2951	1.0800e-003	0.1356	8.2000e-004	0.1365	0.0361	7.6000e-004	0.0368	0.0000	97.3108	97.3108	1.8300e-003	0.0000	97.3564
Total	0.0565	0.4157	0.3606	2.4000e-003	0.1685	1.2000e-003	0.1697	0.0456	1.1300e-003	0.0467	0.0000	222.8699	222.8699	8.8300e-003	0.0000	223.0905

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3.23 Building Construction (Phase 4) - 2026**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331
Total	0.1784	1.6273	2.0991	3.5200e-003		0.0689	0.0689		0.0648	0.0648	0.0000	302.6545	302.6545	0.0711	0.0000	304.4331

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	9.5100e-003	0.3901	0.0655	1.3200e-003	0.0329	3.8000e-004	0.0333	9.5000e-003	3.7000e-004	9.8600e-003	0.0000	125.5591	125.5591	7.0000e-003	0.0000	125.7341
Worker	0.0470	0.0256	0.2951	1.0800e-003	0.1356	8.2000e-004	0.1365	0.0361	7.6000e-004	0.0368	0.0000	97.3108	97.3108	1.8300e-003	0.0000	97.3564
Total	0.0565	0.4157	0.3606	2.4000e-003	0.1685	1.2000e-003	0.1697	0.0456	1.1300e-003	0.0467	0.0000	222.8699	222.8699	8.8300e-003	0.0000	223.0905

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3.24 Paving (Phase 4) - 2026**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2174
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2174

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	5.0000e-004	2.7000e-004	3.1300e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0325	1.0325	2.0000e-005	0.0000	1.0330
Total	5.0000e-004	2.7000e-004	3.1300e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0325	1.0325	2.0000e-005	0.0000	1.0330

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3.24 Paving (Phase 4) - 2026**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2173
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0110	0.1030	0.1749	2.7000e-004		5.0200e-003	5.0200e-003		4.6200e-003	4.6200e-003	0.0000	24.0231	24.0231	7.7700e-003	0.0000	24.2173

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	5.0000e-004	2.7000e-004	3.1300e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0325	1.0325	2.0000e-005	0.0000	1.0330
Total	5.0000e-004	2.7000e-004	3.1300e-003	1.0000e-005	1.4400e-003	1.0000e-005	1.4500e-003	3.8000e-004	1.0000e-005	3.9000e-004	0.0000	1.0325	1.0325	2.0000e-005	0.0000	1.0330

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3.25 Architectural Coating (Phase 4) - 2026**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681
Total	6.0841	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681

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	8.6000e-004	4.7000e-004	5.4300e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.7896	1.7896	3.0000e-005	0.0000	1.7905
Total	8.6000e-004	4.7000e-004	5.4300e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.7896	1.7896	3.0000e-005	0.0000	1.7905

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3.25 Architectural Coating (Phase 4) - 2026**Mitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	6.0821					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.0500e-003	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681
Total	6.0841	0.0138	0.0217	4.0000e-005		6.2000e-004	6.2000e-004		6.2000e-004	6.2000e-004	0.0000	3.0639	3.0639	1.7000e-004	0.0000	3.0681

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	8.6000e-004	4.7000e-004	5.4300e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.7896	1.7896	3.0000e-005	0.0000	1.7905
Total	8.6000e-004	4.7000e-004	5.4300e-003	2.0000e-005	2.4900e-003	2.0000e-005	2.5100e-003	6.6000e-004	1.0000e-005	6.8000e-004	0.0000	1.7896	1.7896	3.0000e-005	0.0000	1.7905

4.0 Operational Detail - Mobile

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4.1 Mitigation Measures Mobile

Improve Walkability Design

Improve Pedestrian Network

	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	0.8965	9.4529	9.7430	0.0590	4.1014	0.0340	4.1354	1.1021	0.0319	1.1340	0.0000	5,489.5149	5,489.5149	0.2752	0.0000	5,496.3951
Unmitigated	0.8603	9.1316	9.0225	0.0543	3.7211	0.0312	3.7522	0.9999	0.0292	1.0291	0.0000	5,055.7599	5,055.7599	0.2667	0.0000	5,062.4272

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	3,398.40	3,538.80	3074.40	9,771,935	10,770,627
Total	3,398.40	3,538.80	3,074.40	9,771,935	10,770,627

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	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
Single Family Housing	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3

4.4 Fleet Mix

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Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.531109	0.030194	0.174770	0.103830	0.013675	0.004237	0.020761	0.111832	0.001761	0.001377	0.004961	0.000902	0.000590

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	985.7706	985.7706	0.0407	8.4200e-003	989.2972
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	985.7706	985.7706	0.0407	8.4200e-003	989.2972
NaturalGas Mitigated	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072
NaturalGas Unmitigated	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072

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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					
Single Family Housing	9.26413e+006	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072
Total		0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072

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					
Single Family Housing	9.26413e+006	0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072
Total		0.0500	0.4269	0.1817	2.7200e-003		0.0345	0.0345		0.0345	0.0345	0.0000	494.3694	494.3694	9.4800e-003	9.0600e-003	497.3072

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5.3 Energy by Land Use - Electricity**Unmitigated**

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	3.09386e+006	985.7706	0.0407	8.4200e-003	989.2972
Total		985.7706	0.0407	8.4200e-003	989.2972

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	3.09386e+006	985.7706	0.0407	8.4200e-003	989.2972
Total		985.7706	0.0407	8.4200e-003	989.2972

6.0 Area Detail**6.1 Mitigation Measures Area**

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Use only Natural Gas Hearths

	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	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523
Unmitigated	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5308					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0158	0.1347	0.0573	8.6000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	155.9547	155.9547	2.9900e-003	2.8600e-003	156.8814
Landscaping	0.0802	0.0308	2.6705	1.4000e-004		0.0148	0.0148		0.0148	0.0148	0.0000	4.3664	4.3664	4.1800e-003	0.0000	4.4709
Total	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523

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6.2 Area by SubCategory**Mitigated**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.6082					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	2.5308					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0158	0.1347	0.0573	8.6000e-004		0.0109	0.0109		0.0109	0.0109	0.0000	155.9547	155.9547	2.9900e-003	2.8600e-003	156.8814
Landscaping	0.0802	0.0308	2.6705	1.4000e-004		0.0148	0.0148		0.0148	0.0148	0.0000	4.3664	4.3664	4.1800e-003	0.0000	4.4709
Total	3.2349	0.1654	2.7278	1.0000e-003		0.0257	0.0257		0.0257	0.0257	0.0000	160.3210	160.3210	7.1700e-003	2.8600e-003	161.3523

7.0 Water Detail**7.1 Mitigation Measures Water**

Use Water Efficient Irrigation System

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	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	63.3643	0.7666	0.0185	88.0497
Unmitigated	64.3702	0.7667	0.0185	89.0592

7.2 Water by Land Use**Unmitigated**

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	23.4554 / 14.7871	64.3702	0.7667	0.0185	89.0592
Total		64.3702	0.7667	0.0185	89.0592

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7.2 Water by Land Use**Mitigated**

	Indoor/Outdoor Use	Total CO ₂	CH ₄	N ₂ O	CO ₂ e
Land Use	Mgal	MT/yr			
Single Family Housing	23.4554 / 13.8851	63.3643	0.7666	0.0185	88.0497
Total		63.3643	0.7666	0.0185	88.0497

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	43.6106	2.5773	0.0000	108.0434
Unmitigated	87.2212	5.1546	0.0000	216.0867

8.2 Waste by Land Use**Unmitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	429.68	87.2212	5.1546	0.0000	216.0867
Total		87.2212	5.1546	0.0000	216.0867

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8.2 Waste by Land Use**Mitigated**

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	214.84	43.6106	2.5773	0.0000	108.0434
Total		43.6106	2.5773	0.0000	108.0434

9.0 Operational Offroad

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

10.0 Stationary Equipment**Fire Pumps and Emergency Generators**

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Appendix B
Traffic Impact Analysis for the
Farrar Subdivision Project

Revised Traffic Impact Analysis

Farrar Estates

Located on the Northwest Corner of
Morrison Street and Tulare Avenue

In the City of Tulare, California

Prepared for:

Land Design Consulting
4950 E. Yale Ave.
Fresno, CA 93727

November 4, 2019

Project No. 037-004



Traffic Engineering, Transportation Planning, & Parking Solutions

516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

Phone: (559) 570-8991

www.JLBtraffic.com



Traffic Engineering, Transportation Planning, & Parking Solutions

Revised Traffic Impact Analysis

**For Farrar Estates located on the Northwest Corner of Morrison Street and
Tulare Avenue**

In the City of Tulare, CA

November 4, 2019

This Revised Traffic Impact Analysis has been prepared under the direction of a licensed Traffic Engineer. The licensed Traffic Engineer attests to the technical information contained therein and has judged the qualifications of any technical specialists providing engineering data from which recommendations, conclusions, and decisions are based.

Prepared by:

A handwritten signature in black ink, reading "Jose L Benavides", is written over a light blue horizontal line.

Jose Luis Benavides, PE, TE

President



Traffic Engineering, Transportation Planning, & Parking Solutions

516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

Phone: (559) 570-8991

www.JLBtraffic.com

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Introduction and Summary

Introduction

This report describes a Revised Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Farrar Estates (Project) located on the northwest corner of Morrison Street and Tulare Avenue in the City of Tulare. The Project proposes to develop 76.5 acres with 360 single-family residential units. The TIA has been revised to a) include analysis for each proposed phase of the Project, b) assume removal of the raised median worm at the intersection of Mooney Boulevard and Seminole Avenue, and c) adjust analysis of the Near Term scenario. The Project proposes to be constructed in four (4) phases. Development of the phases will begin along the north side of Tulare Avenue and continue north until reaching Seminole Avenue. Phase I will develop 99 units estimated to be completed by September 2022, Phase II will develop 117 units estimated to be completed by January 2024, Phase III will develop 82 units estimated to be completed by May 2025, and Phase IV will develop the remaining 62 units estimated to be completed by December 2026. Additional details regarding the proposed phased construction of the Project are illustrated in the Project Site Plan presented in Figure 3. Per City of Tulare staff instruction, the TIA has also been revised to assume that the raised median worm currently placed along the center of Mooney Boulevard at Seminole Avenue will be removed allowing for left-turn movements from Seminole Avenue onto Mooney Boulevard. Finally, given that the Near Term scenario is assumed to take place two (2) years after completion of all phases of the proposed Project, analysis of the Near Term scenario is assumed to take place by year 2028. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. Figure 1 shows the location of the proposed Project site relative to the surrounding roadway network.

The purpose of this TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. The Scope of Work was prepared via consultation with City of Tulare, County of Tulare and Caltrans staff.

Summary

The potential traffic impacts of the proposed Project were evaluated in accordance with the standards set forth by the Level of Service (LOS) policy of the City of Tulare, County of Tulare and Caltrans.

Existing Traffic Conditions

- At present, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the City of Tulare in conjunction with Caltrans complete the following improvements.
 - Mooney Boulevard / Cross Avenue. Based on discussions with City of Tulare staff, the City will be programming the necessary improvements to this intersection as part of a City Capital Improvement Project.
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Existing plus Project (Phase I) Traffic Conditions

- JLB analyzed the location of the proposed access point to be constructed under Phase I relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access point to be constructed under Phase I indicates that it is located at a point that minimizes traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project under Phase I is estimated to generate a maximum of 935 daily trips, 73 AM peak hour trips and 98 PM peak hour trips.
- Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during both peak periods. To improve the LOS of these intersections, it is recommended that the improvement measures presented in the Existing Traffic Conditions scenario be implemented.

Existing plus Project (Phase I & II) Traffic Conditions

- JLB analyzed the location of the proposed access points to be constructed under Phase I and II relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I and II indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project under Phase I and II is estimated to generate a maximum of 2,039 daily trips, 160 AM peak hour trips and 214 PM peak hour trips.

- Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.
 - Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Existing plus Project (Phase I, II & III) Traffic Conditions

- JLB analyzed the location of the proposed access points to be constructed under Phase I, II and III relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I, II and III indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project under Phase I, II and III is estimated to generate a maximum of 2,813 daily trips, 221 AM peak hour trips and 295 PM peak hour trips.
- Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.
 - Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Existing plus Project (Buildout) Traffic Conditions

- JLB analyzed the location of the proposed access points relative to the existing local roads and driveways in the Project's vicinity. A review of the Project access points to be constructed indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.
- At buildout, the proposed Project is estimated to generate a maximum of 3,398 daily trips, 266 AM peak hour trips and 356 PM peak hour trips.
- It is recommended that the Project implement Class II Bike Lanes along its frontages to Seminole Avenue, Morrison Street and Tulare Avenue.
- It is recommended that the Project implement walkways that are ADA compliant along its frontages to Seminole Avenue, Morrison Street and Tulare Avenue.
- Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.
 - Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.
- Planning Recommendations to the City (non-Project mitigations)
 - To promote alternative modes of transportation to Live Oak Middle School, it is recommended that the Tulare City School District work with the City of Tulare to implement a Safe Routes to School Plan and to seek grant funding to help build walkways where they are lacking within a 1.00-mile radius of the existing school site.
 - To promote alternative modes of transportation to Tulare Union High School, it is recommended that the Tulare Joint Union High School District work with the City of Tulare to implement a Safe Routes to School Plan and to seek grant funding to help build walkways where they are lacking within a 2.00-mile radius of the existing school site.

Near Term plus Project (Buildout) Traffic Conditions

- The total trip generation for the Near Term Projects is 60,218 daily trips, 3,087 AM peak hour trips and 5,835 PM peak hour trips.
- Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.
 - Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Cumulative Year 2035 No Project Traffic Conditions

- Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.
 - Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

- Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.
 - Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
 - Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
 - Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

Scope of Work

The TIA primarily focused on evaluating traffic conditions at study intersections that may potentially be impacted by the proposed Project. On June 17, 2019, a Draft Scope of Work for the preparation of a Traffic Impact Analysis for this Project was provided to the City of Tulare, County of Tulare and Caltrans for their review and comment. Any comments to the Draft Scope of Work were to be provided by July 8, 2019.

On June 28, 2019, Caltrans responded to the Draft Scope of Work. Caltrans requested that the intersections of State Route 63 and Cross Avenue and State Route 63 and State Route 137 be included in the analysis. On July 10, 2019, the County of Tulare responded and approved the Draft Scope of Work as presented. JLB contacted the City of Tulare on July 10th and 12th and but did not hear back from the City. It is very likely that the City did not provide comments to the original proposed scope of work because they had previously provided the project applicant with detailed comments as to what should be included in the TIA. However, on October 25, 2019 the City of Tulare provided comments requesting that the TIA include analysis for each proposed phase of the Project. Other comments provided in the City are addressed by the Revised TIA.

Based on the comments received, this TIA includes the analysis of the additional intersections requested by Caltrans and the City of Tulare during the initial Draft Scope of Work review. Furthermore, the Revised TIA includes analysis for each proposed phase of the Project, assumes removal of the raised median worm at the intersection of Mooney Boulevard and Seminole Avenue, adjusts analysis of the Near Term scenario, and addresses the comments received from the City of Tulare on October 25, 2019. The Draft Scope of Work and the comments received from the lead agency and responsible agencies are included in Appendix A.

Study Facilities

The existing peak hour turning movement volume counts were conducted at the study intersections in June 2019 and August 2019, while schools in the vicinity of the proposed Project were in session. The intersection turning movement counts included pedestrian volumes. The traffic counts for the existing study intersections are contained in Appendix B. The existing intersection turning movement volumes, intersection geometrics and traffic controls are illustrated in Figure 2.

Study Intersections

1. Mooney Boulevard (State Route 63) / Prosperity Avenue
2. Morrison Street / Prosperity Avenue
3. Mooney Boulevard (State Route 63) / Cross Avenue
4. Mooney Boulevard (State Route 63) / Seminole Avenue
5. Morrison Street / Seminole Avenue
6. Mooney Boulevard (State Route 63) / Tulare Avenue
7. Morrison Street / Tulare Avenue (State Route 137)

Study Scenarios

Existing Traffic Conditions

This scenario evaluates the Existing Traffic Conditions based on existing traffic volumes and roadway conditions from traffic counts and field surveys conducted in June 2019 and August 2019.

Existing plus Project (Phase I) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project (Phase I) Traffic Conditions. Phase I will develop 99 units estimated to be completed by September 2022. The Existing plus Project (Phase I) traffic volumes were obtained by adding the Project Only Trips under Phase I to the Existing Traffic Conditions scenario. The Project Only Trips under Phase I to the study facilities were developed based on existing travel patterns, the Tulare County Association of Governments (TCAG) Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase I, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. It is worth noting that this scenario assumes that the raised median worm currently placed along the center of Mooney Boulevard at Seminole Avenue will be removed allowing for left-turn movements from Seminole Avenue onto Mooney Boulevard.

Existing plus Project (Phase I & II) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project (Phase I & II) Traffic Conditions. Phase II will develop 117 units estimated to be completed by January 2024. The Existing plus Project (Phase I & II) traffic volumes were obtained by adding the Project Only Trips under Phase II to the Existing plus Project (Phase I) Traffic Conditions scenario. The Project Only Trips under Phase II to the study facilities were developed based on existing travel patterns, the Tulare County Association of Governments (TCAG) Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase II, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project.

Existing plus Project (Phase I, II & III) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project (Phase I, II & III) Traffic Conditions. Phase III will develop 82 units estimated to be completed by May 2025. The Existing plus Project (Phase I, II & III) traffic volumes were obtained by adding the Project Only Trips under Phase III to the Existing plus Project (Phase I & II) Traffic Conditions scenario. The Project Only Trips under Phase III to the study facilities were developed based on existing travel patterns, the Tulare County Association of Governments (TCAG) Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase III, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project.

Existing plus Project (Buildout) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project (Buildout) Traffic Conditions. The Existing plus Project (Buildout) traffic volumes were obtained by adding the Project Only Trips under Phase IV to the Existing plus Project (Phase I, II & III) Traffic Conditions scenario. Phase IV will develop the remaining 62 units estimated to be completed by December 2026. The Project Only Trips under Phase IV to the study facilities were developed based on existing travel patterns, the Tulare County Association of Governments (TCAG) Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase IV, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. The TCAG Models for the Project Select Zone are contained in Appendix C.

Near Term plus Project (Buildout) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project (Buildout) Traffic Conditions. The Near Term plus Project (Buildout) traffic volumes were obtained by adding the Near Term related trips to the Existing plus Project (Buildout) Traffic Conditions scenario. The Near Term scenario is assumed to take place approximately two (2) years after completion of all phases of the proposed Project. Therefore, analysis of the Near Term scenario is assumed to take place by year 2028.

Cumulative Year 2035 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 No Project Traffic Conditions. The Cumulative Year 2035 No Project traffic volumes were obtained by subtracting the Project Only Trips under Buildout from the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions scenario.

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions. The Cumulative Year 2035 plus Project (Buildout) traffic volumes were obtained from the TCAG traffic model runs (Base Year 2019 and Cumulative Year 2035) and existing traffic counts. For those locations where the TCAG model showed little to no growth, JLB expanded the existing traffic volumes by a minimum average annual growth rate. Based on a review of the Annual Average Daily Traffic (AADT) volumes obtained from Caltrans, the 20-year average annual growth rate of State Route 63 (Mooney Boulevard) and State Route 137 (Tulare Avenue) was determined to be 1.26 percent and 1.18 percent, respectively. Thus, JLB utilized an average annual growth rate of 1.26 percent to expand the existing traffic volumes by 16 years for intersections along State Route 63 and an average annual growth rate of 1.18 percent to expand the existing traffic volumes by 16 years for intersections along Tulare Avenue. For intersections not along either of the State Routes, the 1.18 percent average annual growth rate was utilized. Under this scenario, the higher of the increment method and the expansion of the existing traffic counts by an average annual growth rate of 1.26 or 1.18 percent was utilized to determine the Cumulative Year 2035 traffic volumes. Finally, JLB added the Project Only Trips under Buildout to the expanded existing traffic volumes to arrive at the Cumulative Year 2035 plus Project (Buildout) traffic volumes.

Level of Service Analysis Methodology

Level of Service (LOS) is a qualitative index of the performance of an element of the transportation system. LOS is a rating scale running from “A” to “F”, with “A” indicating no congestion of any kind and “F” indicating unacceptable congestion and delays. LOS in this study describes the operating conditions for signalized and unsignalized intersections.

The *Highway Capacity Manual* (HCM) 6th Edition is the standard reference published by the Transportation Research Board and contains the specific criteria and methods to be used in assessing LOS. U-turn movements were analyzed using HCM 2000 methodologies and would yield more accurate results for the reason that HCM 6th Edition methodologies do not allow the analysis of U-turns. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix D.

Criteria of Significance

The City of Tulare 2035 General Plan Circulation Element has established LOS D as the acceptable level of traffic congestion on most major streets. Therefore, the LOS D threshold was utilized to evaluate the potential significance of LOS impacts to City of Tulare roadway facilities.

The County of Tulare has established LOS D as the acceptable level of traffic congestion on county roads. Therefore, LOS D is used to evaluate the potential significance of LOS impacts to Tulare County intersections. In this case, since the LOS threshold for the City and County is the same, LOS D was utilized as the criteria of significance for this TIA.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and D on State highway facilities consistent with the *Caltrans Guide for the Preparation of Traffic Impact Studies* dated December 2002. However, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. The State Route 63 Transportation Concept Report has established LOS D as the concept LOS for State Route 63 within the City of Tulare. The State Route 137 Transportation Concept Report has established LOS D as the concept LOS for State Route 137 within the City of Tulare. In this TIA, study facilities within Caltrans' jurisdiction utilize LOS D threshold as the criteria of significance.

Operational Analysis Assumptions and Defaults

The following operational analysis values, assumptions and defaults were used in this study to ensure a consistent analysis of LOS among the various scenarios.

- Yellow time of 3.2 seconds for left-turn phases
- Yellow time consistent with the California Manual of Uniform Traffic Control Devices (CA MUTCD) based on approach speeds
- All-red clearance intervals of 1.0 second for all phases
- Walk intervals of 7.0 seconds consistent with the CA MUTCD
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- At signalized intersections, the average delays reported assume that all pedestrian phases are actuated in each cycle
- All new or modified signals utilize protective left-turn phasing
- Heavy vehicle factors are based on observations for each intersection
- At existing intersections, the observed approach Peak Hour Factor (PHF) is utilized in the Existing, Existing plus Project and Near Term plus Project scenarios
- A PHF of 0.88, or the Existing PHF if higher, is utilized for all study intersections in the Near Term plus Project (Buildout) scenario
- A PHF of 0.92, or the Existing PHF if higher, is utilized for all study intersections in the Cumulative Year 2035 scenarios

Existing Traffic Conditions

Roadway Network

The Project site and surrounding study area are illustrated in Figure 1. Important roadways serving the Project are discussed below.

Mooney Boulevard (State Route 63) is an existing north-south four-lane divided major arterial in the vicinity of the proposed Project site. In this area, Mooney Boulevard is a four-lane divided major arterial between Oakdale Avenue and Tulare Avenue, a four-lane undivided major arterial between Tulare Avenue and Bardsley Avenue, and a two-lane undivided major arterial south of Bardsley Avenue. The City of Tulare 2035 General Plan Transportation and Circulation Element designates Mooney Boulevard as a major arterial through the City limits. The Transportation Concept Report for State Route 63 designates the segment of State Route 63 between Tulare Avenue and Oakdale Avenue as a six-lane conventional highway.

Prosperity Avenue is an existing two-lane undivided major arterial in the vicinity of the proposed Project site. In this area, Prosperity Avenue is predominantly a two-lane undivided arterial between Enterprise Street (Road 84) and "M" Street, a four-lane arterial divided by a two-way left-turn lane between "M" Street and Blackstone Street, a six-lane divided major arterial between Blackstone Street and Laspina Street, a five-lane divided major arterial between Laspina Street and Mooney Boulevard, and a two-lane undivided arterial between Mooney Boulevard and Morrison Street (Road 120). The City of Tulare 2035 General Plan Transportation and Circulation Element designates Prosperity Avenue as a major arterial between Enterprise Street and Blackstone Street, an arterial between Blackstone Street and Mooney Boulevard, and an arterial between Mooney Boulevard and Morrison Street.

Morrison Street (Road 120) is an existing north-south two-lane undivided collector adjacent to the proposed Project site. In this area, Morrison Street is a two-lane undivided collector between Prosperity Avenue and Bardsley Avenue, and a two-lane local street south of Bardsley Avenue. The City of Tulare 2035 General Plan Transportation and Circulation Element designates Morrison Street as a two-lane undivided collector between Cartmill Avenue and Bardsley Avenue.

Cross Avenue is an existing east-west two-lane undivided arterial in the vicinity of the proposed Project site. In this area, Cross Avenue is a two-lane undivided arterial between Enterprise Street and "B" Street, a two-lane arterial divided by a two-way left-turn lane between "B" Street and "J" Street, a four-lane arterial divided by a two-way left-turn lane between "J" Street and "M" Street, a two-lane arterial divided by a two-way left-turn lane between "M" Street and Cherry Street, a two-lane undivided arterial between Cherry Street and Laspina Street, and a two-lane arterial divided by a two-way left-turn lane between Laspina Street and Mooney Boulevard. The City of Tulare 2035 General Plan Transportation and Circulation Element designates Cross Avenue as a two-lane arterial through the City limits.

Seminole Avenue is an existing east-west two-lane undivided local street in the vicinity of the proposed Project site. In this area, Seminole Avenue currently exists between Mooney Boulevard and Spyglass Street. The City of Tulare 2035 General Plan Transportation and Circulation Element designates Seminole Avenue as a two-lane local roadway between Mooney Boulevard and Morrison Street.

Tulare Avenue (State Route 137) is an existing east-west two-lane highway adjacent to the proposed Project site. In this area, Tulare Avenue is a two-lane undivided collector between Cross Avenue and “J” Street, a four-lane undivided arterial between “J” Street and Blackstone Street, a four-lane undivided major arterial between Blackstone Street and Mooney Boulevard, and a two-lane undivided major arterial between Mooney Boulevard and Road 132. The City of Tulare 2035 General Plan Transportation and Circulation Element designates Tulare Avenue as a collector between Cross Avenue and “J” Street, an arterial between “J” Street and Blackstone Street, and a major arterial between Blackstone Street and Road 132. The Transportation Concept Report for State Route 137 designates State Route 137 as a four-lane conventional highway.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue satisfy the peak hour signal warrant during both peak periods. Based on the signal warrants and engineering judgement, signalization of these intersections is recommended.

Results of Existing Level of Service Analysis

Figure 2 illustrates the Existing Traffic Conditions turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing Traffic Conditions scenario are provided in Appendix E. Table I presents a summary of the Existing peak hour LOS at the study intersections.

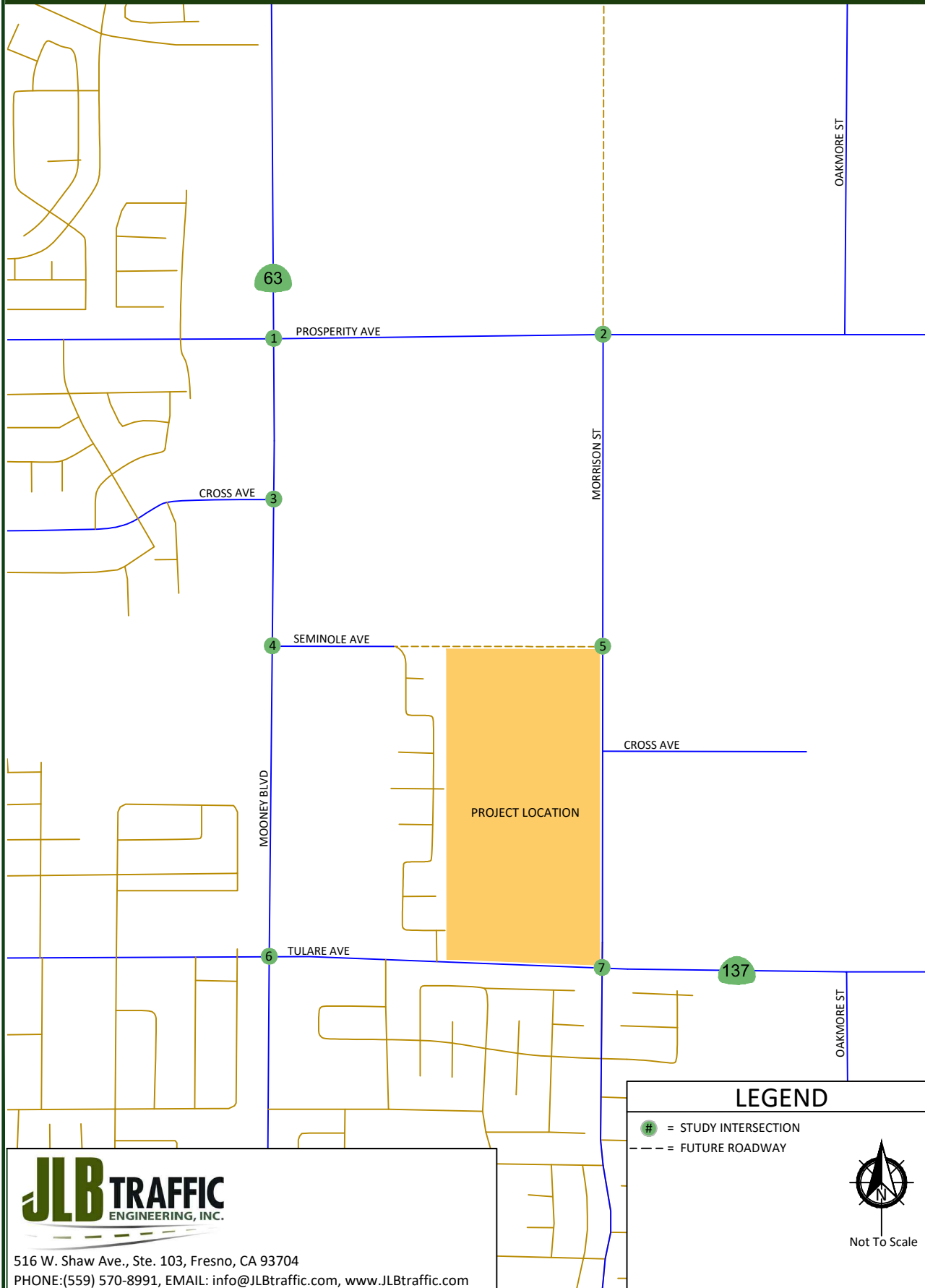
At present, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the City of Tulare in conjunction with Caltrans complete the following improvements. Once these improvements are made to alleviate the existing unacceptable LOS of these intersections, traffic from the Project is not anticipated to reduce their LOS to an unacceptable level.

- Mooney Boulevard / Cross Avenue. Based on discussions with City of Tulare staff, the City will be programing the necessary improvements to this intersection as part of a City Capital Improvement Project.
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Table I: Existing Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	31.1	C	39.0	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	19.5	C	15.7	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	47.2	E	>120.0	F
		Signalized (Improved)	11.9	B	12.6	B
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	13.5	B	12.4	B
5	Morrison Street / Seminole Avenue	Does Not Exist	N/A	N/A	N/A	N/A
6	Mooney Boulevard / Tulare Avenue	Signalized	40.3	D	34.5	C
7	Morrison Street / Tulare Avenue	Two-Way Stop	99.5	F	34.9	D
		Signalized (Improved)	21.9	C	15.2	B

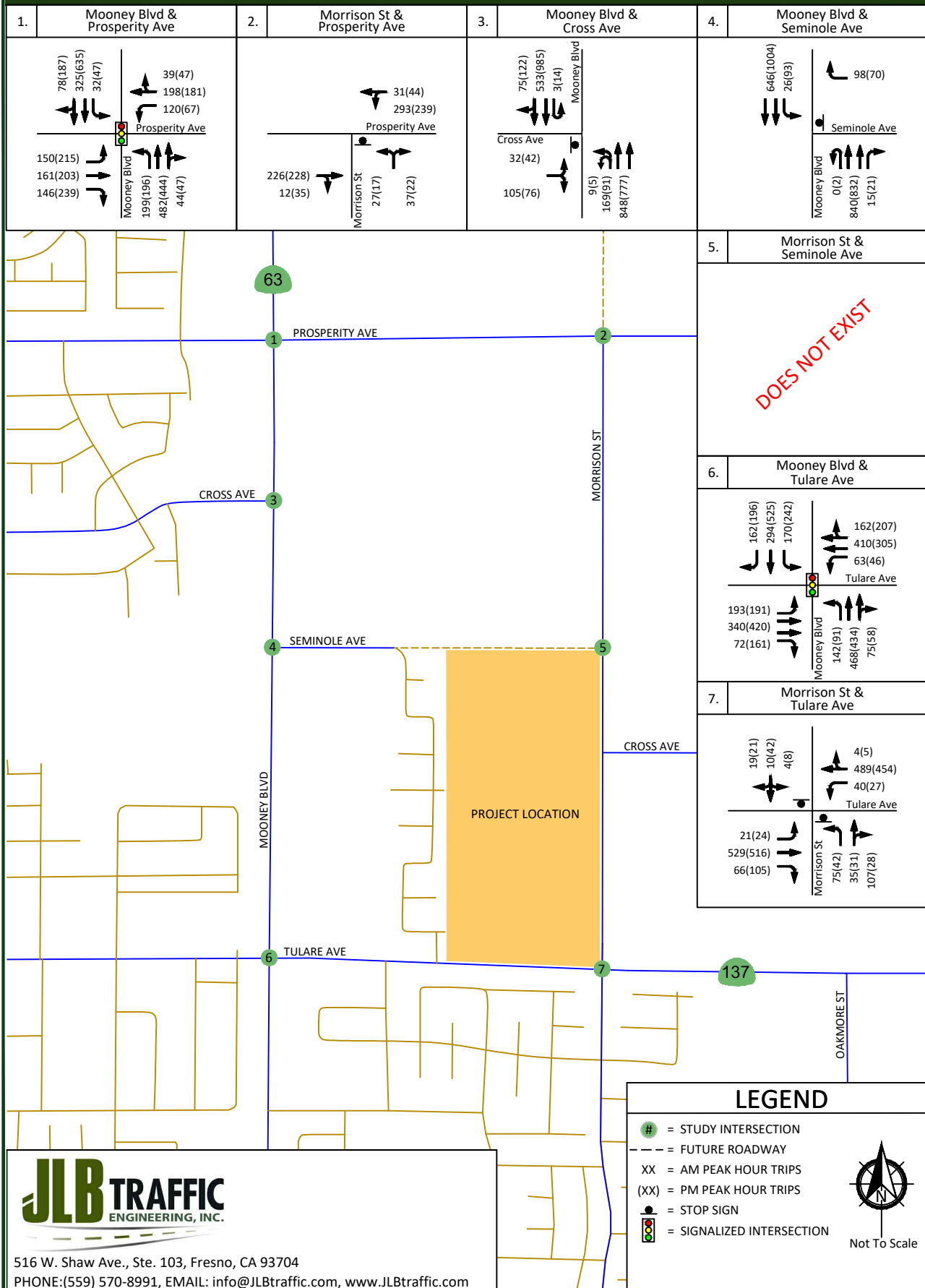
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Farrar Estates - City of Tulare

Existing - Traffic Volumes, Geometrics and Controls

Figure 2



Existing plus Project (Phase I) Traffic Conditions

Project Description

The Project proposes to develop 76.5 acres with 360 single-family residential units. Phase I will develop 99 units along the north side of Tulare Avenue and is estimated to be completed by September 2022. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project Site Plan, access to and from the Project site under Phase I will be from two (2) points located along Tulare Avenue and Morrison Street. Access to Tulare Avenue will be from San Hills Avenue to Hazeltine Street located along the southwestern end of the Project site. Access to Tulare Avenue is currently a full access. The other access point is proposed to be located approximately 675 feet north of Tulare Avenue via Pine Valley Avenue. Access to Morrison Street from Pine Valley Avenue is proposed to be a full access.

JLB analyzed the location of the proposed access point to be constructed under Phase I relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access point to be constructed under Phase I indicates that it is located at a point that minimizes traffic operational impacts to the existing roadway network.

Trip Generation

Trip generation rates for the proposed Project under Phase I were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table II presents the trip generation for the proposed Project under Phase I with trip generation rates for 99 Single-Family Detached Housing units. The proposed Project under Phase I is estimated to generate a maximum of 935 daily trips, 73 AM peak hour trips and 98 PM peak hour trips.

Table II: Project Trip Generation (Phase I)

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	99	d.u.	9.44	935	0.74	25	75	18	55	73	0.99	63	37	62	36	98
Total Project Trips				935				18	55	73				62	36	98

Note: d.u. = Dwelling Units

Trip Distribution

The trip distribution assumptions under Phase I were developed based on existing travel patterns, the TCAG Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase I, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. Figure 4 illustrates the Project Only Trips to the study intersections under Phase I.

Roadway Network

The Existing plus Project (Phase I) Traffic Conditions scenario assumes that the raised median worm currently placed along the center of Mooney Boulevard at Seminole Avenue will be removed allowing for left-turn movements from Seminole Avenue onto Mooney Boulevard. JLB made some assumptions pertaining to changes in travel patterns as a result of the removal of the raised median worm. The removal of the raised median worm has the potential to change travel patterns at the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Mooney Boulevard and Tulare Avenue.

At the time of the preparation of the TIA, the intersection of Mooney Boulevard and Cross Avenue was observed to experience 9 AM and 5 PM northbound to southbound U-turns during the peak hour. JLB rerouted the existing 9 AM and 5 PM U-turns at Mooney Boulevard and Cross Avenue to make a westbound left-turn at Mooney Boulevard and Seminole Avenue and thus removed the trips from the westbound right-turn at Mooney Boulevard and Seminole Avenue, the northbound to southbound U-turn at Mooney Boulevard and Cross Avenue, and the southbound through at Mooney Boulevard and Seminole Avenue. Furthermore, JLB assumed that an additional 9 AM and 5 PM peak hour trips currently heading southbound toward Tulare Avenue to reach Mooney Boulevard would utilize Seminole Avenue instead. As a result, JLB adjusted volumes at the intersection of Mooney Boulevard and Tulare Avenue to reduce volumes for the westbound left-turn and through movements and increase volumes for the southbound through and right-turn movements.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project (Phase I) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to satisfy the peak hour signal warrant during both peak periods. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue is recommended.

Results of Existing plus Project (Phase I) Level of Service Analysis

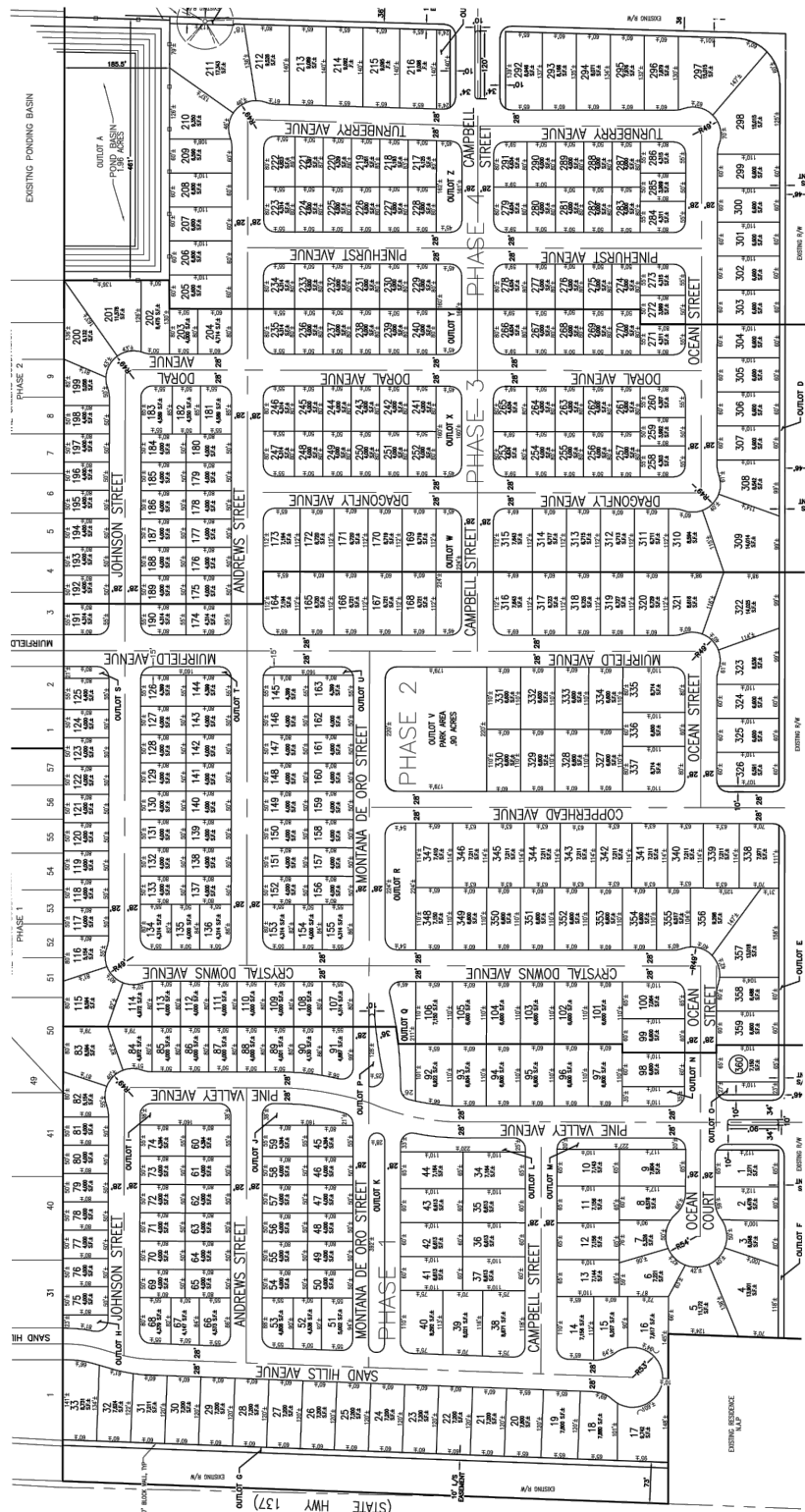
The Existing plus Project (Phase I) Traffic Conditions scenario assumes that the raised median worm currently placed along the center of Mooney Boulevard at Seminole Avenue will be removed allowing for left-turn movements from Seminole Avenue onto Mooney Boulevard. Figure 5 illustrates the Existing plus Project (Phase I) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project (Phase I) Traffic Conditions scenario are provided in Appendix F. Table III presents a summary of the Existing plus Project (Phase I) peak hour LOS at the study intersections.

Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented. To improve the LOS of these intersections, it is recommended that the improvement measures presented in the Existing Traffic Conditions scenario be implemented.

Table III: Existing plus Project (Phase I) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	32.3	C	40.5	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	29.2	D	20.2	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	42.8	E	>120.0	F
		Signalized (Mitigated)	12.0	B	12.4	B
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	20.9	C	20.6	C
5	Morrison Street / Seminole Avenue	Does Not Exist	N/A	N/A	N/A	N/A
6	Mooney Boulevard / Tulare Avenue	Signalized	40.8	D	35.5	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	107.6	F	36.7	E
		Signalized (Mitigated)	21.7	C	15.6	B

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



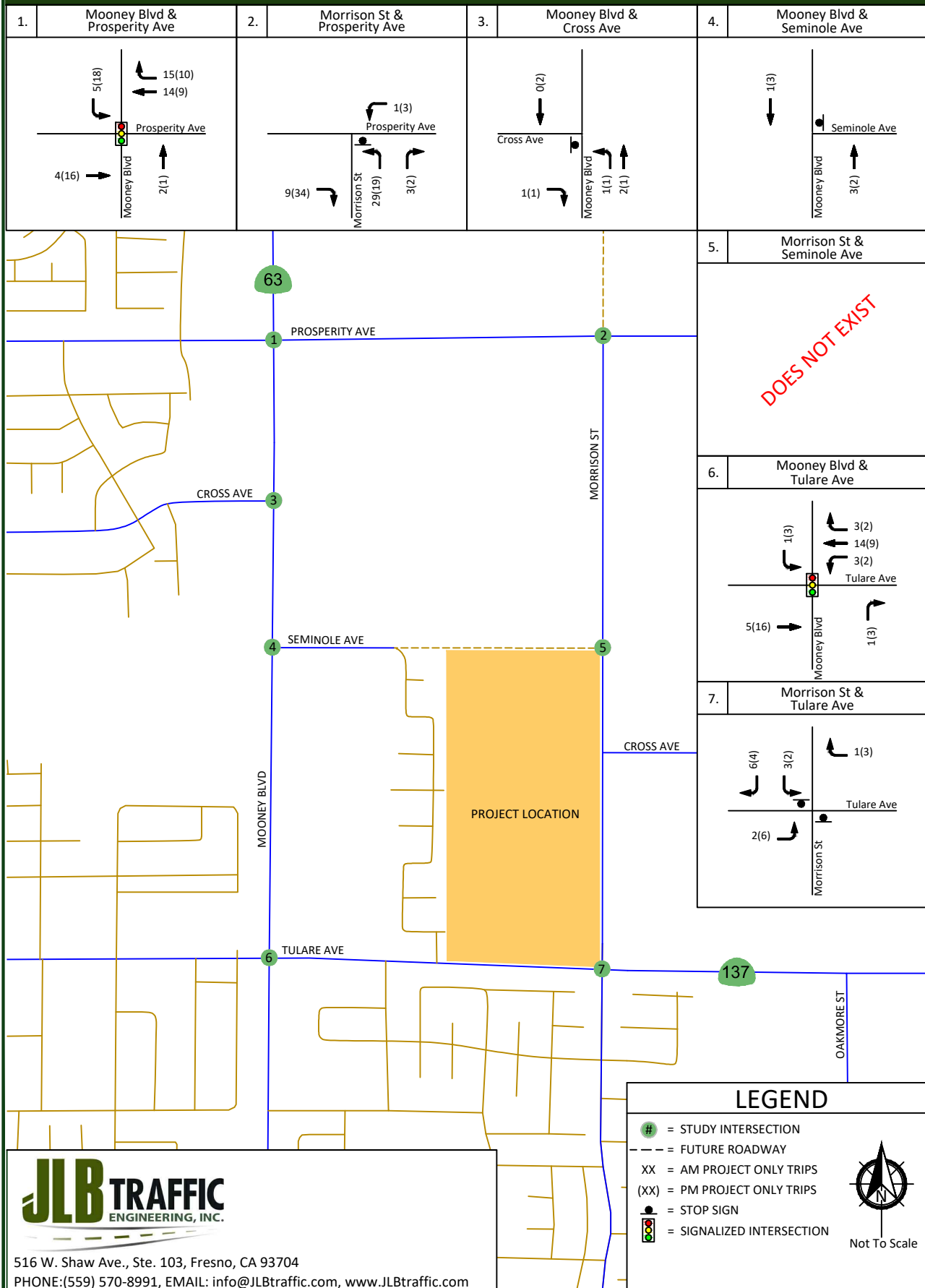
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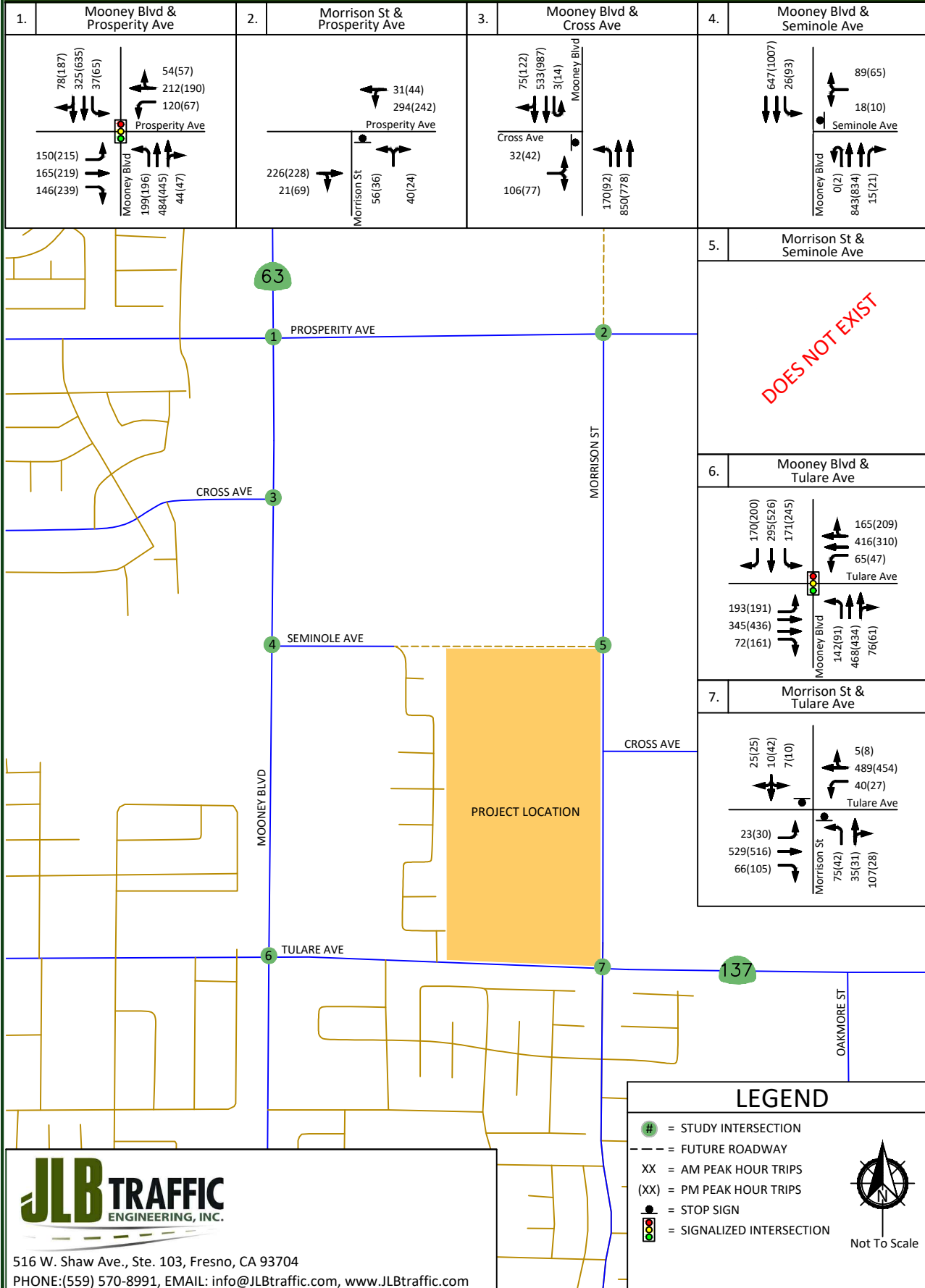
Not To Scale

Farrar Estates - City of Tulare Project Only Trips (Phase I)

Figure 4



Existing plus Project (Phase I) - Traffic Volumes, Geometrics and Controls



Existing plus Project (Phase I & II) Traffic Conditions

Project Description

The Project proposes to develop 76.5 acres with 360 single-family residential units. Phase I will develop 99 units along the north side of Tulare Avenue and Phase II will develop 117 units immediately north of Phase I. Phase II is estimated to be completed by January 2024. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project Site Plan, access to and from the Project site under Phase II will be from four (4) points located along Mooney Boulevard, Tulare Avenue and Morrison Street. Access to Mooney Boulevard will be from Muirfield Avenue located near the center of the Project site. Muirfield Avenue connects to an existing residential subdivision to the west that has access to Seminole Avenue which then connects to Mooney Boulevard. Access to Tulare Avenue will be from San Hills Avenue which connects to an existing residential subdivision to the east that has access to Tulare Avenue. San Hills Avenue is located along the southern end of the Project site. Access to Tulare Avenue is currently a full access. Two access points to Morrison Street are proposed to be located approximately 675 feet and 1,225 feet north of Tulare Avenue via Pine Valley Avenue (675 feet) and Copperhead Avenue (1,225 feet). Access to Morrison Street from Pine Valley Avenue and Copperhead Avenue is proposed to be a full access.

JLB analyzed the location of the proposed access points to be constructed under Phase I and II relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I and II indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

Trip Generation

Trip generation rates for the proposed Project under Phase I and II were obtained from the 10th Edition of the Trip Generation Manual published by ITE. Table IV presents the trip generation for the proposed Project under Phase I and II with trip generation rates for 216 Single-Family Detached Housing units. The proposed Project under Phase I and II is estimated to generate a maximum of 2,039 daily trips, 160 AM peak hour trips and 214 PM peak hour trips.

Table IV: Project Trip Generation (Phase I & II)

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	216	d.u.	9.44	2,039	0.74	25	75	40	120	160	0.99	63	37	135	79	214
Total Project Trips				2,039				40	120	160				135	79	214

Note: d.u. = Dwelling Units

Trip Distribution

The trip distribution assumptions under Phase I and II were developed based on existing travel patterns, the TCAG Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase II, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. Figure 6 illustrates the Project Only Trips to the study intersections under Phase I and II.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project (Phase I & II) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to satisfy the peak hour signal warrant during both peak periods. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue is recommended.

Results of Existing plus Project (Phase I & II) Level of Service Analysis

The Existing plus Project (Phase I & II) Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project (Phase I) Traffic Conditions scenario. Figure 7 illustrates the Existing plus Project (Phase I & II) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project (Phase I & II) Traffic Conditions scenario are provided in Appendix G. Table V presents a summary of the Existing plus Project (Phase I & II) peak hour LOS at the study intersections.

Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.

- Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

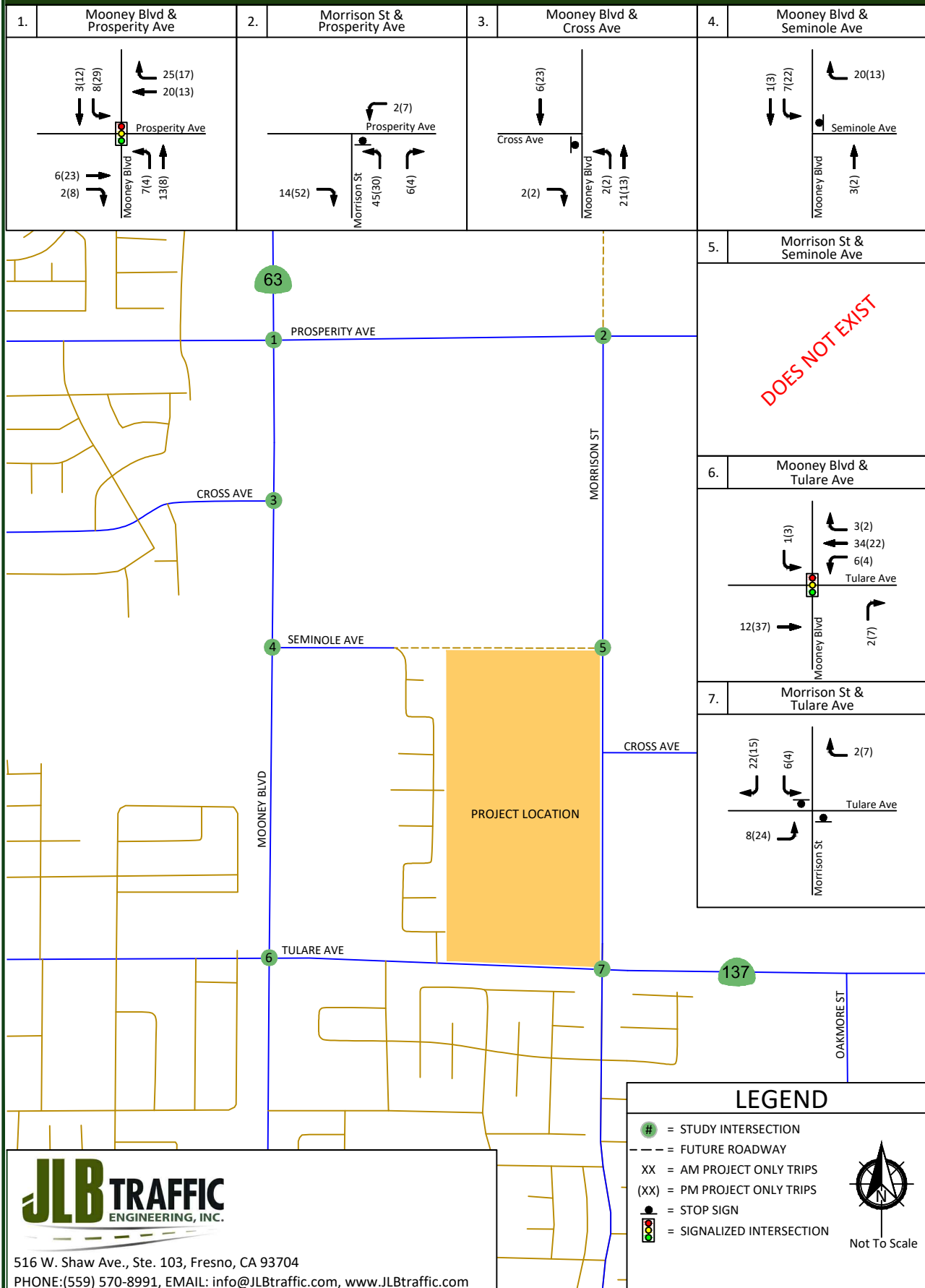
Table V: Existing plus Project (Phase I & II) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	33.6	C	41.6	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	36.3	E	22.9	C
		One-Way Stop (Mitigated)	30.8	D	21.3	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	46.4	E	>120.0	F
		Signalized (Mitigated)	11.8	B	8.6	A
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	21.5	C	21.3	C
5	Morrison Street / Seminole Avenue	Does Not Exist	N/A	N/A	N/A	N/A
6	Mooney Boulevard / Tulare Avenue	Signalized	41.6	D	36.3	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	42.3	E
		Signalized (Mitigated)	25.2	C	19.7	B

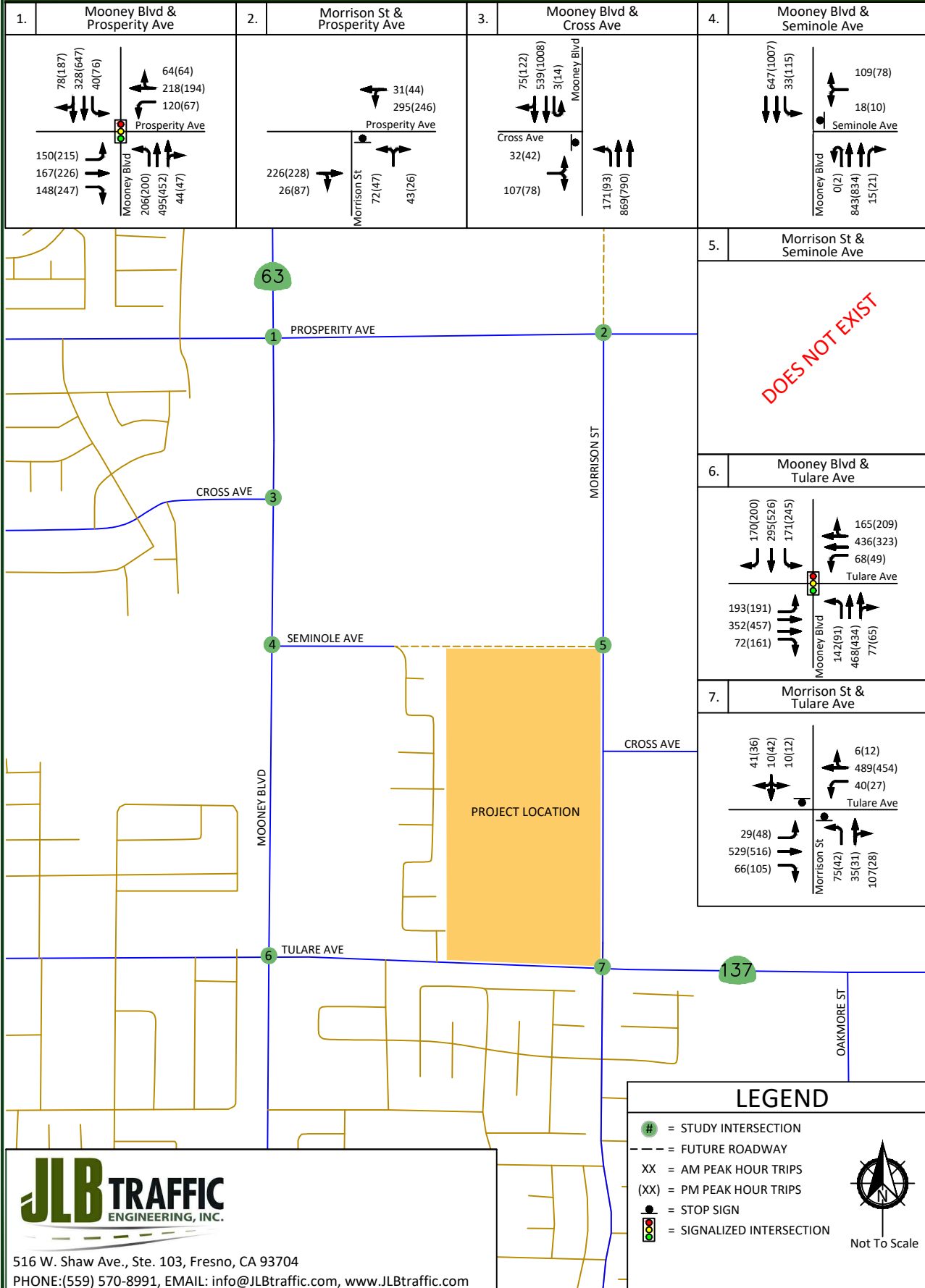
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Farrar Estates - City of Tulare Project Only Trips (Phase I & II)

Figure 6



Existing plus Project (Phase I & II) - Traffic Volumes, Geometrics and Controls



Existing plus Project (Phase I, II & III) Traffic Conditions

Project Description

The Project proposes to develop 76.5 acres with 360 single-family residential units. Phase I will develop 99 units along the north side of Tulare Avenue, Phase II will develop 117 units immediately north of Phase I, and Phase III will develop 82 units immediately north of Phase II. Phase III is estimated to be completed by May 2025. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project Site Plan, access to and from the Project site under Phase III will be from the same four (4) points located along Mooney Boulevard, Tulare Avenue and Morrison Street to be in existence after completion of Phase II. Access to Mooney Boulevard will be from Muirfield Avenue located near the center of the Project site. Muirfield Avenue connects to an existing residential subdivision to the west that has access to Seminole Avenue which then connects to Mooney Boulevard. Access to Tulare Avenue will be from San Hills Avenue which connects to an existing residential subdivision to the west that has access to Tulare Avenue. San Hills Avenue is located along the southern end of the Project site. Access to Tulare Avenue is currently a full access. Two access points to Morrison Street are proposed to be located approximately 675 feet and 1,225 feet north of Tulare Avenue via Pine Valley Avenue (675 feet) and Copperhead Avenue (1,225 feet). Access to Morrison Street from Pine Valley Avenue and Copperhead Avenue is proposed to be a full access.

JLB analyzed the location of the proposed access points to be constructed under Phase I, II and III relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Phase I, II and III indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

Trip Generation

Trip generation rates for the proposed Project under Phase I, II and III were obtained from the 10th Edition of the Trip Generation Manual published by ITE. Table VI presents the trip generation for the proposed Project under Phase I, II and III with trip generation rates for 298 Single-Family Detached Housing units. The proposed Project under Phase I, II and III is estimated to generate a maximum of 2,813 daily trips, 221 AM peak hour trips and 295 PM peak hour trips.

Table VI: Project Trip Generation (Phase I, II & III)

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	298	d.u.	9.44	2,813	0.74	25	75	55	166	221	0.99	63	37	186	109	295
Total Project Trips				2,813				55	166	221				186	109	295

Note: d.u. = Dwelling Units

Trip Distribution

The trip distribution assumptions under Phase I, II and III were developed based on existing travel patterns, the TCAG Project Select Zone, the existing roadway network, the proposed roadway network to be completed by Phase III, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. Figure 8 illustrates the Project Only Trips to the study intersections under Phase I, II and III.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project (Phase I, II & III) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to satisfy the peak hour signal warrant during both peak periods, while the intersection of Mooney Boulevard and Seminole Avenue is projected to satisfy the peak hour signal warrant during the AM peak hour only.

Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue is recommended. However, signalization of the intersection of Mooney Boulevard and Seminole Avenue is not recommended, especially since this intersection is projected to operate at an acceptable LOS during both peak periods. It is worth noting that the CA MUTCD states "satisfaction of a signal warrant or warrants shall not in itself require the installation of a traffic signal." Therefore, it is recommended that prior to the installation of a traffic signal, investigation of CA MUTCD warrants 4 and 7, as applicable, be conducted for this intersection.

Results of Existing plus Project (Phase I, II & III) Level of Service Analysis

The Existing plus Project (Phase I, II & III) Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project (Phase I) Traffic Conditions scenario. Figure 9 illustrates the Existing plus Project (Phase I, II & III) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project (Phase I, II & III) Traffic Conditions scenario are provided in Appendix H. Table VII presents a summary of the Existing plus Project (Phase I, II & II) peak hour LOS at the study intersections.

Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.

- Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

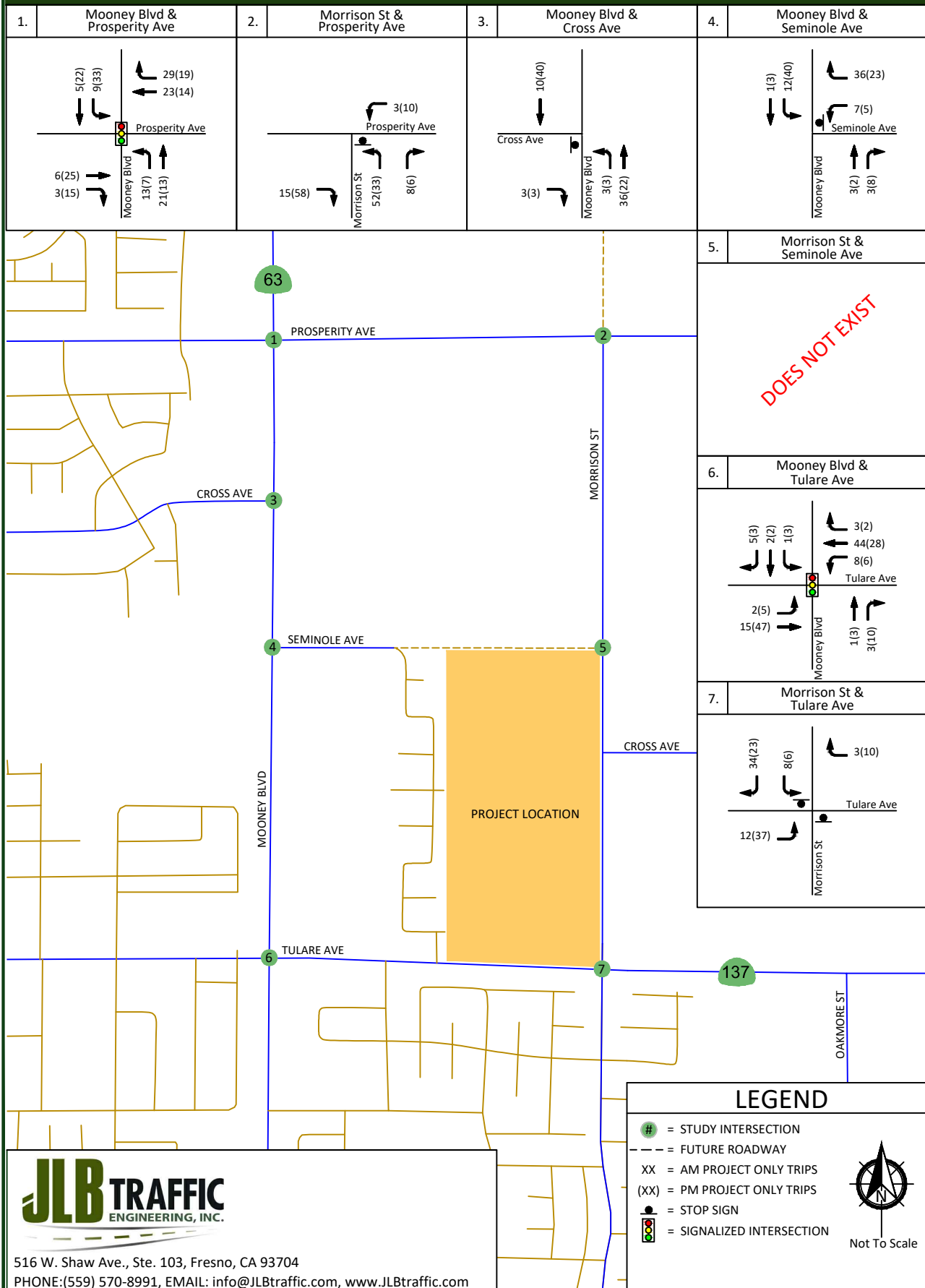
Table VII: Existing plus Project (Phase I, II & III) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	34.0	C	42.2	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	40.5	E	23.9	C
		One-Way Stop (Mitigated)	33.5	C	22.1	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	47.3	E	>120.0	F
		Signalized (Mitigated)	14.0	B	8.7	A
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	26.1	D	27.9	D
5	Morrison Street / Seminole Avenue	Does Not Exist	N/A	N/A	N/A	N/A
6	Mooney Boulevard / Tulare Avenue	Signalized	42.2	D	36.1	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	47.5	E
		Signalized (Mitigated)	20.7	C	20.7	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

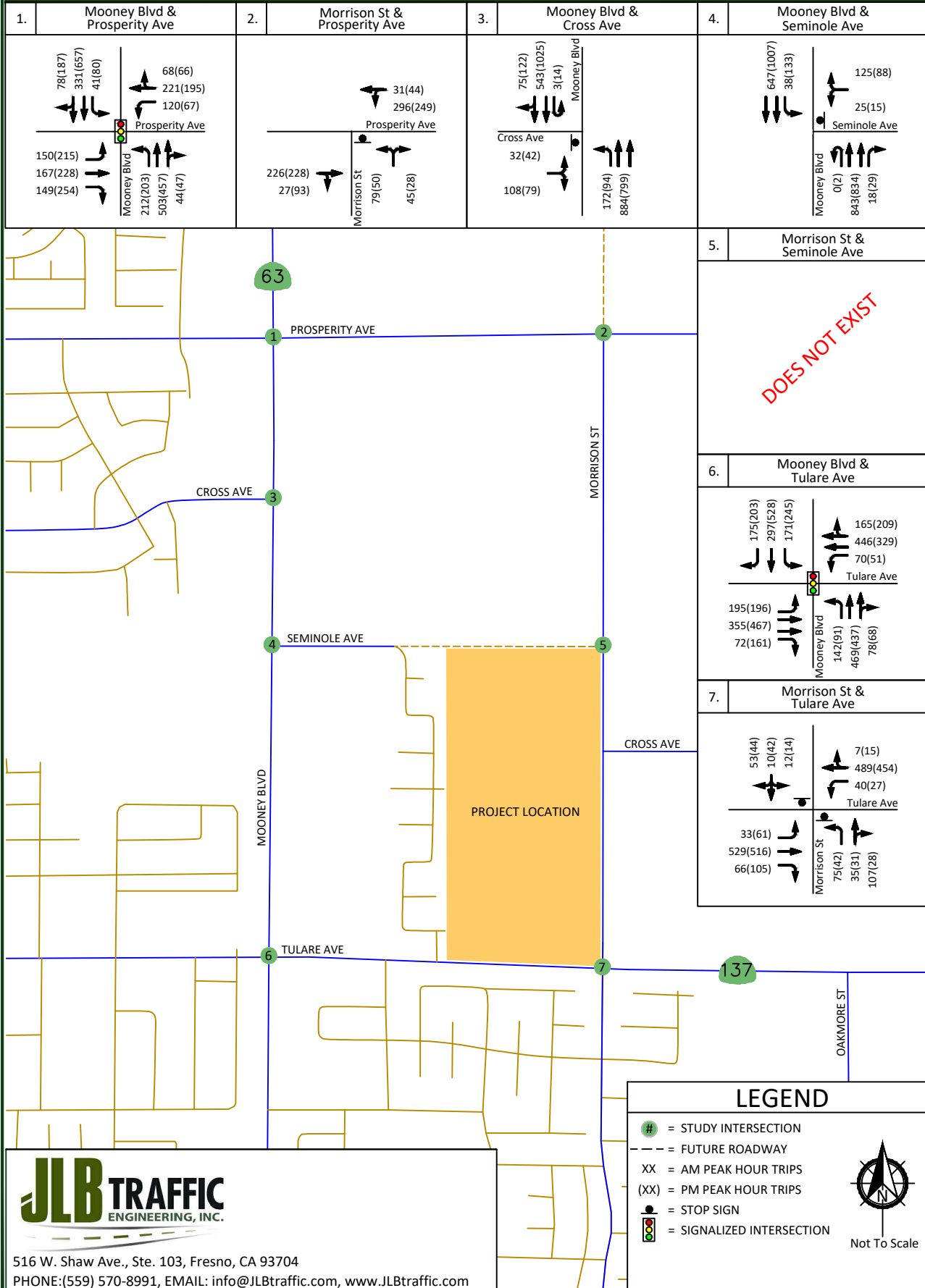
Farrar Estates - City of Tulare Project Only Trips (Phase I, II & III)

Figure 8



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Existing plus Project (Phase I, II & III) - Traffic Volumes, Geometrics and Controls



Existing plus Project (Buildout) Traffic Conditions

Project Description

The Project proposes to develop 76.5 acres with 360 single-family residential units. Phase I will develop 99 units along the north side of Tulare Avenue, Phase II will develop 117 units immediately north of Phase I, Phase III will develop 82 units immediately north of Phase II, and Phase IV will develop the remaining 62 units immediately north of Phase III and south of Seminole Avenue. Phase IV is estimated to be completed by December 2026. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. Figure 3 illustrates the latest Project Site Plan.

Project Access

Based on the latest Project Site Plan, access to and from the Project site under Buildout will be from five (5) points located along Seminole Avenue, Mooney Boulevard, Tulare Avenue and Morrison Street. By Phase IV, the Project will construct Seminole Avenue on its frontage. Access to Seminole Avenue is proposed to be located approximately 550 feet west of Morrison Street via Campbell Street and is proposed as a full access. Access to Mooney Boulevard will be from Seminole Avenue and Muirfield Avenue located near the center of the Project site. Muirfield Avenue connects to an existing residential subdivision to the west that has access to Seminole Avenue which then connects to Mooney Boulevard. Access to Tulare Avenue will be from San Hills Avenue which connects to an existing residential subdivision to the west that has access to Tulare Avenue. San Hills Avenue is located along the southern end of the Project site. Access to Tulare Avenue is currently a full access. The other access points are proposed to be located approximately 675 feet and 1,225 feet north of Tulare Avenue via Pine Valley Avenue (675 feet) and Copperhead Avenue (1,225 feet). Access at to Morrison Street from Pine Valley Avenue and Copperhead Avenue is proposed to be a full access.

JLB analyzed the location of the proposed access points to be constructed under Buildout relative to the existing local roads and driveways in the Project's vicinity. A review of the Project's access points to be constructed under Buildout indicates that they are located at points that minimize traffic operational impacts to the existing roadway network.

Trip Generation

Trip generation rates for the proposed Project under Buildout were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table VIII presents the trip generation for the proposed Project under Buildout with trip generation rates for 360 Single-Family Detached Housing units. At buildout, the proposed Project is estimated to generate a maximum of 3,398 daily trips, 266 AM peak hour trips and 356 PM peak hour trips.

Table VIII: Project Trip Generation (Buildout)

Land Use (ITE Code)	Size	Unit	Daily		AM (7-9) Peak Hour						PM (4-6) Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	360	d.u.	9.44	3,398	0.74	25	75	66	200	266	0.99	63	37	224	132	356
Total Project Trips				3,398				66	200	266				224	132	356

Note: d.u. = Dwelling Units

Trip Distribution

The trip distribution assumptions under Buildout were developed based on existing travel patterns, the TCAG Project Select Zone, the existing roadway network, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the City of Tulare 2035 General Plan Transportation and Circulation Element in the vicinity of the Project. Figure 10 illustrates the Project Only Trips to the study intersections under Buildout.

Bikeways

Currently, while there is no classification for a bicycle facility along State Route 63, bicycle access is not prohibited. The City of Tulare 2035 General Plan Transportation and Circulation Element states that “[t]he City shall promote the development of a comprehensive and safe system of recreational and commuter bicycle routes that provide connections between the city’s major employment and housing areas, between its existing and planned bikeways, and between schools, parks, retail shopping, and residential neighborhoods.” Furthermore, the State Route 137 Transportation Concept Report states that “State Route 137 is classified as a conventional state highway open to local and regional bicycle travel.” Therefore, it is recommended that the Project implement Class II Bike Lanes along its frontages to Seminole Avenue, Morrison Street and Tulare Avenue.

Walkways

Currently, walkways exist in the vicinity of the proposed Project site along Mooney Boulevard, Prosperity Avenue, Cross Street, Seminole Avenue, Tulare Avenue and Morrison Street. The City of Tulare 2035 General Plan Transportation and Circulation Element states that “[t]he City shall require all new development to provide sidewalks or other suitable pedestrian facilities. Whenever feasible, pedestrian paths should be developed to allow for unobstructed pedestrian flow to major destinations such as bus stops, schools, parks, and shopping centers.” Therefore, it is recommended that the Project implement walkways that are ADA compliant along its frontages to Seminole Avenue, Morrison Street and Tulare Avenue.

Transit

Tulare InterModal Express (TIME) is the transit operator in the City of Tulare. At present, the closest route is Route 7 which runs on Tulare Avenue adjacent to the proposed Project site. Route 7 operates at 30-minute intervals between 6:15 AM and 8:45 PM on Monday through Saturday. Its nearest stop to the Project site is located on the south side of Tulare Avenue approximately 330 feet east of Mooney Boulevard. This route provides a direct connection to Mission Oaks High School, College of the Sequoias Tulare College Center, Frank Kohn Elementary School, and Tulare Union High School. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Roadway Network

The Existing plus Project (Buildout) Traffic Conditions scenario assumes that Phase IV will construct Seminole Avenue along its frontage. For purposes of the TIA, it is assumed that Seminole Avenue is built as a two-lane undivided roadway controlled by a one-way stop at the intersection with Morrison Street. Figure 11 illustrates the assumed intersection geometrics and controls for the intersection of Morrison Street and Seminole Avenue under this scenario.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Existing plus Project (Buildout) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue are projected to satisfy the peak hour signal warrant during both peak periods, while the intersection of Mooney Boulevard and Seminole Avenue is projected to satisfy the peak hour signal warrant during the AM peak hour only. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue is recommended.

Results of Existing plus Project (Buildout) Level of Service Analysis

The Existing plus Project (Buildout) Traffic Conditions scenario assumes that Seminole Avenue will exist west of Morrison Street. Figure 11 illustrates the Existing plus Project (Buildout) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Existing plus Project Traffic Conditions scenario are provided in Appendix I. Table IX presents a summary of the Existing plus Project (Buildout) peak hour LOS at the study intersections.

Under this scenario, the intersections of Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of these intersections, it is recommended that the following improvements be implemented.

- Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.
- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

Table IX: Existing plus Project (Buildout) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	34.3	C	42.7	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	40.9	E	24.0	C
		One-Way Stop (Mitigated)	33.5	D	22.1	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	49.6	E	>120.0	F
		Signalized (Mitigated)	11.7	B	8.5	A
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	39.6	E	47.0	E
		Signalized (Mitigated)	10.4	B	10.4	B
5	Morrison Street / Seminole Avenue	One-Way Stop	10.2	B	10.4	B
6	Mooney Boulevard / Tulare Avenue	Signalized	42.6	D	37.1	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	47.7	E
		Signalized (Mitigated)	20.9	C	20.7	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Safe Routes to School

Kindergarten through 8th grade students from the Project will be served by the Tulare City School District (TCSD). The Tulare City School District provides transportation for students who live in excess of an established radius zone. The zone is a radius of 1.00 mile for grades Kindergarten through 8th. Students in 9th through 12th grades from the Project will be served by the Tulare Joint Union High School District.

Based on the attendance area boundaries at the time of the preparation of this TIA, elementary school students would attend Mission Valley Elementary School located on the west corner of Laspina Street and Bella Oaks Drive. Mission Valley Elementary School is located 1.34 and 1.86 miles from the nearest and farthest future home on the Project. Therefore, it is anticipated that all elementary school students will be bussed from the Project to school.

Based on the attendance area boundaries at the time of the preparation of this TIA, middle school students would attend Live Oak Middle School located on the southeast corner of Laspina Street and Ben Franklin Avenue. Live Oak Middle School is located 0.76 and 1.15 miles from the nearest and farthest future home on the Project. Therefore, it is anticipated that the majority, if not all, middle school students will need to walk, bike or be driven to school.

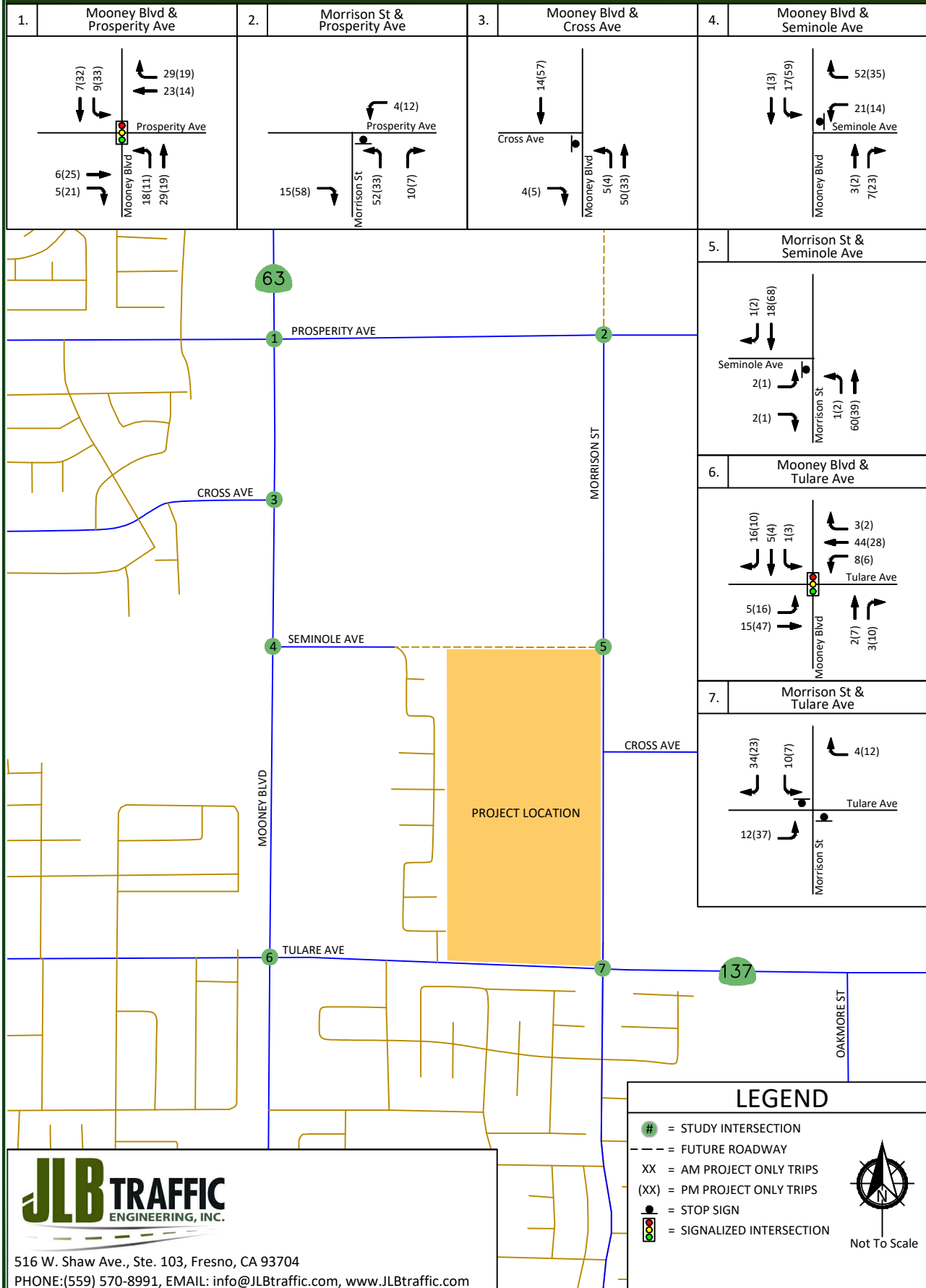
The most direct path from the Project to the Live Oak Middle School campus can begin from the northwest corner of Project site. Students may proceed west along the south side of Seminole Avenue toward the intersection of Mooney Boulevard and Seminole Avenue. The intersection of Mooney Boulevard and Seminole Avenue is controlled by a one-way stop on Seminole Avenue and contains a marked crosswalk across the east leg. Students may proceed to cross Seminole Avenue along the east side of Mooney Boulevard and continue north toward the intersection of Mooney Boulevard and Cross Avenue. The intersection of Mooney Boulevard and Cross Avenue is controlled by a one-way stop on Cross Avenue and contains a marked crosswalk across the south leg. Students may proceed to cross Mooney Boulevard along the south side of Cross Avenue and continue west toward the intersection of Freedom Street and Cross Avenue. The intersection of Freedom Street and Cross Avenue is controlled by a one-way stop on Freedom Street and contains a high-visibility crosswalk across the south leg. Students may proceed south along the east side of Freedom Street toward the intersection of Freedom Street and Ben Franklin Avenue. The intersection of Freedom Street and Ben Franklin Avenue is controlled by a one-way stop on Freedom Street and contains high-visibility crosswalks across the north leg and east leg. Students may proceed to cross Ben Franklin Avenue along the east side of Freedom Street and continue west along the south side of Ben Franklin Avenue until reaching the nearest campus entrance.

Based on the attendance area boundaries at the time of the preparation of this TIA, high school students would attend Tulare Union High School located on the southeast corner of "O" Street and Tulare Avenue. The most direct path from the Project site to the Tulare Union High School campus will begin from the southwest corner of the Project site. Students may proceed west along the north side of Tulare Avenue toward the intersection of Mooney Boulevard and Tulare Avenue. The intersection of Mooney Boulevard and Tulare Avenue is signalized and contains marked crosswalks across all approaches. Students may proceed to cross Mooney Boulevard along the north side of Tulare Avenue and continue west toward the intersection of Highland Street and Tulare Avenue. The intersection of Highland Street and Tulare Avenue is controlled by a one-way stop and contains a marked crosswalk across Tulare Avenue approximately 120 feet west of Highland Street. Students may proceed to cross Tulare Avenue at the mid-block crosswalk to reach the nearest campus entrance.

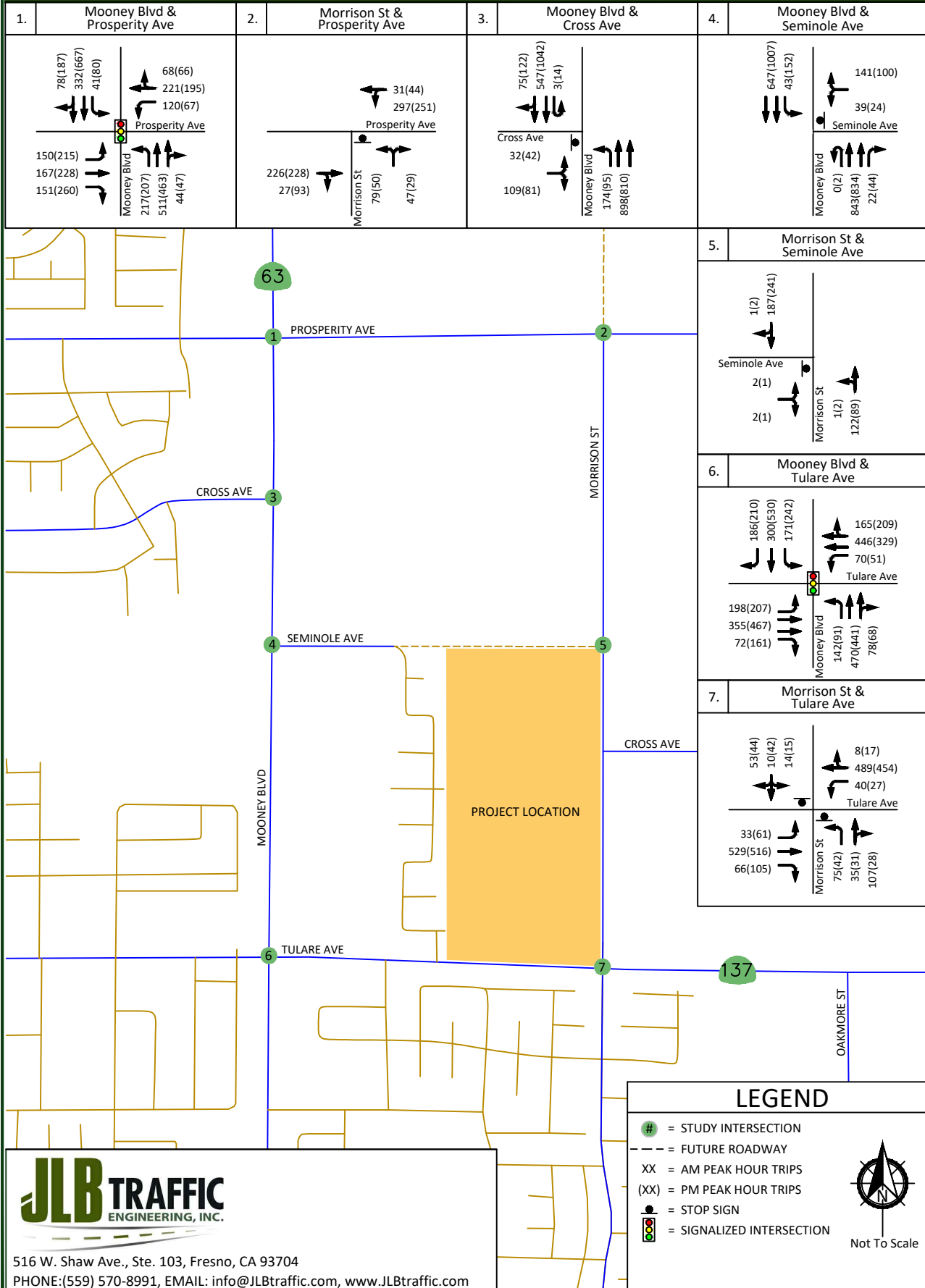
Since the walking distance between the Project and the Tulare Union High School campus is approximately 1.95 miles and there is a lack of walkways, it is anticipated that a large percentage of high school students will likely be driven to school. To promote alternative modes of transportation to Tulare Union High School, it is recommended that the Tulare Joint Union High School District work with the City of Tulare to implement a Safe Routes to School Plan and to seek grant funding to help build walkways where they are lacking within a 2.00-mile radius of the existing school site.

Farrar Estates - City of Tulare Project Only Trips (Buildout)

Figure 10



Existing plus Project (Buildout) - Traffic Volumes, Geometrics and Controls



Near Term plus Project (Buildout) Traffic Conditions

Description of Approved and Pipeline Projects

Approved and Pipeline Projects consist of developments that are either under construction, built but not fully occupied, are not built but have final site development review (SDR) approval, or for which the lead agency or responsible agencies have knowledge of. City of Tulare, County of Tulare and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known of projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects listed in Table X were the only projects that could potentially impact the study intersections analyzed in the Near Term plus Project (Buildout) Traffic Conditions. Therefore, the Near Term Projects listed in Table X were the only projects approved, near approval, or in the pipeline within the proximity of the Project site.

The trip generation listed in Table X is that which is anticipated to be added to the streets and highways by these projects between the time of the preparation of this report and two (2) years after build-out of the Project. As shown in Table X, the total trip generation for the Near Term Projects is 60,218 daily trips, 3,087 AM peak hour trips and 5,835 PM peak hour trips. Figure 12 illustrates the location of the approved, near approval, or pipeline projects and their combined trip assignment to the study intersections under the Near Term plus Project (Buildout) Traffic Conditions scenario.

Table X: Near Term Projects' Trip Generation

Approved Project Location	Approved or Pipeline Project Name	Daily Trips	AM Peak Hour	PM Peak Hour
A	Oak Tree Estates ¹	12,242	330	1,229
B	Eastgate Hotel ¹	1,363	178	187
C	Bethel/Harmony Development Project ¹	1,999	95	103
D	Senior Living Apartments ¹	370	20	26
E	Tulare Apartments ¹	1,230	77	94
F	Commercial Development ¹	575	14	58
G	Ventana ¹	3,591	287	317
H	Altura Health Centers ²	2,656	223	271
I	Kensington Estates ¹	1,265	99	133
J	Willow Glen ¹	20,404	688	2,060
K	Tesori ¹	340	27	36
L	Apartments (portion of) ¹	88	6	7
M	Liberty Hill ¹	3,625	284	380
N	Senior Living ¹	522	32	44
O	Jack-in-the-Box ¹	1,256	107	87
P	Oak Creek (portion of) ¹	1,329	96	125
Q	Palm Ranch (portion of) ¹	1,133	89	119
R	Quail Creek ¹	840	66	88
S	Sierra Vista Estates ¹	491	38	51
T	The Windmills (portion of) ¹	1,293	101	136

Table IV: Near Term Projects' Trip Generation (cont.)

Approved Project Location	Approved or Pipeline Project Name	Daily Trips	AM Peak Hour	PM Peak Hour
U	Mixed-Use Development ¹	3,305	216	263
V	St. Rita's Catholic Church ¹	301	14	21
Total Near Term Project Trips		60,218	3,087	5,835

Note: 1 = Trip Generation prepared by JLB Traffic Engineering, Inc. based on readily available information
2 = Trip Generation based on JLB Traffic Engineering, Inc. Traffic Impact Analysis Report

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Near Term plus Project (Buildout) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue satisfy the peak hour signal warrant during both peak periods. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue is recommended.

Results of Near Term plus Project (Buildout) Level of Service Analysis

The Near Term plus Project (Buildout) Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project (Buildout) Traffic Conditions scenario. Figure 13 illustrates the Near Term plus Project (Buildout) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Near Term plus Project (Buildout) Traffic Conditions scenario are provided in Appendix J. Table XI presents a summary of the Near Term plus Project (Buildout) peak hour LOS at the study intersections.

Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Morrison Street and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.

- Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Morrison Street / Prosperity Avenue
 - Modify the northbound left-right lane to a left-turn lane; and
 - Add a northbound right-turn lane.

- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane;
 - Signalize the intersection with protective left-turn phasing in all directions; and
 - Modify the intersection to accommodate the added lane.

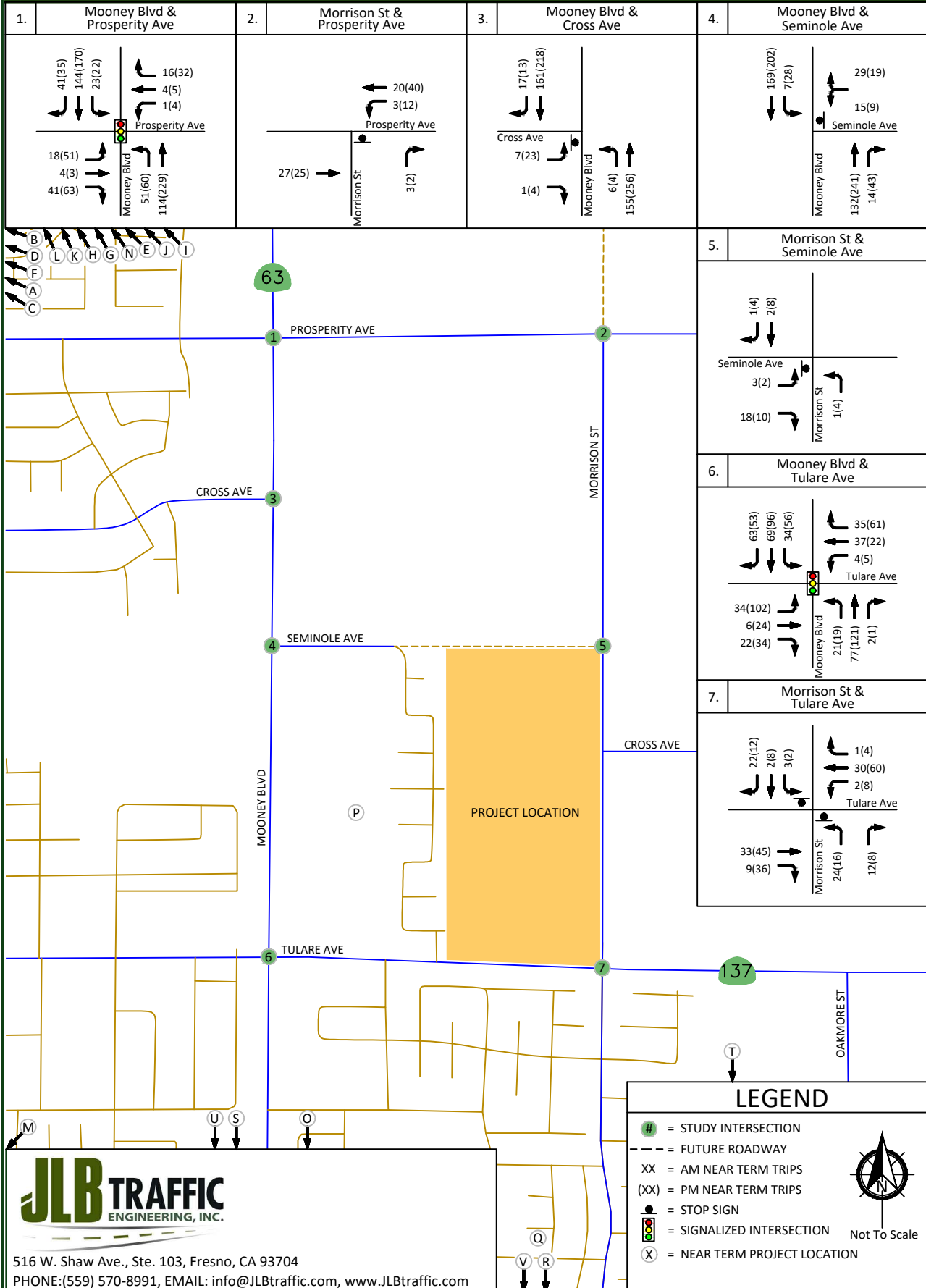
Table XI: Near Term plus Project (Buildout) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	46.6	D	66.5	E
		Signalized (Mitigated)	45.3	D	51.9	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	35.8	E	26.4	D
		One-Way Stop (Mitigated)	29.9	D	24.1	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	9.0	A	10.8	B
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	9.4	A	10.8	B
5	Morrison Street / Seminole Avenue	One-Way Stop	9.8	A	10.2	B
6	Mooney Boulevard / Tulare Avenue	Signalized	58.2	E	67.6	E
		Signalized (Mitigated)	43.6	D	44.5	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	41.5	D	22.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.

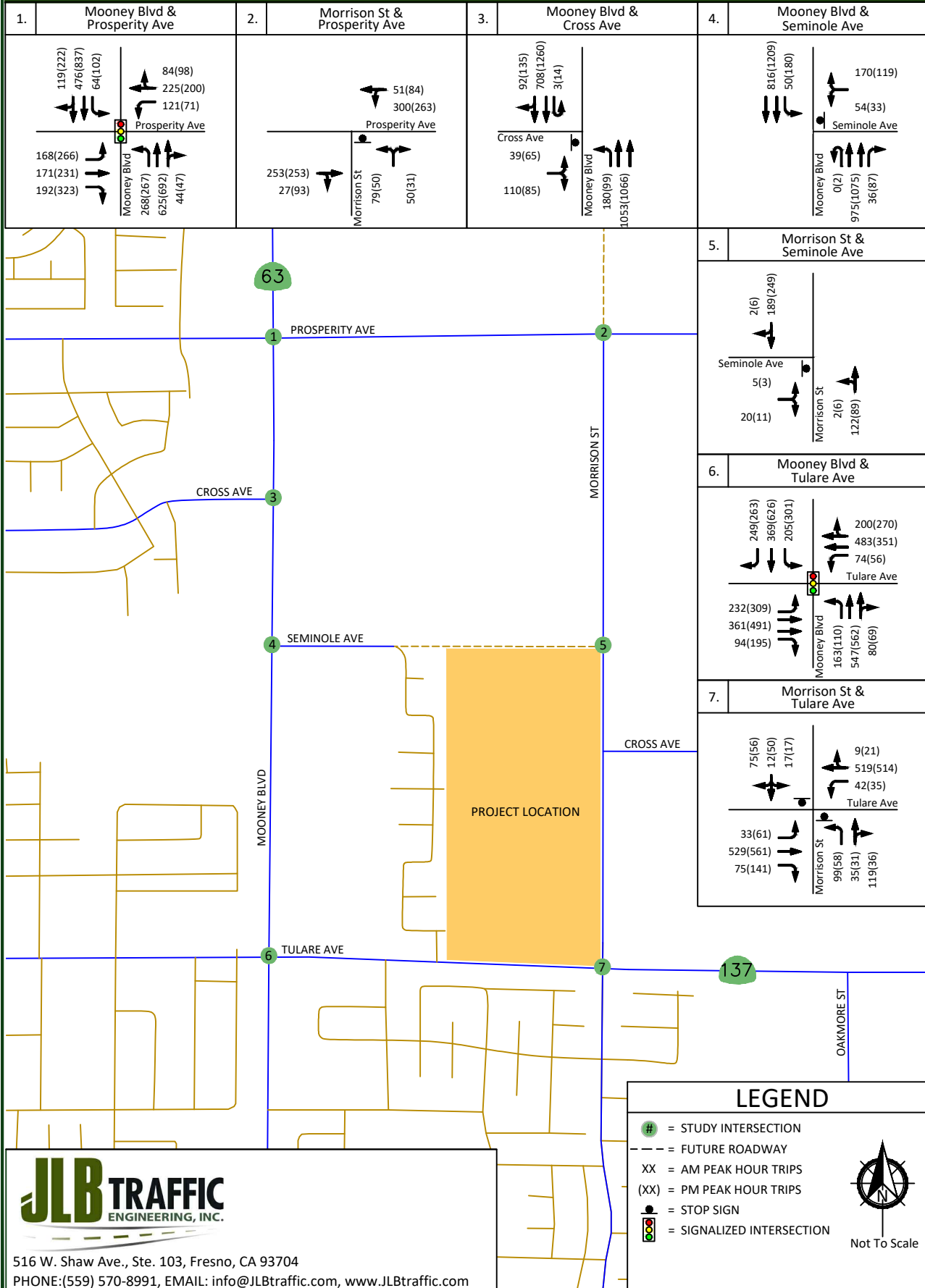
Farrar Estates - City of Tulare Near Term Projects' Trip Assignment

Figure 12



JLB TRAFFIC
ENGINEERING, INC.

516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE: (559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com



Cumulative Year 2035 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 No Project Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue and Morrison Street and Tulare Avenue satisfy the peak hour signal warrant during both peak periods, while the intersection of Mooney Boulevard and Seminole Avenue satisfies the peak hour signal warrant during the AM peak period only. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue is recommended.

Results of Cumulative Year 2035 No Project Level of Service Analysis

The Cumulative Year 2035 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project (Phase I) Traffic Conditions scenario. Figure 14 illustrates the Cumulative Year 2035 No Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 No Project Traffic Conditions scenario are provided in Appendix K. Table XII presents a summary of the Cumulative Year 2035 No Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.

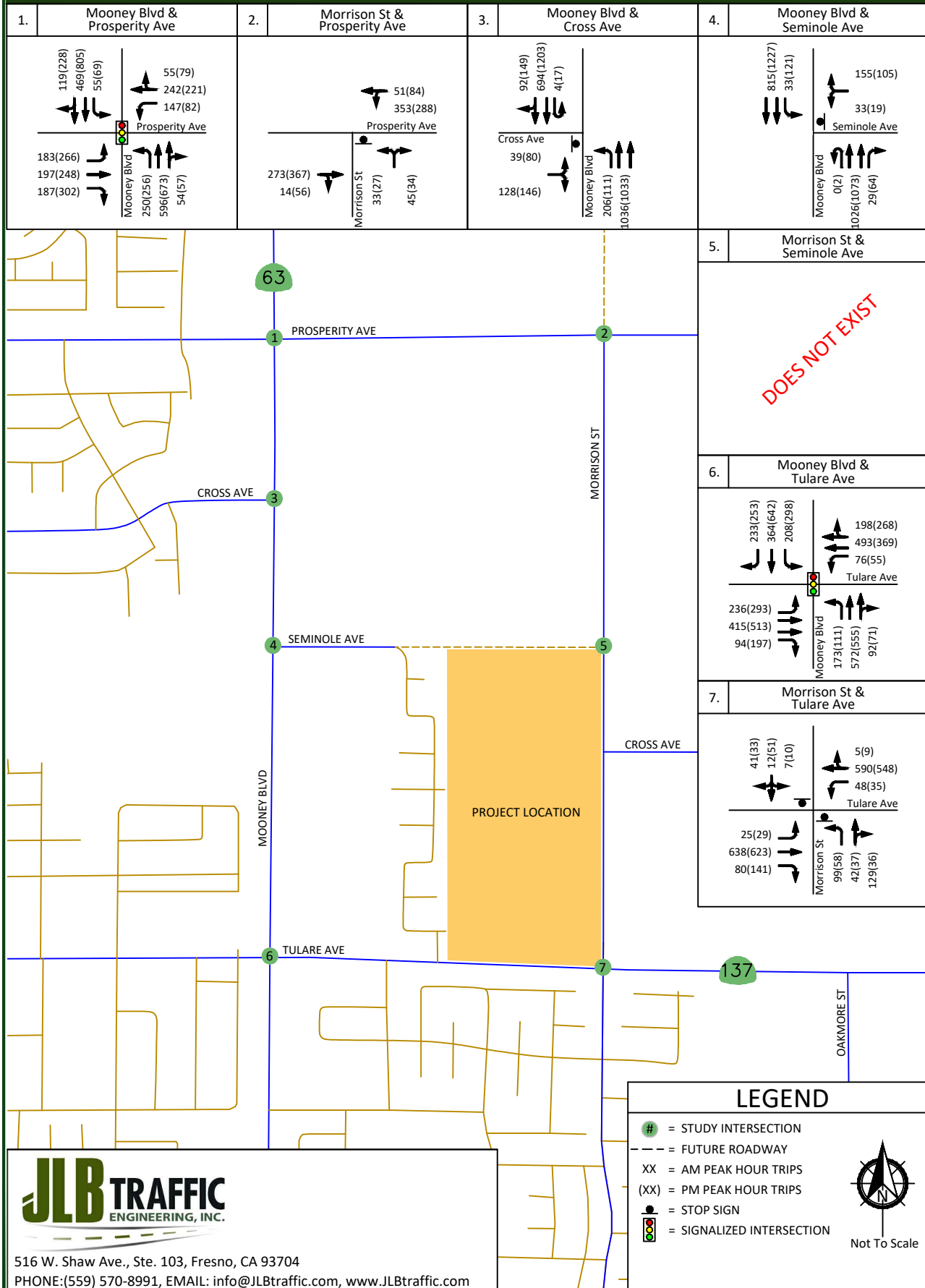
- Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

- Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

Table XII: Cumulative Year 2035 No Project Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	45.2	D	61.2	E
		Signalized (Improved)	42.8	D	52.0	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	23.0	C	23.3	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	>120.0	F	>120.0	F
		Signalized (Improved)	8.7	A	10.7	B
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	50.9	F	82.6	F
		Signalized (Improved)	9.1	A	10.7	B
5	Morrison Street / Seminole Avenue	Does Not Exist	N/A	N/A	N/A	N/A
6	Mooney Boulevard / Tulare Avenue	Signalized	59.0	E	62.7	E
		Signalized (Improved)	41.2	D	44.7	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	>120.0	F
		Signalized (Improved)	41.4	D	22.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls
LOS for two-way and one-way STOP controlled intersections are based on the worst approach/movement of the minor street.



Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the unsignalized intersections in the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions scenario. These warrants are found in Appendix M. The effects of right-turning traffic from the minor approach onto the major approach were taken into account using engineering judgement pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue satisfy the peak hour signal warrant during both peak periods. Based on the signal warrants and engineering judgement, signalization of the intersections of Mooney Boulevard and Cross Avenue, Mooney Boulevard and Seminole Avenue, and Morrison Street and Tulare Avenue is recommended.

Results of Cumulative Year 2035 plus Project (Buildout) Level of Service Analysis

The Cumulative Year 2035 plus Project (Buildout) Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing plus Project (Buildout) Traffic Conditions scenario. Figure 15 illustrates the Cumulative Year 2035 plus Project (Buildout) turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions scenario are provided in Appendix L. Table XIII presents a summary of the Cumulative Year 2035 plus Project (Buildout) peak hour LOS at the study intersections.

Under this scenario, the intersections of Mooney Boulevard and Prosperity Avenue, Mooney Boulevard and Cross Avenue, Mooney Boulevard and Tulare Avenue, and Morrison Street and Tulare Avenue are projected to exceed their acceptable LOS threshold during one or both peak periods. To improve the LOS of the intersections projected to exceed their LOS, it is recommended that the following improvements be implemented.

- Mooney Boulevard / Prosperity Avenue
 - Modify the southbound through-right lane to a through lane;
 - Add a southbound right-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Mooney Boulevard / Cross Avenue
 - Modify the eastbound left-right lane to a left-turn lane;
 - Add an eastbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.
- Mooney Boulevard / Seminole Avenue
 - Modify the westbound left-right lane to a left-turn lane;
 - Add a westbound right-turn lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

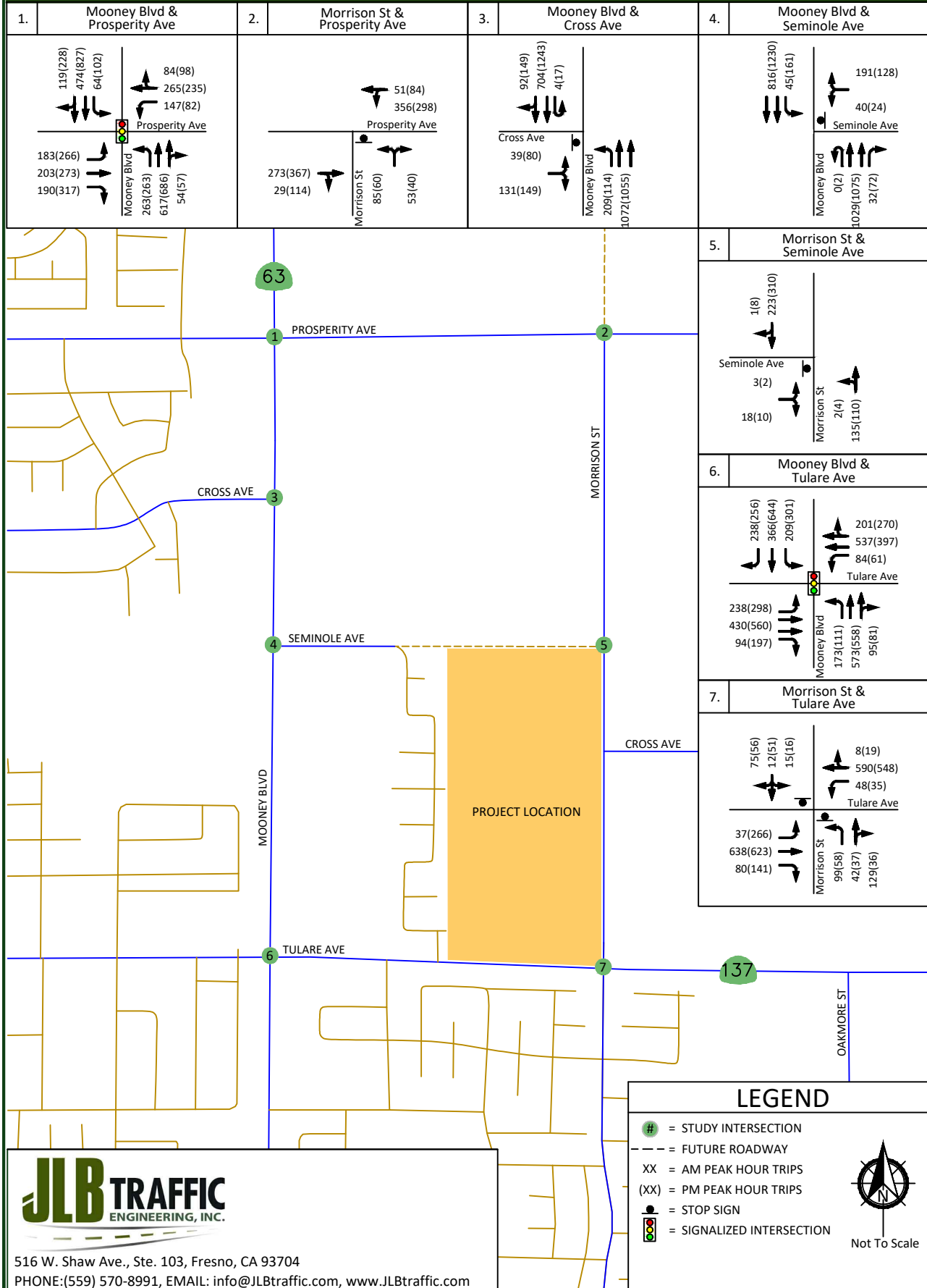
- Mooney Boulevard / Tulare Avenue
 - Add a second eastbound left-turn lane; and
 - Modify the traffic signal to accommodate the added lane.
- Morrison Street / Tulare Avenue
 - Add a southbound left-turn lane;
 - Modify the southbound left-through-right lane to a through-right lane; and
 - Signalize the intersection with protective left-turn phasing in all directions.

Table XIII: Cumulative Year 2035 plus Project (Buildout) Intersection LOS Results

ID	Intersection	Intersection Control	AM (7-9) Peak Hour		PM (4-6) Peak Hour	
			Average Delay (sec/veh)	LOS	Average Delay (sec/veh)	LOS
1	Mooney Boulevard / Prosperity Avenue	Signalized	50.3	D	67.6	E
		Signalized (Mitigated)	42.8	D	52.0	D
2	Morrison Street / Prosperity Avenue	One-Way Stop	52.6	F	44.5	E
		One-Way Stop (Mitigated)	26.1	D	22.0	C
3	Mooney Boulevard / Cross Avenue	One-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	8.7	A	10.7	B
4	Mooney Boulevard / Seminole Avenue	One-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	9.1	A	10.7	B
5	Morrison Street / Seminole Avenue	One-Way Stop	10.0	B	10.6	B
6	Mooney Boulevard / Tulare Avenue	Signalized	60.2	E	66.9	E
		Signalized (Mitigated)	41.2	D	44.7	D
7	Morrison Street / Tulare Avenue	Two-Way Stop	>120.0	F	>120.0	F
		Signalized (Mitigated)	41.4	D	22.5	C

Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

Cumulative Year 2035 plus Project (Buildout) - Traffic Volumes, Geometrics and Controls



JLB TRAFFIC
ENGINEERING, INC.

516 W. Shaw Ave., Ste. 103, Fresno, CA 93704

PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Queuing Analysis

Table XIV provides a queue length summary for left-turn and right-turn lanes at the study intersections under all study scenarios. The queuing analyses for the study intersections are contained in the LOS worksheets for the respective scenarios. Appendix D contains the methodologies used to evaluate these intersections.

Queuing analyses were completed using Sim Traffic output information. Synchro provides both 50th and 95th percentile maximum queue lengths (in feet). According to the Synchro manual, “the 50th percentile maximum queue is the maximum back of queue on a typical cycle and the 95th percentile queue is the maximum back of queue with 95th percentile volumes.” The queues shown on Table XIV are the 95th percentile queue lengths for the respective lane movements.

The Highway Design Manual (HDM) provides guidance for determining deceleration lengths for the left-turn and right-turn lanes based on design speeds. Per the HDM criteria, “tapers for right-turn lanes are usually un-necessary since the main line traffic need not be shifted laterally to provide space for the right-turn lane. If, in some rare instances, a lateral shift were needed, the approach taper would use the same formula as for a left-turn lane.” Therefore, a bay taper length pursuant to the Caltrans HDM would need to be added, as necessary, to the recommended storage lengths presented in Table XIV.

The storage capacity for the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions shall be based on the SimTraffic output files and engineering judgement. The values in bold presented in Table XIV are the projected queue lengths that will likely need to be accommodated by the Cumulative Year 2035 plus Project (Buildout) Traffic Conditions scenario. At the remaining approaches of the study intersections, the existing storage capacity will be sufficient to accommodate the maximum queue.

Table XIV: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project (Phase I)		Existing plus Project (Phase I & II)		Existing plus Project (Phase I, II & III)	
				AM	PM	AM	PM	AM	PM	AM	PM
1	Mooney Boulevard / Prosperity Avenue	EB Left	480	184	315	167	246	146	243	150	444
		EB Thru	>500	136	152	146	195	169	201	146	376
		EB Right	>300	62	116	62	74	49	100	78	115
		WB Left	140	116	94	144	123	153	170	108	150
		WB Thru-Right	>500	176	187	187	218	232	312	188	288
		NB Left	350	199	211	204	218	203	343	169	301
		NB Thru	>500	129	165	142	147	177	210	170	195
		NB Thru-Right	>500	146	188	158	164	170	234	183	201
		SB Left	475	58	63	50	86	67	90	63	109
		SB Thru	>500	123	239	117	242	125	321	142	277
		SB Thru	*	*	*	*	*	*	*	*	*
		SB Thru-Right	>500	138	258	132	251	128	344	170	295
		SB Right	*	*	*	*	*	*	*	*	*
2	Morrison Street / Prosperity Avenue	EB Thru-Right	>500	0	0	0	0	0	26	0	22
		WB Left-Thru	>500	61	57	73	81	68	64	70	98
		NB Left	*	*	*	*	*	52	51	57	52
		NB Left-Right	>500	43	37	56	47	*	*	*	*
		NB Right	*	*	*	*	*	56	34	40	37
3	Mooney Boulevard / Cross Avenue	EB Left	>500	50	57	41	76	48	84	72	67
		EB Right	*	56	69	71	63	52	66	75	58
		NB U-Left	500	146	103	141	93	107	148	193	125
		NB Thru	>500	80	53	71	54	55	66	83	105
		NB Thru	>500	84	61	76	79	62	73	85	87
		SB U-Turn	315	18	30	28	41	16	29	18	41
		SB Thru	>500	148	154	149	207	119	164	155	155
		SB Thru-Right	>500	117	141	133	194	111	174	155	164

Note: * = Does not exist or is not projected to exist

Table XIV: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing plus Project (Buildout)		Near Term plus Project (Buildout)		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project (Buildout)	
				AM	PM	AM	PM	AM	PM	AM	PM
1	Mooney Boulevard / Prosperity Avenue	EB Left	480	147	233	207	439	244	605	216	319
		EB Thru	>500	134	228	168	245	169	560	180	170
		EB Right	>300	65	108	64	159	78	195	68	177
		WB Left	140	104	149	244	170	208	150	196	167
		WB Thru-Right	>500	210	408	436	320	328	407	298	286
		NB Left	350	193	328	386	413	379	320	248	481
		NB Thru	>500	173	220	329	408	248	322	212	542
		NB Thru-Right	>500	188	228	257	361	263	328	219	387
		SB Left	475	51	115	81	122	89	109	102	124
		SB Thru	>500	152	324	170	367	196	360	166	291
		SB Thru	*	*	*	*	361	202	349	143	279
		SB Thru-Right	>500	153	315	151	*	*	*	*	*
		SB Right	*	*	*	*	158	60	204	60	85
2	Morrison Street / Prosperity Avenue	EB Thru-Right	>500	0	10	0	18	0	7	0	18
		WB Left-Thru	>500	72	108	91	105	86	85	93	86
		NB Left	*	61	66	72	62	*	*	70	48
		NB Left-Right	>500	*	*	*	*	86	58	*	*
		NB Right	*	53	41	46	40	*	*	39	54
3	Mooney Boulevard / Cross Avenue	EB Left	>500	55	81	81	101	78	107	60	106
		EB Right	*	63	52	60	74	64	57	81	58
		NB U-Left	500	177	124	223	159	213	136	177	128
		NB Thru	>500	50	134	83	124	91	106	72	141
		NB Thru	>500	51	111	95	116	100	99	83	130
		SB U-Turn	315	17	51	15	33	22	36	0	44
		SB Thru	>500	156	138	196	318	122	356	138	303
		SB Thru-Right	>500	148	143	171	300	128	199	131	241

Note: * = Does not exist or is not projected to exist

Table XIV: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project (Phase I)		Existing plus Project (Phase I & II)		Existing plus Project (Phase I, II & III)	
				AM	PM	AM	PM	AM	PM	AM	PM
4	Mooney Boulevard / Seminole Avenue	WB Left	*	*	*	*	*	*	*	*	*
		WB Left-Right	*	*	*	69	69	80	71	77	54
		WB Right	>300	50	52	*	*	*	*	*	*
		NB U-Turn	320	0	0	0	12	0	11	0	0
		NB Thru	>500	0	0	0	0	0	0	0	0
		NB Thru	>500	0	0	0	0	0	0	0	0
		NB Right	170	0	0	0	0	0	0	0	6
		SB Left	450	33	63	33	81	32	72	41	92
		SB Thru	>500	0	0	0	0	0	0	0	0
		SB Thru	>500	0	0	0	0	0	0	0	0
5	Morrison Street / Seminole Avenue	EB Left-Right	*	*	*	*	*	*	*	*	*
		NB Left-Thru	*	*	*	*	*	*	*	*	*
		SB Thru-Right	*	*	*	*	*	*	*	*	*
6	Mooney Boulevard / Tulare Avenue	EB Left	415	198	358	480	210	196	638	238	334
		EB Dual Lefts	*	*	*	*	*	*	*	*	*
		EB Thru	>500	245	371	374	291	275	1125	268	407
		EB Thru	>500	16	102	148	142	15	1160	85	192
		EB Right	175	59	78	55	101	54	149	50	129
		WB Left	85	111	78	112	87	139	126	130	136
		WB Thru	>500	186	159	218	160	194	216	217	208
		WB Thru-Right	>500	224	221	269	232	226	291	254	260
		NB Left	80	172	161	168	157	175	159	158	150
		NB Thru	>500	269	209	262	229	287	227	274	209
		NB Thru-Right	>500	233	186	227	203	234	198	240	198
		SB Left	470	190	261	188	247	169	703	194	301
		SB Thru	>500	219	479	232	312	274	1520	272	432
		SB Right	>300	64	55	78	74	58	381	102	79

Note: * = Does not exist or is not projected to exist

Table XIV: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing plus Project (Buildout)		Near Term plus Project (Buildout)		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project (Buildout)	
				AM	PM	AM	PM	AM	PM	AM	PM
4	Mooney Boulevard / Seminole Avenue	WB Left	*	48	42	99	83	89	64	76	81
		WB Left-Right	*	*	*	*	*	*	*	*	*
		WB Right	>300	84	47	102	86	98	76	92	68
		NB U-Turn	320	0	12	0	8	0	22	0	0
		NB Thru	>500	155	128	124	262	160	267	193	210
		NB Thru	>500	139	125	122	253	147	275	166	213
		NB Right	170	28	19	22	124	19	55	27	35
		SB Left	450	57	184	54	201	87	192	49	195
		SB Thru	>500	95	118	112	152	60	215	114	170
		SB Thru	>500	62	79	80	135	51	149	107	147
5	Morrison Street / Seminole Avenue	EB Left-Right	*	24	10	42	40	*	*	41	36
		NB Left-Thru	*	0	8	0	17	*	*	8	8
		SB Thru-Right	*	0	0	0	0	*	*	0	0
6	Mooney Boulevard / Tulare Avenue	EB Left	415	287	358	*	*	*	*	*	*
		EB Dual Lefts	*	*	*	148	486	147	391	126	232
		EB Thru	>500	275	395	329	720	319	681	291	482
		EB Thru	>500	76	228	93	583	111	608	90	392
		EB Right	175	88	102	62	153	118	190	92	172
		WB Left	85	105	133	158	110	205	133	156	127
		WB Thru	>500	198	225	247	262	291	227	271	239
		WB Thru-Right	>500	233	292	287	319	326	331	323	323
		NB Left	80	150	155	170	161	165	178	174	172
		NB Thru	>500	280	305	303	298	351	322	373	341
		NB Thru-Right	>500	238	245	254	290	318	279	352	301
		SB Left	470	283	477	229	527	294	312	256	473
		SB Thru	>500	268	410	283	581	214	572	251	535
		SB Right	>300	79	84	110	88	97	66	110	89

Note: * = Does not exist or is not projected to exist

Table XIV: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project (Phase I)		Existing plus Project (Phase I & II)		Existing plus Project (Phase I, II & III)	
				AM	PM	AM	PM	AM	PM	AM	PM
7	Morrison Street / Tulare Avenue	EB Left	300	46	46	54	49	59	77	53	64
		EB Thru	>500	257	210	193	192	294	135	309	102
		EB Right	>300	33	39	25	42	43	31	33	38
		WB Left	300	60	58	64	47	63	54	66	49
		WB Thru-Right	>500	200	151	216	157	199	211	207	200
		NB Left	120	90	61	80	57	66	66	75	71
		NB Thru-Right	>500	95	48	76	36	70	64	76	63
		SB Left	*	23	30	26	26	31	41	30	38
		SB Thru-Right	>500	48	78	40	78	43	127	46	132

Note: * = Does not exist or is not projected to exist

Table XIV: Queuing Analysis (cont.)

ID	Intersection	Existing Queue Storage Length (ft.)		Existing plus Project (Buildout)		Near Term plus Project (Buildout)		Cumulative Year 2035 No Project		Cumulative Year 2035 plus Project (Buildout)	
				AM	PM	AM	PM	AM	PM	AM	PM
7	Morrison Street / Tulare Avenue	EB Left	300	47	98	62	89	160	90	58	91
		EB Thru	>500	311	138	309	157	293	214	270	192
		EB Right	>300	40	32	39	34	45	55	36	33
		WB Left	300	59	61	78	72	78	73	97	73
		WB Thru-Right	>500	213	205	229	213	199	274	214	211
		NB Left	120	78	74	132	81	131	84	139	67
		NB Thru-Right	>500	76	72	158	88	132	72	158	89
		SB Left	*	37	38	37	30	41	41	37	37
		SB Thru-Right	>500	53	131	91	142	69	126	68	132

Note: * = Does not exist or is not projected to exist

Study Participants

JLB Traffic Engineering, Inc. Personnel:

Jose Luis Benavides, PE, TE	Project Manager
Susana Maciel, EIT	Project Engineer
Matthew Arndt, EIT	Engineer I/II
Javier Rios	Engineer I/II
Jove Alcazar, EIT	Engineer I/II
Dennis Wynn	Sr. Engineering Technician
Jesus Garcia	Engineering Aide
Adrian Benavides	Engineering Aide
Justin Barnett	Engineering Aide

Persons Consulted:

Jose Lemus	Land Design Consulting
Michael Miller	City of Tulare
Hector Guerra	County of Tulare
David Deel	Caltrans
Derek Winning	Tulare County Association of Governments

References

1. City of Tulare, *2035 General Plan*.
2. County of Tulare, *2035 General Plan*.
3. *Guide for the Preparation of Traffic Impact Studies*, Caltrans, dated December 2002.
4. *Trip Generation*, 10th Edition, Washington D.C., Institute of Transportation Engineers, 2017.
5. *2014 California Manual on Uniform Traffic Control Devices*, Caltrans, November 7, 2014.
6. Transportation Concept Report, State Route 63, Caltrans, District 06, dated December 2014.
7. Transportation Concept Report, State Route 137, Caltrans, District 06, dated October 2011.

Appendix A: Scope of Work



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Page | A

June 17, 2019

Michael W. Miller, PE
City Engineer
City of Tulare
411 East Kern Avenue
Tulare, CA 93274

Via E-mail Only: mmiller@tulare.ca.gov

Subject: *Proposed Scope of Work for the Preparation of a Traffic Impact Analysis for the Farrar Estates located on the Northwest Corner of Morrison Street and Tulare Avenue in the City of Tulare (JLB Project 037-004)*

Dear Mr. Miller,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Farrar Estates (Project) located on the northwest corner of Morrison Street and Tulare Avenue in the City of Tulare. The Project proposes to build a 355-unit single-family subdivision on 76.5 gross acres. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. An aerial of the Project vicinity and Project site plan are shown in Exhibits A and Exhibit B, respectively.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures and identify any critical traffic issues that should be addressed in the on-going planning process. To evaluate the on-site and off-site traffic impacts of the proposed Project, JLB proposes the following Scope of Work.

Scope of Work

- JLB will request from the Tulare County Association of Governments (Tulare CAG) traffic forecast model runs for the Base Year 2019 and Cumulative Year 2035 scenarios. The Tulare CAG traffic forecasting model will be used to forecast traffic volumes for the Base Year 2019 and Cumulative Year 2035 scenarios.
- JLB will obtain recent (less than 12 months) or schedule and conduct new traffic counts at the study facility(ies) as necessary. These counts will include pedestrians and vehicles.
- JLB will perform a site visit to observe existing traffic conditions, especially during the AM and PM peak hours. Existing roadway conditions including intersection geometrics and traffic controls will be verified.
- JLB will evaluate onsite and offsite circulation and provide recommendations as necessary to improve circulation to and within the Project site. Particular attention will be paid to conflicting traffic movements and the location of local roadways to the major streets.
- JLB will prepare California Manual on Uniform Traffic Control Devices (CA MUTCD) Warrant 3 "Peak Hour" for unsignalized study intersections under all study scenarios.



Traffic Engineering, Transportation Planning, & Parking Solutions

Traffic Engineering, Inc.

www.JLBtraffic.com

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991

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- JLB will qualitatively analyze existing and planned transit routes in the vicinity of the Project.
- JLB will qualitatively analyze existing and planned bikeways in the vicinity of the Project.
- JLB will forecast trip distribution based on turn count information and knowledge of the existing and planned circulation network in the vicinity of the Project.
- JLB will evaluate existing and forecasted levels of service (LOS) at the study intersection(s). JLB will use HCM 6th or HCM 2000 methodologies (as appropriate) within Synchro to perform this analysis for the AM and PM peak hours. JLB will identify the causes of poor LOS.

Study Scenarios

1. Existing Traffic Conditions with needed improvements (if any);
2. Existing plus Project Traffic Conditions with proposed mitigation measures (if any);
3. Near Term plus Project Traffic Conditions with proposed mitigation measures (if any);
4. Cumulative Year 2035 No Project Traffic Conditions with proposed mitigation measures (if any); and
5. Cumulative Year 2035 plus Project Traffic Conditions with proposed mitigation measures (if any).

Weekday peak hours to be analyzed (Tuesday through Thursday only)

1. 7 - 9 AM peak hour
2. 4 - 6 PM peak hour

Study Intersections

1. Morrison Street / Prosperity Avenue
2. Mooney Boulevard (State Route 63) / Seminole Avenue
3. Morrison Street / Seminole Avenue (future roundabout)
4. Morrison Street / Tulare Avenue (State Route 137)

Queuing analysis is included in the proposed Scope of Work for the study intersection(s) listed above under all study scenarios. This analysis will be utilized to recommend minimum storage lengths for left-turn and right-turn lanes at all study intersections.

Study Segments

1. None

Project Only Trip Assignment to State Facilities

1. None

Project Trip Generation

The trip generation rates for the proposed Project were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table I presents the trip generation for the proposed Project with trip generation rates for Single-Family Detached Housing. At buildout, the proposed Project is estimated to generate a maximum of 3,351 daily trips, 263 AM peak hour trips and 351 PM peak hour trips.



Table I: Project Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	355	d.u.	9.44	3,351	0.74	25	75	66	197	263	0.99	63	37	221	130	351
Total Project Trips				3,351				66	197	263				221	130	351

Note: d.u. = Dwelling Units

Near Term Projects to be Included

Based on our local knowledge of the study area and consultation with City of Tulare Planning & Development staff, JLB proposes to include near term projects in the vicinity of the proposed Project under the Near Term plus Project scenario. The near term projects proposed to be included in the Near Term scenario are:

<u>Project Name</u>	<u>General Location</u>
1. Oak Tree Estates	SEQ J Street and Cartmill Avenue
2. Eastgate Hotel	SEQ M Street and Cartmill Avenue
3. Bethel/Harmony Development Project	SWC Retherford Street and Cartmill Avenue
4. Senior Living	NWQ Retherford Street and Leland Avenue
5. Tulare Apartments	SWQ Blackstone Street and Cartmill Avenue
6. Commercial Development	NWC Blackstone Street and Corvina Avenue
7. Ventana	SWQ Blackstone Street and Corvina Avenue
8. Altura Centers for Health	NEC Cartmill Avenue and Hillman Street
9. Kensington Estates	NEC De La Vina Street and Cartmill Avenue
10. Willow Glen	NWC Mooney Boulevard and Cartmill Avenue
11. Tesori	NWC Mooney Boulevard and Bella Oaks Drive
12. Apartments	SWQ Mooney Boulevard and Bella Oaks Drive
13. Liberty Hill	NWC West Street and Bardsley Avenue

Other Near Term Projects the City, County or Caltrans has knowledge and for which it is anticipated that said project(s) is/are projected to be whole or partially built by the Near Term Project Year 2021. City of Tulare, County of Tulare and Caltrans as appropriate would provide JLB with project details such as a project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.



Mr. Miller
Farrar Estates TIA - Draft Scope of Work
June 17, 2019

The Scope of Work is based on our understanding of this Project and our experience with similar TIAs. In the absence of comments by July 8, 2019 it will be assumed that the Scope of Work is acceptable to the agency(ies) that have not submitted any comments. If you have any questions or require additional information, please contact me by phone at (559) 317-6245 or by e-mail at jrios@JLBtraffic.com.

Sincerely,



Javier Rios
Engineer I/II

cc: Hector Guerra, County of Tulare
David Deel, Caltrans District 6
Jose Benavides, JLB Traffic Engineering, Inc.

Z:\01 Projects\037 Tulare\037-004 Farrar Estates TIA\DSOW\L06172019 Draft Scope of Work.docx



Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

www.JLBtraffic.com

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

(559) 570-8991

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Exhibit A – Aerial

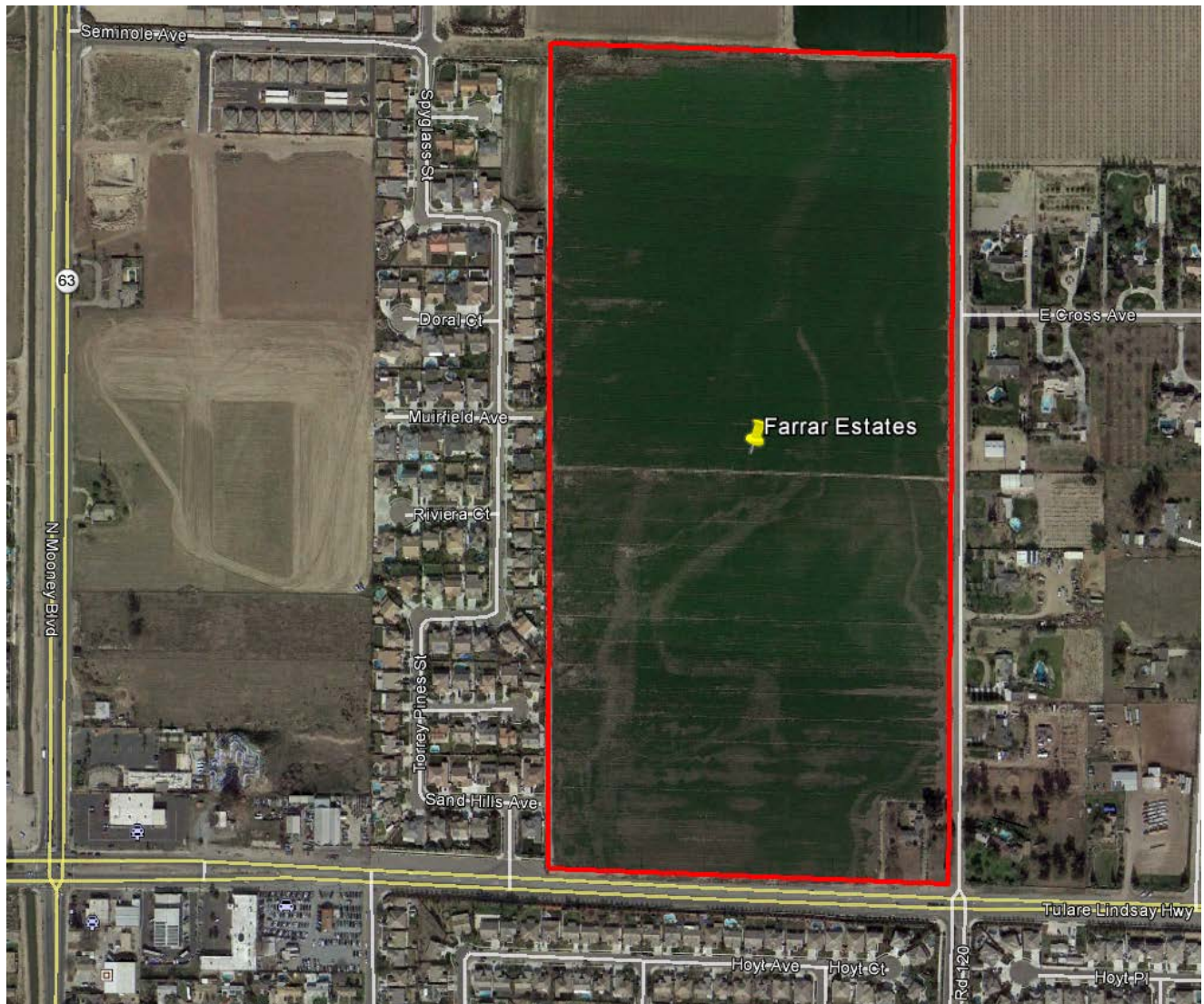
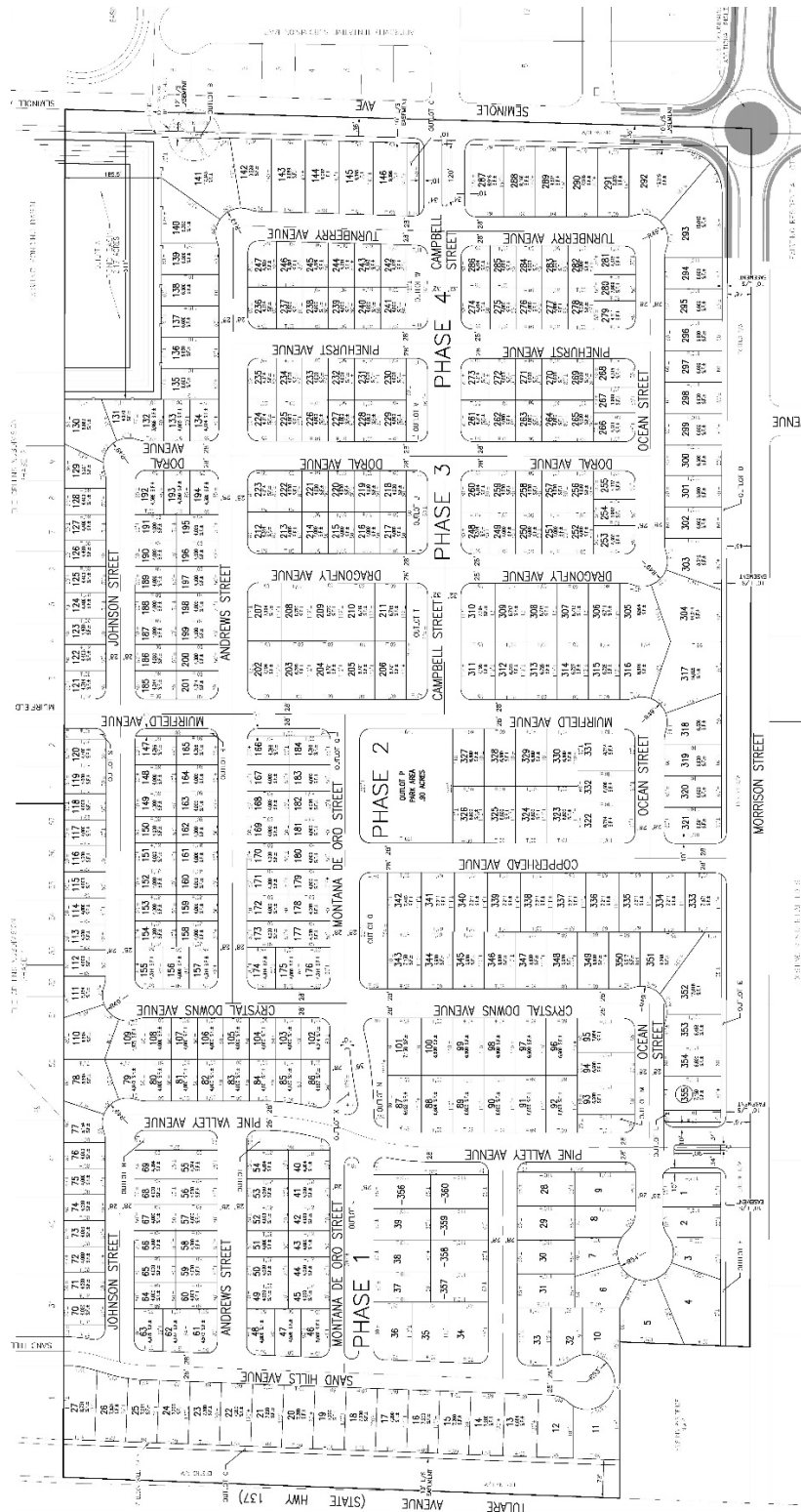


Exhibit B – Project Site Plan



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www.JLBtraffic.com

info@JLBtraffic.com

1300 E. Shaw Ave., Ste. 103

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Page | 6

Jose Benavides

From: Deel, David@DOT <david.deel@dot.ca.gov>
Sent: Friday, June 28, 2019 4:23 PM
To: Javier Rios; mmiller@tulare.ca.gov
Cc: hguerra@co.tulare.ca.us; Jose Benavides; Navarro, Michael@DOT; Wu, Caleb J@DOT
Subject: RE: TIA Draft Scope of Work - JLB Project 037-004

Javier –

Caltrans has complete review of the TIA Scope and provides the following comments:

1. Please add the following intersections to the study:
 - a. SR 137/SR 63 (Mooney) and
 - b. SR 63/Cross Ave

Caltrans looks forward to reviewing the TIA once completed.

Thanks,

DAVID DEEL | 559.488.7396 | CALTRANS D6

From: Javier Rios <jrios@jlbtraffic.com>
Sent: Monday, June 17, 2019 4:37 PM
To: mmiller@tulare.ca.gov
Cc: hguerra@co.tulare.ca.us; Deel, David@DOT <david.deel@dot.ca.gov>; Jose Benavides <jbenavides@jlbtraffic.com>
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Good afternoon,

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We kindly ask that you take a moment to review and comment on the proposed Scope of Work. In the absence of comments by July 8, 2019 it will be assumed that the proposed Scope of Work is acceptable to the agency(ies) that have not submitted any comments.

If you have any questions or require additional information, please contact us at (559) 570-8991 or by e-mail. We sincerely appreciate your time and attention to this matter and look forward to hearing from all of you soon. Thanks.

Sincerely,

Javier Rios,
Engineer I/II



Traffic Engineering, Transportation Planning and Parking Solutions

Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103

Fresno, CA 93710

Direct: (559) 317-6245

Office: (559) 570-8991

www.JLBtraffic.com

Javier Rios

From: Hector Guerra <HGuerra@co.tulare.ca.us>
Sent: Wednesday, July 10, 2019 9:15 AM
To: Javier Rios
Subject: RE: TIA Draft Scope of Work - JLB Project 037-004

Javier,

The County has no comments at this time. Please forward us the draft TIS when it is available.

Best Regards,

Hector

>>> Javier Rios <jrios@jlbtraffic.com> 7/10/2019 8:34 AM >>>
Good morning,

Just wanted to follow up with you all regarding the TIA Draft Scope of Work for the Farrar Estates Project in the City of Tulare. We have yet to hear back from the City or County. As mentioned before, in the absence of comments by July 8, 2019 it will be assumed that the proposed Scope of Work is acceptable to the agency(ies) that have not submitted any comments.

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Sincerely,

Javier Rios,
Engineer I/II

[JLB Logo]

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www.JLBtraffic.com<[https://urldefense.proofpoint.com/v2/url?u=http-](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.jlbtraffic.com_d=DwIFAg&c=LIH32oy6OBtmot7tcUOx1EUIJYTUxwihlBYC0z2BYZI&r=1WHtYLC0_7PCM87OJlia18ttu1KXtfBnui-D4wkj21l&m=0cVjIUpJMkIYAH4xh4qGkyo7d0mEbGW1Ac6rCI0oZg4&s=NI1obFftJAUn96en-mkJOM4YFzbu60xf9S-m3qZAQnQ&e=)

[3A__www.jlbtraffic.com_d=DwIFAg&c=LIH32oy6OBtmot7tcUOx1EUIJYTUxwihlBYC0z2BYZI&r=1WHtYLC0_7PCM87OJlia18ttu1KXtfBnui-D4wkj21l&m=0cVjIUpJMkIYAH4xh4qGkyo7d0mEbGW1Ac6rCI0oZg4&s=NI1obFftJAUn96en-mkJOM4YFzbu60xf9S-m3qZAQnQ&e=](https://urldefense.proofpoint.com/v2/url?u=http-3A__www.jlbtraffic.com_d=DwIFAg&c=LIH32oy6OBtmot7tcUOx1EUIJYTUxwihlBYC0z2BYZI&r=1WHtYLC0_7PCM87OJlia18ttu1KXtfBnui-D4wkj21l&m=0cVjIUpJMkIYAH4xh4qGkyo7d0mEbGW1Ac6rCI0oZg4&s=NI1obFftJAUn96en-mkJOM4YFzbu60xf9S-m3qZAQnQ&e=)

>

From: Deel, David@DOT [mailto:david.deel@dot.ca.gov]
Sent: Friday, June 28, 2019 4:23 PM
To: Javier Rios <jrios@jlbtraffic.com>; mmiller@tulare.ca.gov

Cc: hguerra@co.tulare.ca.us; Jose Benavides <jbenavides@jlbtraffic.com>; Navarro, Michael@DOT <michael.navarro@dot.ca.gov>; Wu, Caleb J@DOT <caleb.wu@dot.ca.gov>
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1. Please add the following intersections to the study:

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- b. SR 63/Cross Ave

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Thanks,

DAVID DEEL | 559.488.7396<tel:559.488.7396> | CALTRANS D6

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Sincerely,

Javier Rios,
Engineer I/II

[JLB Logo]

Traffic Engineering, Transportation Planning and Parking Solutions Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710

Office: (559) 570-8991

>

Javier Rios

From: Javier Rios
Sent: Friday, July 12, 2019 8:58 AM
To: mmiller@tulare.ca.gov
Subject: RE: TIA Draft Scope of Work - JLB Project 037-004

Good morning,

Just wanted to follow up with you regarding the TIA Draft Scope of Work for the Farrar Estates Project in the City of Tulare. We have yet to hear back from the City.

If you have any questions or require additional information, please contact us at (559) 570-8991 or by e-mail. We sincerely appreciate your time and attention to this matter and look forward to hearing from you soon. Thanks.

Sincerely,

Javier Rios,
Engineer I/II



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Certified Disadvantaged Business Enterprise (DBE) and Small Business Enterprise (SBE)

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
Direct: (559) 317-6245
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www.JLBtraffic.com

From: Javier Rios
Sent: Wednesday, July 10, 2019 8:35 AM
To: mmiller@tulare.ca.gov
Cc: hguerra@co.tulare.ca.us
Subject: RE: TIA Draft Scope of Work - JLB Project 037-004

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1300 E. Shaw Ave., Ste. 103
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Direct: (559) 317-6245
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www.JLBtraffic.com

Appendix B: Traffic Counts



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991



Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION Prosperity Ave @ Mooney Blvd
COUNTY Tulare
COLLECTION DATE Tuesday, June 4, 2019

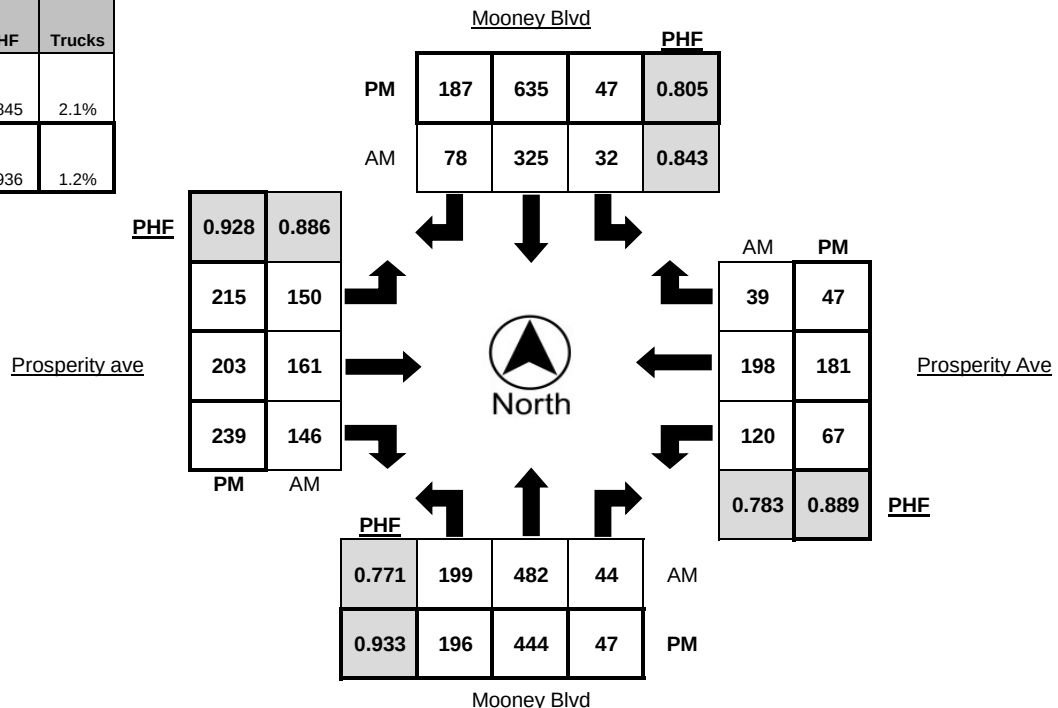
LATITUDE 36.2259
LONGITUDE -119.3130
WEATHER Clear

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	18	75	5	0	3	63	10	1	13	23	34	1	10	18	8	2
7:15 AM - 7:30 AM	32	113	8	6	6	76	13	0	16	38	28	2	8	29	10	3
7:30 AM - 7:45 AM	45	135	7	5	8	83	17	2	44	36	36	1	32	38	11	1
7:45 AM - 8:00 AM	53	164	18	6	8	98	23	5	39	53	37	2	27	51	13	1
8:00 AM - 8:15 AM	57	88	12	5	10	81	18	3	34	45	40	0	35	69	10	0
8:15 AM - 8:30 AM	44	95	7	5	6	63	20	2	33	27	33	1	26	40	5	2
8:30 AM - 8:45 AM	48	90	4	8	7	53	14	6	30	34	32	1	10	25	8	0
8:45 AM - 9:00 AM	43	70	6	4	7	61	15	7	33	25	33	2	19	24	11	0
TOTAL	340	830	67	39	55	578	130	26	242	281	273	10	167	294	76	9

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	36	105	11	5	17	129	41	4	45	45	60	1	23	37	8	3
4:15 PM - 4:30 PM	41	114	9	7	10	149	33	0	47	41	39	3	14	51	10	2
4:30 PM - 4:45 PM	51	111	9	4	12	145	46	5	54	52	58	1	8	39	16	3
4:45 PM - 5:00 PM	51	118	15	4	9	144	47	0	39	57	57	2	29	47	7	1
5:00 PM - 5:15 PM	51	102	15	3	14	140	42	0	72	48	57	2	14	49	13	0
5:15 PM - 5:30 PM	43	113	8	2	12	206	52	2	50	46	67	1	16	46	11	0
5:30 PM - 5:45 PM	61	116	9	2	7	144	38	3	52	40	57	1	20	32	3	0
5:45 PM - 6:00 PM	48	128	6	3	12	159	39	1	35	38	74	2	16	39	6	0
TOTAL	382	907	82	30	93	1216	338	15	394	367	469	13	140	340	74	9

PEAK HOUR	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	199	482	44	21	32	325	78	12	150	161	146	4	120	198	39	4
4:30 PM - 5:30 PM	196	444	47	13	47	635	187	7	215	203	239	6	67	181	47	4

	PHF	Trucks
AM	0.845	2.1%
PM	0.936	1.2%



Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION Prosperity Ave @ Mooney Blvd

LATITUDE 36.2259

COUNTY Tulare

LONGITUDE -119.3130

COLLECTION DATE Tuesday, June 4, 2019

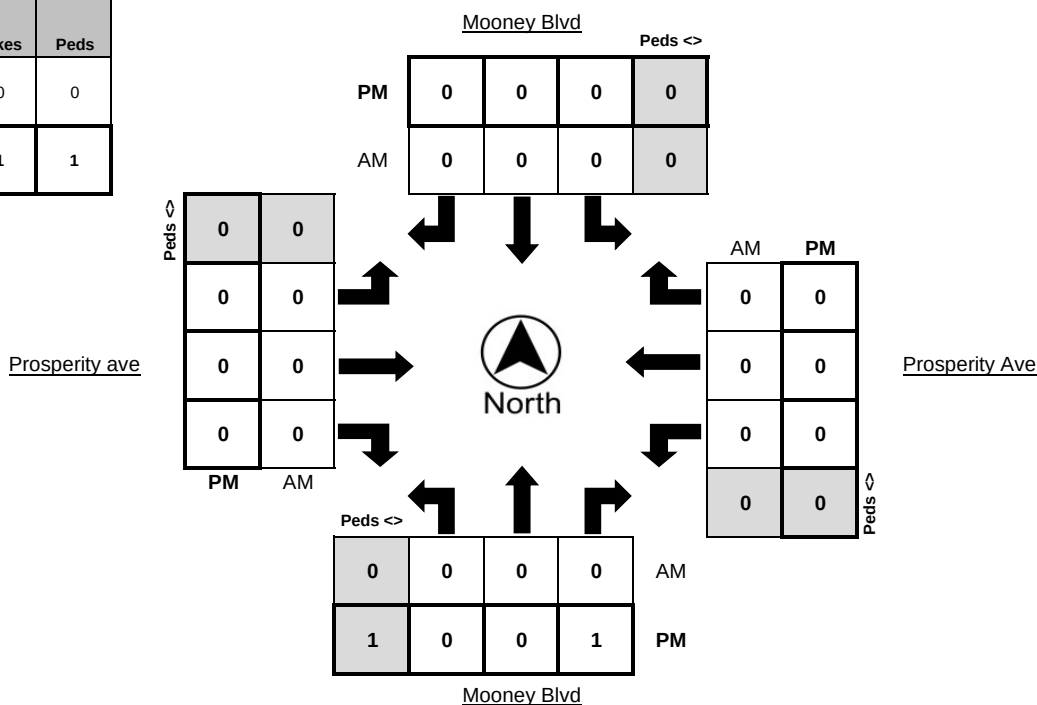
WEATHER Clear

[illegible]

	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
Time	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0

	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
PEAK HOUR	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 5:30 PM	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	1	1





Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION _____ Prosperity Ave @ Morrison St

LATITUDE _____ 36.2260

COUNTY _____ Tulare

LONGITUDE _____ -119.3033

COLLECTION DATE _____ Tuesday, June 4, 2019

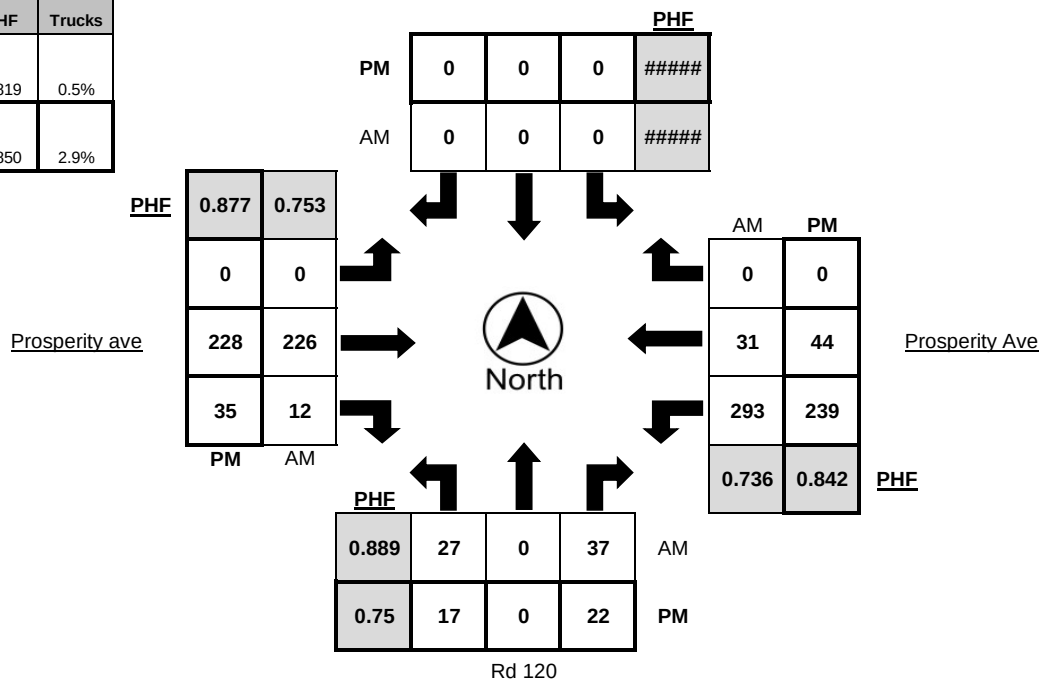
WEATHER _____ Clear

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	3	0	9	0	0	0	0	0	0	28	2	0	29	4	0	1
7:15 AM - 7:30 AM	5	0	8	0	0	0	0	0	0	42	3	0	40	3	0	0
7:30 AM - 7:45 AM	7	0	10	1	0	0	0	0	0	49	4	0	65	10	0	0
7:45 AM - 8:00 AM	5	0	11	0	0	0	0	0	0	78	1	1	89	7	0	0
8:00 AM - 8:15 AM	10	0	8	0	0	0	0	0	0	57	4	1	99	11	0	0
8:15 AM - 8:30 AM	6	0	5	0	0	0	0	0	0	26	9	1	52	3	0	1
8:30 AM - 8:45 AM	2	0	8	0	0	0	0	0	0	42	2	0	33	1	0	0
8:45 AM - 9:00 AM	7	0	7	1	0	0	0	0	0	31	2	0	37	3	0	0
TOTAL	45	0	66	2	0	0	0	0	0	353	27	3	444	42	0	2

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	0	3	0	0	0	0	0	0	62	10	2	65	7	0	2
4:15 PM - 4:30 PM	5	0	6	0	0	0	0	0	0	51	6	0	56	10	0	2
4:30 PM - 4:45 PM	5	0	6	2	0	0	0	0	0	50	9	3	49	12	0	3
4:45 PM - 5:00 PM	6	0	7	0	0	0	0	0	0	65	10	2	69	15	0	1
5:00 PM - 5:15 PM	5	0	6	0	0	0	0	0	0	58	5	1	44	5	0	0
5:15 PM - 5:30 PM	4	0	7	0	0	0	0	0	0	54	5	1	60	14	0	0
5:30 PM - 5:45 PM	8	0	6	0	0	0	0	0	0	55	4	2	39	11	0	1
5:45 PM - 6:00 PM	5	0	3	0	0	0	0	0	0	47	1	0	55	8	0	0
TOTAL	39	0	44	2	0	0	0	0	0	442	50	11	437	82	0	9

PEAK HOUR	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	27	0	37	1	0	0	0	0	0	226	12	2	293	31	0	0
4:00 PM - 5:00 PM	17	0	22	2	0	0	0	0	0	228	35	7	239	44	0	8

	PHF	Trucks
AM	0.819	0.5%
PM	0.850	2.9%





Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION Prosperity Ave @ Morrison St
COUNTY Tulare
COLLECTION DATE Tuesday, June 4, 2019

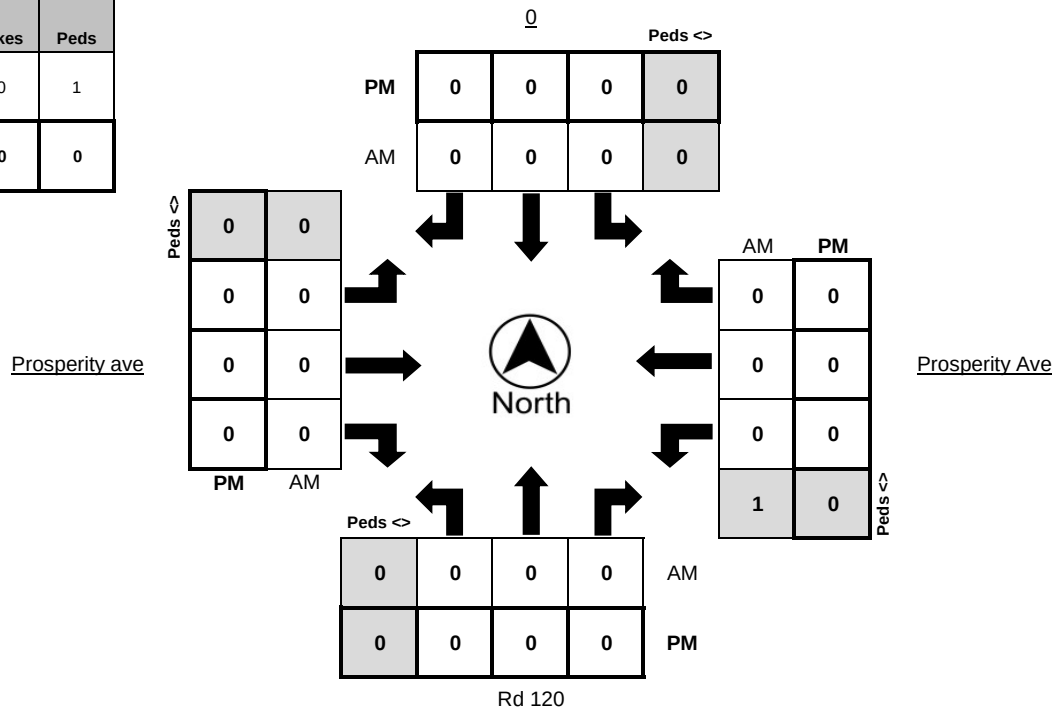
LATITUDE 36.2260
LONGITUDE -119.3033
WEATHER Clear

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Time	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

PEAK HOUR	Northbound Bikes			N.Leg Peds	Southbound Bikes			S.Leg Peds	Eastbound Bikes			E.Leg Peds	Westbound Bikes			W.Leg Peds
	Left	Thru	Right		Left	Thru	Right		Left	Thru	Right		Left	Thru	Right	
7:15 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
4:00 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	1
PM Peak Total	0	0



JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

(559) 570-8991

Traffic Engineering, Transportation Planning & Parking Solutions

www.JLBtraffic.com

File Name : Cross at Mooney

Site Code : 00000000

Start Date : 8/15/2019

Page No : 1

Groups Printed- Unshifted - Bank 2

	MOONEY Southbound				MOONEY Northbound			CROSS Eastbound			
Start Time	U-Turn	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds	Int. Total
07:00 AM	0	109	11	0	23	167	0	7	11	0	328
07:15 AM	0	109	18	0	42	225	0	8	17	0	419
07:30 AM	1	167	20	1	60	214	0	8	36	2	509
07:45 AM	0	140	31	0	42	207	0	11	27	0	458
Total	1	525	80	1	167	813	0	34	91	2	1714
08:00 AM	2	117	6	0	34	202	0	5	25	0	391
08:15 AM	0	113	12	0	14	185	0	9	14	1	348
08:30 AM	0	100	15	1	15	164	0	8	9	0	312
08:45 AM	1	81	18	0	7	101	0	7	18	0	233
Total	3	411	51	1	70	652	0	29	66	1	1284

04:00 PM	0	174	26	0	31	206	0	4	29	1	471
04:15 PM	1	190	18	0	24	209	0	18	22	0	482
04:30 PM	1	231	26	0	20	170	0	8	21	0	477
04:45 PM	2	221	31	0	20	184	0	11	24	0	493
Total	4	816	101	0	95	769	0	41	96	1	1923
05:00 PM	6	237	26	0	19	204	0	8	14	0	514
05:15 PM	4	290	33	0	31	198	0	11	23	0	590
05:30 PM	2	237	32	1	26	191	0	12	15	0	516
05:45 PM	1	223	23	0	29	170	0	7	29	0	482
Total	13	987	114	1	105	763	0	38	81	0	2102
Grand Total	21	2739	346	3	437	2997	0	142	334	4	7023
Apprch %	0.7	88.1	11.1	0.1	12.7	87.3	0	29.6	69.6	0.8	
Total %	0.3	39	4.9	0	6.2	42.7	0	2	4.8	0.1	
Unshifted	0	2738	346	3	412	2997	0	142	334	4	6976
% Unshifted	0	100	100	100	94.3	100	0	100	100	100	99.3
Bank 2	21	1	0	0	25	0	0	0	0	0	47
% Bank 2	100	0	0	0	5.7	0	0	0	0	0	0.7

JLB Traffic Engineering, Inc.

516 W. Shaw Ave., Ste. 103

Fresno, CA 93704

(559) 570-8991

Traffic Engineering, Transportation Planning & Parking Solutions

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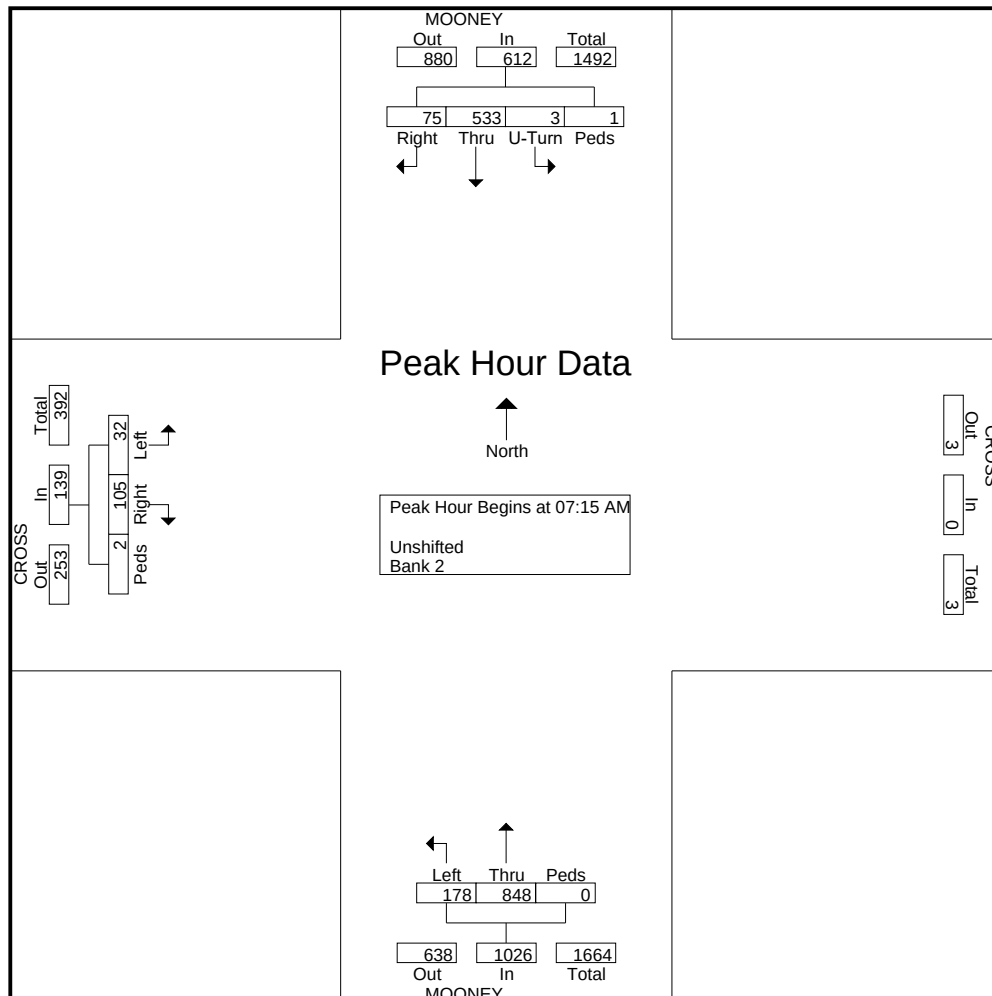
File Name : Cross at Mooney

Site Code : 00000000

Start Date : 8/15/2019

Page No : 2

	MOONEY Southbound					MOONEY Northbound				CROSS Eastbound				
Start Time	U-Turn	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1 Peak Hour for Entire Intersection Begins at 07:15 AM														
07:15 AM	0	109	18	0	127	42	225	0	267	8	17	0	25	419
07:30 AM	1	167	20	1	189	60	214	0	274	8	36	2	46	509
07:45 AM	0	140	31	0	171	42	207	0	249	11	27	0	38	458
08:00 AM	2	117	6	0	125	34	202	0	236	5	25	0	30	391
Total Volume	3	533	75	1	612	178	848	0	1026	32	105	2	139	1777
% App. Total	0.5	87.1	12.3	0.2		17.3	82.7	0		23	75.5	1.4		
PHF	.375	.798	.605	.250	.810	.742	.942	.000	.936	.727	.729	.250	.755	.873



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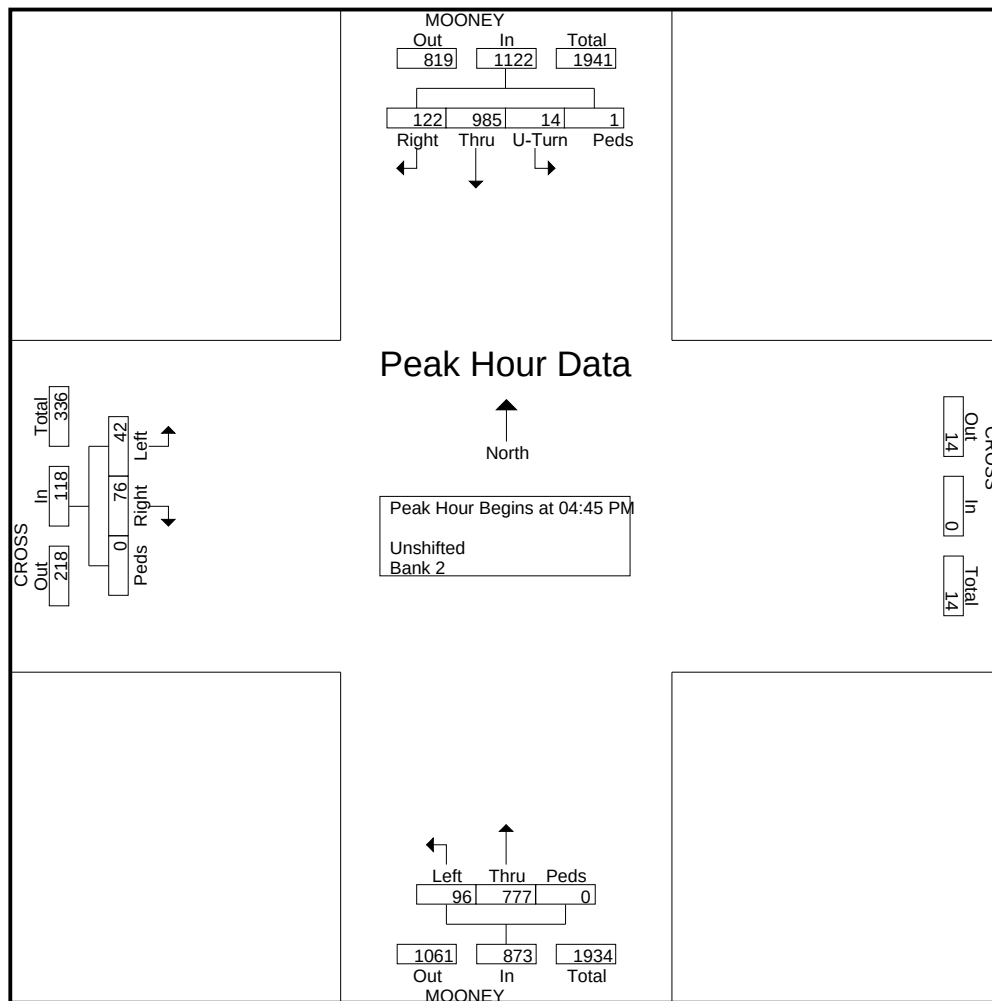
File Name : Cross at Mooney

Site Code : 00000000

Start Date : 8/15/2019

Page No : 3

	MOONEY Southbound					MOONEY Northbound				CROSS Eastbound				
Start Time	U-Turn	Thru	Right	Peds	App. Total	Left	Thru	Peds	App. Total	Left	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1 Peak														
Hour for Entire Intersection Begins at 04:45 PM														
04:45 PM	2	221	31	0	254	20	184	0	204	11	24	0	35	493
05:00 PM	6	237	26	0	269	19	204	0	223	8	14	0	22	514
05:15 PM	4	290	33	0	327	31	198	0	229	11	23	0	34	590
05:30 PM	2	237	32	1	272	26	191	0	217	12	15	0	27	516
Total Volume	14	985	122	1	1122	96	777	0	873	42	76	0	118	2113
% App. Total	1.2	87.8	10.9	0.1		11	89	0		35.6	64.4	0		
PHF	.583	.849	.924	.250	.858	.774	.952	.000	.953	.875	.792	.000	.843	.895



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File Name : Cross at Mooney

Site Code : 00000000

Start Date : 8/15/2019

Page No : 1

Groups Printed- Bank 2

	MOONEY Southbound				MOONEY Northbound			CROSS Eastbound			
Start Time	U-Turn	Thru	Right	Peds	U-Turn	Thru	Peds	Left	Right	Peds	Int. Total
07:00 AM	0	0	0	0	2	0	0	0	0	0	2
07:15 AM	0	0	0	0	3	0	0	0	0	0	3
07:30 AM	1	0	0	0	3	0	0	0	0	0	4
07:45 AM	0	0	0	0	1	0	0	0	0	0	1
Total	1	0	0	0	9	0	0	0	0	0	10
08:00 AM	2	0	0	0	2	0	0	0	0	0	4
08:15 AM	0	0	0	0	1	0	0	0	0	0	1

08:45 AM	1	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	3	0	0	0	0	0	6

04:00 PM	0	0	0	0	2	0	0	0	0	0	2
04:15 PM	1	0	0	0	2	0	0	0	0	0	3
04:30 PM	1	0	0	0	0	0	0	0	0	0	1
04:45 PM	2	0	0	0	1	0	0	0	0	0	3
Total	4	0	0	0	5	0	0	0	0	0	9
05:00 PM	6	0	0	0	0	0	0	0	0	0	6
05:15 PM	4	1	0	0	1	0	0	0	0	0	6
05:30 PM	2	0	0	0	3	0	0	0	0	0	5
05:45 PM	1	0	0	0	4	0	0	0	0	0	5
Total	13	1	0	0	8	0	0	0	0	0	22
Grand Total	21	1	0	0	25	0	0	0	0	0	47
Apprch %	95.5	4.5	0	0	100	0	0	0	0	0	
Total %	44.7	2.1	0	0	53.2	0	0	0	0	0	



Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION Seminole Ave @ Mooney Blvd
COUNTY Tulare
COLLECTION DATE Tuesday, June 4, 2019

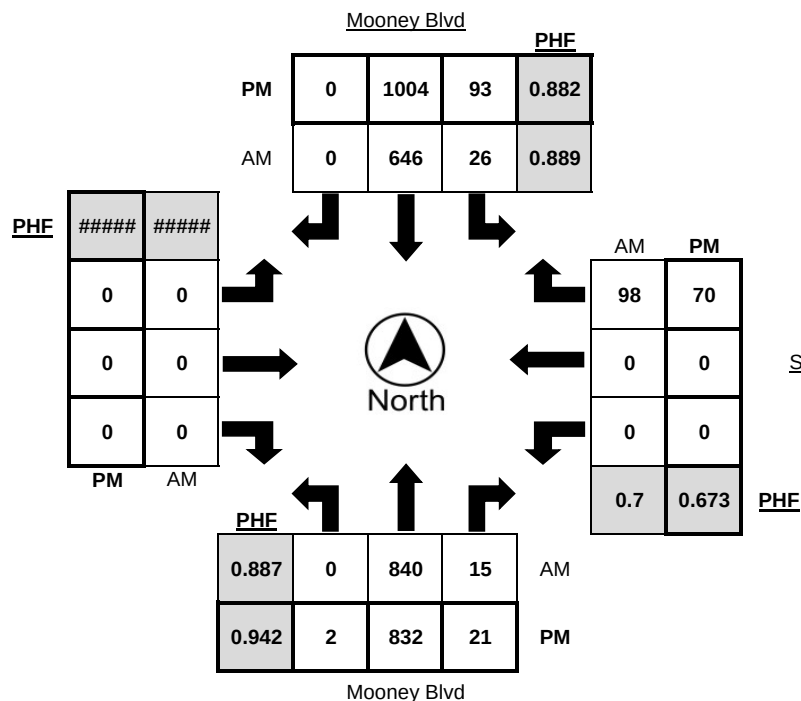
LATITUDE 36.2186
LONGITUDE -119.3130
WEATHER Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	0	97	2	4	5	101	0	5	0	0	0	0	0	0	19	0
7:15 AM - 7:30 AM	1	165	0	4	2	118	0	6	0	0	0	0	0	0	29	0
7:30 AM - 7:45 AM	0	200	4	4	2	169	0	9	0	0	0	0	0	0	29	0
7:45 AM - 8:00 AM	0	239	2	5	4	185	0	3	0	0	0	0	0	0	35	0
8:00 AM - 8:15 AM	0	204	4	7	12	161	0	1	0	0	0	0	0	0	21	0
8:15 AM - 8:30 AM	0	197	5	5	8	131	0	10	0	0	0	0	0	0	13	0
8:30 AM - 8:45 AM	0	149	3	7	1	108	0	9	0	0	0	0	0	0	13	1
8:45 AM - 9:00 AM	1	137	3	3	7	118	0	3	0	0	0	0	0	0	13	0
TOTAL	2	1388	23	39	41	1091	0	46	0	0	0	0	0	0	172	1

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	1	166	7	6	17	203	0	3	0	0	0	0	0	0	12	0
4:15 PM - 4:30 PM	1	187	4	5	21	212	0	0	0	0	0	0	0	0	12	0
4:30 PM - 4:45 PM	1	186	5	1	9	218	0	4	0	0	0	0	0	0	17	0
4:45 PM - 5:00 PM	1	199	4	7	22	212	0	0	0	0	0	0	0	0	14	0
5:00 PM - 5:15 PM	1	222	4	2	25	256	0	0	0	0	0	0	0	0	12	0
5:15 PM - 5:30 PM	0	201	5	4	23	288	0	0	0	0	0	0	0	0	26	0
5:30 PM - 5:45 PM	0	207	7	1	17	237	0	3	0	0	0	0	0	0	17	0
5:45 PM - 6:00 PM	1	202	5	2	28	223	0	2	0	0	0	0	0	0	15	0
TOTAL	6	1570	41	28	162	1849	0	12	0	0	0	0	0	0	125	0

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	0	840	15	21	26	646	0	23	0	0	0	0	0	0	98	0
5:00 PM - 6:00 PM	2	832	21	9	93	1004	0	5	0	0	0	0	0	0	70	0

	PHF	Trucks
AM	0.874	2.7%
PM	0.931	0.7%





Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION Seminole Ave @ Mooney Blvd
COUNTY Tulare
COLLECTION DATE Tuesday, June 4, 2019

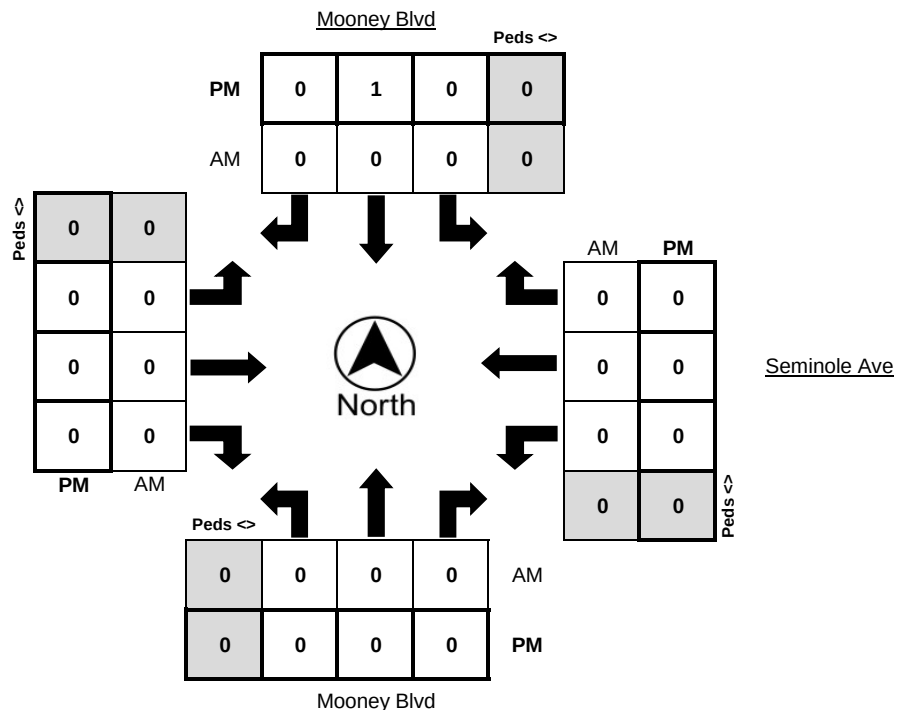
LATITUDE 36.2186
LONGITUDE -119.3130
WEATHER Clear

Time	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:00 AM - 7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM - 7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM - 7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM - 8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM - 8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM - 8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
8:45 AM - 9:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0

Time	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
4:00 PM - 4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM - 4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM - 5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM - 5:30 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM - 6:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

PEAK HOUR	Northbound Bikes			N.Leg	Southbound Bikes			S.Leg	Eastbound Bikes			E.Leg	Westbound Bikes			W.Leg
	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds	Left	Thru	Right	Peds
7:30 AM - 8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM - 6:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	1	0





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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION _____ Tulare Ave @ Mooney Blvd
COUNTY _____ Tulare
COLLECTION DATE _____ Tuesday, June 4, 2019

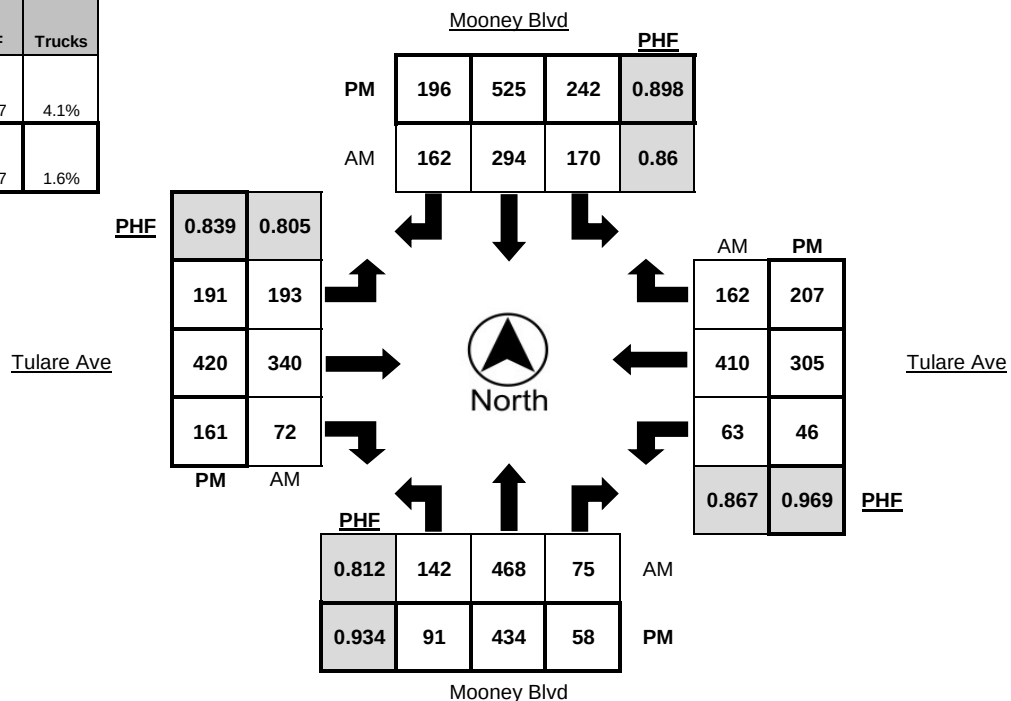
LATITUDE _____ 36.2113
LONGITUDE _____ -119.3131
WEATHER _____ Clear

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	17	19	8	4	23	51	21	3	20	45	10	14	9	52	14	3
7:15 AM - 7:30 AM	27	51	11	5	31	53	31	2	31	69	20	14	10	85	35	14
7:30 AM - 7:45 AM	31	102	14	4	44	65	39	7	48	92	17	9	14	118	30	5
7:45 AM - 8:00 AM	46	131	34	6	62	81	39	7	57	110	21	7	20	99	44	7
8:00 AM - 8:15 AM	36	111	18	14	27	80	49	6	44	88	18	9	21	114	48	2
8:15 AM - 8:30 AM	29	124	9	4	37	68	35	10	44	50	16	5	8	79	40	3
8:30 AM - 8:45 AM	22	85	12	3	25	56	27	5	35	57	23	10	9	63	45	5
8:45 AM - 9:00 AM	12	16	9	3	19	60	22	7	24	41	14	8	9	67	42	4
TOTAL	220	639	115	43	268	514	263	47	303	552	139	76	100	677	298	43

	Northbound				Southbound				Eastbound				Westbound			
Time	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	19	101	12	4	57	118	41	4	40	86	24	7	18	95	31	6
4:15 PM - 4:30 PM	32	78	10	4	46	91	38	2	46	81	19	9	12	81	36	4
4:30 PM - 4:45 PM	17	129	11	3	85	122	28	5	48	85	34	3	17	70	40	3
4:45 PM - 5:00 PM	15	106	12	2	40	112	39	1	52	96	40	7	8	81	51	4
5:00 PM - 5:15 PM	27	105	13	1	74	156	38	0	43	109	33	4	9	76	59	5
5:15 PM - 5:30 PM	21	108	20	2	58	132	64	2	49	128	53	3	12	71	51	4
5:30 PM - 5:45 PM	28	115	13	1	70	125	55	2	47	87	35	5	17	77	46	4
5:45 PM - 6:00 PM	26	107	13	2	50	28	37	2	41	83	27	6	12	76	53	1
TOTAL	185	849	104	19	480	884	340	18	366	755	265	44	105	627	367	31

	Northbound				Southbound				Eastbound				Westbound			
PEAK HOUR	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:30 AM - 8:30 AM	142	468	75	28	170	294	162	30	193	340	72	30	63	410	162	17
4:45 PM - 5:45 PM	91	434	58	6	242	525	196	5	191	420	161	19	46	305	207	17

	PHF	Trucks
AM	0.857	4.1%
PM	0.937	1.6%





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Turning Movement Report

Prepared For:

JLB Traffic Engineering, Inc.
 1300 E. Shaw Ave, Suite 103
 Fresno, CA

LOCATION _____ Tulare Ave @ Morrison St

LATITUDE _____ 36.2110

COUNTY _____ Tulare

LONGITUDE _____ -119.3033

COLLECTION DATE _____ Tuesday, June 4, 2019

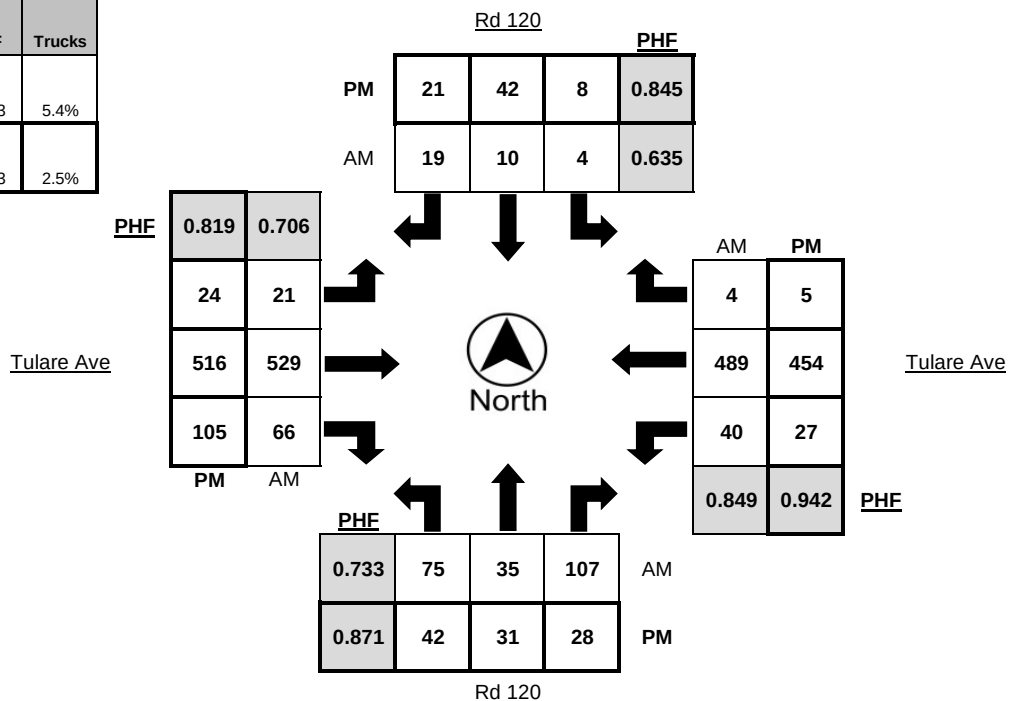
WEATHER _____ Clear

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	12	10	10	2	0	2	5	0	4	80	3	17	0	58	0	3
7:15 AM - 7:30 AM	13	7	17	0	1	1	0	0	8	103	9	13	3	107	0	14
7:30 AM - 7:45 AM	25	5	27	1	2	2	9	0	5	139	8	12	10	112	3	10
7:45 AM - 8:00 AM	16	11	47	0	1	4	3	0	4	190	24	9	12	128	1	6
8:00 AM - 8:15 AM	21	12	16	0	0	3	7	0	4	97	25	8	15	142	0	2
8:15 AM - 8:30 AM	14	7	12	0	3	1	2	0	4	74	9	15	7	103	0	5
8:30 AM - 8:45 AM	8	3	6	0	0	4	5	0	4	81	11	4	5	93	1	5
8:45 AM - 9:00 AM	10	9	6	0	0	1	3	0	1	58	11	11	2	90	1	4
TOTAL	119	64	141	3	7	18	34	0	34	822	100	89	54	833	6	49

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	9	1	4	0	2	5	2	0	2	106	23	5	9	113	0	4
4:15 PM - 4:30 PM	12	7	7	0	3	5	5	0	6	117	23	9	4	109	2	3
4:30 PM - 4:45 PM	9	4	4	0	5	10	2	0	3	131	33	5	5	106	1	2
4:45 PM - 5:00 PM	9	10	5	0	1	13	6	0	4	105	20	4	10	118	1	3
5:00 PM - 5:15 PM	10	6	5	0	1	6	3	0	7	127	26	3	5	120	1	5
5:15 PM - 5:30 PM	14	5	8	0	3	10	7	0	8	153	36	4	5	98	2	3
5:30 PM - 5:45 PM	9	10	10	0	3	13	5	0	5	131	23	6	7	118	1	5
5:45 PM - 6:00 PM	12	6	5	0	2	5	6	0	2	107	25	8	9	97	0	1
TOTAL	84	49	48	0	20	67	36	0	37	977	209	44	54	879	8	26

PEAK HOUR	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:15 AM - 8:15 AM	75	35	107	1	4	10	19	0	21	529	66	42	40	489	4	32
4:45 PM - 5:45 PM	42	31	28	0	8	42	21	0	24	516	105	17	27	454	5	16

	PHF	Trucks
AM	0.793	5.4%
PM	0.933	2.5%



Turning Movement Report

Prepared For:

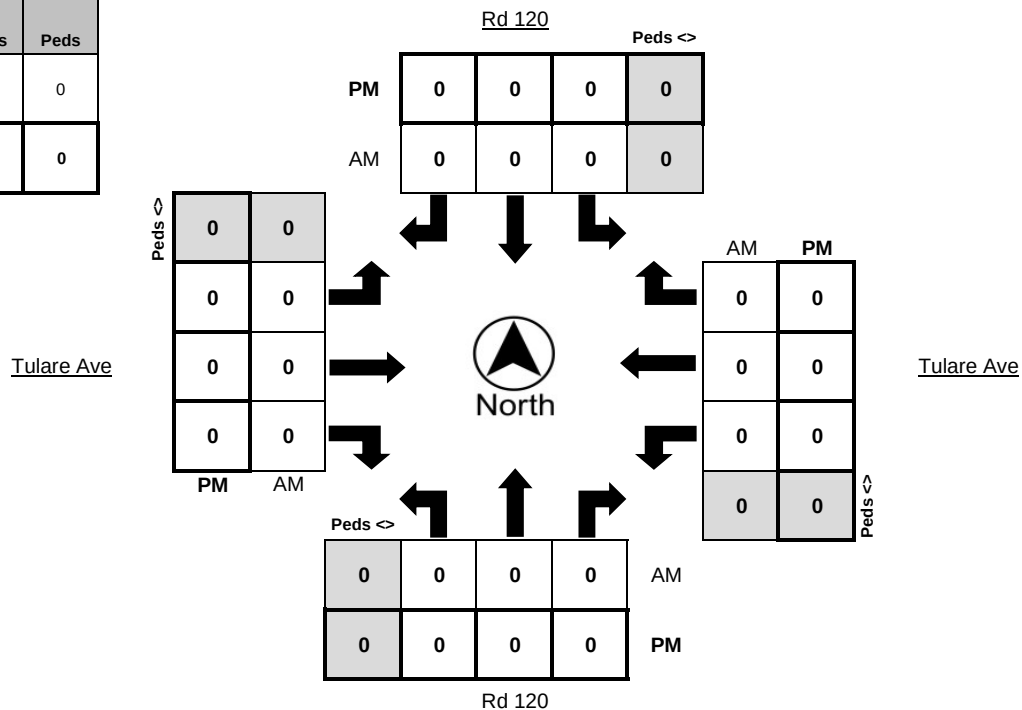
JLB Traffic Engineering, Inc.
1300 E. Shaw Ave, Suite 103
Fresno, CA

LOCATION	Tulare Ave @ Morrison St
COUNTY	Tulare
COLLECTION DATE	Tuesday, June 4, 2019

LATITUDE	36.2110
LONGITUDE	-119.3033
WEATHER	Clear

[illegible][illegible][illegible]

	Bikes	Peds
AM Peak Total	0	0
PM Peak Total	0	0



Appendix C: Traffic Modeling



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info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Page | C

June 20, 2019

Derek Winning
Senior Regional Planner
Tulare County Association of Governments
210 N. Church St. Suite B
Visalia, CA 93291

Via E-mail Only: DWinning@tularecog.org

Subject: Revised Traffic Modeling Request for the Preparation of a Traffic Impact Analysis for the Farrar Estates (Project) located on the Northwest Corner of Morrison Street and Tulare Avenue in the City of Tulare (JLB Project 037-004)

Dear Mr. Winning,

JLB Traffic Engineering, Inc. (JLB) hereby requests traffic modeling for the Farrar Estates (Project) described below. The Project proposes to build a 355-unit single-family subdivision on 76.5 gross acres located at the northwest corner of Morrison Street and Tulare Avenue in the City of Tulare. Based on information provided to JLB, the Project will undergo a General Plan Amendment to allow for the proposed densities. An aerial of the Project vicinity and Project Site Plan are shown in Exhibits A and Exhibit B, respectively.

The purpose of the TIA is to evaluate the potential on-site and off-site traffic impacts, identify short-term roadway and circulation needs, determine potential mitigation measures and identify any critical traffic issues that should be addressed in the on-going planning process.

Scenarios:

The following scenarios are requested:

1. Base Year 2019 (with Link and TAZ modifications)
2. Cumulative Year 2035 plus Project Select Zone (with Link and TAZ modifications)
3. Differences between model runs 2 and 1 above.

Changes and/or additions to the Model Network or TAZ's

JLB reviewed the Tulare CAG model network for the Base Year 2018 and Cumulative Year 2035. Based on this review, JLB requests the following Link and TAZ Network modifications. Details on the requested Link and TAZ modifications for Base Year 2018 and Cumulative Year 2035 are illustrated in Exhibit C.

LINK and TAZ MODIFICATIONS (Base Year ~~2018~~ 2019 Select Zone only):

1. Modify Tulare Avenue to reduce the number of lanes between Node 12180 and Node 12404 to one lane in the westbound direction.
2. Create Seminole Avenue approximately 2,600 feet north of Tulare Avenue extending east for approximately 1,200 feet.



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- a. Classification: Local Street
- b. Lanes: One in each direction
- c. Speed: 25 MPH

LINK and TAZ MODIFICATIONS (For Cumulative Year 2035 plus Project Select Zone only):

1. Create Seminole Avenue approximately 2,600 feet north of Tulare Avenue between Mooney Boulevard and Morrison Street as follows:
 - a. Classification: Local Street
 - b. Lanes: One in each direction
 - c. Speed: 25 MPH
2. Create TAZ A generally located approximately 650 feet west of Morrison Street and 1,300 feet north of Tulare Avenue. TAZ A should have TAZ connectors to Seminole Avenue, Morrison Street and Tulare Avenue.
3. Modify Tulare Avenue to increase the number of lanes between Morrison Street and Oakmore Street to two lanes in each direction.

TAZ A (Project) Trip Generation (Cumulative Year 2035 plus Project Select Zone Scenario Only)

The trip generation rates for TAZ A (Project) were obtained from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Table I presents the trip generation for TAZ A (Project) with trip generation rates for Single-Family Detached Housing. At buildout, the proposed Project is estimated to generate a maximum of 3,351 daily trips, 263 AM peak hour trips and 351 PM peak hour trips.

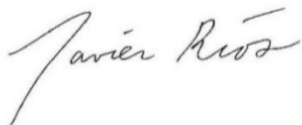
Table I: TAZ A (Project) Trip Generation

Land Use (ITE Code)	Size	Unit	Daily		AM Peak Hour						PM Peak Hour					
			Rate	Total	Trip Rate	In	Out	In	Out	Total	Trip Rate	In	Out	In	Out	Total
						%						%				
Single-Family Detached Housing (210)	355	d.u.	9.44	3,351	0.74	25	75	66	197	263	0.99	63	37	221	130	351
Total Project Trips				3,351				66	197	263				221	130	351

Note: d.u. = Dwelling Units

If you have any questions or require additional information, please do not hesitate to contact me by phone at (559) 317-6245 or by e-mail at jrios@JLBtraffic.com.

Sincerely,



Javier Rios
Engineer I/II

CC: Jose Benavides, JLB Traffic Engineering, Inc.

<Z:\01 Projects\037 Tulare\037-004 Farrar Estates TIA\Modeling\L06202019 Revised Farrar Estates TIA.docx>



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Exhibit A – Aerial

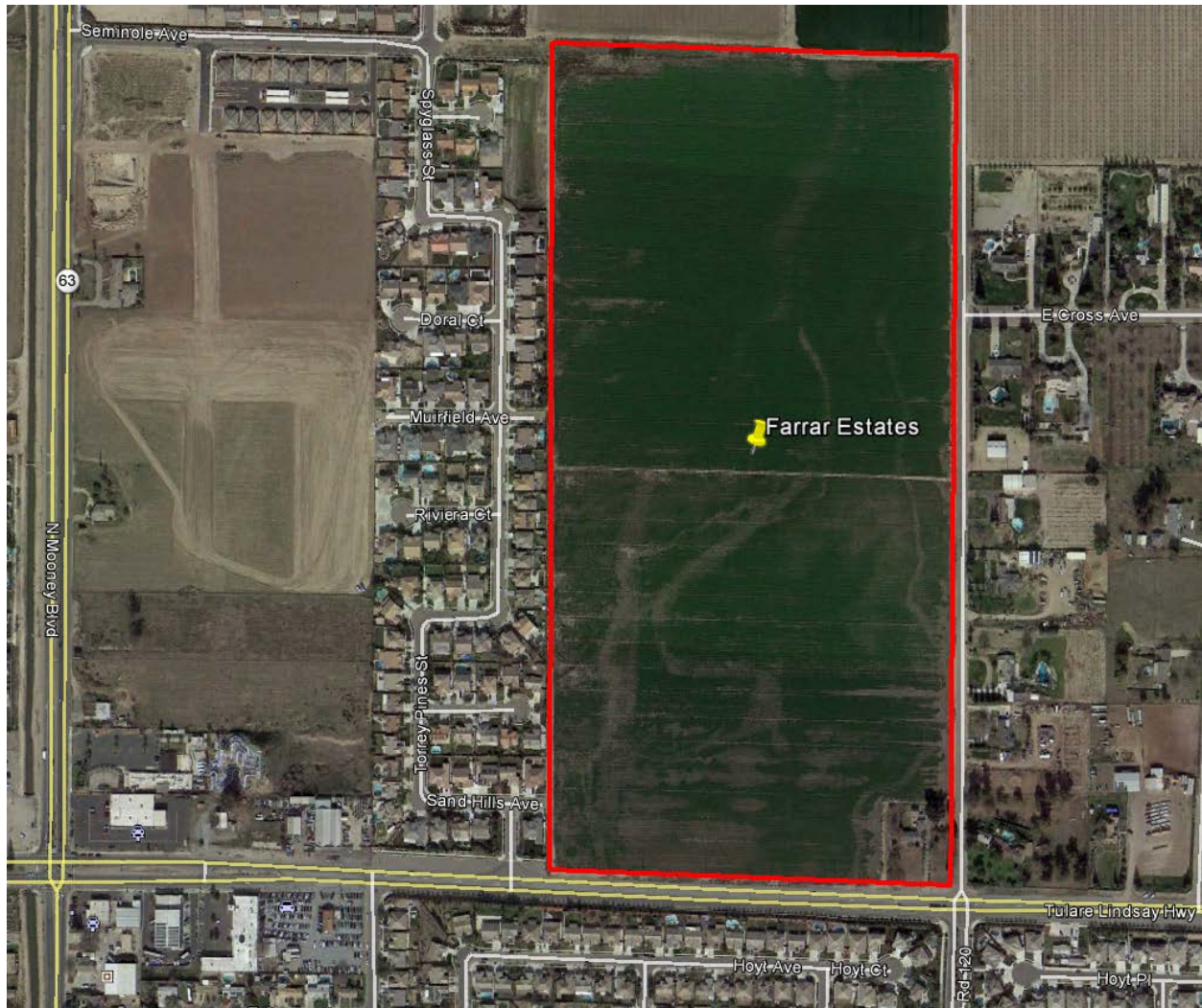
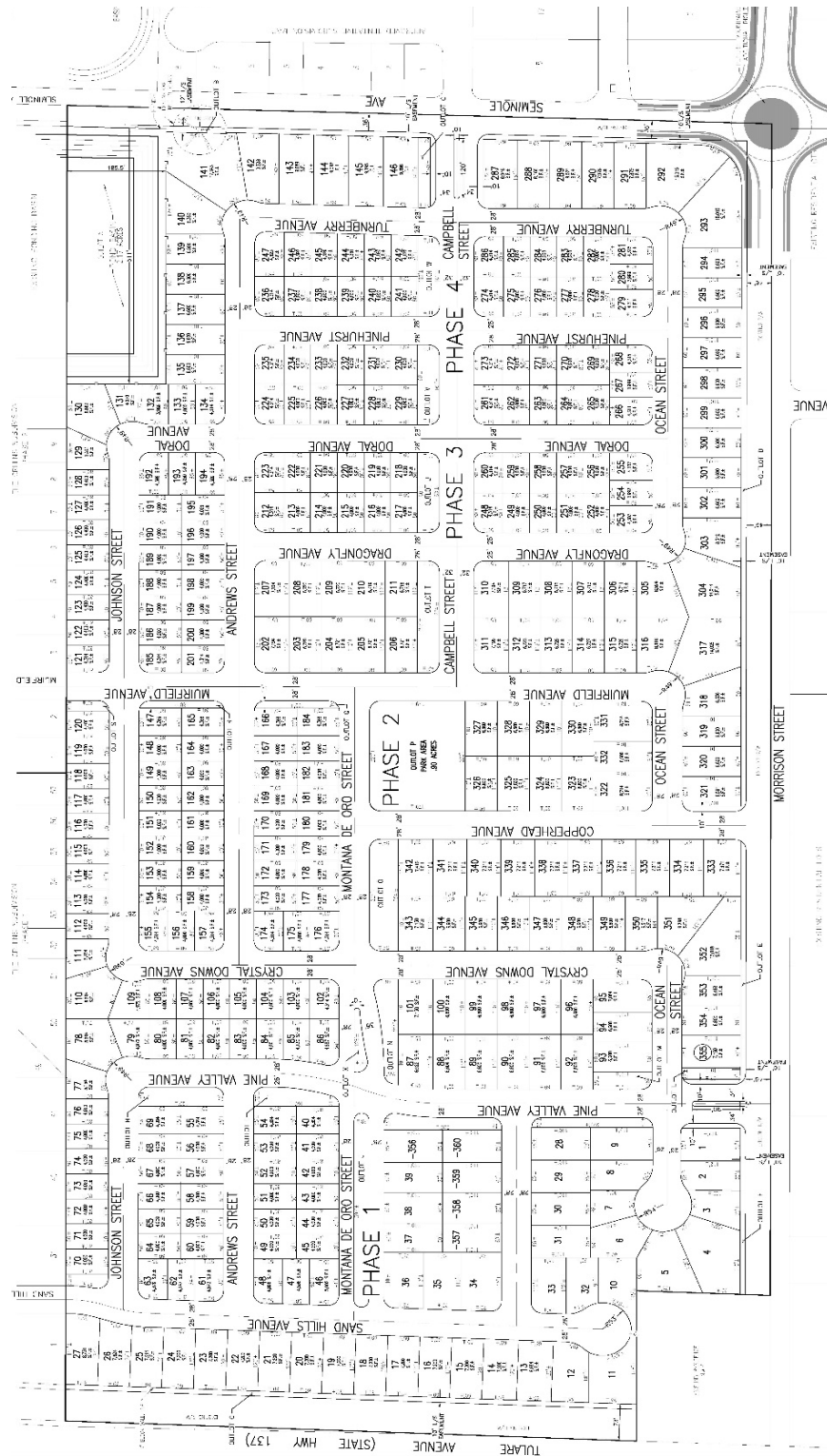


Exhibit B – Site Plan



Traffic Engineering, Inc.

Traffic Engineering, Transportation Planning, & Parking Solutions

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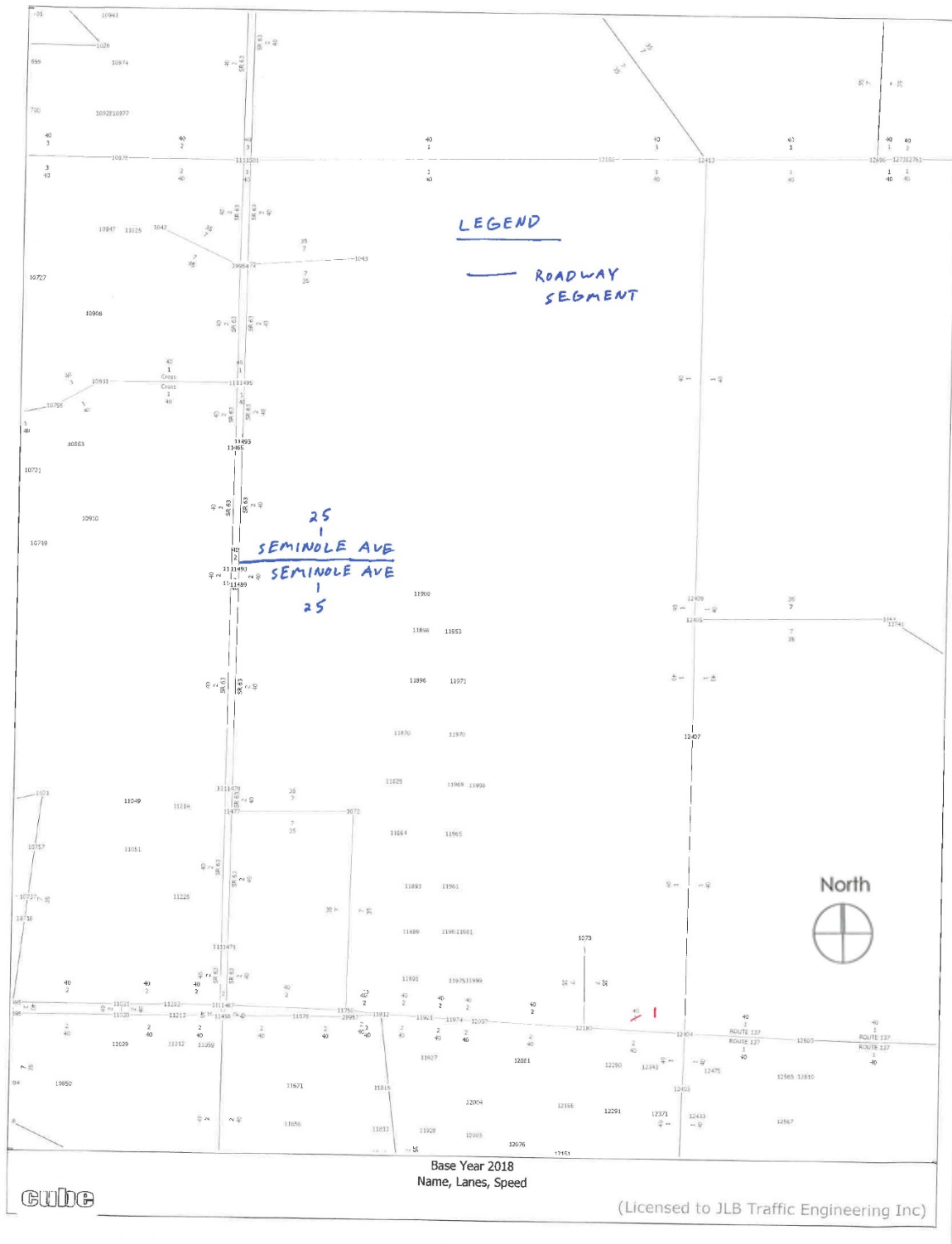
1300 E. Shaw Ave., Ste. 103

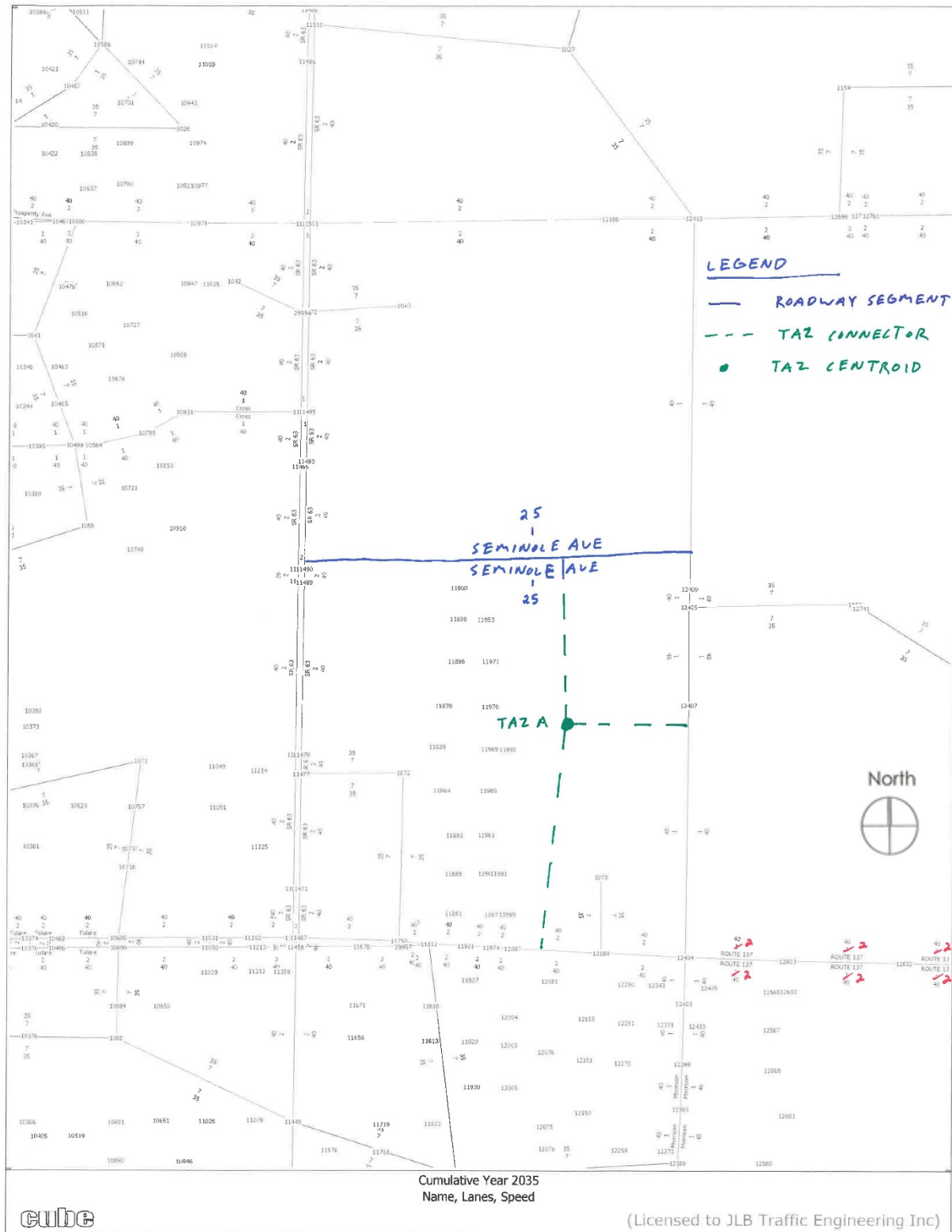
Fresno, CA 93710

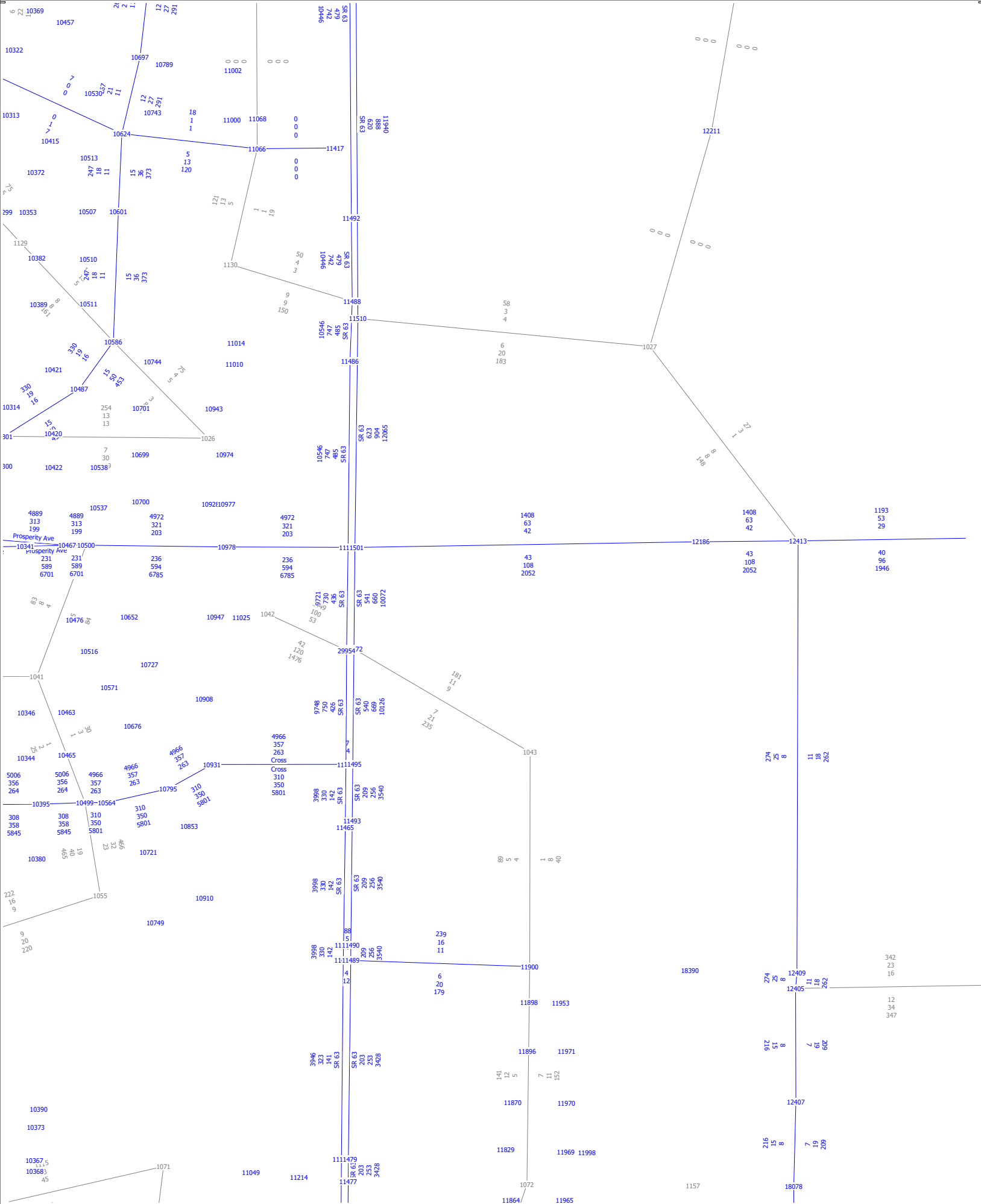
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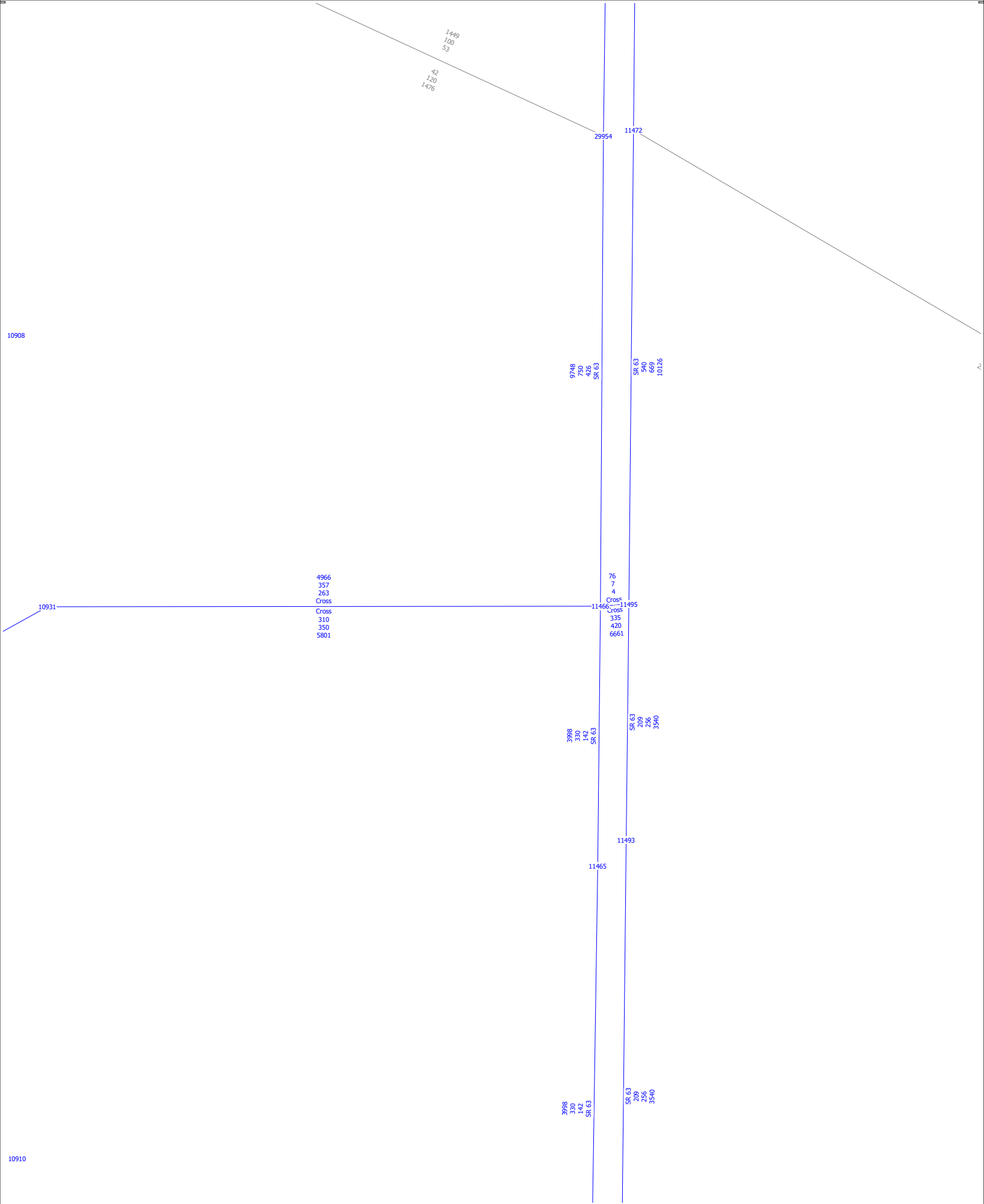
Exhibit C – Model TAZ Modifications







Base Year 2019
AM, PM & Daily Volumes



Base Year 2019
AM, PM & Daily Volumes

263
Cross
310
350
5801

11466-11495
4
Cross
335
420
6661

3998
330
142
SR 63

SR 63
209
256
3540

11493

11465

3998
330
142
SR 63

SR 63
209
256
3540

3998
330
142
SR 63

SR 63
209
256
3540

11462

11490

3998
330
142
SR 63

SR 63
209
256
3540

11461

11489

3998
330
142
SR 63

SR 63
209
256
3540

239
16
11

6
20
179

11900

11898

11896

11870

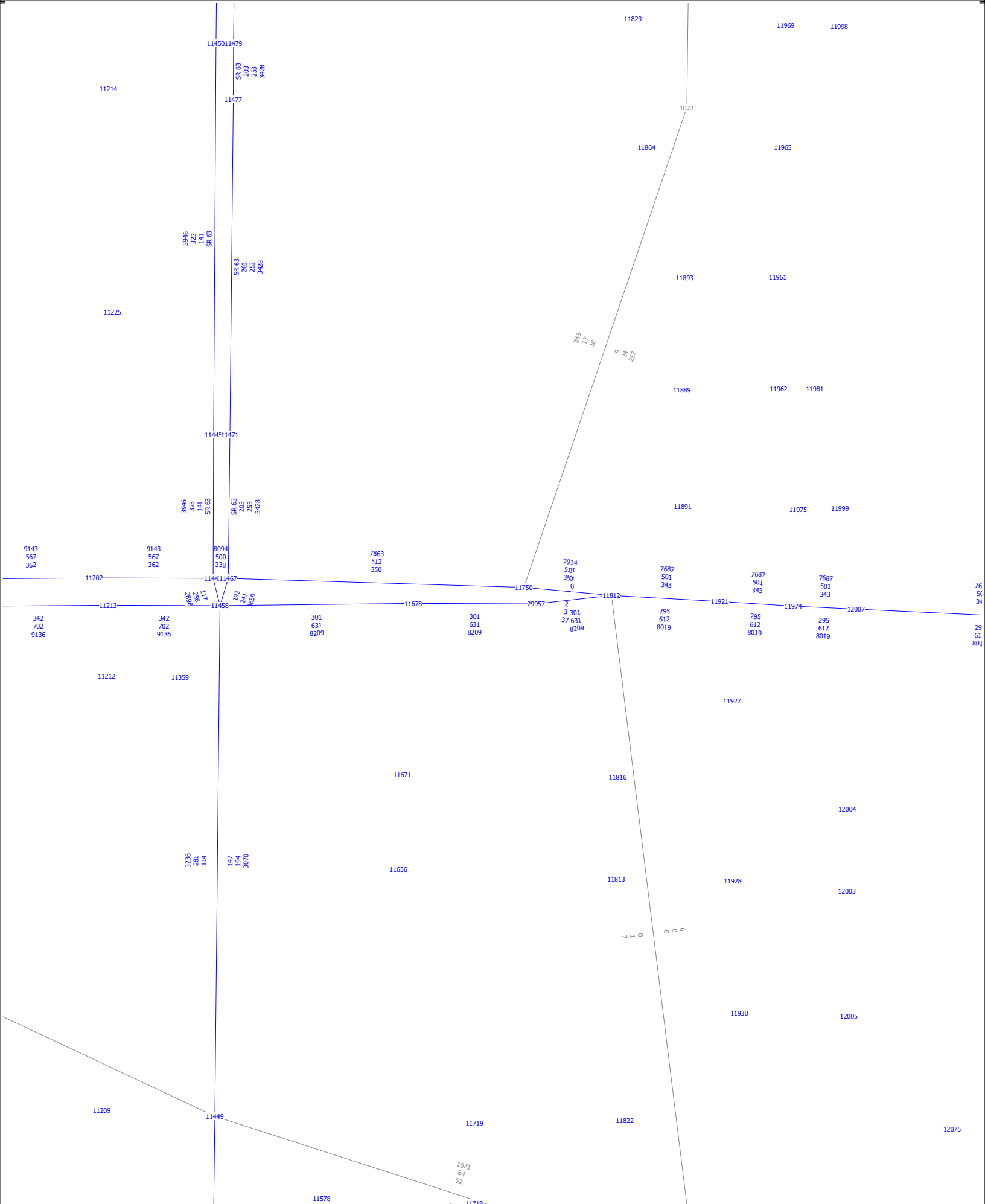
141
11
5

7
11
152

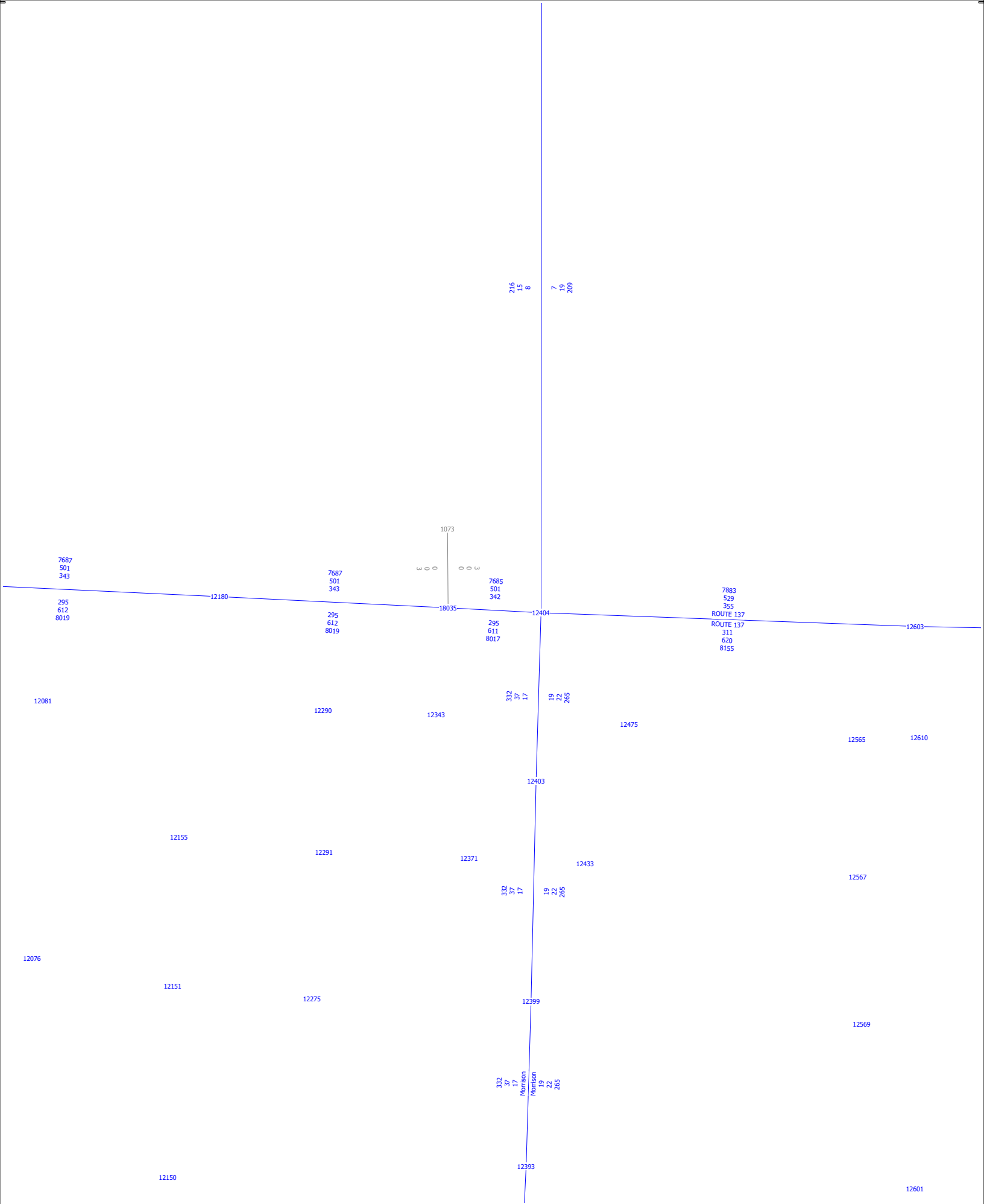
89
5
4

1
8
40

Base Year 2019
AM, PM & Daily Volumes
Seminole Ave



Base Year 2019
AM, PM & Daily Volumes



Base Year 2019
AM, PM & Daily Volumes





Cross
Cross
1
3
22

$$\begin{array}{r} \text{Cross} \\ -1146 \overline{) 11495} \\ \text{Cross} \\ \begin{array}{r} 0 \\ 0 \\ 0 \end{array} \end{array}$$
17
SR 63

SR 63

SR 63

SR 63

11465

11493

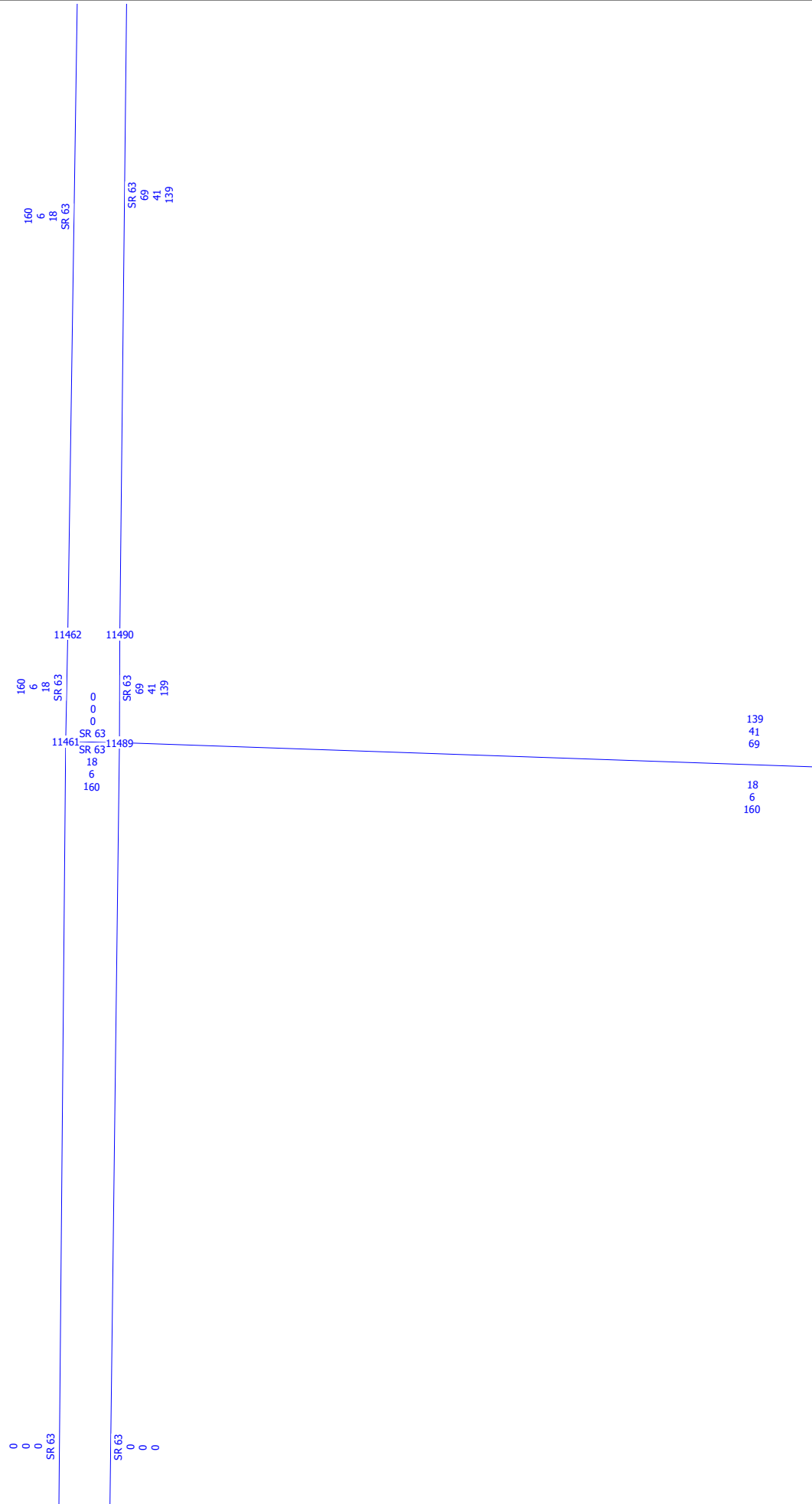
SR 63

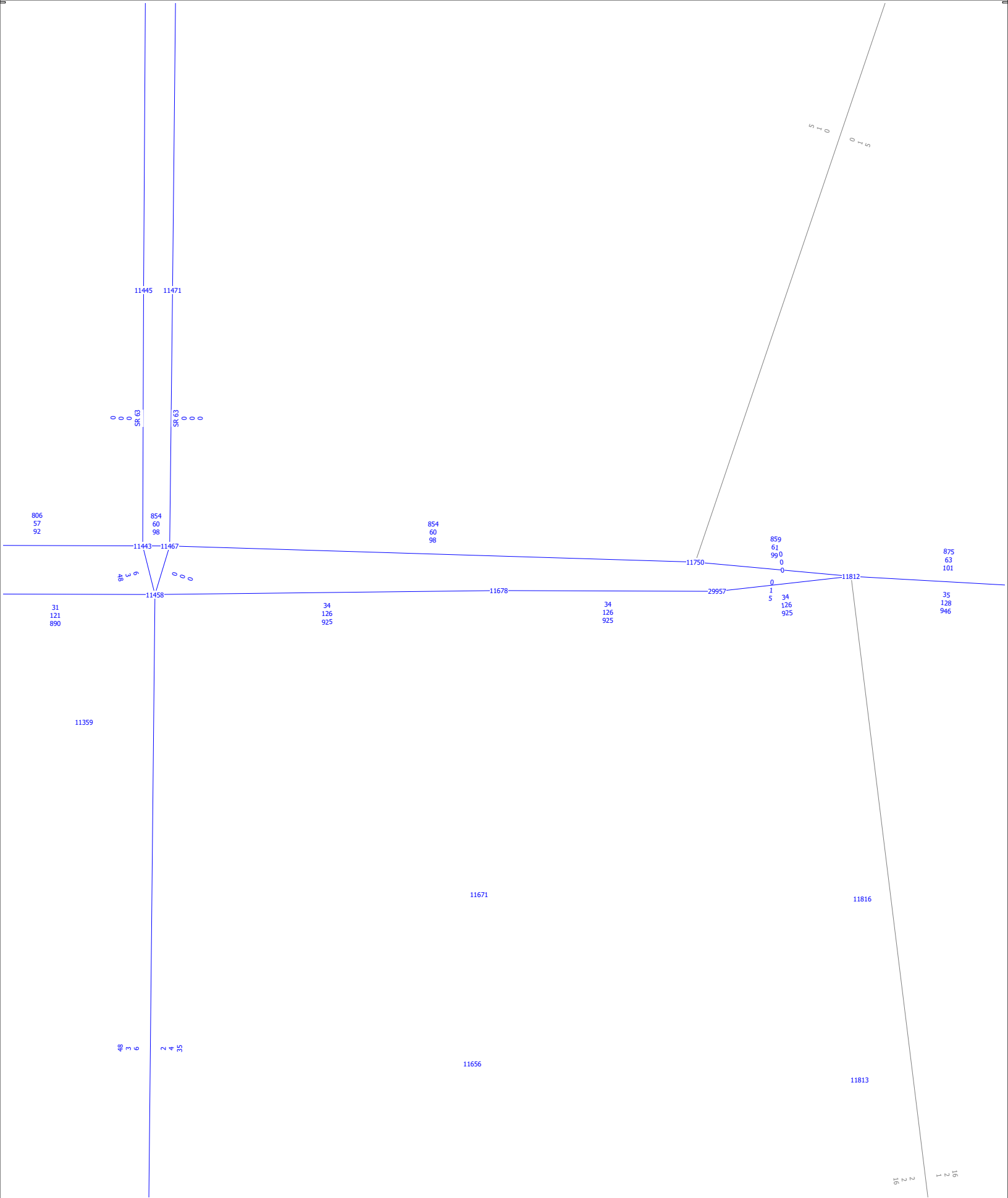
SR 63

Cumulative Year 2035
Select Zone
AM, PM & Daily Volumes

cube (Licensed to JLB Traffic Engineering Inc)

(Licensed to JLB Traffic Engineering Inc)



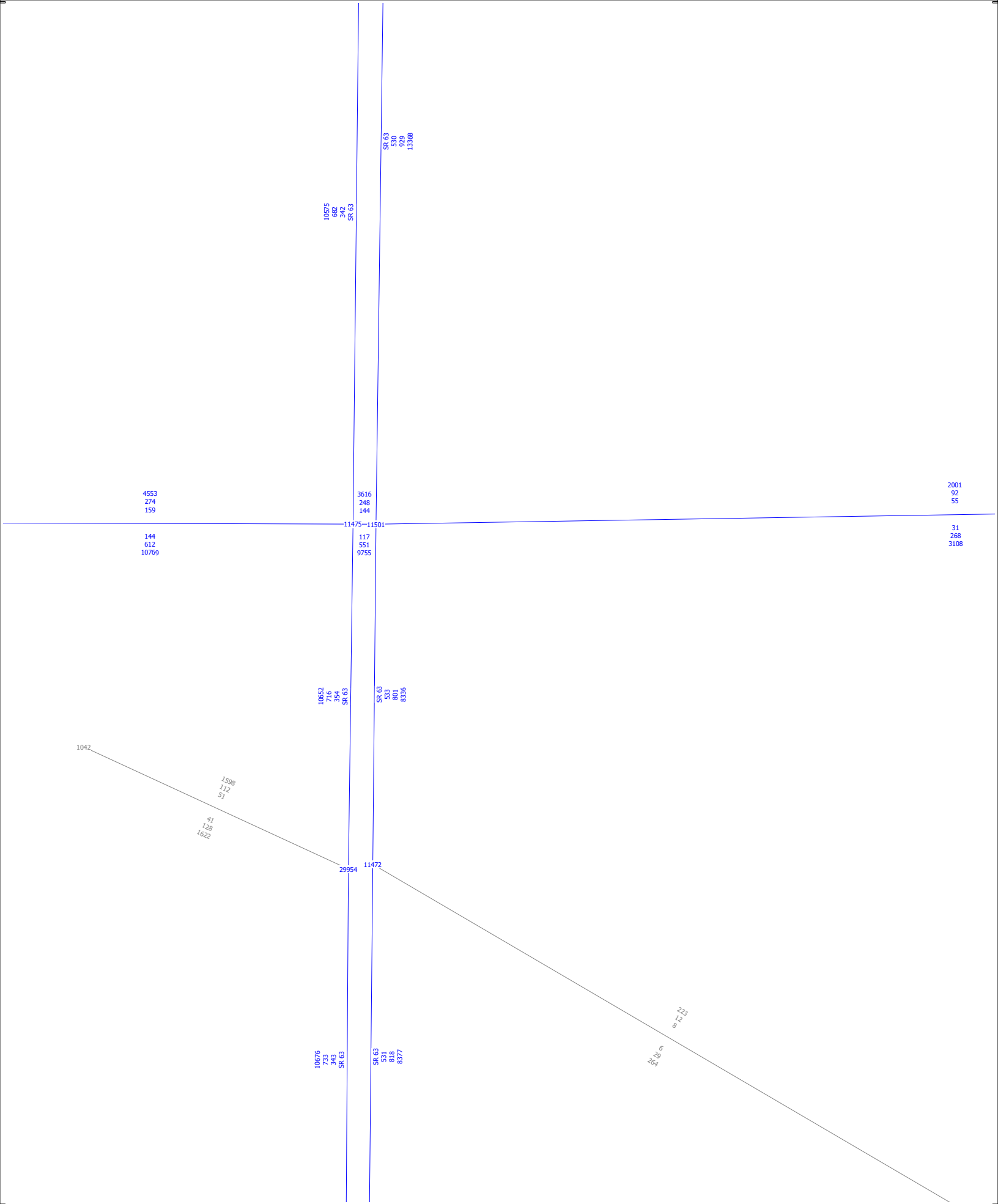


Cumulative Year 2035
 Select Zone
 AM, PM & Daily Volumes
 Tulare Ave (SR 137)





Cumulative Year 2035
Select Zone
AM, PM & Daily Volumes
Prosperity/Morrison



Cumulative Year 2035
AM, PM & Daily Volumes
Prosperity/SR 63

11025

1042

1598
112
51
41
128
1622

29954

11472

2128
2128
2128

10676
733
343
SR 63

SR 63
531
818
8377

5812
361
192
Cross
Cross
288
458
3175

104
8
5
Cross
Cross
312
536
4158

11466-11495

3985
302
132
SR 63

SR 63
224
290
4323

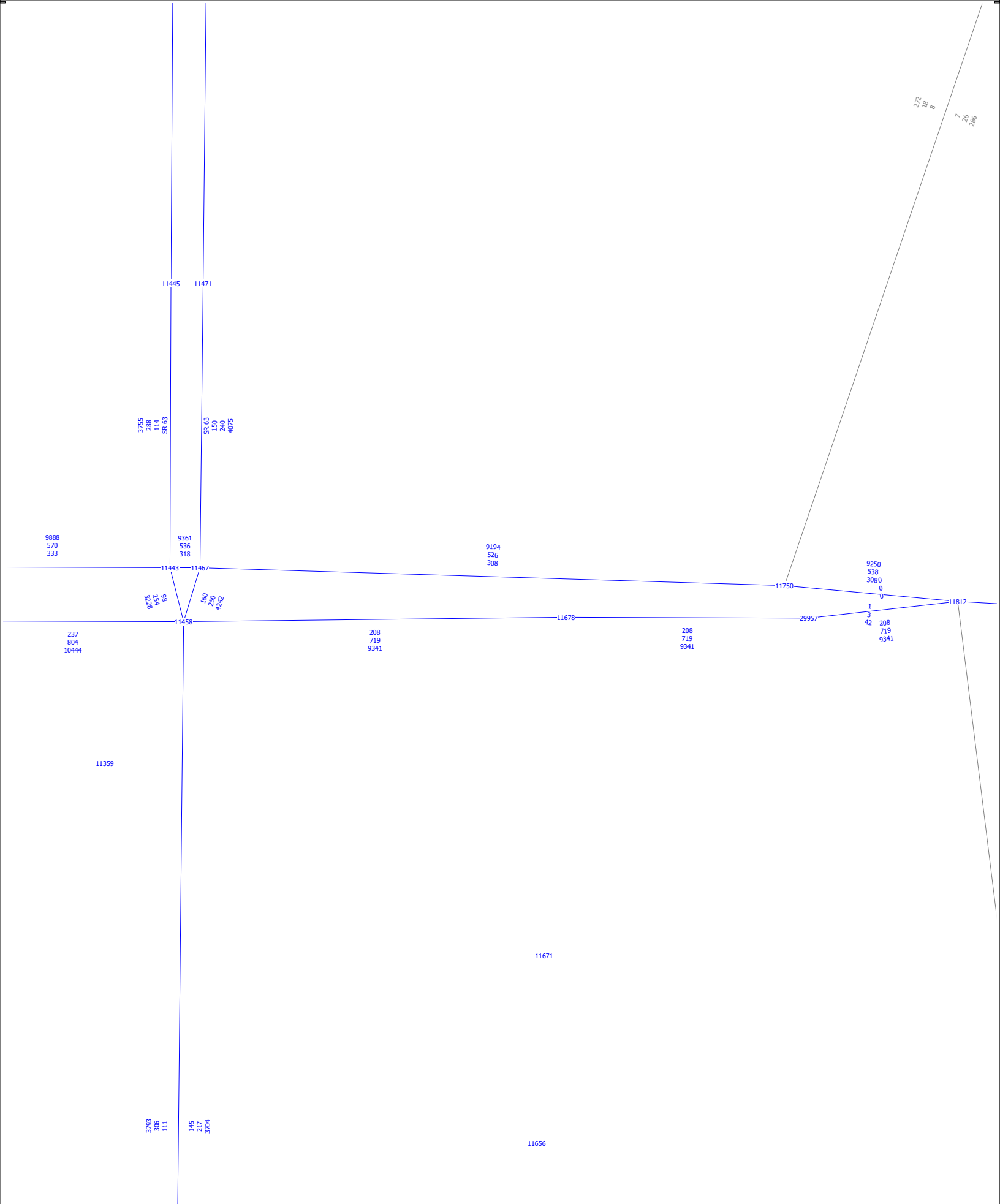
11493

11465

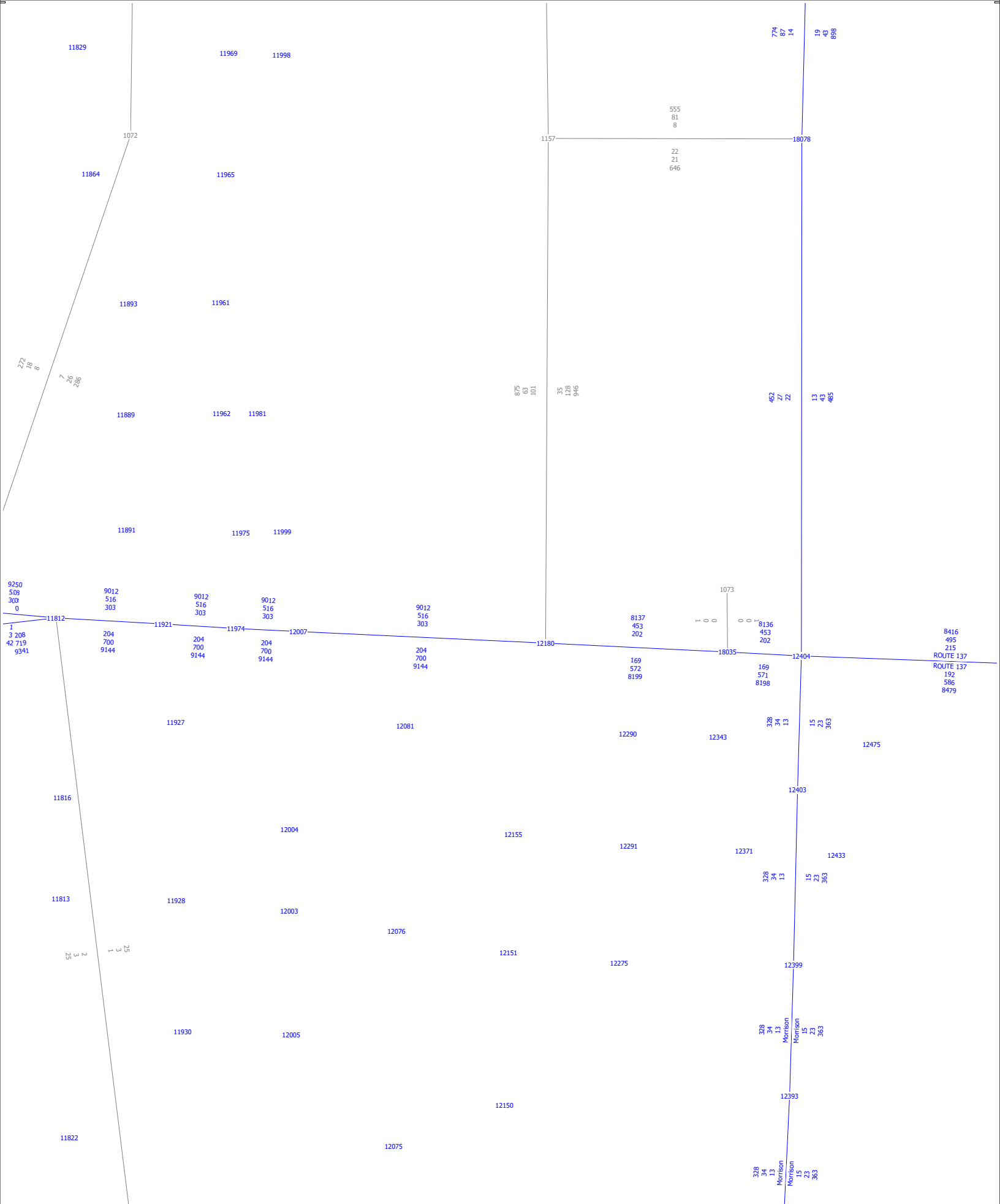
3985
302
132
SR 63

SR 63
224
290
4323

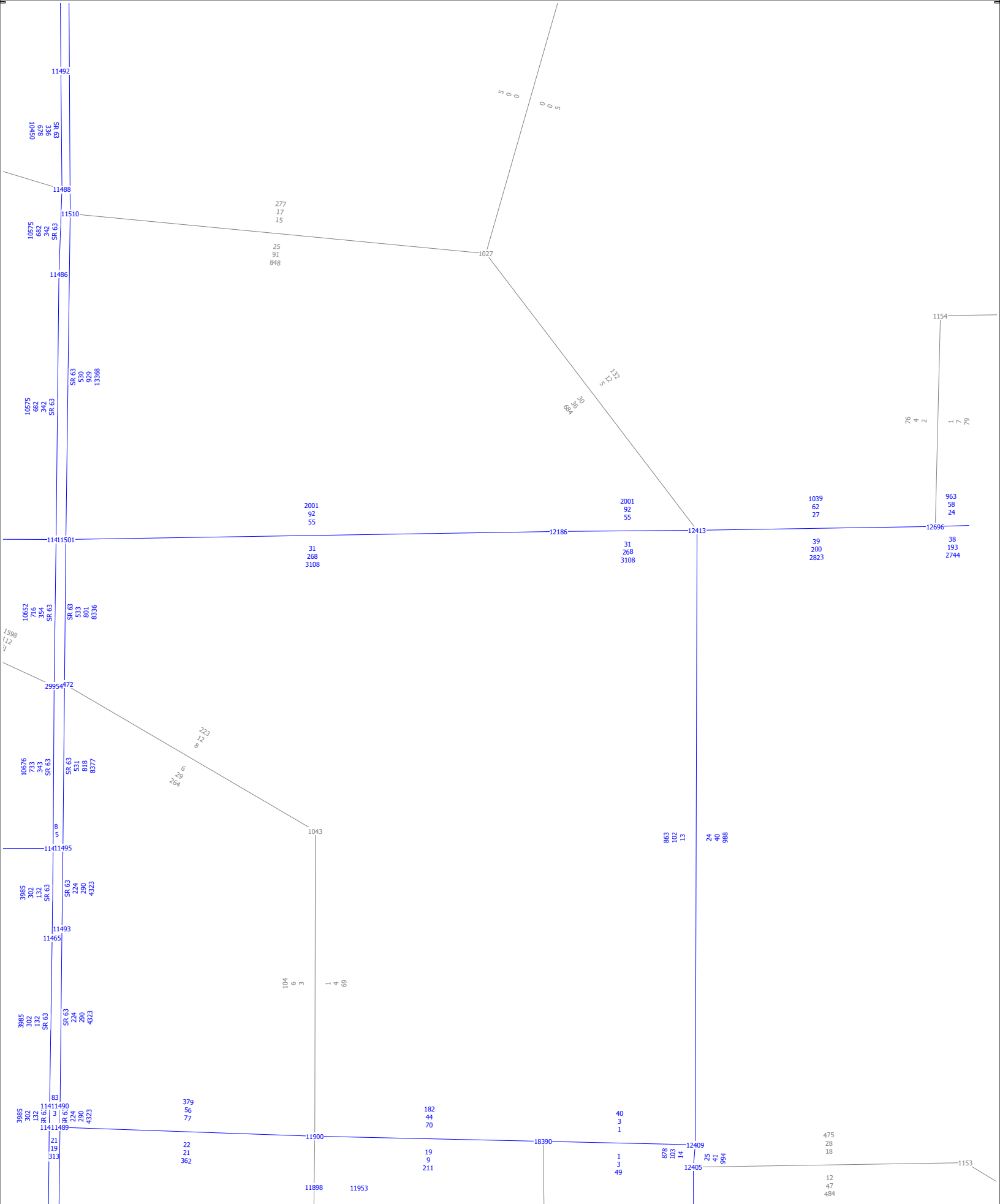
Cumulative Year 2035
AM, PM & Daily Volumes



Cumulative Year 2035
AM, PM & Daily Volumes
SR 137/SR 63



Cumulative Year 2035
AM, PM & Daily Volumes
SR 137/Morrison



Cumulative Year 2035
AM, PM & Daily Volumes
Prosperity/Morrison

Appendix D: Methodology



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Fresno, CA 93704
(559) 570-8991

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Levels of Service Methodology

The description and procedures for calculating capacity and level of service (LOS) are found in the Transportation Research Board, Highway Capacity Manual (HCM). The HCM 2010 represents the research on capacity and quality of service for transportation facilities.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

Six levels of service are defined for each type of facility that has analysis procedures available. Letters designate each level of service (LOS), from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each LOS represents a range of operating conditions and the driver's perception of these conditions. Safety is not included in the measures that establish a LOS.

Urban Streets (Automobile Mode)

The term "urban streets" refers to urban arterials and collectors, including those in downtown areas. Arterial streets are roads that primarily serve longer through trips. However, providing access to abutting commercial and residential land uses is also an important function of arterials. Collector streets provide both land access and traffic circulation within residential, commercial and industrial areas. Their access function is more important than that of arterials, and unlike arterials their operation is not always dominated by traffic signals. Downtown streets are signalized facilities that often resemble arterials. They not only move through traffic but also provide access to local businesses for passenger cars, transit buses, and trucks. Pedestrian conflicts and lane obstructions created by stopping or standing taxicabs, buses, trucks and parking vehicles that cause turbulence in the traffic flow are typical of downtown streets.

Flow Characteristics

The speed of vehicles on urban streets is influenced by three main factors, street environment, interaction among vehicles and traffic control.

The street environment includes the geometric characteristics of the facility, the character of roadside activity, and adjacent land uses. Thus, the environment reflects the number and width of lanes, type of median, driveway/access point density, spacing between signalized intersections, existence of parking, level of pedestrian and bicyclist activity and speed limit.

The interaction among vehicles is determined by traffic density, the proportion of trucks and buses, and turning movements. This interaction affects the operation of vehicles at intersections and, to a lesser extent, between signals.

Traffic controls (including signals and signs) forces a portion of all vehicles to slow or stop. The delays and speed changes caused by traffic control devices reduce vehicle speeds; however, such controls are needed to establish right-of-way.



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Fresno, CA 93704

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Levels of Service (automobile Mode)

The average travel speed for through vehicles along an urban street is the determinant of the operating level of service (LOS). The travel speed along a segment, section or entire length of an urban street is dependent on the running speed between signalized intersections and the amount of control delay incurred at signalized intersections.

LOS A describes primarily free-flow operation. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at signalized intersections is minimal. Travel speeds exceed 85 of the base free flow speed (FFS).

LOS B describes reasonably unimpeded operation. The ability to maneuver within the traffic stream is only slightly restricted and control delay at the boundary intersections is not significant. The travel speed is between 67 and 85 percent of the base FFS.

LOS C describes stable operations. The ability to maneuver and change lanes in midblock location may be more restricted than at LOS B. Longer queues at the boundary intersections may contribute to lower travel speeds. The travel speed is between 50 and 67 percent of the base FFS.

LOS D indicates a less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed. This operation may be due to adverse signal progression, high volumes, inappropriate signal timing, at the boundary intersections. The travel speed is between 40 and 50 percent of the base FFS.

LOS E is characterized unstable operation and significant delay. Such operations may be due to some combination of adverse progression, high volume, and inappropriate signal timing at the boundary intersections. The travel speed is between 30 and 40 percent of the base FFS.

LOS F is characterized by street flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay and extensive queuing. The travel speed is 30 percent or less of the base FFS.

Table A-1: Urban Street Levels of Service (Automobile Mode)

Travel Speed as a Percentage of Base Free-Flow Speed (%)	LOS by Critical Volume-to-Capacity Ratio ^a	
	≤1.0	>1.0
>85	A	F
>67 to 85	B	F
>50 to 67	C	F
>40 to 50	D	F
>30 to 40	E	F
≤30	F	F

a = The Critical volume-to-capacity ratio is based on consideration of the through movement-to-capacity ratio at each boundary intersection in the subject direction of travel. The critical volume-to-capacity ratio is the largest ratio of those considered.

Source: Highway Capacity Manual 2010, Exhibit 16-4. Urban Street LOS Criteria (Automobile Mode)

Intersection Levels of Service

One of the more important elements limiting, and often interrupting the flow of traffic on a highway is the intersection. Flow on an interrupted facility is usually dominated by points of fixed operation such as traffic signals, stop and yield signs.

Signalized Intersections – Performance Measures

For signalized intersections the performance measures include automobile volume-to-capacity ratio, automobile delay, queue storage length, ratio of pedestrian delay, pedestrian circulation area, pedestrian perception score, bicycle delay, and bicycle perception score. LOS is also considered a performance measure. For the automobile mode average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection. A LOS designation is given to the weighted average control delay to better describe the level of operation. A description of LOS for signalized intersections is found in Table A-2.



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Table A-2: Signalized Intersection Level of Service Description (Automobile Mode)

Level of Service	Description	Average Control Delay (seconds per vehicle)
A	Operations with a control delay of 10 seconds/vehicle or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when volume-to-capacity ratio is and either progression is exceptionally favorable or the cycle length is very short. If it's due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.	≤10
B	Operations with control delay between 10.1 to 20.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.	>10.0 to 20.0
C	Operations with average control delays between 20.1 to 35.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual cycle failures (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	>20 to 35
D	Operations with control delay between 35.1 to 55.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop, and individual cycle failures are noticeable.	>35 to 55
E	Operations with control delay between 55.1 to 80.0 seconds/vehicle and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.	>55 to 80
F	Operations with unacceptable control delay exceeding 80.0 seconds/vehicle and a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.	>80

Source: Highway Capacity Manual 2010

Unsignalized Intersections

The HCM 2010 procedures use control delay as a measure of effectiveness to determine level of service. Delay is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. The delay experienced by a motorist is made up of a number of factors that relate to control, traffic and incidents. Total delay is the difference between the travel time actually experienced and the reference travel time that would result during base conditions, i. e., in the absence of traffic control, geometric delay, any incidents, and any other vehicles. Control delay is the increased time of travel for a vehicle approaching and passing through an unsignalized intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection.

All-Way Stop Controlled Intersections

All-way stop controlled intersections is a form of traffic controls in which all approaches to an intersection are required to stop. Similar to signalized intersections, at all-way stop controlled intersections the average control delay per vehicle per approach is determined for the peak hour. A weighted average of control delay per vehicle is then determined for the intersection as a whole. In other words the delay measured for all-way stop controlled intersections is a measure of the average delay for all vehicles passing through the intersection during the peak hour. A LOS designation is given to the weighted average control delay to better describe the level of operation.

Two-Way Stop Controlled Intersections

Two-way stop controlled (TWSC) intersections in which stop signs are used to assign the right-of-way, are the most prevalent type of intersection in the United States. At TWSC intersections the stop-controlled approaches are referred as the minor street approaches and can be either public streets or private driveways. The approaches that are not controlled by stop signs are referred to as the major street approaches.

The capacity of movements subject to delay are determined using the "critical gap" method of capacity analysis. Expected average control delay based on movement volume and movement capacity is calculated. A LOS for TWSC intersection is determined by the computed or measured control delay for each minor movement. LOS is not defined for the intersection as a whole for three main reasons: (a) major-street through vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through vehicles at the typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay from all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements. Table A-3 provides a description of LOS at unsignalized intersections.

Table A-3: Unsignalized Intersection Level of Service Description (Automobile Mode)

Control Delay (seconds per vehicle)	LOS by Volume-to-Capacity Ratio	
	$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	A	F
>10 to 15	B	F
>15 to 25	C	F
>25 to 35	D	F
>35 to 50	E	F
>50	F	F

Source: HCM 2010 Exhibit 19-1.

Appendix E: Existing Traffic Conditions



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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing AM Peak

10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	161	146	120	198	39	199	482	44	32	325	78
Future Volume (vph)	150	161	146	120	198	39	199	482	44	32	325	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1817		1770	3495		1770	3436	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1817		1770	3495		1770	3436	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	176	189	172	141	233	46	234	567	52	38	382	92
RTOR Reduction (vph)	0	0	143	0	8	0	0	6	0	0	21	0
Lane Group Flow (vph)	176	189	29	141	271	0	234	613	0	38	453	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.9	13.8	13.8	15.7	17.2		14.9	26.0		4.8	15.9	
Effective Green, g (s)	11.9	13.8	13.8	15.7	17.2		14.9	26.0		4.8	15.9	
Actuated g/C Ratio	0.15	0.17	0.17	0.19	0.21		0.18	0.32		0.06	0.20	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	261	318	270	344	387		326	1126		105	676	
v/s Ratio Prot	0.10	c0.10		0.08	c0.15		c0.13	c0.18		0.02	0.13	
v/s Ratio Perm			0.02									
v/c Ratio	0.67	0.59	0.11	0.41	0.70		0.72	0.54		0.36	0.67	
Uniform Delay, d1	32.6	30.9	28.3	28.4	29.4		30.9	22.5		36.5	30.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.7	3.0	0.2	0.8	5.6		7.4	0.5		2.1	2.6	
Delay (s)	39.3	33.8	28.4	29.2	35.0		38.3	23.0		38.6	32.6	
Level of Service	D	C	C	C	D		D	C		D	C	
Approach Delay (s)		33.9			33.1			27.2			33.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.1			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			80.7			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			60.9%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Existing AM Peak
10/30/2019

Intersection

Int Delay, s/veh 6.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	12	293	31	27	37
Future Vol, veh/h	226	12	293	31	27	37
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	15	357	38	33	45

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	291
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1282
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1282
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8	19.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	325	-	-	1282	-
HCM Lane V/C Ratio	0.24	-	-	0.279	-
HCM Control Delay (s)	19.5	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	1.1	-

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing AM Peak
10/30/2019

Intersection								
Int Delay, s/veh	4.7							
Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Vol, veh/h	32	105	9	169	848	3	533	75
Future Vol, veh/h	32	105	9	169	848	3	533	75
Conflicting Peds, #/hr	0	2	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	-	None
Storage Length	0	-	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	-	0	-	0	-
Grade, %	0	-	-	-	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3	3
Mvmt Flow	37	121	10	194	975	3	613	86
Major/Minor	Minor2		Major1		Major2			
Conflicting Flow All	1559	353	699	700	0	975	-	0
Stage 1	663	-	-	-	-	-	-	-
Stage 2	896	-	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	6.46	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.53	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	102	640	514	886	-	342	-	-
Stage 1	471	-	-	-	-	-	-	-
Stage 2	356	-	-	-	-	-	-	-
Platoon blocked, %					-		-	-
Mov Cap-1 Maneuver	76	638	840	840	-	342	-	-
Mov Cap-2 Maneuver	76	-	-	-	-	-	-	-
Stage 1	352	-	-	-	-	-	-	-
Stage 2	356	-	-	-	-	-	-	-
Approach	EB		NB		SB			
HCM Control Delay, s	47.2		1.8		0.1			
HCM LOS	E							
Minor Lane/Major Mvmt	NBL		NBT EBLn1		SBU	SBT	SBR	
Capacity (veh/h)	840		-		234	342	-	
HCM Lane V/C Ratio	0.244		-		0.673	0.01	-	
HCM Control Delay (s)	10.7		-		47.2	15.6	-	
HCM Lane LOS	B		-		E	C	-	
HCM 95th %tile Q(veh)	1		-		4.3	0	-	

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing AM Peak
10/30/2019

Intersection							
Int Delay, s/veh	1						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘	↗↗	↗	↘	↗↗
Traffic Vol, veh/h	0	98	0	840	15	26	646
Future Vol, veh/h	0	98	0	840	15	26	646
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	0	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	87	87	87	87	87	87	87
Heavy Vehicles, %	0	0	0	3	1	1	3
Mvmt Flow	0	113	0	966	17	30	743
Major/Minor	Minor1	Major1		Major2			
Conflicting Flow All	-	483	743	0	0	983	0
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	6.9	6.4	-	-	4.12	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.5	-	-	2.21	-
Pot Cap-1 Maneuver	0	535	492	-	-	704	-
Stage 1	0	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	535	492	-	-	704	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	WB	NB		SB			
HCM Control Delay, s	13.5	0		0.4			
HCM LOS	B						
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	492	-	-	535	704		
HCM Lane V/C Ratio	-	-	-	0.211	0.042		
HCM Control Delay (s)	0	-	-	13.5	10.3		
HCM Lane LOS	A	-	-	B	B		
HCM 95th %tile Q(veh)	0	-	-	0.8	0.1		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing AM Peak
10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	340	72	63	410	162	142	468	75	170	294	162
Future Volume (vph)	193	340	72	63	410	162	142	468	75	170	294	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3324		1736	3393		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3324		1736	3393		1736	1827	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	224	395	84	73	477	188	165	544	87	198	342	188
RTOR Reduction (vph)	0	0	62	0	39	0	0	13	0	0	0	140
Lane Group Flow (vph)	224	395	22	73	626	0	165	618	0	198	342	48
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	22.4	22.4	12.1	22.3		10.5	22.9		10.2	22.2	22.2
Effective Green, g (s)	12.2	22.4	22.4	12.1	22.3		10.5	22.9		10.2	22.2	22.2
Actuated g/C Ratio	0.14	0.26	0.26	0.14	0.26		0.12	0.26		0.12	0.25	0.25
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	242	890	393	240	849		208	890		202	464	394
v/s Ratio Prot	c0.13	0.11		0.04	c0.19		0.10	0.18		c0.11	c0.19	
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.93	0.44	0.05	0.30	0.74		0.79	0.69		0.98	0.74	0.12
Uniform Delay, d1	37.1	27.2	24.5	33.8	29.8		37.3	29.0		38.4	29.9	25.0
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	37.9	0.4	0.1	0.7	3.4		18.5	2.4		57.4	6.0	0.1
Delay (s)	75.0	27.6	24.5	34.5	33.2		55.8	31.4		95.8	35.9	25.2
Level of Service	E	C	C	C	C		E	C		F	D	C
Approach Delay (s)		42.3			33.3			36.5			49.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			87.3			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			68.9%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	16.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	529	66	40	489	4	75	35	107	4	10	19
Future Vol, veh/h	21	529	66	40	489	4	75	35	107	4	10	19
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	27	670	84	51	619	5	95	44	135	5	13	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	624	0	0	754	0	0	1466	1450	670	1580	1532	622
Stage 1	-	-	-	-	-	-	724	724	-	724	724	-
Stage 2	-	-	-	-	-	-	742	726	-	856	808	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	962	-	-	861	-	-	107	132	459	89	118	490
Stage 1	-	-	-	-	-	-	419	432	-	420	433	-
Stage 2	-	-	-	-	-	-	409	431	-	355	397	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	962	-	-	861	-	-	~ 87	121	459	42	108	490
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 87	121	-	42	108	-
Stage 1	-	-	-	-	-	-	407	420	-	408	407	-
Stage 2	-	-	-	-	-	-	355	406	-	218	386	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	99.5	39.3
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	87	272	962	-	-	861	-	-	146
HCM Lane V/C Ratio	1.091	0.661	0.028	-	-	0.059	-	-	0.286
HCM Control Delay (s)	210.9	40.7	8.8	-	-	9.4	-	-	39.3
HCM Lane LOS	F	E	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	6.5	4.3	0.1	-	-	0.2	-	-	1.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing PM Peak

10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	203	239	67	181	47	196	444	47	47	635	187
Future Volume (vph)	215	203	239	67	181	47	196	444	47	47	635	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1805		1770	3488		1770	3418	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1805		1770	3488		1770	3418	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	216	254	71	193	50	209	472	50	50	676	199
RTOR Reduction (vph)	0	0	199	0	10	0	0	7	0	0	24	0
Lane Group Flow (vph)	229	216	55	71	233	0	209	515	0	50	851	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.6	21.0	21.0	12.2	18.2		15.1	31.3		11.5	27.7	
Effective Green, g (s)	14.6	21.0	21.0	12.2	18.2		15.1	31.3		11.5	27.7	
Actuated g/C Ratio	0.15	0.22	0.22	0.13	0.19		0.16	0.32		0.12	0.29	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	268	405	340	224	340		277	1132		211	982	
v/s Ratio Prot	c0.13	0.12		0.04	c0.13		c0.12	0.15		0.03	c0.25	
v/s Ratio Perm			0.04									
v/c Ratio	0.85	0.53	0.16	0.32	0.69		0.75	0.46		0.24	0.87	
Uniform Delay, d1	39.9	33.4	30.6	38.3	36.4		38.9	25.8		38.5	32.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.3	1.4	0.2	0.8	5.7		11.1	0.3		0.6	8.1	
Delay (s)	62.2	34.7	30.8	39.1	42.1		50.0	26.1		39.1	40.7	
Level of Service	E	C	C	D	D		D	C		D	D	
Approach Delay (s)		42.3			41.4			32.9			40.6	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			39.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			96.4			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			76.0%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	4.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	35	239	44	17	22
Future Vol, veh/h	228	35	239	44	17	22
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	41	281	52	20	26
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	309	0	903	289
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	614	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1246	-	305	745
Stage 1	-	-	-	-	756	-
Stage 2	-	-	-	-	536	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1246	-	234	745
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	536	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	7.4		15.7		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	382	-	-	1246	-	
HCM Lane V/C Ratio	0.12	-	-	0.226	-	
HCM Control Delay (s)	15.7	-	-	8.7	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0.9	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing PM Peak
10/30/2019

Intersection								
Int Delay, s/veh	11.6							
Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Vol, veh/h	42	76	5	91	777	14	985	122
Future Vol, veh/h	42	76	5	91	777	14	985	122
Conflicting Peds, #/hr	0	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	-	None
Storage Length	0	-	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	-	0	-	0	-
Grade, %	0	-	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3	3
Mvmt Flow	47	84	6	101	863	16	1094	136

Major/Minor	Minor2	Major1			Major2		
Conflicting Flow All	1841	616	1230	1231	0	863	- 0
Stage 1	1195	-	-	-	-	-	-
Stage 2	646	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	6.46	4.16	-	6.46	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.53	2.23	-	2.53	-
Pot Cap-1 Maneuver	66	431	234	556	-	403	-
Stage 1	248	-	-	-	-	-	-
Stage 2	481	-	-	-	-	-	-
Platoon blocked, %					-	-	-
Mov Cap-1 Maneuver	50	431	506	506	-	403	-
Mov Cap-2 Maneuver	50	-	-	-	-	-	-
Stage 1	187	-	-	-	-	-	-
Stage 2	481	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	194.4	1.5	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	506	-	116	403	-	-
HCM Lane V/C Ratio	0.211	-	1.13	0.039	-	-
HCM Control Delay (s)	14	-	194.4	14.3	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.8	-	8	0.1	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing PM Peak
10/30/2019

Intersection							
Int Delay, s/veh	0.9						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations		↗	↘	↗↗	↗	↘	↗↗
Traffic Vol, veh/h	0	70	2	832	21	93	1004
Future Vol, veh/h	0	70	2	832	21	93	1004
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	-	0	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	0	0	5
Mvmt Flow	0	75	2	895	23	100	1080
Major/Minor	Minor1	Major1		Major2			
Conflicting Flow All	-	448	1080	0	0	918	0
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Critical Hdwy	-	6.9	6.4	-	-	4.1	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	2.5	-	-	2.2	-
Pot Cap-1 Maneuver	0	564	300	-	-	752	-
Stage 1	0	-	-	-	-	-	-
Stage 2	0	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	564	300	-	-	752	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-
Approach	WB	NB		SB			
HCM Control Delay, s	12.4	0		0.9			
HCM LOS	B						
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	300	-	-	564	752		
HCM Lane V/C Ratio	0.007	-	-	0.133	0.133		
HCM Control Delay (s)	17.1	-	-	12.4	10.5		
HCM Lane LOS	C	-	-	B	B		
HCM 95th %tile Q(veh)	0	-	-	0.5	0.5		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing PM Peak
10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Traffic Volume (vph)	191	420	161	46	305	207	91	434	58	242	525	196
Future Volume (vph)	191	420	161	46	305	207	91	434	58	242	525	196
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3325		1770	3476		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3325		1770	3476		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	203	447	171	49	324	220	97	462	62	257	559	209
RTOR Reduction (vph)	0	0	123	0	120	0	0	11	0	0	0	127
Lane Group Flow (vph)	203	447	48	49	424	0	97	513	0	257	559	82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.5	26.0	26.0	4.9	17.4		7.1	21.1		20.9	34.5	34.5
Effective Green, g (s)	13.5	26.0	26.0	4.9	17.4		7.1	21.1		20.9	34.5	34.5
Actuated g/C Ratio	0.15	0.28	0.28	0.05	0.19		0.08	0.23		0.23	0.37	0.37
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	258	993	444	93	624		135	792		399	694	589
v/s Ratio Prot	c0.11	0.13		0.03	c0.13		0.05	0.15		c0.15	c0.30	
v/s Ratio Perm			0.03									0.05
v/c Ratio	0.79	0.45	0.11	0.53	0.68		0.72	0.65		0.64	0.81	0.14
Uniform Delay, d1	38.2	27.4	24.7	42.7	35.0		41.8	32.4		32.5	26.0	19.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	14.6	0.3	0.1	5.3	2.9		16.7	1.8		3.5	6.8	0.1
Delay (s)	52.7	27.7	24.8	48.0	37.9		58.4	34.2		36.0	32.8	19.3
Level of Service	D	C	C	D	D		E	C		D	C	B
Approach Delay (s)		33.3			38.8			38.0			30.9	
Approach LOS		C			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			34.5			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			92.6			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			75.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

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	24	516	105	27	454	5	42	31	28	8	42	21
Future Vol, veh/h	24	516	105	27	454	5	42	31	28	8	42	21
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	26	555	113	29	488	5	45	33	30	9	45	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	493	0	0	668	0	0	1190	1158	555	1244	1269	491
Stage 1	-	-	-	-	-	-	607	607	-	549	549	-
Stage 2	-	-	-	-	-	-	583	551	-	695	720	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1081	-	-	931	-	-	166	198	535	152	170	582
Stage 1	-	-	-	-	-	-	487	489	-	524	520	-
Stage 2	-	-	-	-	-	-	502	519	-	436	435	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1081	-	-	931	-	-	120	187	535	119	161	582
Mov Cap-2 Maneuver	-	-	-	-	-	-	120	187	-	119	161	-
Stage 1	-	-	-	-	-	-	475	477	-	511	504	-
Stage 2	-	-	-	-	-	-	426	503	-	374	425	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.5	34.7	34.9
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	120	271	1081	-	-	931	-	-	195
HCM Lane V/C Ratio	0.376	0.234	0.024	-	-	0.031	-	-	0.392
HCM Control Delay (s)	52.1	22.3	8.4	-	-	9	-	-	34.9
HCM Lane LOS	F	C	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	1.6	0.9	0.1	-	-	0.1	-	-	1.7

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing AM Peak
10/30/2019

								
Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	32	105	9	169	848	3	533	75
Future Volume (vph)	32	105	9	169	848	3	533	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1546		1752	3505	1752	3431	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1546		1752	3505	1752	3431	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	37	121	10	194	975	3	613	86
RTOR Reduction (vph)	0	107	0	0	0	0	12	0
Lane Group Flow (vph)	37	14	0	204	975	3	687	0
Confl. Peds. (#/hr)		2						1
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	
Protected Phases	4		5	5	2	1	6	
Permitted Phases		4						
Actuated Green, G (s)	6.7	6.7		16.3	36.6	0.7	21.0	
Effective Green, g (s)	6.7	6.7		16.3	36.6	0.7	21.0	
Actuated g/C Ratio	0.11	0.11		0.28	0.62	0.01	0.36	
Clearance Time (s)	4.2	4.2		4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	199	176		485	2181	20	1225	
v/s Ratio Prot	c0.02			0.12	c0.28	0.00	c0.20	
v/s Ratio Perm		0.01						
v/c Ratio	0.19	0.08		0.42	0.45	0.15	0.56	
Uniform Delay, d1	23.6	23.3		17.4	5.8	28.8	15.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.2		0.6	0.1	3.5	0.6	
Delay (s)	24.0	23.5		18.0	6.0	32.2	15.8	
Level of Service	C	C		B	A	C	B	
Approach Delay (s)	23.6				8.0		15.9	
Approach LOS	C				A		B	
Intersection Summary								
HCM 2000 Control Delay			11.9		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio			0.46					
Actuated Cycle Length (s)			58.8		Sum of lost time (s)		14.8	
Intersection Capacity Utilization			46.9%		ICU Level of Service		A	
Analysis Period (min)			15					
c Critical Lane Group								

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing AM Peak
10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	529	66	40	489	4	75	35	107	4	10	19
Future Volume (veh/h)	21	529	66	40	489	4	75	35	107	4	10	19
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	27	670	84	51	619	5	95	44	135	5	13	24
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	54	765	680	84	839	7	123	61	186	12	62	115
Arrive On Green	0.03	0.43	0.43	0.05	0.47	0.47	0.07	0.15	0.15	0.01	0.10	0.10
Sat Flow, veh/h	1795	1796	1598	1795	1779	14	1795	408	1252	1810	598	1104
Grp Volume(v), veh/h	27	670	84	51	0	624	95	0	179	5	0	37
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1794	1795	0	1660	1810	0	1701
Q Serve(g_s), s	0.9	21.4	1.2	1.7	0.0	17.7	3.3	0.0	6.4	0.2	0.0	1.2
Cycle Q Clear(g_c), s	0.9	21.4	1.2	1.7	0.0	17.7	3.3	0.0	6.4	0.2	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.75	1.00		0.65
Lane Grp Cap(c), veh/h	54	765	680	84	0	846	123	0	247	12	0	178
V/C Ratio(X)	0.50	0.88	0.12	0.60	0.00	0.74	0.77	0.00	0.73	0.42	0.00	0.21
Avail Cap(c_a), veh/h	143	1012	900	143	0	1011	206	0	821	144	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.9	16.5	3.9	29.3	0.0	13.4	28.7	0.0	25.5	31.0	0.0	25.7
Incr Delay (d2), s/veh	7.1	6.9	0.1	6.8	0.0	2.3	9.9	0.0	4.0	21.3	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.9	0.5	0.8	0.0	5.5	1.6	0.0	2.5	0.1	0.0	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	23.4	4.0	36.1	0.0	15.8	38.6	0.0	29.5	52.2	0.0	26.3
LnGrp LOS	D	C	A	D	A	B	D	A	C	D	A	C
Approach Vol, veh/h	781			675			274			42		
Approach Delay, s/veh	21.8			17.3			32.7			29.3		
Approach LOS	C			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.4	14.6	8.9	32.7	8.5	12.5	6.1	35.6				
Change Period (Y+Rc), s	6.0	* 5.3	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	5.0	* 31	5.0	* 35	* 7.2	28.1	* 5	35.3				
Max Q Clear Time (g_c+I1), s	2.2	8.4	3.7	23.4	5.3	3.2	2.9	19.7				
Green Ext Time (p_c), s	0.0	0.9	0.0	3.3	0.0	0.1	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing PM Peak
10/30/2019

								
Movement	EBL	EBR	NBU	NBL	NBT	SBU	SBT	SBR
Lane Configurations								
Traffic Volume (vph)	42	76	5	91	777	14	985	122
Future Volume (vph)	42	76	5	91	777	14	985	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00		1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	
Frt	1.00	0.85		1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568		1752	3505	1752	3439	
Flt Permitted	0.95	1.00		0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568		1752	3505	1752	3439	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	84	6	101	863	16	1094	136
RTOR Reduction (vph)	0	75	0	0	0	0	10	0
Lane Group Flow (vph)	47	9	0	107	863	16	1220	0
Confl. Peds. (#/hr)								1
Turn Type	Prot	Perm	Prot	Prot	NA	Prot	NA	
Protected Phases	4		5	5	2	1	6	
Permitted Phases		4						
Actuated Green, G (s)	6.8	6.8		9.9	42.1	0.7	32.9	
Effective Green, g (s)	6.8	6.8		9.9	42.1	0.7	32.9	
Actuated g/C Ratio	0.11	0.11		0.15	0.65	0.01	0.51	
Clearance Time (s)	4.2	4.2		4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	184	165		269	2291	19	1756	
v/s Ratio Prot	c0.03			c0.06	0.25	0.01	c0.35	
v/s Ratio Perm		0.01						
v/c Ratio	0.26	0.05		0.40	0.38	0.84	0.69	
Uniform Delay, d1	26.5	25.9		24.6	5.1	31.8	11.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1		1.0	0.1	131.7	1.2	
Delay (s)	27.2	26.0		25.5	5.2	163.5	13.2	
Level of Service	C	C		C	A	F	B	
Approach Delay (s)	26.5				7.5		15.1	
Approach LOS	C				A		B	
Intersection Summary								
HCM 2000 Control Delay			12.6		HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio			0.57					
Actuated Cycle Length (s)			64.4		Sum of lost time (s)		14.8	
Intersection Capacity Utilization			53.5%		ICU Level of Service		A	
Analysis Period (min)			15					
c Critical Lane Group								

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing PM Peak
10/30/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	516	105	27	454	5	42	31	28	8	42	21
Future Volume (veh/h)	24	516	105	27	454	5	42	31	28	8	42	21
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	26	555	113	29	488	5	45	33	30	9	45	23
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	56	699	606	61	690	7	86	117	106	21	108	55
Arrive On Green	0.03	0.38	0.38	0.03	0.38	0.38	0.05	0.13	0.13	0.01	0.09	0.09
Sat Flow, veh/h	1810	1856	1610	1810	1819	19	1810	917	833	1810	1185	606
Grp Volume(v), veh/h	26	555	113	29	0	493	45	0	63	9	0	68
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1837	1810	0	1750	1810	0	1791
Q Serve(g_s), s	0.6	12.0	2.1	0.7	0.0	10.3	1.1	0.0	1.5	0.2	0.0	1.6
Cycle Q Clear(g_c), s	0.6	12.0	2.1	0.7	0.0	10.3	1.1	0.0	1.5	0.2	0.0	1.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.48	1.00		0.34
Lane Grp Cap(c), veh/h	56	699	607	61	0	697	86	0	223	21	0	164
V/C Ratio(X)	0.47	0.79	0.19	0.47	0.00	0.71	0.52	0.00	0.28	0.42	0.00	0.42
Avail Cap(c_a), veh/h	200	1200	1042	200	0	1189	256	0	1198	200	0	1143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.6	12.6	9.5	21.5	0.0	11.9	21.1	0.0	17.9	22.2	0.0	19.4
Incr Delay (d2), s/veh	6.0	2.1	0.1	5.6	0.0	1.3	4.8	0.0	0.7	12.6	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	3.5	0.5	0.3	0.0	2.8	0.5	0.0	0.5	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.5	14.7	9.6	27.1	0.0	13.2	25.9	0.0	18.6	34.8	0.0	21.1
LnGrp LOS	C	B	A	C	A	B	C	A	B	C	A	C
Approach Vol, veh/h		694			522			108			77	
Approach Delay, s/veh		14.3			14.0			21.6			22.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.7	11.8	5.7	23.1	6.4	10.1	5.6	23.2				
Change Period (Y+Rc), s	* 4.2	* 6	* 4.2	6.0	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5	* 31	* 5	29.3	* 6.4	28.9	* 5	29.3				
Max Q Clear Time (g_c+I1), s	2.2	3.5	2.7	14.0	3.1	3.6	2.6	12.3				
Green Ext Time (p_c), s	0.0	0.3	0.0	3.0	0.0	0.2	0.0	2.4				

Intersection Summary

HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	223	164	91	164	192	241	148	152	84	170	183
Average Queue (ft)	99	70	35	67	115	118	73	88	23	76	78
95th Queue (ft)	184	136	62	116	176	199	129	146	58	123	138
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				1	4						
Queuing Penalty (veh)				2	5						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	72	50
Average Queue (ft)	28	27
95th Queue (ft)	61	43
Link Distance (ft)	2046	2712
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	UL	T	T	U	T	TR
Maximum Queue (ft)	75	71	248	118	128	28	222	171
Average Queue (ft)	19	32	76	27	32	4	71	55
95th Queue (ft)	50	56	146	80	84	18	148	117
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	62	31
Average Queue (ft)	26	12
95th Queue (ft)	50	33
Link Distance (ft)	1110	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	249	326	49	63	159	231	275	140	301	252	194	250
Average Queue (ft)	120	153	2	32	57	114	141	102	165	130	118	134
95th Queue (ft)	198	245	16	59	111	186	224	172	269	233	190	219
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							1					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)					3	16		14	29			
Queuing Penalty (veh)					6	10		32	41			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	74
Average Queue (ft)	38
95th Queue (ft)	64
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	72	350	50	73	321	123	144	29	49
Average Queue (ft)	18	138	10	35	96	40	41	6	21
95th Queue (ft)	46	257	33	60	200	90	95	23	48
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1			0	0	1		
Queuing Penalty (veh)		0			0	0	0		

Zone Summary

Zone wide Queuing Penalty: 99

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	401	180	137	116	204	254	174	214	68	245	289
Average Queue (ft)	161	96	66	52	118	122	85	106	33	172	173
95th Queue (ft)	315	152	116	94	187	211	165	188	63	239	258
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)					6						
Queuing Penalty (veh)					4						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	54	42
Average Queue (ft)	32	21
95th Queue (ft)	57	37
Link Distance (ft)	2046	2712
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	UL	T	T	U	T	TR
Maximum Queue (ft)	73	74	134	75	63	29	200	206
Average Queue (ft)	24	37	49	19	27	10	79	68
95th Queue (ft)	57	69	103	53	61	30	154	141
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	SB
Directions Served	R	L
Maximum Queue (ft)	66	97
Average Queue (ft)	26	28
95th Queue (ft)	52	63
Link Distance (ft)	1110	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	480	437	311	94	102	177	248	140	233	221	329	526
Average Queue (ft)	187	227	10	44	33	93	141	89	137	106	164	296
95th Queue (ft)	358	371	102	78	78	159	221	161	209	186	261	479
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)	2	0			3	11		11	34			1
Queuing Penalty (veh)	4	0			4	5		23	31			2

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	56
Average Queue (ft)	34
95th Queue (ft)	55
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	51	331	51	72	197	67	65	52	118
Average Queue (ft)	21	96	15	27	76	32	22	8	31
95th Queue (ft)	46	210	39	58	151	61	48	30	78
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		0							
Queuing Penalty (veh)		0							

Zone Summary

Zone wide Queuing Penalty: 74

Appendix F: Existing plus Project (Phase I) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Phase I) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	165	146	120	212	54	199	484	44	37	325	78
Future Volume (vph)	150	165	146	120	212	54	199	484	44	37	325	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1806		1770	3495		1770	3436	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1806		1770	3495		1770	3436	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	176	194	172	141	249	64	234	569	52	44	382	92
RTOR Reduction (vph)	0	0	142	0	9	0	0	6	0	0	21	0
Lane Group Flow (vph)	176	194	30	141	304	0	234	615	0	44	453	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	14.3	14.3	17.1	19.0		14.9	26.5		4.6	16.2	
Effective Green, g (s)	12.0	14.3	14.3	17.1	19.0		14.9	26.5		4.6	16.2	
Actuated g/C Ratio	0.14	0.17	0.17	0.21	0.23		0.18	0.32		0.06	0.20	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	256	321	273	365	413		318	1117		98	671	
v/s Ratio Prot	0.10	c0.10		0.08	c0.17		c0.13	c0.18		0.02	0.13	
v/s Ratio Perm			0.02									
v/c Ratio	0.69	0.60	0.11	0.39	0.74		0.74	0.55		0.45	0.68	
Uniform Delay, d1	33.7	31.7	28.9	28.4	29.6		32.1	23.3		37.9	30.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	7.5	3.2	0.2	0.7	6.7		8.6	0.6		3.2	2.7	
Delay (s)	41.1	34.9	29.1	29.1	36.3		40.7	23.9		41.2	33.6	
Level of Service	D	C	C	C	D		D	C		D	C	
Approach Delay (s)		35.1			34.0			28.5			34.2	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.71									
Actuated Cycle Length (s)			82.9			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			62.6%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	8.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	21	294	31	56	40
Future Vol, veh/h	226	21	294	31	56	40
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	26	359	38	68	49
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	302	0	1045	290
Stage 1	-	-	-	-	289	-
Stage 2	-	-	-	-	756	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1270	-	253	749
Stage 1	-	-	-	-	760	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1270	-	180	748
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	464	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	8.1		29.2		
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	263	-	-	1270	-	
HCM Lane V/C Ratio	0.445	-	-	0.282	-	
HCM Control Delay (s)	29.2	-	-	8.9	0	
HCM Lane LOS	D	-	-	A	A	
HCM 95th %tile Q(veh)	2.2	-	-	1.2	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I) AM Peak
10/31/2019

Intersection							
Int Delay, s/veh	4.4						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	32	106	170	850	3	533	75
Future Vol, veh/h	32	106	170	850	3	533	75
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	37	122	195	977	3	613	86

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1542	353	700	0	977	-	0
Stage 1	663	-	-	-	-	-	-
Stage 2	879	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	105	640	886	-	341	-	-
Stage 1	471	-	-	-	-	-	-
Stage 2	364	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	81	638	885	-	341	-	-
Mov Cap-2 Maneuver	81	-	-	-	-	-	-
Stage 1	364	-	-	-	-	-	-
Stage 2	364	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	42.8	1.7	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	885	-	246	341	-	-
HCM Lane V/C Ratio	0.221	-	0.645	0.01	-	-
HCM Control Delay (s)	10.2	-	42.8	15.7	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.8	-	4	0	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Phase I) AM Peak
10/31/2019

Intersection								
Int Delay, s/veh	1.5							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	18	89	0	843	15	26	647	
Future Vol, veh/h	18	89	0	843	15	26	647	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	87	87	87	87	87	87	87	
Heavy Vehicles, %	0	0	0	3	1	1	3	
Mvmt Flow	21	102	0	969	17	30	744	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1401	485	744	0	0	986	0	
Stage 1	969	-	-	-	-	-	-	
Stage 2	432	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.4	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.5	-	-	2.21	-	
Pot Cap-1 Maneuver	134	533	491	-	-	703	-	
Stage 1	333	-	-	-	-	-	-	
Stage 2	628	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	128	533	491	-	-	703	-	
Mov Cap-2 Maneuver	128	-	-	-	-	-	-	
Stage 1	319	-	-	-	-	-	-	
Stage 2	628	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	20.9	0		0.4				
HCM LOS	C							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	491	-	-	348	703	-		
HCM Lane V/C Ratio	-	-	-	0.353	0.043	-		
HCM Control Delay (s)	0	-	-	20.9	10.3	-		
HCM Lane LOS	A	-	-	C	B	-		
HCM 95th %tile Q(veh)	0	-	-	1.6	0.1	-		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Phase I) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	345	72	65	416	165	142	468	76	171	295	170
Future Volume (vph)	193	345	72	65	416	165	142	468	76	171	295	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3323		1736	3393		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3323		1736	3393		1736	1827	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	224	401	84	76	484	192	165	544	88	199	343	198
RTOR Reduction (vph)	0	0	62	0	39	0	0	13	0	0	0	148
Lane Group Flow (vph)	224	401	22	76	637	0	165	619	0	199	343	50
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	22.6	22.6	12.4	22.8		10.5	23.1		10.2	22.4	22.4
Effective Green, g (s)	12.2	22.6	22.6	12.4	22.8		10.5	23.1		10.2	22.4	22.4
Actuated g/C Ratio	0.14	0.26	0.26	0.14	0.26		0.12	0.26		0.12	0.25	0.25
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	240	891	393	244	860		207	890		201	465	395
v/s Ratio Prot	c0.13	0.12		0.04	c0.19		0.10	0.18		c0.11	c0.19	
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.93	0.45	0.05	0.31	0.74		0.80	0.70		0.99	0.74	0.13
Uniform Delay, d1	37.5	27.5	24.6	34.0	29.9		37.7	29.3		38.8	30.1	25.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	40.0	0.4	0.1	0.7	3.5		18.9	2.4		60.5	6.0	0.1
Delay (s)	77.5	27.8	24.7	34.7	33.4		56.6	31.7		99.3	36.1	25.4
Level of Service	E	C	C	C	C		E	C		F	D	C
Approach Delay (s)		43.2			33.5			36.8			50.3	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			88.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			69.3%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	18.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	529	66	40	489	5	75	35	107	7	10	25
Future Vol, veh/h	23	529	66	40	489	5	75	35	107	7	10	25
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	29	670	84	51	619	6	95	44	135	9	13	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	625	0	0	754	0	0	1475	1455	670	1584	1536	622
Stage 1	-	-	-	-	-	-	728	728	-	724	724	-
Stage 2	-	-	-	-	-	-	747	727	-	860	812	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	961	-	-	861	-	-	105	131	459	89	117	490
Stage 1	-	-	-	-	-	-	416	430	-	420	433	-
Stage 2	-	-	-	-	-	-	407	431	-	353	395	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	961	-	-	861	-	-	~ 83	120	459	42	107	490
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 83	120	-	42	107	-
Stage 1	-	-	-	-	-	-	404	417	-	407	407	-
Stage 2	-	-	-	-	-	-	347	406	-	216	383	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			0.7			107.6			48		
HCM LOS							F			E		
Minor Lane/Major Mvmt	NBLn1 NBLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	83	271	961	-	-	861	-	-	135			
HCM Lane V/C Ratio	1.144	0.663	0.03	-	-	0.059	-	-	0.394			
HCM Control Delay (s)	233.6	41	8.9	-	-	9.4	-	-	48			
HCM Lane LOS	F	E	A	-	-	A	-	-	E			
HCM 95th %tile Q(veh)	6.8	4.3	0.1	-	-	0.2	-	-	1.7			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Phase I) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	219	239	67	190	57	196	445	47	65	635	187
Future Volume (vph)	215	219	239	67	190	57	196	445	47	65	635	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1798		1770	3488		1770	3418	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1798		1770	3488		1770	3418	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	233	254	71	202	61	209	473	50	69	676	199
RTOR Reduction (vph)	0	0	196	0	11	0	0	7	0	0	24	0
Lane Group Flow (vph)	229	233	58	71	252	0	209	516	0	69	851	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.6	22.0	22.0	12.3	19.3		14.3	25.5		16.5	27.7	
Effective Green, g (s)	14.6	22.0	22.0	12.3	19.3		14.3	25.5		16.5	27.7	
Actuated g/C Ratio	0.15	0.23	0.23	0.13	0.20		0.15	0.26		0.17	0.29	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	267	423	355	225	358		261	919		302	979	
v/s Ratio Prot	c0.13	0.13		0.04	c0.14		c0.12	0.15		0.04	c0.25	
v/s Ratio Perm			0.04									
v/c Ratio	0.86	0.55	0.16	0.32	0.70		0.80	0.56		0.23	0.87	
Uniform Delay, d1	40.0	33.0	30.0	38.4	36.0		39.8	30.8		34.6	32.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	22.8	1.6	0.2	0.8	6.2		16.0	0.8		0.4	8.3	
Delay (s)	62.8	34.5	30.2	39.2	42.2		55.8	31.6		35.0	41.1	
Level of Service	E	C	C	D	D		E	C		C	D	
Approach Delay (s)		42.0			41.5			38.5			40.6	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			40.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			96.7			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			77.1%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	5.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	69	242	44	36	24
Future Vol, veh/h	228	69	242	44	36	24
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	81	285	52	42	28
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	349	0	931	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	622	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1204	-	294	726
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	532	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1204	-	222	726
Mov Cap-2 Maneuver	-	-	-	-	222	-
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	532	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.5		20.2	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	307	-	-	1204	-	
HCM Lane V/C Ratio	0.23	-	-	0.236	-	
HCM Control Delay (s)	20.2	-	-	8.9	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	0.9	-	-	0.9	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I) PM Peak
10/31/2019

Intersection							
Int Delay, s/veh	10.7						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	42	77	92	778	14	987	122
Future Vol, veh/h	42	77	92	778	14	987	122
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	47	86	102	864	16	1097	136

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1834	618	1234	0	864	-	0
Stage 1	1198	-	-	-	-	-	-
Stage 2	636	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	67	430	555	-	403	-	-
Stage 1	247	-	-	-	-	-	-
Stage 2	487	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	52	430	554	-	403	-	-
Mov Cap-2 Maneuver	52	-	-	-	-	-	-
Stage 1	193	-	-	-	-	-	-
Stage 2	487	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	178.4	1.4	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	554	-	121	403	-	-
HCM Lane V/C Ratio	0.185	-	1.093	0.039	-	-
HCM Control Delay (s)	13	-	178.4	14.3	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	7.8	0.1	-	-

Intersection							
Int Delay, s/veh	1.2						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	10	65	2	834	21	93	1007
Future Vol, veh/h	10	65	2	834	21	93	1007
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	1	0	0	5
Mvmt Flow	11	70	2	897	23	100	1083

Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1643	449	1083	0	0	920
Stage 1	901	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Critical Hdwy	6.8	6.9	6.4	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.5	-	-	2.2
Pot Cap-1 Maneuver	92	563	299	-	-	750
Stage 1	362	-	-	-	-	-
Stage 2	437	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	79	563	299	-	-	750
Mov Cap-2 Maneuver	79	-	-	-	-	-
Stage 1	312	-	-	-	-	-
Stage 2	437	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.6	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	299	-	-	310	750
HCM Lane V/C Ratio	0.007	-	-	0.26	0.133
HCM Control Delay (s)	17.1	-	-	20.6	10.5
HCM Lane LOS	C	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	1	0.5

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Phase I) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	436	161	47	310	209	91	434	61	245	526	200
Future Volume (vph)	191	436	161	47	310	209	91	434	61	245	526	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3326		1770	3474		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3326		1770	3474		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	203	464	171	50	330	222	97	462	65	261	560	213
RTOR Reduction (vph)	0	0	123	0	115	0	0	12	0	0	0	133
Lane Group Flow (vph)	203	464	48	50	437	0	97	515	0	261	560	80
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.4	26.3	26.3	5.1	18.0		9.0	21.4		20.5	32.5	32.5
Effective Green, g (s)	13.4	26.3	26.3	5.1	18.0		9.0	21.4		20.5	32.5	32.5
Actuated g/C Ratio	0.14	0.28	0.28	0.05	0.19		0.10	0.23		0.22	0.35	0.35
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	255	1000	447	97	643		171	799		390	651	553
v/s Ratio Prot	c0.11	0.13		0.03	c0.13		0.05	0.15		c0.15	c0.30	
v/s Ratio Perm			0.03									0.05
v/c Ratio	0.80	0.46	0.11	0.52	0.68		0.57	0.65		0.67	0.86	0.14
Uniform Delay, d1	38.5	27.5	24.7	42.7	34.8		40.1	32.4		33.1	28.1	20.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	15.7	0.3	0.1	4.6	2.9		4.3	1.8		4.3	11.2	0.1
Delay (s)	54.2	27.9	24.8	47.3	37.7		44.4	34.2		37.5	39.3	20.8
Level of Service	D	C	C	D	D		D	C		D	D	C
Approach Delay (s)		33.6			38.5			35.8			35.1	
Approach LOS		C			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			35.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			93.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			75.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	516	105	27	454	8	42	31	28	10	42	25
Future Vol, veh/h	30	516	105	27	454	8	42	31	28	10	42	25
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	32	555	113	29	488	9	45	33	30	11	45	27

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	497	0	0	668	0	0	1206	1174	555	1258	1283	493
Stage 1	-	-	-	-	-	-	619	619	-	551	551	-
Stage 2	-	-	-	-	-	-	587	555	-	707	732	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1077	-	-	931	-	-	162	193	535	149	167	580
Stage 1	-	-	-	-	-	-	480	483	-	522	519	-
Stage 2	-	-	-	-	-	-	499	516	-	429	430	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1077	-	-	931	-	-	115	181	535	115	157	580
Mov Cap-2 Maneuver	-	-	-	-	-	-	115	181	-	115	157	-
Stage 1	-	-	-	-	-	-	466	469	-	506	503	-
Stage 2	-	-	-	-	-	-	420	500	-	365	417	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.5	36.3	36.7
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	115	264	1077	-	-	931	-	-	194
HCM Lane V/C Ratio	0.393	0.24	0.03	-	-	0.031	-	-	0.427
HCM Control Delay (s)	55.2	22.9	8.4	-	-	9	-	-	36.7
HCM Lane LOS	F	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	1.6	0.9	0.1	-	-	0.1	-	-	2

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I) AM Peak

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	32	106	170	850	3	533	75
Future Volume (vph)	32	106	170	850	3	533	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1546	1752	3505	1752	3431	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1546	1752	3505	1752	3431	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	37	122	195	977	3	613	86
RTOR Reduction (vph)	0	108	0	0	0	12	0
Lane Group Flow (vph)	37	14	195	977	3	687	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	6.8	6.8	16.1	36.4	0.8	21.1	
Effective Green, g (s)	6.8	6.8	16.1	36.4	0.8	21.1	
Actuated g/C Ratio	0.12	0.12	0.27	0.62	0.01	0.36	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	202	178	478	2166	23	1229	
v/s Ratio Prot	c0.02		0.11	c0.28	0.00	c0.20	
v/s Ratio Perm		0.01					
v/c Ratio	0.18	0.08	0.41	0.45	0.13	0.56	
Uniform Delay, d1	23.5	23.3	17.5	6.0	28.7	15.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.2	0.6	0.2	2.6	0.6	
Delay (s)	24.0	23.4	18.1	6.1	31.3	15.7	
Level of Service	C	C	B	A	C	B	
Approach Delay (s)	23.6			8.1		15.8	
Approach LOS	C			A		B	
Intersection Summary							
HCM 2000 Control Delay			12.0		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.46				
Actuated Cycle Length (s)			58.9		Sum of lost time (s)		14.9
Intersection Capacity Utilization			44.9%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary
7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	529	66	40	489	5	75	35	107	7	10	25
Future Volume (veh/h)	23	529	66	40	489	5	75	35	107	7	10	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	29	670	84	51	619	6	95	44	135	9	13	32
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	57	771	686	84	839	8	122	60	185	21	53	130
Arrive On Green	0.03	0.43	0.43	0.05	0.47	0.47	0.07	0.15	0.15	0.01	0.11	0.11
Sat Flow, veh/h	1795	1796	1598	1795	1776	17	1795	408	1252	1810	487	1198
Grp Volume(v), veh/h	29	670	84	51	0	625	95	0	179	9	0	45
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1793	1795	0	1660	1810	0	1684
Q Serve(g_s), s	1.0	21.7	1.2	1.8	0.0	18.0	3.3	0.0	6.6	0.3	0.0	1.6
Cycle Q Clear(g_c), s	1.0	21.7	1.2	1.8	0.0	18.0	3.3	0.0	6.6	0.3	0.0	1.6
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.75	1.00		0.71
Lane Grp Cap(c), veh/h	57	771	686	84	0	847	122	0	246	21	0	183
V/C Ratio(X)	0.51	0.87	0.12	0.61	0.00	0.74	0.78	0.00	0.73	0.43	0.00	0.25
Avail Cap(c_a), veh/h	141	1105	983	141	0	1103	177	0	805	142	0	765
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.5	16.6	4.0	29.9	0.0	13.6	29.3	0.0	26.0	31.4	0.0	26.1
Incr Delay (d2), s/veh	7.0	5.4	0.1	7.0	0.0	1.9	12.4	0.0	4.1	13.4	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.7	0.5	0.8	0.0	5.6	1.7	0.0	2.6	0.2	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	22.0	4.0	36.9	0.0	15.5	41.7	0.0	30.1	44.7	0.0	26.8
LnGrp LOS	D	C	A	D	A	B	D	A	C	D	A	C
Approach Vol, veh/h	783			676			274			54		
Approach Delay, s/veh	20.7			17.1			34.1			29.8		
Approach LOS	C			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	14.8	9.0	33.4	8.6	12.9	6.2	36.2				
Change Period (Y+Rc), s	6.0	* 5.3	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	5.0	* 31	5.0	* 39	* 6.3	29.0	* 5	39.3				
Max Q Clear Time (g_c+I1), s	2.3	8.6	3.8	23.7	5.3	3.6	3.0	20.0				
Green Ext Time (p_c), s	0.0	0.9	0.0	3.7	0.0	0.1	0.0	3.4				

Intersection Summary

HCM 6th Ctrl Delay	21.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I) PM Peak

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	42	77	92	778	14	987	122
Future Volume (vph)	42	77	92	778	14	987	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3439	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3439	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	86	102	864	16	1097	136
RTOR Reduction (vph)	0	77	0	0	0	11	0
Lane Group Flow (vph)	47	9	102	864	16	1222	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	6.8	6.8	9.4	41.8	0.7	33.1	
Effective Green, g (s)	6.8	6.8	9.4	41.8	0.7	33.1	
Actuated g/C Ratio	0.11	0.11	0.15	0.65	0.01	0.52	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	185	166	256	2285	19	1775	
v/s Ratio Prot	c0.03		c0.06	0.25	0.01	c0.36	
v/s Ratio Perm		0.01					
v/c Ratio	0.25	0.05	0.40	0.38	0.84	0.69	
Uniform Delay, d1	26.3	25.8	24.8	5.1	31.6	11.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1	1.0	0.1	131.7	1.1	
Delay (s)	27.0	25.9	25.8	5.3	163.4	12.8	
Level of Service	C	C	C	A	F	B	
Approach Delay (s)	26.3			7.4		14.7	
Approach LOS	C			A		B	
Intersection Summary							
HCM 2000 Control Delay			12.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.57				
Actuated Cycle Length (s)			64.1		Sum of lost time (s)		14.8
Intersection Capacity Utilization			52.8%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary
7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	516	105	27	454	8	42	31	28	10	42	25
Future Volume (veh/h)	30	516	105	27	454	8	42	31	28	10	42	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	32	555	113	29	488	9	45	33	30	11	45	27
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	66	692	600	61	667	12	85	148	135	26	101	60
Arrive On Green	0.04	0.37	0.37	0.03	0.37	0.37	0.05	0.16	0.16	0.01	0.09	0.09
Sat Flow, veh/h	1810	1856	1610	1810	1802	33	1810	917	833	1810	1112	667
Grp Volume(v), veh/h	32	555	113	29	0	497	45	0	63	11	0	72
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1835	1810	0	1750	1810	0	1780
Q Serve(g_s), s	0.8	12.6	1.2	0.7	0.0	11.0	1.1	0.0	1.5	0.3	0.0	1.8
Cycle Q Clear(g_c), s	0.8	12.6	1.2	0.7	0.0	11.0	1.1	0.0	1.5	0.3	0.0	1.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.48	1.00		0.38
Lane Grp Cap(c), veh/h	66	692	600	61	0	679	85	0	283	26	0	161
V/C Ratio(X)	0.49	0.80	0.19	0.48	0.00	0.73	0.53	0.00	0.22	0.43	0.00	0.45
Avail Cap(c_a), veh/h	192	1153	1001	192	0	1140	246	0	1151	192	0	1091
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.3	13.2	2.9	22.4	0.0	12.8	21.9	0.0	17.2	23.1	0.0	20.3
Incr Delay (d2), s/veh	5.5	2.2	0.2	5.7	0.0	1.5	4.9	0.0	0.4	10.8	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	3.7	0.5	0.4	0.0	3.2	0.5	0.0	0.5	0.2	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	15.4	3.1	28.1	0.0	14.4	26.9	0.0	17.6	33.9	0.0	22.3
LnGrp LOS	C	B	A	C	A	B	C	A	B	C	A	C
Approach Vol, veh/h		700			526			108			83	
Approach Delay, s/veh		14.0			15.1			21.5			23.8	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.9	12.9	5.8	23.6	7.5	10.3	5.9	23.5				
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	6.0	5.3	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5	31.0	* 5	29.3	6.4	* 29	* 5	29.3				
Max Q Clear Time (g_c+I1), s	2.3	3.5	2.7	14.6	3.1	3.8	2.8	13.0				
Green Ext Time (p_c), s	0.0	0.3	0.0	3.0	0.0	0.3	0.0	2.4				

Intersection Summary

HCM 6th Ctrl Delay 15.6

HCM 6th LOS B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	178	194	69	214	239	274	195	200	85	133	140
Average Queue (ft)	97	85	38	81	114	118	79	90	19	79	88
95th Queue (ft)	167	146	62	144	187	204	142	158	50	117	132
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				0	4						
Queuing Penalty (veh)				1	5						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	118	54
Average Queue (ft)	38	32
95th Queue (ft)	73	56
Link Distance (ft)	2046	2712
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	50	98	195	94	97	53	190	157
Average Queue (ft)	15	40	76	28	30	6	67	63
95th Queue (ft)	41	71	141	71	76	28	149	133
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	87	52
Average Queue (ft)	38	10
95th Queue (ft)	69	33
Link Distance (ft)	1109	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	484	515	437	74	177	265	297	139	296	256	203	266
Average Queue (ft)	270	189	18	27	52	136	177	111	164	129	119	151
95th Queue (ft)	480	374	148	55	112	218	269	168	262	227	188	232
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)						0	1					
Queuing Penalty (veh)						0	3					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)	9	0			1	21		19	27			
Queuing Penalty (veh)	15	0			3	14		45	38			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	97
Average Queue (ft)	44
95th Queue (ft)	78
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	73	238	29	95	307	107	85	27	52
Average Queue (ft)	20	93	7	28	103	40	38	8	19
95th Queue (ft)	54	193	25	64	216	80	76	26	40
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)					0	0			
Queuing Penalty (veh)					0	0			

Zone Summary

Zone wide Queuing Penalty: 124

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	248	181	71	159	250	276	198	192	90	301	271
Average Queue (ft)	148	111	48	64	124	127	76	96	50	168	172
95th Queue (ft)	246	195	74	123	218	218	147	164	86	242	251
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				1	9						
Queuing Penalty (veh)				3	6						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	137	52
Average Queue (ft)	39	24
95th Queue (ft)	81	47
Link Distance (ft)	2046	2712
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	92	72	113	74	113	53	290	316
Average Queue (ft)	36	34	49	17	29	14	97	77
95th Queue (ft)	76	63	93	54	79	41	207	194
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	NB	SB
Directions Served	LR	U	L
Maximum Queue (ft)	109	22	94
Average Queue (ft)	30	2	36
95th Queue (ft)	69	12	81
Link Distance (ft)	1109		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		320	450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	239	358	263	205	110	180	263	139	287	228	255	333
Average Queue (ft)	134	194	25	41	39	106	152	90	144	113	162	216
95th Queue (ft)	210	291	142	101	87	160	232	157	229	203	247	312
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)							0					
Queuing Penalty (veh)							0					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)					4	16		16	32			
Queuing Penalty (veh)					6	7		35	29			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	98
Average Queue (ft)	41
95th Queue (ft)	74
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	73	237	51	53	214	68	43	28	114
Average Queue (ft)	20	97	21	24	79	28	17	8	34
95th Queue (ft)	49	192	42	47	157	57	36	26	78
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Zone Summary

Zone wide Queuing Penalty: 87

Appendix G: Existing plus Project (Phase I & II) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	167	148	120	218	64	206	495	44	40	328	78
Future Volume (vph)	150	167	148	120	218	64	206	495	44	40	328	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1799		1770	3496		1770	3437	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1799		1770	3496		1770	3437	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	176	196	174	141	256	75	242	582	52	47	386	92
RTOR Reduction (vph)	0	0	144	0	11	0	0	6	0	0	20	0
Lane Group Flow (vph)	176	196	30	141	320	0	242	628	0	47	458	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	14.6	14.6	18.1	20.3		16.0	27.7		5.0	16.7	
Effective Green, g (s)	12.0	14.6	14.6	18.1	20.3		16.0	27.7		5.0	16.7	
Actuated g/C Ratio	0.14	0.17	0.17	0.21	0.24		0.19	0.32		0.06	0.19	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	317	269	373	425		330	1128		103	668	
v/s Ratio Prot	c0.10	0.11		0.08	c0.18		c0.14	c0.18		0.03	0.13	
v/s Ratio Perm			0.02									
v/c Ratio	0.71	0.62	0.11	0.38	0.75		0.73	0.56		0.46	0.69	
Uniform Delay, d1	35.3	33.0	30.1	29.0	30.4		32.9	24.0		39.1	32.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.3	3.6	0.2	0.6	7.4		8.2	0.6		3.2	2.9	
Delay (s)	44.6	36.6	30.3	29.7	37.8		41.1	24.6		42.3	35.0	
Level of Service	D	D	C	C	D		D	C		D	D	
Approach Delay (s)		37.2			35.4			29.1			35.7	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			33.6			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			85.8			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			64.0%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	9.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	26	295	31	72	43
Future Vol, veh/h	226	26	295	31	72	43
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	32	360	38	88	52
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	1050	293
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	758	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1264	-	252	746
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	179	745
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	463	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.1		36.3	
HCM LOS	E					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	250	-	-	1264	-	
HCM Lane V/C Ratio	0.561	-	-	0.285	-	
HCM Control Delay (s)	36.3	-	-	9	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	3.1	-	-	1.2	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

Intersection							
Int Delay, s/veh	4.6						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	32	107	171	869	3	539	75
Future Vol, veh/h	32	107	171	869	3	539	75
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	37	123	197	999	3	620	86

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1564	356	707	0	999	-	0
Stage 1	670	-	-	-	-	-	-
Stage 2	894	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	101	638	881	-	330	-	-
Stage 1	467	-	-	-	-	-	-
Stage 2	357	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	77	636	880	-	330	-	-
Mov Cap-2 Maneuver	77	-	-	-	-	-	-
Stage 1	359	-	-	-	-	-	-
Stage 2	357	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	46.4	1.7	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	880	-	238	330	-	-
HCM Lane V/C Ratio	0.223	-	0.671	0.01	-	-
HCM Control Delay (s)	10.3	-	46.4	16	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.9	-	4.3	0	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

Intersection								
Int Delay, s/veh	1.8							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	18	109	0	843	15	33	647	
Future Vol, veh/h	18	109	0	843	15	33	647	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	87	87	87	87	87	87	87	
Heavy Vehicles, %	0	0	3	3	1	1	3	
Mvmt Flow	21	125	0	969	17	38	744	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1417	485	744	0	0	986	0	
Stage 1	969	-	-	-	-	-	-	
Stage 2	448	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.46	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.53	-	-	2.21	-	
Pot Cap-1 Maneuver	130	533	481	-	-	703	-	
Stage 1	333	-	-	-	-	-	-	
Stage 2	616	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	123	533	481	-	-	703	-	
Mov Cap-2 Maneuver	123	-	-	-	-	-	-	
Stage 1	315	-	-	-	-	-	-	
Stage 2	616	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	21.5	0		0.5				
HCM LOS	C							
Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT		
Capacity (veh/h)	481	-	-	362	703	-		
HCM Lane V/C Ratio	-	-	-	0.403	0.054	-		
HCM Control Delay (s)	0	-	-	21.5	10.4	-		
HCM Lane LOS	A	-	-	C	B	-		
HCM 95th %tile Q(veh)	0	-	-	1.9	0.2	-		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	193	352	72	68	436	165	142	468	77	171	295	170
Future Volume (vph)	193	352	72	68	436	165	142	468	77	171	295	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3328		1736	3391		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3328		1736	3391		1736	1827	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	224	409	84	79	507	192	165	544	90	199	343	198
RTOR Reduction (vph)	0	0	62	0	35	0	0	13	0	0	0	148
Lane Group Flow (vph)	224	409	22	79	664	0	165	621	0	199	343	50
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.1	23.0	23.0	12.6	23.5		10.5	23.3		10.2	22.6	22.6
Effective Green, g (s)	12.1	23.0	23.0	12.6	23.5		10.5	23.3		10.2	22.6	22.6
Actuated g/C Ratio	0.14	0.26	0.26	0.14	0.26		0.12	0.26		0.11	0.25	0.25
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	899	396	246	880		205	889		199	464	395
v/s Ratio Prot	c0.13	0.12		0.05	c0.20		0.10	0.18		c0.11	c0.19	
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.95	0.45	0.05	0.32	0.75		0.80	0.70		1.00	0.74	0.13
Uniform Delay, d1	38.0	27.6	24.7	34.3	30.0		38.2	29.6		39.3	30.4	25.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	44.0	0.4	0.1	0.8	3.7		20.1	2.4		63.8	6.1	0.1
Delay (s)	82.1	28.0	24.8	35.0	33.7		58.2	32.0		103.1	36.5	25.7
Level of Service	F	C	C	D	C		E	C		F	D	C
Approach Delay (s)		44.5			33.8			37.4			51.5	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			88.8			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			69.9%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	21.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	529	66	40	489	6	75	35	107	10	10	41
Future Vol, veh/h	29	529	66	40	489	6	75	35	107	10	10	41
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	37	670	84	51	619	8	95	44	135	13	13	52

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	627	0	0	754	0	0	1502	1473	670	1601	1553	623
Stage 1	-	-	-	-	-	-	744	744	-	725	725	-
Stage 2	-	-	-	-	-	-	758	729	-	876	828	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	960	-	-	861	-	-	101	127	459	86	114	490
Stage 1	-	-	-	-	-	-	408	423	-	420	433	-
Stage 2	-	-	-	-	-	-	401	430	-	346	389	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	960	-	-	861	-	-	~ 76	115	459	40	103	490
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 76	115	-	40	103	-
Stage 1	-	-	-	-	-	-	392	407	-	404	407	-
Stage 2	-	-	-	-	-	-	327	405	-	209	374	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.7	125.5	57.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	76	264	960	-	-	861	-	-	142
HCM Lane V/C Ratio	1.249	0.681	0.038	-	-	0.059	-	-	0.544
HCM Control Delay (s)	281	43.4	8.9	-	-	9.4	-	-	57.1
HCM Lane LOS	F	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	7.3	4.5	0.1	-	-	0.2	-	-	2.7

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Phase I & II) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	226	247	67	194	64	200	452	47	76	647	187
Future Volume (vph)	215	226	247	67	194	64	200	452	47	76	647	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1793		1770	3489		1770	3420	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1793		1770	3489		1770	3420	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	240	263	71	206	68	213	481	50	81	688	199
RTOR Reduction (vph)	0	0	203	0	12	0	0	7	0	0	24	0
Lane Group Flow (vph)	229	240	60	71	262	0	213	524	0	81	863	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.5	22.4	22.4	12.6	20.1		14.5	26.4		16.3	28.2	
Effective Green, g (s)	14.5	22.4	22.4	12.6	20.1		14.5	26.4		16.3	28.2	
Actuated g/C Ratio	0.15	0.23	0.23	0.13	0.20		0.15	0.27		0.17	0.29	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	261	425	356	227	367		261	938		294	983	
v/s Ratio Prot	c0.13	0.13		0.04	c0.15		c0.12	0.15		0.05	c0.25	
v/s Ratio Perm			0.04									
v/c Ratio	0.88	0.56	0.17	0.31	0.71		0.82	0.56		0.28	0.88	
Uniform Delay, d1	40.9	33.5	30.4	38.8	36.3		40.5	30.8		35.7	33.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	26.4	1.7	0.2	0.8	6.5		17.6	0.7		0.5	9.0	
Delay (s)	67.4	35.3	30.6	39.6	42.8		58.1	31.6		36.3	42.3	
Level of Service	E	D	C	D	D		E	C		D	D	
Approach Delay (s)		43.6			42.1			39.2			41.8	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			98.1			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			78.3%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	87	246	44	47	26
Future Vol, veh/h	228	87	246	44	47	26
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	102	289	52	55	31
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	370	0	949	319
Stage 1	-	-	-	-	319	-
Stage 2	-	-	-	-	630	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1183	-	287	717
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	527	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1183	-	215	717
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	527	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.7		22.9	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	286	-	-	1183	-	
HCM Lane V/C Ratio	0.3	-	-	0.245	-	
HCM Control Delay (s)	22.9	-	-	9	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1.2	-	-	1	-	

Intersection							
Int Delay, s/veh	12.1						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	42	78	93	790	14	1008	122
Future Vol, veh/h	42	78	93	790	14	1008	122
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	47	87	103	878	16	1120	136

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1866	629	1257	0	878	-	0
Stage 1	1221	-	-	-	-	-	-
Stage 2	645	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	63	423	544	-	395	-	-
Stage 1	240	-	-	-	-	-	-
Stage 2	482	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	49	423	543	-	395	-	-
Mov Cap-2 Maneuver	49	-	-	-	-	-	-
Stage 1	186	-	-	-	-	-	-
Stage 2	482	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	204.9	1.4	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	543	-	115	395	-	-
HCM Lane V/C Ratio	0.19	-	1.159	0.039	-	-
HCM Control Delay (s)	13.2	-	204.9	14.5	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	8.3	0.1	-	-

Intersection							
Int Delay, s/veh	1.5						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	10	78	2	834	21	115	1007
Future Vol, veh/h	10	78	2	834	21	115	1007
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	1	0	0	5
Mvmt Flow	11	84	2	897	23	124	1083

Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1691	449	1083	0	0	920
Stage 1	901	-	-	-	-	-
Stage 2	790	-	-	-	-	-
Critical Hdwy	6.8	6.9	6.42	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2
Pot Cap-1 Maneuver	86	563	296	-	-	750
Stage 1	362	-	-	-	-	-
Stage 2	413	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	71	563	296	-	-	750
Mov Cap-2 Maneuver	71	-	-	-	-	-
Stage 1	300	-	-	-	-	-
Stage 2	413	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.3	0	1.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	296	-	-	315	750
HCM Lane V/C Ratio	0.007	-	-	0.3	0.165
HCM Control Delay (s)	17.3	-	-	21.3	10.7
HCM Lane LOS	C	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	1.2	0.6

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Phase I & II) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	191	457	161	49	323	209	91	434	65	245	526	200
Future Volume (vph)	191	457	161	49	323	209	91	434	65	245	526	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3331		1770	3470		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3331		1770	3470		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	203	486	171	52	344	222	97	462	69	261	560	213
RTOR Reduction (vph)	0	0	126	0	104	0	0	12	0	0	0	133
Lane Group Flow (vph)	203	486	45	52	462	0	97	519	0	261	560	80
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.1	24.2	24.2	6.6	18.7		9.0	21.6		20.5	32.7	32.7
Effective Green, g (s)	12.1	24.2	24.2	6.6	18.7		9.0	21.6		20.5	32.7	32.7
Actuated g/C Ratio	0.13	0.26	0.26	0.07	0.20		0.10	0.23		0.22	0.35	0.35
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	231	924	413	126	672		172	809		391	657	559
v/s Ratio Prot	c0.11	0.14		0.03	c0.14		0.05	0.15		c0.15	c0.30	
v/s Ratio Perm			0.03									0.05
v/c Ratio	0.88	0.53	0.11	0.41	0.69		0.56	0.64		0.67	0.85	0.14
Uniform Delay, d1	39.5	29.3	26.0	41.1	34.2		39.9	32.0		32.9	27.7	20.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	29.2	0.5	0.1	2.2	2.9		4.2	1.7		4.3	10.4	0.1
Delay (s)	68.7	29.8	26.1	43.3	37.2		44.1	33.8		37.2	38.1	20.5
Level of Service	E	C	C	D	D		D	C		D	D	C
Approach Delay (s)		38.3			37.7			35.4			34.3	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			36.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			92.6			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			75.7%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	516	105	27	454	12	42	31	28	12	42	36
Future Vol, veh/h	48	516	105	27	454	12	42	31	28	12	42	36
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	52	555	113	29	488	13	45	33	30	13	45	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	501	0	0	668	0	0	1254	1218	555	1300	1325	495
Stage 1	-	-	-	-	-	-	659	659	-	553	553	-
Stage 2	-	-	-	-	-	-	595	559	-	747	772	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1074	-	-	931	-	-	150	182	535	140	157	579
Stage 1	-	-	-	-	-	-	456	464	-	521	518	-
Stage 2	-	-	-	-	-	-	494	514	-	408	412	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	931	-	-	100	168	535	106	145	579
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	168	-	106	145	-
Stage 1	-	-	-	-	-	-	434	442	-	496	502	-
Stage 2	-	-	-	-	-	-	406	498	-	339	392	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.5			42.3			40.7		
HCM LOS							E			E		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	100	249	1074	-	-	931	-	-	194
HCM Lane V/C Ratio	0.452	0.255	0.048	-	-	0.031	-	-	0.499
HCM Control Delay (s)	67.7	24.3	8.5	-	-	9	-	-	40.7
HCM Lane LOS	F	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	1.9	1	0.2	-	-	0.1	-	-	2.5

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

Intersection						
Int Delay, s/veh	8.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	26	295	31	72	43
Future Vol, veh/h	226	26	295	31	72	43
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	32	360	38	88	52
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	308	0	1050	293
Stage 1	-	-	-	-	292	-
Stage 2	-	-	-	-	758	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1264	-	252	746
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1264	-	179	745
Mov Cap-2 Maneuver	-	-	-	-	179	-
Stage 1	-	-	-	-	537	-
Stage 2	-	-	-	-	463	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.1		30.8	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	179	745	-	-	1264	-
HCM Lane V/C Ratio	0.491	0.07	-	-	0.285	-
HCM Control Delay (s)	43.1	10.2	-	-	9	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	2.4	0.2	-	-	1.2	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	32	107	171	869	3	539	75
Future Volume (vph)	32	107	171	869	3	539	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.99	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1546	1752	3505	1752	3432	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1546	1752	3505	1752	3432	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	37	123	197	999	3	620	86
RTOR Reduction (vph)	0	109	0	0	0	15	0
Lane Group Flow (vph)	37	14	197	999	3	691	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	6.7	6.7	15.0	35.2	0.7	20.9	
Effective Green, g (s)	6.7	6.7	15.0	35.2	0.7	20.9	
Actuated g/C Ratio	0.12	0.12	0.26	0.61	0.01	0.36	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	204	180	457	2145	21	1247	
v/s Ratio Prot	c0.02		0.11	c0.29	0.00	c0.20	
v/s Ratio Perm		0.01					
v/c Ratio	0.18	0.08	0.43	0.47	0.14	0.55	
Uniform Delay, d1	22.9	22.7	17.7	6.0	28.1	14.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.2	0.7	0.2	3.1	0.5	
Delay (s)	23.4	22.8	18.4	6.2	31.2	15.1	
Level of Service	C	C	B	A	C	B	
Approach Delay (s)	23.0			8.2		15.2	
Approach LOS	C			A		B	
Intersection Summary							
HCM 2000 Control Delay			11.8		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.47				
Actuated Cycle Length (s)			57.5		Sum of lost time (s)		14.9
Intersection Capacity Utilization			45.5%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I & II) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	529	66	40	489	6	75	35	107	10	10	41
Future Volume (veh/h)	29	529	66	40	489	6	75	35	107	10	10	41
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	37	670	84	51	619	8	95	44	135	13	13	52
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	68	743	661	84	799	10	122	61	187	29	38	152
Arrive On Green	0.04	0.41	0.41	0.05	0.45	0.45	0.07	0.15	0.15	0.02	0.11	0.11
Sat Flow, veh/h	1795	1796	1598	1795	1769	23	1795	408	1252	1810	332	1329
Grp Volume(v), veh/h	37	670	84	51	0	627	95	0	179	13	0	65
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1792	1795	0	1660	1810	0	1661
Q Serve(g_s), s	1.3	21.7	1.2	1.7	0.0	18.4	3.2	0.0	6.4	0.4	0.0	2.2
Cycle Q Clear(g_c), s	1.3	21.7	1.2	1.7	0.0	18.4	3.2	0.0	6.4	0.4	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.75	1.00		0.80
Lane Grp Cap(c), veh/h	68	743	661	84	0	809	122	0	247	29	0	191
V/C Ratio(X)	0.54	0.90	0.13	0.60	0.00	0.77	0.78	0.00	0.72	0.44	0.00	0.34
Avail Cap(c_a), veh/h	144	845	752	144	0	843	187	0	826	145	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	17.1	4.1	29.1	0.0	14.4	28.5	0.0	25.3	30.4	0.0	25.4
Incr Delay (d2), s/veh	6.6	11.9	0.1	6.8	0.0	4.4	10.5	0.0	4.0	10.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	9.0	0.5	0.8	0.0	6.3	1.6	0.0	2.5	0.3	0.0	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.0	28.9	4.2	35.9	0.0	18.8	39.0	0.0	29.3	40.6	0.0	26.4
LnGrp LOS	D	C	A	D	A	B	D	A	C	D	A	C
Approach Vol, veh/h	791				678				274			
Approach Delay, s/veh	26.6				20.1				32.6			
Approach LOS	C				C				C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.0	14.6	8.9	31.8	8.4	13.1	6.6	34.1				
Change Period (Y+Rc), s	6.0	* 5.3	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	5.0	* 31	5.0	* 29	* 6.5	28.8	* 5	29.3				
Max Q Clear Time (g_c+I1), s	2.4	8.4	3.7	23.7	5.2	4.2	3.3	20.4				
Green Ext Time (p_c), s	0.0	0.9	0.0	2.0	0.0	0.2	0.0	2.4				

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection						
Int Delay, s/veh	5.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	87	246	44	47	26
Future Vol, veh/h	228	87	246	44	47	26
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	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	102	289	52	55	31
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	370	0	949	319
Stage 1	-	-	-	-	319	-
Stage 2	-	-	-	-	630	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1183	-	287	717
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	527	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1183	-	215	717
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	548	-
Stage 2	-	-	-	-	527	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.7		21.3	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	215	717	-	-	1183	-
HCM Lane V/C Ratio	0.257	0.043	-	-	0.245	-
HCM Control Delay (s)	27.4	10.2	-	-	9	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1	0.1	-	-	1	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I & II) PM Peak

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	42	78	93	790	14	1008	122
Future Volume (vph)	42	78	93	790	14	1008	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3440	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3440	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	87	103	878	16	1120	136
RTOR Reduction (vph)	0	80	0	0	0	6	0
Lane Group Flow (vph)	47	7	103	878	16	1250	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.9	9.9	14.8	92.2	3.1	80.5	
Effective Green, g (s)	9.9	9.9	14.8	92.2	3.1	80.5	
Actuated g/C Ratio	0.08	0.08	0.12	0.77	0.03	0.67	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	144	129	216	2693	45	2307	
v/s Ratio Prot	c0.03		c0.06	0.25	0.01	c0.36	
v/s Ratio Perm		0.00					
v/c Ratio	0.33	0.06	0.48	0.33	0.36	0.54	
Uniform Delay, d1	51.9	50.7	49.0	4.3	57.5	10.2	
Progression Factor	1.00	1.00	0.63	0.60	1.25	0.43	
Incremental Delay, d2	1.3	0.2	1.4	0.3	4.3	0.8	
Delay (s)	53.2	50.9	32.1	2.8	76.1	5.2	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.7			5.9		6.1	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			8.6		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.51				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			53.4%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary
7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I & II) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	516	105	27	454	12	42	31	28	12	42	36
Future Volume (veh/h)	48	516	105	27	454	12	42	31	28	12	42	36
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	52	555	113	29	488	13	45	33	30	13	45	39
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	68	1310	1137	47	1239	33	59	49	45	91	62	54
Arrive On Green	0.04	0.71	0.71	0.03	0.69	0.69	0.03	0.05	0.05	0.05	0.07	0.07
Sat Flow, veh/h	1810	1856	1610	1810	1785	48	1810	917	833	1810	939	814
Grp Volume(v), veh/h	52	555	113	29	0	501	45	0	63	13	0	84
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1832	1810	0	1750	1810	0	1753
Q Serve(g_s), s	3.4	15.1	1.6	1.9	0.0	13.8	3.0	0.0	4.2	0.8	0.0	5.6
Cycle Q Clear(g_c), s	3.4	15.1	1.6	1.9	0.0	13.8	3.0	0.0	4.2	0.8	0.0	5.6
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.48	1.00		0.46
Lane Grp Cap(c), veh/h	68	1310	1137	47	0	1272	59	0	94	91	0	115
V/C Ratio(X)	0.77	0.42	0.10	0.62	0.00	0.39	0.77	0.00	0.67	0.14	0.00	0.73
Avail Cap(c_a), veh/h	148	1310	1137	103	0	1272	133	0	474	91	0	409
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.2	7.4	2.0	57.9	0.0	7.7	57.6	0.0	55.7	54.5	0.0	55.0
Incr Delay (d2), s/veh	16.6	1.0	0.2	12.7	0.0	0.9	18.7	0.0	7.8	0.7	0.0	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.0	0.7	1.0	0.0	4.6	1.6	0.0	2.0	0.4	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.8	8.4	2.2	70.6	0.0	8.6	76.3	0.0	63.6	55.3	0.0	63.4
LnGrp LOS	E	A	A	E	A	A	E	A	E	E	A	E
Approach Vol, veh/h	720			530			108			97		
Approach Delay, s/veh	12.2			12.0			68.9			62.3		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.2	11.8	7.3	90.7	8.1	13.9	8.7	89.3				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.0	* 33	* 6.8	56.0	8.8	* 28	* 9.8	53.0				
Max Q Clear Time (g_c+I1), s	2.8	6.2	3.9	17.1	5.0	7.6	5.4	15.8				
Green Ext Time (p_c), s	0.0	0.2	0.0	3.7	0.0	0.3	0.0	2.9				

Intersection Summary

HCM 6th Ctrl Delay	19.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	178	178	68	214	355	276	202	197	88	132	148
Average Queue (ft)	85	99	30	72	125	116	95	103	27	77	78
95th Queue (ft)	146	169	49	153	232	203	177	170	67	125	128
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				0	6						
Queuing Penalty (veh)				0	7						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	92	53	77
Average Queue (ft)	33	32	26
95th Queue (ft)	68	52	56
Link Distance (ft)	2034	2712	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	71	74	135	76	75	28	158	164
Average Queue (ft)	16	31	59	20	26	3	60	54
95th Queue (ft)	48	52	107	55	62	16	119	111
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	111	31
Average Queue (ft)	42	11
95th Queue (ft)	80	32
Link Distance (ft)	1109	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		450
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	229	324	47	55	194	239	222	140	312	249	176	316
Average Queue (ft)	120	175	2	27	70	120	149	105	182	134	113	167
95th Queue (ft)	196	275	15	54	139	194	226	175	287	234	169	274
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)					10	17		15	36			
Queuing Penalty (veh)					21	12		36	52			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	72
Average Queue (ft)	35
95th Queue (ft)	58
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	52	393	50	74	281	82	87	29	52
Average Queue (ft)	28	136	17	30	98	36	37	10	24
95th Queue (ft)	59	294	43	63	199	66	70	31	43
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1			0				
Queuing Penalty (veh)		0			0				

Zone Summary

Zone wide Queuing Penalty: 129

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	307	223	116	214	312	370	298	320	111	355	374
Average Queue (ft)	158	121	60	80	192	213	114	136	42	203	208
95th Queue (ft)	243	201	100	170	312	343	210	234	90	321	344
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				2	20	1					
Queuing Penalty (veh)				5	14	3					

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	59	72	75	48
Average Queue (ft)	5	36	26	11
95th Queue (ft)	26	64	51	34
Link Distance (ft)	2798	2034	2712	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	95	72	201	75	75	40	256	309
Average Queue (ft)	47	36	73	27	29	8	77	69
95th Queue (ft)	84	66	148	66	73	29	164	174
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	NB	SB
Directions Served	LR	U	L
Maximum Queue (ft)	127	24	74
Average Queue (ft)	31	2	40
95th Queue (ft)	71	11	72
Link Distance (ft)	1109		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		320	450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	T	L	T	TR	L
Maximum Queue (ft)	485	1135	1087	205	163	244	329	42	140	236	196	585
Average Queue (ft)	396	682	496	60	61	140	189	1	83	155	125	427
95th Queue (ft)	638	1125	1160	149	126	216	291	14	159	227	198	703
Link Distance (ft)		2539	2539			266	266	631		1240	1240	
Upstream Blk Time (%)							2					
Queuing Penalty (veh)							5					
Storage Bay Dist (ft)	415			175	85				80			470
Storage Blk Time (%)	43	20			10	24			10	33		30
Queuing Penalty (veh)	98	38			16	12			22	30		156

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	1954	1053
Average Queue (ft)	627	80
95th Queue (ft)	1520	381
Link Distance (ft)	2569	2569
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	7	
Queuing Penalty (veh)	16	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	115	192	28	73	236	69	65	51	182
Average Queue (ft)	37	52	12	22	120	34	34	14	55
95th Queue (ft)	77	135	31	54	211	66	64	41	127
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)									
Queuing Penalty (veh)									

Zone Summary

Zone wide Queuing Penalty: 415

Appendix H: Existing plus Project (Phase I, II & III) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) AM Peak

1: Mooney Boulevard & Prosperity Avenue

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	167	149	120	221	68	212	503	44	41	330	78
Future Volume (vph)	150	167	149	120	221	68	212	503	44	41	330	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1797		1770	3496		1770	3437	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1797		1770	3496		1770	3437	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	176	196	175	141	260	80	249	592	52	48	388	92
RTOR Reduction (vph)	0	0	145	0	11	0	0	6	0	0	20	0
Lane Group Flow (vph)	176	196	30	141	329	0	249	638	0	48	460	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	14.7	14.7	18.5	20.8		15.9	27.9		4.8	16.8	
Effective Green, g (s)	12.0	14.7	14.7	18.5	20.8		15.9	27.9		4.8	16.8	
Actuated g/C Ratio	0.14	0.17	0.17	0.21	0.24		0.18	0.32		0.06	0.19	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	317	269	379	433		326	1130		98	669	
v/s Ratio Prot	c0.10	0.11		0.08	c0.18		c0.14	c0.18		0.03	0.13	
v/s Ratio Perm			0.02									
v/c Ratio	0.72	0.62	0.11	0.37	0.76		0.76	0.56		0.49	0.69	
Uniform Delay, d1	35.5	33.2	30.3	28.9	30.4		33.4	24.2		39.6	32.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.5	3.6	0.2	0.6	7.5		10.2	0.7		3.8	2.9	
Delay (s)	45.0	36.8	30.5	29.6	37.9		43.6	24.8		43.4	35.3	
Level of Service	D	D	C	C	D		D	C		D	D	
Approach Delay (s)		37.4			35.4			30.1			36.0	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			34.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			86.3			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			64.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	10.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	27	296	31	79	45
Future Vol, veh/h	226	27	296	31	79	45
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	33	361	38	96	55
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	1053	294
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	760	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1263	-	251	745
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1263	-	178	744
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	462	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.1		40.5	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	246	-	-	1263	-	
HCM Lane V/C Ratio	0.615	-	-	0.286	-	
HCM Control Delay (s)	40.5	-	-	9	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	3.7	-	-	1.2	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Phase I, II & III) AM Peak

10/31/2019

Intersection							
Int Delay, s/veh	4.7						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	32	108	172	884	3	543	75
Future Vol, veh/h	32	108	172	884	3	543	75
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	37	124	198	1016	3	624	86

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1578	358	711	0	1016	-	0
Stage 1	674	-	-	-	-	-	-
Stage 2	904	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	99	636	878	-	322	-	-
Stage 1	465	-	-	-	-	-	-
Stage 2	353	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	76	634	877	-	322	-	-
Mov Cap-2 Maneuver	76	-	-	-	-	-	-
Stage 1	356	-	-	-	-	-	-
Stage 2	353	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	47.3	1.7	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	877	-	237	322	-	-
HCM Lane V/C Ratio	0.225	-	0.679	0.011	-	-
HCM Control Delay (s)	10.3	-	47.3	16.3	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.9	-	4.4	0	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Phase I, II & III) AM Peak

10/31/2019

Intersection								
Int Delay, s/veh	2.6							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	25	125	0	843	18	38	647	
Future Vol, veh/h	25	125	0	843	18	38	647	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	87	87	87	87	87	87	87	
Heavy Vehicles, %	0	0	3	3	1	1	3	
Mvmt Flow	29	144	0	969	21	44	744	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1429	485	744	0	0	990	0	
Stage 1	969	-	-	-	-	-	-	
Stage 2	460	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.46	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.53	-	-	2.21	-	
Pot Cap-1 Maneuver	128	533	481	-	-	700	-	
Stage 1	333	-	-	-	-	-	-	
Stage 2	608	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	120	533	481	-	-	700	-	
Mov Cap-2 Maneuver	120	-	-	-	-	-	-	
Stage 1	312	-	-	-	-	-	-	
Stage 2	608	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	26.1	0		0.6				
HCM LOS	D							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	481	-	-	339	700	-		
HCM Lane V/C Ratio	-	-	-	0.509	0.062	-		
HCM Control Delay (s)	0	-	-	26.1	10.5	-		
HCM Lane LOS	A	-	-	D	B	-		
HCM 95th %tile Q(veh)	0	-	-	2.7	0.2	-		

HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) AM Peak

6: Mooney Boulevard & Tulare Avenue

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	195	355	72	70	446	165	142	469	78	171	297	175
Future Volume (vph)	195	355	72	70	446	165	142	469	78	171	297	175
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3331		1736	3390		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3331		1736	3390		1736	1827	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	227	413	84	81	519	192	165	545	91	199	345	203
RTOR Reduction (vph)	0	0	62	0	34	0	0	13	0	0	0	151
Lane Group Flow (vph)	227	413	22	81	677	0	165	623	0	199	345	52
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	23.2	23.2	12.8	23.8		10.4	23.4		10.2	22.8	22.8
Effective Green, g (s)	12.2	23.2	23.2	12.8	23.8		10.4	23.4		10.2	22.8	22.8
Actuated g/C Ratio	0.14	0.26	0.26	0.14	0.27		0.12	0.26		0.11	0.26	0.26
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	237	901	398	248	887		202	888		198	466	396
v/s Ratio Prot	c0.13	0.12		0.05	c0.20		0.10	0.18		c0.11	c0.19	
v/s Ratio Perm			0.01									0.03
v/c Ratio	0.96	0.46	0.05	0.33	0.76		0.82	0.70		1.01	0.74	0.13
Uniform Delay, d1	38.3	27.8	24.8	34.4	30.2		38.5	29.8		39.5	30.5	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	46.2	0.4	0.1	0.8	3.9		21.9	2.5		65.3	6.2	0.2
Delay (s)	84.5	28.1	24.9	35.1	34.1		60.4	32.3		104.8	36.8	25.8
Level of Service	F	C	C	D	C		E	C		F	D	C
Approach Delay (s)		45.4			34.2			38.1			51.9	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			89.3			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			70.3%			ICU Level of Service				C		
Analysis Period (min)			15									

c Critical Lane Group

Intersection												
Int Delay, s/veh	24.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	529	66	40	489	7	75	35	107	12	10	53
Future Vol, veh/h	33	529	66	40	489	7	75	35	107	12	10	53
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	42	670	84	51	619	9	95	44	135	15	13	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	628	0	0	754	0	0	1520	1484	670	1612	1564	624
Stage 1	-	-	-	-	-	-	754	754	-	726	726	-
Stage 2	-	-	-	-	-	-	766	730	-	886	838	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	959	-	-	861	-	-	98	125	459	85	113	489
Stage 1	-	-	-	-	-	-	403	419	-	419	433	-
Stage 2	-	-	-	-	-	-	397	429	-	342	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	959	-	-	861	-	-	~ 71	113	459	39	102	489
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 71	113	-	39	102	-
Stage 1	-	-	-	-	-	-	385	401	-	401	407	-
Stage 2	-	-	-	-	-	-	312	404	-	205	367	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.7	140.2	66.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	262	959	-	-	861	-	-	146
HCM Lane V/C Ratio	1.337	0.686	0.044	-	-	0.059	-	-	0.65
HCM Control Delay (s)	\$ 322	44.2	8.9	-	-	9.4	-	-	66.8
HCM Lane LOS	F	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	7.6	4.5	0.1	-	-	0.2	-	-	3.6

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) PM Peak 1: Mooney Boulevard & Prosperity Avenue

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	228	254	67	195	66	203	457	47	80	657	187
Future Volume (vph)	215	228	254	67	195	66	203	457	47	80	657	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1792		1770	3490		1770	3422	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1792		1770	3490		1770	3422	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	243	270	71	207	70	216	486	50	85	699	199
RTOR Reduction (vph)	0	0	208	0	13	0	0	7	0	0	23	0
Lane Group Flow (vph)	229	243	62	71	264	0	216	529	0	85	875	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.4	22.5	22.5	12.5	20.2		14.6	26.7		16.2	28.3	
Effective Green, g (s)	14.4	22.5	22.5	12.5	20.2		14.6	26.7		16.2	28.3	
Actuated g/C Ratio	0.15	0.23	0.23	0.13	0.21		0.15	0.27		0.16	0.29	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	259	426	357	225	368		262	947		291	985	
v/s Ratio Prot	c0.13	0.13		0.04	c0.15		c0.12	0.15		0.05	c0.26	
v/s Ratio Perm			0.04									
v/c Ratio	0.88	0.57	0.17	0.32	0.72		0.82	0.56		0.29	0.89	
Uniform Delay, d1	41.1	33.6	30.4	39.0	36.4		40.6	30.7		36.0	33.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	27.9	1.8	0.2	0.8	6.6		18.6	0.7		0.6	9.8	
Delay (s)	69.0	35.5	30.7	39.8	43.0		59.2	31.5		36.6	43.3	
Level of Service	E	D	C	D	D		E	C		D	D	
Approach Delay (s)		44.1			42.3			39.4			42.7	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			98.3			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			78.9%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	93	249	44	50	28
Future Vol, veh/h	228	93	249	44	50	28
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	109	293	52	59	33
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	377	0	961	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	638	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1176	-	282	713
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	210	713
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	522	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	7.7		23.9		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	281	-	-	1176	-	
HCM Lane V/C Ratio	0.327	-	-	0.249	-	
HCM Control Delay (s)	23.9	-	-	9.1	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1.4	-	-	1	-	

Intersection							
Int Delay, s/veh	13						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	42	79	94	799	14	1025	122
Future Vol, veh/h	42	79	94	799	14	1025	122
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	47	88	104	888	16	1139	136

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1892	639	1276
Stage 1	1240	-	-
Stage 2	652	-	-
Critical Hdwy	6.86	6.96	4.16
Critical Hdwy Stg 1	5.86	-	-
Critical Hdwy Stg 2	5.86	-	-
Follow-up Hdwy	3.53	3.33	2.23
Pot Cap-1 Maneuver	61	416	535
Stage 1	234	-	-
Stage 2	478	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	47	416	534
Mov Cap-2 Maneuver	47	-	-
Stage 1	180	-	-
Stage 2	478	-	-

Approach	EB	NB	SB
HCM Control Delay, s	221.5	1.4	0.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	534	-	112	389	-	-
HCM Lane V/C Ratio	0.196	-	1.2	0.04	-	-
HCM Control Delay (s)	13.4	-	221.5	14.6	-	-
HCM Lane LOS	B	-	F	B	-	-
HCM 95th %tile Q(veh)	0.7	-	8.6	0.1	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Phase I, II & III) PM Peak

10/31/2019

Intersection								
Int Delay, s/veh	2.1							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	15	88	2	834	29	133	1007	
Future Vol, veh/h	15	88	2	834	29	133	1007	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	93	93	93	93	93	93	93	
Heavy Vehicles, %	0	0	1	1	0	0	5	
Mvmt Flow	16	95	2	897	31	143	1083	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1729	449	1083	0	0	928	0	
Stage 1	901	-	-	-	-	-	-	
Stage 2	828	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.42	-	-	4.1	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2	-	
Pot Cap-1 Maneuver	81	563	296	-	-	745	-	
Stage 1	362	-	-	-	-	-	-	
Stage 2	394	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	65	563	296	-	-	745	-	
Mov Cap-2 Maneuver	65	-	-	-	-	-	-	
Stage 1	290	-	-	-	-	-	-	
Stage 2	394	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	27.9	0		1.3				
HCM LOS	D							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	296	-	-	266	745	-		
HCM Lane V/C Ratio	0.007	-	-	0.416	0.192	-		
HCM Control Delay (s)	17.3	-	-	27.9	11	-		
HCM Lane LOS	C	-	-	D	B	-		
HCM 95th %tile Q(veh)	0	-	-	1.9	0.7	-		

HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) PM Peak

6: Mooney Boulevard & Tulare Avenue

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Traffic Volume (vph)	196	467	161	51	329	209	91	437	68	245	528	203
Future Volume (vph)	196	467	161	51	329	209	91	437	68	245	528	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3333		1770	3468		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3333		1770	3468		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	209	497	171	54	350	222	97	465	72	261	562	216
RTOR Reduction (vph)	0	0	125	0	99	0	0	12	0	0	0	137
Lane Group Flow (vph)	209	497	46	54	473	0	97	525	0	261	562	79
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	11.8	24.1	24.1	6.5	18.8		7.6	21.5		18.7	32.2	32.2
Effective Green, g (s)	11.8	24.1	24.1	6.5	18.8		7.6	21.5		18.7	32.2	32.2
Actuated g/C Ratio	0.13	0.27	0.27	0.07	0.21		0.08	0.24		0.21	0.36	0.36
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	230	942	421	127	692		148	823		365	662	563
v/s Ratio Prot	c0.12	0.14		0.03	c0.14		0.05	0.15		c0.15	c0.30	
v/s Ratio Perm			0.03									0.05
v/c Ratio	0.91	0.53	0.11	0.43	0.68		0.66	0.64		0.72	0.85	0.14
Uniform Delay, d1	38.8	28.3	25.1	40.2	33.1		40.2	31.0		33.4	26.9	19.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	35.2	0.5	0.1	2.3	2.8		10.0	1.6		6.5	9.9	0.1
Delay (s)	74.0	28.9	25.2	42.5	35.9		50.2	32.6		39.9	36.8	19.9
Level of Service	E	C	C	D	D		D	C		D	D	B
Approach Delay (s)		38.9			36.5			35.3			34.1	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			36.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.5			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			76.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	7.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	516	105	27	454	15	42	31	28	14	42	44
Future Vol, veh/h	61	516	105	27	454	15	42	31	28	14	42	44
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	66	555	113	29	488	16	45	33	30	15	45	47
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	504	0	0	668	0	0	1287	1249	555	1329	1354	496
Stage 1	-	-	-	-	-	-	687	687	-	554	554	-
Stage 2	-	-	-	-	-	-	600	562	-	775	800	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1071	-	-	931	-	-	142	175	535	133	151	578
Stage 1	-	-	-	-	-	-	440	450	-	520	517	-
Stage 2	-	-	-	-	-	-	491	513	-	394	400	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1071	-	-	931	-	-	91	159	535	98	137	578
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	159	-	98	137	-
Stage 1	-	-	-	-	-	-	413	422	-	488	501	-
Stage 2	-	-	-	-	-	-	397	497	-	321	375	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.5			47.5			46.1		
HCM LOS							E			E		
Minor Lane/Major Mvmt	NBLn1 NBLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	91	239	1071	-	-	931	-	-	190			
HCM Lane V/C Ratio	0.496	0.265	0.061	-	-	0.031	-	-	0.566			
HCM Control Delay (s)	78.5	25.4	8.6	-	-	9	-	-	46.1			
HCM Lane LOS	F	D	A	-	-	A	-	-	E			
HCM 95th %tile Q(veh)	2.1	1	0.2	-	-	0.1	-	-	3			

Intersection								
Int Delay, s/veh	9.7							
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Vol, veh/h	226	27	296	31	79	45		
Future Vol, veh/h	226	27	296	31	79	45		
Conflicting Peds, #/hr	0	0	0	0	0	1		
Sign Control	Free	Free	Free	Free	Stop	Stop		
RT Channelized	-	None	-	None	-	None		
Storage Length	-	-	-	-	0	250		
Veh in Median Storage, #	0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	82	82	82	82	82	82		
Heavy Vehicles, %	1	1	0	0	2	2		
Mvmt Flow	276	33	361	38	96	55		
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	0	0	309	0	1053	294		
Stage 1	-	-	-	-	293	-		
Stage 2	-	-	-	-	760	-		
Critical Hdwy	-	-	4.1	-	6.42	6.22		
Critical Hdwy Stg 1	-	-	-	-	5.42	-		
Critical Hdwy Stg 2	-	-	-	-	5.42	-		
Follow-up Hdwy	-	-	2.2	-	3.518	3.318		
Pot Cap-1 Maneuver	-	-	1263	-	251	745		
Stage 1	-	-	-	-	757	-		
Stage 2	-	-	-	-	462	-		
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1263	-	178	744		
Mov Cap-2 Maneuver	-	-	-	-	178	-		
Stage 1	-	-	-	-	536	-		
Stage 2	-	-	-	-	462	-		
Approach	EB		WB		NB			
HCM Control Delay, s	0		8.1		33.5			
HCM LOS	D							
Minor Lane/Major Mvmt	NBLn1		NBLn2		EBT	EBR	WBL	WBT
Capacity (veh/h)	178		744		-	-	1263	-
HCM Lane V/C Ratio	0.541		0.074		-	-	0.286	-
HCM Control Delay (s)	46.8		10.2		-	-	9	0
HCM Lane LOS	E		B		-	-	A	A
HCM 95th %tile Q(veh)	2.8		0.2		-	-	1.2	-

HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) AM Peak

3: Mooney Boulevard & Cross Avenue

10/31/2019



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	32	108	172	884	3	543	75
Future Volume (vph)	32	108	172	884	3	543	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1544	1752	3505	1752	3432	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1544	1752	3505	1752	3432	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	37	124	198	1016	3	624	86
RTOR Reduction (vph)	0	113	0	0	0	7	0
Lane Group Flow (vph)	37	11	198	1016	3	703	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.3	9.3	20.6	80.5	1.3	61.2	
Effective Green, g (s)	9.3	9.3	20.6	80.5	1.3	61.2	
Actuated g/C Ratio	0.09	0.09	0.19	0.76	0.01	0.58	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	153	135	340	2661	21	1981	
v/s Ratio Prot	c0.02		c0.11	c0.29	0.00	c0.20	
v/s Ratio Perm		0.01					
v/c Ratio	0.24	0.08	0.58	0.38	0.14	0.35	
Uniform Delay, d1	45.1	44.4	38.8	4.3	51.8	11.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	0.3	2.5	0.4	3.1	0.5	
Delay (s)	45.9	44.7	41.3	4.7	54.9	12.4	
Level of Service	D	D	D	A	D	B	
Approach Delay (s)	45.0			10.7		12.6	
Approach LOS	D			B		B	
Intersection Summary							
HCM 2000 Control Delay			14.0		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.42				
Actuated Cycle Length (s)			106.0		Sum of lost time (s)		14.9
Intersection Capacity Utilization			53.5%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I, II & III) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	529	66	40	489	7	75	35	107	12	10	53
Future Volume (veh/h)	33	529	66	40	489	7	75	35	107	12	10	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	42	670	84	51	619	9	95	44	135	15	13	67
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	74	780	694	84	827	12	123	61	186	33	26	136
Arrive On Green	0.04	0.43	0.43	0.05	0.47	0.47	0.07	0.15	0.15	0.02	0.10	0.10
Sat Flow, veh/h	1795	1796	1598	1795	1766	26	1795	408	1252	1810	268	1383
Grp Volume(v), veh/h	42	670	84	51	0	628	95	0	179	15	0	80
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1792	1795	0	1660	1810	0	1651
Q Serve(g_s), s	1.4	21.2	1.2	1.8	0.0	18.1	3.3	0.0	6.5	0.5	0.0	2.9
Cycle Q Clear(g_c), s	1.4	21.2	1.2	1.8	0.0	18.1	3.3	0.0	6.5	0.5	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.01	1.00		0.75	1.00		0.84
Lane Grp Cap(c), veh/h	74	780	694	84	0	839	123	0	247	33	0	163
V/C Ratio(X)	0.57	0.86	0.12	0.61	0.00	0.75	0.77	0.00	0.72	0.45	0.00	0.49
Avail Cap(c_a), veh/h	145	1276	1134	142	0	1269	222	0	829	143	0	733
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.7	16.1	3.8	29.5	0.0	13.7	28.9	0.0	25.6	30.7	0.0	26.9
Incr Delay (d2), s/veh	6.6	3.4	0.1	6.9	0.0	1.4	9.9	0.0	4.0	9.3	0.0	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.0	0.5	0.8	0.0	5.5	1.6	0.0	2.6	0.3	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	19.5	3.8	36.4	0.0	15.1	38.8	0.0	29.6	40.0	0.0	29.2
LnGrp LOS	D	B	A	D	A	B	D	A	C	D	A	C
Approach Vol, veh/h	796		679				274		95			
Approach Delay, s/veh	18.7		16.7				32.8		30.9			
Approach LOS	B		B				C		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.4	15.4	9.0	33.4	8.5	12.2	6.8	35.5				
Change Period (Y+Rc), s	* 4.2	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5	* 32	5.0	* 45	* 7.8	28.0	* 5.1	44.7				
Max Q Clear Time (g_c+I1), s	2.5	8.5	3.8	23.2	5.3	4.9	3.4	20.1				
Green Ext Time (p_c), s	0.0	0.9	0.0	4.2	0.0	0.3	0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay	20.7											
HCM 6th LOS	C											
Notes												

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	93	249	44	50	28
Future Vol, veh/h	228	93	249	44	50	28
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	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	109	293	52	59	33
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	377	0	961	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	638	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1176	-	282	713
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	522	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	210	713
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	542	-
Stage 2	-	-	-	-	522	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.7		22.1	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	210	713	-	-	1176	-
HCM Lane V/C Ratio	0.28	0.046	-	-	0.249	-
HCM Control Delay (s)	28.7	10.3	-	-	9.1	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1.1	0.1	-	-	1	-

HCM Signalized Intersection Capacity Analysis Existing plus Project (Phase I, II & III) PM Peak 3: Mooney Boulevard & Cross Avenue

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	42	79	94	799	14	1025	122
Future Volume (vph)	42	79	94	799	14	1025	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3441	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3441	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	88	104	888	16	1139	136
RTOR Reduction (vph)	0	81	0	0	0	6	0
Lane Group Flow (vph)	47	7	104	888	16	1269	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.9	9.9	14.9	92.2	3.1	80.4	
Effective Green, g (s)	9.9	9.9	14.9	92.2	3.1	80.4	
Actuated g/C Ratio	0.08	0.08	0.12	0.77	0.03	0.67	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	144	129	217	2693	45	2305	
v/s Ratio Prot	c0.03		c0.06	0.25	0.01	c0.37	
v/s Ratio Perm		0.00					
v/c Ratio	0.33	0.06	0.48	0.33	0.36	0.55	
Uniform Delay, d1	51.9	50.7	48.9	4.3	57.5	10.4	
Progression Factor	1.00	1.00	0.63	0.60	1.25	0.45	
Incremental Delay, d2	1.3	0.2	1.4	0.3	4.2	0.8	
Delay (s)	53.2	50.9	32.4	2.9	76.0	5.5	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.7			6.0		6.3	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			8.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.52				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			53.9%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary 7: Morrison Street & Tulare Avenue

Existing plus Project (Phase I, II & III) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	516	105	27	454	15	42	31	28	14	42	44
Future Volume (veh/h)	61	516	105	27	454	15	42	31	28	14	42	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	555	113	29	488	16	45	33	30	15	45	47
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	85	1300	1128	47	1204	39	59	49	45	100	60	63
Arrive On Green	0.05	0.70	0.70	0.03	0.68	0.68	0.03	0.05	0.05	0.06	0.07	0.07
Sat Flow, veh/h	1810	1856	1610	1810	1772	58	1810	917	833	1810	851	889
Grp Volume(v), veh/h	66	555	113	29	0	504	45	0	63	15	0	92
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1830	1810	0	1750	1810	0	1740
Q Serve(g_s), s	4.3	15.3	1.6	1.9	0.0	14.6	3.0	0.0	4.2	0.9	0.0	6.2
Cycle Q Clear(g_c), s	4.3	15.3	1.6	1.9	0.0	14.6	3.0	0.0	4.2	0.9	0.0	6.2
Prop In Lane	1.00		1.00	1.00		0.03	1.00		0.48	1.00		0.51
Lane Grp Cap(c), veh/h	85	1300	1128	47	0	1244	59	0	94	100	0	124
V/C Ratio(X)	0.77	0.43	0.10	0.62	0.00	0.41	0.77	0.00	0.67	0.15	0.00	0.74
Avail Cap(c_a), veh/h	163	1300	1128	103	0	1244	133	0	471	100	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	7.7	2.1	57.9	0.0	8.5	57.6	0.0	55.7	54.0	0.0	54.7
Incr Delay (d2), s/veh	13.7	1.0	0.2	12.7	0.0	1.0	18.7	0.0	7.8	0.7	0.0	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.1	0.7	1.0	0.0	5.0	1.6	0.0	2.0	0.4	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	8.7	2.3	70.6	0.0	9.5	76.3	0.0	63.5	54.7	0.0	63.2
LnGrp LOS	E	A	A	E	A	A	E	A	E	D	A	E
Approach Vol, veh/h	734			533			108			107		
Approach Delay, s/veh	13.2			12.8			68.9			62.0		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	11.8	7.3	90.1	8.1	14.5	9.9	87.5				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.2	* 32	* 6.8	56.0	8.8	* 28	* 11	52.0				
Max Q Clear Time (g_c+I1), s	2.9	6.2	3.9	17.3	5.0	8.2	6.3	16.6				
Green Ext Time (p_c), s	0.0	0.2	0.0	3.7	0.0	0.3	0.0	2.9				

Intersection Summary

HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	195	158	97	116	206	190	214	275	68	222	259
Average Queue (ft)	88	80	45	66	120	105	97	108	30	81	88
95th Queue (ft)	150	146	78	108	188	169	170	183	63	142	170
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)					6						
Queuing Penalty (veh)					7						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	95	72	47
Average Queue (ft)	40	32	23
95th Queue (ft)	70	57	40
Link Distance (ft)	2034	2712	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	72	93	261	116	113	27	160	187
Average Queue (ft)	32	38	113	30	29	4	77	76
95th Queue (ft)	72	75	193	83	85	18	155	155
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	86	52
Average Queue (ft)	43	14
95th Queue (ft)	77	41
Link Distance (ft)	1109	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	450	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	266	307	257	51	194	252	302	139	365	362	226	329
Average Queue (ft)	132	178	9	24	63	134	169	96	158	120	120	159
95th Queue (ft)	238	268	85	50	130	217	254	158	274	240	194	272
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)						0	1					
Queuing Penalty (veh)						0	3					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)					4	20		19	26			
Queuing Penalty (veh)					9	14		43	37			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	150
Average Queue (ft)	52
95th Queue (ft)	102
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	72	417	29	74	212	90	83	50	53
Average Queue (ft)	21	156	16	30	115	45	44	9	24
95th Queue (ft)	53	309	33	66	207	75	76	30	46
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		2							
Queuing Penalty (veh)		1							

Zone Summary

Zone wide Queuing Penalty: 115

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	533	570	139	214	334	346	246	234	149	342	330
Average Queue (ft)	235	177	63	66	180	171	107	120	53	189	201
95th Queue (ft)	444	376	115	150	288	301	195	201	109	277	295
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)		0									
Queuing Penalty (veh)		0									
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)	2	0			21	0					
Queuing Penalty (veh)	5	0			14	0					

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	46	118	71	48
Average Queue (ft)	4	46	22	15
95th Queue (ft)	22	98	52	37
Link Distance (ft)	2798	2034	2712	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	75	91	158	153	138	74	202	239
Average Queue (ft)	35	29	62	34	31	10	63	69
95th Queue (ft)	67	58	125	105	87	41	155	164
Link Distance (ft)	2623			1238	1238		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	67	20	97
Average Queue (ft)	30	1	45
95th Queue (ft)	54	6	92
Link Distance (ft)	1109		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		170	450
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	T	L	T	TR	L
Maximum Queue (ft)	446	445	355	205	194	264	329	35	139	247	225	327
Average Queue (ft)	204	263	37	54	69	143	180	1	82	125	102	180
95th Queue (ft)	334	407	192	129	136	208	260	12	150	209	198	301
Link Distance (ft)		2539	2539			266	266	631		1240	1240	
Upstream Blk Time (%)						0	2					
Queuing Penalty (veh)						0	4					
Storage Bay Dist (ft)	415			175	85				80			470
Storage Blk Time (%)	1	1			7	23			15	26		
Queuing Penalty (veh)	2	1			11	12			33	24		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	466	100
Average Queue (ft)	230	40
95th Queue (ft)	432	79
Link Distance (ft)	2569	2569
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	74	135	51	73	245	109	65	51	178
Average Queue (ft)	35	42	12	17	98	27	30	12	67
95th Queue (ft)	64	102	38	49	200	71	63	38	132
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)						0			
Queuing Penalty (veh)						0			

Zone Summary

Zone wide Queuing Penalty: 107

Appendix I: Existing plus Project (Buildout) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Buildout) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	167	151	120	221	68	217	511	44	41	332	78
Future Volume (vph)	150	167	151	120	221	68	217	511	44	41	332	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1797		1770	3497		1770	3438	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1797		1770	3497		1770	3438	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	176	196	178	141	260	80	255	601	52	48	391	92
RTOR Reduction (vph)	0	0	148	0	11	0	0	6	0	0	20	0
Lane Group Flow (vph)	176	196	30	141	329	0	255	647	0	48	463	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	14.7	14.7	18.4	20.7		15.9	28.3		4.6	17.0	
Effective Green, g (s)	12.0	14.7	14.7	18.4	20.7		15.9	28.3		4.6	17.0	
Actuated g/C Ratio	0.14	0.17	0.17	0.21	0.24		0.18	0.33		0.05	0.20	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	245	316	269	376	430		325	1145		94	676	
v/s Ratio Prot	c0.10	0.11		0.08	c0.18		c0.14	c0.19		0.03	0.13	
v/s Ratio Perm			0.02									
v/c Ratio	0.72	0.62	0.11	0.38	0.76		0.78	0.57		0.51	0.68	
Uniform Delay, d1	35.6	33.3	30.3	29.1	30.6		33.6	24.0		39.8	32.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.6	3.8	0.2	0.6	7.9		11.7	0.6		4.6	2.9	
Delay (s)	45.2	37.0	30.5	29.7	38.5		45.4	24.6		44.4	35.1	
Level of Service	D	D	C	C	D		D	C		D	D	
Approach Delay (s)		37.5			35.9			30.4			35.9	
Approach LOS		D			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			34.3			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			86.4			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			65.1%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Existing plus Project (Buildout) AM Peak
10/31/2019

Intersection						
Int Delay, s/veh	11					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	226	27	297	31	79	47
Future Vol, veh/h	226	27	297	31	79	47
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	276	33	362	38	96	57
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	309	0	1055	294
Stage 1	-	-	-	-	293	-
Stage 2	-	-	-	-	762	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1263	-	250	745
Stage 1	-	-	-	-	757	-
Stage 2	-	-	-	-	461	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1263	-	177	744
Mov Cap-2 Maneuver	-	-	-	-	177	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	461	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.1		40.9	
HCM LOS					E	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	247	-	-	1263	-	
HCM Lane V/C Ratio	0.622	-	-	0.287	-	
HCM Control Delay (s)	40.9	-	-	9	0	
HCM Lane LOS	E	-	-	A	A	
HCM 95th %tile Q(veh)	3.7	-	-	1.2	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Buildout) AM Peak
10/31/2019

Intersection							
Int Delay, s/veh	4.8						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	32	109	174	898	3	547	75
Future Vol, veh/h	32	109	174	898	3	547	75
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	37	125	200	1032	3	629	86

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1595	361	716
Stage 1	679	-	-
Stage 2	916	-	-
Critical Hdwy	6.86	6.96	4.16
Critical Hdwy Stg 1	5.86	-	-
Critical Hdwy Stg 2	5.86	-	-
Follow-up Hdwy	3.53	3.33	2.23
Pot Cap-1 Maneuver	97	633	874
Stage 1	462	-	-
Stage 2	348	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	74	631	873
Mov Cap-2 Maneuver	74	-	-
Stage 1	353	-	-
Stage 2	348	-	-

Approach	EB	NB	SB
HCM Control Delay, s	49.6	1.7	0.1
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	873	-	233	314	-	-
HCM Lane V/C Ratio	0.229	-	0.696	0.011	-	-
HCM Control Delay (s)	10.3	-	49.6	16.6	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.9	-	4.5	0	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Buildout) AM Peak
10/31/2019

Intersection								
Int Delay, s/veh	4.4							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	39	141	0	843	22	43	647	
Future Vol, veh/h	39	141	0	843	22	43	647	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	87	87	87	87	87	87	87	
Heavy Vehicles, %	0	0	3	3	1	1	3	
Mvmt Flow	45	162	0	969	25	49	744	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1439	485	744	0	0	994	0	
Stage 1	969	-	-	-	-	-	-	
Stage 2	470	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.46	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.53	-	-	2.21	-	
Pot Cap-1 Maneuver	126	533	481	-	-	698	-	
Stage 1	333	-	-	-	-	-	-	
Stage 2	601	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	117	533	481	-	-	698	-	
Mov Cap-2 Maneuver	117	-	-	-	-	-	-	
Stage 1	310	-	-	-	-	-	-	
Stage 2	601	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	39.6	0		0.7				
HCM LOS	E							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	481	-	-	301	698	-		
HCM Lane V/C Ratio	-	-	-	0.687	0.071	-		
HCM Control Delay (s)	0	-	-	39.6	10.6	-		
HCM Lane LOS	A	-	-	E	B	-		
HCM 95th %tile Q(veh)	0	-	-	4.7	0.2	-		

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	2	1	122	187	1
Future Vol, veh/h	2	2	1	122	187	1
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	81	81	81	81	81	81
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	2	2	1	151	231	1

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	385	232	232	0	-	0
Stage 1	232	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	620	810	1342	-	-	-
Stage 1	809	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	619	810	1342	-	-	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	808	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1342	-	702	-	-
HCM Lane V/C Ratio	0.001	-	0.007	-	-
HCM Control Delay (s)	7.7	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Buildout) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	355	72	70	446	165	142	470	78	171	300	186
Future Volume (vph)	198	355	72	70	446	165	142	470	78	171	300	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3331		1736	3391		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3331		1736	3391		1736	1827	1553
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	230	413	84	81	519	192	165	547	91	199	349	216
RTOR Reduction (vph)	0	0	62	0	34	0	0	13	0	0	0	160
Lane Group Flow (vph)	230	413	22	81	677	0	165	625	0	199	349	56
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.2	23.2	23.2	12.8	23.8		10.3	23.5		10.2	23.0	23.0
Effective Green, g (s)	12.2	23.2	23.2	12.8	23.8		10.3	23.5		10.2	23.0	23.0
Actuated g/C Ratio	0.14	0.26	0.26	0.14	0.27		0.12	0.26		0.11	0.26	0.26
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	236	900	397	248	886		200	891		198	470	399
v/s Ratio Prot	c0.13	0.12		0.05	c0.20		0.10	0.18		c0.11	c0.19	
v/s Ratio Perm			0.01									0.04
v/c Ratio	0.97	0.46	0.05	0.33	0.76		0.82	0.70		1.01	0.74	0.14
Uniform Delay, d1	38.4	27.8	24.9	34.4	30.2		38.7	29.8		39.6	30.5	25.6
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	51.0	0.4	0.1	0.8	3.9		23.3	2.5		65.3	6.2	0.2
Delay (s)	89.4	28.2	24.9	35.2	34.2		62.0	32.3		104.9	36.7	25.7
Level of Service	F	C	C	D	C		E	C		F	D	C
Approach Delay (s)		47.2			34.3			38.4			51.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			89.4			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			70.5%			ICU Level of Service			C			
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th TWSC
7: Morrison Street & Tulare Avenue

Existing plus Project (Buildout) AM Peak
10/31/2019

Intersection												
Int Delay, s/veh	25.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	529	66	40	489	8	75	35	107	14	10	53
Future Vol, veh/h	33	529	66	40	489	8	75	35	107	14	10	53
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	42	670	84	51	619	10	95	44	135	18	13	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	629	0	0	754	0	0	1520	1485	670	1612	1564	624
Stage 1	-	-	-	-	-	-	754	754	-	726	726	-
Stage 2	-	-	-	-	-	-	766	731	-	886	838	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	958	-	-	861	-	-	98	125	459	85	113	489
Stage 1	-	-	-	-	-	-	403	419	-	419	433	-
Stage 2	-	-	-	-	-	-	397	429	-	342	384	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	958	-	-	861	-	-	~ 71	113	459	39	102	489
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 71	113	-	39	102	-
Stage 1	-	-	-	-	-	-	385	401	-	401	407	-
Stage 2	-	-	-	-	-	-	312	404	-	205	367	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.7	140.2	80
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	71	262	958	-	-	861	-	-	136
HCM Lane V/C Ratio	1.337	0.686	0.044	-	-	0.059	-	-	0.717
HCM Control Delay (s)	\$ 322	44.2	8.9	-	-	9.4	-	-	80
HCM Lane LOS	F	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	7.6	4.5	0.1	-	-	0.2	-	-	4.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	215	228	260	67	195	66	207	463	47	80	667	187
Future Volume (vph)	215	228	260	67	195	66	207	463	47	80	667	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1792		1770	3490		1770	3423	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1792		1770	3490		1770	3423	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	229	243	277	71	207	70	220	493	50	85	710	199
RTOR Reduction (vph)	0	0	214	0	13	0	0	7	0	0	23	0
Lane Group Flow (vph)	229	243	63	71	264	0	220	536	0	85	886	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.8	22.5	22.5	11.9	20.2		14.8	27.0		16.5	28.7	
Effective Green, g (s)	13.8	22.5	22.5	11.9	20.2		14.8	27.0		16.5	28.7	
Actuated g/C Ratio	0.14	0.23	0.23	0.12	0.21		0.15	0.27		0.17	0.29	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	248	426	357	214	368		266	958		297	999	
v/s Ratio Prot	c0.13	0.13		0.04	c0.15		c0.12	0.15		0.05	c0.26	
v/s Ratio Perm			0.04									
v/c Ratio	0.92	0.57	0.18	0.33	0.72		0.83	0.56		0.29	0.89	
Uniform Delay, d1	41.7	33.6	30.5	39.6	36.4		40.5	30.6		35.8	33.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	36.9	1.8	0.2	0.9	6.6		18.6	0.7		0.5	9.6	
Delay (s)	78.6	35.5	30.7	40.5	43.0		59.1	31.3		36.3	42.9	
Level of Service	E	D	C	D	D		E	C		D	D	
Approach Delay (s)		46.9			42.5			39.3			42.3	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			42.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			98.3			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			79.4%			ICU Level of Service			D			
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Existing plus Project (Buildout) PM Peak
10/31/2019

Intersection						
Int Delay, s/veh	6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	93	251	44	50	29
Future Vol, veh/h	228	93	251	44	50	29
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	109	295	52	59	34
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	377	0	965	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1176	-	280	713
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	208	713
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	520	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.7		24	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	281	-	-	1176	-	
HCM Lane V/C Ratio	0.331	-	-	0.251	-	
HCM Control Delay (s)	24	-	-	9.1	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1.4	-	-	1	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Existing plus Project (Buildout) PM Peak
10/31/2019

Intersection							
Int Delay, s/veh	14.8						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	42	81	95	810	14	1042	122
Future Vol, veh/h	42	81	95	810	14	1042	122
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	47	90	106	900	16	1158	136
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1921	648	1295	0	900	-	0
Stage 1	1259	-	-	-	-	-	-
Stage 2	662	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	58	411	526	-	382	-	-
Stage 1	229	-	-	-	-	-	-
Stage 2	472	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 44	411	525	-	382	-	-
Mov Cap-2 Maneuver	~ 44	-	-	-	-	-	-
Stage 1	175	-	-	-	-	-	-
Stage 2	472	-	-	-	-	-	-
Approach	EB	NB		SB			
HCM Control Delay, s	253.4	1.4		0.2			
HCM LOS	F						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR	
Capacity (veh/h)	525	-	107	382	-	-	
HCM Lane V/C Ratio	0.201	-	1.277	0.041	-	-	
HCM Control Delay (s)	13.6	-	253.4	14.8	-	-	
HCM Lane LOS	B	-	F	B	-	-	
HCM 95th %tile Q(veh)	0.7	-	9.2	0.1	-	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

Intersection							
Int Delay, s/veh	3.5						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	24	100	2	834	44	152	1007
Future Vol, veh/h	24	100	2	834	44	152	1007
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	1	0	0	5
Mvmt Flow	26	108	2	897	47	163	1083

Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1769	449	1083	0	0	944
Stage 1	901	-	-	-	-	-
Stage 2	868	-	-	-	-	-
Critical Hdwy	6.8	6.9	6.42	-	-	4.1
Critical Hdwy Stg 1	5.8	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2
Pot Cap-1 Maneuver	76	563	296	-	-	735
Stage 1	362	-	-	-	-	-
Stage 2	376	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	59	563	296	-	-	735
Mov Cap-2 Maneuver	59	-	-	-	-	-
Stage 1	280	-	-	-	-	-
Stage 2	376	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	47	0	1.5
HCM LOS	E		

Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	296	-	-	212	735
HCM Lane V/C Ratio	0.007	-	-	0.629	0.222
HCM Control Delay (s)	17.3	-	-	47	11.3
HCM Lane LOS	C	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	3.7	0.8

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	2	89	241	2
Future Vol, veh/h	1	1	2	89	241	2
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	82	82	82	82	82	82
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	1	1	2	109	294	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	408	295	296	0	-	0
Stage 1	295	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	601	747	1271	-	-	-
Stage 1	758	-	-	-	-	-
Stage 2	914	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	600	747	1271	-	-	-
Mov Cap-2 Maneuver	600	-	-	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	914	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1271	-	665	-	-
HCM Lane V/C Ratio	0.002	-	0.004	-	-
HCM Control Delay (s)	7.8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 				
Traffic Volume (vph)	207	467	161	51	329	209	91	441	68	245	530	210
Future Volume (vph)	207	467	161	51	329	209	91	441	68	245	530	210
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3333		1770	3469		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3333		1770	3469		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	220	497	171	54	350	222	97	469	72	261	564	223
RTOR Reduction (vph)	0	0	125	0	99	0	0	12	0	0	0	141
Lane Group Flow (vph)	220	497	46	54	473	0	97	529	0	261	564	82
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	11.8	24.1	24.1	6.5	18.8		7.5	21.6		18.6	32.3	32.3
Effective Green, g (s)	11.8	24.1	24.1	6.5	18.8		7.5	21.6		18.6	32.3	32.3
Actuated g/C Ratio	0.13	0.27	0.27	0.07	0.21		0.08	0.24		0.21	0.36	0.36
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	230	942	421	127	692		146	827		363	664	564
v/s Ratio Prot	c0.12	0.14		0.03	c0.14		0.05	0.15		c0.15	c0.30	
v/s Ratio Perm			0.03									0.05
v/c Ratio	0.96	0.53	0.11	0.43	0.68		0.66	0.64		0.72	0.85	0.14
Uniform Delay, d1	39.1	28.3	25.1	40.2	33.1		40.3	31.0		33.5	26.9	19.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	46.7	0.5	0.1	2.3	2.8		10.8	1.6		6.7	9.9	0.1
Delay (s)	85.8	28.9	25.2	42.5	35.9		51.1	32.6		40.2	36.8	19.9
Level of Service	F	C	C	D	D		D	C		D	D	B
Approach Delay (s)		42.3			36.5			35.4			34.0	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			37.1			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.83									
Actuated Cycle Length (s)			90.5			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			76.9%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	7.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	516	105	27	454	17	42	31	28	15	42	44
Future Vol, veh/h	61	516	105	27	454	17	42	31	28	15	42	44
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	66	555	113	29	488	18	45	33	30	16	45	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	506	0	0	668	0	0	1288	1251	555	1330	1355	497
Stage 1	-	-	-	-	-	-	687	687	-	555	555	-
Stage 2	-	-	-	-	-	-	601	564	-	775	800	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1069	-	-	931	-	-	142	174	535	133	151	577
Stage 1	-	-	-	-	-	-	440	450	-	520	516	-
Stage 2	-	-	-	-	-	-	491	512	-	394	400	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1069	-	-	931	-	-	91	158	535	98	137	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	91	158	-	98	137	-
Stage 1	-	-	-	-	-	-	413	422	-	488	500	-
Stage 2	-	-	-	-	-	-	397	496	-	321	375	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.5	47.7	47.5
HCM LOS			E	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	91	237	1069	-	-	931	-	-	188
HCM Lane V/C Ratio	0.496	0.268	0.061	-	-	0.031	-	-	0.578
HCM Control Delay (s)	78.5	25.7	8.6	-	-	9	-	-	47.5
HCM Lane LOS	F	D	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	2.1	1	0.2	-	-	0.1	-	-	3.1

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Existing plus Project (Buildout) AM Peak
10/31/2019

Intersection								
Int Delay, s/veh	9.7							
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Vol, veh/h	226	27	297	31	79	47		
Future Vol, veh/h	226	27	297	31	79	47		
Conflicting Peds, #/hr	0	0	0	0	0	1		
Sign Control	Free	Free	Free	Free	Stop	Stop		
RT Channelized	-	None	-	None	-	None		
Storage Length	-	-	-	-	0	250		
Veh in Median Storage, #	0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	82	82	82	82	82	82		
Heavy Vehicles, %	1	1	0	0	2	2		
Mvmt Flow	276	33	362	38	96	57		
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	0	0	309	0	1055	294		
Stage 1	-	-	-	-	293	-		
Stage 2	-	-	-	-	762	-		
Critical Hdwy	-	-	4.1	-	6.42	6.22		
Critical Hdwy Stg 1	-	-	-	-	5.42	-		
Critical Hdwy Stg 2	-	-	-	-	5.42	-		
Follow-up Hdwy	-	-	2.2	-	3.518	3.318		
Pot Cap-1 Maneuver	-	-	1263	-	250	745		
Stage 1	-	-	-	-	757	-		
Stage 2	-	-	-	-	461	-		
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1263	-	177	744		
Mov Cap-2 Maneuver	-	-	-	-	177	-		
Stage 1	-	-	-	-	535	-		
Stage 2	-	-	-	-	461	-		
Approach	EB		WB		NB			
HCM Control Delay, s	0		8.1		33.5			
HCM LOS					D			
Minor Lane/Major Mvmt	NBLn1		NBLn2		EBT	EBR	WBL	WBT
Capacity (veh/h)	177		744		-	-	1263	-
HCM Lane V/C Ratio	0.544		0.077		-	-	0.287	-
HCM Control Delay (s)	47.3		10.2		-	-	9	0
HCM Lane LOS	E		B		-	-	A	A
HCM 95th %tile Q(veh)	2.8		0.2		-	-	1.2	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Buildout) AM Peak

10/31/2019



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	32	109	174	898	3	547	75
Future Volume (vph)	32	109	174	898	3	547	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1544	1752	3505	1752	3433	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1544	1752	3505	1752	3433	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	37	125	200	1032	3	629	86
RTOR Reduction (vph)	0	114	0	0	0	7	0
Lane Group Flow (vph)	37	11	200	1032	3	708	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.3	9.3	20.7	80.5	1.3	61.1	
Effective Green, g (s)	9.3	9.3	20.7	80.5	1.3	61.1	
Actuated g/C Ratio	0.09	0.09	0.20	0.76	0.01	0.58	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	153	135	342	2661	21	1978	
v/s Ratio Prot	c0.02		c0.11	c0.29	0.00	c0.21	
v/s Ratio Perm		0.01					
v/c Ratio	0.24	0.08	0.58	0.39	0.14	0.36	
Uniform Delay, d1	45.1	44.4	38.7	4.3	51.8	12.0	
Progression Factor	1.00	1.00	0.79	0.32	1.00	1.00	
Incremental Delay, d2	0.8	0.3	2.4	0.4	3.1	0.5	
Delay (s)	45.9	44.7	32.8	1.8	54.9	12.5	
Level of Service	D	D	C	A	D	B	
Approach Delay (s)	45.0			6.8		12.7	
Approach LOS	D			A		B	
Intersection Summary							
HCM 2000 Control Delay			11.7		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.42				
Actuated Cycle Length (s)			106.0		Sum of lost time (s)		14.9
Intersection Capacity Utilization			53.6%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Buildout) AM Peak

10/31/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	30	141	0	843	22	43	647
Future Volume (vph)	30	141	0	843	22	43	647
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	0.95
Frt	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615		3505	1599	1787	3505
Flt Permitted	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615		3505	1599	1787	3505
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	34	162	0	969	25	49	744
RTOR Reduction (vph)	0	141	0	0	7	0	0
Lane Group Flow (vph)	34	21	0	969	18	49	744
Heavy Vehicles (%)	0%	0%	0%	3%	1%	1%	3%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	13.9	13.9		70.9	70.9	6.4	81.5
Effective Green, g (s)	13.9	13.9		70.9	70.9	6.4	81.5
Actuated g/C Ratio	0.13	0.13		0.67	0.67	0.06	0.77
Clearance Time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	236	211		2344	1069	107	2694
v/s Ratio Prot	c0.02			c0.28		c0.03	0.21
v/s Ratio Perm		0.01			0.01		
v/c Ratio	0.14	0.10		0.41	0.02	0.46	0.28
Uniform Delay, d1	40.8	40.5		8.0	5.9	48.1	3.6
Progression Factor	1.00	1.00		1.00	1.00	1.27	0.29
Incremental Delay, d2	0.3	0.2		0.5	0.0	3.0	0.2
Delay (s)	41.1	40.8		8.6	5.9	64.1	1.3
Level of Service	D	D		A	A	E	A
Approach Delay (s)	40.8			8.5			5.2
Approach LOS	D			A			A
Intersection Summary							
HCM 2000 Control Delay			10.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.38				
Actuated Cycle Length (s)			106.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			44.0%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing plus Project (Buildout) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	529	66	40	489	8	75	35	107	14	10	53
Future Volume (veh/h)	33	529	66	40	489	8	75	35	107	14	10	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	42	670	84	51	619	10	95	44	135	18	13	67
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	74	779	693	84	824	13	123	61	186	39	27	140
Arrive On Green	0.04	0.43	0.43	0.05	0.47	0.47	0.07	0.15	0.15	0.02	0.10	0.10
Sat Flow, veh/h	1795	1796	1598	1795	1763	28	1795	408	1252	1810	268	1383
Grp Volume(v), veh/h	42	670	84	51	0	629	95	0	179	18	0	80
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1791	1795	0	1660	1810	0	1651
Q Serve(g_s), s	1.5	21.4	1.2	1.8	0.0	18.3	3.3	0.0	6.5	0.6	0.0	2.9
Cycle Q Clear(g_c), s	1.5	21.4	1.2	1.8	0.0	18.3	3.3	0.0	6.5	0.6	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.75	1.00		0.84
Lane Grp Cap(c), veh/h	74	779	693	84	0	838	123	0	246	39	0	168
V/C Ratio(X)	0.57	0.86	0.12	0.61	0.00	0.75	0.77	0.00	0.73	0.46	0.00	0.48
Avail Cap(c_a), veh/h	144	1267	1127	141	0	1261	221	0	818	148	0	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.9	16.2	3.8	29.7	0.0	13.9	29.1	0.0	25.8	30.7	0.0	26.9
Incr Delay (d2), s/veh	6.7	3.5	0.1	6.9	0.0	1.4	9.9	0.0	4.1	8.4	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	7.2	0.5	0.8	0.0	5.6	1.6	0.0	2.6	0.3	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	19.7	3.9	36.6	0.0	15.3	38.9	0.0	29.9	39.1	0.0	29.0
LnGrp LOS	D	B	A	D	A	B	D	A	C	D	A	C
Approach Vol, veh/h	796			680			274			98		
Approach Delay, s/veh	19.0			16.9			33.0			30.9		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	15.4	9.0	33.5	8.5	12.4	6.8	35.7				
Change Period (Y+Rc), s	* 4.2	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5.2	* 31	5.0	* 45	* 7.8	28.0	* 5.1	44.7				
Max Q Clear Time (g_c+I1), s	2.6	8.5	3.8	23.4	5.3	4.9	3.5	20.3				
Green Ext Time (p_c), s	0.0	0.9	0.0	4.2	0.0	0.3	0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay				20.9								
HCM 6th LOS				C								
Notes												

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	228	93	251	44	50	29
Future Vol, veh/h	228	93	251	44	50	29
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	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	268	109	295	52	59	34
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	377	0	965	323
Stage 1	-	-	-	-	323	-
Stage 2	-	-	-	-	642	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1176	-	280	713
Stage 1	-	-	-	-	729	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1176	-	208	713
Mov Cap-2 Maneuver	-	-	-	-	208	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	520	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.7		22.1	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	208	713	-	-	1176	-
HCM Lane V/C Ratio	0.283	0.048	-	-	0.251	-
HCM Control Delay (s)	29	10.3	-	-	9.1	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1.1	0.1	-	-	1	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	42	81	95	810	14	1042	122
Future Volume (vph)	42	81	95	810	14	1042	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3442	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3442	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	90	106	900	16	1158	136
RTOR Reduction (vph)	0	83	0	0	0	6	0
Lane Group Flow (vph)	47	7	106	900	16	1288	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.9	9.9	15.0	92.2	3.1	80.3	
Effective Green, g (s)	9.9	9.9	15.0	92.2	3.1	80.3	
Actuated g/C Ratio	0.08	0.08	0.12	0.77	0.03	0.67	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	144	129	219	2693	45	2303	
v/s Ratio Prot	c0.03		c0.06	0.26	0.01	c0.37	
v/s Ratio Perm		0.00					
v/c Ratio	0.33	0.06	0.48	0.33	0.36	0.56	
Uniform Delay, d1	51.9	50.7	48.9	4.3	57.5	10.5	
Progression Factor	1.00	1.00	0.52	0.44	1.23	0.48	
Incremental Delay, d2	1.3	0.2	1.6	0.3	4.2	0.9	
Delay (s)	53.2	50.9	27.0	2.2	75.1	5.9	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.7			4.8		6.8	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			8.5		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.53				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			54.5%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	19	100	2	834	44	152	1007
Future Volume (vph)	19	100	2	834	44	152	1007
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1805	3574	1615	1805	3438
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1805	3574	1615	1805	3438
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	108	2	897	47	163	1083
RTOR Reduction (vph)	0	96	0	0	14	0	0
Lane Group Flow (vph)	20	12	2	897	33	163	1083
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	5%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	13.6	13.6	1.7	76.0	76.0	15.6	89.9
Effective Green, g (s)	13.6	13.6	1.7	76.0	76.0	15.6	89.9
Actuated g/C Ratio	0.11	0.11	0.01	0.63	0.63	0.13	0.75
Clearance Time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	204	183	25	2263	1022	234	2575
v/s Ratio Prot	c0.01		c0.00	0.25		c0.09	c0.32
v/s Ratio Perm		0.01			0.02		
v/c Ratio	0.10	0.07	0.08	0.40	0.03	0.70	0.42
Uniform Delay, d1	47.7	47.5	58.4	10.8	8.2	49.9	5.5
Progression Factor	1.00	1.00	0.84	0.42	0.20	1.26	0.23
Incremental Delay, d2	0.2	0.2	1.1	0.4	0.0	7.6	0.4
Delay (s)	47.9	47.7	49.9	4.9	1.7	70.4	1.7
Level of Service	D	D	D	A	A	E	A
Approach Delay (s)	47.7			4.8			10.7
Approach LOS	D			A			B
Intersection Summary							
HCM 2000 Control Delay			10.4		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.41				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			48.5%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Existing plus Project (Buildout) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	516	105	27	454	17	42	31	28	15	42	44
Future Volume (veh/h)	61	516	105	27	454	17	42	31	28	15	42	44
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	555	113	29	488	18	45	33	30	16	45	47
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	85	1300	1128	47	1198	44	59	49	45	100	60	63
Arrive On Green	0.05	0.70	0.70	0.03	0.68	0.68	0.03	0.05	0.05	0.06	0.07	0.07
Sat Flow, veh/h	1810	1856	1610	1810	1764	65	1810	917	833	1810	851	889
Grp Volume(v), veh/h	66	555	113	29	0	506	45	0	63	16	0	92
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1829	1810	0	1750	1810	0	1740
Q Serve(g_s), s	4.3	15.3	1.6	1.9	0.0	14.7	3.0	0.0	4.2	1.0	0.0	6.2
Cycle Q Clear(g_c), s	4.3	15.3	1.6	1.9	0.0	14.7	3.0	0.0	4.2	1.0	0.0	6.2
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.48	1.00		0.51
Lane Grp Cap(c), veh/h	85	1300	1128	47	0	1243	59	0	94	100	0	124
V/C Ratio(X)	0.77	0.43	0.10	0.62	0.00	0.41	0.77	0.00	0.67	0.16	0.00	0.74
Avail Cap(c_a), veh/h	163	1300	1128	103	0	1243	133	0	462	100	0	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	7.7	2.1	57.9	0.0	8.5	57.6	0.0	55.7	54.0	0.0	54.7
Incr Delay (d2), s/veh	13.7	1.0	0.2	12.7	0.0	1.0	18.7	0.0	7.9	0.7	0.0	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.1	0.7	1.0	0.0	5.0	1.6	0.0	2.0	0.5	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	8.7	2.3	70.6	0.0	9.5	76.3	0.0	63.6	54.8	0.0	63.2
LnGrp LOS	E	A	A	E	A	A	E	A	E	D	A	E
Approach Vol, veh/h	734			535			108			108		
Approach Delay, s/veh	13.2			12.8			68.9			61.9		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.8	11.8	7.3	90.1	8.1	14.5	9.9	87.5				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.8	* 32	* 6.8	56.0	8.8	* 28	* 11	52.0				
Max Q Clear Time (g_c+I1), s	3.0	6.2	3.9	17.3	5.0	8.2	6.3	16.7				
Green Ext Time (p_c), s	0.0	0.2	0.0	3.7	0.0	0.3	0.0	2.9				

Intersection Summary

HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	175	180	92	116	260	216	198	212	88	183	175
Average Queue (ft)	83	79	35	64	131	109	92	106	23	96	77
95th Queue (ft)	147	134	65	104	210	193	173	188	51	152	153
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)					8						
Queuing Penalty (veh)					9						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	76	79	61
Average Queue (ft)	33	33	24
95th Queue (ft)	72	61	53
Link Distance (ft)	2034	2712	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	52	74	206	78	53	28	185	184
Average Queue (ft)	27	38	99	13	16	4	77	65
95th Queue (ft)	55	63	177	50	51	17	156	148
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	47	172	277	243	52	69	139	114
Average Queue (ft)	22	37	50	43	7	28	32	21
95th Queue (ft)	48	84	155	139	28	57	95	62
Link Distance (ft)	1110		2569	2569			1226	1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250			170	450		
Storage Blk Time (%)				1				
Queuing Penalty (veh)				0				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	5
95th Queue (ft)	24
Link Distance (ft)	1257
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	T	TR	L	T
Maximum Queue (ft)	339	321	231	200	194	257	285	139	408	351	309	313
Average Queue (ft)	174	172	8	32	51	121	148	96	155	115	153	160
95th Queue (ft)	287	275	76	88	105	198	233	150	280	238	283	268
Link Distance (ft)		2539	2539			266	266		1240	1240		2569
Upstream Blk Time (%)						0	0					
Queuing Penalty (veh)						0	1					
Storage Bay Dist (ft)	415			175	85			80			470	
Storage Blk Time (%)					0	15		15	31			
Queuing Penalty (veh)					1	11		34	43			

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB
Directions Served	R
Maximum Queue (ft)	92
Average Queue (ft)	46
95th Queue (ft)	79
Link Distance (ft)	2569
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	50	398	50	73	270	84	84	52	53
Average Queue (ft)	20	141	16	29	97	42	42	12	29
95th Queue (ft)	47	311	40	59	213	78	76	37	53
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1							
Queuing Penalty (veh)		0							

Zone Summary

Zone wide Queuing Penalty: 100

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	TR
Maximum Queue (ft)	247	260	136	214	499	328	260	229	200	403	408
Average Queue (ft)	140	133	61	66	232	209	128	136	50	199	201
95th Queue (ft)	233	228	108	149	408	328	220	228	115	324	315
Link Distance (ft)		580	580		2798		1329	1329		2616	2616
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	480			140		350			475		
Storage Blk Time (%)				0	28						
Queuing Penalty (veh)				0	19						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	22	182	98	50
Average Queue (ft)	1	46	29	20
95th Queue (ft)	10	108	66	41
Link Distance (ft)	2798	2034	2712	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	114	70	140	263	193	96	160	222
Average Queue (ft)	38	31	73	42	40	17	76	62
95th Queue (ft)	81	52	124	134	111	51	138	143
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	47	62	24	171	181	27	225	199	156
Average Queue (ft)	14	24	2	46	42	4	102	32	18
95th Queue (ft)	42	47	12	128	125	19	184	118	79
Link Distance (ft)	1110			2569	2569			1226	1226
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		250	320			170	450		
Storage Blk Time (%)					0				
Queuing Penalty (veh)					0				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	31	25
Average Queue (ft)	1	1
95th Queue (ft)	10	8
Link Distance (ft)	1257	2683
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB	SB
Directions Served	L	T	T	R	L	T	TR	T	L	T	TR	L
Maximum Queue (ft)	396	404	357	205	194	293	329	60	139	360	298	476
Average Queue (ft)	231	264	48	47	62	133	185	4	96	167	123	295
95th Queue (ft)	358	395	228	102	133	225	292	28	155	305	245	477
Link Distance (ft)		2539	2539			266	266	631		1240	1240	
Upstream Blk Time (%)						1	3					
Queuing Penalty (veh)						2	9					
Storage Bay Dist (ft)	415			175	85				80			470
Storage Blk Time (%)	0	0			4	20			34	24		1
Queuing Penalty (veh)	0	0			6	10			75	22		5

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	476	103
Average Queue (ft)	210	45
95th Queue (ft)	410	84
Link Distance (ft)	2569	2569
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)	0	
Queuing Penalty (veh)	0	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	116	201	50	92	246	111	83	52	160
Average Queue (ft)	50	51	11	21	108	32	36	13	68
95th Queue (ft)	98	138	32	61	205	74	72	38	131
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)						0			
Queuing Penalty (veh)						0			

Zone Summary

Zone wide Queuing Penalty: 148

Appendix J: Near Term plus Project (Buildout) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Future Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1787		1770	3504		1770	3433	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1787		1770	3504		1770	3433	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	191	194	218	138	256	95	305	710	50	73	541	135
RTOR Reduction (vph)	0	0	161	0	12	0	0	4	0	0	17	0
Lane Group Flow (vph)	191	194	57	138	339	0	305	756	0	73	659	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.9	31.4	31.4	10.5	27.6		21.8	49.7		8.0	35.9	
Effective Green, g (s)	13.9	31.4	31.4	10.5	27.6		21.8	49.7		8.0	35.9	
Actuated g/C Ratio	0.12	0.26	0.26	0.09	0.23		0.18	0.41		0.07	0.30	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	205	487	414	154	411		321	1451		118	1027	
v/s Ratio Prot	c0.11	c0.10		0.08	c0.19		c0.17	0.22		0.04	c0.19	
v/s Ratio Perm			0.04									
v/c Ratio	0.93	0.40	0.14	0.90	0.82		0.95	0.52		0.62	0.64	
Uniform Delay, d1	52.6	36.5	33.9	54.2	43.9		48.6	26.3		54.5	36.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.12	0.52		1.00	1.00	
Incremental Delay, d2	43.8	0.5	0.2	43.2	12.6		32.4	1.1		9.3	3.1	
Delay (s)	96.4	37.1	34.1	97.4	56.5		86.6	14.7		63.8	39.6	
Level of Service	F	D	C	F	E		F	B		E	D	
Approach Delay (s)		54.8			68.0			35.3			41.9	
Approach LOS		D			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			46.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			75.4%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

Intersection

Int Delay, s/veh 9.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	27	300	51	79	50
Future Vol, veh/h	253	27	300	51	79	50
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	288	31	341	58	90	57

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	319
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1252
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1252
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	7.6	35.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	258	-	-	1252	-
HCM Lane V/C Ratio	0.568	-	-	0.272	-
HCM Control Delay (s)	35.8	-	-	8.9	0
HCM Lane LOS	E	-	-	A	A
HCM 95th %tile Q(veh)	3.2	-	-	1.1	-

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

Intersection							
Int Delay, s/veh	15.2						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	39	110	180	1053	3	708	92
Future Vol, veh/h	39	110	180	1053	3	708	92
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	44	125	205	1197	3	805	105

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1874	458	911	0	1197	-	0
Stage 1	865	-	-	-	-	-	-
Stage 2	1009	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	63	547	737	-	246	-	-
Stage 1	370	-	-	-	-	-	-
Stage 2	311	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	45	545	736	-	246	-	-
Mov Cap-2 Maneuver	45	-	-	-	-	-	-
Stage 1	263	-	-	-	-	-	-
Stage 2	311	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	208.8	1.7	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	736	-	139	246	-	-
HCM Lane V/C Ratio	0.278	-	1.218	0.014	-	-
HCM Control Delay (s)	11.8	-	208.8	19.8	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1.1	-	10.1	0	-	-

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

Intersection								
Int Delay, s/veh	17.8							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	54	170	0	975	36	50	816	
Future Vol, veh/h	54	170	0	975	36	50	816	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	88	88	88	88	88	88	88	
Heavy Vehicles, %	0	0	3	3	1	1	3	
Mvmt Flow	61	193	0	1108	41	57	927	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1686	554	927	0	0	1149	0	
Stage 1	1108	-	-	-	-	-	-	
Stage 2	578	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.46	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.53	-	-	2.21	-	
Pot Cap-1 Maneuver	87	481	367	-	-	610	-	
Stage 1	282	-	-	-	-	-	-	
Stage 2	530	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	79	481	367	-	-	610	-	
Mov Cap-2 Maneuver	79	-	-	-	-	-	-	
Stage 1	256	-	-	-	-	-	-	
Stage 2	530	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	164	0		0.7				
HCM LOS	F							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1		SBL	SBT		
Capacity (veh/h)	367	-	-	216	610	-		
HCM Lane V/C Ratio	-	-	-	1.178	0.093	-		
HCM Control Delay (s)	0	-	-	164	11.5	-		
HCM Lane LOS	A	-	-	F	B	-		
HCM 95th %tile Q(veh)	0	-	-	12.5	0.3	-		

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	20	2	122	189	2
Future Vol, veh/h	5	20	2	122	189	2
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	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	6	23	2	139	215	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	359	216	217
Stage 1	216	-	-
Stage 2	143	-	-
Critical Hdwy	6.41	6.21	4.11
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.309	2.209
Pot Cap-1 Maneuver	642	826	1359
Stage 1	822	-	-
Stage 2	887	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	641	826	1359
Mov Cap-2 Maneuver	641	-	-
Stage 1	820	-	-
Stage 2	887	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.8	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1359	-	781	-	-
HCM Lane V/C Ratio	0.002	-	0.036	-	-
HCM Control Delay (s)	7.7	0	9.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Future Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1531	1736	3319		1736	3399		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1531	1736	3319		1736	3399		1736	1827	1553
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	264	410	107	84	549	227	185	622	91	233	419	283
RTOR Reduction (vph)	0	0	74	0	38	0	0	9	0	0	0	188
Lane Group Flow (vph)	264	410	33	84	738	0	185	704	0	233	419	95
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	14.7	36.8	36.8	9.1	31.2		13.8	39.2		15.2	40.2	40.2
Effective Green, g (s)	14.7	36.8	36.8	9.1	31.2		13.8	39.2		15.2	40.2	40.2
Actuated g/C Ratio	0.12	0.31	0.31	0.08	0.26		0.12	0.33		0.13	0.34	0.34
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	212	1064	469	131	862		199	1110		219	612	520
v/s Ratio Prot	c0.15	0.12		0.05	c0.22		c0.11	0.21		c0.13	c0.23	
v/s Ratio Perm			0.02									0.06
v/c Ratio	1.25	0.39	0.07	0.64	0.86		0.93	0.63		1.06	0.68	0.18
Uniform Delay, d1	52.6	32.7	29.5	53.9	42.3		52.6	34.3		52.4	34.4	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.76	0.63	0.78
Incremental Delay, d2	143.5	0.2	0.1	10.3	8.3		43.8	2.8		75.7	5.6	0.7
Delay (s)	196.2	32.9	29.5	64.1	50.6		96.4	37.1		115.6	27.3	22.7
Level of Service	F	C	C	E	D		F	D		F	C	C
Approach Delay (s)		87.7			51.9			49.3			47.9	
Approach LOS		F			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			58.2			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			92.9%			ICU Level of Service			F			
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th TWSC
7: Morrison Street & Tulare Avenue

Near Term plus Project (Buildout) AM Peak

10/31/2019

Intersection												
Int Delay, s/veh	30.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	562	75	42	519	9	99	35	119	17	12	75
Future Vol, veh/h	33	562	75	42	519	9	99	35	119	17	12	75
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	38	639	85	48	590	10	113	40	135	19	14	85

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	600	0	0	724	0	0	1456	1411	639	1536	1491	595
Stage 1	-	-	-	-	-	-	715	715	-	691	691	-
Stage 2	-	-	-	-	-	-	741	696	-	845	800	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	982	-	-	883	-	-	~ 108	139	478	96	125	508
Stage 1	-	-	-	-	-	-	423	436	-	438	449	-
Stage 2	-	-	-	-	-	-	410	445	-	360	400	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	982	-	-	883	-	-	~ 76	126	478	49	114	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 76	126	-	49	114	-
Stage 1	-	-	-	-	-	-	407	419	-	421	425	-
Stage 2	-	-	-	-	-	-	312	421	-	225	384	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.7	164.9	61.7
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	76	292	982	-	-	883	-	-	173
HCM Lane V/C Ratio	1.48	0.599	0.038	-	-	0.054	-	-	0.683
HCM Control Delay (s)	\$ 368.3	34.2	8.8	-	-	9.3	-	-	61.7
HCM Lane LOS	F	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	9.2	3.6	0.1	-	-	0.2	-	-	4.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Near Term plus Project (Buildout) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Future Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1771		1770	3505		1770	3428	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1771		1770	3505		1770	3428	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	246	344	76	213	104	284	736	50	109	890	236
RTOR Reduction (vph)	0	0	245	0	16	0	0	4	0	0	19	0
Lane Group Flow (vph)	283	246	99	76	301	0	284	782	0	109	1107	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.8	34.7	34.7	6.8	26.3		14.8	37.4		20.7	43.3	
Effective Green, g (s)	14.8	34.7	34.7	6.8	26.3		14.8	37.4		20.7	43.3	
Actuated g/C Ratio	0.12	0.29	0.29	0.06	0.22		0.12	0.31		0.17	0.36	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	538	451	100	388		218	1092		305	1236	
v/s Ratio Prot	c0.16	0.13		0.04	c0.17		c0.16	0.22		0.06	c0.32	
v/s Ratio Perm			0.06									
v/c Ratio	1.30	0.46	0.22	0.76	0.78		1.30	0.72		0.36	0.90	
Uniform Delay, d1	52.6	34.9	32.4	55.8	44.1		52.6	36.6		43.8	36.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.91	0.54		1.00	1.00	
Incremental Delay, d2	163.6	0.6	0.2	28.2	9.4		157.2	2.8		0.7	10.3	
Delay (s)	216.2	35.6	32.6	84.0	53.5		205.0	22.5		44.5	46.5	
Level of Service	F	D	C	F	D		F	C		D	D	
Approach Delay (s)		93.0			59.4			70.9			46.3	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			66.5			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.98									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			93.6%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	5.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	93	263	84	50	31
Future Vol, veh/h	253	93	263	84	50	31
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	288	106	299	95	57	35
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	394	0	1034	341
Stage 1	-	-	-	-	341	-
Stage 2	-	-	-	-	693	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1159	-	255	697
Stage 1	-	-	-	-	716	-
Stage 2	-	-	-	-	493	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1159	-	186	697
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	493	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7		26.4	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	259	-	-	1159	-	
HCM Lane V/C Ratio	0.355	-	-	0.258	-	
HCM Control Delay (s)	26.4	-	-	9.2	0	
HCM Lane LOS	D	-	-	A	A	
HCM 95th %tile Q(veh)	1.5	-	-	1	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Near Term plus Project (Buildout) PM Peak

10/31/2019

Intersection							
Int Delay, s/veh	77.9						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	65	85	99	1066	14	1260	135
Future Vol, veh/h	65	85	99	1066	14	1260	135
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	72	94	110	1184	16	1400	150
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	2320	776	1551	0	1184	-	0
Stage 1	1508	-	-	-	-	-	-
Stage 2	812	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	~ 31	338	418	-	250	-	-
Stage 1	168	-	-	-	-	-	-
Stage 2	394	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 21	338	418	-	250	-	-
Mov Cap-2 Maneuver	~ 21	-	-	-	-	-	-
Stage 1	116	-	-	-	-	-	-
Stage 2	394	-	-	-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, \$	1402.8		1.4		0.2		
HCM LOS	F						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR	
Capacity (veh/h)	418	-	45	250	-	-	
HCM Lane V/C Ratio	0.263	-	3.704	0.062	-	-	
HCM Control Delay (s)	16.7	\$	1402.8	20.4	-	-	
HCM Lane LOS	C	-	F	C	-	-	
HCM 95th %tile Q(veh)	1	-	18.6	0.2	-	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Near Term plus Project (Buildout) PM Peak

10/31/2019

Intersection							
Int Delay, s/veh	25.3						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	33	119	2	1075	87	180	1209
Future Vol, veh/h	33	119	2	1075	87	180	1209
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	1	0	0	5
Mvmt Flow	35	128	2	1156	94	194	1300
Major/Minor	Minor1	Major1		Major2			
Conflicting Flow All	2198	578	1300	0	0	1250	0
Stage 1	1160	-	-	-	-	-	-
Stage 2	1038	-	-	-	-	-	-
Critical Hdwy	6.8	6.9	6.42	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2	-
Pot Cap-1 Maneuver	39	464	215	-	-	564	-
Stage 1	265	-	-	-	-	-	-
Stage 2	307	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 25	464	215	-	-	564	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-	-
Stage 1	172	-	-	-	-	-	-
Stage 2	307	-	-	-	-	-	-
Approach	WB	NB		SB			
HCM Control Delay, s\$	432.3	0		1.9			
HCM LOS	F						
Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	215	-	-	96	564	-	
HCM Lane V/C Ratio	0.01	-	-	1.703	0.343	-	
HCM Control Delay (s)	21.9	-	-	\$ 432.3	14.7	-	
HCM Lane LOS	C	-	-	F	B	-	
HCM 95th %tile Q(veh)	0	-	-	13.1	1.5	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	6	89	249	6
Future Vol, veh/h	3	11	6	89	249	6
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	88	88	88	88	88	88
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	3	13	7	101	283	7

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	402	287	290	0	-	0
Stage 1	287	-	-	-	-	-
Stage 2	115	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	606	754	1278	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	602	754	1278	-	-	-
Mov Cap-2 Maneuver	602	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	912	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1278	-	715	-	-
HCM Lane V/C Ratio	0.005	-	0.022	-	-
HCM Control Delay (s)	7.8	0	10.2	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Near Term plus Project (Buildout) PM Peak

10/31/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Future Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3308		1770	3481		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3308		1770	3481		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	329	522	207	60	373	287	117	598	73	320	666	280
RTOR Reduction (vph)	0	0	153	0	128	0	0	8	0	0	0	124
Lane Group Flow (vph)	329	522	54	60	532	0	117	663	0	320	666	156
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.6	31.4	31.4	7.3	25.1		8.2	37.9		23.7	53.0	53.0
Effective Green, g (s)	13.6	31.4	31.4	7.3	25.1		8.2	37.9		23.7	53.0	53.0
Actuated g/C Ratio	0.11	0.26	0.26	0.06	0.21		0.07	0.32		0.20	0.44	0.44
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	200	926	414	107	691		120	1099		349	822	699
v/s Ratio Prot	c0.19	0.15		0.03	c0.16		c0.07	0.19		c0.18	c0.36	
v/s Ratio Perm			0.03									0.10
v/c Ratio	1.65	0.56	0.13	0.56	0.77		0.97	0.60		0.92	0.81	0.22
Uniform Delay, d1	53.2	38.4	33.9	54.8	44.7		55.8	34.7		47.2	29.1	20.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.73	0.55	0.05
Incremental Delay, d2	311.6	0.8	0.1	6.6	5.2		73.7	2.5		24.3	7.1	0.6
Delay (s)	364.8	39.2	34.0	61.4	49.9		129.5	37.1		58.6	23.3	1.7
Level of Service	F	D	C	E	D		F	D		E	C	A
Approach Delay (s)		139.4			50.9			50.9			27.4	
Approach LOS		F			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			67.6			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			91.3%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	20											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	61	561	141	35	514	21	58	31	36	17	50	56
Future Vol, veh/h	61	561	141	35	514	21	58	31	36	17	50	56
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	66	603	152	38	553	23	62	33	39	18	54	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	576	0	0	755	0	0	1433	1387	603	1488	1528	565
Stage 1	-	-	-	-	-	-	735	735	-	641	641	-
Stage 2	-	-	-	-	-	-	698	652	-	847	887	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1007	-	-	865	-	-	113	144	503	103	119	528
Stage 1	-	-	-	-	-	-	414	428	-	466	473	-
Stage 2	-	-	-	-	-	-	434	467	-	359	365	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1007	-	-	865	-	-	~ 56	129	503	70	106	528
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 56	129	-	70	106	-
Stage 1	-	-	-	-	-	-	387	400	-	435	452	-
Stage 2	-	-	-	-	-	-	324	446	-	284	341	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.6	144.2	103.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	56	215	1007	-	-	865	-	-	150
HCM Lane V/C Ratio	1.114	0.335	0.065	-	-	0.044	-	-	0.882
HCM Control Delay (s)	276.2	30	8.8	-	-	9.4	-	-	103.5
HCM Lane LOS	F	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.2	1.4	0.2	-	-	0.1	-	-	6

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Near Term plus Project (Buildout) AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Future Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	191	194	218	138	256	95	305	710	50	73	541	135
RTOR Reduction (vph)	0	0	161	0	12	0	0	4	0	0	0	95
Lane Group Flow (vph)	191	194	57	138	339	0	305	756	0	73	541	40
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.9	31.4	31.4	10.5	27.6		21.8	46.5		11.2	35.9	35.9
Effective Green, g (s)	13.9	31.4	31.4	10.5	27.6		21.8	46.5		11.2	35.9	35.9
Actuated g/C Ratio	0.12	0.26	0.26	0.09	0.23		0.18	0.39		0.09	0.30	0.30
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	205	487	414	154	411		321	1357		165	1058	473
v/s Ratio Prot	c0.11	0.10		0.08	c0.19		c0.17	c0.22		0.04	c0.15	
v/s Ratio Perm			0.04									0.03
v/c Ratio	0.93	0.40	0.14	0.90	0.82		0.95	0.56		0.44	0.51	0.09
Uniform Delay, d1	52.6	36.5	33.9	54.2	43.9		48.6	28.7		51.4	34.8	30.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	0.59		1.00	1.00	1.00
Incremental Delay, d2	43.8	0.5	0.2	43.2	12.6		35.4	1.5		1.9	1.8	0.4
Delay (s)	96.4	37.1	34.1	97.4	56.5		76.6	18.6		53.3	36.6	30.6
Level of Service	F	D	C	F	E		E	B		D	D	C
Approach Delay (s)		54.8			68.0			35.2			37.1	
Approach LOS		D			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)			20.8		
Intersection Capacity Utilization			71.6%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	8.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	27	300	51	79	50
Future Vol, veh/h	253	27	300	51	79	50
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	288	31	341	58	90	57
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	319	0	1044	305
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	740	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1252	-	254	735
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1252	-	183	734
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	538	-
Stage 2	-	-	-	-	472	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.6		29.9	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	183	734	-	-	1252	-
HCM Lane V/C Ratio	0.491	0.077	-	-	0.272	-
HCM Control Delay (s)	42.3	10.3	-	-	8.9	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	2.4	0.3	-	-	1.1	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Near Term plus Project (Buildout) AM Peak

11/01/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	39	110	180	1053	3	708	92
Future Volume (vph)	39	110	180	1053	3	708	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1543	1752	3505	1752	3436	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1543	1752	3505	1752	3436	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	44	125	205	1197	3	805	105
RTOR Reduction (vph)	0	115	0	0	0	6	0
Lane Group Flow (vph)	44	10	205	1197	3	904	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.7	9.7	22.7	94.1	1.3	72.7	
Effective Green, g (s)	9.7	9.7	22.7	94.1	1.3	72.7	
Actuated g/C Ratio	0.08	0.08	0.19	0.78	0.01	0.61	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	141	124	331	2748	18	2081	
v/s Ratio Prot	c0.03		c0.12	c0.34	0.00	c0.26	
v/s Ratio Perm		0.01					
v/c Ratio	0.31	0.08	0.62	0.44	0.17	0.43	
Uniform Delay, d1	52.0	51.0	44.7	4.2	58.8	12.7	
Progression Factor	1.00	1.00	0.63	0.27	1.17	0.40	
Incremental Delay, d2	1.3	0.3	3.2	0.5	3.8	0.6	
Delay (s)	53.3	51.3	31.2	1.6	72.5	5.7	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.8			5.9		5.9	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			9.0		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.47				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.9
Intersection Capacity Utilization			53.9%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Near Term plus Project (Buildout) AM Peak

11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	54	170	0	975	36	50	816
Future Volume (vph)	54	170	0	975	36	50	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	0.95
Frt	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615		3505	1599	1787	3505
Flt Permitted	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615		3505	1599	1787	3505
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	61	193	0	1108	41	57	927
RTOR Reduction (vph)	0	169	0	0	9	0	0
Lane Group Flow (vph)	61	24	0	1108	32	57	927
Heavy Vehicles (%)	0%	0%	0%	3%	1%	1%	3%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	15.2	15.2		82.5	82.5	7.5	94.2
Effective Green, g (s)	15.2	15.2		82.5	82.5	7.5	94.2
Actuated g/C Ratio	0.13	0.13		0.69	0.69	0.06	0.79
Clearance Time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	204		2409	1099	111	2751
v/s Ratio Prot	c0.03			c0.32		c0.03	0.26
v/s Ratio Perm		0.02			0.02		
v/c Ratio	0.27	0.12		0.46	0.03	0.51	0.34
Uniform Delay, d1	47.4	46.5		8.6	6.0	54.5	3.8
Progression Factor	1.00	1.00		0.47	0.36	1.26	0.28
Incremental Delay, d2	0.6	0.3		0.4	0.0	3.7	0.3
Delay (s)	48.0	46.7		4.5	2.2	72.2	1.4
Level of Service	D	D		A	A	E	A
Approach Delay (s)	47.0			4.4			5.5
Approach LOS	D			A			A
Intersection Summary							
HCM 2000 Control Delay			9.4		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.44				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			47.6%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Near Term plus Project (Buildout) AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Future Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	264	410	107	84	549	227	185	622	91	233	419	283
RTOR Reduction (vph)	0	0	78	0	38	0	0	9	0	0	0	181
Lane Group Flow (vph)	264	410	29	84	738	0	185	704	0	233	419	102
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.2	32.9	32.9	8.5	31.2		15.7	40.6		18.3	42.8	42.8
Effective Green, g (s)	10.2	32.9	32.9	8.5	31.2		15.7	40.6		18.3	42.8	42.8
Actuated g/C Ratio	0.08	0.27	0.27	0.07	0.26		0.13	0.34		0.15	0.36	0.36
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	286	951	419	122	862		227	1149		264	651	553
v/s Ratio Prot	c0.08	0.12		0.05	c0.22		c0.11	0.21		c0.13	c0.23	
v/s Ratio Perm			0.02									0.07
v/c Ratio	0.92	0.43	0.07	0.69	0.86		0.81	0.61		0.88	0.64	0.18
Uniform Delay, d1	54.5	35.8	32.2	54.5	42.3		50.7	33.1		49.8	32.2	26.6
Progression Factor	1.00	1.00	1.00	0.90	0.96		1.00	1.00		0.69	0.63	0.55
Incremental Delay, d2	33.5	0.3	0.1	13.5	7.5		19.7	2.4		26.5	4.7	0.7
Delay (s)	88.0	36.2	32.3	62.4	48.3		70.4	35.6		60.7	25.0	15.4
Level of Service	F	D	C	E	D		E	D		E	C	B
Approach Delay (s)		53.2			49.7			42.8			31.0	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			43.6			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			86.6%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Near Term plus Project (Buildout) AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Future Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	38	639	85	48	590	10	112	40	135	19	14	85
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	54	686	610	499	1135	19	138	51	173	35	18	111
Arrive On Green	0.03	0.38	0.38	0.28	0.64	0.64	0.08	0.14	0.14	0.02	0.08	0.08
Sat Flow, veh/h	1795	1796	1598	1795	1761	30	1795	378	1277	1810	233	1413
Grp Volume(v), veh/h	38	639	85	48	0	600	112	0	175	19	0	99
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1791	1795	0	1655	1810	0	1646
Q Serve(g_s), s	2.5	41.0	3.1	2.4	0.0	21.5	7.4	0.0	12.3	1.2	0.0	7.1
Cycle Q Clear(g_c), s	2.5	41.0	3.1	2.4	0.0	21.5	7.4	0.0	12.3	1.2	0.0	7.1
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.77	1.00		0.86
Lane Grp Cap(c), veh/h	54	686	610	499	0	1155	138	0	225	35	0	130
V/C Ratio(X)	0.71	0.93	0.14	0.10	0.00	0.52	0.81	0.00	0.78	0.54	0.00	0.76
Avail Cap(c_a), veh/h	76	793	706	499	0	1155	177	0	483	83	0	384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.7	35.6	13.2	32.1	0.0	11.4	54.6	0.0	50.1	58.3	0.0	54.2
Incr Delay (d2), s/veh	15.6	21.2	0.5	0.1	0.0	1.7	19.8	0.0	5.7	12.1	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	20.5	1.5	1.0	0.0	7.6	4.0	0.0	5.3	0.7	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	56.8	13.7	32.2	0.0	13.1	74.3	0.0	55.8	70.3	0.0	63.1
LnGrp LOS	E	E	B	C	A	B	E	A	E	E	A	E
Approach Vol, veh/h	762				648				287			
Approach Delay, s/veh	52.8				14.5				63.1			
Approach LOS	D				B				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	22.3	39.4	51.8	13.4	15.4	7.8	83.4				
Change Period (Y+Rc), s	* 4.2	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5.5	* 35	6.8	* 53	* 12	28.0	* 5.1	54.7				
Max Q Clear Time (g_c+I1), s	3.2	14.3	4.4	43.0	9.4	9.1	4.5	23.5				
Green Ext Time (p_c), s	0.0	0.9	0.0	2.8	0.1	0.4	0.0	3.6				

Intersection Summary

HCM 6th Ctrl Delay	41.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Near Term plus Project (Buildout) PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Future Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	246	344	76	213	104	284	736	50	109	890	236
RTOR Reduction (vph)	0	0	240	0	16	0	0	4	0	0	0	154
Lane Group Flow (vph)	283	246	104	76	301	0	284	782	0	109	890	82
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Effective Green, g (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Actuated g/C Ratio	0.15	0.30	0.30	0.07	0.22		0.15	0.31		0.15	0.30	0.30
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	565	474	125	386		269	1074		264	1073	480
v/s Ratio Prot	c0.16	0.13		0.04	c0.17		c0.16	0.22		0.06	c0.25	
v/s Ratio Perm			0.07									0.05
v/c Ratio	1.05	0.44	0.22	0.61	0.78		1.06	0.73		0.41	0.83	0.17
Uniform Delay, d1	50.9	33.6	31.2	54.1	44.2		50.9	37.1		46.3	38.9	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.83	0.76		1.00	1.00	1.00
Incremental Delay, d2	69.2	0.5	0.2	8.1	9.8		68.2	4.0		1.1	7.4	0.8
Delay (s)	120.0	34.1	31.4	62.2	54.0		110.4	32.1		47.3	46.3	31.5
Level of Service	F	C	C	E	D		F	C		D	D	C
Approach Delay (s)		60.9			55.6			52.9			43.6	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			51.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			86.5%			ICU Level of Service			E			
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	5.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	93	263	84	50	31
Future Vol, veh/h	253	93	263	84	50	31
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	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	288	106	299	95	57	35

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	394	0	1034
Stage 1	-	-	-	-	341
Stage 2	-	-	-	-	693
Critical Hdwy	-	-	4.13	-	6.44
Critical Hdwy Stg 1	-	-	-	-	5.44
Critical Hdwy Stg 2	-	-	-	-	5.44
Follow-up Hdwy	-	-	2.227	-	3.536
Pot Cap-1 Maneuver	-	-	1159	-	255
Stage 1	-	-	-	-	716
Stage 2	-	-	-	-	493
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1159	-	186
Mov Cap-2 Maneuver	-	-	-	-	186
Stage 1	-	-	-	-	521
Stage 2	-	-	-	-	493

Approach	EB	WB	NB
HCM Control Delay, s	0	7	24.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	186	697	-	-	1159	-
HCM Lane V/C Ratio	0.305	0.051	-	-	0.258	-
HCM Control Delay (s)	32.6	10.4	-	-	9.2	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1.2	0.2	-	-	1	-

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Near Term plus Project (Buildout) PM Peak

11/01/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	65	85	99	1066	14	1260	135
Future Volume (vph)	65	85	99	1066	14	1260	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3447	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3447	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	72	94	110	1184	16	1400	150
RTOR Reduction (vph)	0	85	0	0	0	6	0
Lane Group Flow (vph)	72	9	110	1184	16	1544	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	11.0	11.0	15.0	91.5	2.7	79.2	
Effective Green, g (s)	11.0	11.0	15.0	91.5	2.7	79.2	
Actuated g/C Ratio	0.09	0.09	0.12	0.76	0.02	0.66	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	143	219	2672	39	2275	
v/s Ratio Prot	c0.04		c0.06	0.34	0.01	c0.45	
v/s Ratio Perm		0.01					
v/c Ratio	0.45	0.06	0.50	0.44	0.41	0.68	
Uniform Delay, d1	51.6	49.8	49.0	5.1	57.9	12.6	
Progression Factor	1.00	1.00	0.63	0.82	1.31	0.60	
Incremental Delay, d2	2.0	0.2	1.6	0.5	5.7	1.4	
Delay (s)	53.6	50.0	32.7	4.6	81.4	8.9	
Level of Service	D	D	C	A	F	A	
Approach Delay (s)	51.6			7.0		9.6	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			10.8		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.63				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			61.1%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Near Term plus Project (Buildout) PM Peak

11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	33	119	2	1075	87	180	1209
Future Volume (vph)	33	119	2	1075	87	180	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1805	3574	1615	1805	3438
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1805	3574	1615	1805	3438
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	35	128	2	1156	94	194	1300
RTOR Reduction (vph)	0	113	0	0	22	0	0
Lane Group Flow (vph)	35	15	2	1156	72	194	1300
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	5%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Effective Green, g (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Actuated g/C Ratio	0.12	0.12	0.01	0.62	0.62	0.14	0.75
Clearance Time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	212	189	15	2206	997	255	2581
v/s Ratio Prot	c0.02		c0.00	c0.32		c0.11	0.38
v/s Ratio Perm		0.01			0.04		
v/c Ratio	0.17	0.08	0.13	0.52	0.07	0.76	0.50
Uniform Delay, d1	47.7	47.2	59.1	13.0	9.2	49.5	6.0
Progression Factor	1.00	1.00	0.88	0.37	0.13	1.26	0.32
Incremental Delay, d2	0.4	0.2	2.8	0.6	0.1	9.9	0.5
Delay (s)	48.0	47.4	55.0	5.4	1.3	72.4	2.5
Level of Service	D	D	D	A	A	E	A
Approach Delay (s)	47.5			5.2			11.6
Approach LOS	D			A			B
Intersection Summary							
HCM 2000 Control Delay			10.8		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.51				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			56.2%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Near Term plus Project (Buildout) PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Future Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	329	522	207	60	373	287	117	598	73	320	666	280
RTOR Reduction (vph)	0	0	155	0	128	0	0	8	0	0	0	123
Lane Group Flow (vph)	329	522	52	60	532	0	117	663	0	320	666	157
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Effective Green, g (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Actuated g/C Ratio	0.09	0.25	0.25	0.05	0.21		0.07	0.34		0.20	0.46	0.46
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	303	893	399	79	691		131	1169		358	858	729
v/s Ratio Prot	c0.10	0.15		0.03	c0.16		c0.07	0.19		c0.18	c0.36	
v/s Ratio Perm			0.03									0.10
v/c Ratio	1.09	0.58	0.13	0.76	0.77		0.89	0.57		0.89	0.78	0.21
Uniform Delay, d1	54.7	39.3	34.7	56.7	44.7		55.1	32.7		46.6	27.2	19.4
Progression Factor	1.00	1.00	1.00	0.93	0.85		1.00	1.00		0.60	0.45	0.40
Incremental Delay, d2	76.5	1.0	0.1	30.9	4.7		47.6	2.0		21.5	6.1	0.6
Delay (s)	131.2	40.3	34.8	83.7	42.9		102.6	34.7		49.3	18.3	8.4
Level of Service	F	D	C	F	D		F	C		D	B	A
Approach Delay (s)		67.5			46.3			44.8			23.9	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			44.5			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			83.0%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Near Term plus Project (Buildout) PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Future Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	603	152	38	553	23	62	33	39	18	54	60
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	85	1246	1081	54	1148	48	80	48	56	135	69	77
Arrive On Green	0.05	0.67	0.67	0.03	0.65	0.65	0.04	0.06	0.06	0.07	0.08	0.08
Sat Flow, veh/h	1810	1856	1610	1810	1755	73	1810	793	938	1810	822	913
Grp Volume(v), veh/h	66	603	152	38	0	576	62	0	72	18	0	114
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1828	1810	0	1731	1810	0	1736
Q Serve(g_s), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Cycle Q Clear(g_c), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.54	1.00		0.53
Lane Grp Cap(c), veh/h	85	1246	1081	54	0	1195	80	0	104	135	0	147
V/C Ratio(X)	0.77	0.48	0.14	0.70	0.00	0.48	0.77	0.00	0.69	0.13	0.00	0.78
Avail Cap(c_a), veh/h	148	1246	1081	103	0	1195	145	0	475	135	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	9.6	2.6	57.7	0.0	10.5	56.7	0.0	55.3	51.9	0.0	53.8
Incr Delay (d2), s/veh	13.8	1.3	0.3	15.2	0.0	1.4	14.4	0.0	8.0	0.4	0.0	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.7	1.2	1.3	0.0	6.8	2.1	0.0	2.3	0.5	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	11.0	2.9	72.9	0.0	11.9	71.1	0.0	63.4	52.3	0.0	62.4
LnGrp LOS	E	B	A	E	A	B	E	A	E	D	A	E
Approach Vol, veh/h		821			614			134			132	
Approach Delay, s/veh		14.2			15.6			67.0			61.0	
Approach LOS		B			B			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	12.5	7.8	86.6	9.5	16.1	9.9	84.5				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.4	* 33	* 6.8	55.2	9.6	* 28	* 9.8	52.2				
Max Q Clear Time (g_c+I1), s	3.1	6.9	4.5	21.0	6.1	9.7	6.3	21.1				
Green Ext Time (p_c), s	0.0	0.3	0.0	4.2	0.0	0.4	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	242	207	82	214	473	450	492	310	89	172	161	99
Average Queue (ft)	133	87	27	140	262	234	166	158	43	110	92	32
95th Queue (ft)	207	168	64	244	436	386	329	257	81	170	151	59
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)				27	33	3						
Queuing Penalty (veh)				84	40	11						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	131	98	52
Average Queue (ft)	41	36	23
95th Queue (ft)	91	72	46
Link Distance (ft)	2034	2712	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	90	64	266	145	116	27	305	234
Average Queue (ft)	37	39	128	25	38	3	69	67
95th Queue (ft)	81	60	223	83	95	15	196	171
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)							0	
Queuing Penalty (veh)							0	

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	134	125	139	160	29	53	172	156
Average Queue (ft)	46	54	53	43	5	29	29	22
95th Queue (ft)	99	102	124	122	22	54	112	80
Link Distance (ft)	1110		2569	2569			1226	1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250			170	450		
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB
Directions Served	LR
Maximum Queue (ft)	32
Average Queue (ft)	17
95th Queue (ft)	42
Link Distance (ft)	1257
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB
Directions Served	L	L	T	T	R	L	T	TR	L	T	TR	L
Maximum Queue (ft)	160	173	335	261	73	195	302	307	140	308	276	231
Average Queue (ft)	81	92	215	13	31	90	175	210	109	202	157	139
95th Queue (ft)	144	151	329	93	62	158	247	287	170	303	254	229
Link Distance (ft)			2539	2539			266	266		1240	1240	
Upstream Blk Time (%)							1	3				
Queuing Penalty (veh)							3	9				
Storage Bay Dist (ft)	415	415			175	85			80			470
Storage Blk Time (%)						12	30		32	35		
Queuing Penalty (veh)						28	22		88	57		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB
Directions Served	T	R
Maximum Queue (ft)	320	132
Average Queue (ft)	145	58
95th Queue (ft)	283	110
Link Distance (ft)	2569	2569
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	73	372	51	116	282	163	201	49	97
Average Queue (ft)	29	161	12	38	131	66	78	14	47
95th Queue (ft)	62	309	39	78	229	132	158	37	91
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		0			0	3	3		
Queuing Penalty (veh)		0			0	4	3		

Zone Summary

Zone wide Queuing Penalty: 349

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	463	387	168	214	401	449	601	468	151	418	432	370
Average Queue (ft)	265	131	89	76	222	277	222	217	71	259	256	57
95th Queue (ft)	439	245	159	170	320	413	408	361	122	367	361	158
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)	0				26	8	1				10	
Queuing Penalty (veh)	0				18	26	3				23	

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	49	149	74	50
Average Queue (ft)	2	52	30	18
95th Queue (ft)	18	105	62	40
Link Distance (ft)	2798	2034	2712	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	135	77	204	179	162	30	430	429
Average Queue (ft)	49	42	82	35	36	12	148	129
95th Queue (ft)	101	74	159	124	116	33	318	300
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)							2	
Queuing Penalty (veh)							0	

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	89	152	24	249	290	314	249	310	306
Average Queue (ft)	41	40	1	121	118	29	111	55	38
95th Queue (ft)	83	86	8	262	253	124	201	152	135
Link Distance (ft)	1110			2569	2569			1226	1226
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		250	320			170	450		
Storage Blk Time (%)					5				
Queuing Penalty (veh)					4				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	32	50
Average Queue (ft)	14	2
95th Queue (ft)	40	17
Link Distance (ft)	1257	2683
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B18	B18	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	T	L	T
Maximum Queue (ft)	449	485	924	653	205	194	329	348	19	86	140	330
Average Queue (ft)	221	322	396	215	67	54	162	205	1	7	104	193
95th Queue (ft)	408	563	720	583	153	110	262	319	6	45	161	298
Link Distance (ft)			2539	2539			266	266	631	631		1240
Upstream Blk Time (%)							2	5				
Queuing Penalty (veh)							5	15				
Storage Bay Dist (ft)	415	415			175	85					80	
Storage Blk Time (%)	1	5	18			1	30				37	37
Queuing Penalty (veh)	2	11	56			3	17				103	41

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	311	584	633	93
Average Queue (ft)	158	288	353	48
95th Queue (ft)	290	527	581	88
Link Distance (ft)	1240		2569	2569
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		470		
Storage Blk Time (%)		7	2	
Queuing Penalty (veh)		44	8	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	116	207	28	98	232	89	127	30	140
Average Queue (ft)	56	68	17	30	122	39	41	10	75
95th Queue (ft)	89	157	34	72	213	81	88	30	142
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)							1		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 378

Appendix K: Cumulative Year 2035 No Project Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	197	187	147	242	55	250	596	54	55	469	119
Future Volume (vph)	183	197	187	147	242	55	250	596	54	55	469	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1811		1770	3495		1770	3432	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1811		1770	3495		1770	3432	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	214	203	160	263	60	272	648	59	60	510	129
RTOR Reduction (vph)	0	0	152	0	8	0	0	5	0	0	17	0
Lane Group Flow (vph)	199	214	51	160	315	0	272	702	0	60	622	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	15.5	30.2	30.2	11.8	26.1		19.7	50.3		7.3	37.9	
Effective Green, g (s)	15.5	30.2	30.2	11.8	26.1		19.7	50.3		7.3	37.9	
Actuated g/C Ratio	0.13	0.25	0.25	0.10	0.22		0.16	0.42		0.06	0.32	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	228	468	398	174	393		290	1464		107	1083	
v/s Ratio Prot	c0.11	c0.11		0.09	c0.17		c0.15	0.20		0.03	c0.18	
v/s Ratio Perm			0.03									
v/c Ratio	0.87	0.46	0.13	0.92	0.80		0.94	0.48		0.56	0.57	
Uniform Delay, d1	51.3	38.0	34.7	53.6	44.5		49.5	25.3		54.8	34.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.11	0.51		1.00	1.00	
Incremental Delay, d2	28.6	0.7	0.1	45.1	11.2		31.5	0.9		6.6	2.2	
Delay (s)	79.9	38.7	34.9	98.7	55.7		86.4	13.9		61.4	36.5	
Level of Service	E	D	C	F	E		F	B		E	D	
Approach Delay (s)		50.7			70.0			34.1			38.7	
Approach LOS		D			E			C			D	
Intersection Summary												
HCM 2000 Control Delay			45.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.74									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			74.2%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection						
Int Delay, s/veh	6.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	273	14	353	51	33	45
Future Vol, veh/h	273	14	353	51	33	45
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	1	1	0	0	2	2
Mvmt Flow	297	15	384	55	36	49
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	312	0	1128	306
Stage 1	-	-	-	-	305	-
Stage 2	-	-	-	-	823	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1260	-	226	734
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	431	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1260	-	155	733
Mov Cap-2 Maneuver	-	-	-	-	155	-
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	431	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8		23	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	284	-	-	1260	-	
HCM Lane V/C Ratio	0.299	-	-	0.305	-	
HCM Control Delay (s)	23	-	-	9.1	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1.2	-	-	1.3	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

Intersection								
Int Delay, s/veh	14.4							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR	
Lane Configurations								
Traffic Vol, veh/h	39	128	206	1036	4	694	92	
Future Vol, veh/h	39	128	206	1036	4	694	92	
Conflicting Peds, #/hr	0	2	1	0	0	0	1	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	-	None	
Storage Length	0	-	500	-	315	-	-	
Veh in Median Storage, #	0	-	-	0	-	0	-	
Grade, %	0	-	-	0	-	0	-	
Peak Hour Factor	92	92	92	92	92	92	92	
Heavy Vehicles, %	3	3	3	3	3	3	3	
Mvmt Flow	42	139	224	1126	4	754	100	
Major/Minor	Minor2	Major1		Major2				
Conflicting Flow All	1824	430	855	0	1126	-	0	
Stage 1	813	-	-	-	-	-	-	
Stage 2	1011	-	-	-	-	-	-	
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-	
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-	
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-	
Pot Cap-1 Maneuver	68	571	774	-	273	-	-	
Stage 1	394	-	-	-	-	-	-	
Stage 2	310	-	-	-	-	-	-	
Platoon blocked, %				-		-	-	
Mov Cap-1 Maneuver	47	569	773	-	273	-	-	
Mov Cap-2 Maneuver	47	-	-	-	-	-	-	
Stage 1	275	-	-	-	-	-	-	
Stage 2	310	-	-	-	-	-	-	
Approach	EB	NB		SB				
HCM Control Delay, s	174.9	1.9		0.1				
HCM LOS	F							
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR		
Capacity (veh/h)	773	-	158	273	-	-		
HCM Lane V/C Ratio	0.29	-	1.149	0.016	-	-		
HCM Control Delay (s)	11.5	-	174.9	18.4	-	-		
HCM Lane LOS	B	-	F	C	-	-		
HCM 95th %tile Q(veh)	1.2	-	9.9	0	-	-		

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

Intersection								
Int Delay, s/veh	4.7							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	33	155	0	1026	29	33	815	
Future Vol, veh/h	33	155	0	1026	29	33	815	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	92	92	92	92	92	92	92	
Heavy Vehicles, %	0	0	3	3	1	1	3	
Mvmt Flow	36	168	0	1115	32	36	886	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	1630	558	886	0	0	1147	0	
Stage 1	1115	-	-	-	-	-	-	
Stage 2	515	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.46	-	-	4.12	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.53	-	-	2.21	-	
Pot Cap-1 Maneuver	94	478	390	-	-	611	-	
Stage 1	280	-	-	-	-	-	-	
Stage 2	570	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	88	478	390	-	-	611	-	
Mov Cap-2 Maneuver	88	-	-	-	-	-	-	
Stage 1	263	-	-	-	-	-	-	
Stage 2	570	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	50.9	0		0.4				
HCM LOS	F							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	390	-	-	269	611	-		
HCM Lane V/C Ratio	-	-	-	0.76	0.059	-		
HCM Control Delay (s)	0	-	-	50.9	11.3	-		
HCM Lane LOS	A	-	-	F	B	-		
HCM 95th %tile Q(veh)	0	-	-	5.6	0.2	-		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	236	415	94	76	493	198	173	572	92	208	364	233
Future Volume (vph)	236	415	94	76	493	198	173	572	92	208	364	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1531	1736	3322		1736	3393		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1531	1736	3322		1736	3393		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	257	451	102	83	536	215	188	622	100	226	396	253
RTOR Reduction (vph)	0	0	71	0	37	0	0	10	0	0	0	166
Lane Group Flow (vph)	257	451	31	83	714	0	188	712	0	226	396	87
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	14.6	36.2	36.2	9.0	30.6		13.4	41.3		13.8	41.3	41.3
Effective Green, g (s)	14.6	36.2	36.2	9.0	30.6		13.4	41.3		13.8	41.3	41.3
Actuated g/C Ratio	0.12	0.30	0.30	0.08	0.26		0.11	0.34		0.12	0.34	0.34
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	211	1047	461	130	847		193	1167		199	628	534
v/s Ratio Prot	c0.15	0.13		0.05	c0.21		c0.11	0.21		c0.13	c0.22	
v/s Ratio Perm			0.02									0.06
v/c Ratio	1.22	0.43	0.07	0.64	0.84		0.97	0.61		1.14	0.63	0.16
Uniform Delay, d1	52.7	33.6	29.9	53.9	42.4		53.1	32.7		53.1	33.0	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.76	0.62	0.74
Incremental Delay, d2	133.2	0.3	0.1	9.9	7.6		56.8	2.4		102.1	4.3	0.6
Delay (s)	185.9	33.9	29.9	63.8	50.1		110.0	35.0		142.5	24.8	20.9
Level of Service	F	C	C	E	D		F	D		F	C	C
Approach Delay (s)		81.6			51.4			50.5			54.1	
Approach LOS		F			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			59.0			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.89									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			93.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	27.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	638	80	48	590	5	99	42	129	7	12	41
Future Vol, veh/h	25	638	80	48	590	5	99	42	129	7	12	41
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	300	-	0	300	-	-	120	-	-	-	-	-
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, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	27	693	87	52	641	5	108	46	140	8	13	45

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	646	0	0	780	0	0	1524	1497	693	1632	1582	644
Stage 1	-	-	-	-	-	-	747	747	-	748	748	-
Stage 2	-	-	-	-	-	-	777	750	-	884	834	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	944	-	-	842	-	-	~ 97	123	445	82	110	476
Stage 1	-	-	-	-	-	-	407	422	-	408	423	-
Stage 2	-	-	-	-	-	-	391	420	-	343	386	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	944	-	-	842	-	-	~ 74	112	445	36	100	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 74	112	-	36	100	-
Stage 1	-	-	-	-	-	-	395	410	-	396	397	-
Stage 2	-	-	-	-	-	-	322	394	-	203	375	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.7	163.3	46.3
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	74	257	944	-	-	842	-	-	150
HCM Lane V/C Ratio	1.454	0.723	0.029	-	-	0.062	-	-	0.435
HCM Control Delay (s)	\$ 361.5	48.6	8.9	-	-	9.6	-	-	46.3
HCM Lane LOS	F	E	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	8.8	5	0.1	-	-	0.2	-	-	1.9

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	248	302	82	221	79	256	673	57	69	805	228
Future Volume (vph)	266	248	302	82	221	79	256	673	57	69	805	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1789		1770	3498		1770	3422	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1789		1770	3498		1770	3422	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	264	321	87	235	84	272	716	61	73	856	243
RTOR Reduction (vph)	0	0	233	0	12	0	0	5	0	0	20	0
Lane Group Flow (vph)	283	264	88	87	307	0	272	772	0	73	1079	0
Confl. Peds. (#/hr)			1	1								
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	15.8	32.9	32.9	8.9	25.6		14.8	43.6		14.2	43.0	
Effective Green, g (s)	15.8	32.9	32.9	8.9	25.6		14.8	43.6		14.2	43.0	
Actuated g/C Ratio	0.13	0.27	0.27	0.07	0.21		0.12	0.36		0.12	0.36	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	233	510	428	131	381		218	1270		209	1226	
v/s Ratio Prot	c0.16	0.14		0.05	c0.17		c0.15	0.22		0.04	c0.32	
v/s Ratio Perm			0.06									
v/c Ratio	1.21	0.52	0.21	0.66	0.81		1.25	0.61		0.35	0.88	
Uniform Delay, d1	52.1	36.8	33.5	54.1	44.8		52.6	31.2		48.7	36.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.96	0.52		1.00	1.00	
Incremental Delay, d2	129.2	0.9	0.2	12.0	11.8		135.5	1.5		1.0	9.2	
Delay (s)	181.3	37.7	33.7	66.1	56.6		186.0	17.8		49.7	45.3	
Level of Service	F	D	C	E	E		F	B		D	D	
Approach Delay (s)		83.1			58.7			61.4			45.6	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			61.2			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			92.2%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

Intersection						
Int Delay, s/veh	4.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	367	56	288	84	27	34
Future Vol, veh/h	367	56	288	84	27	34
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	399	61	313	91	29	37
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	460	0	1147	430
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	717	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1096	-	218	621
Stage 1	-	-	-	-	652	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1096	-	152	621
Mov Cap-2 Maneuver	-	-	-	-	152	-
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	480	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	7.4		23.3		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	262	-	-	1096	-	
HCM Lane V/C Ratio	0.253	-	-	0.286	-	
HCM Control Delay (s)	23.3	-	-	9.6	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile Q(veh)	1	-	-	1.2	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

Intersection							
Int Delay, s/veh	119.5						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	80	146	111	1033	17	1203	149
Future Vol, veh/h	80	146	111	1033	17	1203	149
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	87	159	121	1123	18	1308	162
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	2230	736	1471	0	1123	-	0
Stage 1	1426	-	-	-	-	-	-
Stage 2	804	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	~ 36	359	449	-	274	-	-
Stage 1	186	-	-	-	-	-	-
Stage 2	398	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 25	359	449	-	274	-	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-	-
Stage 1	127	-	-	-	-	-	-
Stage 2	398	-	-	-	-	-	-
Approach	EB	NB		SB			
HCM Control Delay, \$	1439.6	1.5		0.2			
HCM LOS	F						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR	
Capacity (veh/h)	449	-	63	274	-	-	
HCM Lane V/C Ratio	0.269	-	3.899	0.067	-	-	
HCM Control Delay (s)	15.9	\$	1439.6	19.1	-	-	
HCM Lane LOS	C	-	F	C	-	-	
HCM 95th %tile Q(veh)	1.1	-	26.3	0.2	-	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

HCM 6th TWSC
4: Mooney Boulevard & Seminole Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

Intersection								
Int Delay, s/veh	4.5							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT	
Lane Configurations								
Traffic Vol, veh/h	19	105	2	1073	64	121	1227	
Future Vol, veh/h	19	105	2	1073	64	121	1227	
Conflicting Peds, #/hr	0	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	
RT Channelized	-	None	-	-	None	-	None	
Storage Length	0	-	320	-	170	450	-	
Veh in Median Storage, #	0	-	-	0	-	-	0	
Grade, %	0	-	-	0	-	-	0	
Peak Hour Factor	93	93	93	93	93	93	93	
Heavy Vehicles, %	0	0	1	1	0	0	5	
Mvmt Flow	20	113	2	1154	69	130	1319	
Major/Minor	Minor1	Major1		Major2				
Conflicting Flow All	2078	577	1319	0	0	1223	0	
Stage 1	1158	-	-	-	-	-	-	
Stage 2	920	-	-	-	-	-	-	
Critical Hdwy	6.8	6.9	6.42	-	-	4.1	-	
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-	
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2	-	
Pot Cap-1 Maneuver	47	465	209	-	-	577	-	
Stage 1	265	-	-	-	-	-	-	
Stage 2	353	-	-	-	-	-	-	
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	36	465	209	-	-	577	-	
Mov Cap-2 Maneuver	36	-	-	-	-	-	-	
Stage 1	203	-	-	-	-	-	-	
Stage 2	353	-	-	-	-	-	-	
Approach	WB	NB		SB				
HCM Control Delay, s	82.6	0		1.2				
HCM LOS	F							
Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT			
Capacity (veh/h)	209	-	-	165	577	-		
HCM Lane V/C Ratio	0.01	-	-	0.808	0.225	-		
HCM Control Delay (s)	22.4	-	-	82.6	13	-		
HCM Lane LOS	C	-	-	F	B	-		
HCM 95th %tile Q(veh)	0	-	-	5.4	0.9	-		

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	513	197	55	369	268	111	555	71	298	642	253
Future Volume (vph)	293	513	197	55	369	268	111	555	71	298	642	253
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3316		1770	3479		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3316		1770	3479		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	312	546	210	59	393	285	118	590	76	317	683	269
RTOR Reduction (vph)	0	0	153	0	120	0	0	9	0	0	0	118
Lane Group Flow (vph)	312	546	57	59	558	0	118	657	0	317	683	151
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.7	32.5	32.5	7.3	26.1		8.2	35.8		24.7	51.9	51.9
Effective Green, g (s)	13.7	32.5	32.5	7.3	26.1		8.2	35.8		24.7	51.9	51.9
Actuated g/C Ratio	0.11	0.27	0.27	0.06	0.22		0.07	0.30		0.21	0.43	0.43
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	958	428	107	721		120	1037		364	805	684
v/s Ratio Prot	c0.18	0.15		0.03	c0.17		c0.07	0.19		c0.18	c0.37	
v/s Ratio Perm			0.04									0.10
v/c Ratio	1.54	0.57	0.13	0.55	0.77		0.98	0.63		0.87	0.85	0.22
Uniform Delay, d1	53.1	37.7	33.1	54.8	44.2		55.8	36.4		46.1	30.5	21.4
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.72	0.58	0.07
Incremental Delay, d2	268.1	0.8	0.1	6.0	5.2		76.5	2.9		17.1	9.2	0.6
Delay (s)	321.3	38.5	33.2	60.8	49.4		132.3	39.4		50.3	26.8	2.1
Level of Service	F	D	C	E	D		F	D		D	C	A
Approach Delay (s)		120.1			50.3			53.4			27.4	
Approach LOS		F			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			62.7			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			91.7%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	16.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	623	141	35	548	9	58	37	36	10	51	33
Future Vol, veh/h	29	623	141	35	548	9	58	37	36	10	51	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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	31	670	152	38	589	10	62	40	39	11	55	35

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	599	0	0	822	0	0	1447	1407	670	1518	1554	594
Stage 1	-	-	-	-	-	-	732	732	-	670	670	-
Stage 2	-	-	-	-	-	-	715	675	-	848	884	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	988	-	-	816	-	-	110	140	460	99	114	509
Stage 1	-	-	-	-	-	-	416	430	-	450	459	-
Stage 2	-	-	-	-	-	-	425	456	-	359	366	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	988	-	-	816	-	-	~ 57	129	460	65	105	509
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 57	129	-	65	105	-
Stage 1	-	-	-	-	-	-	403	417	-	436	437	-
Stage 2	-	-	-	-	-	-	330	435	-	288	355	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.6	137.2	88.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	57	200	988	-	-	816	-	-	133
HCM Lane V/C Ratio	1.094	0.392	0.032	-	-	0.046	-	-	0.76
HCM Control Delay (s)	266.9	34.2	8.8	-	-	9.6	-	-	88.4
HCM Lane LOS	F	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	5.2	1.7	0.1	-	-	0.1	-	-	4.5

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Future Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	186	209	132	245	91	291	679	48	70	517	129
RTOR Reduction (vph)	0	0	155	0	12	0	0	4	0	0	0	89
Lane Group Flow (vph)	183	186	54	132	324	0	291	723	0	70	517	40
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	14.3	30.9	30.9	10.5	26.7		21.3	46.5		11.7	36.9	36.9
Effective Green, g (s)	14.3	30.9	30.9	10.5	26.7		21.3	46.5		11.7	36.9	36.9
Actuated g/C Ratio	0.12	0.26	0.26	0.09	0.22		0.18	0.39		0.10	0.31	0.31
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	210	479	407	154	397		314	1357		172	1088	486
v/s Ratio Prot	c0.10	0.10		0.07	c0.18		c0.16	c0.21		0.04	c0.15	
v/s Ratio Perm			0.03									0.03
v/c Ratio	0.87	0.39	0.13	0.86	0.82		0.93	0.53		0.41	0.48	0.08
Uniform Delay, d1	51.9	36.8	34.2	54.0	44.3		48.6	28.4		50.9	33.7	29.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.74	0.63		1.00	1.00	1.00
Incremental Delay, d2	30.2	0.5	0.1	34.6	12.1		30.7	1.4		1.6	1.5	0.3
Delay (s)	82.2	37.3	34.4	88.6	56.4		66.5	19.3		52.5	35.2	29.8
Level of Service	F	D	C	F	E		E	B		D	D	C
Approach Delay (s)		50.4			65.5			32.8			35.9	
Approach LOS		D			E			C			D	
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			71.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	39	110	180	1053	3	708	92
Future Volume (vph)	39	110	180	1053	3	708	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1543	1752	3505	1752	3436	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1543	1752	3505	1752	3436	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	120	196	1145	3	770	100
RTOR Reduction (vph)	0	110	0	0	0	6	0
Lane Group Flow (vph)	42	10	196	1145	3	864	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.7	9.7	22.1	94.1	1.3	73.3	
Effective Green, g (s)	9.7	9.7	22.1	94.1	1.3	73.3	
Actuated g/C Ratio	0.08	0.08	0.18	0.78	0.01	0.61	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	141	124	322	2748	18	2098	
v/s Ratio Prot	c0.02		c0.11	c0.33	0.00	c0.25	
v/s Ratio Perm		0.01					
v/c Ratio	0.30	0.08	0.61	0.42	0.17	0.41	
Uniform Delay, d1	51.9	51.0	45.0	4.2	58.8	12.1	
Progression Factor	1.00	1.00	0.64	0.26	1.30	0.34	
Incremental Delay, d2	1.2	0.3	3.1	0.4	3.9	0.5	
Delay (s)	53.1	51.3	31.8	1.5	80.2	4.7	
Level of Service	D	D	C	A	F	A	
Approach Delay (s)	51.8			6.0		4.9	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			8.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.45				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.9
Intersection Capacity Utilization			53.9%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	54	170	0	975	36	50	816
Future Volume (vph)	54	170	0	975	36	50	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	0.95
Frt	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615		3505	1599	1787	3505
Flt Permitted	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615		3505	1599	1787	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	185	0	1060	39	54	887
RTOR Reduction (vph)	0	162	0	0	9	0	0
Lane Group Flow (vph)	59	23	0	1060	30	54	887
Heavy Vehicles (%)	0%	0%	0%	3%	1%	1%	3%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	15.2	15.2		82.4	82.4	7.6	94.2
Effective Green, g (s)	15.2	15.2		82.4	82.4	7.6	94.2
Actuated g/C Ratio	0.13	0.13		0.69	0.69	0.06	0.79
Clearance Time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	204		2406	1097	113	2751
v/s Ratio Prot	c0.03			c0.30		c0.03	0.25
v/s Ratio Perm		0.01			0.02		
v/c Ratio	0.26	0.11		0.44	0.03	0.48	0.32
Uniform Delay, d1	47.3	46.4		8.4	6.0	54.3	3.7
Progression Factor	1.00	1.00		0.44	0.32	1.20	0.27
Incremental Delay, d2	0.6	0.3		0.4	0.0	3.0	0.3
Delay (s)	47.9	46.7		4.1	2.0	68.3	1.3
Level of Service	D	D		A	A	E	A
Approach Delay (s)	47.0			4.0			5.1
Approach LOS	D			A			A
Intersection Summary							
HCM 2000 Control Delay			9.1		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.42				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			47.6%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Future Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	392	102	80	525	217	177	595	87	223	401	271
RTOR Reduction (vph)	0	0	73	0	39	0	0	9	0	0	0	173
Lane Group Flow (vph)	252	392	29	80	703	0	177	673	0	223	401	98
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.9	34.2	34.2	7.0	30.3		15.1	41.3		17.8	43.6	43.6
Effective Green, g (s)	10.9	34.2	34.2	7.0	30.3		15.1	41.3		17.8	43.6	43.6
Actuated g/C Ratio	0.09	0.29	0.29	0.06	0.25		0.13	0.34		0.15	0.36	0.36
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	305	989	436	101	838		218	1169		257	663	564
v/s Ratio Prot	c0.07	0.11		0.05	c0.21		c0.10	0.20		c0.13	c0.22	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.83	0.40	0.07	0.79	0.84		0.81	0.58		0.87	0.60	0.17
Uniform Delay, d1	53.6	34.6	31.3	55.8	42.5		51.1	32.2		49.9	31.2	26.0
Progression Factor	1.00	1.00	1.00	0.90	0.95		1.00	1.00		0.73	0.62	0.26
Incremental Delay, d2	16.5	0.3	0.1	30.8	6.8		20.1	2.1		24.4	3.9	0.7
Delay (s)	70.1	34.8	31.3	80.8	47.0		71.1	34.2		60.8	23.3	7.4
Level of Service	E	C	C	F	D		E	C		E	C	A
Approach Delay (s)		46.3			50.3			41.8			27.9	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			41.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.1		
Intersection Capacity Utilization			86.6%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Cumulative Year 2035 No Project AM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Future Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	36	611	82	46	564	10	108	38	129	18	13	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	52	660	587	534	1144	20	133	50	168	34	17	108
Arrive On Green	0.03	0.37	0.37	0.30	0.65	0.65	0.07	0.13	0.13	0.02	0.08	0.08
Sat Flow, veh/h	1795	1796	1598	1795	1759	31	1795	377	1278	1810	225	1419
Grp Volume(v), veh/h	36	611	82	46	0	574	108	0	167	18	0	95
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1791	1795	0	1655	1810	0	1644
Q Serve(g_s), s	2.4	39.1	3.1	2.2	0.0	19.8	7.1	0.0	11.7	1.2	0.0	6.8
Cycle Q Clear(g_c), s	2.4	39.1	3.1	2.2	0.0	19.8	7.1	0.0	11.7	1.2	0.0	6.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.77	1.00		0.86
Lane Grp Cap(c), veh/h	52	660	587	534	0	1165	133	0	218	34	0	125
V/C Ratio(X)	0.69	0.93	0.14	0.09	0.00	0.49	0.81	0.00	0.77	0.53	0.00	0.76
Avail Cap(c_a), veh/h	76	793	706	534	0	1165	177	0	484	81	0	384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.7	36.4	14.2	30.4	0.0	10.8	54.7	0.0	50.3	58.3	0.0	54.3
Incr Delay (d2), s/veh	14.9	21.0	0.5	0.1	0.0	1.5	18.5	0.0	5.5	12.2	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	19.7	1.5	0.9	0.0	6.9	3.8	0.0	5.0	0.6	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	57.4	14.7	30.5	0.0	12.3	73.2	0.0	55.9	70.5	0.0	63.3
LnGrp LOS	E	E	B	C	A	B	E	A	E	E	A	E
Approach Vol, veh/h	729				620				275			
Approach Delay, s/veh	53.3				13.6				62.7			
Approach LOS	D				B				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	21.8	41.7	50.1	13.1	15.2	7.7	84.0				
Change Period (Y+Rc), s	* 4.2	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5.4	* 35	6.8	* 53	* 12	28.0	* 5.1	54.7				
Max Q Clear Time (g_c+I1), s	3.2	13.7	4.2	41.1	9.1	8.8	4.4	21.8				
Green Ext Time (p_c), s	0.0	0.8	0.0	2.9	0.1	0.4	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay	41.4											
HCM 6th LOS	D											
Notes												

HCM Signalized Intersection Capacity Analysis

1: Mooney Boulevard & Prosperity Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Future Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	246	344	76	213	104	284	736	50	109	890	236
RTOR Reduction (vph)	0	0	240	0	16	0	0	4	0	0	0	154
Lane Group Flow (vph)	283	246	104	76	301	0	284	782	0	109	890	82
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Effective Green, g (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Actuated g/C Ratio	0.15	0.30	0.30	0.07	0.22		0.15	0.31		0.15	0.30	0.30
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	565	474	125	386		269	1074		264	1073	480
v/s Ratio Prot	c0.16	0.13		0.04	c0.17		c0.16	0.22		0.06	c0.25	
v/s Ratio Perm			0.07									0.05
v/c Ratio	1.05	0.44	0.22	0.61	0.78		1.06	0.73		0.41	0.83	0.17
Uniform Delay, d1	50.9	33.6	31.2	54.1	44.2		50.9	37.1		46.3	38.9	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	0.75		1.00	1.00	1.00
Incremental Delay, d2	69.2	0.5	0.2	8.1	9.8		68.3	4.0		1.1	7.4	0.8
Delay (s)	120.0	34.1	31.4	62.2	54.0		111.4	31.9		47.3	46.3	31.5
Level of Service	F	C	C	E	D		F	C		D	D	C
Approach Delay (s)		60.9			55.6			53.0			43.6	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			52.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			86.5%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis

3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	65	85	99	1066	14	1260	135
Future Volume (vph)	65	85	99	1066	14	1260	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3447	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3447	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	92	108	1159	15	1370	147
RTOR Reduction (vph)	0	84	0	0	0	5	0
Lane Group Flow (vph)	71	8	108	1159	15	1512	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	11.0	11.0	15.1	91.4	2.8	79.1	
Effective Green, g (s)	11.0	11.0	15.1	91.4	2.8	79.1	
Actuated g/C Ratio	0.09	0.09	0.13	0.76	0.02	0.66	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	143	220	2669	40	2272	
v/s Ratio Prot	c0.04		c0.06	0.33	0.01	c0.44	
v/s Ratio Perm		0.01					
v/c Ratio	0.44	0.06	0.49	0.43	0.38	0.67	
Uniform Delay, d1	51.6	49.8	48.9	5.1	57.7	12.4	
Progression Factor	1.00	1.00	0.63	0.84	1.29	0.60	
Incremental Delay, d2	2.0	0.2	1.5	0.5	4.7	1.3	
Delay (s)	53.6	49.9	32.3	4.7	79.1	8.7	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.5			7.1		9.3	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.62				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			61.1%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

4: Mooney Boulevard & Seminole Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	33	119	2	1075	87	180	1209
Future Volume (vph)	33	119	2	1075	87	180	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1805	3574	1615	1805	3438
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1805	3574	1615	1805	3438
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	35	128	2	1156	94	194	1300
RTOR Reduction (vph)	0	113	0	0	22	0	0
Lane Group Flow (vph)	35	15	2	1156	72	194	1300
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	5%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Effective Green, g (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Actuated g/C Ratio	0.12	0.12	0.01	0.62	0.62	0.14	0.75
Clearance Time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	212	189	15	2206	997	255	2581
v/s Ratio Prot	c0.02		c0.00	c0.32		c0.11	0.38
v/s Ratio Perm		0.01			0.04		
v/c Ratio	0.17	0.08	0.13	0.52	0.07	0.76	0.50
Uniform Delay, d1	47.7	47.2	59.1	13.0	9.2	49.5	6.0
Progression Factor	1.00	1.00	0.87	0.37	0.14	1.23	0.29
Incremental Delay, d2	0.4	0.2	2.8	0.6	0.1	10.2	0.6
Delay (s)	48.0	47.4	54.3	5.4	1.4	71.1	2.3
Level of Service	D	D	D	A	A	E	A
Approach Delay (s)	47.5			5.2			11.2
Approach LOS	D			A			B
Intersection Summary							
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.51				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			56.2%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis

6: Mooney Boulevard & Tulare Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Future Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	329	522	207	60	373	287	117	598	73	320	666	280
RTOR Reduction (vph)	0	0	155	0	128	0	0	8	0	0	0	123
Lane Group Flow (vph)	329	522	52	60	532	0	117	663	0	320	666	157
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Effective Green, g (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Actuated g/C Ratio	0.09	0.25	0.25	0.05	0.21		0.07	0.34		0.20	0.46	0.46
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	303	893	399	79	691		131	1169		358	858	729
v/s Ratio Prot	c0.10	0.15		0.03	c0.16		c0.07	0.19		c0.18	c0.36	
v/s Ratio Perm			0.03									0.10
v/c Ratio	1.09	0.58	0.13	0.76	0.77		0.89	0.57		0.89	0.78	0.21
Uniform Delay, d1	54.7	39.3	34.7	56.7	44.7		55.1	32.7		46.6	27.2	19.4
Progression Factor	1.00	1.00	1.00	0.93	0.85		1.00	1.00		0.61	0.47	0.47
Incremental Delay, d2	76.5	1.0	0.1	30.9	4.7		47.6	2.0		21.5	6.1	0.6
Delay (s)	131.2	40.3	34.8	83.7	42.9		102.6	34.7		49.8	18.8	9.8
Level of Service	F	D	C	F	D		F	C		D	B	A
Approach Delay (s)		67.5			46.3			44.8			24.7	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			44.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			83.0%			ICU Level of Service				E		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary

7: Morrison Street & Tulare Avenue

Cumulative Year 2035 No Project PM Peak

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Future Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	603	152	38	553	23	62	33	39	18	54	60
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	85	1246	1081	54	1148	48	80	48	56	135	69	77
Arrive On Green	0.05	0.67	0.67	0.03	0.65	0.65	0.04	0.06	0.06	0.07	0.08	0.08
Sat Flow, veh/h	1810	1856	1610	1810	1755	73	1810	793	938	1810	822	913
Grp Volume(v), veh/h	66	603	152	38	0	576	62	0	72	18	0	114
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1828	1810	0	1731	1810	0	1736
Q Serve(g_s), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Cycle Q Clear(g_c), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.54	1.00		0.53
Lane Grp Cap(c), veh/h	85	1246	1081	54	0	1195	80	0	104	135	0	147
V/C Ratio(X)	0.77	0.48	0.14	0.70	0.00	0.48	0.77	0.00	0.69	0.13	0.00	0.78
Avail Cap(c_a), veh/h	148	1246	1081	103	0	1195	145	0	475	135	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	9.6	2.6	57.7	0.0	10.5	56.7	0.0	55.3	51.9	0.0	53.8
Incr Delay (d2), s/veh	13.8	1.3	0.3	15.2	0.0	1.4	14.4	0.0	8.0	0.4	0.0	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.7	1.2	1.3	0.0	6.8	2.1	0.0	2.3	0.5	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	11.0	2.9	72.9	0.0	11.9	71.1	0.0	63.4	52.3	0.0	62.4
LnGrp LOS	E	B	A	E	A	B	E	A	E	D	A	E
Approach Vol, veh/h		821			614			134			132	
Approach Delay, s/veh		14.2			15.6			67.0			61.0	
Approach LOS		B			B			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	12.5	7.8	86.6	9.5	16.1	9.9	84.5				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.4	* 33	* 6.8	55.2	9.6	* 28	* 9.8	52.2				
Max Q Clear Time (g_c+I1), s	3.1	6.9	4.5	21.0	6.1	9.7	6.3	21.1				
Green Ext Time (p_c), s	0.0	0.3	0.0	4.2	0.0	0.4	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	302	245	102	215	334	438	266	282	113	221	209	91
Average Queue (ft)	138	82	42	98	197	226	162	164	40	131	121	33
95th Queue (ft)	244	169	78	208	328	379	248	263	89	196	202	60
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)				2	28	3						
Queuing Penalty (veh)				8	34	8						

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB
Directions Served	LT	LR
Maximum Queue (ft)	142	100
Average Queue (ft)	42	46
95th Queue (ft)	86	86
Link Distance (ft)	2046	2712
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	74	90	270	119	118	29	186	201
Average Queue (ft)	37	37	119	28	39	6	53	54
95th Queue (ft)	78	64	213	91	100	22	122	128
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	108	144	195	184	30	118	98	74
Average Queue (ft)	45	49	65	53	4	39	17	15
95th Queue (ft)	89	98	160	147	19	87	60	51
Link Distance (ft)	1110		2569	2569			1226	1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250			170	450		
Storage Blk Time (%)				0				
Queuing Penalty (veh)				0				

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B18	B18	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	T	L	T
Maximum Queue (ft)	162	160	415	219	205	194	329	329	33	42	140	479
Average Queue (ft)	85	93	203	18	39	104	191	233	1	1	121	208
95th Queue (ft)	142	151	319	111	118	205	291	326	11	14	165	351
Link Distance (ft)			2539	2539			266	266	631	631		1240
Upstream Blk Time (%)							1	5				
Queuing Penalty (veh)							3	19				
Storage Bay Dist (ft)	415	415			175	85					80	
Storage Blk Time (%)			0			12	38				41	35
Queuing Penalty (veh)			0			30	28				111	57

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	NB	SB	SB	SB
Directions Served	TR	L	T	R
Maximum Queue (ft)	419	371	202	131
Average Queue (ft)	175	181	126	49
95th Queue (ft)	318	294	214	97
Link Distance (ft)	1240		2569	2569
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		470		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	408	410	50	95	229	136	168	51	90
Average Queue (ft)	43	148	20	36	112	65	63	17	37
95th Queue (ft)	160	293	45	78	199	131	132	41	69
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1				1	2		
Queuing Penalty (veh)		0				2	2		

Zone Summary

Zone wide Queuing Penalty: 302

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	566	591	239	214	521	353	385	348	130	397	432	370
Average Queue (ft)	358	239	96	68	243	220	188	195	58	257	242	70
95th Queue (ft)	605	560	195	150	407	320	322	328	109	360	349	204
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)	1	0										
Queuing Penalty (veh)	0	0										
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)	9	5			27	1					9	
Queuing Penalty (veh)	20	13			19	4					19	

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB
Directions Served	TR	LT	LR
Maximum Queue (ft)	22	136	74
Average Queue (ft)	1	45	32
95th Queue (ft)	7	85	58
Link Distance (ft)	2798	2046	2712
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	115	74	136	161	168	53	355	300
Average Queue (ft)	58	32	74	37	34	13	109	82
95th Queue (ft)	107	57	136	106	99	36	256	199
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)							1	
Queuing Penalty (veh)							0	

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	U	T	T	R	L	T	T
Maximum Queue (ft)	89	101	52	353	368	74	264	287	260
Average Queue (ft)	25	39	4	111	114	22	113	77	42
95th Queue (ft)	64	76	22	267	275	55	192	215	149
Link Distance (ft)	1110			2569	2569			1226	1226
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		250	320			170	450		
Storage Blk Time (%)				1	6				
Queuing Penalty (veh)				0	5				

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	L	T	TR
Maximum Queue (ft)	215	485	707	617	205	194	290	329	87	140	385	369
Average Queue (ft)	122	286	449	255	83	63	157	229	3	113	201	163
95th Queue (ft)	205	576	681	608	190	133	227	331	29	178	322	279
Link Distance (ft)			2539	2539			266	266	631		1240	1240
Upstream Blk Time (%)							0	6				
Queuing Penalty (veh)							1	17				
Storage Bay Dist (ft)	415	415			175	85				80		
Storage Blk Time (%)			23	0	0	2	25			33	41	
Queuing Penalty (veh)			70	0	0	4	14			92	45	

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	300	562	74
Average Queue (ft)	215	387	40
95th Queue (ft)	312	572	66
Link Distance (ft)		2569	2569
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	470		
Storage Blk Time (%)		5	
Queuing Penalty (veh)		15	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	117	331	70	118	413	107	87	52	136
Average Queue (ft)	42	101	24	34	142	44	35	16	66
95th Queue (ft)	90	214	55	73	274	84	72	41	126
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1			1	0			
Queuing Penalty (veh)		0			0	0			

Zone Summary

Zone wide Queuing Penalty: 340

Appendix L: Cumulative Year 2035 plus Project (Buildout) Traffic Conditions



www.JLBtraffic.com
info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

1: Mooney Boulevard & Prosperity Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	183	203	192	147	265	84	268	625	54	64	476	119
Future Volume (vph)	183	203	192	147	265	84	268	625	54	64	476	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1583	1770	1796		1770	3497		1770	3433	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1583	1770	1796		1770	3497		1770	3433	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	199	221	209	160	288	91	291	679	59	70	517	129
RTOR Reduction (vph)	0	0	145	0	11	0	0	5	0	0	20	0
Lane Group Flow (vph)	199	221	64	160	368	0	291	733	0	70	626	0
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.4	29.5	29.5	8.6	24.3		14.0	31.0		6.4	23.4	
Effective Green, g (s)	13.4	29.5	29.5	8.6	24.3		14.0	31.0		6.4	23.4	
Actuated g/C Ratio	0.14	0.31	0.31	0.09	0.25		0.15	0.32		0.07	0.24	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	247	573	486	158	455		258	1130		118	837	
v/s Ratio Prot	c0.11	0.12		c0.09	c0.20		c0.16	0.21		0.04	c0.18	
v/s Ratio Perm			0.04									
v/c Ratio	0.81	0.39	0.13	1.01	0.81		1.13	0.65		0.59	0.75	
Uniform Delay, d1	40.0	26.1	24.0	43.7	33.6		41.0	27.8		43.5	33.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	17.2	0.4	0.1	75.0	10.2		94.9	1.3		7.8	3.7	
Delay (s)	57.2	26.5	24.1	118.6	43.8		135.8	29.1		51.3	37.2	
Level of Service	E	C	C	F	D		F	C		D	D	
Approach Delay (s)		35.4			66.0			59.3			38.6	
Approach LOS		D			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			50.3			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			95.9			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			78.3%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Cumulative Year 2035 plus Project (Buildout) AM Peak

11/01/2019

Intersection						
Int Delay, s/veh	12.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	273	29	357	51	85	55
Future Vol, veh/h	273	29	357	51	85	55
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	1	1	0	0	2	2
Mvmt Flow	297	32	388	55	92	60
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	329	0	1144	314
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	831	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1242	-	221	726
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	428	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1242	-	150	725
Mov Cap-2 Maneuver	-	-	-	-	150	-
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	428	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.1		52.6	
HCM LOS	F					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	218	-	-	1242	-	
HCM Lane V/C Ratio	0.698	-	-	0.312	-	
HCM Control Delay (s)	52.6	-	-	9.2	0	
HCM Lane LOS	F	-	-	A	A	
HCM 95th %tile Q(veh)	4.5	-	-	1.3	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 plus Project (Buildout) AM Peak

11/01/2019

Intersection							
Int Delay, s/veh	17						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	39	132	211	1086	4	708	92
Future Vol, veh/h	39	132	211	1086	4	708	92
Conflicting Peds, #/hr	0	2	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	42	143	229	1180	4	770	100

Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	1877	438	871	0	1180	-	0
Stage 1	829	-	-	-	-	-	-
Stage 2	1048	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	62	564	763	-	252	-	-
Stage 1	386	-	-	-	-	-	-
Stage 2	296	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	43	562	762	-	252	-	-
Mov Cap-2 Maneuver	43	-	-	-	-	-	-
Stage 1	265	-	-	-	-	-	-
Stage 2	296	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	210.4	1.9	0.1
HCM LOS	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR
Capacity (veh/h)	762	-	150	252	-	-
HCM Lane V/C Ratio	0.301	-	1.239	0.017	-	-
HCM Control Delay (s)	11.7	-	210.4	19.5	-	-
HCM Lane LOS	B	-	F	C	-	-
HCM 95th %tile Q(veh)	1.3	-	10.9	0.1	-	-

Intersection

Int Delay, s/veh 20

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	54	207	0	1029	36	50	816
Future Vol, veh/h	54	207	0	1029	36	50	816
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	3	3	1	1	3
Mvmt Flow	59	225	0	1118	39	54	887

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	1670	559	887
Stage 1	1118	-	-
Stage 2	552	-	-
Critical Hdwy	6.8	6.9	6.46
Critical Hdwy Stg 1	5.8	-	-
Critical Hdwy Stg 2	5.8	-	-
Follow-up Hdwy	3.5	3.3	2.53
Pot Cap-1 Maneuver	89	478	389
Stage 1	279	-	-
Stage 2	546	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	81	478	389
Mov Cap-2 Maneuver	81	-	-
Stage 1	254	-	-
Stage 2	546	-	-

Approach	WB	NB	SB
HCM Control Delay, s	165.3	0	0.7
HCM LOS	F		

Minor Lane/Major Mvmt	NBU	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	389	-	-	237	605
HCM Lane V/C Ratio	-	-	-	1.197	0.09
HCM Control Delay (s)	0	-	-	165.3	11.5
HCM Lane LOS	A	-	-	F	B
HCM 95th %tile Q(veh)	0	-	-	13.6	0.3

HCM 6th TWSC
5: Morrison Street & Seminole Avenue

Cumulative Year 2035 plus Project (Buildout) AM Peak

11/01/2019

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	20	3	135	223	2
Future Vol, veh/h	5	20	3	135	223	2
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, %	1	1	1	1	1	1
Mvmt Flow	5	22	3	147	242	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	396	243	244	0	-	0
Stage 1	243	-	-	-	-	-
Stage 2	153	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	611	798	1328	-	-	-
Stage 1	800	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	610	798	1328	-	-	-
Mov Cap-2 Maneuver	610	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1328	-	752	-	-	
HCM Lane V/C Ratio	0.002	-	0.036	-	-	
HCM Control Delay (s)	7.7	0	10	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

6: Mooney Boulevard & Tulare Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	241	430	94	84	537	201	173	574	95	209	369	249
Future Volume (vph)	241	430	94	84	537	201	173	574	95	209	369	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1736	3471	1532	1736	3330		1736	3391		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1736	3471	1532	1736	3330		1736	3391		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	262	467	102	91	584	218	188	624	103	227	401	271
RTOR Reduction (vph)	0	0	68	0	34	0	0	13	0	0	0	193
Lane Group Flow (vph)	262	467	34	91	768	0	188	714	0	227	401	78
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	12.1	32.4	32.4	7.0	27.3		9.0	26.7		10.3	27.6	27.6
Effective Green, g (s)	12.1	32.4	32.4	7.0	27.3		9.0	26.7		10.3	27.6	27.6
Actuated g/C Ratio	0.13	0.34	0.34	0.07	0.28		0.09	0.28		0.11	0.29	0.29
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	218	1170	516	126	945		162	942		186	524	446
v/s Ratio Prot	c0.15	0.13		0.05	c0.23		c0.11	0.21		c0.13	c0.22	
v/s Ratio Perm			0.02									0.05
v/c Ratio	1.20	0.40	0.07	0.72	0.81		1.16	0.76		1.22	0.77	0.17
Uniform Delay, d1	42.0	24.4	21.6	43.6	32.0		43.5	31.7		42.9	31.3	25.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	126.2	0.2	0.1	18.4	5.4		120.4	3.5		137.8	6.6	0.2
Delay (s)	168.2	24.6	21.7	62.0	37.4		164.0	35.3		180.7	37.9	25.9
Level of Service	F	C	C	E	D		F	D		F	D	C
Approach Delay (s)		69.5			39.9			61.7			70.3	
Approach LOS		E			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			60.2			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			96.1			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			82.0%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

Intersection												
Int Delay, s/veh	39.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	37	638	80	48	590	9	99	42	129	17	12	75
Future Vol, veh/h	37	638	80	48	590	9	99	42	129	17	12	75
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	300	-	0	300	-	-	120	-	-	-	-	-
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, %	1	7	1	1	7	1	1	1	1	0	0	0
Mvmt Flow	40	693	87	52	641	10	108	46	140	18	13	82
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	651	0	0	780	0	0	1571	1528	693	1660	1610	646
Stage 1	-	-	-	-	-	-	773	773	-	750	750	-
Stage 2	-	-	-	-	-	-	798	755	-	910	860	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.11	6.51	6.21	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.1	5.5	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.509	4.009	3.309	3.5	4	3.3
Pot Cap-1 Maneuver	940	-	-	842	-	-	~ 90	118	445	78	106	475
Stage 1	-	-	-	-	-	-	393	410	-	407	422	-
Stage 2	-	-	-	-	-	-	381	418	-	332	376	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	940	-	-	842	-	-	~ 62	106	445	33	95	475
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 62	106	-	33	95	-
Stage 1	-	-	-	-	-	-	376	392	-	389	396	-
Stage 2	-	-	-	-	-	-	286	392	-	192	360	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.7			216			111.5		
HCM LOS							F			F		
Minor Lane/Major Mvmt	NBLn1 NBLn2		EBL	EBT	EBR	WBL	WBT	WBR	SBLn1			
Capacity (veh/h)	62	249	940	-	-	842	-	-	130			
HCM Lane V/C Ratio	1.736	0.746	0.043	-	-	0.062	-	-	0.87			
HCM Control Delay (s)	\$ 498.3	52.5	9	-	-	9.6	-	-	111.5			
HCM Lane LOS	F	F	A	-	-	A	-	-	F			
HCM 95th %tile Q(veh)	9.8	5.3	0.1	-	-	0.2	-	-	5.5			
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s			+: Computation Not Defined				*: All major volume in platoon			

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

1: Mooney Boulevard & Prosperity Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	273	323	82	235	98	267	692	57	102	837	228
Future Volume (vph)	266	273	323	82	235	98	267	692	57	102	837	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1563	1770	1781		1770	3499		1770	3425	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1563	1770	1781		1770	3499		1770	3425	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	290	344	87	250	104	284	736	61	109	890	243
RTOR Reduction (vph)	0	0	246	0	13	0	0	6	0	0	19	0
Lane Group Flow (vph)	283	290	98	87	341	0	284	791	0	109	1114	0
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	14.8	34.1	34.1	8.4	27.3		14.8	37.3		19.8	42.3	
Effective Green, g (s)	14.8	34.1	34.1	8.4	27.3		14.8	37.3		19.8	42.3	
Actuated g/C Ratio	0.12	0.28	0.28	0.07	0.23		0.12	0.31		0.17	0.35	
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	218	529	444	123	405		218	1087		292	1207	
v/s Ratio Prot	c0.16	0.16		0.05	c0.19		c0.16	0.23		0.06	c0.33	
v/s Ratio Perm			0.06									
v/c Ratio	1.30	0.55	0.22	0.71	0.84		1.30	0.73		0.37	0.92	
Uniform Delay, d1	52.6	36.4	32.8	54.6	44.3		52.6	36.8		44.6	37.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.96	0.52		1.00	1.00	
Incremental Delay, d2	163.6	1.2	0.3	16.9	14.6		157.1	2.9		0.8	13.0	
Delay (s)	216.2	37.6	33.0	71.5	58.9		207.6	22.1		45.4	50.2	
Level of Service	F	D	C	E	E		F	C		D	D	
Approach Delay (s)		91.0			61.4			70.8			49.8	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			67.6			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.01									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			95.6%			ICU Level of Service				F		
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Cumulative Year 2035 plus Project (Buildout) PM Peak

11/01/2019

Intersection						
Int Delay, s/veh	7.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	367	114	300	84	60	41
Future Vol, veh/h	367	114	300	84	60	41
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	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	399	124	326	91	65	45
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	523	0	1204	461
Stage 1	-	-	-	-	461	-
Stage 2	-	-	-	-	743	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1038	-	201	596
Stage 1	-	-	-	-	631	-
Stage 2	-	-	-	-	467	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1038	-	134	596
Mov Cap-2 Maneuver	-	-	-	-	134	-
Stage 1	-	-	-	-	422	-
Stage 2	-	-	-	-	467	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.9		44.5	
HCM LOS	E					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	196	-	-	1038	-	
HCM Lane V/C Ratio	0.56	-	-	0.314	-	
HCM Control Delay (s)	44.5	-	-	10	0	
HCM Lane LOS	E	-	-	B	A	
HCM 95th %tile Q(veh)	3	-	-	1.4	-	

HCM 6th TWSC
3: Mooney Boulevard & Cross Avenue

Cumulative Year 2035 plus Project (Buildout) PM Peak

11/01/2019

Intersection							
Int Delay, s/veh	153.9						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	80	151	115	1066	17	1260	149
Future Vol, veh/h	80	151	115	1066	17	1260	149
Conflicting Peds, #/hr	0	0	1	0	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	500	-	315	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	87	164	125	1159	18	1370	162
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	2318	767	1533	0	1159	-	0
Stage 1	1488	-	-	-	-	-	-
Stage 2	830	-	-	-	-	-	-
Critical Hdwy	6.86	6.96	4.16	-	6.46	-	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	5.86	-	-	-	-	-	-
Follow-up Hdwy	3.53	3.33	2.23	-	2.53	-	-
Pot Cap-1 Maneuver	~ 31	343	425	-	260	-	-
Stage 1	172	-	-	-	-	-	-
Stage 2	386	-	-	-	-	-	-
Platoon blocked, %				-		-	-
Mov Cap-1 Maneuver	~ 20	343	425	-	260	-	-
Mov Cap-2 Maneuver	~ 20	-	-	-	-	-	-
Stage 1	113	-	-	-	-	-	-
Stage 2	386	-	-	-	-	-	-
Approach	EB		NB		SB		
HCM Control Delay, \$	1880.4		1.7		0.2		
HCM LOS	F						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBU	SBT	SBR	
Capacity (veh/h)	425	-	52	260	-	-	
HCM Lane V/C Ratio	0.294	-	4.829	0.071	-	-	
HCM Control Delay (s)	17	\$ 1880.4		19.9	-	-	
HCM Lane LOS	C	-	F	C	-	-	
HCM 95th %tile Q(veh)	1.2	-	28.2	0.2	-	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

Intersection							
Int Delay, s/veh	28.5						
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	33	140	2	1075	87	180	1230
Future Vol, veh/h	33	140	2	1075	87	180	1230
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	320	-	170	450	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	1	1	0	0	5
Mvmt Flow	35	151	2	1156	94	194	1323
Major/Minor	Minor1	Major1		Major2			
Conflicting Flow All	2210	578	1323	0	0	1250	0
Stage 1	1160	-	-	-	-	-	-
Stage 2	1050	-	-	-	-	-	-
Critical Hdwy	6.8	6.9	6.42	-	-	4.1	-
Critical Hdwy Stg 1	5.8	-	-	-	-	-	-
Critical Hdwy Stg 2	5.8	-	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.51	-	-	2.2	-
Pot Cap-1 Maneuver	38	464	207	-	-	564	-
Stage 1	265	-	-	-	-	-	-
Stage 2	302	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 25	464	207	-	-	564	-
Mov Cap-2 Maneuver	~ 25	-	-	-	-	-	-
Stage 1	172	-	-	-	-	-	-
Stage 2	302	-	-	-	-	-	-
Approach	WB	NB		SB			
HCM Control Delay, s	\$ 437	0		1.9			
HCM LOS	F						
Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	207	-	-	107	564	-	
HCM Lane V/C Ratio	0.01	-	-	1.739	0.343	-	
HCM Control Delay (s)	22.6	-	-	\$ 437	14.7	-	
HCM Lane LOS	C	-	-	F	B	-	
HCM 95th %tile Q(veh)	0	-	-	14.6	1.5	-	
Notes							
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon	

HCM 6th TWSC
5: Morrison Street & Seminole Avenue

Cumulative Year 2035 plus Project (Buildout) PM Peak

11/01/2019

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	11	6	110	310	10
Future Vol, veh/h	3	11	6	110	310	10
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, %	1	1	1	1	1	1
Mvmt Flow	3	12	7	120	337	11

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	477	343	348	0	-	0
Stage 1	343	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	549	702	1216	-	-	-
Stage 1	721	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	546	702	1216	-	-	-
Mov Cap-2 Maneuver	546	-	-	-	-	-
Stage 1	717	-	-	-	-	-
Stage 2	895	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1216	-	662	-	-
HCM Lane V/C Ratio	0.005	-	0.023	-	-
HCM Control Delay (s)	8	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

6: Mooney Boulevard & Tulare Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	309	560	197	61	397	270	111	562	81	301	646	263
Future Volume (vph)	309	560	197	61	397	270	111	562	81	301	646	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	3539	1583	1770	3324		1770	3472		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	3539	1583	1770	3324		1770	3472		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	329	596	210	65	422	287	118	598	86	320	687	280
RTOR Reduction (vph)	0	0	151	0	108	0	0	10	0	0	0	124
Lane Group Flow (vph)	329	596	59	65	601	0	118	674	0	320	687	156
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	13.7	33.5	33.5	7.6	27.4		8.2	34.7		24.5	50.6	50.6
Effective Green, g (s)	13.7	33.5	33.5	7.6	27.4		8.2	34.7		24.5	50.6	50.6
Actuated g/C Ratio	0.11	0.28	0.28	0.06	0.23		0.07	0.29		0.20	0.42	0.42
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	202	987	441	112	758		120	1003		361	785	667
v/s Ratio Prot	c0.19	0.17		0.04	c0.18		c0.07	0.19		c0.18	c0.37	
v/s Ratio Perm			0.04									0.10
v/c Ratio	1.63	0.60	0.13	0.58	0.79		0.98	0.67		0.89	0.88	0.23
Uniform Delay, d1	53.1	37.5	32.4	54.6	43.6		55.8	37.6		46.4	31.8	22.3
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.71	0.57	0.08
Incremental Delay, d2	304.4	1.1	0.1	7.4	5.7		76.5	3.6		18.8	11.0	0.7
Delay (s)	357.5	38.5	32.5	62.1	49.3		132.3	41.2		51.7	29.2	2.4
Level of Service	F	D	C	E	D		F	D		D	C	A
Approach Delay (s)		129.9			50.4			54.6			29.0	
Approach LOS		F			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			66.9			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			93.6%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
7: Morrison Street & Tulare Avenue

Cumulative Year 2035 plus Project (Buildout) PM Peak

11/01/2019

Intersection												
Int Delay, s/veh	33.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	66	623	141	35	548	21	58	37	36	17	51	56
Future Vol, veh/h	66	623	141	35	548	21	58	37	36	17	51	56
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	300	-	0	300	-	-	120	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	3	0	0	4	0	0	0	0	0	0	0
Mvmt Flow	71	670	152	38	589	23	62	40	39	18	55	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	612	0	0	822	0	0	1546	1500	670	1605	1641	601
Stage 1	-	-	-	-	-	-	812	812	-	677	677	-
Stage 2	-	-	-	-	-	-	734	688	-	928	964	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	977	-	-	816	-	-	94	123	460	86	101	504
Stage 1	-	-	-	-	-	-	376	395	-	446	455	-
Stage 2	-	-	-	-	-	-	415	450	-	324	336	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	977	-	-	816	-	-	~ 39	109	460	52	89	504
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 39	109	-	52	89	-
Stage 1	-	-	-	-	-	-	349	366	-	413	434	-
Stage 2	-	-	-	-	-	-	304	429	-	245	311	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.6	254.6	174.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	39	175	977	-	-	816	-	-	123
HCM Lane V/C Ratio	1.599	0.449	0.073	-	-	0.046	-	-	1.084
HCM Control Delay (s)	\$ 523	41.3	9	-	-	9.6	-	-	174.1
HCM Lane LOS	F	E	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	6.5	2.1	0.2	-	-	0.1	-	-	7.7

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

1: Mooney Boulevard & Prosperity Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Future Volume (vph)	168	171	192	121	225	84	268	625	44	64	476	119
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1583	1770	1787		1770	3504		1770	3539	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	186	209	132	245	91	291	679	48	70	517	129
RTOR Reduction (vph)	0	0	155	0	12	0	0	4	0	0	0	89
Lane Group Flow (vph)	183	186	54	132	324	0	291	723	0	70	517	40
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	14.3	30.9	30.9	10.5	26.7		21.3	46.5		11.7	36.9	36.9
Effective Green, g (s)	14.3	30.9	30.9	10.5	26.7		21.3	46.5		11.7	36.9	36.9
Actuated g/C Ratio	0.12	0.26	0.26	0.09	0.22		0.18	0.39		0.10	0.31	0.31
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	210	479	407	154	397		314	1357		172	1088	486
v/s Ratio Prot	c0.10	0.10		0.07	c0.18		c0.16	c0.21		0.04	c0.15	
v/s Ratio Perm			0.03									0.03
v/c Ratio	0.87	0.39	0.13	0.86	0.82		0.93	0.53		0.41	0.48	0.08
Uniform Delay, d1	51.9	36.8	34.2	54.0	44.3		48.6	28.4		50.9	33.7	29.5
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.74	0.63		1.00	1.00	1.00
Incremental Delay, d2	30.2	0.5	0.1	34.6	12.1		30.7	1.4		1.6	1.5	0.3
Delay (s)	82.2	37.3	34.4	88.6	56.4		66.5	19.3		52.5	35.2	29.8
Level of Service	F	D	C	F	E		E	B		D	D	C
Approach Delay (s)		50.4			65.5			32.8			35.9	
Approach LOS		D			E			C			D	
Intersection Summary												
HCM 2000 Control Delay			42.8			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			71.6%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Cumulative Year 2035 plus Project (Buildout) AM Peak

11/01/2019

Intersection						
Int Delay, s/veh	7.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	27	300	51	79	50
Future Vol, veh/h	253	27	300	51	79	50
Conflicting Peds, #/hr	0	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	0	0	2	2
Mvmt Flow	275	29	326	55	86	54
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	304	0	997	291
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	707	-
Critical Hdwy	-	-	4.1	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.2	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1268	-	271	748
Stage 1	-	-	-	-	759	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1268	-	199	747
Mov Cap-2 Maneuver	-	-	-	-	199	-
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	489	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.5		26.1	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	199	747	-	-	1268	-
HCM Lane V/C Ratio	0.432	0.073	-	-	0.257	-
HCM Control Delay (s)	36.2	10.2	-	-	8.8	0
HCM Lane LOS	E	B	-	-	A	A
HCM 95th %tile Q(veh)	2	0.2	-	-	1	-

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

3: Mooney Boulevard & Cross Avenue

11/01/2019

							
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	39	110	180	1053	3	708	92
Future Volume (vph)	39	110	180	1053	3	708	92
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1543	1752	3505	1752	3436	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1543	1752	3505	1752	3436	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	120	196	1145	3	770	100
RTOR Reduction (vph)	0	110	0	0	0	6	0
Lane Group Flow (vph)	42	10	196	1145	3	864	0
Confl. Peds. (#/hr)		2					1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	9.7	9.7	22.1	94.1	1.3	73.3	
Effective Green, g (s)	9.7	9.7	22.1	94.1	1.3	73.3	
Actuated g/C Ratio	0.08	0.08	0.18	0.78	0.01	0.61	
Clearance Time (s)	4.3	4.3	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	141	124	322	2748	18	2098	
v/s Ratio Prot	c0.02		c0.11	c0.33	0.00	c0.25	
v/s Ratio Perm		0.01					
v/c Ratio	0.30	0.08	0.61	0.42	0.17	0.41	
Uniform Delay, d1	51.9	51.0	45.0	4.2	58.8	12.1	
Progression Factor	1.00	1.00	0.64	0.26	1.30	0.34	
Incremental Delay, d2	1.2	0.3	3.1	0.4	3.9	0.5	
Delay (s)	53.1	51.3	31.8	1.5	80.2	4.7	
Level of Service	D	D	C	A	F	A	
Approach Delay (s)	51.8			6.0		4.9	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			8.7		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.45				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.9
Intersection Capacity Utilization			53.9%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

4: Mooney Boulevard & Seminole Avenue

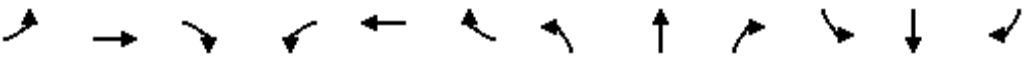
11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	54	170	0	975	36	50	816
Future Volume (vph)	54	170	0	975	36	50	816
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00		0.95	1.00	1.00	0.95
Frt	1.00	0.85		1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615		3505	1599	1787	3505
Flt Permitted	0.95	1.00		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615		3505	1599	1787	3505
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	185	0	1060	39	54	887
RTOR Reduction (vph)	0	162	0	0	9	0	0
Lane Group Flow (vph)	59	23	0	1060	30	54	887
Heavy Vehicles (%)	0%	0%	0%	3%	1%	1%	3%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	15.2	15.2		82.4	82.4	7.6	94.2
Effective Green, g (s)	15.2	15.2		82.4	82.4	7.6	94.2
Actuated g/C Ratio	0.13	0.13		0.69	0.69	0.06	0.79
Clearance Time (s)	4.2	4.2		6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	204		2406	1097	113	2751
v/s Ratio Prot	c0.03			c0.30		c0.03	0.25
v/s Ratio Perm		0.01			0.02		
v/c Ratio	0.26	0.11		0.44	0.03	0.48	0.32
Uniform Delay, d1	47.3	46.4		8.4	6.0	54.3	3.7
Progression Factor	1.00	1.00		0.44	0.32	1.20	0.27
Incremental Delay, d2	0.6	0.3		0.4	0.0	3.0	0.3
Delay (s)	47.9	46.7		4.1	2.0	68.3	1.3
Level of Service	D	D		A	A	E	A
Approach Delay (s)	47.0			4.0			5.1
Approach LOS	D			A			A
Intersection Summary							
HCM 2000 Control Delay			9.1		HCM 2000 Level of Service		A
HCM 2000 Volume to Capacity ratio			0.42				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			47.6%		ICU Level of Service		A
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) AM Peak

6: Mooney Boulevard & Tulare Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↗	↗	↕↕		↗	↕↕		↗	↕	↗
Traffic Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Future Volume (vph)	232	361	94	74	483	200	163	547	80	205	369	249
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.96		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3367	3471	1531	1736	3319		1736	3399		1736	1827	1553
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	252	392	102	80	525	217	177	595	87	223	401	271
RTOR Reduction (vph)	0	0	73	0	39	0	0	9	0	0	0	173
Lane Group Flow (vph)	252	392	29	80	703	0	177	673	0	223	401	98
Confl. Peds. (#/hr)			2						1			
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.9	34.2	34.2	7.0	30.3		15.1	41.3		17.8	43.6	43.6
Effective Green, g (s)	10.9	34.2	34.2	7.0	30.3		15.1	41.3		17.8	43.6	43.6
Actuated g/C Ratio	0.09	0.29	0.29	0.06	0.25		0.13	0.34		0.15	0.36	0.36
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	305	989	436	101	838		218	1169		257	663	564
v/s Ratio Prot	c0.07	0.11		0.05	c0.21		c0.10	0.20		c0.13	c0.22	
v/s Ratio Perm			0.02									0.06
v/c Ratio	0.83	0.40	0.07	0.79	0.84		0.81	0.58		0.87	0.60	0.17
Uniform Delay, d1	53.6	34.6	31.3	55.8	42.5		51.1	32.2		49.9	31.2	26.0
Progression Factor	1.00	1.00	1.00	0.90	0.95		1.00	1.00		0.73	0.62	0.26
Incremental Delay, d2	16.5	0.3	0.1	30.8	6.8		20.1	2.1		24.4	3.9	0.7
Delay (s)	70.1	34.8	31.3	80.8	47.0		71.1	34.2		60.8	23.3	7.4
Level of Service	E	C	C	F	D		E	C		E	C	A
Approach Delay (s)		46.3			50.3			41.8			27.9	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			41.2			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			86.6%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Cumulative Year 2035 plus Project (Buildout) AM Peak

7: Morrison Street & Tulare Avenue

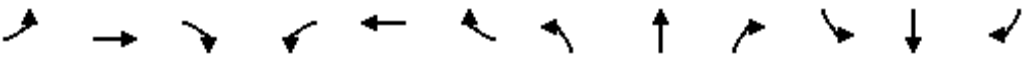
11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Future Volume (veh/h)	33	562	75	42	519	9	99	35	119	17	12	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1796	1885	1885	1796	1796	1885	1885	1885	1900	1900	1900
Adj Flow Rate, veh/h	36	611	82	46	564	10	108	38	129	18	13	82
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	7	1	1	7	7	1	1	1	0	0	0
Cap, veh/h	52	660	587	534	1144	20	133	50	168	34	17	108
Arrive On Green	0.03	0.37	0.37	0.30	0.65	0.65	0.07	0.13	0.13	0.02	0.08	0.08
Sat Flow, veh/h	1795	1796	1598	1795	1759	31	1795	377	1278	1810	225	1419
Grp Volume(v), veh/h	36	611	82	46	0	574	108	0	167	18	0	95
Grp Sat Flow(s),veh/h/ln	1795	1796	1598	1795	0	1791	1795	0	1655	1810	0	1644
Q Serve(g_s), s	2.4	39.1	3.1	2.2	0.0	19.8	7.1	0.0	11.7	1.2	0.0	6.8
Cycle Q Clear(g_c), s	2.4	39.1	3.1	2.2	0.0	19.8	7.1	0.0	11.7	1.2	0.0	6.8
Prop In Lane	1.00		1.00	1.00		0.02	1.00		0.77	1.00		0.86
Lane Grp Cap(c), veh/h	52	660	587	534	0	1165	133	0	218	34	0	125
V/C Ratio(X)	0.69	0.93	0.14	0.09	0.00	0.49	0.81	0.00	0.77	0.53	0.00	0.76
Avail Cap(c_a), veh/h	76	793	706	534	0	1165	177	0	484	81	0	384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	57.7	36.4	14.2	30.4	0.0	10.8	54.7	0.0	50.3	58.3	0.0	54.3
Incr Delay (d2), s/veh	14.9	21.0	0.5	0.1	0.0	1.5	18.5	0.0	5.5	12.2	0.0	9.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	19.7	1.5	0.9	0.0	6.9	3.8	0.0	5.0	0.6	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.6	57.4	14.7	30.5	0.0	12.3	73.2	0.0	55.9	70.5	0.0	63.3
LnGrp LOS	E	E	B	C	A	B	E	A	E	E	A	E
Approach Vol, veh/h	729				620				275			
Approach Delay, s/veh	53.3				13.6				62.7			
Approach LOS	D				B				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	21.8	41.7	50.1	13.1	15.2	7.7	84.0				
Change Period (Y+Rc), s	* 4.2	* 6	6.0	* 6	* 4.2	6.0	* 4.2	6.0				
Max Green Setting (Gmax), s	* 5.4	* 35	6.8	* 53	* 12	28.0	* 5.1	54.7				
Max Q Clear Time (g_c+I1), s	3.2	13.7	4.2	41.1	9.1	8.8	4.4	21.8				
Green Ext Time (p_c), s	0.0	0.8	0.0	2.9	0.1	0.4	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			41.4									
HCM 6th LOS			D									
Notes												

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

1: Mooney Boulevard & Prosperity Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Future Volume (vph)	266	231	323	71	200	98	267	692	47	102	837	222
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1863	1563	1770	1771		1770	3505		1770	3539	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	283	246	344	76	213	104	284	736	50	109	890	236
RTOR Reduction (vph)	0	0	240	0	16	0	0	4	0	0	0	154
Lane Group Flow (vph)	283	246	104	76	301	0	284	782	0	109	890	82
Confl. Peds. (#/hr)			1									
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Effective Green, g (s)	18.3	36.4	36.4	8.5	26.2		18.3	36.8		17.9	36.4	36.4
Actuated g/C Ratio	0.15	0.30	0.30	0.07	0.22		0.15	0.31		0.15	0.30	0.30
Clearance Time (s)	4.2	5.3	5.3	4.5	6.0		4.2	6.4		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	269	565	474	125	386		269	1074		264	1073	480
v/s Ratio Prot	c0.16	0.13		0.04	c0.17		c0.16	0.22		0.06	c0.25	
v/s Ratio Perm			0.07									0.05
v/c Ratio	1.05	0.44	0.22	0.61	0.78		1.06	0.73		0.41	0.83	0.17
Uniform Delay, d1	50.9	33.6	31.2	54.1	44.2		50.9	37.1		46.3	38.9	30.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		0.85	0.75		1.00	1.00	1.00
Incremental Delay, d2	69.2	0.5	0.2	8.1	9.8		68.3	4.0		1.1	7.4	0.8
Delay (s)	120.0	34.1	31.4	62.2	54.0		111.4	31.9		47.3	46.3	31.5
Level of Service	F	C	C	E	D		F	C		D	D	C
Approach Delay (s)		60.9			55.6			53.0			43.6	
Approach LOS		E			E			D			D	
Intersection Summary												
HCM 2000 Control Delay			52.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)				20.8		
Intersection Capacity Utilization			86.5%			ICU Level of Service				E		
Analysis Period (min)			15									

c Critical Lane Group

HCM 6th TWSC
2: Morrison Street & Prosperity Avenue

Cumulative Year 2035 plus Project (Buildout) PM Peak

11/01/2019

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	253	93	263	84	50	31
Future Vol, veh/h	253	93	263	84	50	31
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	250
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	3	3	3	4	4
Mvmt Flow	275	101	286	91	54	34
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	376	0	989	326
Stage 1	-	-	-	-	326	-
Stage 2	-	-	-	-	663	-
Critical Hdwy	-	-	4.13	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	2.227	-	3.536	3.336
Pot Cap-1 Maneuver	-	-	1177	-	271	711
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	509	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1177	-	202	711
Mov Cap-2 Maneuver	-	-	-	-	202	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	509	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		6.8		22	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	202	711	-	-	1177	-
HCM Lane V/C Ratio	0.269	0.047	-	-	0.243	-
HCM Control Delay (s)	29.3	10.3	-	-	9	0
HCM Lane LOS	D	B	-	-	A	A
HCM 95th %tile Q(veh)	1	0.1	-	-	1	-

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

3: Mooney Boulevard & Cross Avenue

11/01/2019



Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	65	85	99	1066	14	1260	135
Future Volume (vph)	65	85	99	1066	14	1260	135
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1752	1568	1752	3505	1752	3447	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1752	1568	1752	3505	1752	3447	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	92	108	1159	15	1370	147
RTOR Reduction (vph)	0	84	0	0	0	5	0
Lane Group Flow (vph)	71	8	108	1159	15	1512	0
Confl. Peds. (#/hr)							1
Turn Type	Prot	Perm	Prot	NA	Prot	NA	
Protected Phases	4		5	2	1	6	
Permitted Phases		4					
Actuated Green, G (s)	11.0	11.0	15.1	91.4	2.8	79.1	
Effective Green, g (s)	11.0	11.0	15.1	91.4	2.8	79.1	
Actuated g/C Ratio	0.09	0.09	0.13	0.76	0.02	0.66	
Clearance Time (s)	4.2	4.2	4.2	6.4	4.2	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	160	143	220	2669	40	2272	
v/s Ratio Prot	c0.04		c0.06	0.33	0.01	c0.44	
v/s Ratio Perm		0.01					
v/c Ratio	0.44	0.06	0.49	0.43	0.38	0.67	
Uniform Delay, d1	51.6	49.8	48.9	5.1	57.7	12.4	
Progression Factor	1.00	1.00	0.63	0.84	1.29	0.60	
Incremental Delay, d2	2.0	0.2	1.5	0.5	4.7	1.3	
Delay (s)	53.6	49.9	32.3	4.7	79.1	8.7	
Level of Service	D	D	C	A	E	A	
Approach Delay (s)	51.5			7.1		9.3	
Approach LOS	D			A		A	
Intersection Summary							
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.62				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			61.1%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

4: Mooney Boulevard & Seminole Avenue

11/01/2019

							
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Volume (vph)	33	119	2	1075	87	180	1209
Future Volume (vph)	33	119	2	1075	87	180	1209
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Frt	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1805	3574	1615	1805	3438
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1805	3574	1615	1805	3438
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	35	128	2	1156	94	194	1300
RTOR Reduction (vph)	0	113	0	0	22	0	0
Lane Group Flow (vph)	35	15	2	1156	72	194	1300
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	5%
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Effective Green, g (s)	14.1	14.1	1.0	74.1	74.1	17.0	90.1
Actuated g/C Ratio	0.12	0.12	0.01	0.62	0.62	0.14	0.75
Clearance Time (s)	4.2	4.2	4.2	6.4	6.4	4.2	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	212	189	15	2206	997	255	2581
v/s Ratio Prot	c0.02		c0.00	c0.32		c0.11	0.38
v/s Ratio Perm		0.01			0.04		
v/c Ratio	0.17	0.08	0.13	0.52	0.07	0.76	0.50
Uniform Delay, d1	47.7	47.2	59.1	13.0	9.2	49.5	6.0
Progression Factor	1.00	1.00	0.87	0.37	0.14	1.23	0.29
Incremental Delay, d2	0.4	0.2	2.8	0.6	0.1	10.2	0.6
Delay (s)	48.0	47.4	54.3	5.4	1.4	71.1	2.3
Level of Service	D	D	D	A	A	E	A
Approach Delay (s)	47.5			5.2			11.2
Approach LOS	D			A			B
Intersection Summary							
HCM 2000 Control Delay			10.7		HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.51				
Actuated Cycle Length (s)			120.0		Sum of lost time (s)		14.8
Intersection Capacity Utilization			56.2%		ICU Level of Service		B
Analysis Period (min)			15				
c Critical Lane Group							

HCM Signalized Intersection Capacity Analysis - Alternative Year 2035 plus Project (Buildout) PM Peak

6: Mooney Boulevard & Tulare Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↕↕	↗	↗	↕↕		↗	↕↕		↗	↕	↗
Traffic Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Future Volume (vph)	309	491	195	56	351	270	110	562	69	301	626	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Lane Util. Factor	0.97	0.95	1.00	1.00	0.95		1.00	0.95		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93		1.00	0.98		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	3433	3539	1583	1770	3308		1770	3481		1770	1863	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	329	522	207	60	373	287	117	598	73	320	666	280
RTOR Reduction (vph)	0	0	155	0	128	0	0	8	0	0	0	123
Lane Group Flow (vph)	329	522	52	60	532	0	117	663	0	320	666	157
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									6
Actuated Green, G (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Effective Green, g (s)	10.6	30.3	30.3	5.4	25.1		8.9	40.3		24.3	55.3	55.3
Actuated g/C Ratio	0.09	0.25	0.25	0.05	0.21		0.07	0.34		0.20	0.46	0.46
Clearance Time (s)	4.2	5.3	5.3	4.2	5.3		4.2	6.0		4.2	6.4	6.4
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	303	893	399	79	691		131	1169		358	858	729
v/s Ratio Prot	c0.10	0.15		0.03	c0.16		c0.07	0.19		c0.18	c0.36	
v/s Ratio Perm			0.03									0.10
v/c Ratio	1.09	0.58	0.13	0.76	0.77		0.89	0.57		0.89	0.78	0.21
Uniform Delay, d1	54.7	39.3	34.7	56.7	44.7		55.1	32.7		46.6	27.2	19.4
Progression Factor	1.00	1.00	1.00	0.93	0.85		1.00	1.00		0.61	0.47	0.47
Incremental Delay, d2	76.5	1.0	0.1	30.9	4.7		47.6	2.0		21.5	6.1	0.6
Delay (s)	131.2	40.3	34.8	83.7	42.9		102.6	34.7		49.8	18.8	9.8
Level of Service	F	D	C	F	D		F	C		D	B	A
Approach Delay (s)		67.5			46.3			44.8			24.7	
Approach LOS		E			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			44.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			120.0			Sum of lost time (s)			20.1			
Intersection Capacity Utilization			83.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary Cumulative Year 2035 plus Project (Buildout) PM Peak

7: Morrison Street & Tulare Avenue

11/01/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Future Volume (veh/h)	61	561	141	35	514	21	58	31	36	17	50	56
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1856	1900	1900	1841	1841	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	66	603	152	38	553	23	62	33	39	18	54	60
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	0	3	0	0	4	4	0	0	0	0	0	0
Cap, veh/h	85	1246	1081	54	1148	48	80	48	56	135	69	77
Arrive On Green	0.05	0.67	0.67	0.03	0.65	0.65	0.04	0.06	0.06	0.07	0.08	0.08
Sat Flow, veh/h	1810	1856	1610	1810	1755	73	1810	793	938	1810	822	913
Grp Volume(v), veh/h	66	603	152	38	0	576	62	0	72	18	0	114
Grp Sat Flow(s),veh/h/ln	1810	1856	1610	1810	0	1828	1810	0	1731	1810	0	1736
Q Serve(g_s), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Cycle Q Clear(g_c), s	4.3	19.0	2.5	2.5	0.0	19.1	4.1	0.0	4.9	1.1	0.0	7.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.54	1.00		0.53
Lane Grp Cap(c), veh/h	85	1246	1081	54	0	1195	80	0	104	135	0	147
V/C Ratio(X)	0.77	0.48	0.14	0.70	0.00	0.48	0.77	0.00	0.69	0.13	0.00	0.78
Avail Cap(c_a), veh/h	148	1246	1081	103	0	1195	145	0	475	135	0	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.5	9.6	2.6	57.7	0.0	10.5	56.7	0.0	55.3	51.9	0.0	53.8
Incr Delay (d2), s/veh	13.8	1.3	0.3	15.2	0.0	1.4	14.4	0.0	8.0	0.4	0.0	8.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.7	1.2	1.3	0.0	6.8	2.1	0.0	2.3	0.5	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.3	11.0	2.9	72.9	0.0	11.9	71.1	0.0	63.4	52.3	0.0	62.4
LnGrp LOS	E	B	A	E	A	B	E	A	E	D	A	E
Approach Vol, veh/h		821			614			134			132	
Approach Delay, s/veh		14.2			15.6			67.0			61.0	
Approach LOS		B			B			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.2	12.5	7.8	86.6	9.5	16.1	9.9	84.5				
Change Period (Y+Rc), s	4.2	* 5.3	* 4.2	6.0	4.2	* 6	* 4.2	6.0				
Max Green Setting (Gmax), s	5.4	* 33	* 6.8	55.2	9.6	* 28	* 9.8	52.2				
Max Q Clear Time (g_c+I1), s	3.1	6.9	4.5	21.0	6.1	9.7	6.3	21.1				
Green Ext Time (p_c), s	0.0	0.3	0.0	4.2	0.0	0.4	0.0	3.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	276	216	101	214	426	316	212	208	107	177	155	78
Average Queue (ft)	116	99	36	112	186	154	124	130	51	115	87	32
95th Queue (ft)	216	180	68	196	298	248	212	219	102	166	143	60
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)				10	30							
Queuing Penalty (veh)				32	36							

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	WB	NB	NB
Directions Served	LT	L	R
Maximum Queue (ft)	153	89	31
Average Queue (ft)	46	35	20
95th Queue (ft)	93	70	39
Link Distance (ft)	2034	2712	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			250
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (ft)	73	114	184	97	116	192	195
Average Queue (ft)	35	45	109	22	30	52	49
95th Queue (ft)	60	81	177	72	83	138	131
Link Distance (ft)	2623			1226	1226	1329	1329
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)		250	500				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	107	108	337	333	31	52	217	198
Average Queue (ft)	35	49	68	59	7	26	31	32
95th Queue (ft)	76	92	193	166	27	49	114	107
Link Distance (ft)	1110		2569	2569			1226	1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250			170	450		
Storage Blk Time (%)			0	1				
Queuing Penalty (veh)			0	0				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	32	25
Average Queue (ft)	16	1
95th Queue (ft)	41	8
Link Distance (ft)	1257	2683
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	L	T	TR
Maximum Queue (ft)	139	139	324	266	205	194	272	329	26	140	488	443
Average Queue (ft)	74	87	194	11	35	79	184	224	2	116	211	181
95th Queue (ft)	122	129	291	90	92	156	271	323	13	174	373	352
Link Distance (ft)			2539	2539			266	266	631		1240	1240
Upstream Blk Time (%)							1	5				
Queuing Penalty (veh)							2	18				
Storage Bay Dist (ft)	415	415			175	85				80		
Storage Blk Time (%)						5	36			43	26	
Queuing Penalty (veh)						12	26			118	42	

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	374	292	123
Average Queue (ft)	144	146	60
95th Queue (ft)	256	251	110
Link Distance (ft)		2569	2569
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	470		
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	52	324	71	117	354	179	226	51	74
Average Queue (ft)	30	119	11	42	100	73	71	13	40
95th Queue (ft)	58	270	36	97	214	139	158	37	68
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)		1			1	1	3		
Queuing Penalty (veh)		0			0	1	3		

Zone Summary

Zone wide Queuing Penalty: 292

Intersection: 1: Mooney Boulevard & Prosperity Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	TR	L	T	TR	L	T	T	R
Maximum Queue (ft)	353	172	231	214	348	450	748	656	151	308	332	98
Average Queue (ft)	192	113	96	82	206	279	241	199	72	225	212	53
95th Queue (ft)	319	170	177	167	286	481	542	387	124	291	279	85
Link Distance (ft)		567	567		2798		1329	1329		2616	2616	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	480			140		350			475			250
Storage Blk Time (%)				1	24	20	0				3	
Queuing Penalty (veh)				2	17	68	1				6	

Intersection: 2: Morrison Street & Prosperity Avenue

Movement	EB	WB	NB	NB
Directions Served	TR	LT	L	R
Maximum Queue (ft)	35	139	53	73
Average Queue (ft)	3	41	24	20
95th Queue (ft)	18	86	48	54
Link Distance (ft)	2798	2034	2712	
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)			250	
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: Mooney Boulevard & Cross Avenue

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	U	T	TR
Maximum Queue (ft)	138	76	138	258	236	53	548	468
Average Queue (ft)	51	31	66	43	45	16	114	84
95th Queue (ft)	106	58	128	141	130	44	303	241
Link Distance (ft)	2623			1226	1226		1329	1329
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	500			315		
Storage Blk Time (%)							2	
Queuing Penalty (veh)							0	

Intersection: 4: Mooney Boulevard & Seminole Avenue

Movement	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	T	T	R	L	T	T
Maximum Queue (ft)	110	86	287	298	51	250	223	225
Average Queue (ft)	32	34	88	85	10	105	61	44
95th Queue (ft)	81	68	210	213	35	195	170	147
Link Distance (ft)	1110		2569	2569			1226	1226
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250			170	450		
Storage Blk Time (%)				2				
Queuing Penalty (veh)				2				

Intersection: 5: Morrison Street & Seminole Avenue

Movement	EB	NB
Directions Served	LR	LT
Maximum Queue (ft)	32	25
Average Queue (ft)	11	1
95th Queue (ft)	36	8
Link Distance (ft)	1257	2683
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	EB	EB	EB	EB	EB	WB	WB	WB	B18	NB	NB	NB
Directions Served	L	L	T	T	R	L	T	TR	T	L	T	TR
Maximum Queue (ft)	186	484	576	422	205	194	288	341	113	140	449	403
Average Queue (ft)	112	143	334	132	70	64	152	204	7	121	226	182
95th Queue (ft)	165	299	482	392	172	127	239	323	44	172	341	301
Link Distance (ft)			2539	2539			266	266	631		1240	1240
Upstream Blk Time (%)							1	5				
Queuing Penalty (veh)							3	17				
Storage Bay Dist (ft)	415	415			175	85				80		
Storage Blk Time (%)			4			5	30			48	39	
Queuing Penalty (veh)			13			8	17			136	43	

Intersection: 6: Mooney Boulevard & Tulare Avenue

Movement	SB	SB	SB
Directions Served	L	T	R
Maximum Queue (ft)	584	590	120
Average Queue (ft)	286	337	51
95th Queue (ft)	473	535	89
Link Distance (ft)		2569	2569
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	470		
Storage Blk Time (%)	1	3	
Queuing Penalty (veh)	8	9	

Intersection: 7: Morrison Street & Tulare Avenue

Movement	EB	EB	EB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	TR	L	TR	L	TR
Maximum Queue (ft)	161	204	28	96	238	67	124	52	138
Average Queue (ft)	39	96	14	33	116	36	34	13	69
95th Queue (ft)	91	192	33	73	211	67	89	37	132
Link Distance (ft)		1812	1812		2076		1421		2683
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	300			300		120		250	
Storage Blk Time (%)							0		
Queuing Penalty (veh)							0		

Zone Summary

Zone wide Queuing Penalty: 349

Appendix M: Signal Warrants



www.JLBtraffic.com
info@JLBtraffic.com

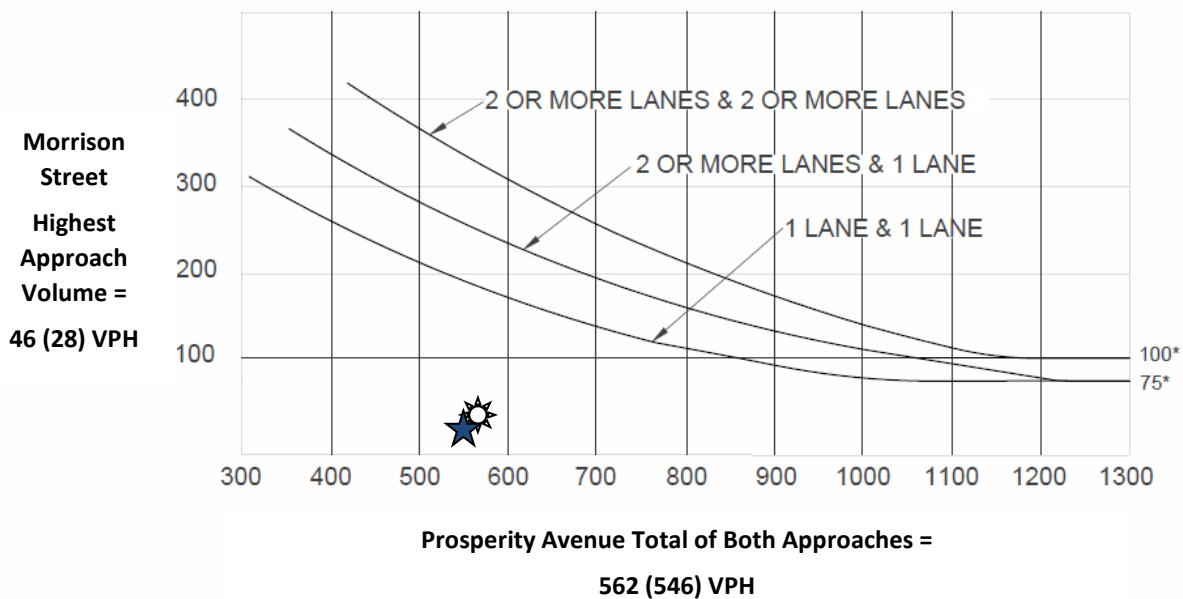
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

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Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions
2. Morrison Street / Prosperity Avenue
AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
Part 4: Highway Traffic Signals
November 7, 2014



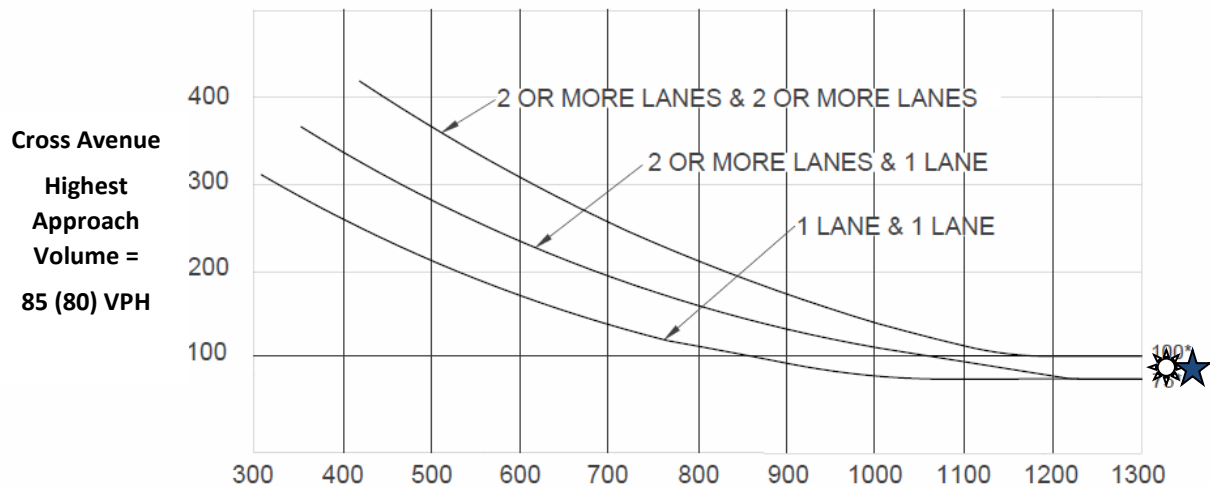
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info@JLBtraffic.com

516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
(559) 570-8991

Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions
3. Mooney Boulevard / Cross Avenue
AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =
1637 (1994) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
Chapter 4C: Traffic Control Signal Needs Studies
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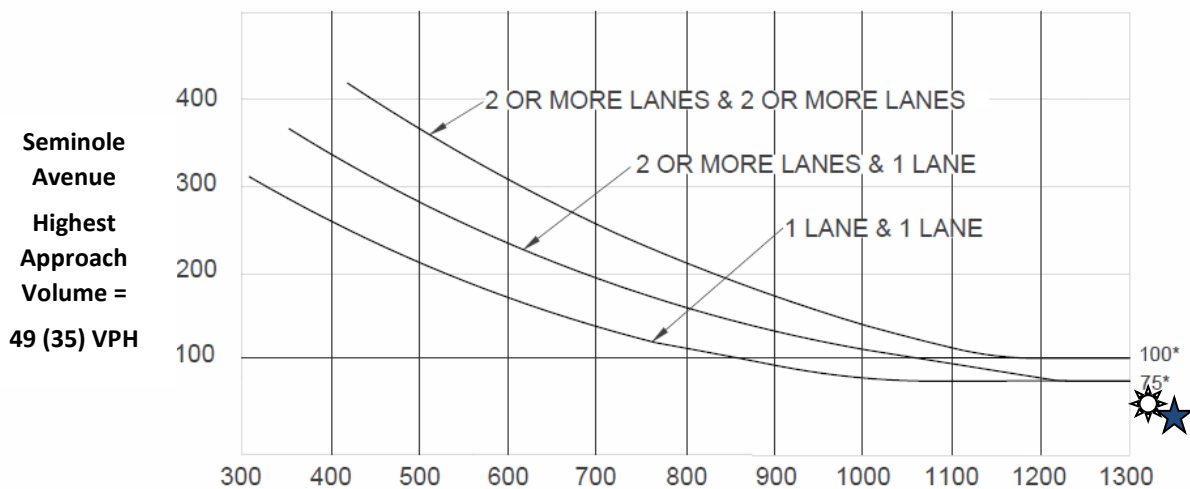
Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1527 (1952) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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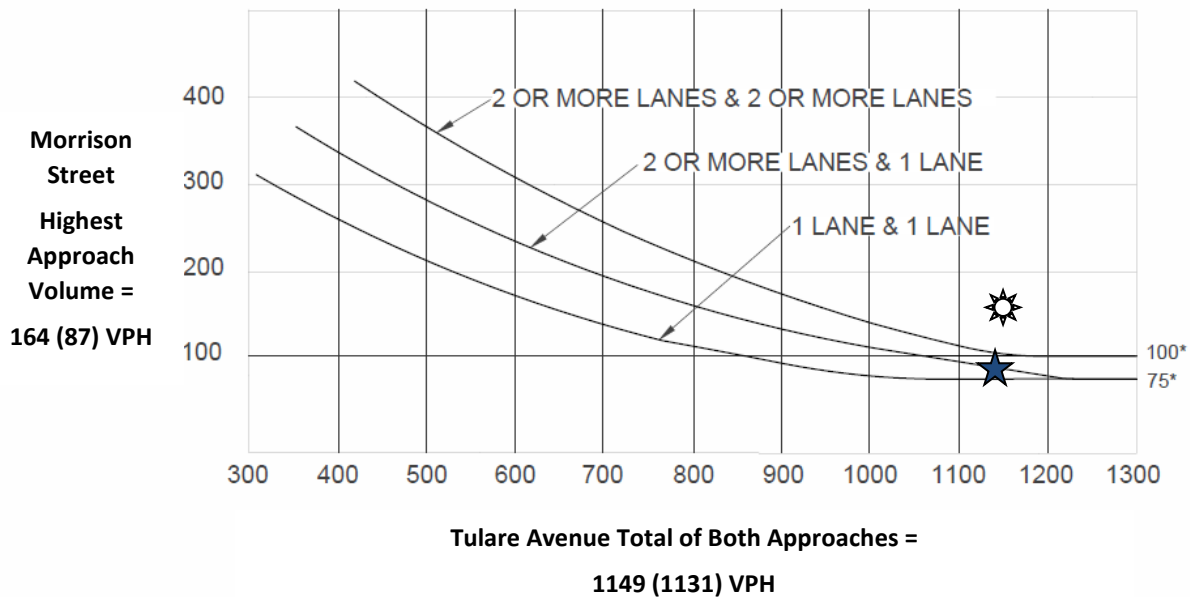
Fresno, CA 93704

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Warrant 3: Peak Hour (Rural)

Existing Traffic Conditions
7. Morrison Street / Tulare Avenue
AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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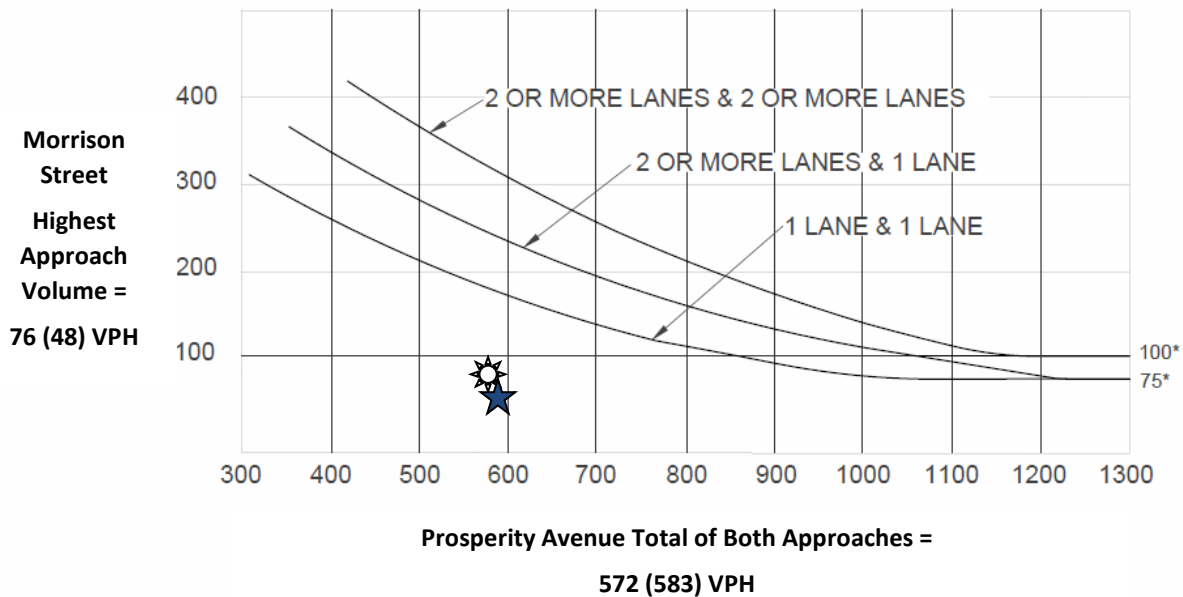
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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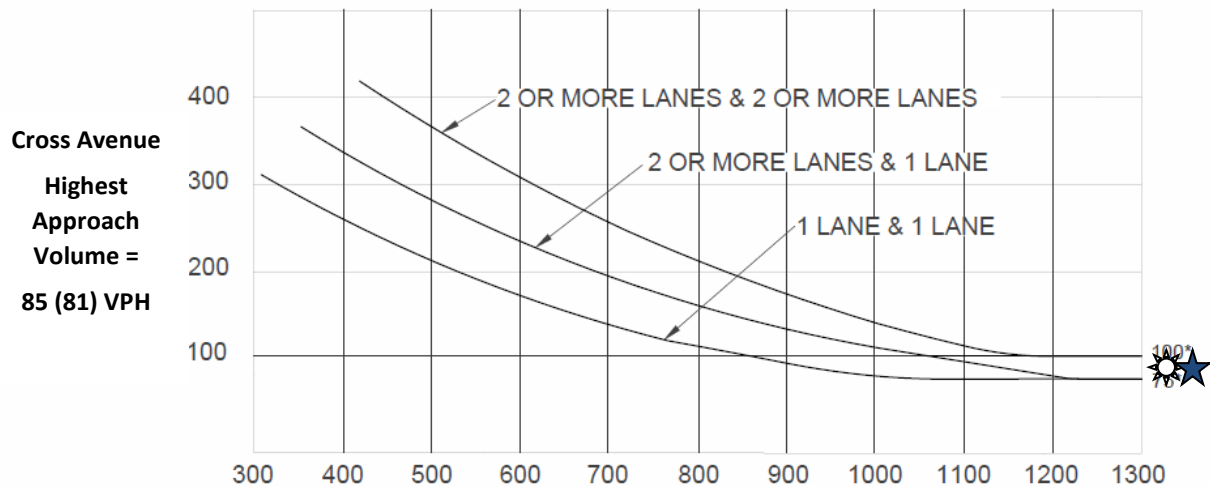
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I) Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1631 (1993) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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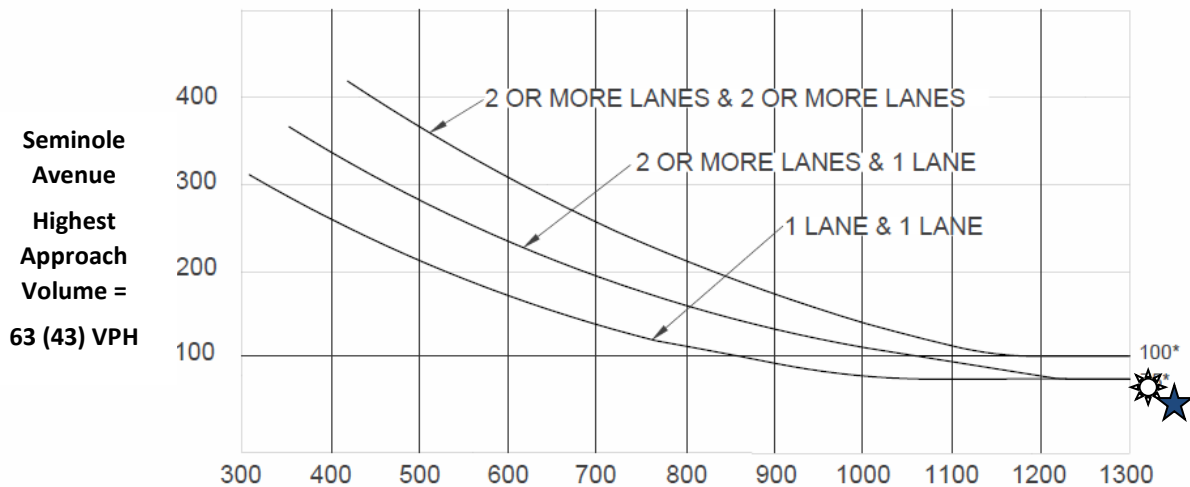
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1531 (1957) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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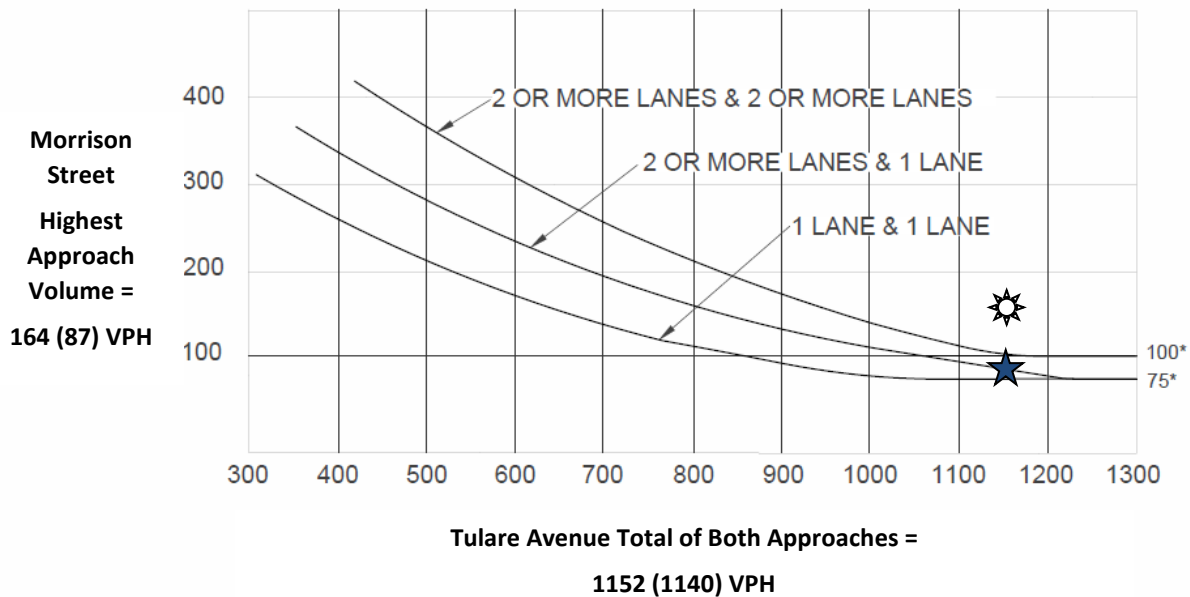
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I) Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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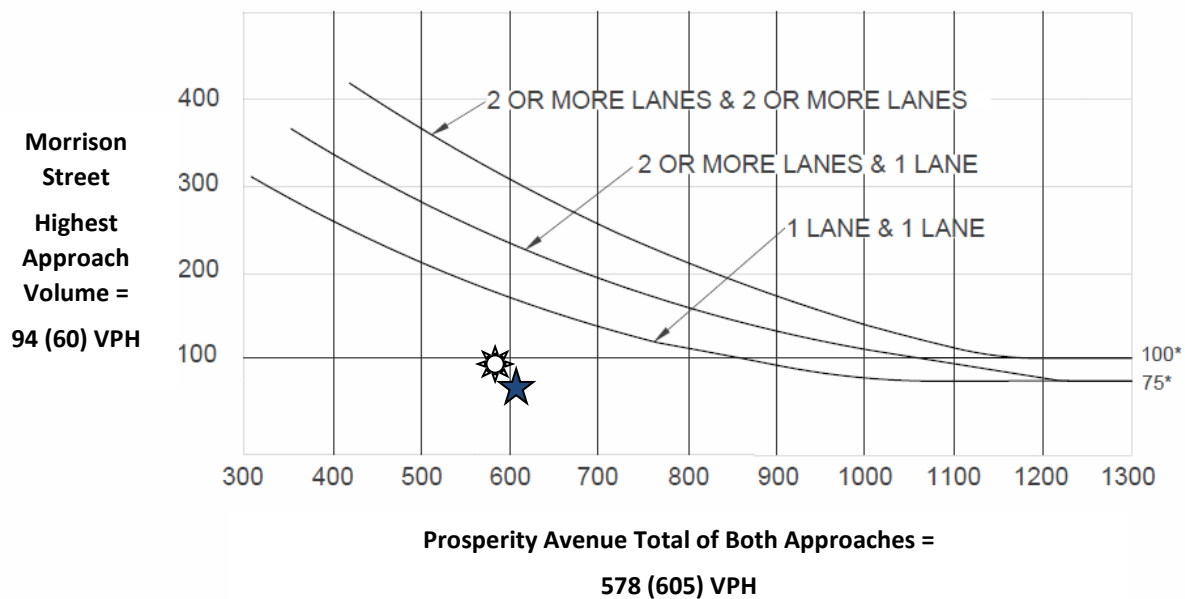
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I & II) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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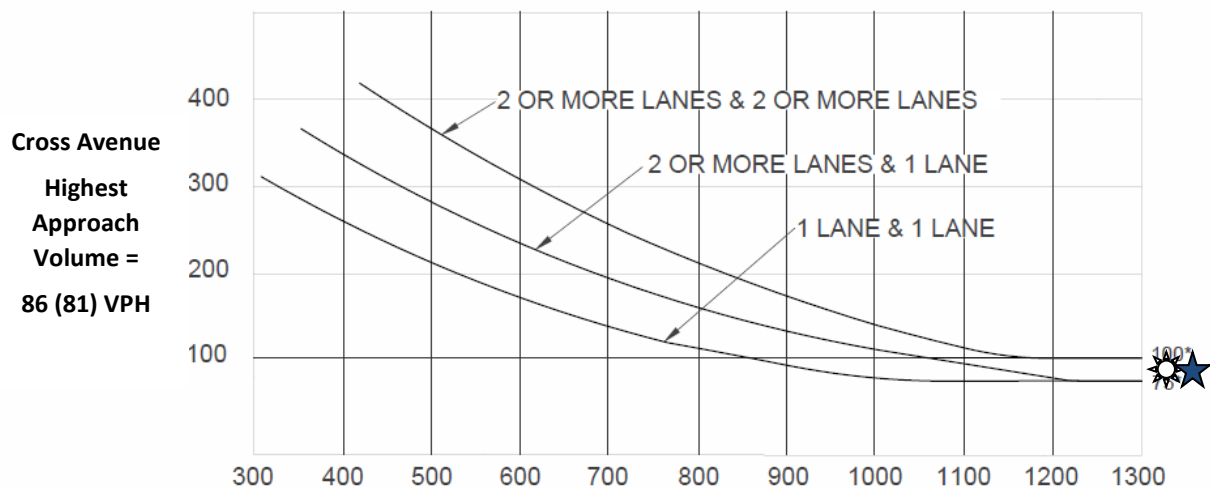
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I & II) Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1657 (2027) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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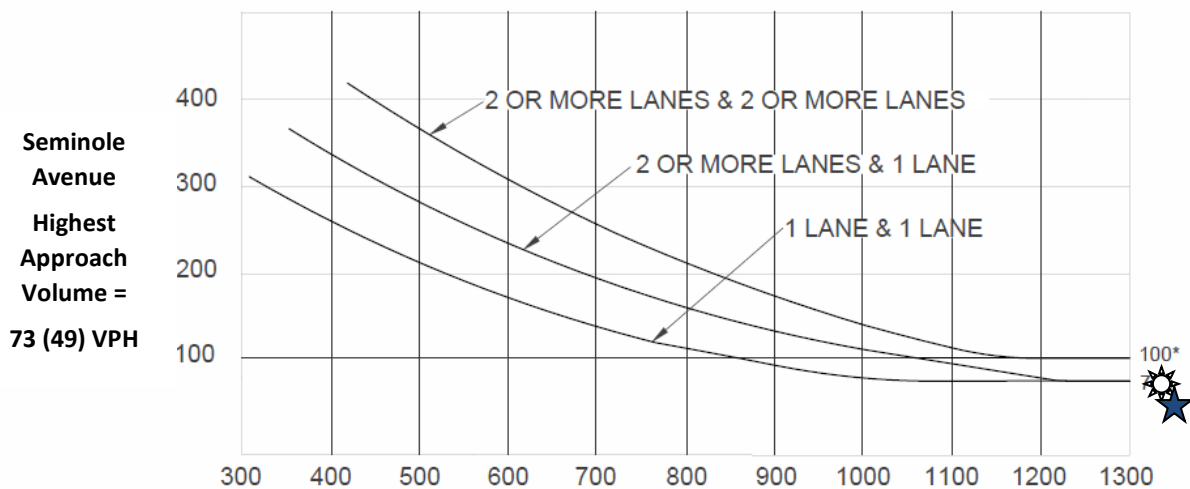
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I & II) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1538 (1979) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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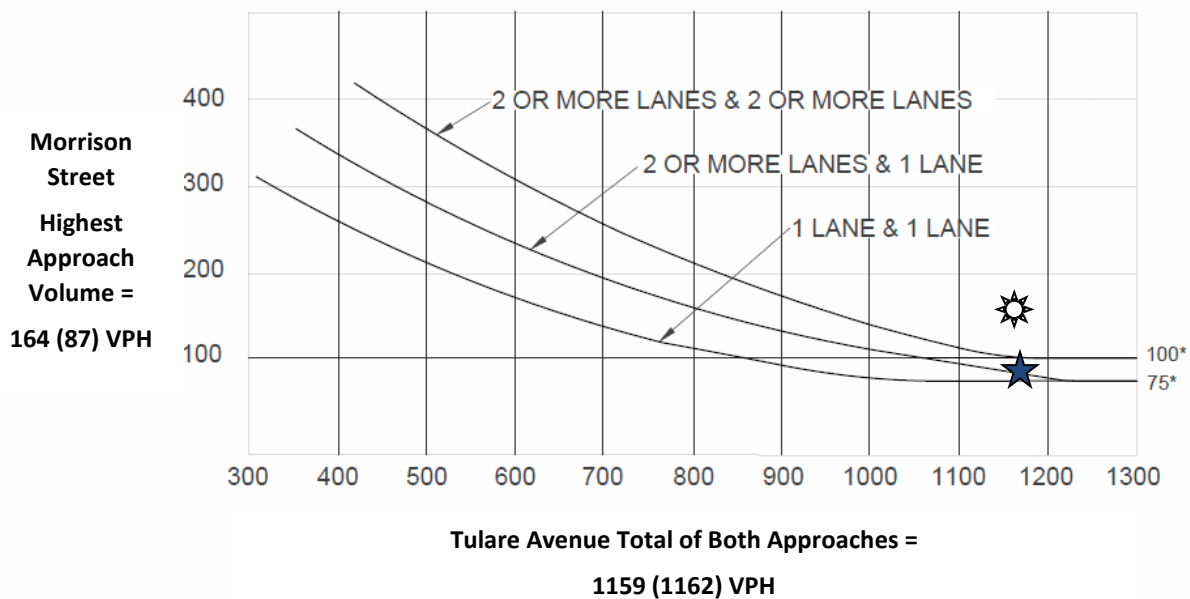
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I & II) Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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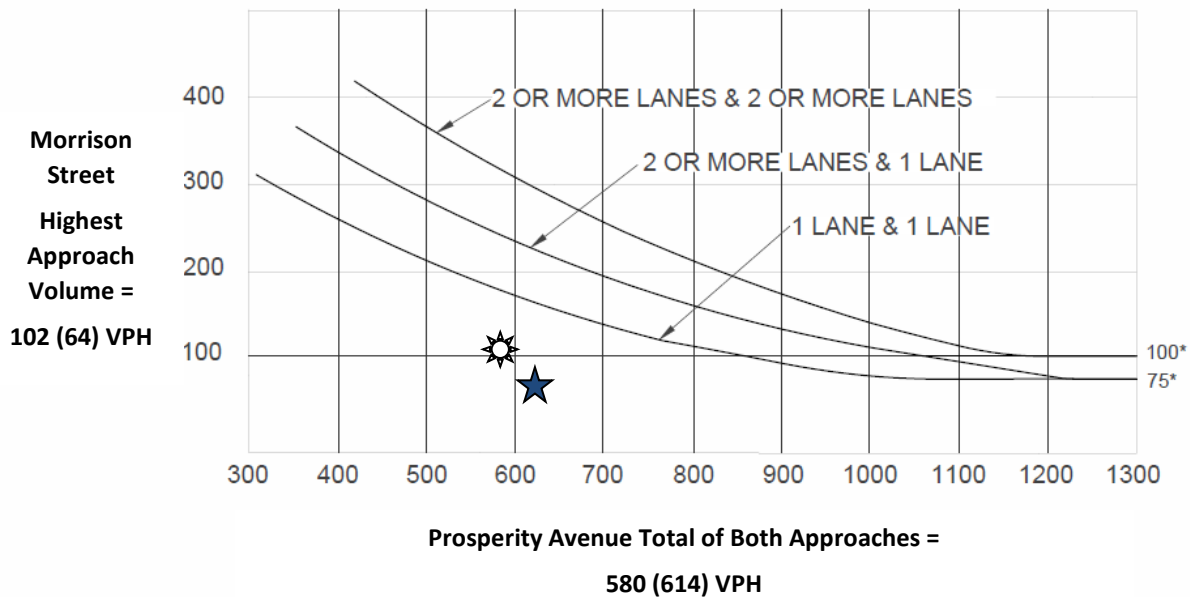
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I, II & III) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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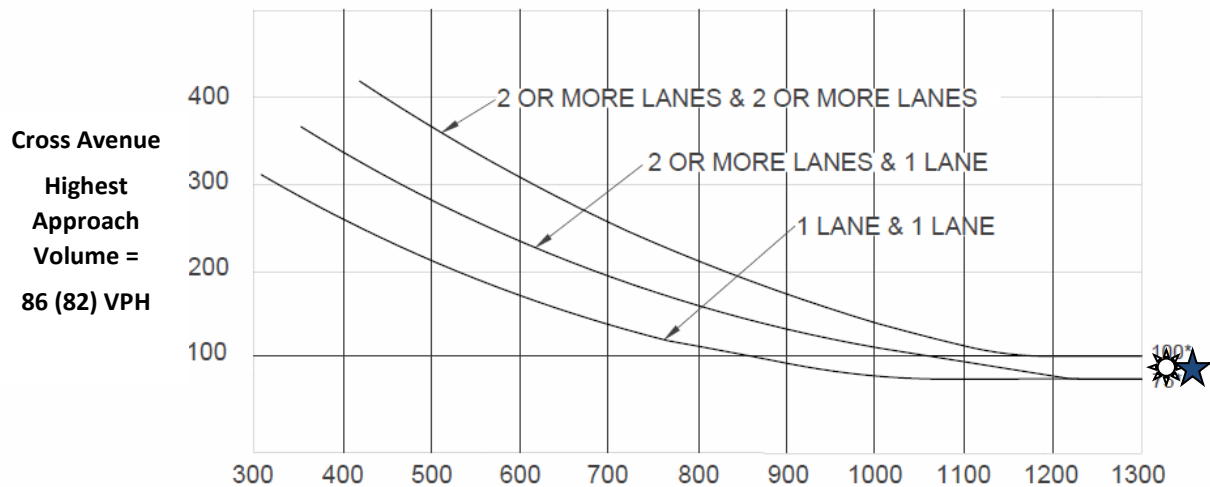
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I, II & III) Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1677 (2054) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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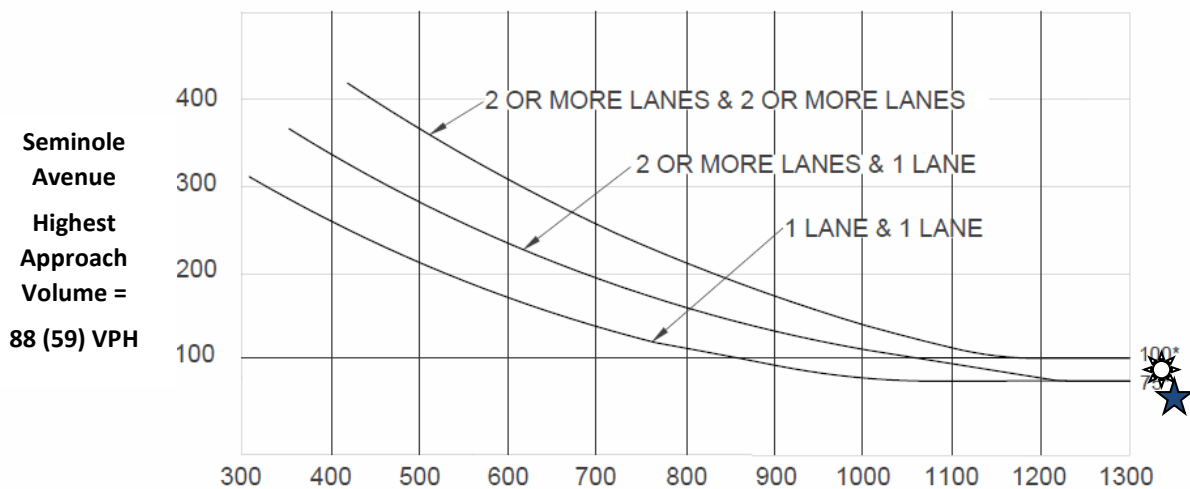
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I, II & III) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1546 (2005) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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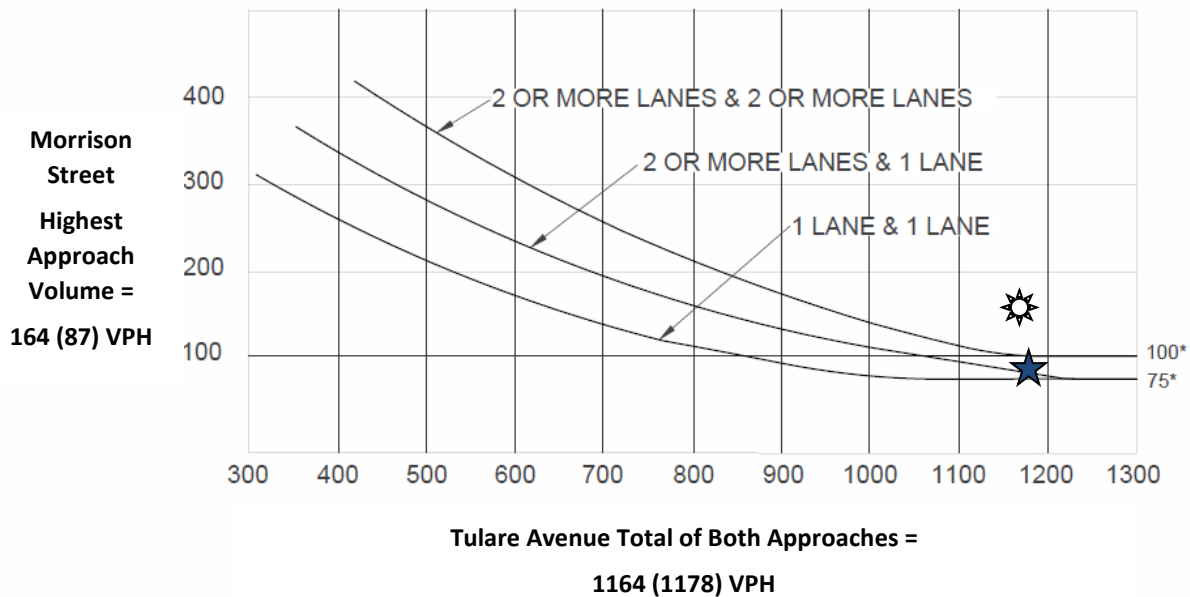
Warrant 3: Peak Hour (Rural)

Existing plus Project (Phase I, II & III) Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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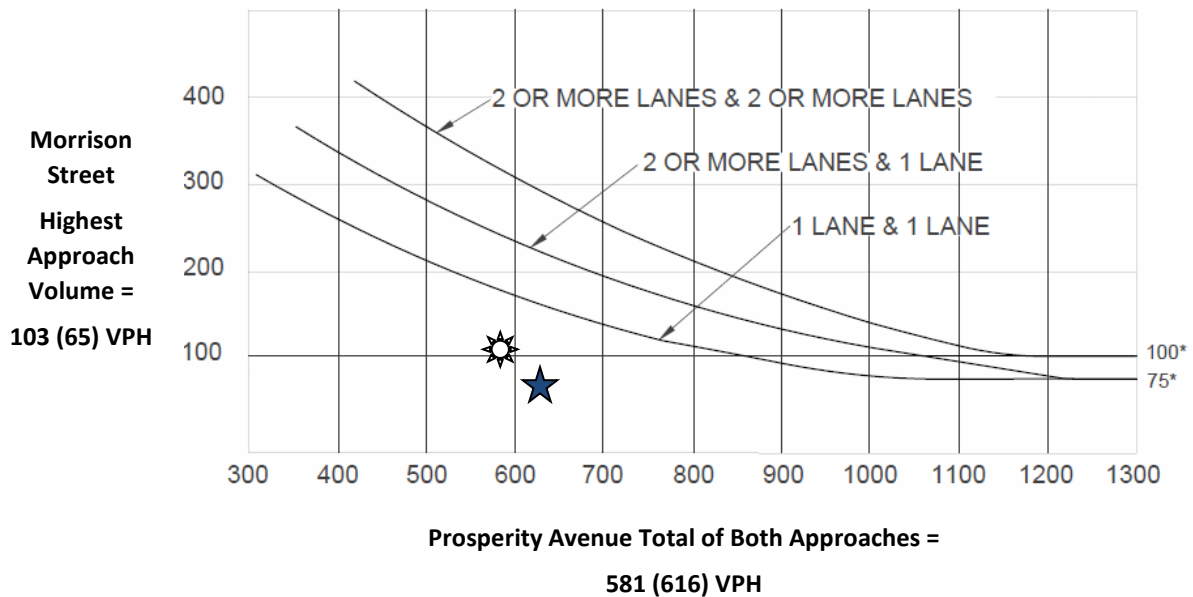
Warrant 3: Peak Hour (Rural)

Existing plus Project (Buildout) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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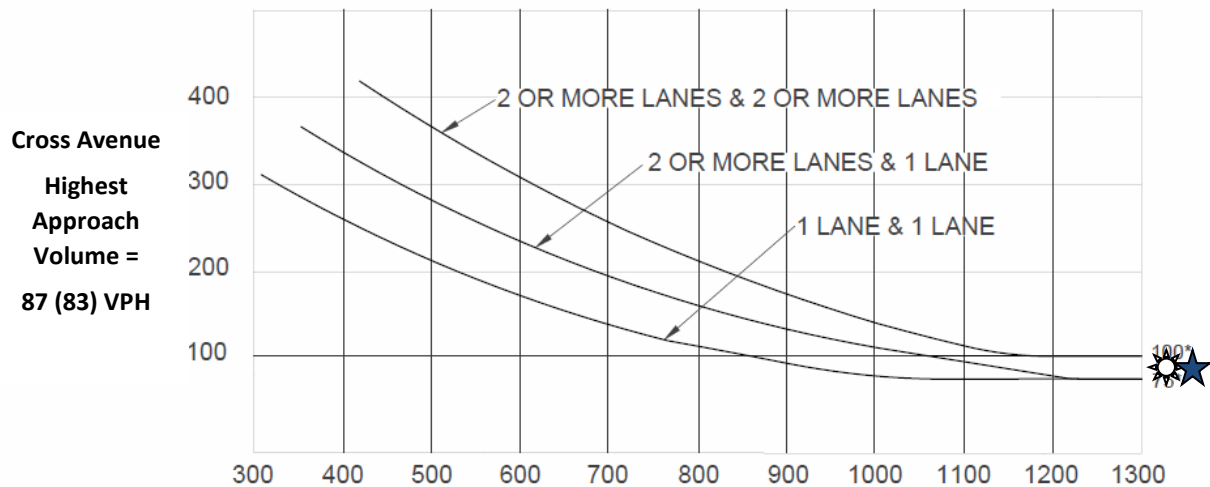
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Warrant 3: Peak Hour (Rural)

Existing plus Project (Buildout) Traffic Conditions
3. Mooney Boulevard / Cross Avenue
AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =
1697 (2083) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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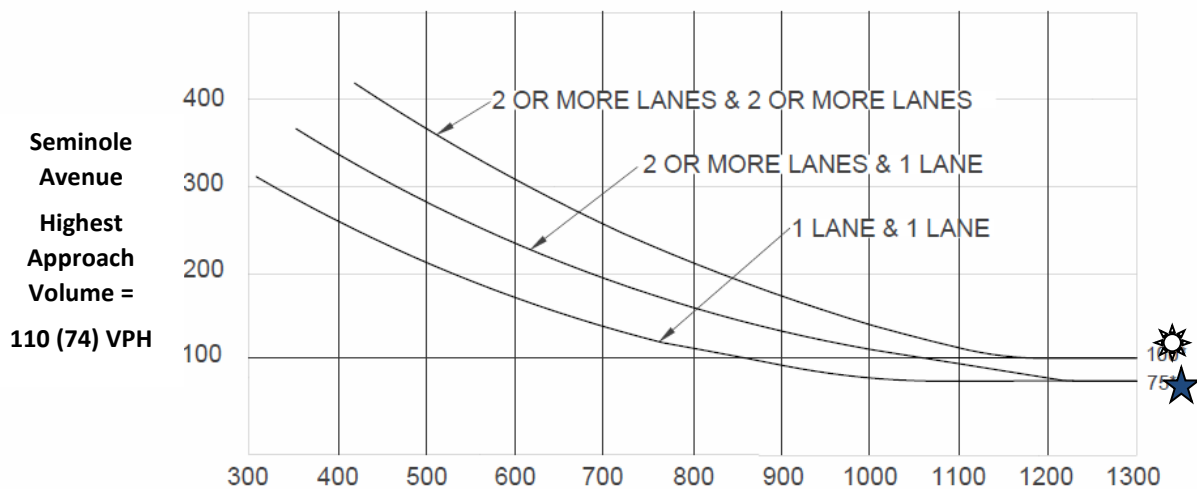
Warrant 3: Peak Hour (Rural)

Existing plus Project (Buildout) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1555 (2039) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Not Met

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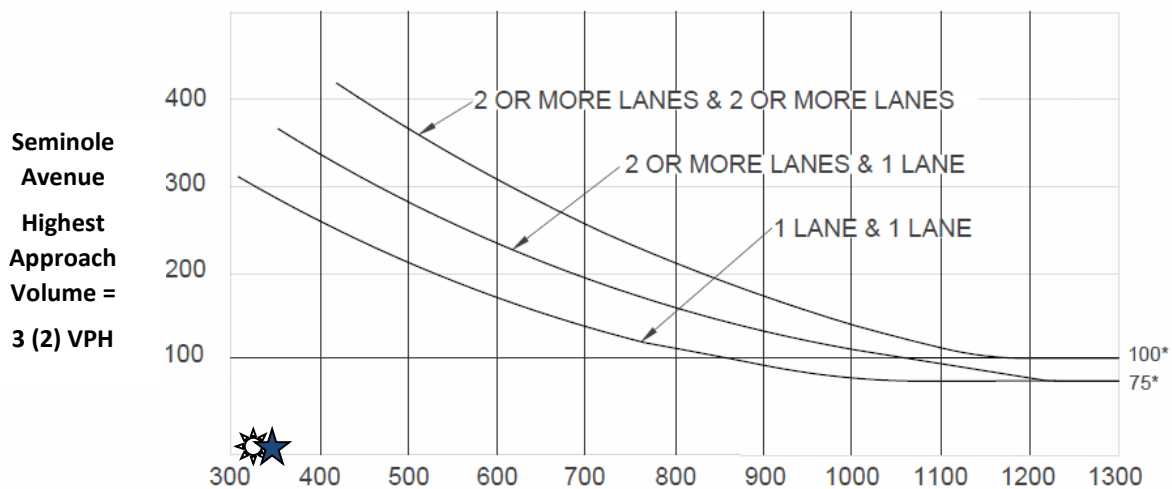
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Warrant 3: Peak Hour (Rural)

Existing plus Project (Buildout) Traffic Conditions
5. Morrison Street / Seminole Avenue
AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Morrison Street Total of Both Approaches =
311 (334) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



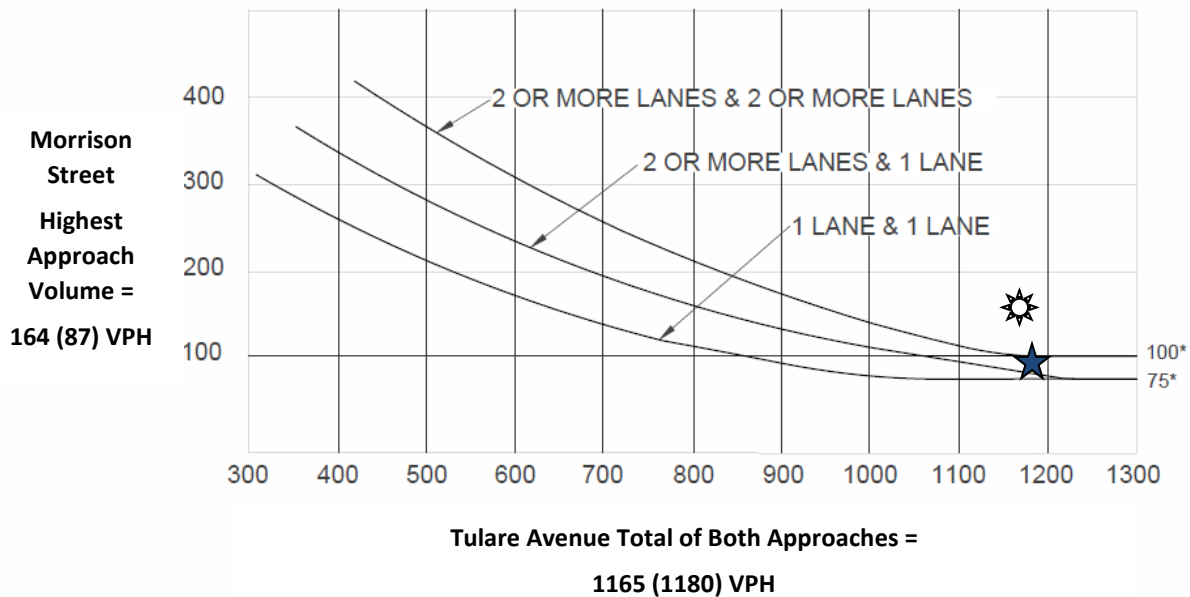
PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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Warrant 3: Peak Hour (Rural)

Existing plus Project (Buildout) Traffic Conditions
7. Morrison Street / Tulare Avenue
AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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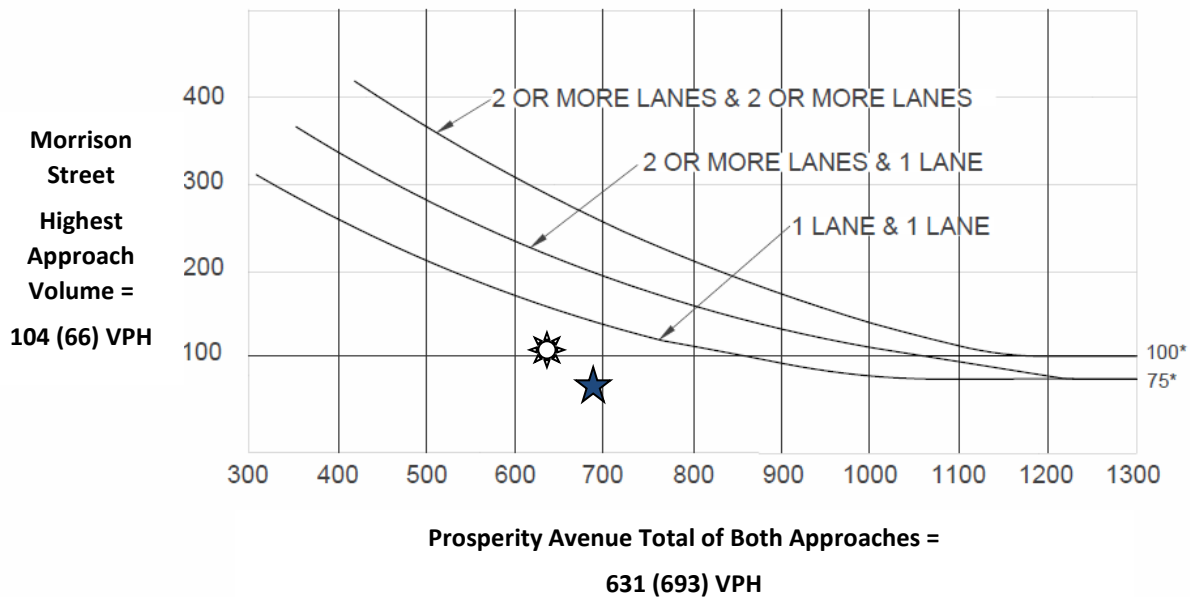
Warrant 3: Peak Hour (Rural)

Near Term plus Project (Buildout) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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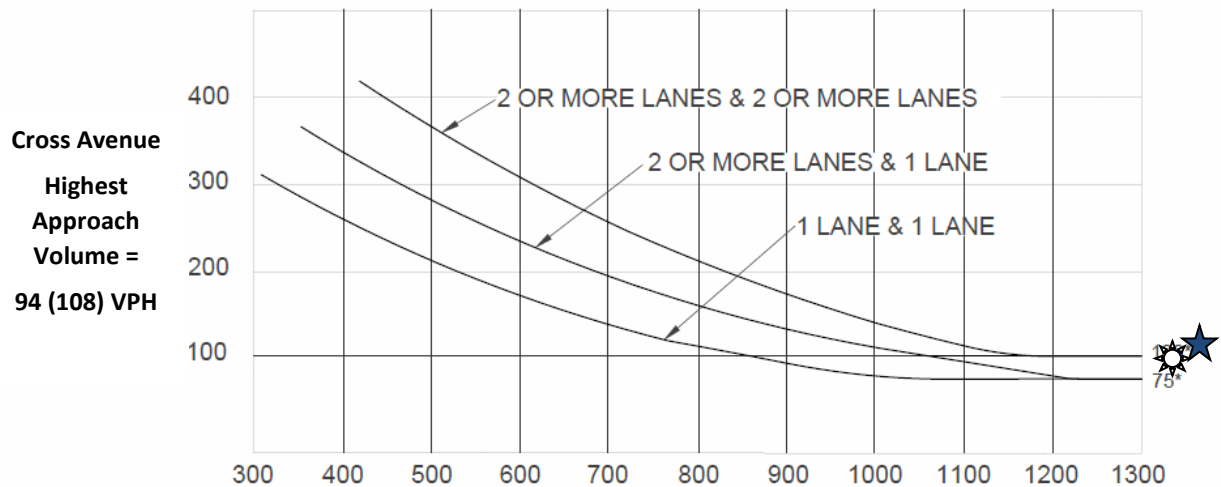
Warrant 3: Peak Hour (Rural)

Near Term plus Project (Buildout) Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

2033 (2560) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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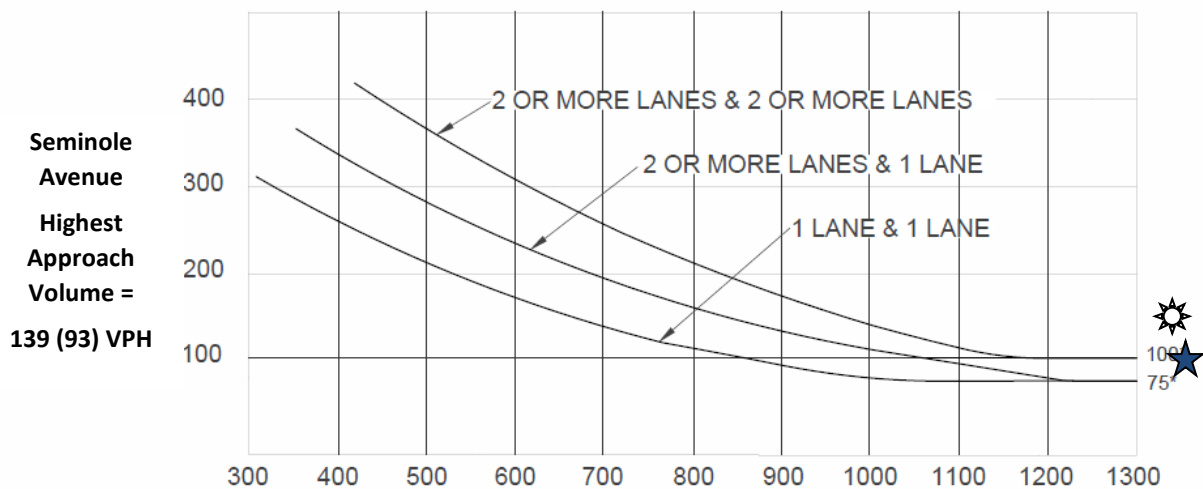
Warrant 3: Peak Hour (Rural)

Near Term plus Project (Buildout) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1877 (2551) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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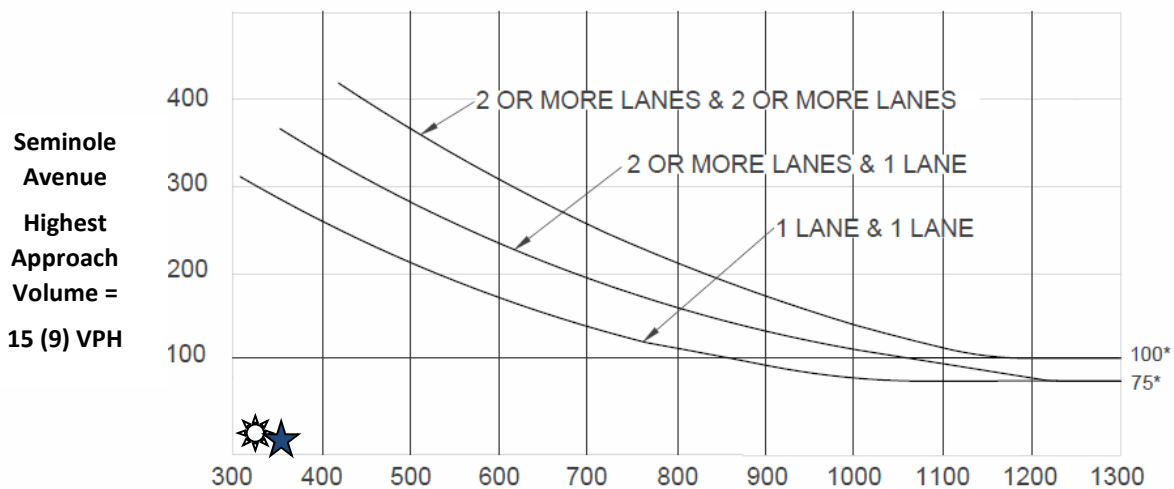
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Warrant 3: Peak Hour (Rural)

Near Term plus Project (Buildout) Traffic Conditions
5. Morrison Street / Seminole Avenue
AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Morrison Street Total of Both Approaches =
315 (350) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)
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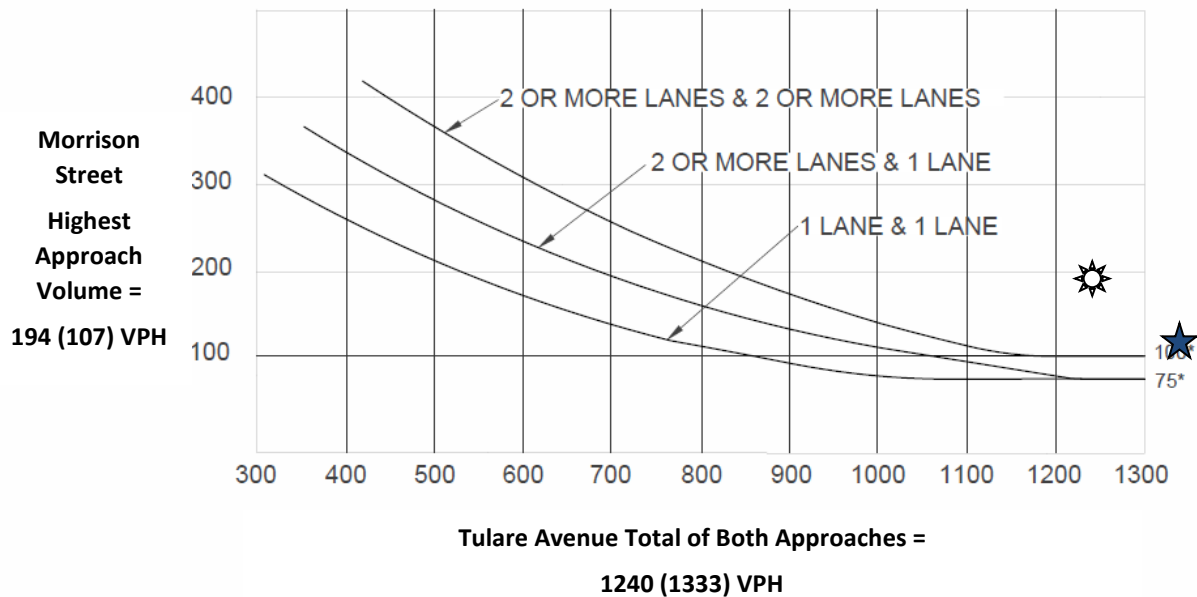
Warrant 3: Peak Hour (Rural)

Near Term plus Project (Buildout) Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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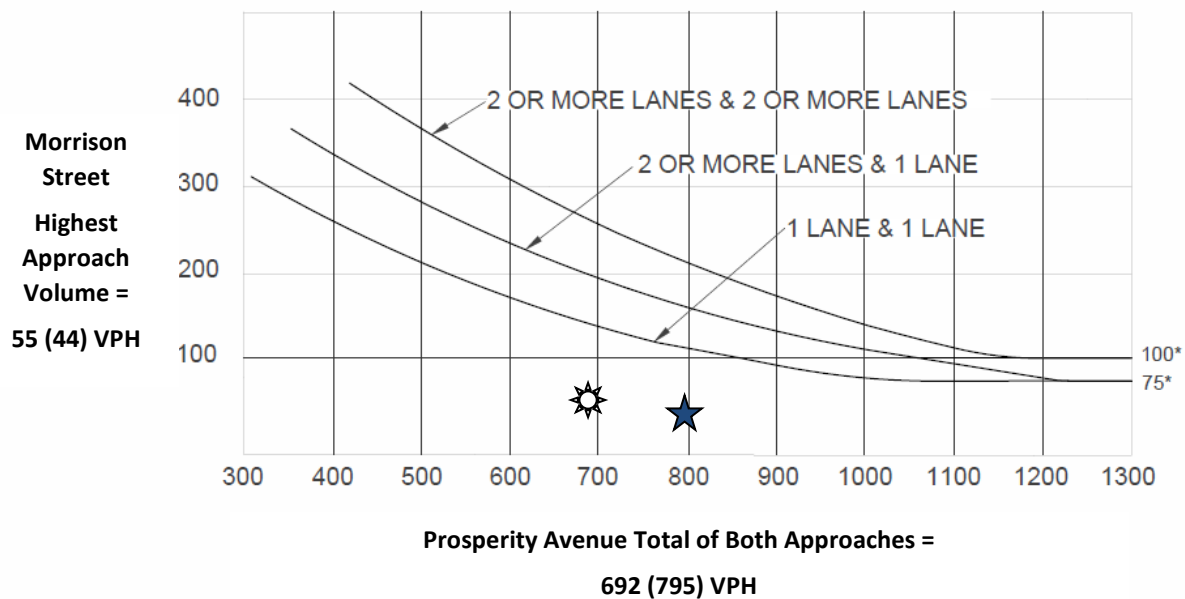
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 No Project Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

Source: California Manual of Uniform Traffic Control Devices (CA MUTCD 2014 Edition)

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Part 4: Highway Traffic Signals

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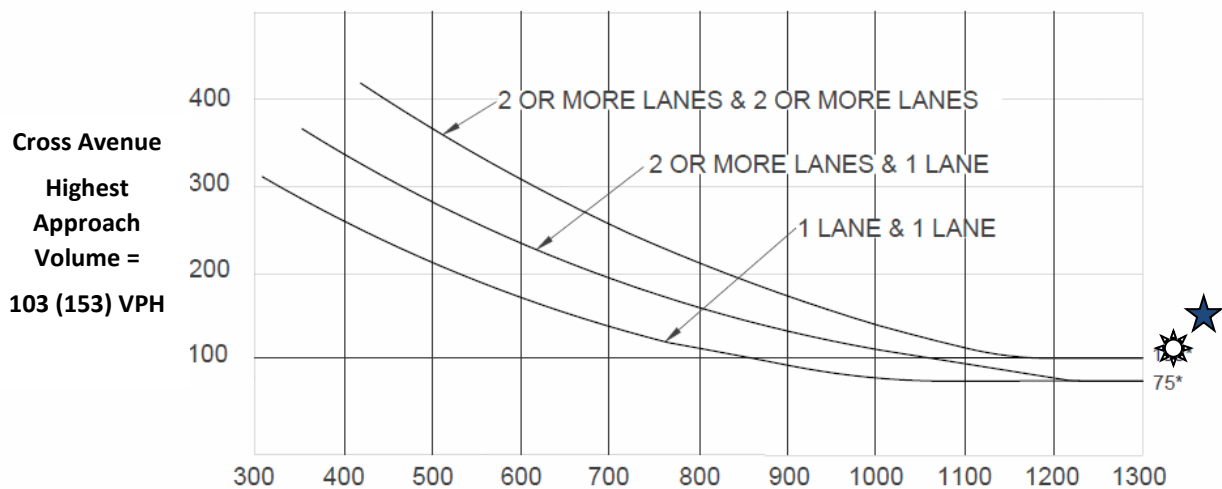
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 No Project Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

2029 (2497) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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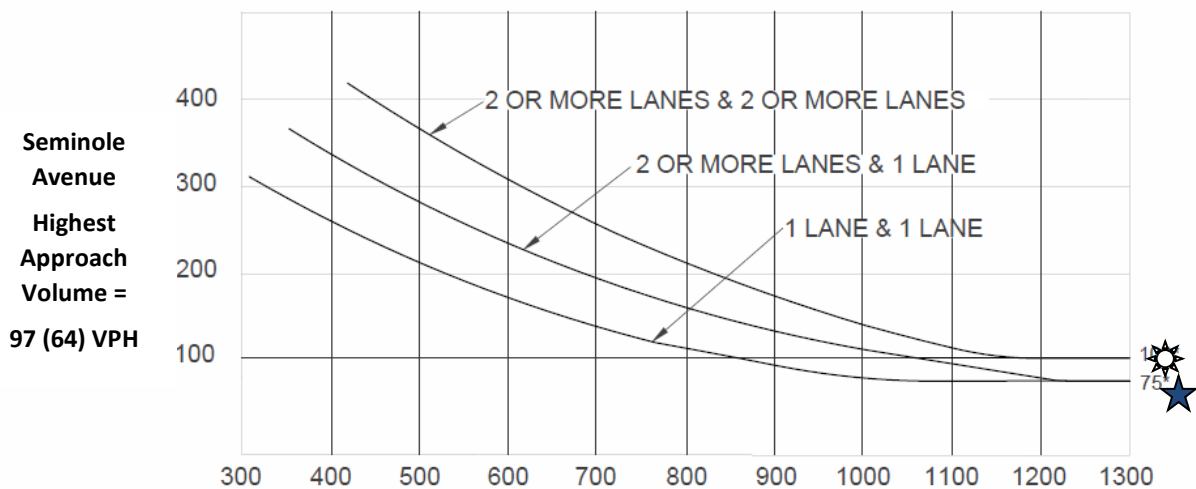
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 No Project Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1903 (2485) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Not Met

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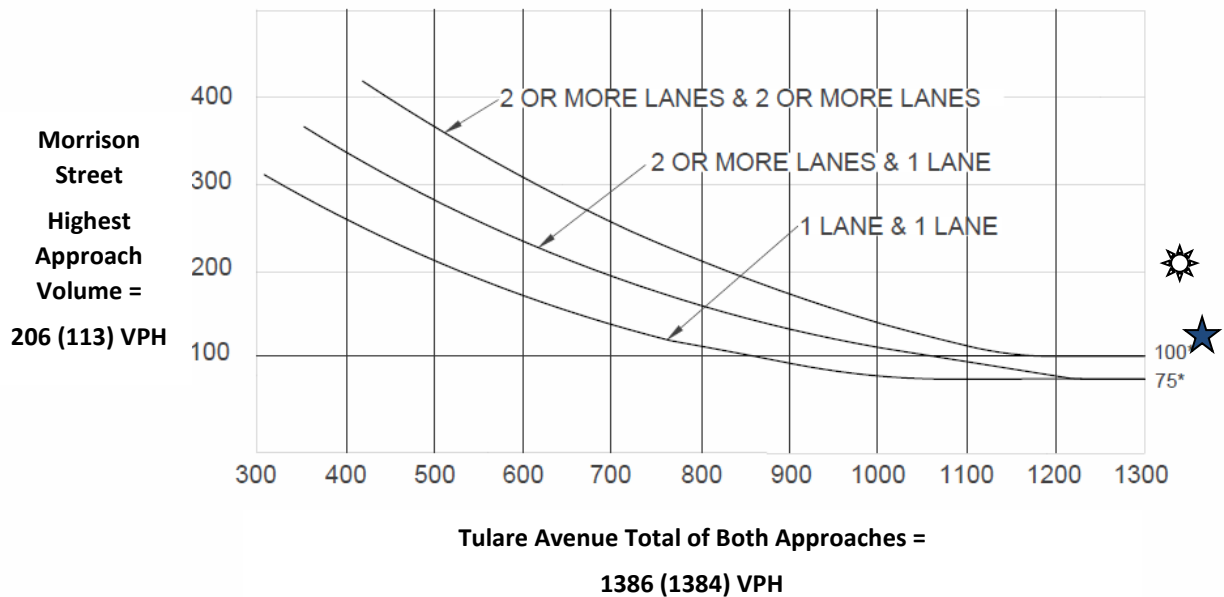
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 No Project Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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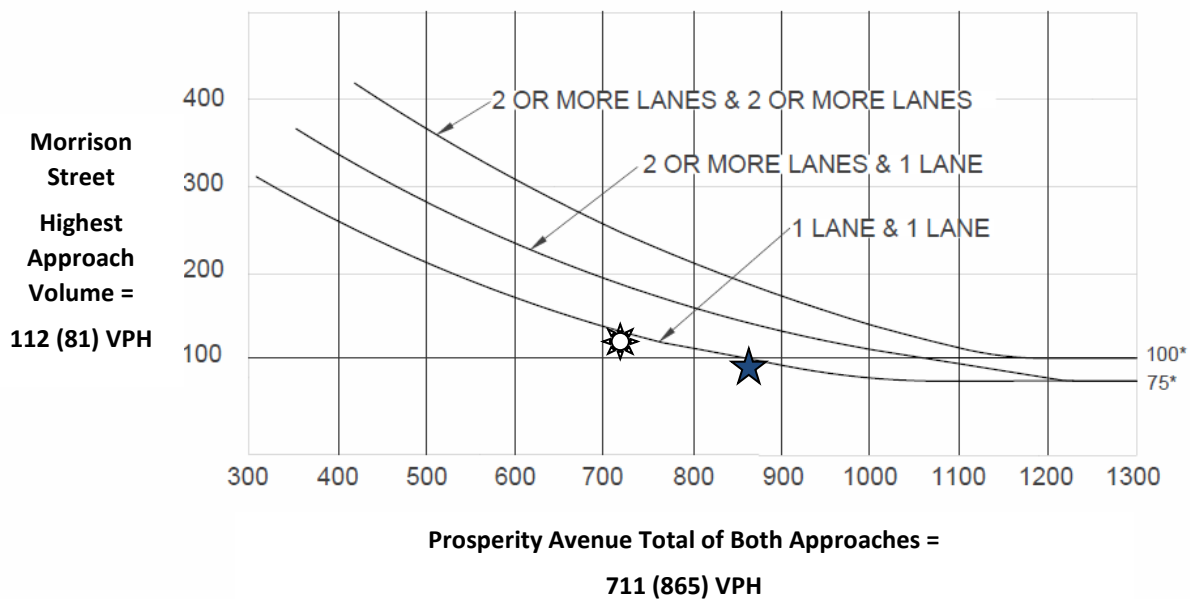
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

2. Morrison Street / Prosperity Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

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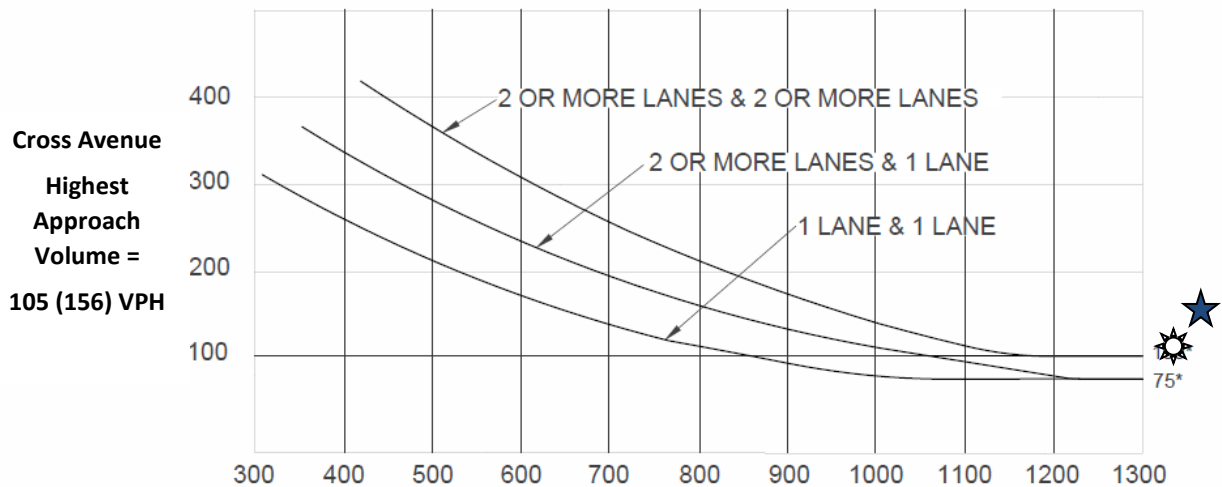
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

3. Mooney Boulevard / Cross Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

2098 (2591) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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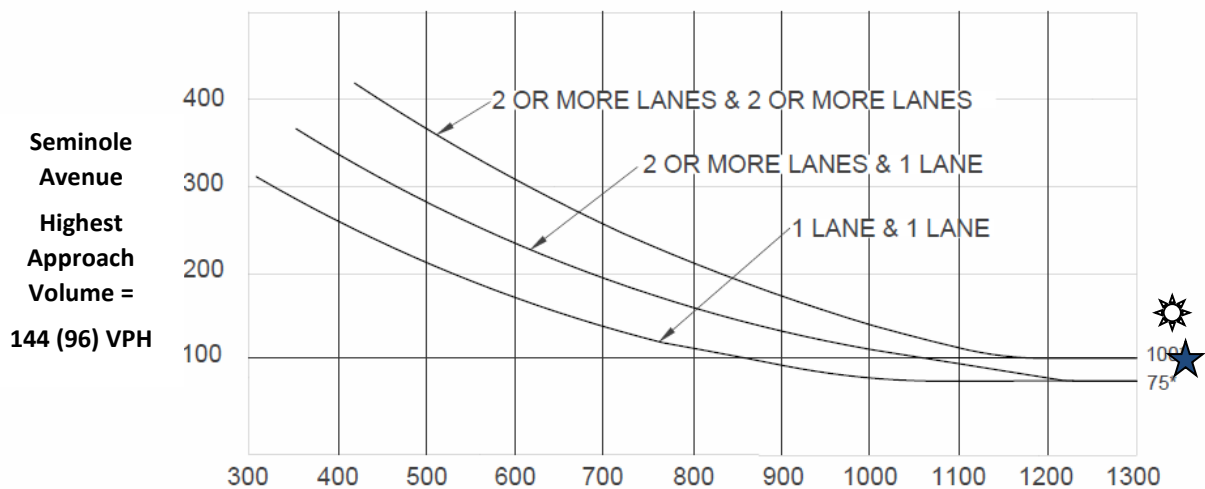
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

4. Mooney Boulevard / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Mooney Boulevard Total of Both Approaches =

1931 (2572) VPH

*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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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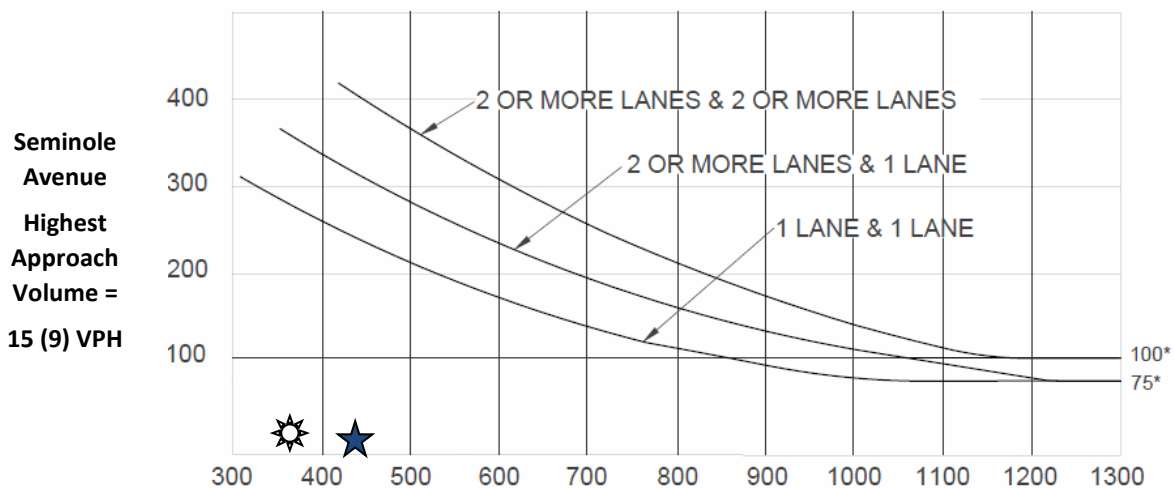
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

5. Morrison Street / Seminole Avenue

AM (PM) Peak Hour

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



Morrison Street Total of Both Approaches =

363 (436) VPH

*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.



AM Peak Hour – Signal Warrant is Not Met



PM Peak Hour – Signal Warrant is Not Met

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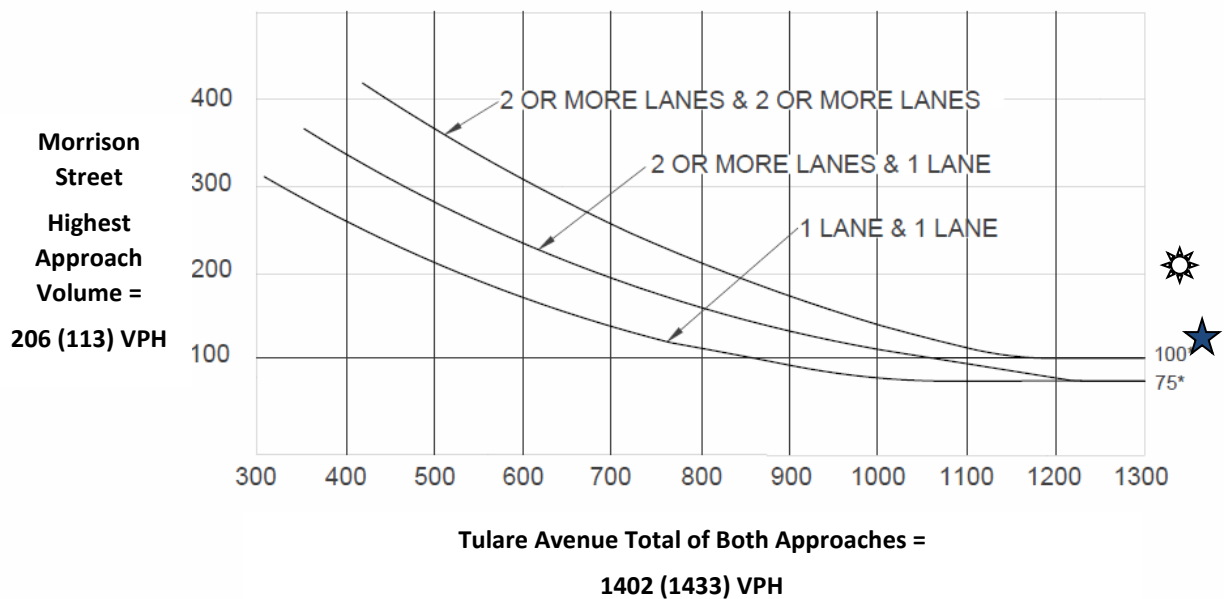
Warrant 3: Peak Hour (Rural)

Cumulative Year 2035 plus Project (Buildout) Traffic Conditions

7. Morrison Street / Tulare Avenue

AM (PM) Peak Hour

(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.



AM Peak Hour – Signal Warrant is Met



PM Peak Hour – Signal Warrant is Met

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