CITY OF MERCED
PLANNING & PERMITTING DIVISION

TYPE OF PROPOSAL: **General Plan Amendment #19-03, Site Utilization Plan (SUP) Revision #3 to Planned Development #72, and Environmental Review #19-28**

INITIAL STUDY: #19-28

DATE RECEIVED: September 26, 2019

LOCATION: Northeast corner of East Yosemite Avenue and G Street

ASSESSOR'S PARCEL NUMBERS: 231-040-004 AND 231-040-005

Please forward any written comments by December 4, 2019 to:

Michael Hren, Principal Planner
City of Merced Planning & Permitting Division
678 West 18th Street
Merced, CA 95340
hrenm@cityofmerced.org

Applicant Contact Information:

Yosemite and G, LLC
1155 W. Shaw Ave., Ste. 104
Fresno, CA 93711-3748

General Plan and Zoning Designations

Current General Plan Designation: Commercial Office (CO) and High to Medium Density Residential (HMD) – refer to the General Plan and Zoning Map at Figure 3.

Current Zoning Designation: Planned Development (#72) – refer to the General Plan and Zoning Map at Figure 3.

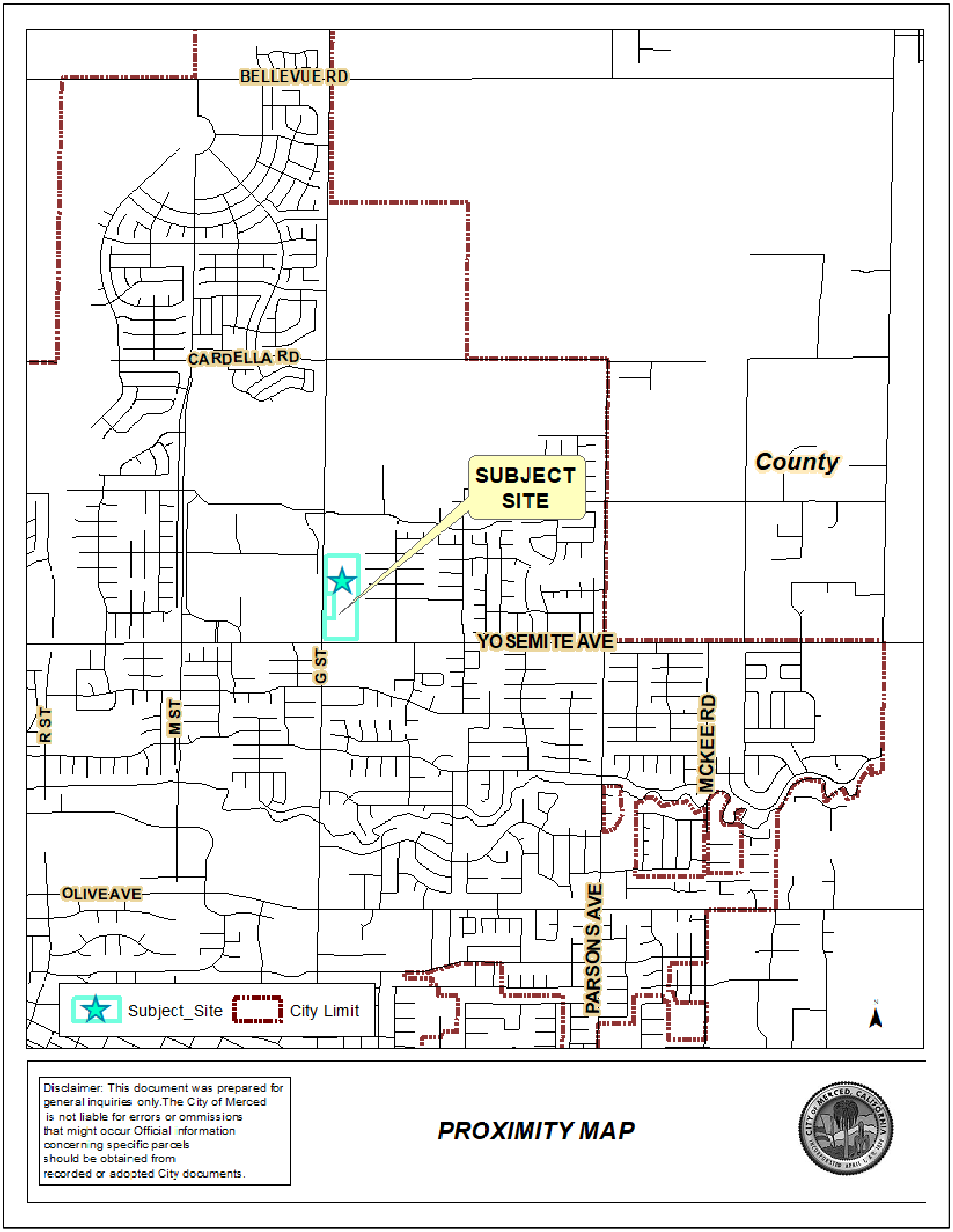
Project Site

The proposed project is located at the northeast corner of Yosemite Avenue and G Street (Figures 1 and 2). The site is comprised of two parcels (APN's: 231-040-004 and 231-040-005) totaling approximately 21.5 acres (Figure 2). The surrounding land uses are shown on the map at Figure 2 and listed in the table below.

Surrounding Land	Existing Use of Land	Zoning Designation	City General Plan Land Use Designation
North	Mercy Medical Center and Vacant Lot	C-O	Commercial Office (CO)
South	Retail, Restaurants, Grocery (across Yosemite Avenue)	P-D #26	Neighborhood Commercial (CN)
East	Single-Family Residential	R-1-6, P-D #72	Low Density Residential (LD), High to Medium Density Residential (HMD), and Neighborhood Commercial (CN)
West	Merced College (across G Street)	R-1-6	School

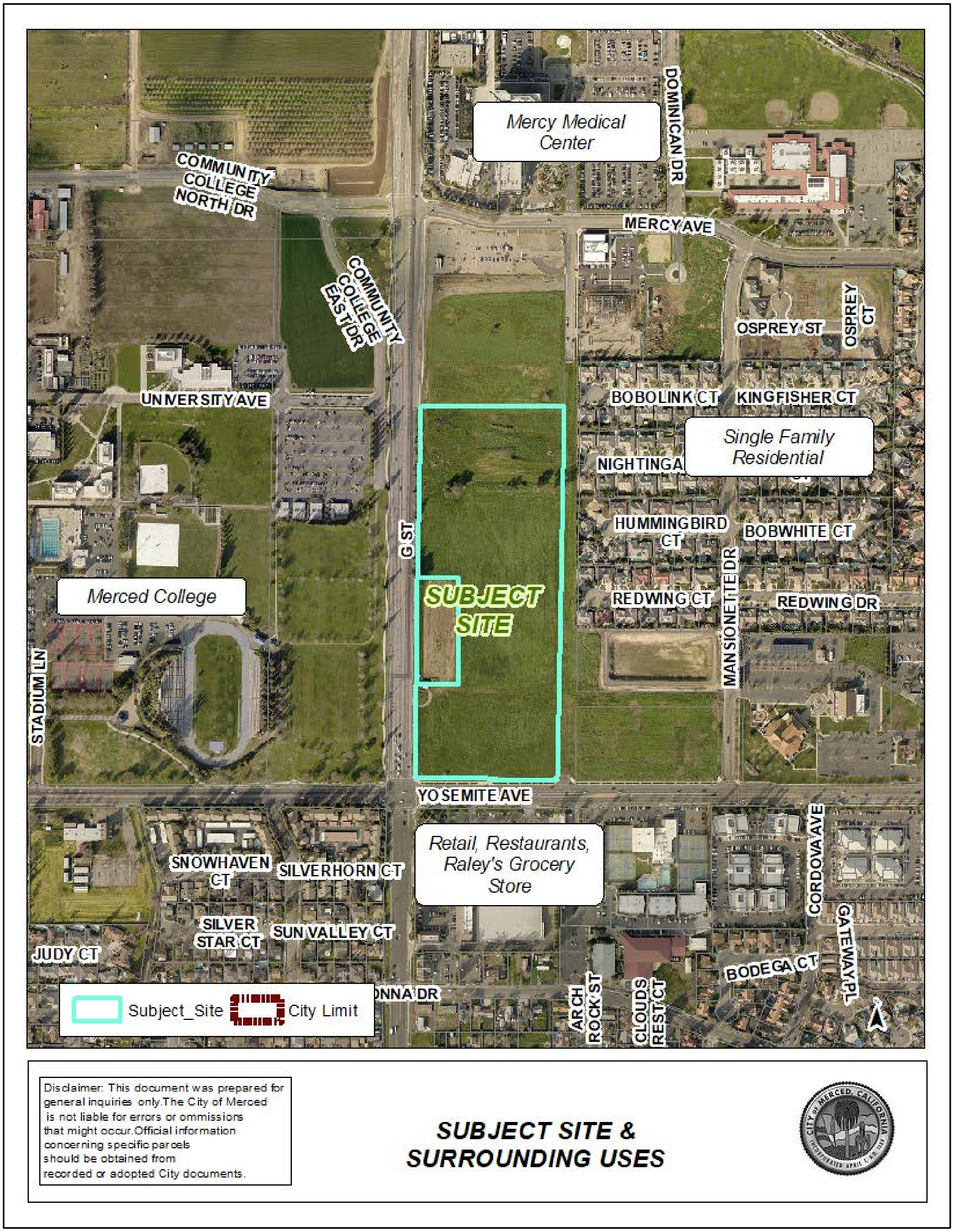
ATTACHMENT 7

Figure 1
Proximity Map



Disclaimer: This document was prepared for general inquiries only.The City of Merced is not liable for errors or ommissions that might occur.Official information concerning specific parcels should be obtained from recorded or adopted City documents.

Figure 2
Subject Site & Surrounding Uses



Disclaimer: This document was prepared for general inquiries only. The City of Merced is not liable for errors or ommissions that might occur. Official information concerning specific parcels should be obtained from recorded or adopted City documents.

Project Description

The proposed project includes a General Plan Amendment and Site Utilization Plan (SUP) Revision for 21.5 acres of land on the Subject Site (refer to the map at Figure 3). As shown on the Proposed Land Use Changes Map at Figure 3, the site has two General Plan designations of Commercial Office (CO) and High to Medium Density Residential (HMD); it also has a Zoning designation of Planned Development (P-D) #72. The proposed General Plan Amendment would change the General Plan designation to Neighborhood Commercial (CN).

The Site Utilization Plan (SUP) Revision includes changes to a number of aspects of Planned Development #72, including a four-story hotel of approximately 80,104 square feet and 128 rooms, and two medical office buildings totaling approximately 66,465 square feet. It also includes 44 Units of Multi-Family Residential Housing totaling approximately 29,887 square feet, fast food uses with drive-through windows totaling approximately 5,494 square feet, and a mixed-use development with approximately 59,616 square feet of other retail and office uses, shown on the Site Plan at Figure 4.

The Zoning Ordinance describes uses that are allowed within a specific zone “by right” and those allowed with a discretionary review, such as a Conditional Use Permit. Under ordinary circumstances, drive-through sales, alcoholic beverage sales in restaurants for on-site consumption, multi-family dwellings, and gas and service stations are allowed within a C-N zone with approval of a Conditional Use Permit. Day care centers require a Minor Use Permit and hotels are listed as “use not allowed” in an ordinary C-N zone.

Additionally, Section 20.32 of the Zoning Ordinance sets out the requirements for interface regulations to help integrate potentially incompatible zones. This section requires Site Plan Review be obtained prior to construction on a parcel with a Neighborhood Commercial (C-N) zone when it is adjacent to or across the street from an R-1-6 zone. In this case, several properties to the east are zoned R-1-6. The uses in this area include single-family dwellings located on approximately 0.2-acre lots. This project is designed in such a way that may at a future time be desirable to separate the parcels, as noted by the “proposed parcel line” notations on the Site Plan, shown at Figure 4; however, no parcel modifications have been submitted at this time.

Instead of the typical requirements for additional Conditional Use Permits and Site Plan Review for interface, this Site Utilization Plan process will address interface regulations, additional review, and permissibility of specific uses in Planned Development #72. These modifications apply in the portions of Planned Development #72 covered by the subject site parcels (Assessor’s Parcel Number 231-040-004 and 231-040-005) in the following manner, taking into consideration that the adjacency of parcels may change in the event of parcel modifications in the future:

- Multi-family housing will require a Site Plan Review Permit rather than a Conditional Use Permit, and if on a parcel abutting or across from (per the definitions in Section 20.32.020 of the Zoning Ordinance) a property with R-1 zoning, will require a publicly noticed public hearing at the Site Plan Review meeting per Section 20.32 of the Zoning Ordinance.
- The hotel, rather than being a “use not allowed,” shall require a Site Plan Review Permit rather than a Conditional Use Permit, and if on a parcel abutting or across from (per the definitions in Section 20.32.020 of the Zoning Ordinance) a property with R-1 zoning, will require a publicly noticed public hearing at a Site Plan Review meeting per Section 20.32 of the Zoning Ordinance, but will not require an additional Conditional Use Permit.

- Restaurants selling alcohol for consumption on-site will require only a Site Plan Review Permit use without further requirement for a Conditional Use Permit or public hearing for interface considerations.
- Gas and service stations will require only a Site Plan Review Permit without further requirement for a Conditional Use Permit unless the gas and service station wishes to sell alcohol, in which case a Conditional Use Permit is required, and a letter of Public Convenience and Necessity may be required, but an additional public hearing for interface consideration is not required.
- Day care centers require only a Site Plan Review Permit without further requirement for a Minor Use Permit or public hearing for interface considerations.
- Drive-through and drive-up sales require only a Site Plan Review Permit without further requirement for a Conditional Use Permit or public hearing for interface considerations.
- General retail uses, professional offices, restaurants, and banks require only a Site Plan Review Permit without further requirement for a public hearing for interface considerations.

Figure 3 - Proposed Land Use Changes

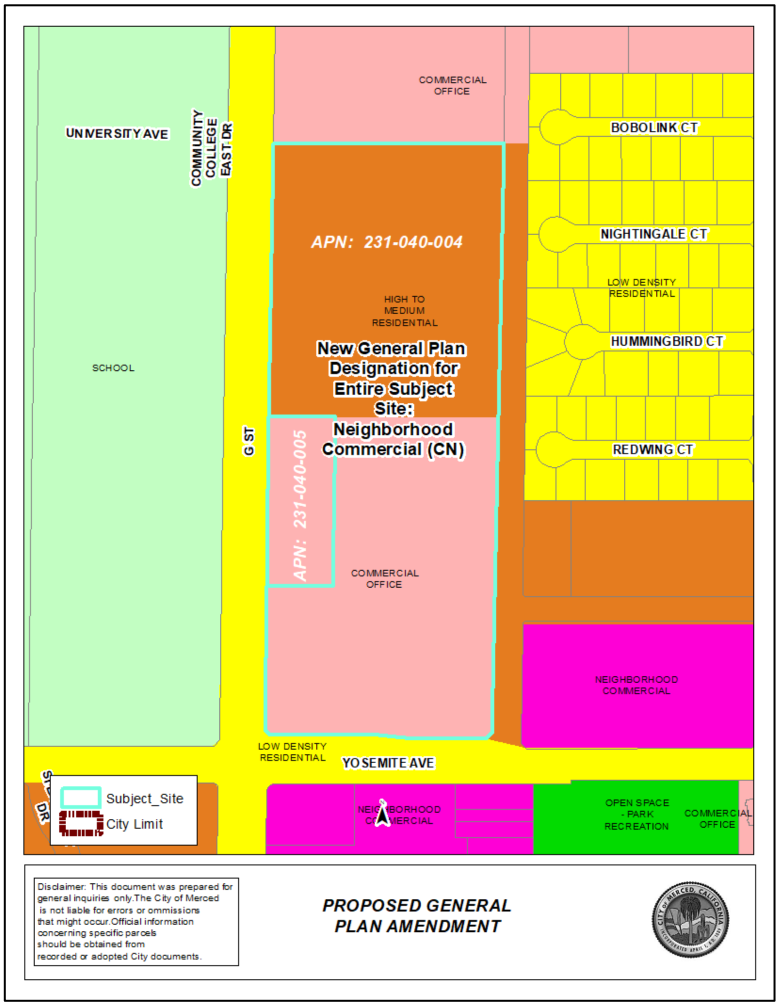
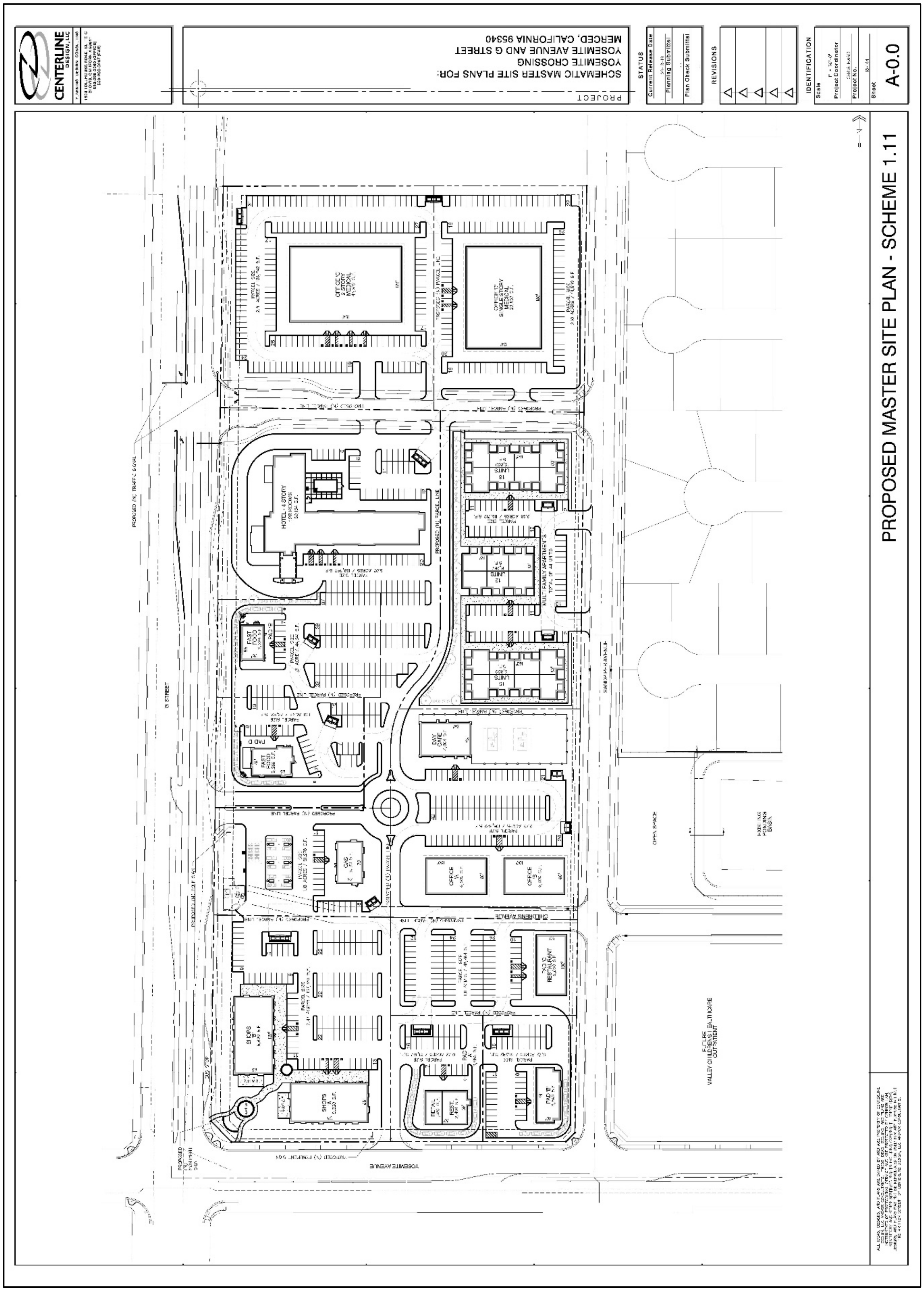


Figure 4 -Site Plan

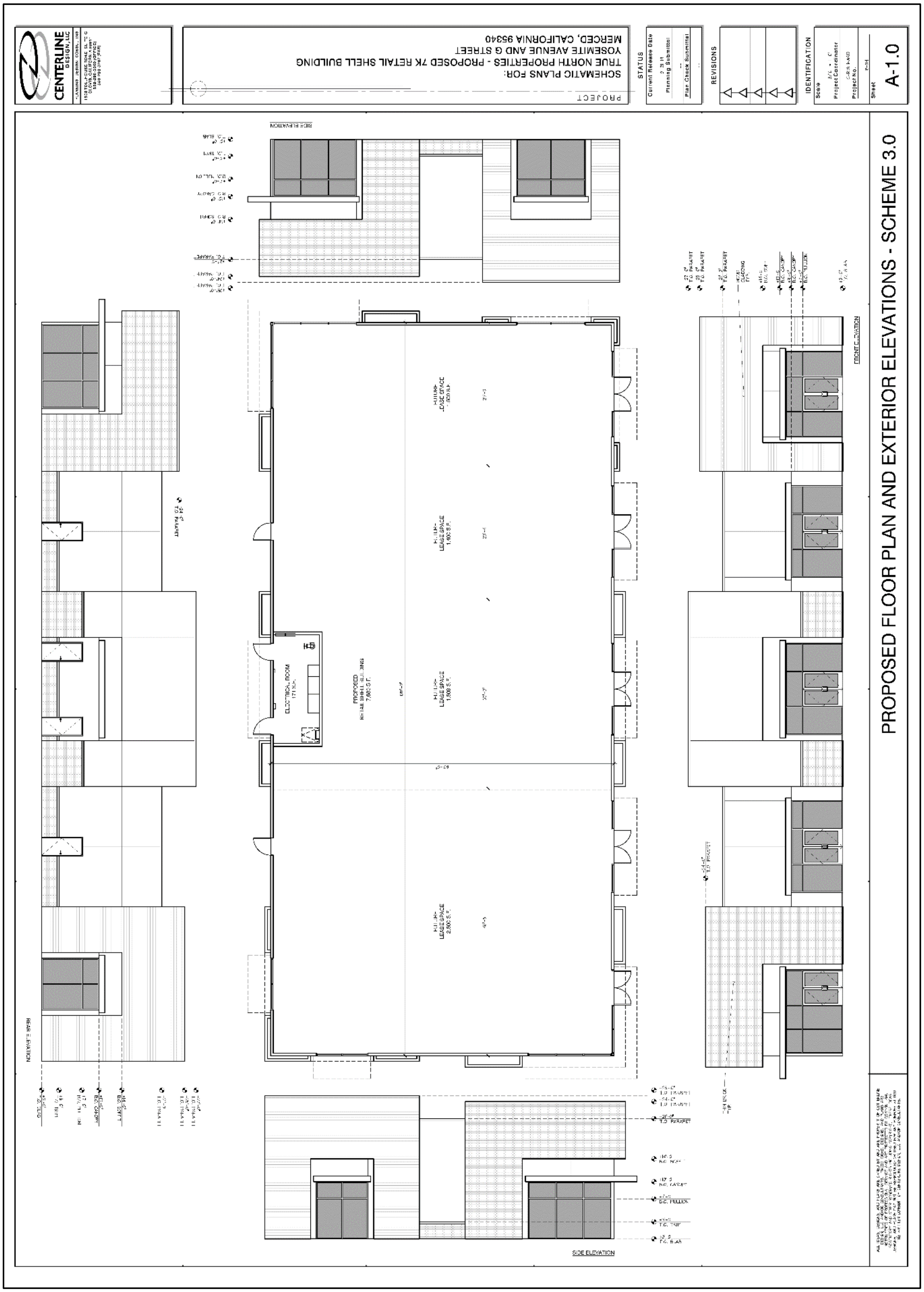


ATTACHMENT 7

Figure 5 – Rendering of Retail Buildings at corner of Yosemite and G

ATTACHMENT 7

Figure 6- Typical Elevations and Floor Plans



ATTACHMENT 7

Background

This site was previously entitled through General Plan Amendment #10-02, Revision #3 to the Northeast Yosemite Specific Plan, Zone Change #410, and Establishment of Planned Development (P-D) #72 in 2010. These items changed the General Plan designation of the 11.5-acre parcel at the northeast corner of Yosemite Avenue and G Street from High-Medium Density (HMD) Residential to Commercial Office (CO) and allowed for a curb-cut on G Street approximately 520 feet north of the intersection at G Street and Yosemite Avenue. The Planned Development was established and the zoning changed for an area including the 11.5-acre parcel at the northeast corner of Yosemite Avenue and G Street, the adjacent parcel to the north [designated High-Medium Density (HMD) Residential], and the adjacent parcel to the east (also HMD Residential).

The first phase of the Planned Development was to be the development of a commercial office center at the northeast corner of G Street and Yosemite Avenue. The second and third phases were for the adjacent residential parcels to the north and east.

The plans at the time were to develop the 11.5-acre parcel with the following uses:

Building	Use	Size
Office Building “A”	General and/or Medical Office	7,400 s.f.
Office Building “B”	General and/or Medical Office	2,540 s.f.
Office Building “B”	Fast-Food Restaurant (**no drive-thru allowed)**	2,500 s.f
Office Building “C”	General and/or Medical Office	4,800 s.f
Office Building “D”	General and/or Medical Office	4,800 s.f.
Bank	Bank	4,536 s.f.
Restaurant	Family-style Restaurant (approximately 150 seats).	7,930 s.f.
Hotel	2 or 3 story – 84 units	24,000 s.f.
Total		75,346 s.f

The southern half of the parcel to the east (northeast corner of Yosemite Avenue and the future Sandpiper Drive) was sold to the City. The remaining northern half of the parcel and the parcel north of the proposed commercial development were planned for high-medium density residential uses.

With this change, an additional environmental review (Initial Study #14-32) was prepared and also resulted in a Mitigated Negative Declaration (MND). The Mitigation Monitoring Program for Initial Study #10-06 applied to this project.

The project site was also part of General Plan Amendment #11-05, and Site Utilization Plan (SUP) Revision #1 to Planned Development (P-D) #72 in 2011. The General Plan Amendment was to allow an exception to the General Plan Policies addressing the spacing of driveways along arterial roadways (Policies T-1.3.j and T-1.3.k) and the Site Utilization Plan Revision allowed the relocation of the drainage basin previously approved for the northeast side of the parcel located at the corner of G Street and Yosemite Avenue to the newly created parcel between the future Sandpiper Avenue and Mansionette Drive, and the construction of five additional office buildings on the parcel at Yosemite Avenue and G Street.

A. INITIAL FINDINGS

A. The proposal is a project as defined by CEQA Guidelines Section 15378.

B. The project is not a ministerial or emergency project as defined under CEQA Guidelines (Sections 15369 and 15369).

C. The project is therefore discretionary and subject to CEQA (Section 15357).

D. The project is not Categorically Exempt.

E. The project is not Statutorily Exempt.

F. Therefore, an Environmental Checklist has been required and filed.

B. CHECKLIST FINDINGS

A. An on-site inspection was made by this reviewer on November 7, 2019.

B. The checklist was prepared on November 8, 2019.

C. The *Merced Vision 2030 General Plan* and its associated EIR (SCH# 2008071069) were certified in January 2012. The document comprehensively examined the potential environmental impacts that may occur as a result of build-out of the 28,576-acre Merced SUDP/SOI. For those significant environmental impacts (Loss of Agricultural Soils and Air Quality) for which no mitigation measures were available, the City adopted a Statement of Overriding Considerations (City Council Resolution #2011-63). This document herein incorporates by reference the *Merced Vision 2030 General Plan, the General Plan Program EIR* (SCH# 2008071069), and Resolution #2011-63.

As a subsequent development project within the SUDP/SOI, many potential environmental effects of the Project have been previously considered at the program level and addressed within the General Plan and associated EIR. (Copies of the General Plan and its EIR are available for review at the City of Merced Planning and Permitting Division, 678 West 18th Street, Merced, CA 95340.) As a second tier environmental document, Initial Study #19-28 plans to incorporate goals, policies, and implementing actions of the *Merced Vision 2030 General Plan*, along with mitigation measures from the General Plan EIR, as mitigation for potential impacts of the Project.

Project-level environmental impacts and mitigation measures (if applicable) have been identified through site-specific review by City staff. This study also utilizes existing technical information contained in prior documents and incorporates this information into this study. This site was included in General Plan Amendment #10-02, Revision #3 to the Northeast Yosemite Specific Plan, Zone Change #410, and Establishment of Planned Development (P-D) #72, as well as General Plan Amendment #11-05, and Site Utilization Plan (SUP) Revision #1 to Planned Development (P-D) #72.

Project-level environmental impacts have been identified through site-specific review by City staff. This study also utilizes existing technical information contained in prior documents and incorporates this information into this study.

Project-level environmental impacts have been identified through site-specific review by City staff. This study also utilizes existing technical information contained in prior documents and incorporates this information into this study.

C. ENVIRONMENTAL IMPACTS:

Will the proposed project result in significant impacts in any of the listed categories? Significant impacts are those which are substantial, or potentially substantial, changes that may adversely affect the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant. (Section 15372, State CEQA Guidelines. Appendix G of the Guidelines contains examples of possible significant effects.)

A narrative description of all "potentially significant," "negative declaration: potentially significant unless mitigation incorporated," and "less than significant impact" answers are provided within this Initial Study.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is "Less than Significant" or "Less than Significant with Mitigation Incorporated," as indicated by the checklist on the following pages.

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

DETERMINATION

On the basis of this initial evaluation:

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.

Prepared by: ______________________ 11/14/19
Michael Hren, Principal Planner
Date

Approved by: ______________________ 11/14/19
Kim Espinosa, Planning Manager
Environmental Coordinator, City of Merced
Date

Distributed for Public Review: November 14, 2019

The project site is comprised of two parcels totaling approximately 21.5 acres located at the northeast corner of East Yosemite Avenue and G Street. The site is currently vacant. The site is surrounded by urban development consisting of single-family homes to the east, Merced College to the west across G Street, Mercy Medical Center to the north, and commercial businesses to the south across Yosemite Avenue.

The site is not located within a designated scenic corridor and there are no scenic vistas visible from the site. The topography of the site is level and there are no outstanding features noted.

The proposed project would include the construction of twelve single-story buildings, four two-story buildings, and a single four-story hotel. The buildings would be dispersed throughout the site with parking surrounding the buildings (refer to the site plan at Figure 4, and proposed renderings and elevations at Figures 5 and 6, on pages 7 through 9).

The site would be enhanced with landscaping along the perimeter and between the buildings as well as parking lot trees.

Parking lot lighting and exterior building lighting would be added to the site.

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
1. <u>Aesthetics.</u> Will the project:				
a) Have a substantial adverse effect on a scenic vista?				✓
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				✓
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?			✓	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			✓	

Impact Analysis

Would the project:

a) *Have a substantial adverse effect on a scenic vista?*

The site is not designated as a scenic vista and is not located near any designated scenic vistas. Therefore, the project would not have any adverse impacts on a scenic vista and there would be **no impact**.

b) *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*

There are no officially designated State Scenic Highways or Routes in the project vicinity. Therefore, the project would have **no impact** on scenic resources, such as rock outcroppings, trees, or historic buildings within a scenic highway.

c) *If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*

The project site is located within an urbanized area with development surrounding the site. The current general plan designation for the site is split between Commercial Office (CO) and High to Medium Density Residential (HMD). The proposed General Plan Amendment would change the site to Neighborhood Commercial (C-N). With the exception of the four-story hotel, the proposed buildings would not exceed the maximum height allowed within a C-N zone when directly across from or adjacent to a residential zone (35 feet) Per Table 20.10-2 of the Zoning Ordinance. The City’s zoning ordinance does not regulate scenic quality other than building height and general aesthetics. Because the site is currently vacant and has been for many years, the development of the site would improve the aesthetic value of the site. Additionally, existing buildings in the vicinity within a quarter of a mile are between three and seven stories tall, including the Mercy Medical Center buildings and the Merced College Stadium. Based upon these buildings’ existing heights, the addition of a single four-story (approximately 50 ft.) structure would have negligible impact on the visual character of the site, and would be a **less than significant impact.**

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

The General Plan Amendment and Site Utilization Plan Revision would not create any additional source of light or glare that would affect views in the area. The construction of the mixed-use development on the site would add artificial lighting to the area. The parking areas and buildings would add artificial lighting to the site and area. However, given the fact that the site is surrounded by urban development and is currently zoned, in part, for commercial development, the impacts would be less than significant. The proposed project may result in low level, off-site light and glare from street lights, security lights, parking lot lighting and reflective material. Off-site effects depend upon the type of lighting fixtures installed and building materials used to construct the buildings. All lighting would be required to meet the California Energy Code and would be required to be shielded so it does not spillover onto adjacent properties as required by the Energy Code. The addition of lighting would be a **less than significant impact.**

2. Agriculture Resources

SETTING AND DESCRIPTION

Merced County is among the largest agriculture producing Counties in California (ranked fifth), with a gross income of more than $3.4 billion in 2017. The County's leading agriculture commodities include milk, chickens, almonds, cattle and calves, tomatoes, and sweet potatoes.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
2. Agriculture and Forestry Resources. Will the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and monitoring Program of the California Resources Agency, to non - agriculture?				✓
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				✓
c) Conflict with existing zoning for, or cause rezoning of, forest land [as defined in Public Resources Code Section 12220(g)], timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production [as defined by Government Code Section 51104(g)]?				✓
d) Result in the loss of forest land or conversion of forest land to non-forest use?				✓
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				✓

Impact Analysis

Would the project:

a) *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and monitoring Program of the California Resources Agency, to non -agriculture?*

The project site is located within the City Limits of Merced and was annexed in 1992. The California Department of Conservation prepares Important Farmland Maps through its Farmlands Mapping and Monitoring Program (FMMP). The system of classifying areas is based on soil type and use. According to the 2018 Merced County Important Farmlands Map, the site is classified as "Farmland of Local Importance" (Figure 7A). Therefore, the proposed General Plan Amendment, Zone Change, and Conditional Use Permit would not have any effect on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The proposed project would not affect protected farmland and there would be **no impact.**

b) *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*

There are no Williamson Act contract lands in this area. Therefore, there is **no impact.**

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

There is no forest land or timberland on the site. The project would not conflict with any zoning or plan for forest land or timberland. Therefore, **there is no impact**.

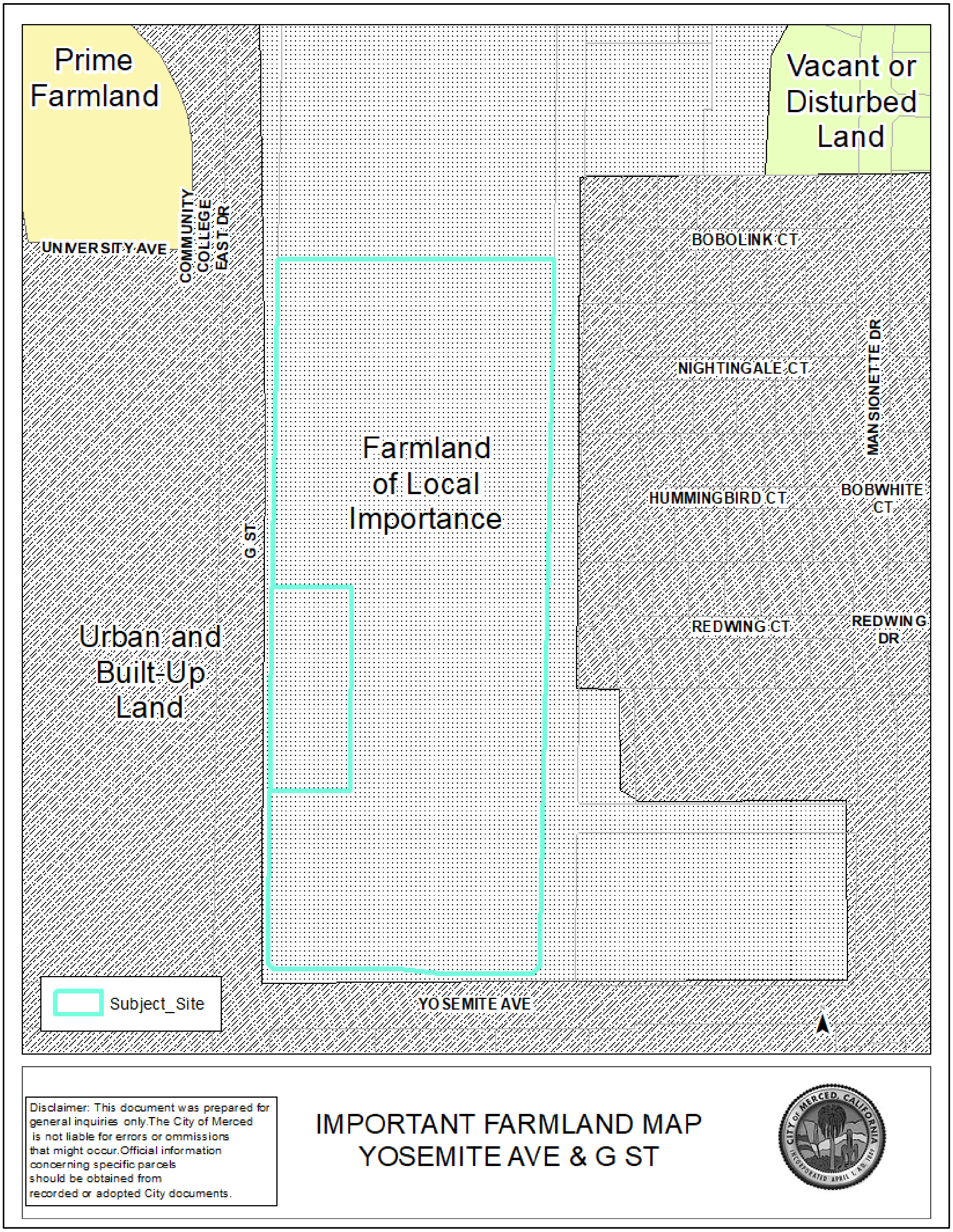
d) *Result in the loss of forest land or conversion of forest land to non-forest use?*

There is no forest land on the site. **No impact.**

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?*

The nearest land being used for farming is to the west, being used by Merced College for agricultural education purposes. The proposed development would not cause the use of this land to change. Therefore, there is **no impact.**

Figure 7A - Important Farmland Map



3. Air Quality

SETTING AND DESCRIPTION

The San Joaquin Valley Air Pollution Control District (SJVAPCD) will review the project to assess the impact to air quality and to establish acceptable mitigation measures. Hence, the City recognizes that additional mitigation measures may be applied to subsequent phases of the development of this area. While the action of the SJVAPCD is independent of City reviews and actions, their process allows the City to review proposed mitigation measures that could affect project design and operation. Any proposed changes are subject to approval by the City.

The project is located in the San Joaquin Valley Air Basin (SJVAB), which occupies the southern half of the Central Valley and is approximately 250 miles in length and, on average, 35 miles in width. The Coast Range, which has an average elevation of 3,000 feet, serves as the western border of the SJVAB. The San Emigdio Mountains, part of the Coast Range, and the Tehachapi Mountains, part of the Sierra Nevada, are both located to the south of the SJVAB. The Sierra Nevada extends in a northwesterly direction and forms the eastern boundary of the SJVAB. The SJVAB is basically flat with a downward gradient to the northwest.

The climate of the SJVAB is strongly influenced by the presence of these mountain ranges. The mountain ranges to the west and south induce winter storms from the Pacific to release precipitation on the western slopes, producing a partial rain shadow over the valley. A rain shadow is defined as the region on the leeward side of the mountain where precipitation is noticeably less because moisture in the air is removed in the form of clouds and precipitation on the windward side. In addition, the mountain ranges block the free circulation of air to the east, resulting in the entrapment of stable air in the valley for extended periods during the cooler months.

Winter in the SJVAB is characterized as mild and fairly humid, and the summer is hot, dry, and cloudless. During the summer, a Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind.

For additional information, please refer to the Air Quality Analysis prepared by LSA found at Appendix A.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
3. Air Quality. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				✓
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?			✓	
c) Expose sensitive receptors to substantial pollutant concentrations?		✓		
d) Create objectionable odors affecting a substantial number of people?			✓	

Impact Analysis

Would the project:

a) *Conflict with or obstruct implementation of the applicable air quality plan?*

Per the Air Quality Analysis found at Appendix A, the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, there would be **no impact.**

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?*

Per the Air Quality Analysis found at Appendix A, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant. Therefore, this impact is considered **less than significant.**

c) *Expose sensitive receptors to substantial pollutant concentrations?*

Construction of the proposed project may expose surrounding sensitive receptors to airborne particulates, as well as a small quantity of construction equipment pollutants (i.e., usually diesel-fueled vehicles and equipment). As shown in Table 10 of the Air Quality Analysis found at Appendix A, construction emissions associated with the project would not exceed the SJVAPCD's thresholds for ROG, NO_x, CO, SO_x, $PM_{2.5}$, or PM_{10} emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measure for dust control during construction. These control measures are intended to reduce the amount of PM_{10} emissions during the construction period. Implementation of mitigation measure AIR-1 would ensure that the proposed project complies with Regulation VIII and further reduces the short-term construction period air quality impacts.

Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. Exposure from diesel exhaust associated with construction activity contributes to both cancer and chronic non-cancer health risks. According to the SJVAPCD, a project would result in a significant impact if it would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 20.0 in one million or an increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute).

As shown in Table 12 of the Air Quality Analysis found at Appendix A, the risk of unmitigated inhalation health risks from project construction to off-site receptors for carcinogenic inhalation health risk would be 45.3 in one million, which would exceed the SJVAPCD cancer risk threshold of 10 in one million. The highest chronic hazard index would be 0.041, which would not exceed the threshold of 1.0. Implementation of Mitigation Measure AIR-2 would be required to reduce substantial pollutant concentrations during project construction and would reduce this impact of the project to a less-than-significant level. As shown in Table 13, the risk with implementation of Mitigation Measure AIR-2 would be 8.8 in one million, which would not exceed the SJVAPCD cancer risk of 10 in one million threshold. Therefore, with implementation of Mitigation Measure AIR-2, construction of the project would not exceed SJVAPCD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations.

In addition, once the proposed project is constructed, the project would not be a significant source of long-term operational emissions. All gasoline dispensing operations associated with the project would be subject to SJVAPCD Rule 4622 which would limit emissions of gasoline vapors from the transfer of gasoline into motor vehicle fuel tanks. Therefore, with implementation of Mitigation Measure AIR-2, the proposed project would not expose sensitive receptors to substantial pollutant concentrations.

Compliance with these mitigation measures would reduce this impact to **less than significant with mitigation.**

<u>Mitigation Measures:</u>

AIR-1) Consistent with SJVAPCD Regulation VIII (Fugitive PM10 Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.

- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.

- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.

- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.

- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. (The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.)

- Following the addition of materials to, or the removal of materials from, the surface of out-door storage piles, said piles shall be effectively stabilized of fugitive dust emission utilizing sufficient water or chemical stabilizer/suppressant.

AIR-2) The project contractor shall ensure all off-road diesel-powered construction equipment of 50 horsepower or more used for the project meet the California Air Resources Board (CARB) Tier 2 with a Level 3 Diesel Particulate Filter emissions standards or equivalent.

d) *Create objectionable odors affecting a substantial number of people?*

During construction, the various diesel powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and are not likely to be noticeable for extended periods of time beyond the project site. The potential for diesel odor impacts is therefore considered less than significant. In addition, the proposed residential and commercial uses are not expected to produce any offensive odors that would result in frequent odor complaints. All gasoline dispensing operations associated with the project would be subject to SJVAPCD Rule 4622 which would limit emissions of gasoline odors from the transfer of gasoline into motor vehicle fuel tanks. Additionally, the siting of the proposed gas station at the west side of the property makes the possibility of odors reaching the residential properties to the east unlikely. With G Street between the subject site and Merced College to the west, the potential impact of odors on the College is similarly unlikely. The proposed project would not create objectionable odors affecting a substantial number of people during project construction or operation, and this impact is considered **less than significant.**

4. Biological Resources

SETTING AND DESCRIPTION

The plan area is located in the Central California Valley eco-region. This eco-region is characterized by flat, intensively farmed plains with long, hot dry summers and cool, wet winters (14-20 inches of precipitation per year). The Central California Valley eco-region includes the Sacramento Valley to the north and the San Joaquin Valley to the south and it ranges between the Sierra Nevada Foothills to the east to the Coastal Range foothills to the west. Nearly half of the eco-region is actively farmed, and about three fourths of that farmed land is irrigated.

The biological resources evaluation, prepared as part of the *Merced Vision 2030 General Plan Program Environmental Impact Report* (EIR), does not identify the project site as containing any seasonal or non-seasonal wetland or vernal pool areas. Given the adjacent, built-up, urban land uses and major roadways, no form of unique, rare or endangered species of plant and/or animal life could be sustained on the subject site.

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
4. Biological Resources. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?		✓		
b) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			✓	
c) Conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?				✓
d) Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				✓
e) Conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?				✓
f) *Conflict with the provisions of an adopted Habitat Conservation plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*				✓

Impact Analysis

Would the project:

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

The proposed project would not have any direct effects on animal life by changing the diversity of species, number of species, reduce any rare or endangered species, introduce any new species, or deteriorate existing fish or wildlife habitat. Although the *Merced Vision 2030 General Plan* identifies several species of plant and animal life that exist within the City's urban boundaries, the subject site, which is surrounded by developed urban uses, does not contain any rare or endangered species of plant or animal life.

A biological resources inventory was prepared as part of the environmental review for the annexation of this area. Cross-referencing the list of wildlife present on the entirety of the site at that time with the Special Animals List from the California Natural Diversity Database (CNDD), August 2019 version, the only animals to be on both lists were the White-tailed Kite and Black-tailed Jack Rabbit. However, the CNDD list specifies the San Diego black-tailed Jack Rabbit, which according to the San Diego Management & Monitoring Program ranges from the Los Padres National Forest southward and west of the peninsular range into northwestern Baja California, Mexico. Based on this range, it is unlikely that the San Diego Black-tailed Jack Rabbit is present in the subject site. Additionally, the potential presence of the White-tailed Kite on the site in the modern environment is unlikely. The environmental report indicated that "these raptors perch (and some may nest) in the trees on the project site." At the time of the report, the site contained several rows of trees that are no longer present, making perching and nesting activities significantly reduced from the time of the original report. There are very few remaining trees on the site.

The report provided two mitigation measures that are applicable to this site. Based on this information, with continued practice of the mitigation measures, the project will not have a substantial adverse effect, either directly or through habitat modification on any species identified as a candidate, sensitive, or special status species. This impact would be **less than significant with mitigation.**

Mitigation Measures:

BIO-1) Impacts of the proposed project upon vegetation and wildlife habitat can be mitigated by preserving as many of the existing trees as possible (if any still exist) and incorporating them into the proposed project. The Cottonwood trees have the greatest wildlife habitat value, although they are generally less visually attractive and in poorer condition than either the Olive trees or the Eucalyptus trees. However, in spite of appearances, a Cottonwood, even in poor condition, provides good wildlife habitat.

Impacts to wildlife habitat can also be reduced by using native plant materials in landscaping to the greatest extent possible. Native plant species provide the best wildlife habitat since native vegetation has co-evolved with the wildlife and affords food sources for which wildlife is best adapted. Native species cannot always be used to produce the desired form and floral characteristics, but some native species can usually be incorporated.

Goal Area OS-1: Open Space for the Preservation of Natural Resources	
Policies:	
OS-1.1	Identify and mitigate impacts to wildlife habitats which support rare, endangered, or threatened species.

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 U.S. Fish and Wildlife Service?*

The proposed project would not have any direct effects on riparian habitat or other sensitive natural community. The City General Plan identifies Bear, Black Rascal, Cottonwood, Miles, Fahrens, and Owens Creeks within the City's growth area. The subject site is not located adjacent to any of these areas or any water way. Additionally, mitigation measures were adopted in the environmental review for annexation of this area, for project sites that abut Cottonwood Creek and the Sells Lateral Irrigation Channel. Because this project site abuts neither the creek nor the irrigation channel, these mitigation measures are not applicable to this project. Therefore, the project would have a **less than significant impact** on riparian habitat.

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*

The project site would not have any direct effect on wetlands as no wetlands have been identified in this area. The area surrounding the subject site has been modified from its original state and is developed with urban uses. There is **no impact.**

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?*

The project would not have any adverse effects on any resident or migratory fish or wildlife species or with established native resident migratory wildlife corridor, or impede the use of native wildlife nursery sites. There is **no impact.**

e) *Conflict with any local policies or ordinance protecting biological resources, such as a tree preservation policy or ordinance?*

The proposed project would not conflict with local policies and/or ordinances protecting biological resources. There are few remaining trees present on the site. The City's General Plan does not identify this site as being a biological resource. Therefore, there is **no impact.**

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

The proposed project would not have any effects on a habitat conservation plan. There are no adopted habitat conservation plans, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan for the City of Merced or Merced County. There is **no impact.**

5. Cultural Resources

SETTING AND DESCRIPTION

The City of Merced area lies within the ethnographic territory of the Yokuts people. The Yokuts were members of the Penutian language family which held all of the Central Valley, San Francisco Bay Area, and the Pacific Coast from Marin County to near Point Sur.

Merced County was first explored by Gabriel Moraga in 1806, when he named the Merced River, "El Rio de Nuestra Senra de la Merced." Moraga's explorations were designed to locate appropriate sites for an inland chain of missions. Moraga explored the region again in 1808 and 1810.

Archaeology

Archaeological sites are defined as locations containing significant levels of resources that identify human activity. Very little archaeological survey work has been conducted within the City or its surrounding areas. Creeks, drainage, and sloughs exist in the northern expansion area of the City, and Bear Creek and Cottonwood Creek pass through the developed area. Archaeological sites in the Central Valley are commonly located adjacent to waterways and represent potential for significant archaeological resources.

Paleontological sites are those that show evidence of pre-human existence. Quite frequently, they are small outcroppings visible on the earth's surface. While the surface outcroppings are important indications of paleontological resources, the geologic formations are the most important. There are no known sectors within the project area known to contain sites of paleontological significance.

Historic Resources

In 1985, in response to community concerns over the loss of some of the City's historic resources, and the perceived threats to many remaining resources, a survey of historic buildings was undertaken in the City. The survey focused on pre-1941 districts, buildings, structures, and objects of historical, architectural, and cultural significance. The survey area included a roughly four square-mile area of the central portion of the City.

The National Register of Historic Places, the California Historical Landmarks List, and the California Inventory of Historic Resources identify several sites within the City of Merced. These sites are listed on the Merced Historical Site Survey and maintained by the Merced Historical Society. There are no listed historical sites on the Project site.

According to the environmental review conducted for the annexation of this area, there are no listed historical sites and no known sectors within the project area known to contain sites of paleontological or archeological significance. However, mitigation measures were adopted to ensure proper steps are taken in the event evidence of archeological artifacts area discovered during construction.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5. Cultural Resources. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		✓		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		✓		
c) Disturb any human remains, including those interred outside of formal cemeteries?		✓		

Impact Analysis

Would the project:

a) *Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?*

The project would not alter or destroy any historic archaeological site, building, structure, or object, nor would it alter or affect unique ethnic cultural values or restrict religious or sacred uses.

As a part of the annexation to the City of Merced that these parcels were a part of, Marcus Arguelles of the Merced College Archaeology Department was contracted to conduct limited subsurface testing on the area of the Northeast Specific Plan. A series of ten auger test units was laid out and ascertained that no cultural materials were observed in the course of conducting the auger testing. Additionally, the texture and color of the soil from each unit did not exhibit any of the properties of an anthrosoil. The test concluded that the possibility of buried archaeological deposits in the area are minimal.

An earlier study related to the same project noted that ground contours and the presence of hydrologic features suggested that three loci may yield significant prehistoric material. Locus 1 and Locus 2 were both in the vicinity of the Cottonwood Creek, which is outside the subject site for this project. Locus 3 was noted to be, "located in the southerly portion of the site. It is highly possible that deeply buried subsurface deposits could yield significant artifactural material in this area." While the locus is never fully shown on a map or described with greater locational detail, the subject site is in the southerly portion of the Northeast Specific Plan. While it is unclear where the potential locus precisely resides, an additional thirty years of inattention and laying vacant have reduced the likelihood that valuable cultural materials will be found even further. Adhering to Mitigation Measure CUL-1 reduces the danger to cultural resources to less than significant.

Additionally, a cultural resources records search was conducted by the Central California Information Center (CCIC) at California State University, Stanislaus as part of the City's General Plan update. No historic resources were found at or near the project site. The impact of this project would be less than significant. However, as part of the Environmental

Impact Report prepared for this site as part of the annexation process, mitigation measures were applied to ensure no cultural resources would be disturbed. Since the creation of that Environmental Impact Report, the standard for these mitigation measures has changed, as reflected in Mitigation Measure CUL-1, CUL-2, and CUL-3. This project would be required to comply with those mitigation measures. Compliance with these mitigation measures would reduce this impact to **less than significant with mitigation.**

Mitigation Measures:

CUL-1) If unknown pre-contact or historic-period archaeological materials are encountered during project activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations.

Cultural resources materials may include pre-contact resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock, as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations shall be required to mitigate adverse impacts from project implementation. These additional studies may include, but are not limited to, recordation, archaeological excavation, or other forms of significance evaluations.

The applicant shall inform its contractor(s) of the sensitivity of the project site for archaeological deposits, and include the following directive in the appropriate contract documents:

"The subsurface of the construction site is sensitive for archaeological deposits. If archaeological deposits are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist shall assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any archaeological materials. Archaeological deposits can include, but are not limited to, shellfish remains; bones, including human remains; and tools made from, obsidian, chert, and basalt; mortars and pestles; historical trash deposits containing glass, ceramics, and metal artifacts; and structural remains, including foundations and wells."

The City shall verify that the language has been included in the grading plans prior to issuance of a grading permit or other permitted project action that includes ground-disturbing activities on the project site.

b) *Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?*

The project would not alter or destroy any prehistoric archaeological site, building, structure, or object, nor would it alter or affect unique ethnic cultural values or restrict religious or sacred uses.

A cultural resources records search was conducted by the Central California Information Center (CCIC) at California State University, Stanislaus as part of the City's General Plan update. No archeological resources were found at or near the project site. Therefore, this impact would be **less than significant with mitigation**.

Mitigation Measure:

CUL-2) Implementation of Mitigation Measure CUL-1.

c) *Disturb any human remains, including those interred outside of formal cemeteries?*

Disturbance of human remains interred outside of formal cemeteries would result in a significant impact. If human remains are identified during project construction, Section 7050.5 of the California Health and Safety Code and Section 5097.98 of the Public Resources Code shall apply, appropriate. Therefore, implementation of Mitigation Measure CUL-3 reduce potential impacts to human remains to **less than significant with mitigation.**

Mitigation Measure:

CUL-3) If human remains are identified during construction and cannot be preserved in place, the applicant shall fund: 1) the removal and documentation of the human remains from the project corridor by a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology; 2) the scientific analysis of the remains by a qualified archaeologist, should such analysis be permitted by the Native American Most Likely Descendant; and, 3) the reburial of the remains, as appropriate. All excavation, analysis, and reburial of Native American human remains shall be done in consultation with the Native American Most Likely Descendant, as identified by the California Native American Heritage Commission.

6. Energy

SETTING AND DESCRIPTION

Appendix F (Energy Conservation) of the CEQA Guidelines provides that potentially significant energy implications of a project must be considered in an EIR, with particular emphasis on avoiding or reducing the inefficient, wasteful and unnecessary consumption of energy. As such, this discussion considers the proposed Project's consumption of energy resources, particularly electricity, natural gas, and transportation fuels, during both the project's construction and operational phases.

The proposed mixed use project would be built to meet the California Energy Code requirements and may include the installation of solar panels. Additionally, the project would provide bicycle parking and promote the use of active transportation and public transit to help reduce energy consumed for transportation. The site is located within ¼-mile of a transit stop. The project would incorporate recycling procedures for the disposal of recyclable materials in accordance with the City's recycling ordinance and AB 341.

According to data from the U.S. Energy Information Administration, apartment buildings with 5 or more units typically use less energy than other home types. Households in apartment buildings with 5 or more units use approximately 50% less energy as other types of homes. The lower energy consumption can be attributed, in part to smaller living spaces and units being bordered by other units or common areas which reduces exposure to outside temperatures and the number of windows in the unit.

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

Impact Analysis

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

The project is not expected to result in potentially significant impacts due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation. The project would be constructed on an in-fill lot that has access to existing electrical and telecommunications services. No new transportation, electrical, or telecommunications facilities are required to support the project leading to unnecessary consumption of energy resources. Compliance with the California Green Building Standards Code, AB 341- Solid Waste Diversion, and the San Joaquin Valley Air Pollution Control District standards during construction and operation of the project will further ensure the efficient consumption of energy resources. Implementation of these regulations would reduce impacts to **less than significant with mitigation.**

Mitigation Measure:

ENE-1) The applicant shall comply with all applicable California Energy Code, AB 341, and San Joaquin Valley Air Pollution Control District rules and regulations regulating energy efficiency and waste.

b) *Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*

With the implementation of the regulations described in item “a” above, the proposed project would not conflict with a state or local plan for renewable energy or energy efficiency. This impact is **less than significant with mitigation.**

ENE-2) Implementation of Mitigation Measure ENE-1.

7. Geology and Soils

SETTING AND DESCRIPTION

The City of Merced is located approximately 150 miles southeast of San Francisco along the west side of the southern portion of the Great Valley Geomorphic Province, more commonly referred to as the San Joaquin Valley. The valley is a broad lowlands bounded by the Sierra Nevada to the east and Coastal Ranges to the west. The San Joaquin Valley has been filled with a thick sequence of sedimentary deposits of Jurassic to recent age. A review of the geologic map indicates that the area around Merced is primarily underlain by the Pleistocene Modesto and Riverbank Formations with Holocene alluvial deposits in the drainages. Miocene-Pliocene Mehrten and Pliocene Laguna Formation materials are present in outcrops on the east side of the SUDP/SOI. Modesto and Riverbank Formation deposits are characterized by sand and silt alluvium derived from weathering of rocks deposited east of the SUDP/SOI. The Laguna Formation is made up of consolidated gravel sand and silt alluvium and the Mehrten Formation is generally a well consolidated andesitic mudflow breccia conglomerate.

Faults and Seismicity

A fault, or a fracture in the crust of the earth along which rocks on one side have moved relative to those on the other side, is an indication of past seismic activity. It is assumed that those that have been active recently are the most likely to be active in the future, although even inactive faults may not be "dead." "Potentially Active" faults are those that have been active during the past two million years or during the Quaternary Period. "Active" faults are those that have been active within the past 11,000 years. Earthquakes originate as movement or slippage occurring along an active fault. These movements generate shock waves that result in ground shaking.

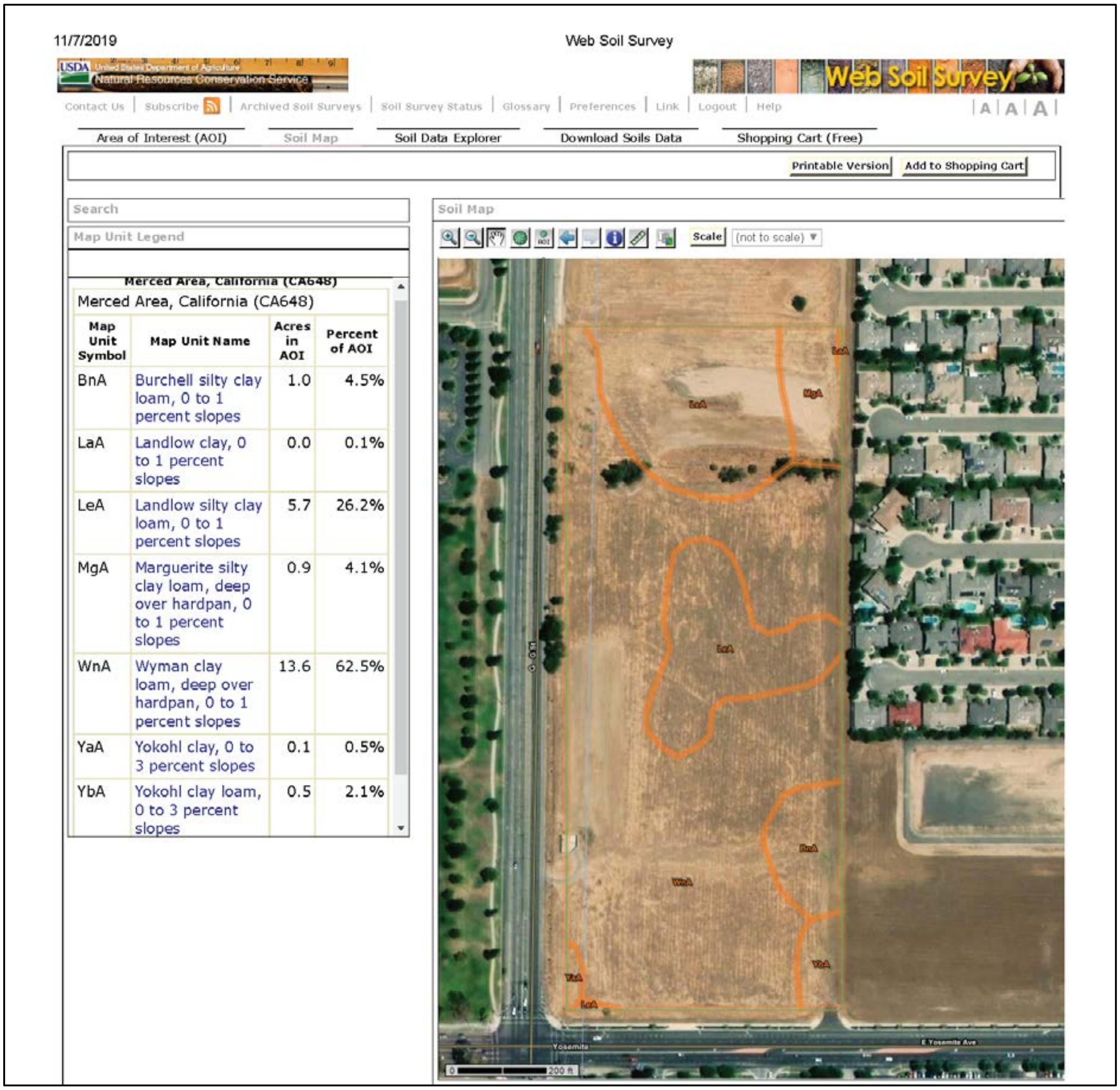
Based on review of geologic maps and reports for the area, there are no known active or potentially active faults, or Alquist-Priolo Earthquake Fault Zones (formerly referred to as a Special Studies Zone) in the SUDP/SOI. In order to determine the distance of known active faults within 50 miles of the Site, the computer program EZ-FRISK was used in the General Plan Update.

Soils

According to the USDA Natural Resources Conservation Service website, the soil on the site includes the soils in the table and map found at Figure 7B. Soil properties can influence the development of building sites, including site selection, structural design, construction, performance after construction, and maintenance. Soil properties that affect the load-supporting capacity of an area include depth to groundwater, ponding, flooding, subsidence, shrink-swell potential, and compressibility.

The City of Merced regulates the effects of soils and geological constraints primarily through the enforcement of the California Building Code (CBC), which requires the implementation of engineering solutions for constraints to development posed by slopes, soils, and geology.

Figure 7B – Soil Survey



Merced Area, California (CA648)

Merced Area, California (CA648)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BnA	Burchell silty clay loam, 0 to 1 percent slopes	1.0	4.5%
LaA	Landlow clay, 0 to 1 percent slopes	0.0	0.1%
LeA	Landlow silty clay loam, 0 to 1 percent slopes	5.7	26.2%
MgA	Marguerite silty clay loam, deep over hardpan, 0 to 1 percent slopes	0.9	4.1%
WnA	Wyman clay loam, deep over hardpan, 0 to 1 percent slopes	13.6	62.5%
YaA	Yokohl clay, 0 to 3 percent slopes	0.1	0.5%
YbA	Yokohl clay loam, 0 to 3 percent slopes	0.5	2.1%

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
7. <u>Geology and Soils.</u> Would the project:				
a) Expose people or structures to 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?			✓	
ii) Strong seismic ground shaking?			✓	
iii) Seismic-related ground failure, including liquefaction?			✓	
iv) Landslides?			✓	
b) Result in substantial soil erosion or 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 risks to life or property?			✓	
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?			✓	
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			✓	

Impact Analysis

Would the project:

a) *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:*

   i) *Strong seismic ground shaking?*

   ii) *Strong seismic ground shaking?*

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

   iv) *Landslides?*

The project site is not located within a mapped fault hazard zone, and there is no record or evidence of faulting on the project site (City of Merced General Plan Figure 11.1). Because no faults underlie the project site, no people or structures would be exposed to substantial adverse effects related to earthquake rupture, and no impact would result from the project.

Ground shaking of moderate severity may be expected to be experienced on the project site during a large seismic event. All building permits are reviewed to ensure compliance with the California Building Code (CBC). In addition, the City enforces the provisions of the Alquist Priolo Special Study Zones Act that limits development in areas identified as having special seismic hazards. All structures shall be designed and built in accordance with the standards of the California Building Code. Pursuant to CEQA §15162, the project will not create any impacts that warrant additional environmental documentation over and above the impacts addressed in the City's General Plan EIR.

The project **may** expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. According to the City's *Merced Vision 2030 General Plan EIR*, the probability of soil liquefaction occurring within the City of Merced is considered to be a low to moderate hazard; however, detailed geotechnical engineering investigation required in compliance with the California Building Code (CBC) would be required for the project.

APPLICABLE GENERAL PLAN GOALS AND POLICIES:

The City's *Merced Vision 2030 General Plan* contains policies that address seismic safety.

Goal Area S-2: Seismic Safety:	
Goal **Reasonable Safety for City Residents from the Hazards of Earthquake and Other Geologic Activity**	
Policies	
S-2.1	Restrict urban development in all areas with potential ground failure characteristics.

The project would not expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Landslides generally occur on slopes of 15 percent or greater. The project site's topography is generally of slopes between 0 and 3 percent, which are considered insufficient to produce hazards other than minor sliding during seismic activity.

These impacts are considered **less than significant.**

b) *Result in substantial soil erosion or loss of topsoil?*

Construction of the proposed project could result in temporary soil erosion and the loss of top soil due to construction activities, including clearing, grading, site preparation activities, and installation of the proposed drainage and on-site sewer and water systems. Construction activities disturbing one or more acres are required by the State Water Resources Board (SWRCB) to obtain a General Construction Activity Stormwater Permit, which would require the proposed project to implement a Storm Water Pollution Prevention Plan (SWPPP). Project compliance with SWRCB and the City of Merced regulations to avoid erosion siltation effects would reduce this impact to **less than significant with mitigation**.

Mitigation Measures:

GEO-1) The project shall comply with all requirements of the State Water Resources Board (SWRCB) and obtain a General Construction Activity Stormwater Permit.

GEO-2) The project shall comply with all applicable mitigation measures for Environmental Review #10-06 (Appendix C).

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?*

The City of Merced is located in the Valley area of Merced County and is therefore less likely to experience landslides than other areas in the County. The probability of soil liquefaction actually taking place anywhere in the City of Merced is considered to be a low hazard. Soil types in the area are not conducive to liquefaction because they are either too coarse or too high in clay content. According to the *Merced Vision 2030 General Plan* EIR, no significant free face failures were observed within the SUDP/SOI and the potential for lurch cracking and lateral spreading is, therefore, very low within the SUDP/SOI area. This impact is **less than significant.**

d) *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?*

Expansive soils are those possessing clay particles that react to moisture changes by shrinking (when they dry) or swelling (when they become wet). Expansive soils can also consist of silty to sandy clay. The extent of shrinking and swelling is influenced by the environment, extent of wet or dry cycles, and by the amount of clay in the soil. This physical change in the soils can react unfavorably with building foundations, concrete walkways, swimming pools, roadways, and masonry walls.

Implementation of General Plan Policies, adherence to the Alquist-Priolo Act, and enforcement of the California Building Code (CBC) Standards would reduce this impact to **less than significant.**

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?*

The EIR prepared for the City's *Merced Vision 2030 General Plan* states the following:

"According to the Geologic, Geohazards and Environmental Health Hazards Evaluation Report (Geocon Consultants, Inc.), the soils in the SUDP/SOI are not generally considered to be expansive, have a generally low to moderate erosion potential, and are generally considered suitable for wastewater disposal using conventional septic systems."

However, no new septic systems are allowed in the City and any future construction on the site will be required to connect to the City's sewer system. Based on this evaluation, this impact is **less than significant.**

f) *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*

The proposed project would be located on an in-fill site. The site has been used for previously altered from its native state. Therefore, this impact would be **less than significant.**

8. Greenhouse Gas Emissions

SETTING AND DESCRIPTION

The issue of project-generated Greenhouse Gas (GHG) Emissions is a reflection of the larger concern of Global Climate Change. While GHG emissions can be evaluated on a project level, overall, the issue reflects a more regional or global concern. CEQA requires all projects to discuss a project's GHG contributions. However, from the standpoint of CEQA, GHG impacts on global climate change are inherently cumulative. The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, it can safely be assumed that existing conditions do not measurably contribute to a noticeable incremental change in the global climate.

The project applicant provided a Greenhouse Gas study as a part of the Air Quality and Greenhouse Gas Analysis (Appendix A). Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO2, CH4, and N2O. Furthermore, CH4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that construction of the proposed project would generate approximately 2,138.3 metric tons of CO2e. Table 14 of Appendix A lists the annual GHG emissions for each construction phase. Implementation of the Mitigation Measure AIR-1 (see Section 3, Air Quality, above) would reduce GHG emissions by reducing the amount of construction vehicle idling and by requiring the use of properly maintained equipment.

Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle trips), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the project. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment. Operational GHG emissions were estimated using CalEEMod and the results are presented in Table 15 of Appendix A.

THRESHOLDS OF SIGNIFICANCE

The proposed project would result in a significant impact on the environment if it would:

- Generate GHG emissions either directly or indirectly, that may have a significant impact on the environment;
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
8. <u>Greenhouse Gas Emissions.</u> Would the project:				
a) Generate greenhouse gas emission, either directly or indirectly, that may have a significant impact on the environment?			✓	
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?			✓	

Impact Analysis

Would the project:

a) *Generate greenhouse gas emission, either directly or indirectly, that may have a significant impact on the environment?*

The project would generate 4,726.6 metric tons of CO2e per year. The City of Merced Climate Action Plan (CAP) is considered a qualified GHG reduction plan and includes a performance-based development approach that includes the measures in the CAP that apply to new development projects. Therefore, the proposed project's GHG emissions would not be considered a significant impact if the proposed project would be consistent with the PCAP. Although the proposed project would likely implement many of the measures the PCAP has included, the exact selections and corresponding total percent reduction cannot be determined. The CAP states that new projects that do not comply with the CAP measures or the UDM, may elect to conduct a quantitative analysis of GHG emissions. Because the project would begin operations in the post-2020 timeframe, the City's 2020 reduction targets would not apply. Therefore, to be conservative, this analysis evaluates the proposed project's potential GHG emissions based on the City's CAP provisional 2030 target of approximately 38 percent below 2008 baseline levels.

Table 16 of Appendix A provides a comparison of the estimated metric tons of CO2e per year emissions from the project's operational activities in 2008 and 2030. As provided in Table 16, the project's estimated annual GHG emissions would be approximately 12,426.0 metric tons of CO2e under 2008 BAU conditions and 6,919.1 metric tons of CO2e in 2030 for project operations. This represents a 49 percent decrease in emissions, which meets the City's provisional 2030 target of approximately 38 percent below 2008 baseline levels.

In addition, the project, and vehicles traveling to the project site, would implement several measures required by State regulations to reduce GHG emissions, including the following:

- Pavley II (LEV III) Advanced Clean Cars Program;
- 2016 California Green Building Code Standards;
- Renewable Portfolio Standard;
- California Model Water Efficient Landscape Ordinance; and
- CalRecycle Waste Diversion and Recycling Mandate.

The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. The California Green Building Code Standards reduce GHGs by including a variety of different measures, including reduction of construction waste, wastewater, water use, and building energy use. The 2019 Building Energy Efficiency Standards, which will take effect on January 1, 2020, were included in the CalEEMod analysis and are anticipated to reduce energy use by 30 percent compared to the 2016 standards, representing a substantial reduction compared to 2008 levels. The Renewable Portfolio Standard requires electricity purchased for use at the project site to be composed of at least 33 percent renewable energy by 2020. The Water Efficient Landscape Ordinance will reduce outdoor water use by 20 percent and the CalRecycle Waste Diversion and Recycling Mandate will reduce solid waste production by 25 percent.

Implementation of these measures is expected to allow the State to achieve AB 32 emission targets by 2020. The proposed project would not be operational until 2022; however, SB 32, signed in 2016, effectively establishes a new GHG reduction goal for Statewide emissions of 40 percent below 1990 levels by 2030. Therefore, operation of the proposed project would be consistent with the SB 32 goal. Therefore, at this time no additional regulations are required from new development beyond those already established by the State to achieve the AB 32 and SB 32 targets. Therefore, the BAU analysis that indicates that the project would achieve the reductions required by regulations to meet the AB 32 and SB 32 targets and demonstrates that the project's GHG emissions would not be significant.

Therefore, GHG emissions from the proposed project would be **less than significant**.

b) *Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*
The SJVAPCD has adopted a Climate Change Action Plan (CCAP), which includes suggested Best Performance Standards (BPS) for proposed development projects. Appendix J of the SJVAPCD Final Staff Report for the CCAP contains GHG reduction measures that would be applicable to the proposed project. The proposed project's consistency with these measures is included in Table 17 of the Air Quality and Greenhouse Gas Analysis, shown at Appendix A. As shown in Table 17, the project would be consistent with the CCAP measures.

Absent any other local or regional Climate Action Plan, the proposed project was analyzed for consistency with the CARB's adopted Scoping Plan. The proposed project would be consistent with the Scoping Plan measures, including the following.

- California Light-Duty Vehicle Greenhouse Gas Standards. The standards would be applicable to light-duty vehicles that would access the project site.

- Energy Efficiency. The project would increase its energy efficiency through compliance with the new Title 24 standards.

- Low Carbon Fuel Standard. Vehicles that access the project site would comply with the standard, by way of consuming transportation fuel that will meet the goal of a 10 percent reduction in carbon intensity by 2020.

- Recycling and Waste. The project would contribute toward a Statewide reduction in waste by utilizing the City of Clovis recycling services, which have consistently exceeded State recycling mandates.

Based on Table 17 and the discussion above, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions and impacts would be **less than significant.**

9. Hazards and Hazardous Materials

SETTING AND DESCRIPTION

Hazardous Materials

A substance may be considered hazardous due to a number of criteria, including toxicity, ignitability, corrosivity, or reactivity. The term "hazardous material" is defined in law as any material that, because of quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment.

Wildland and Urban Fire Hazards

Both urban and wildland fire hazard potential exists in the City of Merced and surrounding areas, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. Wildland fires affect grassland, brush or woodlands, and any structures on or near these fires. Such fires can result from either human made or natural causes.

Urban fires comprise the majority of fires in the City of Merced while the potential for wildland fires could increase as large blocks of undeveloped land are annexed into the City. Most of the fires are caused by human activities involving motor vehicles, equipment, arson, and burning of debris.

Airport Safety

The City of Merced is impacted by the presence of two airports-Merced Regional Airport, which is in the southwest corner of the City, and Castle Airport (the former Castle Air Force Base), located approximately eight miles northwest of the subject site.

The continued operation of the Merced Regional Airport involves various hazards to both flight (physical obstructions in the airspace or land use characteristics which affect flight safety) and safety on the ground (damage due to an aircraft accident). Growth is restricted around the Regional Airport in the southwest corner of the City due to the noise and safety hazards associated with the flight path.

Castle Airport also impacts the City. Portions of the northwest part of the City’s SUDP/SOI and the incorporated City are within Castle’s safety zones. The primary impact is due to noise (Zones C and D), though small areas have density restrictions (Zone B2). The military discontinued operations at Castle in 1995. One important criterion for determining the various zones is the noise factor. Military aircraft are designed solely for performance, whereas civilian aircraft have extensive design features to control noise.

Potential hazards to flight include physical obstructions and other land use characteristics that can affect flight safety, which include: visual hazards such as distracting lights, glare, and sources of smoke; electronic interference with aircraft instruments or radio communications; and uses which may attract flocks of birds. In order to safeguard an airport's long-term usability, preventing encroachment of objects into the surrounding airspace is imperative.

Railroad

Hazardous materials are regularly shipped on the BNSF and SP/UP Railroad lines that pass through the City. While unlikely, an incident involving the derailment of a train could result in the spillage of cargo from the train in transporting. The spillage of hazardous materials could have devastating results. The City has little to no control over the types of materials shipped via the rail lines. There is also a safety concern for pedestrians along the tracks and vehicles utilizing at-grade crossings. The design and operation of at-grade crossings allows the City some control over rail-related hazards. Ensuring proper gate operation at the crossings is the most effective strategy to avoid collision and possible derailments.

Public Protection and Disaster Planning

Hospitals, ambulance companies, and fire districts provide medical emergency services. Considerable thought and planning have gone into efforts to improve responses to day-to-day emergencies and planning for a general disaster response capability. The City's Emergency Plan and the County Hazardous Waste Management Plan both deal with detailed emergency response procedures under various conditions for hazardous materials spills. The City also works with the State Department of Health Services to establish cleanup plans and to monitor the cleanup of known hazardous waste sites within the City.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
9. **<u>Hazards and Hazardous Materials.</u>** Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			✓	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			✓	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			✓	
d) Be located on a site which is included on a list of hazardous materials site complied 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 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 to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				✓

Impact Analysis

Would the project:

a) *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*

Hazards and hazardous materials are extensively regulated at the federal, state, and local levels. The only known land use at this time that would involve the use of a large amount of a hazardous material would be the gas station. However, as previously mentioned, there are federal and state regulations that govern the use and delivery of gasoline.

Construction activities of the proposed project would involve the use, storage, transport, and disposal of oil, gasoline, diesel fuel, paints, solvents, and other hazardous materials. After construction, the proposed gas station would store and sell gasoline and potentially propane. No other hazardous materials are anticipated to be stored or used on the site after construction. The project would be required to adhere to all applicable federal and state health and safety standards. Construction activity must also be in compliance with the California Occupational Safety and Health Administration regulations (Occupational Safety and Health Act of 1970). This impact would be **less than significant** with compliance with these requirements.

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?*

Construction on the project site would be reviewed for the use of hazardous materials at the building permit stage. Implementation of Fire Department and Building Code regulations for hazardous materials, as well as implementation of federal and state requirements, would reduce any risk caused by a future use on the site from hazardous materials to a **less than significant** level.

APPLICABLE GENERAL PLAN GOALS AND POLICIES:

The City of Merced *Vision 2030 General Plan* contains policies that address hazardous materials.

Goal Area S-7: Hazardous Materials	
Goal **Hazardous Materials Safety for City Residents**	
Policies	
S-2.1	Prevent injuries and environmental contamination due to the uncontrolled release of hazardous materials.
Implementing Actions:	
7.1.a	Support Merced County in carrying out and enforcing the Merced County Hazardous Waste Management Plan.
7.1.b	Continue to update and enforce local ordinances regulating the permitted use and storage of hazardous gases, liquids, and solids.
7.1.d	Provide continuing training for hazardous materials enforcement and response personnel.

c) *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*

There is one middle school and one college located within a ¼-mile radius of the site. Cruickshank Middle School is located to the northeast along Mercy Avenue approximately 0.18 miles from the subject site. Merced College is directly across G Street from the subject site. Hazardous materials other than the gasoline at the gas and service station are not expected to be at the project site after construction. Compliance with Fire Department regulations, as well as state and federal regulations through annual inspections and permitting requirements makes this impact **less than significant**.

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

According to the California Department of Toxic Substances Control EnviroStor database search, the project site is not listed as a hazardous waste site, and no significant hazard to the public or the environment would result with project implementation. Therefore, there is **no impact.**

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

The project site is located approximately 3.5 miles from the Merced Regional Airport and approximately 5 miles from the Castle Airport. The project site is not located in an area for which an Airport Land Use Plan has been prepared, and no public or private airfields are within two miles of the project area. Therefore, no at-risk population working at the site would be exposed to hazards due to aircraft over-flight. Therefore, implementation of the proposed project would not expose persons to airport-related hazards, and **no impact** would occur.

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

The proposed project will not adversely affect any adopted emergency response plan or emergency evacuation plan. No additional impacts will result from the development of the project area over and above those already evaluated by the EIR prepared for the *Merced Vision 2030 General Plan.* The project would not modify any roadways or cause any other changes that would impair the implementation of an adopted emergency response plan. Therefore, there is **no impact.**

APPLICABLE GENERAL PLAN GOALS AND POLICIES:

The *Merced Vision 2030 General Plan* contains policies that address disaster preparedness.

Goal Area S-1: Disaster Preparedness	
Goal **General Disaster Preparedness**	
Policies	
S-1.1	Develop and maintain emergency preparedness procedures for the City.

Implementing Actions:	
1.1.a	Keep up-to-date through annual review the City's existing Emergency Plan and coordinate with the countywide Emergency Plan.
1.1.b	Prepare route capacity studies and determine evacuation procedures and routes for different types of disasters, including means for notifying residents of a need to evacuate because of a severe hazard as soon as possible.
7.1.d	Provide continuing training for hazardous materials enforcement and response personnel.

g) *Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?*

The project site is located within an urban area and is not located within a very high fire hazard severity zone. According to the EIR prepared for the *Merced Vision 2030 General Plan*, the risk for wildland fire in the City of Merced is minimal. According to the Cal Fire website, the Merced County Fire Hazard Severity Zone Map shows the project site is designated as a "Local Area of Responsibility" with a Hazard Classification of "Urban Unzoned."

The City of Merced Fire Department is the responsible agency for responding to fires at the subject site. The project site is located within Fire District #5, and is served by Station #55 located at 3520 Parsons Avenue (approximately 0.5 miles from the project site). The proposed project would not expose people or structures to significant loss, injury or death involving wildland fires and there would be **no impact.**

10. Hydrology and Water Quality

SETTING AND DESCRIPTION

Water Supplies and Facilities

The City's water supply system consists of four elevated storage tanks with a combined storage capacity of approximately 1.4 million gallons, 23 wells and 14 pumping stations equipped with variable speed pumps that attempt to maintain 45 to 50 psi (pounds per square inch) nominal water pressure. The City is required to meet State Health pressure requirements, which call for a minimum of 20 psi at every service connection under the annual peak hour condition and maintenance of the annual average day demand plus fire flow, whichever is stricter.

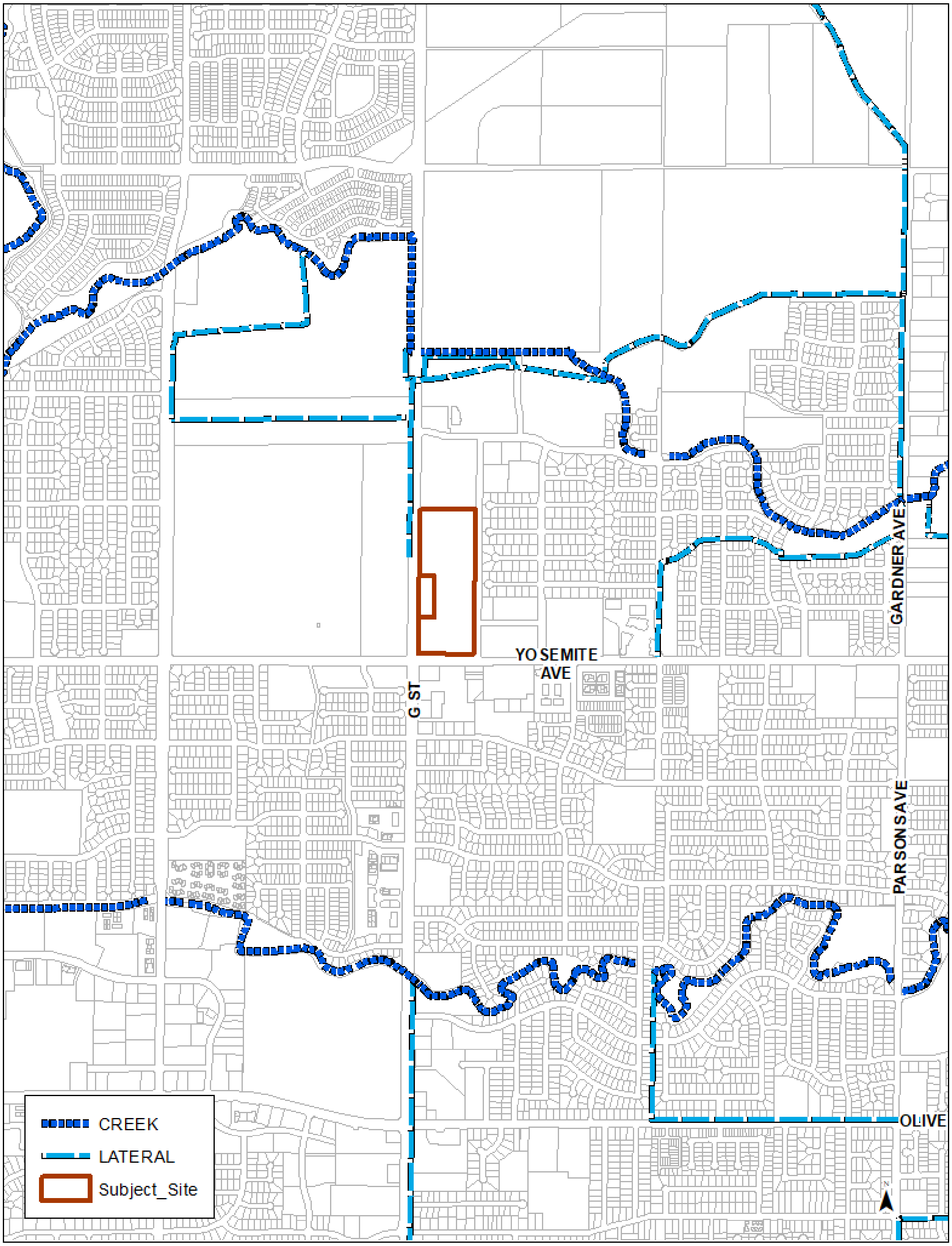
Storm Drainage/Flooding

In accordance with the adopted City of Merced Standard Designs of Common Engineering Structures, percolation/detention basins are designed to temporarily collect run-off so that it can be metered at acceptable rates into canals and streams, which have limited capacity.

Proximity to Existing Waterways

The project site is located at the northeast corner of Yosemite Avenue and G Street. There is an irrigation canal (lateral) across G Street from the site that feeds into Cottonwood Creek. Cottonwood Creek is approximately 0.3 miles to the south of the site and Black Rascal Creek is located approximately 0.6 miles south of the site. Refer to the map at Figure 8.

Figure 8 - Waterways



ATTACHMENT 7

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
10. <u>Hydrology and Water Quality.</u> Would the project:				
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 a 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?			✓	

Impact Analysis

Would the project:

a) *Violate any water quality standards or waste discharge requirements?*

The project site is currently vacant. Construction of the proposed mixed-use project and associated parking would result in the majority of the site being covered with impervious surfaces.

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

Pollutants of concern during construction include sediments, trash, petroleum products, concrete waste (dry and wet), sanitary waste, and chemicals. During construction activities, excavated soil would be exposed with an increased potential to expose soils to wind and water erosion, which could result in temporary minimal increases in sediment load into the MID nearby water bodies, including the Black Rascal Creek, located approximately 0.5 miles to the south, and Cottonwood Creek, located approximately 0.5 mile to the north. Any potential short-term water quality effects from project related construction activities can be minimized and reduced to a level of **less than significant with mitigation** by implementing the following mitigation measure.

Mitigation Measure:

HYDRO-1) To minimize any potential short-term water quality effects from project-related construction activities, the project contractor shall implement Best Management Practices (BMPs) in conformance with the California Storm Water Best Management Practice Handbook for Construction Activity. In addition, the proposed project shall be in compliance with existing regulatory requirements, including the Water Pollution Control Preparation (WPCP) Manual. In addition, implementation of a Storm Water Pollution Prevention Plan (SWPPP) would be required under the National Pollutant Discharge Elimination System (NPDES) to regulate water quality associated with construction activities.

HYDRO-2) If any storm drainage from the site is to drain into MID facilities, the developer shall first enter into a “Storm Drainage Agreement” with MID and pay all applicable fees.

The nearest water bodies to the proposed project include the Black Rascal Creek, located approximately 0.6 miles to the south, and Cottonwood Creek, located approximately 0.3 miles to the north. Operation of the proposed project could result in surface water pollution associated with chemicals, liquid products, petroleum products (such as paints, solvents, and fuels), and waste that may be spilled or leaked and have the potential to be transported via runoff during periods of heavy precipitation into these water bodies. Implementation of Mitigation Measure HYDRO-3, described below, would ensure that stormwater runoff from the proposed project would be appropriately managed to prevent pollutants from being discharged into these water bodies, reducing any potential impacts to **less than significant with mitigation.**

Mitigation Measure:

HYDRO-3) To reduce the potential for degradation of surface water quality during project operation, a SWPPP shall be prepared for the proposed project. The SWPPP shall describe specific programs to minimize stormwater pollution resulting from the proposed project. Specifically, the SWPPP shall identify and describe source control measures, treatment controls, and BMP maintenance requirements to ensure that the project complies with post-construction stormwater management requirements of the RWQCB.

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

The City receives all of its water supply from groundwater. Based on the City’s Urban Water Management Plan (UWMP), water consumption in 2015 was estimated to be 15.9 million gallons of water per day (mgd) or approximately 17,855 acre-feet per year. The UWMP also estimates the projected acre-feet of water use for years 2020, 2025, 2030, and 2035, which are projected to increase each year. By 2035, the City’s projected water use is expected to be 31,960 acre-feet of potable and raw water and 5,869 acre-feet of recycled water.

The proposed project would generate a need for approximately 40,449 gallons per day, broken into 10,560 gallons per day for the residential uses and approximately 29,889 gallons per day for the retail/office/hotel uses. Based on the 2015 water well production of 15.9 mgd, the proposed project would use approximately 0.25% of the total daily water demand for the City.

Although development of the site would restrict onsite recharge where new impervious surface areas are created, all alterations to groundwater flow would be captured and routed to the stormwater basin to the east of the site or pervious surfaces with no substantial net loss in recharge potential anticipated. This reduces this impact to a **less than significant** level.

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 a 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?*

Implementation of the project would result in grading and landform alterations on the site that would expose native soils that could be subject to the effects associated with wind and water erosion unless adequate measures are taken to limit the transport of soils in surface water from the site to downstream locations. As discussed above, the project applicant would be required to implement a SWPPP that would identify specific measures to address erosion and siltation resulting from grading and construction as well as the potential long-term water quality impacts.

Construction of the project would include connecting on-site drainage facilities to the City's storm drain system. The City has approximately 112 miles of underground storm drain lines, underground storage pipes, and 141 acres of detention ponds. A 24-inch storm drain line exists in G Street that the on-site storm drainage system would connect to. The project site would consist of approximately 304,920 square feet of impervious surfaces. All storm water run-off would be required to be captured on-site and metered into the City's storm drainage per City Standards. Additionally, at the time of construction, the developer would be required to provide calculations to demonstrate that the proposed on-site retention and the City's storm water system would be able to accommodate the additional run-off from the site.

According to FEMA, the project site as well as the area surrounding the site are located within a Zone X which is considered to be outside the flood plain. As previously mentioned any run-off from the site would be required to be captured on-site and metered into the City's storm drain system. Therefore runoff from the site would not increase the rate or amount of surface water flooding or impede or redirect flood flows.

Implementation of Mitigation Measure HYDRO-1 and Mitigation Measure HYDRO-4 below would reduce any impacts from site drainage to **less than significant with mitigation**.

Mitigation Measure:

HYDRO-4) Prior to issuance of a building permit or as required by the City Engineer, the developer shall demonstrate to the City that storm drainage facilities are adequate to meet the Project demands and that improvements are consistent with the City Standards and the City's Storm Drain Master Plan.

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

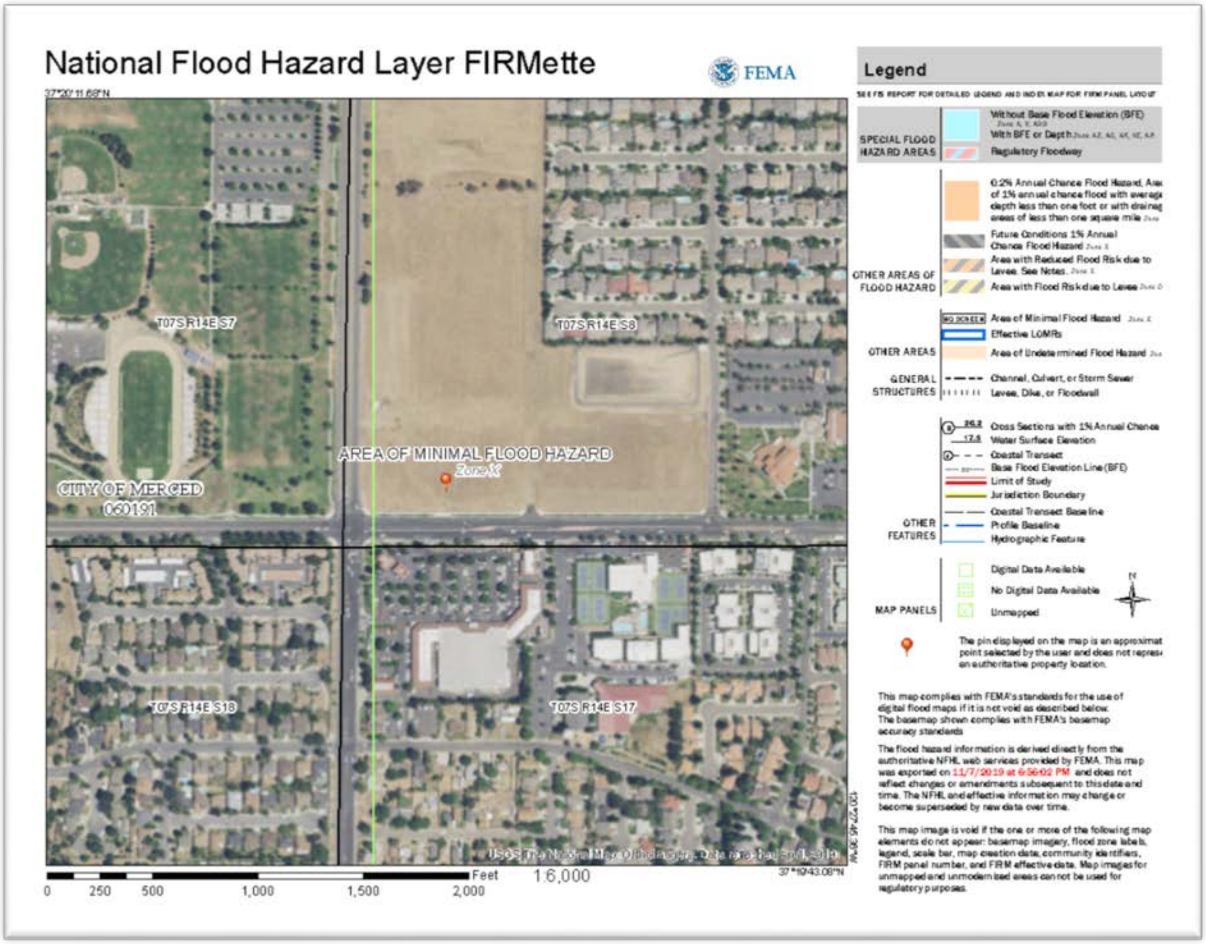
As shown on the map located at Figure 9 on the following page, the project site is located within Flood Zone "X." The Federal Emergency Management Agency (FEMA), defines Zone X as an area of minimal flood hazard. Zone X is the area determined to be outside the 500-year flood and protected by levee from 100-year flood.

The site is not in a tsunami or seiche zone and would not present a risk for release of pollutants due to inundation. This impact is **less than significant.**

e) *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?*

The proposed project would not obstruct or conflict with the implementation of a water quality control plan or sustainable groundwater management plan. The project would be required to comply with all City of Merced standards and Master Plan requirements for groundwater and water quality control. This impact is **less than significant.**

Figure 9 - FEMA Flood Map



11. <u>Land Use and Planning</u>

SETTING AND DESCRIPTION

The project site is located within the City Limits of Merced and within its Specific Urban Development Plan and Sphere of Influence (SUDP/SOI). The site has two General Plan designations of Commercial Office (CO) and High to Medium Density Residential (HMD) and a Zoning designation of Planned Development (P-D) #72. The proposed General Plan Amendment would change the General Plan designation to Neighborhood Commercial (CN). The current and proposed General Plan designations are shown on the map at Figure 3.

Surrounding Uses

Refer to Figure 2 on Page 3 and the table below for the surrounding land uses.

Surrounding Land	Existing Use of Land	Zoning Designation	City General Plan Land Use Designation
North	Mercy Medical Center and Vacant Lot	C-O	Commercial Office (CO)
South	Retail, Restaurants, Grocery (across Yosemite Avenue)	P-D #26	Neighborhood Commercial (CN)
East	Single-Family Residential (across extended Sandpiper Avenue)	R-1-6, P-D #72	Low Density Residential (LD), High to Medium Density Residential (HMD), and Neighborhood Commercial (CN)
West	Merced College (across G Street)	R-1-6	School

Current Use/Background

The project site is currently vacant, other than City of Merced Storm Pump Station 10. This small, enclosed area is used by Public Works staff a few times a year and requires enough space for a large vehicle to pull up to the enclosure. The proposed design of the site takes this structure’s need into account. The site consists of two individual parcels, Assessor’s Parcel Numbers (APN) 231-040-004 and 231-040-005. The site is currently designated on the *Merced Vision 2030 General Plan* Land Use Map as Commercial Office (CO) in the southerly portion, which encompasses the entirety of the smaller parcel, APN 231-040-005, and High to Medium Density Residential (HMD) in the northerly portion. The requested changes would change the land use classification for the entire site to Neighborhood Commercial (CN).

This site was included in General Plan Amendment #10-02, Revision #3 to the Northeast Yosemite Specific Plan, Zone Change #410, and Establishment of Planned Development (P-D) #72 in 2010. These items changed the General Plan designation of the 11.5-acre parcel at the northeast corner of Yosemite Avenue and G Street from High-Medium Density (HMD) Residential to Commercial Office (CO) and allowed for a curb-cut on G Street approximately 520 feet north of the intersection at G Street and Yosemite Avenue. The Planned Development was established and the zoning changed for an area including the 11.5-acre parcel at the northeast corner of Yosemite Avenue and G Street, the adjacent parcel to the north [designated High-Medium Density (HMD) Residential], and the adjacent parcel to the east (also HMD Residential).

The southern half of the parcel to the east (northeast corner of Yosemite Avenue and the future Sandpiper Drive) was sold to the City. The remaining northern half of the parcel and the parcel north of the proposed commercial development planned are for high-medium density residential uses.

With this change, an additional environmental review (Initial Study #14-32) was prepared and also resulted in a Mitigated Negative Declaration (MND). The Mitigation Monitoring Program for Initial Study #10-06, applied to this project (Appendix C).

The project site was also part of General Plan Amendment #11-05, and Site Utilization Plan (SUP) Revision #1 to Planned Development (P-D) #72 in 2011. The General Plan Amendment was to allow an exception to the General Plan Policies addressing the spacing of driveways along arterial roadways (Policies T-1.3.j and T-1.3.k) and the Site Utilization Plan Revision allowed the relocation of the drainage basin previously approved for the northeast side of the parcel located at the corner of G Street and Yosemite Avenue to the newly created parcel between the future Sandpiper Avenue and Mansionette Drive, and the construction of five additional office buildings on the parcel at Yosemite Avenue and G Street.

Project Characteristics

The proposed project includes a General Plan Amendment and Site Utilization Plan Revision for 21.5 acres of land on the Subject Site (refer to the map at Figure 3). As shown on the General Plan and Zoning Map at Figure 3, the site has two General Plan designations of Commercial Office (CO) and High to Medium Density Residential (HMD) and a Zoning designation of Planned Development (P-D) #72. The proposed General Plan Amendment would change the General Plan designation to Neighborhood Commercial (CN).

The Site Utilization Plan (SUP) Revision includes changes to a number of aspects of Planned Development #72, including a four-story, 128-room hotel of approximately 80,104 square feet, and two medical office buildings totaling approximately 66,465 square feet. It also includes 44 Units of Multi-Family Residential Housing totaling approximately 29,887 square feet, fast food uses with drive-through windows totaling approximately 5,494 square feet, and a mixed-use development with approximately 59,616 square feet of other retail and office uses, shown on the Site Plan at Figure 4.

The Zoning Ordinance describes uses that are allowed within a specific zone "by right" and those allowed with a discretionary review such as a Conditional Use Permit. Under ordinary circumstances, drive-through sales, alcoholic beverage sales in restaurants for on-site consumption, multi-family dwellings, and gas and service stations are allowed within a C-N zone with approval of a Conditional Use Permit. Day care centers require a Minor Use Permit and hotels are listed as "use not allowed" in an ordinary C-N zone.

The SUP Revision proposes to condense a number of the typical public hearings for interface along with Conditional Use Permitting, into the single SUP Revision. Notable exceptions are that the hotel and multi-family residential components will still require publicly noticed public hearings for their Site Plan Review Permits if they are on a parcel that is abutting or across from a parcel with R-1 or R-2 zoning. Section 20.32 of the Zoning Ordinance sets out the requirements for interface regulations to help integrate potentially incompatible zones. This section requires Site Plan Review be obtained prior to construction on a parcel with a Neighborhood Commercial (C-N) zone when it is adjacent to or across the street from an R-1-6 zone. In this case, several properties to the east of the larger parcel on the subject site (APN 231-040-004) are zoned R-1-6. The uses in this area include single-family dwellings located on approximately 0.2-acre lots. This project is designed in such a way that may at a future time be desirable to separate the parcels, as noted by the "proposed parcel line" notations on the Site Plan, shown at Figure 4; however, no parcel modifications have been submitted at this time.

The Zoning Ordinance does not specify a density for multi-family housing allowed within a C-N zone. The General Plan has a range of multi-family densities: Low-Medium Density (LMD) – 6 to 12 units/acre; High-medium Density (HMD) – 12 to 24 units/acre; and High Density (HD) 24 to 36 units/acre. The Zoning designations that correlate to the multi-family General Plan designations would be R-2; R-3-1.5; R-3, and R-4. The proposed density for this project, based on the number of units is approximately 16.4 units per acre, considering the size of the proposed parcel the multi-family residential component is shown on. This density fits into an HMD General Plan designation comfortably; the site also currently has the HMD designation for the portion of the site that the multi-family residential component is proposed for.

	Potentially Significant Impact	**Less Than Significant with Mitigation Incorporated**	**Less Than Significant Impact**	**No Impact**
11. <u>Land Use and Planning.</u> Would the project:				
a) Physically divide an established community?				✓
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?				✓

Impact Analysis

Would the project:

a) *Physically divide an established community?*

The project site was annexed in 1992 and is surrounded by urban uses. The proposed project would develop an existing vacant lot and would become a part of the adjacent, surrounding community. The project would not physically divide the community, therefore, there is **no impact.**

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?*

The Housing Element of the *Merced Vision 2030 General Plan* includes policies supporting mixed-use development.

Policy H 1.1.c Encourage Mixed Use Development

The proposed project would provide a mixture of retail commercial uses to serve the neighborhood and multi-family dwelling units.

Policy 1.8b Prioritize City efforts to encourage residential development by focusing on in-fill development and densification within the existing City Limits.

The proposed project is an in-fill project on a vacant lot. The proposed density of the multi-family residential component, when considering the proposed future parcel size, is in keeping with the current General Plan designation of the property.

Based on the forgoing analysis, the project would comply with the General Plan. Therefore, there is **no impact.**

12. Mineral Resources

SETTING AND DESCRIPTION

The City of Merced does not contain any mineral resources that require managed production, according to the State Mining and Geology Board. Based on observed site conditions and review of geological maps for the area, economic deposits of precious or base metals are not expected to underlie the Merced SUDP/SOI. According to the California Geological Survey, Aggregate Availability in California - Map Sheet 52, Updated 2006, minor aggregate production occurs west and north of the City of Merced, but economic deposits of aggregate minerals are not mined within the immediate vicinity of the SUDP/SOI. Commercial deposits of oil and gas are not known to occur within the SUDP/SOI or vicinity.

According to the Merced County General Plan Background Report (June 21, 2007), very few traditional hard rock mines exist in the County. The County's mineral resources are almost all sand and gravel mining operations. Approximately 38 square miles of Merced County, in 10 aggregate resource areas (ARA), have been classified by the California Division of Mines and Geology for aggregate. The 10 identified resource areas contain an estimated 1.18 billion tons of concrete resources with approximately 574 million tons in western Merced County and approximately 605 million tons in eastern Merced County. Based on available production data and population projections, the Division of Mines and Geology estimated that 144 million tons of aggregate would be needed to satisfy the projected demand for construction aggregate in the County through the year 2049. The available supply of aggregate in Merced County substantially exceeds the current and projected demand.

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

Impact Analysis

Would the project:

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

Based on observed site conditions and review of geological maps for the area, economic deposits of precious or base metals are not known to occur in the Merced SUDP/SOI. Therefore implementation of the proposed project would have **no impact** on the availability of mineral resources or impact current or future mining operations.

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

No Mineral Resource Zones or mineral resource recovery sites exist within the City of Merced or in the area designated for future expansion of the City (the SUDP/SOI). Therefore implementation of the proposed project would have **no impact** on the availability of mineral resources or impact current of future mining operations.

13. Noise

SETTING AND DESCRIPTION

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

As noise spreads from a source, it loses energy so that the farther away the noise receiver is from the noise source, the lower the perceived noise level would be. Geometric spreading causes the sound level to attenuate or be reduced, resulting in a 6 dB reduction in the noise level for each doubling of distance from a single point source of noise to the noise sensitive receptor of concern. According to the *Merced Vision 2030 General Plan,* outdoor noise exposure not exceeding 60 db is considered to be a “normally acceptable” noise level for residential uses.

Potential noise impacts of the proposed project can be categorized as those resulting from construction and those from operational activities. Construction noise would have a short-term effect; operational noise would continue throughout the lifetime of the project.

The existing noise in the area is predominantly traffic related. Merced College, to the west across G Street, has a stadium that when active can generate a large amount of noise during events that only occur occasionally. Otherwise, residential and commercial uses surround the site.

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

Impact Analysis

Would the project result in:

a) *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*

Construction Noise

Construction of the project would temporarily increase noise levels in the area during the construction period. The project is proposed to be phased in such a way that the southern portion of the site, consisting primarily of retail uses, is to be constructed first. The applicants project that the hotel and office uses would be the most likely to be constructed in the second phase, along with any of the retail sites that are not built in Phase I. The multi-family residential component is most likely a third phase. Therefore, the noise from construction may be steady for several weeks and then cease all together, with this cycle repeating over the course of several years. Construction activities, including site clearing, building construction, and paving would be considered an intermittent noise impact throughout the construction period. These activities could result in various effects on sensitive receptors, depending on the presence of intervening barriers or other insulating materials. Although construction activities would likely occur only during daytime hours, construction noise could still be considered disruptive to local residents. The City of Merced does not have a noise ordinance, but past practice has been to allow construction activities during daylight hours (between 7:00 a.m. and 7:00 p.m.). Implementation of the mitigation measures below would reduce potential impacts from construction noise to **less than significant with mitigation.**

Operational Noise

Noise from the mixed-use development would be primarily traffic related. Additionally, there would be added noise from outdoor activities such as loading and unloading of materials and products for the retail uses and possible outdoor activities of the tenants, as well as more frequent refuse collection to serve the site. Parking for the site is located on the interior of the property.

To the east of the project are existing single-family residences. There is an approximately 6-foot block wall with openings for pedestrians to pass through along the border of these properties. The project may include outdoor retail activity areas such as restaurant seating; these uses as proposed are not directly adjacent to the existing residential area, mitigating the possibility of noise issues arising.

Acceptable outdoor noise levels in residential areas is not exceeding 60 dB. According to Table 10.2 of the *Merced Vision General Plan*, the current noise level generated by traffic along Yosemite Avenue within 100 feet of the roadway is 61.2 dB. Using this as a reference, it is unlikely that noise from the apartments or outdoor recreation areas would exceed 60 dB. However, the increase in traffic may increase the noise level generated from Yosemite Avenue. According to Table 10.2 at time of the General Plan buildout, it is expected that in order to achieve a rating of 60dB, a sensitive use would have to be 297 feet from the roadway. While it is not expected that this project would increase traffic to the level expected by the General Plan buildout, there will be an increase over the existing traffic in the area, but it is not expected to significantly increase the noise impacts. Therefore, operational noise is expected to be **less than significant.**

Mitigation Measure:

NOI-1) To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the project:

- The construction contractor shall ensure that all internal combustion engine-driven equipment is equipped with mufflers that are in good condition and appropriate for the equipment.
- The construction contractor shall locate stationary noise-generating equipment as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction disturbance area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
- The construction contractor shall prohibit unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes is prohibited).
- The construction contractor shall locate, to the maximum extent practical, on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.
- The construction contractor shall limit all noise producing construction activities, including deliveries and warming up of equipment, to the

hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday. No such work shall be permitted on Sundays or federal holidays without prior approval from the City.

b) *Generation of excessive groundborne vibration or groundborne noise levels?*

No permanent noise sources would be located within the project site that would expose persons to excessive groundborne vibration or noise levels. Construction activities associated with implementation of the proposed project are not expected to result in excessive groundborne vibration or groundborne noise levels. Therefore, implementation of the proposed project would not permanently expose persons within or around the project sites to excessive groundborne vibration or noise and the project impacts would be ***less than significant***

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

The nearest airports to the project site include Merced Regional Airport, located approximately 3.5 miles southwest of the project site, and Castle Airport, located approximately 5 miles northwest of the project site. No portion of the project site lies within the 55 dBA CNEL noise contours of these airports. Given the project site's distance from the nearest airports, project implementation would not expose people residing or working in the project area to excessive noise levels and impacts would be **less than significant**.

14. Population and Housing

SETTING AND DESCRIPTION

The implementation of the proposed project would result in the construction of a mixed use project that would consist of 44 dwelling units, in three two-story buildings, totaling approximately 29,887 square feet. The hotel is projected to have 128 rooms over 80,104 square feet. These are the only residential uses proposed. The project site is surrounded by urban uses.

Expected Population and Employment Growth

According to the State Department of Finance, the City of Merced's population for 2019 is estimated to be 87,110. Population projections estimate that the Merced SUDP/SOI area will have a population of 159,900 by the Year 2030. The 2019 population projections prepared by the State also indicate a vacancy rate of 6.31% and an average household size of 3.24 persons per household.

According to the *Merced Vision 2030 General Plan*, the City of Merced is expected to experience significant employment growth by the Year 2030.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
14. Population and Housing. Would the project:				
a) Induce substantial population growth in an area either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?			✓	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓

Impact Analysis

Would the project:

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

The proposed mixed-use project includes the construction of 44 dwelling units. Each unit is expected to house approximately two persons, which would add 88 people to the site on a continual basis. The project would create an internal roadway system, and would extend Sandpiper Avenue as the project reaches full buildout and usage. Sandpiper Avenue appears on the Circulation Map in the City of Merced's General Plan as a roadway that extends in the manner proposed by this plan. Since the implementation matches the vision of the General Plan, this impact would be **less than significant.**

b) *Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?*

Implementation of the proposed project would not displace any existing housing. The subject site is currently vacant. There is **no impact.**

15. Public Services

SETTING AND DESCRIPTION

Fire Protection

The City of Merced Fire Department provides fire protection, rescue, and emergency medical services from five fire stations throughout the urban area. The City's Central Fire Station is located in the downtown area at 16th and G Streets. The City also has four other stations throughout the City. Station #55, located at 3520 Parsons Avenue, would serve the project site.

Police Protection

The City of Merced Police Department provides police protection for the entire City. The Police Department employs a mixture of sworn officers, non-sworn officer positions (clerical, etc.), and unpaid volunteers (VIP's). The service standard used for planning future police facilities is approximately 1.37 sworn officers per 1,000 population, per the Public Facilities Financing Plan.

Schools

The public school system in Merced is served by three districts: 1) Merced City School District (elementary and middle schools); 2) Merced Union High School District (MUHSD); and, 3) Weaver Union School District (serving a small area in the southeastern part of the City with elementary schools). The districts include various elementary schools, middle (junior high) schools, and high schools. The Project site falls within the Merced City School District and Merced Union High School District (MUHSD).

As the City grows, new schools will need to be built to serve our growing population. According to the Development Fee Justification Studies from 2017 for MUHSD and MCSD, Merced City Schools students are generated by new multi-family development at the following rate:

Student Generation Rates

Commercial/Industrial Category	**Elementary (K-8) (Students per 1,000 sq.ft.)**	**High School (9-12) (Students per 1,000 sq.ft.)**
Warehouse	0.041	0.023
Lodging	0.064	0.037
Industrial Park	0.097	0.055
Community Shopping Center	0.101	0.057
Corporate Office	0.155	0.088
Neighborhood Shopping Center	0.162	0.092
Bank	0.164	0.093
Scientific Research & Development	0.176	0.100
Business Park	0.216	0.123
Medical Office	0.248	0.141
Commercial Office	0.273	0.155
Housing Category	**Elementary (K-8) (Students per unit)**	**High School (9-12) (Students per unit)**
Single Family	0.441	0.213
Multi-Family	0.195	.074

Based on the generation rates from the table above and the square footages of the proposed mixed-use project, this development would be expected to generate 65 total new students, 41 of them Elementary School (K-8) students, and 24 of them High School students. See the on the next page for individual values.

Commercial/Industrial/Housing Category	Project Site Square Footage	Elementary Students Generated	High School Students Generated
Warehouse	0	0	0
Lodging	80,104	6	3
Industrial Park	0	0	0
Community Shopping Center	0	0	0
Corporate Office	0	0	0
Neighborhood Shopping Center	34,250	6	4
Bank	3,560	1	1
Scientific Research & Development	0	0	0
Business Park	0	0	0
Medical Office	66,465	17	10
Commercial Office	16,804	5	3
Single Family Housing	0	0	0
Multi-Family Housing	29,887	6	3
TOTAL		***41***	***24***

Parks

Davenport Park, around ½ mile to the northeast of the site would be the closest park to the project site. Lester K. Yoshida Park is approximately 0.8 miles to the north of the site, the Merced Dog Park is 1 mile to the west, and Rahilly Park and Bob Carpenter Park are each approximately 1 mile away from the project site, both to the southeast.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
15. Public Services. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:				
i. Fire Protection?			✓	
ii. Police Protection?			✓	
iii. Schools?			✓	
iv. Parks?			✓	
v. Other Public Facilities?			✓	

Impact Analysis

Would the project:

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

   i. *Fire Protection* - The City of Merced Fire Department would provide fire protection services to the site. The project site is located within Fire District #5 and would be served by Fire Station #55, located at 3520 Parsons Avenue. The response from this station would meet the desired response time of 4 to 6 minutes, citywide. The proposed change in land use designation would not affect the City's ability to provide fire protection. Buildings on the project site of 5,000 square feet or more, the day care, and any buildings with fryers or cooking equipment would be required to be constructed with a fire sprinkler system and to meet all buildings are required to meet the requirements of the California Fire Code and the Merced Municipal Code.

   At the time a building permit is issued, the developer would be required to pay the fees required by the Public Facility Financing Plan (PFFP). A portion of this fee goes to cover the City's costs for fire protection such as fire stations, etc. In addition, the developer would be required to deannex from its existing Maintenance District and annex into the City's Community Facilities District for Services (CFD #2003-2). This would result in an assessment paid with property taxes in which a portion of the tax would go to pay for fire protection services.

   Compliance with all Fire, Building, and Municipal Code requirements as well as payment of the Impact Fees required by the Public Facilities Financing Program, and annexation into the City's CFD for services makes any potential impacts **less than significant**.

   ii. *Police Protection* - Development of the project would require additional police services in the area. The proposed mixed-use project is located on a site that is currently vacant. Any change to the status of the site would require additional services. However, the impacts from the proposed project would not substantially increase the impacts beyond what was anticipated with the previous Site Utilization Plan. Payment of the required Public Facilities Impact Fees and annexation into the City's Community Facilities District (CFD) for services would reduce any potential impacts to a **less than significant** level.

   iii. *Schools* - Based on the table provided in the "Settings and Description" section above, the proposed mixed-use project would generate 41 Elementary School (K-8) students and 24 High School students. The project would be required to pay all fees required by the Leroy F. Greene School Facilities Act of 1988. The payment of this statutory fee under California Government Code §65995 is deemed “full and complete mitigation” of school impacts. Thus, these impacts are **less than significant**.

iv. *Parks* - The development of the mixed use project would not trigger the need to construct a new park in the area. Payment of the fees required under the Public Facilities Financing Program (PFFP) as described above and payment of Quimby Act fees would be required at time of building permit issuance to help fund future parks and maintenance of existing parks as well as the payment of fees in lieu of land dedication for future parks would be required at the building permit stage for the residential buildings. The proposed amenities onsite and the payment of fees would reduce this potential impact to **less than significant**.

v. *Other Public Facilities* - The development of the project could impact the maintenance of public facilities and could generate impacts to other governmental services. Payment of the fees required under the Public Facilities Financing Program (PFFP) as described above would mitigate these impacts to a **less than significant** level.

16. Recreation

SETTING AND DESCRIPTION

The City of Merced has a well-developed network of parks and recreation facilities. Davenport Park is the nearest Neighborhood Park to the site, with the primary section of the park approximately ½ mile from the project site, and the park’s entrance pathway along the nearby creek 0.4 miles from the project site at the intersection of Paulson Road and Cormorant Drive. Lester K. Yoshida Park (a Neighborhood Park) is located within the Bellevue Ranch East Subdivision at the corner of Bixby Way and Revelle Drive, approximately 0.8 miles to the northwest from the site. Bob Carpenter Park (a Neighborhood Park) is located at the corner of Parsons Avenue and Silverado Drive, approximately 1 mile from the site. Rahilly Park (a Regional Park) is also located on Parsons Avenue approximately 1 mile from the project site. The Merced Dog Park is 1 mile to the west of the site, at the corner of Yosemite Avenue and R Street. The Rascal Creek Bike path is also accessible from G Street approximately ½ mile south of the site.

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

Impact Analysis

Would the project:

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

The construction of the proposed project would provide 44 units which, in turn, would introduce 88 residents to this area. As described above, there are several parks within a short distance of the site. Additionally, the developer would be required to pay the fees described under the Parks section above which would help fund future recreation needs. This impact would be **less than significant.**

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?*

As previously described, the project would be required to pay all impact fees required at the time of building permit issuance which would makes any impacts **less than significant**.

17. Transportation/Traffic

SETTING AND DESCRIPTION

The Project proposes to develop 66,465 square feet of medical-dental office space, a 128-room hotel, 11,458 square feet of fast-food restaurant with drive-through window, a gasoline/service station with convenience market (12 fueling positions), 18,222 square feet of shopping center, 5,000 square feet high turnover (sit-down) restaurant, 12,000 square feet of general office space, 4,804 square feet of day care center, and 44 multifamily units. At present, all intersections studied in the Traffic Impact Analysis operate at an acceptable Level of Service (LOS) during both peak periods. The City of Merced has determined that roads must operate at LOS of “D” or greater in order to be acceptable. The Traffic Impact Analysis, prepared by JLB Traffic Engineering, Inc. appears at Appendix B.

Project Access

Based on the latest Project Site Plan, access to and from the Project site will be from five (5) access driveways located along Sandpiper Avenue, G Street, and Yosemite Avenue. Two (2) access points are proposed to be located along the east side of G Street. One is located approximately 1,250 south of Mercy Avenue and is proposed as a full access, with left turns in and out. The other is located approximately 625 feet north of Yosemite Avenue and is proposed as left-in, right-in and right-out access only. The access point off of Yosemite Avenue is located approximately 300 feet east of G Street and is limited to right-in and right-out access only. The remaining two access points are proposed to be located along the extension of Sandpiper Avenue. While Sandpiper Avenue will eventually go through to Mercy Avenue, at the beginning of the project, access to Sandpiper Avenue will be limited to Yosemite Avenue, which will be limited to right-in and right-out access only onto Sandpiper. Sandpiper will connect to Children’s Avenue.

Walkways

Currently, walkways exist in the vicinity of the proposed Project site along G Street, Yosemite Avenue and Mercy Avenue. The Merced Vision 2030 General Plan recommends that walkways be implemented during all phases of a Project to guarantee adequate and safe pedestrian facilities at all times. Therefore, it is recommended that the Project implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to G Street.

Bikeways

Currently, bikeways exist in the vicinity of the proposed Project site along G Street, Yosemite Avenue, Mercy Avenue and Mansionette Drive. The *Merced Vision 2030 General Plan* recommends that a Class II Bike Lane be implemented on G Street north of Yosemite Avenue and a Class I Bike Lane beginning on G Street and extending approximately 950 feet north of Mercy Avenue. Therefore, it is recommended that the Project implement a Class II Bike Lane along its frontage to G Street.

Transit

The Bus, Merced's Regional Transit System, is the single public transportation service provider for all of Merced County. At present, there are three routes - M3, M4 and UC - that have stops adjacent to the proposed Project and two more - M1 and M2 - that stop approximately 0.5 miles from the Project. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Route "M3" runs on G Street and Yosemite Avenue adjacent to the proposed Project. Its nearest stops to the Project are located along the south side of Yosemite Avenue approximately 100 feet east of G Street and along the west side of G Street approximately 1,600 feet north of Yosemite Avenue. Route M3 operates at 30-minute intervals on weekdays and 90-minute intervals on weekends. This route provides a direct connection to County Administration, Police Department, Target, Walmart, Merced Mall, Merced College, Social Security, Mercy Hospital, and Raley's.

Route "M4" runs on G Street and Yosemite Avenue adjacent to the proposed Project. Its nearest stops to the Project are located along the south side of Yosemite Avenue approximately 100 feet east of G Street and along the west side of G Street approximately 1,600 feet north of Yosemite Avenue. Route M4 operates at 30-minute intervals on weekdays and 90-minute intervals on weekends. This route provides a direct connection to East Campus, Save Mart, Raley's, Merced College, Mercy Medical, Health Department, Family Care Clinic, Fairgrounds, and Mental Health.

Route "UC" runs on G Street adjacent to the proposed Project. Its nearest stop to the Project is located along the west side of G Street approximately 1,600 feet north of Yosemite Avenue. Route UC operates at 40-minute intervals on weekdays and weekends. This route provides a direct connection to Merced College, Amtrak, Mercy Medical, Promenade, UC Merced, Social Security, Downtown area, and University Medical.

Trip Generation

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). The Project buildout is estimated to generate a maximum of 13,160 daily trips, 1,009 AM peak hour trips and 1,059 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). JLB also analyzed the estimated maximum trip generation of a prior version of the Project Site Plan. Due to a lack of secured users for the site, the exact square footages of the pads shown on the latest Project Site Plan may differ. At buildout, the prior Project Site Plan is anticipated to generate a maximum of 13,741 daily trips, 1,092 AM peak hour trips and 1,074 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). Compared to the prior Project Site Plan, the latest Project Site Plan is estimated to yield less traffic by 581 daily trips, 83 AM peak hour trips and 15 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). The TIA assumed the trip generation of the prior Project Site Plan, as it is the more impactful.

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

Impact Analysis

Would the project:

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

Transportation and traffic impacts were analyzed by JLB Traffic Engineering, Inc. in a Traffic Impact Analysis (Appendix B). The conclusions regarding the proposed project would allow the impacts of the project to be **less than significant with mitigation** by implementing the following mitigation measures. The project shall contribute its equitable fair share as listed in Table XV of the Traffic Impact Analysis (Appendix B).

Mitigation Measures

TRA-01 Project Driveway 1 shall have a minimum throat depth of 150 feet before any vehicular openings to the north.

TRA-02 The Project shall implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to G Street. Based on the implementation progress of the project, the timing of these improvements shall be at the discretion of the City Engineer.

TRA-03 The Project shall implement a Class II Bike Lane along its frontage to G Street. Based on the implementation progress of the project, the timing of this improvement shall be at the discretion of the City Engineer.

TRA-04 The intersection of G Street and Project Driveway 1 shall be signalized with protective left-turn phasing in all directions.

TRA-05 The intersection of Sandpiper Avenue and Mercy Avenue shall be modified as an All-Way Stop with the following details:

- Stripe a westbound left-turn lane;
- Modify the westbound left-through-right lane to a through-right lane;
- Stripe a northbound left-turn;
- Modify the northbound left-through-right lane to a through-right lane; and
- Implement an all-way stop control.
- Based on the implementation progress of the project, the timing of these improvements shall be at the discretion of the City Engineer.

TRA-06 The intersection of G Street and Yosemite Avenue shall have a second southbound left-turn lane added, the traffic signal shall be modified to implement overlap phasing of the northbound right-turn with the westbound left-turn phase, and westbound to eastbound U-turns shall be prohibited. Prior to implementation of this measure, design details and timing are to be approved by the City Engineer.

TRA-07 The intersection of Paulson Road and Yosemite Avenue shall have an eastbound through-right lane with a receiving lane east of Paulson Road added. Prior to implementation of this measure, design details and timing are to be approved by the City Engineer.

b) *Conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b)?*

Senate Bill (SB) 743 (Steinberg 2013) was approved by then Governor Brown on September 27, 2013. SB 743 created a path to revise the definition of transportation impacts according to CEQA. The revised CEQA Guidelines requiring VMT analysis became effective December 28, 2018; however, agencies have until July 1, 2020 to finalize their local guidelines on VMT analysis. Therefore, as agencies finalize their VMT analysis protocol, CEQA transportation impacts are to be determined using LOS of intersections and roadways, which is a measure of congestion. The intent of SB 743 is to align CEQA transportation study methodology with and promote the statewide goals and policies of reducing vehicle miles traveled (VMT) and greenhouse gases (GHG). Three objectives of SB 743 related to development are to reduce GHG, diversify land uses, and focus on creating a multimodal environment. It is hoped that this will spur infill development.

The Technical Advisory on Evaluating Transportation Impacts in CEQA published by the Governor's Office of Planning and Research (OPR) dated December 2018 acknowledges that lead agencies should set criteria and thresholds for VMT and transportation impacts. However, the Technical Advisory provides guidance to residential, office and retail uses, citing these as the most common land uses. Beyond these three land uses, there is no guidance provided for any other land use type. The Technical Advisory also notes that land uses may have a less than significant impact if located within low VMT areas of a region. Screening maps are suggested for this determination.

VMT is simply the product of a number of trips and the length of those trips. The first step in a VMT analysis is to establish the baseline average VMT, which requires the definition of a region. The Technical Advisory states that existing VMT may be measured at the regional or city level. On the contrary, the Technical Advisory also notes that VMT analyses should not be truncated due to "jurisdictional or other boundaries."

As the Project is within a defined service area, it is likely that the Project would not add VMT per capita of service population to the region. Additionally, the Project site is located near transit services and pedestrian and bicycle networks. In the near future, the City may wish to coordinate with the regional agency (MCAG) and develop criteria and thresholds that balance the direction from OPR and the goals of SB743 with the vision for Merced and economic development, affordable housing, access to goods and services, and overall quality of life. The potential impacts are **less than significant.**

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

Implementation of the proposed project would not alter any existing roads or create new roads in such a way to substantially increase hazards due to a geometric design feature. The proposed project would alter the a number of intersections as required by Mitigation Measures TRA-01 through TRA-07. Construction of the proposed project would create **less than significant impact with mitigation.**

d) *Result in inadequate emergency access?*

The proposed project includes multiple points of access the site, two off of G Street, one off of Yosemite Avenue, and two off of Sandpiper Avenue. Providing two points of access into the site satisfies the Fire Departments requirements for emergency access. Any impacts would be **less than significant.**

18. Tribal Cultural Resources

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
18. Tribal Cultural Resources Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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 § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				✓

Impact Analysis

Would the project:

a) *Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 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)?*

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 § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*

As stated in the Cultural Resources Section of this Initial Study, improvements associated with the project include site excavation, grading, paving, and construction of buildings. The areas of the project subject to demolition and construction facilities are likely to have been subject to ground disturbance in the past. No tribal resources are known to have occurred or have been identified at the project site or in the vicinity of the project site. However, as noted in the Cultural Resources Section, implementation of Mitigation Measures CUL-1 and CUL-3 would protect previously unrecorded or unknown cultural resources, including Native American artifacts and human remains, should these be encountered during project construction.

In addition, Assembly Bill (AB) 52 provides for consultation between lead agencies and Native American tribal organizations during the CEQA process. Since AB 52 was enacted in July 2015, the City has not been contacted by any California Native American tribes requesting that they be notified when projects are proposed in Merced. As a result, the City is not required to notify any tribes of this project, and no tribes have requested consultation pursuant to Public Resources Code section 21080.3.1. Therefore, it is assumed that no Tribal Cultural Resources would be adversely affected by the project. As a result, **no impact** would occur.

19. Utilities and Service Systems

SETTING AND DESCRIPTION

Water

The City's water system is composed of 23 groundwater production wells located throughout the City, approximately 350 miles of main lines, and 4 water tower tanks for storage. Well pump operators ensure reliability and adequate system pressure at all times to satisfy customer demand. Diesel powered generators help maintain uninterrupted operations during power outage. The City of Merced water system delivers more than 24 million gallons of drinking water per day to approximately 20,733 residential, commercial, and industrial customer locations. The City is required to meet State Health pressure requirements, which call for a minimum of 20 psi at every service connection under the annual peak hour condition and maintenance of the annual average day demand plus fire flow, whichever is stricter. The City of Merced Water Division is operated by the Public Works Department.

The City of Merced's wells have an average depth of 414 feet and range in depth from 161 feet to 800 feet. The depth of these wells would suggest that the City of Merced is primarily drawing water from a deep aquifer associated with the Mehrten geologic formation. Increasing urban demand and associated population growth, along with an increased shift by agricultural users from surface water to groundwater and prolonged drought, have resulted in declining groundwater levels due to overdraft. This condition was recognized by the City of Merced and the Merced Irrigation District (MID) in 1993, at which time the two entities began a two-year planning process to assure a safe and reliable water supply for Eastern Merced County through the year 2030. Integrated Regional Water Planning continues today through various efforts.

Wastewater

Wastewater (sanitary sewer) collection and treatment in the Merced urban area is provided by the City of Merced. The wastewater collection system handles wastewater generated by residential, commercial, and industrial uses in the City.

The City Wastewater Treatment Plant (WWTP), located in the southwest part of the City about two miles south of the airport, has been periodically expanded and upgraded to meet the needs of the City's growing population and new industry. The City's wastewater treatment facility has a capacity of 11.5 million gallons per day (mgd), with an average flow of 8.5 mgd. The City has recently completed an expansion project to increase capacity to 12 mgd and upgrade to tertiary treatment with the addition of filtration and ultraviolet disinfection. Future improvements would add another 8 mgd in capacity (in increments of 4 mgd), for a total of 20 mgd. This design capacity can support a population of approximately 174,000. The collection system will also need to be expanded as development occurs.

Treated effluent is disposed of in several ways depending on the time of year. Most of the treated effluent (75% average) is discharged to Hartley Slough throughout the year. The remaining treated effluent is delivered to a land application area and the on-site City-owned wetland area south of the treatment plant.

Storm Drainage

The Draft *City of Merced Storm Drainage Master Plan* addresses the collection and disposal of surface water runoff in the City’s SUDP. The study addresses both the collection and disposal of storm water. Systems of storm drain pipes and catch basins are laid out, sized, and costed in the plan to serve present and projected urban land uses.

It is the responsibility of the developer to ensure that utilities, including storm water and drainage facilities, are installed in compliance with City regulations and other applicable regulations. Necessary arrangements with the utility companies or other agencies will be made for such installation, according to the specifications of the governing agency and the City (Ord. 1342 § 2 (part), 1980: prior code § 25.21(f)). The City requires the construction of storm water percolation/detention basins with new development. Percolation basins are designed to collect storm water and filter it before it is absorbed into the soil and reaches groundwater tables. Detention basins are designed to temporarily collect runoff so it can be metered at acceptable rates into canals and streams which have limited capacity. The disposal system is mainly composed of MID facilities, including water distribution canals and laterals, drains, and natural channels that traverse the area.

The City of Merced has been involved in developing a Storm Water Management Plan (SWMP) to fulfill requirements of storm water discharges from Small Municipal Separate Storm Sewer System (MS4) operators in accordance with Section 402(p) of the Federal Clean Water Act (CWA). The SWMP was developed to also comply with General Permit Number CAS000004, Water Quality Order No. 2003-0005-DWQ.

Solid Waste

The City of Merced is served by the Highway 59 Landfill and the Highway 59 Compost Facility, located at 6040 North Highway 59, one and one-half miles north of Old Lake Road. The County of Merced is the contracting agency for landfill operations and maintenance, while the facilities are owned by the Regional Waste Authority. The City of Merced provides services for all refuse pick-up within the City limits and franchise hauling companies collect in the unincorporated areas. In addition to these two landfill sites, there is one private disposal facility, the Flintkote County Disposal Site, at SR 59 and the Merced River. This site is restricted to concrete and earth material.

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

Impact Analysis

Would the project:

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

The proposed project would be served, largely through lines in Yosemite Avenue and G Street, by the City's existing water, wastewater treatment, and storm water drainage systems. Electrical power, natural gas, and telecommunications facilities are all located near the site. It is not anticipated that any new facilities would be required. This impact would be **less than significant.**

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

The City's water supply system consists of four elevated storage tanks with a combined storage capacity of approximately 1.4 million gallons, 23 wells and 14 pumping stations. The project is expected to use approximately 53,125 gallons of water per day. There is a 16-inch water line in Yosemite Avenue and another 16-inch line in McKee Road to serve the project site. The City's water supply would be sufficient to serve the proposed project. This impact would be **less than significant.**

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

The City's wastewater collection system handles wastewater generated by residential, commercial, and industrial uses in the City. The City Wastewater Treatment Plant (WWTP), located in the southwest part of the City about 2 miles south of the airport, has been periodically expanded and upgraded to meet the needs of the City's growing population and new industry.

The WWTP recently finished two major upgrades (Phase IV and Phase V) to improve the quality of the treated water, referred to as plant effluent, and to improve the quality of biosolids and methods of treatment. The Merced Wastewater Treatment Plant is now one of the most advanced facilities in the state. It is capable of treating up to 12 million gallons of influent a day. The proposed project is estimated to generate approximately 35,788 gallons of wastewater per day (based on 213 gallons/dwelling unit, 108 gallons/day/1,000 square feet of floor area for office and commercial uses gallons, and 100 gallons/day/room for the hotel). The additional wastewater generated by the project would be approximately 0.3% of the overall capacity of the WWTP.

There is sufficient capacity at the WWTP, and the existing lines in Yosemite Avenue and G Street have enough capacity during peak hours to accommodate the additional wastewater and transmit it to the WWTP for processing. This impact is **less than significant.**

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?*

Solid wastes within the County of Merced are disposed of at two landfill sites owned and operated by the Merced County Regional Waste Management Authority. The west side of the County is served by the Billy Wright Road landfill, and the east side (including the City of Merced) by the Highway 59 landfill, 1.5 miles north of Old Lake Road. The County of Merced is the contracting agency for landfill operation and maintenance. It is estimated that the remaining capacity of the Highway 59 site will last until the year 2030. The City of Merced provides services for all refuse pick-up within the City limits, including green waste and recycling. Street sweeping services are also offered.

The proposed project would be required to provide recycling containers for the multi-family residences as well as general garbage containers. Additionally, in order to reduce the number of containers on site for general waste, the developer may install trash compactors. CalRecycle estimates that the average multi-family unit generates approximately 4 pounds of waste per day (combined trash and recyclables). This equates to 176 pounds/day for the overall project. It is expected that approximately ½ of the total waste generated by the multi-family residential component could be recycled. The City's Refuse Department would be able to serve the project and sufficient capacity is available at the landfill to serve the project. This impact would be **less than significant.**

e) *Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*

The California Integrated Waste Management Act of 1989 (AB 939) changed the focus of solid waste management from landfill to diversion strategies such as source reduction, recycling, and composting. The purpose of the diversion strategies is to reduce dependence on landfills for solid waste disposal. AB 939 established mandatory diversion goals of 25 percent by 1995 and 50 percent by 2000. The proposed project would be required to comply with all federal, State, and local regulations related to solid waste. Furthermore, the proposed project would be required to comply with all standards related to solid waste diversion, reduction, and recycling during project construction and operation of the project. Therefore, the proposed project is anticipated to result in **less-than-significant** impacts related to potential conflicts with federal, State, and local statutes and regulations related to solid waste.

20. Wildfire

SETTING AND DESCRIPTION

Both urban and wildland fire hazard potential exists in the City of Merced and surrounding areas, creating the potential for injury, loss of life, and property damage. Urban fires primarily involve the uncontrolled burning of residential, commercial, or industrial structures due to human activities. Wildland fires affect grassland, brush or woodlands, and any structures on or near these fires. Such fires can result from either human made or natural causes.

Urban fires comprise the majority of fires in the City of Merced. The site is surrounded by urban uses. The single-family lots to the south are lots of approximately 0.2 to 0.3 acres in size. These lots contain areas of grass and other vegetation that could be susceptible to fires. However, the

City of Merced Fire Department has procedures in place to address the issue of wildland fires, so no additional mitigation would be necessary.

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

Impact Analysis

Would the project:

a) *Substantially impair an adopted emergency response plan or emergency evacuation plan?*

The project construction of new roadways for the project is limited to the internal roadway network and the extension of Sandpiper Drive, which as previously discussed is contemplated in the City of Merced General Plan thorough the Circulation Map. The project would also be required to comply with all applicable requirements of the California Fire Code. As such, the project would not have major impact on an adopted emergency response plan or emergency evacuation plan. This impact would be **less than significant.**

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?*

According to the California Department of Forestry and Fire Protection, the project site is not located in any fire hazard zone. The areas surrounding the project site are mostly developed, urban land.

There is a low potential for wildland fires within these parameters. Additionally, the California Building Code and the California Fire Codes work together to regulate building construction and related items such as the care of vacant lots and the storage of flammable liquids.

To provide effective fire prevention activities for low hazard occupancies, the Fire Department conducts seasonal hazard removal programs (primarily weed abatement). The City of Merced employs a weed abatement program, which requires property owners to eliminate flammable vegetation and rubbish from their properties. Each property within the City is surveyed each spring and notices are sent to the property owners whose properties have been identified to pose a fire risk. Since inception of this program in 1992, grass or brush related fires within the City have been greatly reduced. The City also picks up abandoned vehicles, and a "Spring Clean-up" conducted annually allows people to have bulky refuse picked up at transfer stations without charge. A permanent site recently opened near Highway 59 and Yosemite Avenue. Further, staging areas, building areas, and/or areas slated for development using spark-producing equipment are cleared of dried vegetation or other materials that could serve as fuel for combustion; impacts are considered **less than significant**.

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?*

The project would be required to repair/replace any missing or damaged infrastructure along their property frontage. However, the on-going maintenance of roadways would fall to the City. All other infrastructure or utilities exist in the area. No additional infrastructure or on-going maintenance would be required that would cause an impact to the environment. This impact is **less than significant.**

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?*

The project site and surrounding area is relatively flat with no risk of downslope or downstream flooding or landslides. Therefore, there is **no impact.**

21. Mandatory Findings of Significance

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
21. Mandatory Findings of Significance. Would the project:				
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?			✓	
b) 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 probably future projects?)			✓	
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?			✓	

Impact Analysis

Would the project:

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

As previously discussed in this document, the project does not have the potential to adversely affect biological resources or cultural resources because such resources are lacking on the project site, and any potential impacts would be avoided with implementation of the mitigation measures and other applicable codes identified in this report. Also, the project would not significantly change the existing urban setting of the project area. Thus, this impact would be **less than significant.**

b) *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 probably future projects?)*

The Program Environmental Impact Report conducted for the *Merced Vision 2030 General Plan, and the General Plan Program EIR* (SCH# 2008071069) has recognized that future development and build-out of the SUDP/SOI will result in cumulative and unavoidable impacts in the areas of Air Quality and Loss of Agricultural Soils. In conjunction with this conclusion, the City has adopted a Statement of Overriding Considerations for these impacts (Resolution #2011-63) which is herein incorporated by reference.

The certified General Plan EIR addressed and analyzed cumulative impacts resulting from changing agricultural use to urban uses. No new or unaddressed cumulative impacts will result from the Project that have not previously been considered by the certified General Plan EIR or by the Statement of Overriding Considerations, or mitigated by this Expanded Initial Study. This Initial Study does not disclose any new and/or feasible mitigation measures which would lessen the unavoidable and significant cumulative impacts.

The analysis of impacts associated with the development of the proposed change will contribute to the cumulative impacts identified in the General Plan EIR. The nature and extent of these impacts, however, falls within the parameters of impacts previously analyzed in the General Plan EIR. No individual or cumulative impacts will be created by the Project that have not previously been considered at the program level by the General Plan EIR or mitigated by this Initial Study. This impact is **less than significant.**

c) *Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*

Development anticipated by the *Merced Vision 2030 General Plan* will have significant adverse effects on human beings. These include the incremental degradation of air quality in the San Joaquin Basin, the loss of prime agricultural soils, the incremental increase in traffic, and the increased demand on natural resources, public services, and facilities. However, consistent with the provisions of CEQA previously identified, the analysis of the Project is limited to those impacts which are peculiar to the Project site or which were not previously identified as significant effects in the prior EIR. The previously-certified General Plan EIR and the Statement of Overriding Considerations addressed those cumulative impacts; hence, there is no requirement to address them again as part of this Project.

This previous EIR has concluded that these significant adverse impacts are accounted for in the mitigation measures incorporated into the General Plan EIR. In addition, a Statement of Overriding Considerations has been adopted by City Council Resolution #2011-63 that indicates that the significant impacts associated with development of the Project are offset by the benefits that will be realized in providing necessary jobs for residents of the City. The analysis and mitigation of impacts has been detailed in the Environmental Impact Report prepared for the *Merced Vision 2030 General Plan,* which are incorporated into this document by reference.

While this issue was addressed and resolved with the General Plan EIR in an abundance of caution, in order to fulfill CEQA's mandate to fully disclose potential environmental consequences of projects, this analysis is considered herein. However, as a full disclosure document, this issue is repeated in abbreviated form for purposes of disclosure, even though it was resolved as a part of the General Plan.

Potential impacts associated with the Project's development have been described in this Initial Study. All impacts were determined to either be **less than significant** or **less than significant with mitigation measures.**

Attachments:

A) Public Hearing Notice and Notice Area Map
B) Mitigation Monitoring Program

Appendices:

A) Air Quality and Greenhouse Gas Impact Analysis for General Plan Amendment #19-03
B) Traffic Impact Analysis for General Plan Amendment #19-03
C) Mitigation Monitoring Program for Initial Study #10-06

NOTICE OF PUBLIC HEARING
FOR GENERAL PLAN AMENDMENT #19-03, SUP REVISION #3 to PD #72 , AND NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

A public hearing will be held by the Merced City Planning Commission on Wednesday, December 4, 2019, at 7:00 p.m., or as soon thereafter as may be heard in the City Council Chambers located at 678 W. 18th Street, Merced, CA, concerning General Plan Amendment #19-03 and Site Utilization Plan (SUP) Revision #3 to PD #72. This application was initiated by Yosemite & G, LLC., property owner. The General Plan Amendment and SUP Revision application is a request to change the General Plan designation from Commercial Office (CO) and High to Medium Density Residential (HMD) to Neighborhood Commercial (CN) for approximately 21.5 acres of land generally located at the northeast corner of Yosemite Avenue and G Street. The SUP Revision includes a four-story hotel of approximately 80,104 square feet, two medical office buildings totaling approximately 66,465 square feet, 44 Units of Multi-Family Residential Housing totaling approximately 29,887 square feet, fast food uses with drive-thru windows totaling approximately 5,494 square feet, and a mixed-use development with approximately 59,616 square feet of other retail and office uses. The property is more particularly described as: "Remainder C" of Final Map No. 5233, amended map for Mansionette Estates Unit 1, according to the map filed July 13, 2000 in Book 52, Pages 31, 32, and 33 of Official Plats, Merced Country Records; also known as Assessor's Parcel Number (APN) 231-040-004 and APN 231-040-005.

An environmental review checklist has been filed for this project, and a draft mitigated negative declaration has been prepared under the California Environmental Quality Act. A copy of this staff evaluation ("Initial Study") is available for public inspection at the City of Merced Planning Department during regular business hours, at 678 West 18th Street, Merced, CA. A copy of this document can also be purchased at the Planning Department for the price of reproduction.

All persons in favor of, opposed to, or in any manner interested in this request for a General Plan Amendment and Site Utilization Plan, are invited to attend this public hearing or forward written comments to the Director of Development Services, City of Merced, 678 W. 18th Street, Merced, CA 95340. The public review period for the environmental determination begins on November 14, 2019, and ends on December 4, 2019. Please feel free to call the Planning Department at (209) 385-6858 for additional information. If you challenge the decision of the Planning Commission in court, you may be limited to raising only those issues you or someone else raised at the public hearing described in this notice, or in written correspondence delivered to the City of Merced at, or prior to, the public hearing.

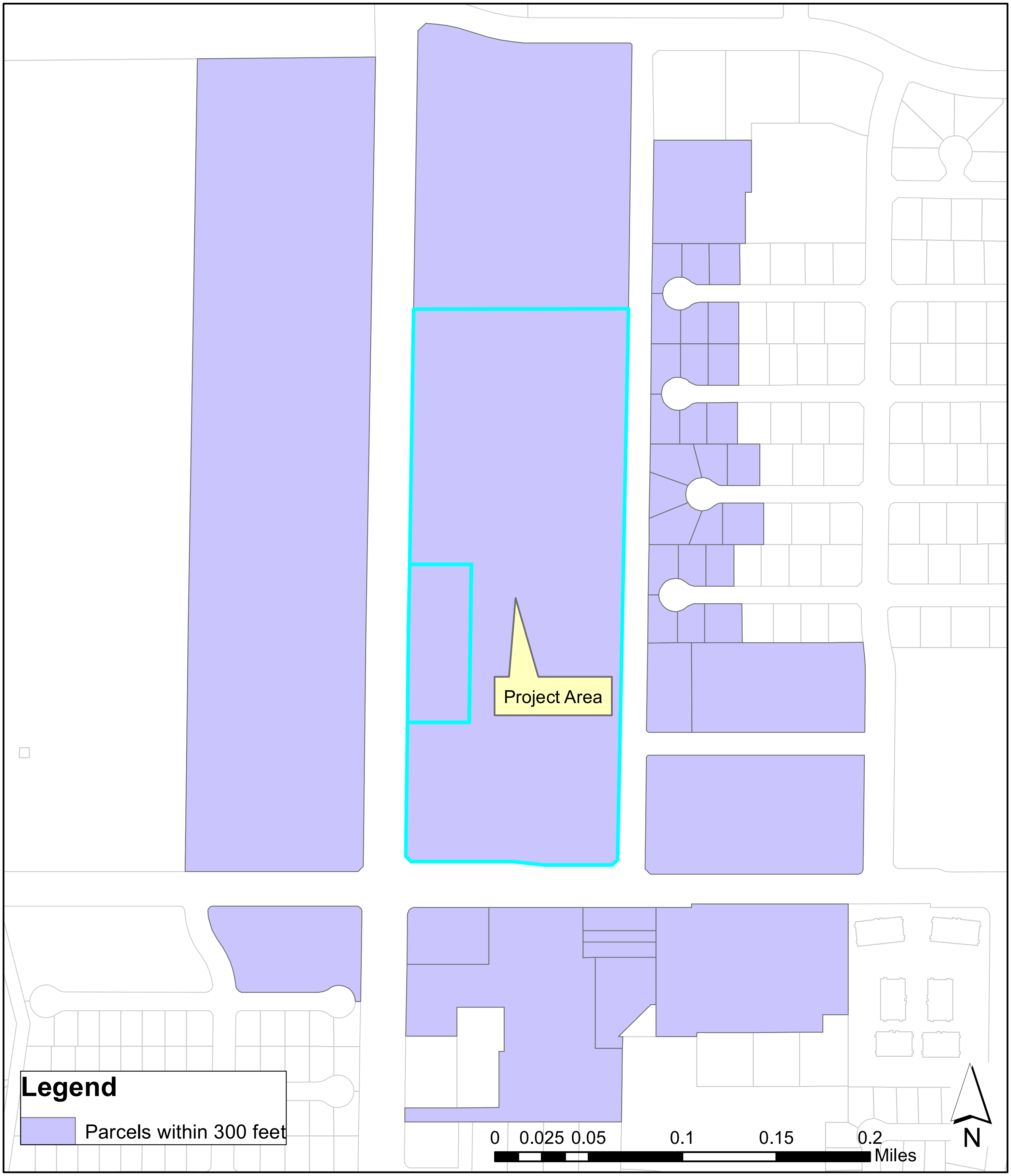
After the Planning Commission makes its decision on this matter, the General Plan Amendment and Site Utilization Plan Revision will also be considered at a public hearing before the City Council. A separate notice of that public hearing will also be given.

November 14, 2019

Kim Espinosa,
Planning Manager

ATTACHMENT A

ATTACHMENT 7



General Plan Amendment #19-03, SUP Revision #3 to PD #72, and Environmental Review #19-28

ATTACHMENT 7

ENVIRONMENTAL REVIEW #19-28
Mitigation Monitoring Program

MITIGATION MONITORING CONTENTS

This mitigation monitoring program includes a brief discussion of the legal basis and purpose of the mitigation monitoring program, a key to understanding the monitoring matrix, a discussion of noncompliance complaints, and the mitigation monitoring matrix itself.

LEGAL BASIS AND PURPOSE OF THE MITIGATION MONITORING PROGRAM

Public Resource Code (PRC) 21081.6 requires public agencies to adopt mitigation monitoring or reporting programs whenever certifying an environmental impact report or mitigated negative declaration. This requirement facilitates implementation of all mitigation measures adopted through the California Environmental Quality Act (CEQA) process.

The City of Merced has adopted its own "Mitigation Monitoring and Reporting Program" (MMC 19.28). The City's program was developed in accordance with the advisory publication, *Tracking CEQA Mitigation Measures*, from the Governor's Office of Planning and Research.

As required by MMC 19.28.050, the following findings are made:

1) The requirements of the adopted mitigation monitoring program for the General Plan Amendment #19-03 and Site Utilization Plan Revision #3 to Planned Development #72 shall run with the real property. Successive owners, heirs, and assigns of this real property are bound to comply with all of the requirements of the adopted program.
2) Prior to any lease, sale, transfer, or conveyance of any portion of the subject real property, the applicant shall provide a copy of the adopted program to the prospective lessee, buyer, transferee, or one to whom the conveyance is made.

MITIGATION MONITORING PROCEDURES

In most cases, mitigation measures can be monitored through the City's construction plan approval/plan check process. When the approved project plans and specifications, with mitigation measures, are submitted to the City Development Services Department, a copy of the monitoring checklist will be attached to the submittal. The Mitigation Monitoring Checklist will be filled out upon project approval with mitigation measures required. As project plans and specifications are checked, compliance with each mitigation measure can be reviewed.

In instances where mitigation requires on-going monitoring, the Mitigation Monitoring Checklist will be used until monitoring is no longer necessary. The Development Services Department will be required to file periodic reports on how the implementation of various mitigation measures is progressing or is being maintained. Department staff may be required to conduct periodic inspections to assure compliance. In some instances, outside agencies and/or consultants may be required to conduct necessary periodic inspections as part of the mitigation monitoring program. Fees may be imposed per MMC 19.28.070 for the cost of implementing the monitoring program.

GENERAL PLAN MITIGATION MEASURES

As a second tier environmental document, Initial Study #19-28 incorporates some mitigation measures adopted as part of the *Merced Vision 2030 General Plan Program Environmental Impact Report* (SCH# 2008071069), as mitigation for potential impacts of the Project.

NONCOMPLIANCE COMPLAINTS

Any person or agency may file a complaint asserting noncompliance with the mitigation measures associated with the project. The complaint shall be directed to the Director of Development Services in written form providing specific information on the asserted violation. The Director of Development Services shall cause an investigation and determine the validity of the complaint. If noncompliance with a mitigation measure has occurred, the Director of Development Services shall cause appropriate actions to remedy any violation. The complainant shall receive written confirmation indicating the results of the investigation or the final action corresponding to the particular noncompliance issue. Merced Municipal Code (MMC) Sections 19.28.080 and 19.28.090 outline the criminal penalties and civil and administrative remedies which may be incurred in the event of noncompliance. MMC 19.28.100 spells out the appeals procedures.

MONITORING MATRIX

The following pages provide a series of tables identifying the mitigation measures proposed specifically for General Plan Amendment #19-03 and Site Utilization Plan Revision #3 to Planned Development #72. The columns within the tables are defined as follows:

Mitigation Measure:	Describes the Mitigation Measure (referenced by number).
Timing:	Identifies at what point in time or phase of the project that the mitigation measure will be completed.
Agency/Department Consultation:	This column references any public agency or City department with which coordination is required to satisfy the identified mitigation measure.
Verification:	These columns will be initialed and dated by the individual designated to verify adherence to the project specific mitigation.

General Plan Amendment #19-02/Site Utilization Plan Revision #3 to Planned Development #72
Mitigation Monitoring Checklist

Project Name:____ **File Number:**____
Approval Date:____ **Project Location** ____
Brief Project Description____

The following environmental mitigation measures were incorporated into the Conditions of Approval for this project in order to mitigate identified environmental impacts to a level of insignificance. A completed and signed checklist for each mitigation measure indicates that this mitigation measure has been complied with and implemented, and fulfills the City of Merced's Mitigation Monitoring Requirements (MMC 19.28) with respect to Assembly Bill 3180 (Public Resources Code Section 21081.6).

ATTACHMENT 7

3) Air Quality

Impact	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
c	AIR-1) Consistent with SJVAPCD Regulation VIII (Fugitive PM10 Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site: -All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover. -All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant -All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. -When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained. -All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. *(continued on next page)*			

ATTACHMENT 7

Impact No.		***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
c		-The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden. - Following the addition of materials to, or the removal of materials from, the surface of out-door storage piles, said piles shall be effectively stabilized of fugitive dust emission utilizing sufficient water or chemical stabilizer/suppressant.	Building Permits	Planning Department	
c	AIR-2)	The project contractor shall ensure all off-road diesel-powered construction equipment of 50 horsepower or more used for the project meet the California Air Resources Board (CARB) Tier 2 with a Level 3 Diesel Particulate Filter emissions standards or equivalent.	Building Permits	Planning Department	

ATTACHMENT 7

4) Biological Resources				
Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
a	BIO-1) Impacts of the proposed project upon vegetation and wildlife habitat can be mitigated by preserving as many of the existing trees as possible (if any still exist) and incorporating them into the proposed project. The Cottonwood trees have the greatest wildlife habitat value, although they are generally less visually attractive and in poorer condition than either the Olive trees or the Eucalyptus trees. However, in spite of appearances, a Cottonwood, even in poor condition, provides good wildlife habitat. Impacts to wildlife habitat can also be reduced by using native plant materials in landscaping to the greatest extent possible. Native plant species provide the best wildlife habitat since native vegetation has co-evolved with the wildlife and affords food sources for which wildlife is best adapted. Native species cannot always be used to produce the desired form and floral characteristics, but some native species can usually be incorporated.	Building Permits	Planning Department	

ATTACHMENT 7

5) Cultural Resources

Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
a	CUL-1) If unknown pre-contact or historic-period archaeological materials are encountered during project activities, all work in the immediate vicinity of the find shall halt until a qualified archaeologist can evaluate the find and make recommendations. Cultural resources materials may include pre-contact resources such as flaked and ground stone tools and debris, shell, bone, ceramics, and fire-affected rock, as well as historic resources such as glass, metal, wood, brick, or structural remnants. If the qualified archaeologist determines that the discovery represents a potentially significant cultural resource, additional investigations shall be required to mitigate adverse impacts from project implementation. These additional studies may include, but are not limited to, recordation, archaeological excavation, or other forms of significance evaluations. The applicant shall inform its contractor(s) of the sensitivity of the project site for archaeological deposits, and include the following directive in the appropriate contract documents: *(continued on next page)*			

ATTACHMENT 7

Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
	"The subsurface of the construction site is sensitive for archaeological deposits. If archaeological deposits are encountered during project subsurface construction, all ground-disturbing activities within 25 feet shall be redirected and a qualified archaeologist shall assess the situation, consult with agencies as appropriate, and make recommendations for the treatment of the discovery. Project personnel shall not collect or move any archaeological materials. Archaeological deposits can include, but are not limited to, shellfish remains; bones, including human remains; and tools made from, obsidian, chert, and basalt; mortars and pestles; historical trash deposits containing glass, ceramics, and metal artifacts; and structural remains, including foundations and wells." The City shall verify that the language has been included in the grading plans prior to issuance of a grading permit or other permitted project action that includes ground-disturbing activities on the project site.	Building Permits	Planning Department	

ATTACHMENT 7

Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
c	CUL-3) If human remains are identified during construction and cannot be preserved in place, the applicant shall fund: 1) the removal and documentation of the human remains from the project corridor by a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards for Archaeology; 2) the scientific analysis of the remains by a qualified archaeologist, should such analysis be permitted by the Native American Most Likely Descendant; and, 3) the reburial of the remains, as appropriate. All excavation, analysis, and reburial of Native American human remains shall be done in consultation with the Native American Most Likely Descendant, as identified by the California Native American Heritage Commission.	Building Permits	Planning Department	

ATTACHMENT 7

6) Energy				
a	ENE-1) The applicant shall comply with all applicable California Energy Code, AB 341, and San Joaquin Valley Air Pollution Control District rules and regulations regulating energy efficiency and waste.	Building Permits	Building Department	
b	ENE-2) Implementation of Mitigation Measure ENE-1.	Building Permits	Building Department	
7) Geology and Soils				
Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
b	GEO-1) The project shall comply with all requirements of the State Water Resources Board (SWRCB) and obtain a General Construction Activity Stormwater Permit.	Building/ Encroachment Permits	Engineering Department	
b	GEO-2) The project shall comply with all applicable mitigation measures for Expanded Initial Study #02-27 for General Plan Amendment #02-02 and Annexation/Pre-Zoning Application #02-02.	Building/ Encroachment Permits	Engineering Department	

8) Hydrology and Water Quality				
a	HYDRO-1) To minimize any potential short-term water quality effects from project-related construction activities, the project contractor shall implement Best Management Practices (BMPs) in conformance with the California Storm Water Best Management Practice Handbook for Construction Activity. In addition, the proposed project shall be in compliance with existing regulatory requirements, including the Water Pollution Control Preparation (WPCP) Manual. In addition, implementation of a Storm Water Pollution Prevention Plan (SWPPP) would be required under the National Pollutant Discharge Elimination System (NPDES) to regulate water quality associated with construction activities.	Building/ Encroachment Permits	Engineering Department	

ATTACHMENT 7

Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
a	HYDRO-2 If any storm drainage from the site is to drain into MID facilities, the developer shall first enter into a "Storm Drainage Agreement" with MID and pay all applicable fees.	Building/ Encroachment Permits	Engineering Department	
a	HYDRO-3) To reduce the potential for degradation of surface water quality during project operation, a SWPPP shall be prepared for the proposed project. The SWPPP shall describe specific programs to minimize stormwater pollution resulting from the proposed project. Specifically, the SWPPP shall identify and describe source control measures, treatment controls, and BMP maintenance requirements to ensure that the project complies with post-construction stormwater management requirements of the RWQCB.	Building/ Encroachment Permits	Engineering Department	
c	HYDRO-4 Prior to issuance of a building permit or as required by the City Engineer, the developer shall demonstrate to the City that storm drainage facilities are adequate to meet the Project demands and that improvements are consistent with the City Standards and the City's Storm Drain Master Plan.	Building/ Encroachment Permits	Engineering Department	

13) Noise				
Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
a	NOI-1) To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the project: • The construction contractor shall ensure that all internal combustion engine-driven equipment is equipped with mufflers that are in good condition and appropriate for the equipment. • The construction contractor shall locate stationary noise-generating equipment as far as feasible from sensitive receptors when sensitive receptors adjoin or are near a construction disturbance area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. • The construction contractor shall prohibit unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes is prohibited). • The construction contractor shall locate, to the maximum extent practical, on-site equipment staging areas so as to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. *(continued on next page)*	Building Permit	Building Department	

Impact No.	***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
	• The construction contractor shall limit all noise producing construction activities, including deliveries and warming up of equipment, to the hours of 7:00 a.m. to 7:00 p.m., Monday through Saturday. No such work shall be permitted on Sundays or federal holidays without prior approval from the City.	Building Permit	Planning Department	
17) Transportation and Traffic				
a, c	**TRA-01** Project Driveway 1 shall have a minimum throat depth of 150 feet before any vehicular openings to the north.	Building Permit	Planning/ Engineering Department	

17) Transportation and Traffic					
Impact No.		***Mitigation Measures***	***Timing***	***Agency or Department***	***City Verification (date and initials)***
a, c	**TRA-01**	Project Driveway 1 shall have a minimum throat depth of 150 feet before any vehicular openings to the north.	Building Permit	Planning/ Engineering Department	
a, c	**TRA-02**	The Project shall implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to G Street. Based on the implementation progress of the project, the timing of these improvements shall be at the discretion of the City Engineer.	Building Permit	Planning/ Engineering Department	
a, c	**TRA-03**	The Project shall implement a Class II Bike Lane along its frontage to G Street. Based on the implementation progress of the project, the timing of this improvement shall be at the discretion of the City Engineer.	Building Permit	Planning/ Engineering Department	
a, c	**TRA-04**	The intersection of G Street and Project Driveway 1 shall be signalized with protective left-turn phasing in all directions.	Building Permit	Planning/ Engineering Department	

a, c	**TRA-05** The The intersection of Sandpiper Avenue and Mercy Avenue shall be modified as an All-Way Stop with the following details: o Stripe a westbound left-turn lane; o Modify the westbound left-through-right lane to a through-right lane; o Stripe a northbound left-turn; o Modify the northbound left-through-right lane to a through-right lane; and o Implement an all-way stop control. o Based on the implementation progress of the project, the timing of these improvements shall be at the discretion of the City Engineer.	Building Permit	Planning/ Engineering Department	
a, c	**TRA-06** The intersection of G Street and Yosemite Avenue shall have a second southbound left-turn lane added, the traffic signal shall be modified to implement overlap phasing of the northbound right-turn with the westbound left-turn phase, and westbound to eastbound U-turns shall be prohibited. Prior to implementation of this measure, design details and timing are to be approved by the City Engineer.	Building Permit	Planning/ Engineering Department	

ATTACHMENT 7

a, c	**TRA-07**	The intersection of Paulson Road and Yosemite Avenue shall have an eastbound through-right lane with a receiving lane east of Paulson Road added. Prior to implementation of this measure, design details and timing are to be approved by the City Engineer.	Building Permit	Planning/ Engineering Department	

Certificate of Completion:
By signing below, the environmental coordinator confirms that the required mitigation measures have been implemented as evidenced by the Schedule of Tasks and Sign-Off Checklist, and that all direct and indirect costs have been paid. This act constitutes the issuance of a *Certificate of Completion*.

Environmental Coordinator

Date

ATTACHMENT 7

AIR QUALITY AND GREENHOUSE GAS IMPACT ANALYSIS

YOSEMITE CROSSING PROJECT

CITY OF MERCED, CALIFORNIA

APPENDIX A TO IS #19-28

LSA

September 2019

ATTACHMENT 7

This page intentionally left blank

ATTACHMENT 7

AIR QUALITY AND GREENHOUSE GAS IMPACT ANALYSIS

YOSEMITE CROSSING PROJECT

CITY OF MERCED, CALIFORNIA

Submitted to:

True North Properties
1155 W. Shaw #104
Fresno, California 93711

Prepared by:

LSA
7086 North Maple Avenue, Suite 104
Fresno, California 93720
559.490.1210

Project No. YOG1901

September 2019

ATTACHMENT 7

This page intentionally left blank

ATTACHMENT 7

TABLE OF CONTENTS

APPENDICES

ATTACHMENT 7

FIGURES AND TABLES

FIGURES

TABLES

LIST OF ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
°C	degrees Celsius
$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AB	Assembly Bill
APS	Alternative Planning Strategy
AQMP	Air Quality Management Plan
BAU	Business-as-Usual
Bio-CO_2	biologically generated carbon dioxide
BPS	Best Performance Standards
CAA	Clean Air Act
CAAQS	California ambient air quality standards
CAT	Climate Action Team
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAP	Climate Action Plan
CARB	California Air Resources Board
CCAA	California Clean Air Act
CCAP	Climate Change Action Plan
CEQA	California Environmental Quality Act
CH_4	methane
City	City of Merced
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
GHG	greenhouse gas
GWP	global warming potential
HFCs	hydrofluorocarbons
hr	hour
IPCC	Intergovernmental Panel on Climate Change
ISR	Indirect Source Review
LOS	level of service
mg/m^3	milligrams per cubic meter
MPO	Metropolitan Planning Organization
N_2O	nitrous oxide

NAAQS	national ambient air quality standards
NBio-CO_2	non-biologically generated carbon dioxide
ND	no data available
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone (or smog)
OEHHA	California's Office of Environmental Health Hazard Assessment
Pb	lead
PCAP	Programmatic Climate Action Plan
PFCs	perfluorocarbons
PG&E	Pacific Gas & Electric Company
PM	particulate matter
PM_{10}	particulate matter less than 10 microns in size
$PM_{2.5}$	particulate matter less than 2.5 microns in size
ppb	parts per billion
ppm	parts per million
project	Yosemite Crossing Project
ROG	reactive organic gas
RTP	Regional Transportation Plan
SB	Senate Bill
SCS	Sustainable Communities Strategy
SJVAB	San Joaquin Valley Air Basin
SJVAPCD	San Joaquin Valley Air Pollution Control District
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
SO_X	sulfur oxides
State	State of California
TACs	toxic air contaminants
UDM	Urban Design Manual
USEPA	United States Environmental Protection Agency
UNFCCC	United Nations Framework Convention on Climate Change
VOCs	volatile organic compounds

1.0 AIR QUALITY IMPACT ANALYSIS

1.1 INTRODUCTION

This Air Quality and Greenhouse Gas Analysis for the proposed Yosemite Crossing Project (project) in the City of Merced (City) in Merced County, California has been prepared using methods and assumptions recommended in the San Joaquin Valley Air Pollution Control District's (SJVAPCD) *Guidance for Assessing and Mitigating Air Quality Impacts* (GAMAQI).[1] This analysis includes a description of existing regulatory framework, an assessment of project construction and operation-period emissions, and an assessment of greenhouse gas (GHG) emissions. Measures to reduce or eliminate significant impacts are identified, where appropriate.

1.2 PROJECT DESCRIPTION

The 21.4-acre project site is located at the northeast corner of G Street and Yosemite Avenue in Merced. The project site is bound to the north by vacant land, to the east by single family residential uses, open space, a ponding basin, and a proposed Valley Children's facility, to the south by Yosemite Avenue, and to the west by G Street. Figure 1 shows the site's regional and local context. Figure 2 depicts an aerial photograph of the project site.

The proposed project would include a variety of uses, including 66,465 square feet of medical-dental office space, a 128-room hotel, 7,898 square feet of fast-food restaurants with drive-through windows, a 3,130 square foot gasoline/service station with 12 fueling positions, 18,222 square feet of shopping center uses, a 5,000 square foot high-turnover (sit-down) restaurant, 12,000 square feet of general office space, a 4,804 square foot day care center, a 3,560 square foot drive-in bank, residential uses, and a total of 912 parking spaces. The project would also include 44 units of multi-family apartments. The project site plan is shown in Figure 3.

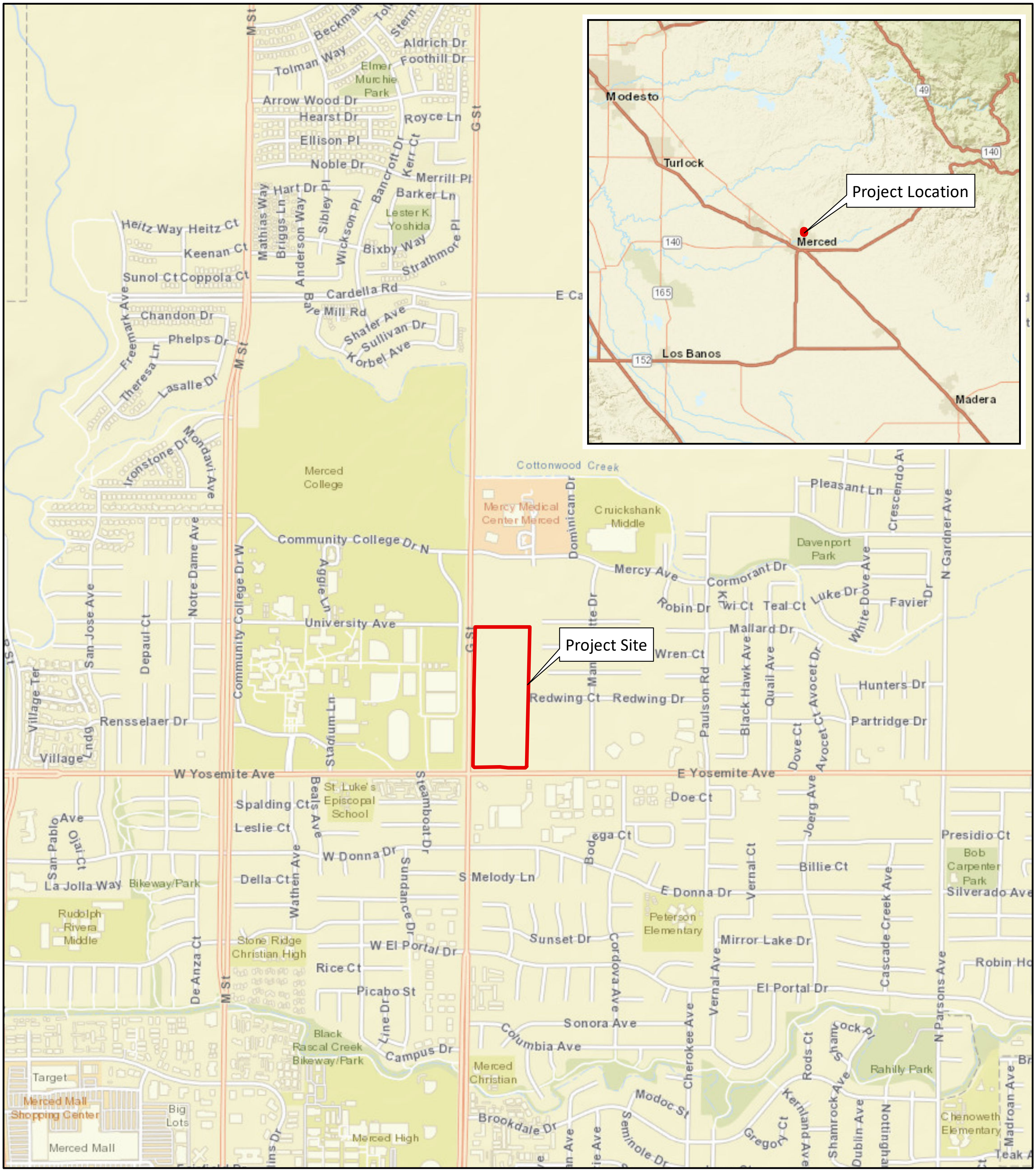
Access to the project would be provided by five driveways, along Mercy Avenue, "G" Street, and Yosemite Avenue. Regional access to the site is provided by State Route 99, which is located approximately 2.5 miles south of the project site. The project site is located in an area developed with single-family residential, medical, commercial, religious, and school uses. Mercy Medical Center Hospital is located approximately 0.1 mile north of the project site, Merced College is located approximately 0.1 mile west of the project site, and Cruickshank Middle School is located approximately 0.2 mile northeast of the project site.

Construction of Phase I of the project would include Pad A, Shop A, Shop B, the gas station, Pad D, and Pad E and is expected to begin September 2020. The construction schedule for future phases has not been determined. Construction activities are expected to utilize standard construction equipment.

---

[1] San Joaquin Valley Air Pollution Control District, 2015. *Guidance for Assessing and Mitigating Air Quality Impacts*. March 19. Website: www.valleyair.org/transportation/ceqa_idx.htm (accessed August 2019).

This page intentionally left blank



LEGEND

🟥 Project Site

FIGURE 1

0 750 1500

FEET

SOURCE: ESRI World Street Map (08/19).

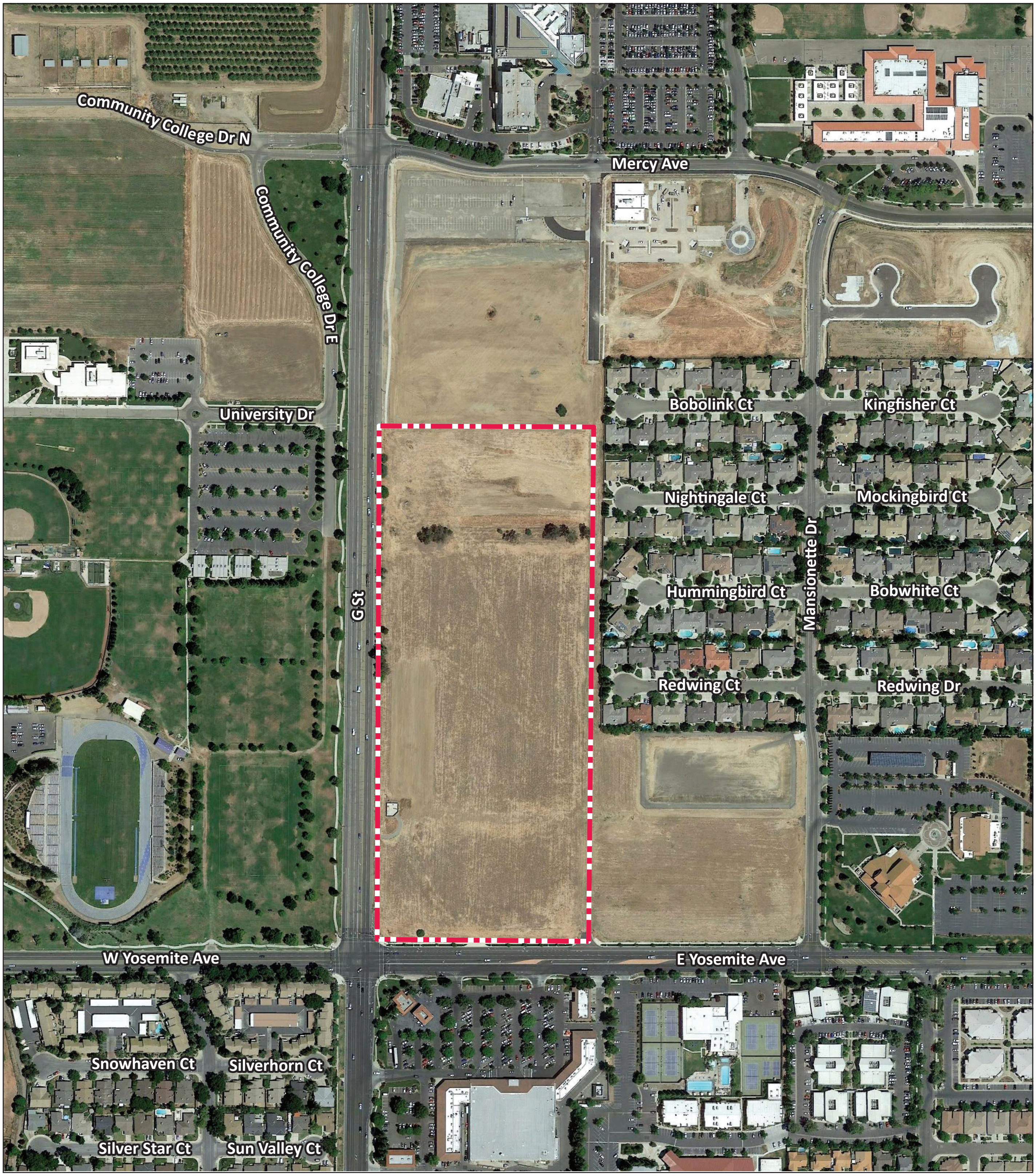
Yosemite Crossing

Merced, Merced County, California

Project Vicinity Map

I:\YOG1901\GIS\Maps\Figure 1_Project Vicinity Map.mxd (8/26/2019)

ATTACHMENT G



LSA

FIGURE 2

0 250 500
FEET

N

Project Site

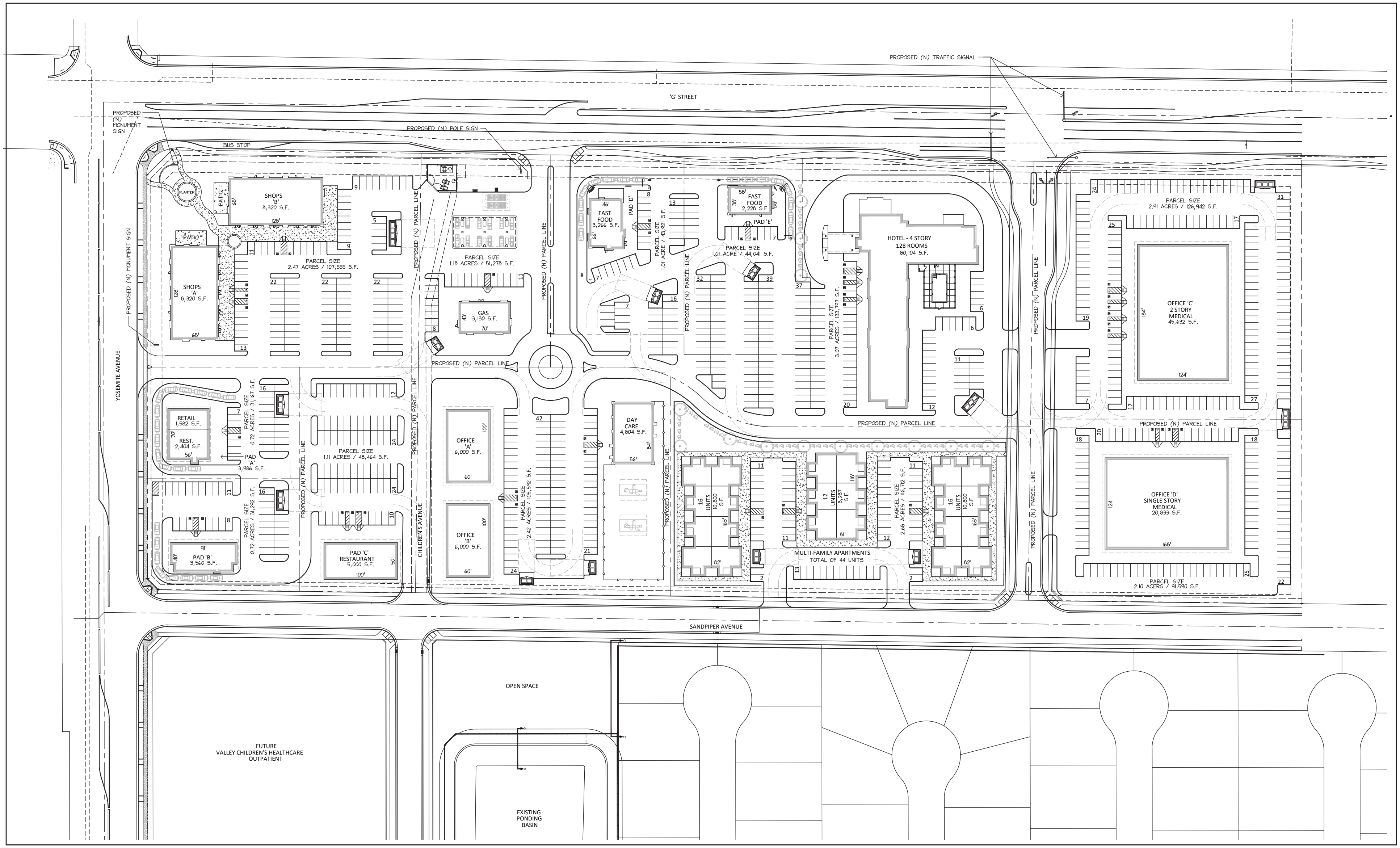
Yosemite Crossing

Aerial Photograph of the Project Site

SOURCES: GOOGLE EARTH, 5/16/18; LSA, 2019.

FRE10\P:\YOG1901 Yosemite Crossing\PRODUCTS\Figures\Figure_2.ai (8/23/19)

ATTACHMENT G



LSA

FIGURE 3

NOT TO SCALE

N

Yosemite Crossing

Site Plan

SOURCE: CENTERLINE DESIGN, LLC, SEPTEMBER 2019.

FRE10\P:\YOG1901 Yosemite Crossing\PRODUCTS\Figures\Figure_3.ai (9/19/19)

ATTACHMENT G

1.2.1 Existing Sensitive Land Uses in the Project Area

For the purposes of this analysis, sensitive receptors are areas of population that have an increased sensitivity to air pollution or environmental contaminants. Sensitive receptor locations include residences, schools, day care centers, hospitals, parks, and similar uses which are sensitive to air quality. Impacts on sensitive receptors are of particular concern because they are the population most vulnerable to the effects of air pollution.[2] The closest sensitive receptor locations to the project site include the single family residences located immediately east of the project site, along Redwing Court, Hummingbird Court, Nightingale Cord, and Bobolink Court.

1.3 AIR QUALITY BACKGROUND

This section provides background information on air pollutants and their health effects. It also provides brief information from the California Air Resources Board's Air Quality and Land Use Handbook[3] (CARB Handbook) and the supplement; Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory[4], a brief description of the general health risks of toxics, and the California Environmental Quality Act (CEQA) significance criteria for project evaluation.

1.3.1 Air Pollutants and Health Effects

Both State and Federal governments have established health-based Ambient Air Quality Standards for six criteria air pollutants:[5] carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and suspended particulate matter (PM). In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Long-term exposure to elevated levels of criteria pollutants may result in adverse health effects. However, emission thresholds established by an air district are used to manage total regional emissions within an air basin based on the air basin's attainment status for criteria pollutants. These emission thresholds were established for individual projects that would contribute to regional emissions and pollutant concentrations and could adversely affect or delay the projected attainment target year for certain criteria pollutants.

Because of the conservative nature of the thresholds and the basin-wide context of individual project emissions, there is no direct correlation between a single project and localized air quality-related health effects. One individual project that generates emissions exceeding a threshold does not necessarily result in adverse health effects for residents in the project vicinity. This condition is especially true when the criteria pollutants exceeding thresholds are those with regional effects, such as ozone precursors like nitrogen oxides (NO_x) and reactive organic gases (ROG).

---

[2] San Joaquin Valley Air Pollution Control District, 2015. op. cit.

[3] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

[4] California Air Resources Board, 2017. *Strategies to Reduce Air Pollution Exposure Near High-Volume Roadways: Technical Advisory.*

[5] United States Environmental Protection Agency (USEPA), 2014. Criteria pollutants are defined as those pollutants for which the Federal and State governments have established ambient air quality standards, or criteria, for outdoor concentrations in order to protect public health.

Occupants of facilities such as schools, daycare centers, parks and playgrounds, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to air pollutants because these population groups have increased susceptibility to respiratory disease. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. Residential areas are considered more sensitive to air quality conditions, compared to commercial and industrial areas, because people generally spend longer periods of time at their residences, with greater associated exposure to ambient air quality conditions. Recreational uses are also considered sensitive compared to commercial and industrial uses due to greater exposure to ambient air quality conditions associated with exercise.

1.3.1.1 Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving ROG and NO_x. The main sources of ROG and NO_x, often referred to as ozone precursors, are combustion processes (including combustion in motor vehicle engines) and the evaporation of solvents, paints, and fuels. Automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

1.3.1.2 Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles. CO transport is limited - it disperses with distance from the source under normal meteorological conditions. However, under certain extreme meteorological conditions, CO concentrations near congested roadways or intersections may reach unhealthful levels that adversely affect local sensitive receptors (e.g., residents, schoolchildren, the elderly, and hospital patients). Typically, high CO concentrations are associated with roadways or intersections operating at unacceptable levels of service (LOS) or with extremely high traffic volumes. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Extremely high levels of CO, such as those generated when a vehicle is running in an unventilated garage, can be fatal.

1.3.1.3 Particulate Matter

Particulate matter is the term used for a mixture of solid particles and liquid droplets found in the air. Coarse particles are those that are 10 microns or less in diameter, or PM_{10}. Fine, suspended particulate matter with an aerodynamic diameter of 2.5 microns or less, or $PM_{2.5}$, is not readily filtered out by the lungs. Nitrates, sulfates, dust, and combustion particulates are major components of PM_{10} and $PM_{2.5}$. These small particles can be directly emitted into the atmosphere as byproducts of fuel combustion; through abrasion, such as tire or brake lining wear; or through fugitive dust (wind or mechanical erosion of soil). They can also be formed in the atmosphere through chemical reactions. Particulates may transport carcinogens and other toxic compounds that adhere to the particle surfaces and can enter the human body through the lungs.

1.3.1.4 Nitrogen Dioxide

NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 also contributes to other pollution problems, including a high concentration of fine particulate matter, poor visibility, and acid deposition. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. NO_2 decreases lung function and may reduce resistance to infection.

1.3.1.5 Sulfur Dioxide

SO_2 is a colorless, irritating gas formed primarily from incomplete combustion of fuels containing sulfur. Industrial facilities also contribute to gaseous SO_2 levels in the region. SO_2 irritates the respiratory tract, can injure lung tissue when combined with fine particulate matter, and reduces visibility and the level of sunlight.

1.3.1.6 Lead

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been mobile and industrial sources. As a result of the phase-out of leaded gasoline, metal processing is currently the primary source of lead emissions. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery factories. Twenty years ago, mobile sources were the main contributor to ambient lead concentrations in the air. In the early 1970s, the United States Environmental Protection Agency (USEPA) established national regulations to gradually reduce the lead content in gasoline. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The USEPA banned the use of leaded gasoline in highway vehicles in December 1995. As a result of the USEPAs regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector and levels of lead in the air decreased dramatically.

1.3.1.7 Visibility-Reducing Particles

Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials (e.g., metals, soot, soil, dust, and salt). The Statewide standard is intended to limit the frequency and severity of visibility impairment due to regional haze. The entire San Joaquin Valley Air Basin (SJVAB) is unclassified for the State standard for visibility-reducing particles.

1.3.1.8 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated by the USEPA and CARB. Some examples of TACs include benzene, butadiene, formaldehyde, and hydrogen sulfide. The identification, regulation, and monitoring of TACs is relatively recent compared to that for criteria pollutants.

TACs do not have ambient air quality standards, but are regulated by the USEPA, CARB, and the SJVAPCD. In 1998, the CARB identified particulate matter from diesel-fueled engines as a TAC. The CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[6] High-volume freeways, stationary diesel engines, and facilities attracting heavy and constant diesel vehicle traffic (e.g., distribution centers and truck stops) were identified as posing the highest risk to adjacent receptors. Other facilities associated with increased risk include warehouse distribution centers, large retail or industrial facilities, high-volume transit centers, and schools with a high volume of bus traffic. Health risks from TACs are a function of both concentration and duration of exposure.

Unlike TACs emitted from industrial and other stationary sources noted above, most diesel particulate matter is emitted from mobile sources—primarily “off-road” sources such as construction and mining equipment, agricultural equipment, and truck-mounted refrigeration units, as well as trucks and buses traveling on freeways and local roadways.

Although not specifically monitored, recent studies indicate that exposure to diesel particulate matter may contribute significantly to a cancer risk (a risk of approximately 500 to 700 in 1,000,000) that is greater than all other measured TACs combined.[7] The technology for reducing diesel particulate matter emissions from heavy-duty trucks is well established, and both State and Federal agencies are moving aggressively to regulate engines and emission control systems to reduce and remediate diesel emissions. The CARB anticipates that by 2020, average statewide diesel particulate matter concentrations will decrease by 85 percent from levels in 2000 with full implementation of the CARB’s Diesel Risk Reduction Plan,[8] meaning that the statewide health risk from diesel particulate matter is expected to decrease from 540 cancer cases in 1,000,000 to 21.5 cancer cases in 1,000,000.

Table 1 summarizes the sources and health effects of air pollutants discussed in this section. Table 2 presents a summary of State and Federal ambient air quality standards (AAQS).

---

[6] CARB, 2000. Stationary Source Division and Mobile Source Control Division. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October.

[7] Ibid.

[8] Ibid.

Table 1: Sources and Health Effects of Air Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	● Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust ● Natural events, such as decomposition of organic matter	● Reduced tolerance for exercise ● Impairment of mental function ● Impairment of fetal development ● Death at high levels of exposure ● Aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	● Motor vehicle exhaust ● High temperature stationary combustion ● Atmospheric reactions	● Aggravation of respiratory illness ● Reduced visibility ● Reduced plant growth ● Formation of acid rain
Ozone (O_3)	● Atmospheric reaction of organic gases with nitrogen oxides in sunlight	● Aggravation of respiratory and cardiovascular diseases ● Irritation of eyes ● Impairment of cardiopulmonary function ● Plant leaf injury
Lead (Pb)	● Contaminated soil	● Impairment of blood functions and nerve construction ● Behavioral and hearing problems in children
Suspended Particulate Matter ($PM_{2.5}$ and PM_{10})	● Stationary combustion of solid fuels ● Construction activities ● Industrial processes ● Atmospheric chemical reactions	● Reduced lung function ● Aggravation of the effects of gaseous pollutants ● Aggravation of respiratory and cardiorespiratory diseases ● Increased cough and chest discomfort ● Soiling ● Reduced visibility
Sulfur Dioxide (SO_2)	● Combustion of sulfur-containing fossil fuels ● Smelting of sulfur-bearing metal ores Industrial processes	● Aggravation of respiratory diseases (asthma, emphysema) ● Reduced lung function ● Irritation of eyes ● Reduced visibility ● Plant injury ● Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board (2015).

Table 2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]		Federal Standards[b]		
		Concentration[c]	Method[d]	Primary[c,e]	Secondary[c,f]	Method[g]
Ozone (O3)[h]	1-Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	–	Same as Primary Standard	Ultraviolet Photometry
	8-Hour	0.07 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[i]	24-Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		–		
Fine Particulate Matter (PM2.5)[i]	24-Hour	-		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3		
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	–	Non-Dispersive Infrared Photometry (NDIR)
	1-Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8-Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		–	–	
Nitrogen Dioxide (NO2)[j]	Annual Arithmetic Mean	0.03 ppm (57 µg/m^3)	Gas Phase Chemi-luminescence	53 ppb (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemi-luminescence
	1-Hour	0.18 ppm (339 µg/m^3)		100 ppb (188 µg/m^3)	-	
Lead (Pb)[l,m]	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)[l]	Same as Primary Standard	
	Rolling 3-Month Average[i]	–		0.15 µg/m^3		
Sulfur Dioxide (SO2)[k]	24-Hour	0.04 ppm (105 µg/m3)	Ultraviolet Fluorescence	0.14 ppm (for certain areas)	–	Ultraviolet Fluorescence; Spectro-photometry (Pararosaniline Method)
	3-Hour	–		–	0.5 ppm (1300 µg/m^3)	
	1-Hour	0.25 ppm (655 µg/m^3)		75 ppb (196 µg/m^3)[k]	–	
	Annual Arithmetic Mean	–		0.030 ppm (for certain areas)[k]	–	
Visibility-Reducing Particles[l]	8-Hour	See footnote n	Beta Attenuation and Transmittance through Filter Tape.	No Federal Standards		
Sulfates	24-Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1-Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[j]	24-Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

Table notes are provided on the following page.

[a] California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, 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.

[b] 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 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For $PM_{2.5}$, 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 USEPA for further clarification and current national policies.

[c] 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.

[d] Any equivalent measurement method which can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.

[e] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[f] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[g] Reference method as described by the USEPA. An “equivalent method” of measurement may be used but must have a “consistent relationship to the reference method” and must be approved by the USEPA.

[h] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM_{10} standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

[j] 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 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

[k] On June 2, 2010, a new 1-hour SO_2 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 SO_2 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 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.

[l] The CARB 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.

[m] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ 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.

[n] In 1989, the CARB 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.

°C = degrees Celsius
CARB = California Air Resources Board
USEPA = United States Environmental Protection Agency
ppb = parts per billion
ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter
Source: California Air Resources Board, 2016. https://www.arb.ca.gov/research/aaqs/aaqs2.pdf

1.3.2 Greenhouse Gases and Global Climate Change

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. The Earth's average near-surface atmospheric temperature rose 0.6 ± 0.2° Celsius (°C) or 1.1 ± 0.4° Fahrenheit (°F) in the 20th century. The prevailing scientific opinion on climate change is that most of the warming observed over the last 50 years is attributable to human activities. The increased amounts of carbon dioxide (CO_2) and other GHGs are the primary causes of the human-induced component of warming. GHGs are released by the burning of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.[9]

GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change are:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF_6)

Over the last 200 years, humans have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change in the long term. Water vapor is excluded from the list of GHGs above because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation. For the purposes of this air quality analysis, the term "GHGs" will refer collectively to the six gases listed above only.

---

[9] The temperature on Earth is regulated by a system commonly known as the "greenhouse effect." Just as the glass in a greenhouse lets heat from sunlight in and reduces the heat escaping, greenhouse gases like carbon dioxide, methane, and nitrous oxide in the atmosphere keep the Earth at a relatively even temperature. Without the greenhouse effect, the Earth would be a frozen globe; thus, although an excess of greenhouse gas results in global warming, the *naturally occurring* greenhouse effect is necessary to keep our planet at a comfortable temperature.

These gases vary considerably in terms of Global Warming Potential (GWP), which is a concept developed to compare the ability of each GHG to trap heat in the atmosphere relative to another gas. The global warming potential is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to carbon dioxide, the most abundant GHG; the definition of GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to the ratio of heat trapped by one unit mass of CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of "CO_2 equivalents" (CO_2e). Table 3 shows the GWP for each type of GHG. For example, sulfur hexafluoride is 22,800 times more potent at contributing to global warming than carbon dioxide.

Table 3: Global Warming Potential of Greenhouse Gases

Gas	Atmospheric Lifetime (Years)	Global Warming Potential (100-Year Time Horizon)
Carbon Dioxide	50-200	1
Methane	12	25
Nitrous Oxide	114	298
HFC-23	270	14,800
HFC-134a	14	1,430
HFC-152a	1.4	124
PFC: Tetrafluoromethane (CF_4)	50,000	7,390
PFC: Hexafluoromethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC* (Intergovernmental Panel on Climate Change, 2007).

The following discussion summarizes the characteristics of the six GHGs and black carbon.

1.3.2.1 Carbon Dioxide

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic out gassing, decomposition of organic matter and evaporation from the oceans. Human caused sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production, and deforestation. Natural sources release approximately 150 billion tons of CO_2 each year, far outweighing the 7 billion tons of man-made emissions of CO_2 each year. Nevertheless, natural removal processes, such as photosynthesis by land- and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and consequently, the gas is building up in the atmosphere.

In 2016, CO_2 emissions accounted for approximately 83 percent of California's overall GHG emissions.[10] The transportation sector accounted for California's largest portion of CO_2 emissions,

---

[10] California Air Resources Board. 2018. *California Greenhouse Gas Emission Inventory – 2018 Edition*. July 11. Website: www.arb.ca.gov/cc/inventory/data/data.htm (accessed August 2019).

approximately 39 percent, with gasoline consumption making up the greatest portion of these emissions. Industrial sources were California's second largest category of GHG emissions.

1.3.2.2 Methane

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California. Methane accounted for approximately 9.0 percent of GHG emissions in California in 2016.[11]

Total annual emissions of methane in California are approximately 38.9 million tons, with manmade emissions accounting for the majority. As with CO_2, the major removal process of atmospheric methane—a chemical breakdown in the atmosphere—cannot keep pace with source emissions, and methane concentrations in the atmosphere are increasing.

1.3.2.3 Nitrous Oxide

Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion emit N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California. Nitrous oxide emissions accounted for approximately 3 percent of GHG emissions in California in 2016.[12]

1.3.2.4 Hydrofluorocarbons, Perfluorocarbons, and Sulfur Hexafluoride

HFCs are primarily used as substitutes for ozone-depleting substances regulated under the Montreal Protocol.[13] PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs. HFCs, PFCs, and SF_6 accounted for about 6 percent of man-made GHG emissions (CO_2e) in California in 2016.[14]

1.3.2.5 Black Carbon

Black carbon is the most strongly light-absorbing component of PM formed by burning fossil fuels such as coal, diesel, and biomass. Black carbon is emitted directly into the atmosphere in the form of

---

[11] Ibid.

[12] Ibid.

[13] The Montreal Protocol is an international treaty that was approved on January 1, 1989, and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion.

[14] Ibid.

$PM_{2.5}$ and is the most effective form of PM, by mass, at absorbing solar energy. Per unit of mass in the atmosphere, black carbon can absorb a million times more energy than CO_2.[15] Black carbon contributes to climate change both directly, such as absorbing sunlight, and indirectly, such as affecting cloud formation. However, because black carbon is short-lived in the atmosphere, it can be difficult to quantify its effect on global-warming.

Most U.S. emissions of black carbon come from mobile sources (52 percent), particularly from diesel fueled vehicles. The other major source of black carbon is open biomass burning, including wildfires, although residential heating and industry also contribute. The CARB estimates that the annual black carbon emissions in California have decreased approximately 70 percent between 1990 and 2010 and are expected to continue to decline significantly due to controls on mobile diesel emissions.

1.3.3 Air Quality Regulatory Setting

The USEPA and the CARB regulate direct emissions from motor vehicles. The SJVAPCD is the regional agency primarily responsible for regulating air pollution emissions from stationary sources (e.g., factories) and indirect sources (e.g., traffic associated with new development), as well as monitoring ambient pollutant concentrations.

1.3.3.1 Federal Clean Air Act

The 1970 Federal Clean Air Act authorized the establishment of national health-based air quality standards and also set deadlines for their attainment. The Federal Clean Air Act Amendments of 1990 changed deadlines for attaining national standards as well as the remedial actions required of areas of the nation that exceed the standards. Under the Clean Air Act, State and local agencies in areas that exceed the national standards are required to develop State Implementation Plans to demonstrate how they will achieve the national standards by specified dates.

1.3.3.2 California Clean Air Act

In 1988, the California Clean Air Act (CCAA) required that all air districts in the State endeavor to achieve and maintain California ambient air quality standards (CAAQS) for carbon monoxide, ozone, sulfur dioxide and nitrogen dioxide by the earliest practical date. The California Clean Air Act provides districts with authority to regulate indirect sources and mandates that air quality districts focus particular attention on reducing emissions from transportation and area-wide emission sources. Each nonattainment district is required to adopt a plan to achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each nonattainment pollutant or its precursors. A Clean Air Plan shows how a district would reduce emissions to achieve air quality standards. Generally, the State standards for these pollutants are more stringent than the national standards.

---

[15] U.S. Environmental Protection Agency, 2015. *Black Carbon*. September Website: www3.epa.gov/blackcarbon/basic.html, accessed August 2019.

1.3.3.3 California Air Resources Board Handbook

The CARB has developed an Air Quality and Land Use Handbook[16] which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. According to the CARB Handbook, recent air pollution studies have shown an association between respiratory and other non-cancer health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California. The CARB Handbook recommends that county and city planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools and playgrounds.

Land use designations with air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners and large gasoline service stations. Key recommendations in the CARB Handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day or rural roads with 50,000 vehicles/day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet); and
- Within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater).

The CARB Handbook specifically states that its recommendations are advisory and acknowledges land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.

The recommendations are generalized and do not consider site specific meteorology, freeway truck percentages or other factors that influence risk for a particular project site. The purpose of the land use compatibility analysis is to further examine the project site for actual health risk associated with the location of new housing on the project site.

1.3.3.4 San Joaquin Valley Air Pollution Control District

The SJVAPCD has specific air quality-related planning documents, rules, and regulations. This section summarizes the local planning documents and regulations that may be applicable to the project as administered by the SJVAPCD with CARB oversight.

---

[16] California Air Resources Board, 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April.

Rule 2280—Portable Equipment Registration. Portable equipment used at project sites for less than six consecutive months must be registered with the SJVAPCD. The SJVAPCD will issue the registrations 30 days after receipt of the application.[17]

Rule 2303—Mobile Source Emission Reduction Credits. A project may qualify for SJVAPCD vehicle emission reduction credits if it meets the specific requirements of Rule 2303 for any of the following categories[18]:

- Low-Emission Transit Buses
- Zero-Emission Vehicles
- Retrofit Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles
- Retrofit Heavy-Duty Vehicles

Rule 4201 and Rule 4204—Particulate Matter Concentration and Emission Rates. Rule 4201 and Rule 4202 apply to operations that emit or may emit dust, fumes, or total suspended particulate matter.[19]

Rule 8011—General Requirements: Fugitive Dust Emission Sources. Fugitive dust regulations are applicable to outdoor fugitive dust sources. Operations, including construction operations, must control fugitive dust emissions in accordance with SJVAPCD Regulation VIII. According to Rule 8011, the SJVAPCD requires the implementation of control measures for fugitive dust emission sources. For projects in which construction-related activities would disturb equal to or greater than 1 acre of surface area, the SJVAPCD recommends that demonstration of receipt of an SJVAPCD-approved Dust Control Plan or Construction Notification Form, before issuance of the first grading permit, be made a condition of approval.[20]

Rule 9510—Indirect Source Review. In December 2005, the SJVAPCD adopted the Indirect Source Rule (Rule 9510) to meet its emission reduction commitments in the PM_{10} and O_3 Attainment Plans. Indirect Source Review regulation applies to any development project that includes at least 2,000 square feet of commercial space. This Rule requires project applicants to reduce operation

---

[17] San Joaquin Valley Air Pollution Control District, 1996. Portable Equipment Registration. Amended May 16. Website: https://www.valleyair.org/rules/currntrules/r2280.pdf, accessed August 2019.

[18] San Joaquin Valley Air Pollution Control District, 1994. Mobile Source Emission Reduction Credits. Adopted May 19. Website: http://www.valleyair.org/rules/currntrules/r2303.pdf, accessed August 2019.

[19] San Joaquin Valley Air Pollution Control District, 1996. Rule 4202. Particulate Matter - Emission Rate. Amended December 17. Website: https://www.valleyair.org/rules/currntrules/r4202.pdf, accessed August 2019.

[20] San Joaquin Valley Air Pollution Control District, 2004. Rule 8011. Indirect Source Review. Amended August 19. Website: https://www.valleyair.org/rules/currntrules/r8011.pdf, accessed August 2019.

emissions of NO_x by 33.3 percent of the project's operational baseline and 50 percent of the project's operational PM_{10} emissions.[21]

Guidance for Assessing and Mitigating Air Quality Impacts. The SJVAPCD prepared the GAMAQI to assist lead agencies and project applicants in evaluating the potential air quality impacts of projects in the SJVAB. The GAMAQI provides SJVAPCD-recommended procedures for evaluating potential air quality impacts during the CEQA environmental review process. The GAMAQI provides guidance on evaluating short-term (construction) and long-term (operational) air emissions. The most recent version of the GAMAQI, adopted March 19, 2015, was used in this evaluation. It contains guidance on the following:

- Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
- Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
- Methods to mitigate air quality impacts; and
- Information for use in air quality assessments and environmental documents, including air quality, regulatory setting, climate, and topography data.

Regional Air Quality Management Plan. The SJVAPCD is responsible for formulating and implementing the Air Quality Management Plan (AQMP) for the SJVAB. The main purpose of an AQMP is to bring the area into compliance with federal and State air quality standards. The SJVAPCD does not have one single AQMP for criteria pollutants, rather the District address each criteria pollutant with its own Plan. The SJVAPCD has the following AQMPs:

- 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ standard
- 2016 Plan for the 2008 8-Hour Ozone Standard
- 2013 Plan for the Revoked 1-Hour Ozone Standard
- 2007 PM_{10} Maintenance Plan
- 2004 Revision to the California State Implementation Plan for Carbon Monoxide

The SJVAPCD's AQMPs incorporate the latest scientific and technological information and planning assumptions, including updated emission inventory methodologies for various source categories. The SJVAPCD's AQMPs included the integrated strategies and measures needed to meet the national ambient air quality standards (NAAQS), implementation of new technology measures, and demonstrations of attainment of the 1-hour and 8-hour ozone NAAQS as well as the latest 24-hour and annual $PM_{2.5}$ standards.

---

[21] San Joaquin Valley Air Pollution Control District, 2015. Rule 9510. Indirect Source Review. Adopted December 21, 2017, Effective March 21. Website: https://www.valleyair.org/rules/currntrules/r9510.pdf, accessed August 2019.

1.3.3.5 City of Merced General Plan

The City of Merced addresses air quality in the Sustainable Development Element of the City's General Plan.[22] The Sustainable Development Element includes goals, policies, and implementing actions that work toward clean air with minimal toxic substances and odor, clean air with minimal particulate content, effective and efficient transportation infrastructure, and coordinated and cooperative intergovernmental air quality programs. The following policies and implementing actions from the Sustainable Development Element would be applicable to the proposed project.

- **Policy SD-1.1:** Accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the City of Merced.

- **Policy SD-1.3:** Integrate land use planning, transportation planning, and air quality planning for the most efficient use of public resources and for a healthier environment.

- **Implementing Action 1.1.b:** Ensure that significant air quality impacts identified during CEQA review are consistently and fairly mitigated.

- **Implementing Action 1.1.c:** All air quality mitigation measures should be feasible, implementable, and cost effective.

- **Implementing Action 1.1.e:** Reduce the air quality impacts of development projects that may be insignificant by themselves, but cumulatively are significant.

- **Implementing Action 1.6.a:** Work with the SJVAPCD to reduce to the maximum extent feasible particulate emissions from construction, grading, excavation, and demolition.

- **Implementing Action 1.6.c:** Require all access roads, driveways, and parking areas in new commercial and industrial development to be paved or constructed of other materials that minimize particulate emissions.

1.3.4 Global Climate Change Regulation

This section describes regulations related to Global Climate Change at the federal, State, and local level.

1.3.4.1 Federal Regulations

The United States has historically had a voluntary approach to reducing GHG emissions. However, on April 2, 2007, the United States Supreme Court ruled that the USEPA has the authority to regulate CO_2 emissions under the federal Clean Air Act. While there currently are no adopted federal regulations for the control or reduction of GHG emissions, the USEPA commenced several actions in 2009 to implement a regulatory approach to global climate change.

---

[22] Merced, City of, 2012. *Merced Vision 2030 General Plan*. June 20. Website: https://www.cityofmerced.org/civicax/filebank/blobdload.aspx?BlobID=11481 (accessed August 2019).

This includes the 2009 USEPA final rule for mandatory reporting of GHGs from large GHG emission sources in the United States. Additionally, the USEPA Administrator signed an endangerment finding action in 2009 under the Clean Air Act, finding that six GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, SF_6) constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to global climate change, leading to national GHG emission standards.

1.3.4.2 State Regulations

The CARB is the lead agency for implementing climate change regulations in the State. Since its formation, the CARB has worked with the public, the business sector, and local governments to find solutions to California's air pollution problems. Key efforts by the State are described below.

Assembly Bill 1493 (2002). In a response to the transportation sector's significant contribution to California's CO_2 emissions, Assembly Bill 1493 (AB 1493) was enacted on July 22, 2002. AB 1493 requires the CARB to set GHG emission standards for passenger vehicles and light duty trucks (and other vehicles whose primary use is noncommercial personal transportation in the State) manufactured in 2009 and all subsequent model years. These standards (starting in model years 2009 to 2016) were approved by the CARB in 2004, but the needed waiver of California Clean Air Act (CAA) Preemption was not granted by the USEPA until June 30, 2009. The CARB responded by amending its original regulation, now referred to as Low Emission Vehicle III, to take effect for model years starting in 2017 to 2025.

Executive Order S-3-05 (2005). Governor Arnold Schwarzenegger signed Executive Order S-3-05 on June 1, 2005, which proclaimed that California is vulnerable to the impacts of climate change. To combat those concerns, the executive order established California's GHG emissions reduction targets, which established the following goals:

- GHG emissions should be reduced to 2000 levels by 2010;
- GHG emissions should be reduced to 1990 levels by 2020; and
- GHG emissions should be reduced to 80 percent below 1990 levels by 2050.

The Secretary of the California Environmental Protection Agency (CalEPA) is required to coordinate efforts of various State agencies in order to collectively and efficiently reduce GHGs. A biannual progress report must be submitted to the Governor and State Legislature disclosing the progress made toward greenhouse emission reduction targets. In addition, another biannual report must be submitted illustrating the impacts of global warming on California's water supply, public health, agriculture, the coastline, and forestry, and report possible mitigation and adaptation plans to address these impacts.

The Secretary of CalEPA leads this Climate Action Team (CAT) made up of representatives from State agencies as well as numerous other boards and departments. The CAT members work to coordinate Statewide efforts to implement global warming emission reduction programs and the State's Climate Adaptation Strategy. The CAT is also responsible for reporting on the progress made toward meeting the Statewide GHG targets that were established in the executive order and further defined under AB 32, the "Global Warming Solutions Act of 2006." The first CAT Report to the Governor and the Legislature was released in March 2006, which it laid out 46 specific emission reduction strategies for reducing GHG emissions and reaching the targets established in the Executive Order. The CAT Report to the Governor and Legislature; the most recent was released in December 2010.

Assembly Bill 32 (2006), California Global Warming Solutions Act. California's major initiative for reducing GHG emissions is AB 32, passed by the State legislature on August 31, 2006. This effort aims at reducing GHG emissions to 1990 levels by 2020. The CARB has established the level of GHG emissions in 1990 at 427 million metric tons CO_2e. The emissions target of 427 million metric tons requires the reduction of 169 million metric tons from the State's projected business-as-usual 2020 emissions of 596 million metric tons. AB 32 requires the CARB to prepare a Scoping Plan that outlines the main State strategies for meeting the 2020 deadline and to reduce GHGs that contribute to global climate change. The Scoping Plan was approved by the CARB on December 11, 2008, and contains the main strategies California will implement to achieve the reduction of approximately 169 million metric tons of CO_2e, or approximately 30 percent, from the State's projected 2020 emission level of 596 million metric tons of CO_2e under a business-as-usual scenario (this is a reduction of 42 million metric tons CO_2e, or almost 10 percent from 2002-2004 average emissions). The Scoping Plan also includes CARB-recommended GHG reductions for each emissions sector of the State's GHG inventory. The Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 million metric tons CO_2e);
- The Low-Carbon Fuel Standard (15.0 million metric tons CO_2e);
- Energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 million metric tons CO_2e); and
- A renewable portfolio standard for electricity production (21.3 million metric tons CO_2e).

The Scoping Plan identifies 18 emission reduction measures that address cap-and-trade programs, vehicle gas standards, energy efficiency, low carbon fuel standards, renewable energy, regional transportation-related GHG targets, vehicle efficiency measures, goods movement, solar roof programs, industrial emissions, high speed rail, green building strategies, recycling, sustainable forests, water, and air. The measures would result in a total reduction of 174 million metric tons CO_2e by 2020.

On August 24, 2011, the CARB unanimously approved both the new supplemental assessment and reapproved its Scoping Plan, which provides the overall roadmap and rule measures to carry out AB 32. The CARB also approved a more robust CEQA equivalent document supporting the supplemental analysis of the cap-and-trade program. The cap-and-trade took effect on January 1, 2012, with an enforceable compliance obligation that began January 1, 2013.

CARB has not yet determined what amount of GHG reductions it recommends from local government operations and local land use decisions; however, the Scoping Plan states that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions (meanwhile, CARB is also developing an additional protocol for community emissions). CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The Scoping Plan states that the ultimate GHG reduction assignment to local government operations is to be determined. With regard to land use planning, the Scoping Plan expects an approximately 5.0 million metric tons CO_2e reduction due to implementation of Senate Bill 375 (SB 375).

In addition to reducing GHG emissions to 1990 levels by 2020, AB 32 directed the CARB and the CAT to identify a list of “discrete early action GHG reduction measures” that could be adopted and made enforceable by January 1, 2010. On January 18, 2007, Governor Schwarzenegger signed Executive Order S-1-07, further solidifying California’s dedication to reducing GHGs by setting a new Low Carbon Fuel Standard. The Executive Order sets a target to reduce the carbon intensity of California transportation fuels by at least 10 percent by 2020 and directs the CARB to consider the Low Carbon Fuel Standard as a discrete early action measure. In 2011, U.S. District Court Judge Lawrence O’Neil issued an injunction preventing implementation of the Low Carbon Fuel Standard, ruling that it is unconstitutional. In 2012, the Ninth Circuit Court of Appeal stayed the District Court’s injunction, allowing implementation of the Low Carbon Fuel Standard. The Ninth Circuit decided to uphold the Low Carbon Fuel Standard.

In June 2007, the CARB approved a list of 37 early action measures, including three discrete early action measures (Low Carbon Fuel Standard, Restrictions on GWP Refrigerants, and Landfill CH_4 Capture).[23] Discrete early action measures are measures that were required to be adopted as regulations and made effective no later than January 1, 2010, the date established by Health and Safety Code Section 38560.5. The CARB adopted additional early action measures in October 2007 that tripled the number of discrete early action measures. These measures relate to truck efficiency, port electrification, reduction of PFCs from the semiconductor industry, reduction of propellants in consumer products, proper tire inflation, and SF_6 reductions from the non-electricity sector. The combination of early action measures is estimated to reduce Statewide GHG emissions by nearly 16 million metric tons.[24]

The CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB climate change priorities until 2020, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California’s progress toward meeting the “near-term” 2020 GHG emission reduction goals as defined in the initial Scoping Plan. It also evaluates how to align the State’s “longer-term” GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land

---

[23] California Air Resources Board. 2007. *Expanded List of Early Action Measures to Reduce Greenhouse Gas Emissions in California Recommended for Board Consideration*. October.

[24] California Air Resources Board. 2007. “ARB approves tripling of early action measures required under AB 32” News Release 07-46. October 25.

use. CARB released a second update to the Scoping Plan, the 2017 Scoping Plan,[25] to reflect the 2030 target set by Executive Order B-30-15 and codified by Senate Bill 32 (SB 32).

Senate Bill 97 (2007). Senate Bill 97 (SB 97), signed by the Governor in August 2007 (Chapter 185, Statutes of 2007; Public Resources Code, Sections 21083.05 and 21097), acknowledges climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the OPR to prepare, develop, and transmit to the California Resources Agency guidelines for mitigating GHG emissions or the effects of GHG emissions, as required by CEQA.

The California Natural Resources Agency adopted the amendments to the CEQA Guidelines in January 2010, which went into effect in March 2010. The amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. The amendments encourage lead agencies to consider many factors in performing a CEQA analysis, but preserve the discretion granted by CEQA to lead agencies in making their own determinations based on substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs when they perform individual project analyses.

Senate Bill 375 (2008). Signed into law on October 1, 2008, SB 375 supplements GHG reductions from new vehicle technology and fuel standards with reductions from more efficient land use patterns and improved transportation. Under the law, the CARB approved GHG reduction targets in February 2011 for California's 18 federally designated regional planning bodies, known as Metropolitan Planning Organizations (MPOs). The CARB may update the targets every 4 years and must update them every 8 years. MPOs in turn must demonstrate how their plans, policies and transportation investments meet the targets set by the CARB through Sustainable Community Strategies (SCS). The SCS are included with the Regional Transportation Plan (RTP), a report required by State law. However, if an MPO finds that their SCS will not meet the GHG reduction target, they may prepare an Alternative Planning Strategy (APS). The APS identifies the impediments to achieving the targets.

Executive Order B-30-15 (2015). Governor Jerry Brown signed Executive Order B-30-15 on April 29, 2015, which added the immediate target of:

- GHG emissions should be reduced to 40 percent below 1990 levels by 2030.

All State agencies with jurisdiction over sources of GHG emissions were directed to implement measures to achieve reductions of GHG emissions to meet the 2030 and 2050 targets. CARB was directed to update the AB 32 Scoping Plan to reflect the 2030 target, and therefore, is moving forward with the update process. The mid-term target is critical to help frame the suite of policy measures, regulations, planning efforts, and investments in clean technologies and infrastructure needed to continue reducing emissions.

---

[25] California Air Resources Board. 2017. *California's 2017 Climate Change Scoping Plan*. November.

Senate Bill 350 (2015) Clean Energy and Pollution Reduction Act. Senate Bill 350 (SB 350), signed by Governor Jerry Brown on October 7, 2015, updates and enhances AB 32 by introducing the following set of objectives in clean energy, clean air, and pollution reduction for 2030:

- Raise California's renewable portfolio standard from 33 percent to 50 percent; and
- Increasing energy efficiency in buildings by 50 percent by the year 2030.

The 50 percent renewable energy standard will be implemented by the California Public Utilities Commission for the private utilities and by the California Energy Commission for municipal utilities. Each utility must submit a procurement plan showing it will purchase clean energy to displace other non-renewable resources. The 50 percent increase in energy efficiency in buildings must be achieved through the use of existing energy efficiency retrofit funding and regulatory tools already available to state energy agencies under existing law. The addition made by this legislation requires state energy agencies to plan for, and implement those programs in a manner that achieves the energy efficiency target.

Senate Bill 32, California Global Warming Solutions Act of 2016, and Assembly Bill 197. In summer 2016 the Legislature passed, and the Governor signed, SB 32, and Assembly Bill 197 (AB 197). SB 32 affirms the importance of addressing climate change by codifying into statute the GHG emissions reductions target of at least 40 percent below 1990 levels by 2030 contained in Governor Brown's April 2015 Executive Order B-30-15. SB 32 builds on AB 32 and keeps us on the path toward achieving the State's 2050 objective of reducing emissions to 80 percent below 1990 levels, consistent with an Intergovernmental Panel on Climate Change (IPCC) analysis of the emissions trajectory that would stabilize atmospheric GHG concentrations at 450 parts per million CO_2e and reduce the likelihood of catastrophic impacts from climate change.

The companion bill to SB 32, AB 197, provides additional direction to CARB related to the adoption of strategies to reduce GHG emissions. Additional direction in AB 197 meant to provide easier public access to air emissions data that are collected by CARB was posted in December 2016.

Senate Bill 100. On September 10, 2018, Governor Brown signed SB 100, which raises California's RPS requirements to 60 percent by 2030, with interim targets, and 100 percent by 2045. The bill also establishes a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Executive Order B-55-18. Executive Order B-55-18, signed September 10, 2018, sets a goal "to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter." Executive Order B-55-18 directs CARB to work with relevant state agencies to ensure future Scoping Plans identify and recommend measures to achieve the carbon neutrality goal. The goal of carbon neutrality by 2045 is in addition to other statewide goals, meaning not only should emissions be reduced to 80 percent below 1990 levels by 2050, but that, by no later than 2045, the remaining emissions be offset by equivalent net removals of CO_2e from the atmosphere, including through sequestration in forests, soils, and other natural landscapes.

1.3.4.3 San Joaquin Valley Air Pollution Control District

In August 2008, the SJVAPCD adopted the Climate Change Action Plan (CCAP).[26] The CCAP directed the SJVAPCD to develop guidance to assist lead agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific GHG emissions on global climate change.

In December 2009, the SJVAPCD adopted the guidance: Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA[27] and the policy: District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency.[28] The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS),[29] to assess significance of project-specific GHG emissions on global climate change during the environmental review process, as required by CEQA. Projects implementing BPS in accordance with SJVAPCD's guidance would be determined to have a less than significant individual and cumulative impact on GHG emissions and would not require project specific quantification of GHG emissions.

1.3.4.4 City of Merced

The City of Merced's Climate Action Plan (CAP)[30], adopted October 2012, is a community-based policy document that establishes a goal to reduce GHG emissions achieved through implementation of a variety of actions, that when implemented, will help to achieve broadly-supported community values including: 1) protecting water and air resources; 2) reducing the waste-stream to the landfill; 3) improving energy-efficiency; 4) enhancing choice in mobility; and 5) creating healthy and livable communities, while at the same time reducing greenhouse gas emissions. The GHG reduction opportunities come from a wide variety of sources in the community, including transportation, buildings, and water conservation.

In 2013, the City of Merced launched an effort, building upon the CAP, to create a suite of tools to identify and monitor near-term community GHG emission reduction efforts, adoption of new development-related codes, and to create the Urban Design Manual (UDM) that demonstrates City development policies and codes in order to develop the Programmatic Climate Action Plan (PCAP).[31]

As part of the CAP, the City adopted a community-wide GHG reduction target of 1990 levels by 2020. This target is equivalent to a 15 percent reduction below the baseline year of 2008 by 2020,

---

[26] San Joaquin Valley Air Pollution Control District, 2008. Climate Change Action Plan. November.

[27] San Joaquin Valley Air Pollution Control District, 2009. Guidance for Valley Land-Use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA. December 17.

[28] San Joaquin Valley Air Pollution Control District, 2009. Addressing GHG Emission Impacts for Stationary Source Projects under CEQA When Serving as the Lead Agency. December 17.

[29] San Joaquin Valley Air Pollution Control District, 2009. Final Staff Report Appendix J: GHG Emission Reduction Measures – Development Projects. December 17.

[30] Merced, City of, 2012. *Merced Climate Action Plan*. October 1.

[31] Merced, City of, 2015. *City of Merced Programmatic Climate Action Plan Administrative Draft*. July.

consistent with the Statewide target established by AB 32. A key outcome of the PCAP is to provide a group of measures that are capable of achieving the target, consistent with the standards for a qualified GHG reduction strategy identified in State CEQA Guidelines Section 15183.5(b).

However, the CAP does not provide a target beyond 2020. Executive Order S-3-05 set a 2050 reduction goal of 80 percent below 1990 levels for the State. The trajectory toward the 2050 target is equivalent to a 2030 target of approximately 38 percent below baseline levels. The provisional 2030 target, a 38 percent reduction below baseline 2008 levels, is provided in the PCAP to illustrate the commitment that would be needed to be on a trajectory to achieve the 2050 reduction target identified in EO S-3-05. To achieve a reduction of approximately 38 percent below baseline 2008 levels, the City would need to increase reductions post-2020. The City would need to achieve an additional reduction of 300,790 metric tons of CO_2e beyond State and existing local actions by 2030 to achieve a reduction of approximately 38 percent below baseline levels to maintain a trajectory toward California's long-term 2050 GHG reduction goals.

In addition, the PCAP includes a performance-based development approach that includes the measures in the CAP that apply to new development projects. The Residential and Nonresidential Project Options Checklists in Appendix A of the PCAP summarize the criteria for a project to claim consistency with the CAP allow CEQA streamlining for purposes of analyzing GHG emissions. Projects that demonstrate consistency with the CAP by meeting the criteria on these checklists can rely on the City's analysis of GHG emissions for purposes of CEQA. Where certain CAP performance measures also have a visual component, the City provides further guidance in the UDM. The Project Options Checklists and the UDM use a performance-based approach to identify measures and performance requirements for new projects seeking consistency with the CAP. If new projects do not comply with the CAP measures or the UDM, they may elect to conduct a quantitative analysis of GHG emissions.

1.4 ENVIRONMENTAL SETTING

1.4.1 Existing Climate and Air Quality

Air quality is a function of both local climate and local sources of air pollution. The amount of a given pollutant in the atmosphere is determined by the amount of the pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain, and for photochemical pollutants, sunshine.

The project site is located within the SJVAB and is under the jurisdiction of the SJVAPCD. A region's topographic features have a direct correlation with air pollution flow and therefore are used to determine the boundary of air basins. The SJVAB is comprised of approximately 25,000 square miles and covers of eight counties including Fresno, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare, and the western portion of Kern. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000 to 14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi mountains in the south (6,000 to 8,000 feet in elevation). The valley is basically flat with a slight downward gradient to the northwest. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. An aerial view of the SJVAB would simulate a “bowl” opening only to the north. These topographic features restrict air movement through and out of the basin.

Although marine air generally flows into the basin from the San Joaquin River Delta, the Coast Range hinders wind access into the SJVAB from the west, the Tehachapi Mountains prevent southerly passage of air flow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak air flow which becomes blocked vertically by high barometric pressure over the SJVAB. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500 to 3,000 feet).

Local climatological effects, including wind speed and direction, temperature, inversion layers, precipitation and fog, can exacerbate the air quality in the SJVAB. Wind speed and direction play an important role in dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing vertically and by transporting it to other locations. For example, in the summer, wind usually originates at the north end of the SJVAB and flows in a south-southeasterly direction through the SJVAB, through Tehachapi pass, into the Southeast Desert Air Basin. In the winter, wind direction is reversed and flows in a north-northwesterly direction. In addition to the seasonal wind flow, a sea breeze flows into SJVAB during the day and a land breeze flowing out of the SJVAB at night. The diversified wind flow enhances the pollutant transport capability within SJVAB.

The annual average temperature varies throughout the SJVAB, ranging from the low 40s to high 90s, measured in degrees Fahrenheit (°F). With a more pronounced valley influence, inland areas show more variability in annual minimum and maximum temperatures than coastal areas. The climatological station closest to the site is the Merced (045532) AP Station. The monthly average maximum temperature recorded at this station from June 1899 to June 2016 ranged from 54.9°F in January to 97.1°F in July, with an annual average maximum of 76.3°F. The monthly average minimum temperature recorded at this station ranged from 35.6°F in December to 60.9°F in July, with an annual average minimum of 47.1°F.[32] These levels are still representative of the project area. January and December are typically the coldest months and July is typically the warmest month in this area of the SJVAB.

The majority of annual rainfall in the SJVAB occurs between November and March. Summer rainfall is minimal and is generally limited to scattered thundershowers in desert regions and slightly heavier showers near the lower portion of the Basin and along the Sierra Nevada mountains to the east. Average monthly rainfall during that period varied from 0.01 inches in July to 2.46 inches in February, with an annual total of 6.17 inches.[33] Patterns in monthly and yearly rainfall totals are predictable due to the recognizable differences in seasons within the valley.

The vertical dispersion of air pollutants in the SJVAB is limited by the presence of persistent temperature inversions. Because of cooling of the atmosphere, air temperature usually decreases

---

[32] Western Regional Climate Center (WRCC). Website: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5532, accessed August 2019.

[33] Ibid.

with altitude. A reversal of this atmospheric state, where the air temperature increases with height, is termed an inversion. Inversions can exist at the surface, or at any height above the ground. The height of the base of the inversion is known as the "mixing height." This is the level within which pollutants can mix vertically. Air above and below the inversion base does not mix because of the differences in air density. Semi-permanent systems of high barometric pressure fronts frequently establish themselves over the SJVAB, preventing low pressure systems that might otherwise bring rain and winds that clean the air.

Inversion layers are significant in determining ozone formation, and CO and PM_{10} concentrations. Ozone and its precursors will mix and react to produce higher ozone concentrations under an inversion. The inversion will also simultaneously trap and hold directly emitted pollutants such as carbon monoxide. PM_{10} is both directly emitted and created in the atmosphere as a chemical reaction. Concentration levels of pollutants are directly related to inversion layers due to the limitation of mixing space.

Surface or radiation inversions are formed when the ground surface becomes cooler than the air above it during the night. The earth's surface goes through a radiative process on clear nights, where heat energy is transferred from the ground to a cooler night sky. As the earth's surface cools during the evening hours, the air directly above it also cools, while air higher up remains relatively warm. The inversion is destroyed when heat from the sun warms the ground, which in turn heats the lower layers of air; this heating stimulates the ground level air to float up through the inversion layer.

The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days of no inversion or high wind speeds, ambient air pollutant concentrations are lowest. Periods of low inversions and low wind speeds are conditions favorable to high concentrations of CO and PM_{10}. In the winter, the greatest pollution problems are CO and NO_x because of extremely low inversions and air stagnation during the night and early morning hours. In the summer, the longer daylight hours and the brighter sunshine combine to cause a reaction between hydrocarbons and oxides of nitrogen to form photochemical smog.

1.4.2 Attainment Status

The CARB is required to designate areas of the State as attainment, nonattainment or unclassified for all State standards. An *attainment* designation for an area signifies that pollutant concentrations did not violate the standard for that pollutant in that area. A *nonattainment* designation indicates that a pollutant concentration violated the standard at least once, excluding those occasions when a violation was caused by an exceptional event, as defined in the criteria. An *unclassified* designation signifies that data does not support either an attainment or nonattainment status. The California Clean Air Act divides districts into moderate, serious, and severe air pollution categories, with increasingly stringent control requirements mandated for each category.

The USEPA also designates areas as attainment, nonattainment, or classified. The air quality data are also used to monitor progress in attaining air quality standards. Table 4 provides a summary of the attainment status for the SJVAB with respect to national and State ambient air quality standards.

Table 4: Attainment Status of Criteria Pollutants in the San Joaquin Valley Air Basin

Pollutant	State	Federal
O_3 1-hour	Nonattainment/Severe	No Federal Standard[1]
O_3 8-hour	Nonattainment	Extreme Nonattainment[2]
PM_{10}	Nonattainment	Attainment[3]
$PM_{2.5}$	Nonattainment	Nonattainment[4]
CO	Attainment/Unclassified	Attainment/Unclassified
NO_2	Attainment	Attainment/Unclassified
SO_2	Attainment	Attainment/Unclassified
Lead	Attainment	No Designation/Classification
All others	Attainment/Unclassified	N/A

Source: SJVAPCD, Ambient Air Quality Standards and Valley Attainment Status.
Website: http://www.valleyair.org/aqinfo/attainment.htm, accessed August 2019.

[1] Effective June 15, 2005, the U.S. Environmental Protection Agency (USEPA) revoked the federal 1-hour ozone standard, including associated designations and classifications. USEPA had previously classified the SJVAB as extreme nonattainment for this standard. USEPA approved the 2004 Extreme Ozone Attainment Demonstration Plan on March 8, 2010 (effective April 7, 2010). Many applicable requirements for extreme 1-hour ozone nonattainment areas continue to apply to the SJVAB.

[2] Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, USEPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

[3] On September 25, 2008, USEPA re-designated the San Joaquin Valley to attainment for the PM_{10} National Ambient Air Quality Standard (NAAQS) and approved the PM_{10} Maintenance Plan.

[4] The Valley is designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. USEPA designated the Valley as nonattainment for the 2006 $PM_{2.5}$ NAAQS on November 13, 2009 (effective December 14, 2009).

CO = carbon monoxide
N/A = not applicable
NO_2 = nitrogen dioxide
O_3 = ozone
PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
SO_2 = sulfur dioxide

1.4.3 Air Quality Monitoring Results

Air quality monitoring stations are located throughout the nation and maintained by the local air pollution control district and state air quality regulating agencies. Ambient air data collected at permanent monitoring stations are used by the USEPA to identify regions as attainment or nonattainment depending on whether the regions met the requirements stated in the primary NAAQS. Attainment areas are required to maintain their status through moderate, yet effective air quality maintenance plans. Nonattainment areas are imposed with additional restrictions as required by the USEPA. In addition, different classifications of attainment such as marginal, moderate, serious, severe, and extreme are used to classify each air basin in the state on a pollutant-by-pollutant basis. Different classifications have different mandated attainment dates and are used as guidelines to create air quality management strategies to improve air quality and comply with the NAAQS by the attainment date. A region is determined to be unclassified when the data collected from the air quality monitoring stations do not support a designation of attainment or nonattainment, due to lack of information, or a conclusion cannot be made with the available data.

The SJVAPCD, together with CARB, maintains ambient air quality monitoring stations in the SJVAB. The air quality monitoring station closest to the site is the Merced – 2334 M Street, which monitors criteria air pollutant data. The air quality trends from this station are used to represent the ambient air quality in the project area. Ambient air quality in the project area from 2016 to 2018 is shown in

Table 5. The pollutants monitored were $PM_{2.5}$ and PM_{10}. Air quality trends for O_3 and NO_2 are not available at the 2334 M Street monitoring station, and were obtained from the Merced – S. Coffee Avenue monitoring station. Air quality trends for CO and SO_2 are not monitored in Merced County; therefore, CO data were obtained from the Madera County – Road 29 ½, north of Avenue 8 monitoring station and SO_2 data were obtained from the Fresno – 3727 N. First Street monitoring station.

As indicated in the monitoring results, the State 1-hour O_3 standard was exceeded 2 times in 2016 and 4 times in 2018 and the State 8-hour O_3 standard was exceeded 29 times in 2016, 17 times in 2017, and 23 times in 2018. In addition, the federal 8-hour O_3 standard was exceeded 28 times in 2016, 16 times in 2017, and 21 times in 2018. The State PM_{10} standard was exceeded 6 times in 2016, 12 times in 2017, and 10 times in 2018. The federal PM_{10} standard was not exceeded during the 3-year period. The federal $PM_{2.5}$ standard was exceeded 2 times in 2016, 6 times in 2017, and 10 times in 2018. The CO, NO_2, and SO_2 standards were not exceeded in this area during the 3-year period.

1.4.4 Greenhouse Gas Emissions Inventory

An emissions inventory that identifies and quantifies the primary human-generated sources and sinks of GHGs is a well-recognized and useful tool for addressing climate change. This section summarizes the latest information on global, United States, California, and local GHG emission inventories.

1.4.4.1 Global Emissions

Worldwide emissions of GHGs in 2016 totaled approximately 26 billion metric tons of CO_2e.[34] Global estimates are based on country inventories developed as part of the programs of the United Nations Framework Convention on Climate Change (UNFCCC).

1.4.4.2 United States Emissions

In 2015, the United States emitted about 6.6 billion metric tons of CO_2e or about 21 metric tons per year per person. The total 2015 CO_2e emissions represent a 3.5 percent increase since 1990 but a 10 percent decrease since 2005. Of the six major sectors nationwide – residential, commercial, agricultural, industry, transportation, and electricity generation – electricity generation accounts for the highest amount of GHG emissions (approximately 29 percent), with transportation second at 27 percent; these emissions are generated entirely from direct fossil fuel combustion.[35]

---

[34] United Nations Framework Convention on Climate Change (UNFCCC). 2016. GHG data from UNFCCC. Website: https://unfccc.int/process/transparency-and-reporting/greenhouse-gas-data/ghg-data-unfccc, accessed August 2019.

[35] U.S. Environmental Protection Agency. 2017. Inventory of U.S. Greenhouse Gas Emissions and Sinks. 1990-2015. Available online at: www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf, accessed August 2019.

Table 5: Ambient Air Quality Monitored in the Project Vicinity

Pollutant	Standard	2016	2017	2018
Carbon Monoxide (CO)[1]				
Maximum 1-hr concentration (ppm)		5.1	3.1	1.9
Number of days exceeded:	State: > 20 ppm	0	0	0
	Federal: > 35 ppm	0	0	0
Maximum 8-hr concentration (ppm)		2.3	1.2	1.2
Number of days exceeded:	State: ≥ 9.0 ppm	0	0	0
	Federal: ≥ 9.0 ppm	0	0	0
Ozone (O_3)[2]				
Maximum 1-hr concentration (ppm)		0.097	0.093	0.104
Number of days exceeded:	State: > 0.09 ppm	2	0	4
Maximum 8-hr concentration (ppm)		0.087	0.085	0.084
Number of days exceeded:	State: > 0.070 ppm	29	17	23
	Federal: > 0.070 ppm	28	16	21
Coarse Particulates (PM_{10})[3]				
Maximum 24-hr concentration (µg/m^3)		64.5	146.6	142.7
Number of days exceeded:	State: > 50 µg/m^3	6	12	10
	Federal: > 150 µg/m^3	0	0	0
Annual arithmetic average concentration (µg/m^3)		29.5	35.8	34.6
Exceeded for the year:	State: > 20 µg/m^3	Yes	Yes	Yes
Fine Particulates ($PM_{2.5}$)[3]				
Maximum 24-hr concentration (µg/m^3)		42.8	66.7	94.7
Number of days exceeded:	Federal: > 35 µg/m^3	2	6	10
Annual arithmetic average concentration (µg/m^3)		11.1	12.6	14.2
Exceeded for the year:	State: > 12 µg/m^3	No	Yes	Yes
	Federal: > 15 µg/m^3	No	No	No
Nitrogen Dioxide (NO_2)[2]				
Maximum 1-hr concentration (ppm)		0.035	0.038	0.046
Number of days exceeded:	State: > 0.18 ppm	0	0	0
Annual arithmetic average concentration (ppm)		0.006	0.007	0.007
Exceeded for the year:	State: > 0.030 ppm	No	No	No
	Federal: > 0.053 ppm	No	No	No
Sulfur Dioxide (SO_2)[4]				
Maximum 24-hr concentration (ppm)		0.002	0.002	0.003
Number of days exceeded:	State: > 0.04 ppm	No	No	No
	Federal: > 0.14 ppm	0.001	0.001	0.001
Annual arithmetic average concentration (ppm)		No	No	No
Exceeded for the year:	Federal: > 0.030 ppm	No	No	No

Source: United States Environmental Protection Agency. 2016–2018 Air Quality Data. Website: https://www.epa.gov/outdoor-air-quality-data, accessed August 2019. California Air Resources Board (CARB). iADAM: Air Quality Data Statistics. Website: http://www.arb.ca.gov/adam/welcome.html, accessed August 2019.

[1] Data from the Madera County – Road 29 ½, north of Avenue 8 monitoring site.

[2] Data from the Merced – S. Coffee Avenue monitoring site.

[3] Data from the Merced – 2334 M Street monitoring site.

[4] Data from the Fresno – 3727 N. First Street monitoring site.

µg/m^3 = micrograms per cubic meter
hr = hour
ND = no data available
O_3 = ozone

PM_{10} = particulate matter less than 10 microns in size
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
ppm = parts per million

1.4.4.3 State of California Emissions

According to CARB emission inventory estimates, the State emitted approximately 429.4 million metric tons of CO_2e (million metric tons CO_2e) emissions in 2016. This is a decrease of 12 million metric tons CO_2e since 2015.[36]

The CARB estimates that transportation was the source of approximately 39 percent of the State's GHG emissions in 2016, followed by industrial sources at 21 percent and electricity generation at 16 percent. The remaining sources of GHG emissions were residential and commercial activities at 9 percent, agriculture at 8 percent, high-GWP gases at 5 percent, and recycling and waste at 2 percent.[37]

1.4.4.4 City of Merced Greenhouse Gas Emissions

The City of Merced developed a baseline community-wide GHG emissions inventory for calendar year 2008. Table 6 below identifies the sources of emissions from community-wide activities. In 2008, the community emitted 599.090 metric tons of CO_2e, most of which was the result of transportation (39 percent) and nonresidential and residential energy use (39 percent and 19 percent respectively).[38]

Table 6: City of Merced 2008 Community Greenhouse Gas Emissions

Sector	Metric Tons of CO_2e	Percentage
Transportation	235,570	39%
Nonresidential Energy	216,680	36%
Residential Energy	115,110	19%
Solid Waste	18,750	3%
Water and Wastewater	6,670	1%
Off-road Equipment	6,310	1%
Total	**599,090**	**100**

Source: City of Merced (2015).

1.5 METHODOLOGY

1.5.1 Construction Emissions

Construction activities can generate a substantial amount of air pollution. Construction activities are considered temporary; however, short-term impacts can contribute to exceedances of air quality standards. Construction activities include site preparation, earthmoving, and general construction. The emissions generated from these common construction activities include fugitive dust from soil disturbance, fuel combustion from mobile heavy-duty diesel and gasoline powered equipment, portable auxiliary equipment, and worker commute trips. The California Emission Estimator Model version 2016.3.2 (CalEEMod) computer program was used to calculate emissions from on-site construction equipment and emissions from worker and vehicle trips to the site.

---

[36] California Air Resources Board. 2018. op. cit.

[37] Ibid.

[38] Merced, City of, 2015. op. cit.

1.5.2 Operational Emissions

The air quality analysis includes estimating emissions associated with long-term operation of the project. Indirect emissions of criteria pollutants with regional impacts would be emitted by project-generated vehicle trips. In addition, localized air quality impacts (i.e., higher carbon monoxide concentrations or "hot spots") near intersections or roadway segments in the project vicinity would also potentially occur due to project-generated vehicle trips.

Consistent with the SJVAPCD guidance for estimating emissions associated with land use development projects, the CalEEMod computer program was used to calculate the long-term operational emissions associated with the project.

1.5.3 Greenhouse Gas Emissions

There are two aspects of the proposed project that would result in the emissions of GHGs: construction and operation. During construction of the project, GHG emissions would be emitted through the operation of construction equipment and from worker and vendor vehicles, each of which typically uses fossil-based fuels to operate. During operations, there would be many sources of GHG emissions, including area sources (i.e. landscaping), energy consumption, on-road transportation, solid waste, and water use. CalEEMod was used to estimate the project's GHG emissions.

1.6 THRESHOLDS OF SIGNIFICANCE

The State *CEQA Guidelines* indicate that a project would normally have a significant adverse air quality impact if project-generated pollutant emissions would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is nonattainment under applicable federal or state ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) affecting a substantial number of people.

The SJVAPCD has established thresholds of significance for criteria pollutant emissions generated during construction and operation of projects as shown in Table 7.

Table 7: SJVAPCD Construction and Operation Thresholds of Significance (Tons per Year)

	CO	NO_x	ROG	SO_x	PM_{10}	$PM_{2.5}$
Construction Thresholds	100	10	10	27	15	15
Operation Thresholds	100	10	10	27	15	15

Source: SJVAPCD, 2015. Guidance for Assessing and Mitigating Air Quality Impacts. March 2018.

The emissions thresholds in the SJVAPCD GAMAQI were established based on the attainment status of the air basin in regard to air quality standards for specific criteria pollutants. Because the concentration standards were set at a level that protects public health with an adequate margin of safety, these emission thresholds are regarded as conservative and would overstate an individual project's contribution to health risks.

The SJVAPCD has also established a threshold for both carcinogenic and non-carcinogenic TACs. A community is at risk, or impacts are considered significant, when individual risk exposure to carcinogenic TACs equals or exceeds 20 in one million. Carcinogenic risk is expressed as cancer cases per one million. A community is at risk, or impacts are considered significant, when individual risk exposure to non-carcinogenic TACs equals or exceeds a hazard index of 1 for both acute and chronic TACs. Non-carcinogenic hazard indices are expressed as a ratio of expected exposure levels to acceptable exposure levels.

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

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

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

The SJVAPCD's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*[39] suggests project GHG emissions would considered less than significant if a project meets any of the following conditions: is exempt from CEQA requirements; complies with an approved GHG emission reduction plan or GHG mitigation program; or implements BPS. Additionally, projects that demonstrate that GHG emissions would be reduced or mitigated by at

---

[39] San Joaquin Valley Air Pollution Control District, 2009. *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA*. December 17. Available online at: www.valleyair.org/Programs/CCAP/12-17-09/3%20CCAP%20-%20FINAL%20LU%20Guidance%20-%20Dec%2017%202009.pdf (accessed July 2019).

least 29 percent compared to BAU, including GHG emission reductions achieved since the 2002-2004 baseline period, would be considered less than significant.

The City of Merced PCAP is considered a qualified GHG reduction plan. Therefore, the proposed project's GHG emissions would not be considered a significant impact if the proposed project would be consistent with the PCAP.

1.7 IMPACTS AND MITIGATION MEASURES

Air pollutant emissions associated with the project would occur over the short term from construction activities (e.g., fugitive dust from site preparation and grading) and emissions from equipment exhaust. Long-term regional emissions associated with the project would be related to vehicular trips and from energy consumption (e.g., electricity usage) used by future tenants of the project. The analysis of project related air impacts are described in this section.

1.7.1 Air Quality Impacts

1.7.1.1 Consistency with Applicable Air Quality Plans

An air quality plan describes air pollution control strategies to be implemented by a city, county, or region classified as a non-attainment area. The main purpose of the air quality plan is to bring the area into compliance with the requirements of the federal and State air quality standards. To bring the San Joaquin Valley into attainment, the SJVAPCD has developed the 2013 Plan for the Revoked 1-Hour Ozone Standard, adopted on September 19, 2013.[40] The SJVAPCD also adopted the 2016 Plan for the 2008 8-Hour Ozone Standard in June 2016 to satisfy Clean Air Act requirements and ensure attainment of the 75 parts per billion (ppb) 8-hour ozone standard.[41]

To assure the SJVAB's continued attainment of the USEPA PM_{10} standard, the SJVAPCD adopted the 2007 PM_{10} Maintenance Plan in September 2007.[42] SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions) is designed to reduce PM_{10} emissions generated by human activity. The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards in November 2018 to address the USEPA 1997 annual $PM_{2.5}$ standard of 15 µg/m^3 and 24-hour $PM_{2.5}$ standard of 65 µg/m^3, the 2006 24-hour $PM_{2.5}$ standard of 35 µg/m^3, and the 2012 annual $PM_{2.5}$ standard of 12 µg/m^3.[43]

---

[40] San Joaquin Valley Air Pollution Control District (SJVAPCD), 2013. *2013 Plan for the Revoked 1-Hour Ozone Standard*. September 19. Website: www.valleyair.org/Air_Quality_Plans/Ozone-OneHourPlan-2013.htm, accessed August 2019.

[41] San Joaquin Valley Air Pollution Control District (SJVAPCD), 2016. *2016 Plan for the 2008 8-Hour Ozone Standard*. June 16. Website: www.valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm, accessed August 2019.

[42] San Joaquin Valley Air Pollution Control District, 2007. *2007 PM_{10} Maintenance Plan and Request for Redesignation*. Available online at: www.valleyair.org/Air_Quality_Plans/docs/Maintenance%20Plan10-25-07.pdf (accessed August 2019).

[43] San Joaquin Valley Air Pollution Control District, 2018. *2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards*. November 15. Website: http://valleyair.org/pmplans/documents/2018/pm-plan-adopted/2018-Plan-for-the-1997-2006-and-2012-PM2.5-Standards.pdf (accessed August 2019).

CEQA requires that certain projects be analyzed for consistency with the applicable air quality plan. For a project to be consistent with SJVAPCD air quality plans, the pollutants emitted from a project should not exceed the SJVAPCD emission thresholds or cause a significant impact on air quality. In addition, emission reductions achieved through implementation of offset requirements are a major component of the SJVAPCD air quality plans. As discussed below, construction of the project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of Mitigation Measure AIR-1 would further reduce construction dust impacts. Operational emissions associated with the project would not exceed SJVAPCD established significance thresholds for ROG, NO_x, CO, sulfur oxides (SO_x), PM_{10}, or $PM_{2.5}$ emissions. With implementation of Rule 9510, NO_x and PM_{10} emissions would further be reduced. Therefore, the project would not conflict with or obstruct implementation of SJVAPCD air quality plans.

1.7.1.2 Criteria Pollutant Analysis

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

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

Short-Term Construction Emissions. During construction, short-term degradation of air quality may occur due to the release of particulate emissions generated by grading, paving, building, and other activities. Emissions from construction equipment are also anticipated and would include CO, NO_x, ROG, directly-emitted particulate matter ($PM_{2.5}$ and PM_{10}), and TACs such as diesel exhaust particulate matter.

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

Fugitive dust emissions are generally associated with land clearing and exposure of soils to the air and wind, as well as cut-and-fill grading operations. Dust generated during construction varies substantially on a project-by-project basis, depending on the level of activity, the specific operations, and weather conditions at the time of construction. The project would be required to comply with District Regulation VIII (Fugitive PM_{10} Prohibition) to control fugitive dust. SJVAPCD Rule 8011, General Requirements, and Rule 8021, Construction, Demolition Excavation, Extraction, and Other Earthmoving Activities, would also be applicable.

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

Construction emissions were estimated for the project using CalEEMod. Table 8 lists the tentative project construction schedule for the project based on a start date in September 2020. Other construction details are not yet known; therefore, default assumptions (e.g., construction duration and fleet activities) from CalEEMod were used. Based on CalEEMod default assumptions, this analysis assumes a 21-month construction period. Table 9 lists the potential construction equipment to be used during project construction under each phase of construction. Construction-related emissions are presented in Table 10. CalEEMod output sheets are included in Attachment A.

Table 8: Tentative Project Construction Schedule

Phase Number	Phase Name	Phase Start Date	Phase End Date	Number of Days/Week	Number of Days
1	Site Preparation	9/7/2020	9/18/2020	5	10
2	Grading	9/19/2020	11/6/2020	5	35
3	Building Construction	11/7/2020	4/8/2022	5	370
4	Paving	4/9/2022	5/6/2022	5	20
5	Architectural Coating	5/7/2022	6/3/2022	5	20

Source: Compiled by LSA using CalEEMod defaults (September 2019).

Table 9: Diesel Construction Equipment Utilized by Construction Phase

Construction Phase	Off-Road Equipment Type	Off-Road Equipment Unit Amount	Hours Used per Day	Horsepower	Load Factor
Site Preparation	Rubber Tired Dozers	3	8	247	0.40
	Tractors/Loaders/Backhoes	4	8	97	0.37
Grading	Excavators	2	8	158	0.38
	Graders	1	8	187	0.41
	Rubber Tired Dozers	1	8	247	0.40
	Scrapers	2	8	367	0.48
	Tractors/Loaders/Backhoes	2	8	97	0.37
Building Construction	Cranes	1	7	231	0.29
	Forklifts	3	8	89	0.20
	Generator Sets	1	8	84	0.74
	Tractors/Loaders/Backhoes	3	7	97	0.37
	Welders	1	8	46	0.45
Architectural Coating	Air Compressors	1	6	78	0.48
Paving	Pavers	2	8	130	0.42
	Paving Equipment	2	8	132	0.36
	Rollers	2	8	80	0.38

Source: Compiled by LSA using CalEEMod defaults (September 2019).

Table 10: Project Construction Emissions

Construction Year	Total Regional Pollutant Emissions[1] (tons/year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2020	0.2	1.9	1.4	<0.1	0.4	0.2
2021	0.6	5.1	4.4	<0.1	0.8	0.3
2022	2.2	1.4	1.3	<0.1	0.2	0.1
Maximum	**2.2**	**5.1**	**4.4**	**<0.1**	**0.8**	**0.3**
SJVAPCD Thresholds	**10.0**	**10.0**	**100.0**	**27.0**	**15.0**	**15.0**
Significant Emissions?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (September 2019).

[1] All on-site and off-site emissions are presented as construction mitigation in the CalEEMod model output files.

CO = carbon monoxide
NO_X = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides
ROG = reactive organic gases

As shown in Table 10, construction emissions associated with the project would not exceed the SJVAPCD's thresholds for ROG, NO_x, CO, SO_x, $PM_{2.5,}$ or PM_{10} emissions. In addition to the construction period thresholds of significance, the SJVAPCD has implemented Regulation VIII measures for dust control during construction. These control measures are intended to reduce the amount of PM_{10} emissions during the construction period. Implementation of Mitigation Measure AIR-1 would ensure that the proposed project complies with Regulation VIII and further reduces the short-term construction period air quality impacts.

Mitigation Measure AIR-1 Consistent with SJVAPCD Regulation VIII (Fugitive PM_{10} Prohibitions), the following controls are required to be included as specifications for the proposed project and implemented at the construction site:

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

As shown in Table 10, the short-term construction emissions associated with the project would be well below SJVAPCD established significance thresholds. Therefore, construction of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

Long-Term Operational Emissions. Long-term air pollutant emission impacts are those associated with area sources and mobile sources related to the proposed project. In addition to the short-term construction emissions, the project would also generate long-term air pollutant emissions, such as those associated with changes in permanent use of the project site. These long-term emissions are primarily mobile source emissions that would result from vehicle trips associated with the proposed project. Area sources, such as landscape equipment would also result in pollutant emissions.

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

Energy source emissions result from activities in buildings for which electricity and natural gas are used. The quantity of emissions is the product of usage intensity (i.e., the amount of electricity or natural gas) and the emission factor of the fuel source. Major sources of energy demand for the proposed project could include building mechanical systems, such as heating and air conditioning, lighting, and plug-in electronics, such as refrigerators or computers. Greater building or appliance efficiency reduces the amount of energy for a given activity and thus lowers the resultant emissions. The emission factor is determined by the fuel source, with cleaner energy sources, like renewable energy, producing fewer emissions than conventional sources. The project would comply with the 2019 California Building Standards Code (California Code of Regulations, Title 24), which was accounted for in CalEEMod. Area source emissions associated with the project would include emissions from the use of architectural coatings, consumer products, and landscaping equipment.

Emission estimates for operation of the project were calculated using CalEEMod. Model results are shown in Table 11. For purposes of evaluating the proposed project, the air district in CalEEMod was specified as the SJVAPCD and the climate zone of 3 was selected with the urban land use setting. Based on this climate zone, CalEEMod assumed a wind speed of 2.7 meters per second and precipitation frequency of 45 days per year. The operational year was assumed to be 2022. The utility company for the region was selected as Pacific Gas & Electric Company (PG&E) and the CO_2 intensity was determined to be 328.8 pounds per megawatt hour based on a 5-year average estimated by PG&E.

Trip generation rates for the project were estimated based on the latest project site plan and take into account reductions associated with internal capture and pass-by trips, as identified in the Traffic Impact Assessment.[44] As such, this analysis assumes that the proposed project would generate approximately 8,557 average daily trips. Fleet mix percentages were revised based data for similar shopping centers projects in the Central Valley. Where project-specific data were not available, default assumptions from CalEEMod were used to estimate project emissions.

The primary emissions associated with the project are regional in nature, meaning that air pollutants are rapidly dispersed on release or, in the case of vehicle emissions associated with the project; emissions are released in other areas of the Air Basin. The annual emissions associated with project operational trip generation, energy, and area sources are identified in Table 11 for ROG, NO_x, CO, sulfur oxides (SO_x), PM_{10}, and $PM_{2.5}$. CalEEMod output sheets are included in Attachment A.

---

[44] JLB Traffic Engineering, Inc., 2019. *Draft Traffic Impact Analysis Merced Mixed-Use Development Located on the Northeast Corner of "G" Street and Yosemite Avenue*. August 6.

Table 11: Project Operational Emissions

Source	Pollutant Emissions (tons/year)					
	ROG	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
Area	1.3	<0.1	0.4	<0.1	<0.1	<0.1
Energy	<0.1	0.3	0.2	<0.1	<0.1	<0.1
Mobile	1.9	2.7	15.7	<0.1	3.9	1.1
Total Project Emissions	**3.2**	**3.0**	**16.3**	**<0.1**	**3.9**	**1.1**
SJVAPCD Thresholds	**10.0**	**10.0**	**100.0**	**27.0**	**15.0**	**15.0**
Significant?	**No**	**No**	**No**	**No**	**No**	**No**

Source: LSA (September 2019).

CO = carbon monoxide
NO_x = nitrogen oxides
$PM_{2.5}$ = particulate matter less than 2.5 microns in size
PM_{10} = particulate matter less than 10 microns in size
SJVAPCD = San Joaquin Valley Air Pollution Control District
SO_X = sulfur oxides
ROG = reactive organic gases

The results shown in Table 11 indicate the project would not exceed the significance criteria for annual ROG, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ emissions; therefore, the proposed project would not have a significant effect on regional air quality. As shown in Table 11, SJVAPCD emissions of ROG, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ would be below the thresholds. Therefore, operation of the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or State AAQS.

The project would be required to implement District Rule 9510 (Indirect Source Review [ISR]) as the project would develop more than 2,000 square feet of commercial space. Implementation of Rule 9510 would reduce operational emissions of NO_x and PM_{10} by 33.3 percent and 50 percent respectively. The Air Impact Assessment must be submitted to the SJVAPCD consistent with Rule 9510 prior to obtaining building permits.

CO Analysis. There is a direct relationship between traffic and circulation congestion and CO impacts because exhaust fumes from vehicular traffic are the primary source of CO, which is a localized gas that dissipates very quickly under normal meteorological conditions. Therefore, CO concentrations decrease substantially as distance from the source increases. The highest CO concentrations are typically found in areas directly adjacent to congested roadway intersections. These areas of vehicle congestion have historically had the potential to create pockets of elevated levels of CO that are called “hot spots.” However, with the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the project vicinity have steadily declined.

With implementation of future intersection improvements recommended in the Traffic Impact Assessment, the project would not substantially affect the existing LOS at each intersection of the project vicinity. Given the existing CO concentrations in the project area are relatively low, project-related vehicles are not expected to contribute significantly to increased levels of CO concentrations in the project area. The project is not expected to result in CO concentrations that would exceed the State or federal CO standards. Because no new CO hot spots would occur, there would be no project-related impacts on CO concentrations.

1.7.1.3 Health Risk on Nearby Sensitive Receptors

Sensitive receptors are defined as residential uses, schools, daycare centers, nursing homes, and medical centers. Individuals particularly vulnerable to diesel particulate matter are children, whose lung tissue is still developing, and the elderly, who may have serious health problems that can be aggravated by exposure to diesel particulate matter. Exposure from diesel exhaust associated with construction activity contributes to both cancer and chronic non-cancer health risks.

According to the SJVAPCD, a project would result in a significant impact if it would expose sensitive receptors to TACs resulting in an increased cancer risk greater than 20.0 in one million or an increased non-cancer risk of greater than 1.0 on the hazard index (chronic or acute). Impacts from substantial pollutant concentrations are discussed below.

A construction HRA was prepared for the proposed project, which evaluates construction period health risk to off-site receptors. The project site is located adjacent to existing residential uses that could be exposed to diesel emission exhaust during the construction period. To estimate the potential cancer risk associated with construction of the proposed project from equipment exhaust (including diesel particulate matter), a dispersion model was used to translate an emission rate from the source location to a concentration at the receptor location of interest (i.e., a nearby residence and worksites). Dispersion modeling varies from a simpler, more conservative screening-level analysis to a more complex and refined detailed analysis. This refined assessment was conducted using the CARB exposure methodology with the air dispersion modeling performed using the USEPA dispersion model AERMOD. The model provides a detailed estimate of exhaust concentrations based on site and source geometry, source emissions strength, distance from the source to the receptor, and meteorological data. Construction equipment is unknown at this time; therefore, the CalEEMod default of Tier 0 was used. Table 12 identifies the results of the analysis utilizing the CalEEMod default of Tier 0 construction Equipment. Model snap shots of the sources are shown in Appendix B.

Table 12: Unmitigated Inhalation Health Risks from Project Construction to Off-Site Receptors

	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index
Maximum Exposed Individual Location (Residential)	45.3	0.041
Threshold	**20.0**	**1.0**

Source: LSA (September 2019).

As shown in Table 12, the risk would be 45.3 in one million, which would exceed the SJVAPCD cancer risk threshold of 10 in one million. The highest chronic hazard index would be 0.041, which would not exceed the threshold of 1.0. As indicated above, the cancer risk of 45.1 in one million would exceed the SVJAPCD's threshold.

Implementation of Mitigation Measure AIR-2 would be required to reduce substantial pollutant concentrations during project construction and would reduce this impact of the project to a less-than-significant level.

Mitigation Measure AIR-2 The project contractor shall ensure all off-road diesel-powered construction equipment of 50 horsepower or more used for the project meet the California Air Resources Board (CARB) Tier 2 with a Level 3 Diesel Particulate Filter emissions standards or equivalent.

Table 13 identifies the results of the analysis with implementation of Mitigation Measure AIR-2.

Table 13: Mitigated Inhalation Health Risks from Project Construction to Off-Site Receptors

	Carcinogenic Inhalation Health Risk in One Million	Chronic Inhalation Hazard Index
Maximum Exposed Individual Location (Residential)	8.8	0.0086
Threshold	**20.0**	**1.0**

Source: LSA (September 2019).

As shown in Table 13, the risk with implementation of Mitigation Measure AIR-2 would be 8.8 in one million, which would not exceed the SJVAPCD cancer risk of 10 in one million threshold. Therefore, with implementation of Mitigation Measure AIR-2, construction of the project would not exceed SJVAPCD thresholds and would not expose nearby sensitive receptors to substantial pollutant concentrations. In addition, once the proposed project is constructed, the project would not be a significant source of long-term operational emissions. All gasoline dispensing operations associated with the project would be subject to SJVAPCD Rule 4622 which would limit emissions of gasoline vapors from the transfer of gasoline into motor vehicle fuel tanks. Therefore, with implementation of Mitigation Measure AIR-2, the proposed project would not expose sensitive receptors to substantial pollutant concentrations.

1.7.1.4 Odors

Heavy-duty equipment in the project area during construction would emit odors, primarily from the equipment exhaust. However, the construction activity would cease to occur after individual construction is completed. No other sources of objectionable odors have been identified for the project, and no mitigation measures are required.

The SJVAPCD addresses odor criteria within the GAMAQI. The district has not established a rule or standard regarding odor emissions, rather, the district has a nuisance rule: “Any project with the potential to frequently expose members of the public to objectionable odors should be deemed to have a significant impact.” The proposed uses are not anticipated to emit any objectionable odors. The gas station could release localized odors; however, all the gasoline dispensers would be equipped with vapor recovery systems. In addition, such odors in general would be confined mainly to the project site and would readily dissipate. Therefore, the proposed project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

1.7.2 Greenhouse Gas Impacts

1.7.2.1 Generate Greenhouse Gas Emissions

This section discusses the project's impacts related to the release of GHG emissions for both construction and operational phases of the project.

Construction GHG Emissions. Construction activities associated with the proposed project would produce combustion emissions from various sources. During construction, GHGs would be emitted through the operation of construction equipment and from worker and builder supply vendor vehicles, each of which typically use fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, CH_4, and N_2O. Furthermore, CH_4 is emitted during the fueling of heavy equipment. Exhaust emissions from on-site construction activities would vary daily as construction activity levels change.

The SJVAPCD does not have an adopted threshold of significance for construction-related GHG emissions. However, lead agencies are encouraged to quantify and disclose GHG emissions that would occur during construction. Using CalEEMod, it is estimated that construction of the proposed project would generate approximately 2,138.3 metric tons of CO_2e. Table 14 lists the annual GHG emissions for each construction phase (details are provided in the CalEEMod output in Appendix A).

Table 14: Greenhouse Gas Construction Emissions

Construction Year	Peak Annual Emissions (Metric Tons CO_2e per Year)			
	CO_2	CH_4	N_2O	CO_2e
2020	328.3	0.1	0.0	329.7
2021	1,403.5	0.1	0.0	1,406.9
2022	400.7	<0.1	0.0	401.7
			Total Construction Emissions	**2,138.3**

Source: Compiled by LSA (September 2019).

CH_4 = methane

CO_2 = carbon dioxide

CO_2e = carbon dioxide equivalent

N_2O = nitrous oxide

Implementation of the Mitigation Measure AIR-1 would reduce GHG emissions by reducing the amount of construction vehicle idling and by requiring the use of properly maintained equipment.

Operational GHG Emissions. Long-term GHG emissions are typically generated from mobile sources (e.g., vehicle trips), area sources (e.g., maintenance activities and landscaping), indirect emissions from sources associated with energy consumption, waste sources (land filling and waste disposal), and water sources (water supply and conveyance, treatment, and distribution). Mobile-source GHG emissions would include project-generated vehicle trips to and from the project. Area-source emissions would be associated with activities such as landscaping and maintenance on the project site. Energy source emissions would be generated at off-site utility providers as a result of increased electricity demand generated by the project. Waste source emissions generated by the proposed project include energy generated by land filling and other methods of disposal related to transporting and managing project generated waste. In addition, water source emissions associated with the proposed project are generated by water supply and conveyance, water treatment, water distribution, and wastewater treatment. Operational GHG emissions were estimated using CalEEMod and the results are presented in Table 15.

Table 15: Operational Greenhouse Gas Emissions

Operational Source	Pollutant Emissions (Metric Tons CO_2e per Year)					
	Bio-CO_2	NBio-CO_2	Combined CO_2	CH_4	N_2O	Total CO_2e
Area	0.0	21.4	21.4	<0.1	<0.1	21.5
Energy	0.0	649.2	649.2	<0.1	<0.1	653.6
Mobile	0.0	3,615.9	3,615.9	0.1	0.0	3,619.6
Waste	153.3	0.0	153.3	9.1	0.0	379.8
Water	7.2	21.2	28.4	0.7	<0.1	52.1
Total Project Emissions						**4,726.6**

Source: Compiled by LSA (September 2019).

Bio-CO_2 = biologically generated CO_2
CH_4 = methane
CO_2 = carbon dioxide
CO_2e = carbon dioxide equivalent
N_2O = nitrous oxide
NBio-CO_2 = non-biologically generated CO_2

As shown in Table 15, the project would generate 4,726.6 metric tons of CO_2e per year. As discussed above, the City of Merced PCAP is considered a qualified GHG reduction plan and includes a performance-based development approach that includes the measures in the CAP that apply to new development projects. Therefore, the proposed project's GHG emissions would not be considered a significant impact if the proposed project would be consistent with the PCAP. Although the proposed project would likely implement many of the measures the PCAP has included, the exact selections and corresponding total percent reduction cannot be determined. The PCAP states that new projects that do not comply with the CAP measures or the UDM, they may elect to conduct a quantitative analysis of GHG emissions.

Because the project would begin operations in the post-2020 timeframe, the City's 2020 reduction targets would not apply. Therefore, to be conservative, this analysis evaluates the proposed project's potential GHG emissions based on the City's PCAP provisional 2030 target of approximately 38 percent below 2008 baseline levels.

Table 16 provides a comparison of the estimated metric tons of CO_2e per year emissions from the project's operational activities in 2008 and 2030. As provided in Table 16, the project's estimated annual GHG emissions would be approximately 12,426.0 metric tons of CO_2e under 2008 BAU conditions and 6,919.1 metric tons of CO_2e in 2030 for project operations. This represents a 49 percent decrease in emissions, which meets the City's provisional 2030 target of approximately 38 percent below 2008 baseline levels.

Table 16: Comparison of 2030 Project and 2008 Business-As-Usual GHG Emissions

Emissions Source	GHG Emissions (Metric Tons CO_2e per Year)		Percent Reduction
	2008	2030	
Area	21.5	21.5	0
Energy	1,669.2	653.6	61
Mobile	10,155.2	5,812.0	43
Waste	506.4	379.8	25
Water	73.7	52.1	29
Total Operational	**13,649.1**	**6,919.1**	**49**
City of Merced PCAP Criteria	38 percent reduction from BAU		
Significant impact?	**No**		

Source: LSA (September 2019).

In addition, the project, and vehicles traveling to the project site, would implement several measures required by State regulations to reduce GHG emissions, including the following:

- Pavley II (LEV III) Advanced Clean Cars Program;
- 2016 California Green Building Code Standards;
- Renewable Portfolio Standard;
- California Model Water Efficient Landscape Ordinance; and
- CalRecycle Waste Diversion and Recycling Mandate.

The second phase of Pavley standards will reduce GHG emissions from new cars by 34 percent from 2016 levels by 2025, resulting in a 3 percent decrease in average vehicle emissions for all vehicles by 2020. The California Green Building Code Standards reduce GHGs by including a variety of different measures, including reduction of construction waste, wastewater, water use, and building energy use. The 2019 Building Energy Efficiency Standards, which will take effect on January 1, 2020, were included in the CalEEMod analysis and are anticipated to reduce energy use by 30 percent compared to the 2016 standards, representing a substantial reduction compared to 2008 levels. The Renewable Portfolio Standard requires electricity purchased for use at the project site to be composed of at least 33 percent renewable energy by 2020. The Water Efficient Landscape Ordinance will reduce outdoor water use by 20 percent and the CalRecycle Waste Diversion and Recycling Mandate will reduce solid waste production by 25 percent.

Implementation of these measures is expected to allow the State to achieve AB 32 emission targets by 2020. The proposed project would not be operational until 2022; however, SB 32, signed in 2016, effectively establishes a new GHG reduction goal for Statewide emissions of 40 percent below 1990 levels by 2030. Therefore, operation of the proposed project would be consistent with the SB 32 goal. Therefore, at this time no additional regulations are required from new development beyond those already established by the State to achieve the AB 32 and SB 32 targets. Therefore, the BAU analysis that indicates that the project would achieve the reductions required by regulations to meet the AB 32 and SB 32 targets and demonstrates that the project's GHG emissions would not be significant.

1.7.2.2 Consistency with Greenhouse Gas Reduction Plans

The SJVAPCD has adopted a CCAP, which includes suggested BPS for proposed development projects. Appendix J of the SJVAPCD Final Staff Report for the CCAP contains GHG reduction measures that would be applicable to the proposed project. The proposed project's consistency with these measures is included in Table 17 below. As shown in Table 17, the project would be consistent with the CCAP measures.

Absent any other local or regional Climate Action Plan, the proposed project was analyzed for consistency with the CARB's adopted Scoping Plan. The proposed project would be consistent with the Scoping Plan measures, including the following.

- **California Light-Duty Vehicle Greenhouse Gas Standards**. The standards would be applicable to light-duty vehicles that would access the project site.

- **Energy Efficiency**. The project would increase its energy efficiency through compliance with the new Title 24 standards.

- **Low Carbon Fuel Standard**. Vehicles that access the project site would comply with the standard, by way of consuming transportation fuel that will meet the goal of a 10 percent reduction in carbon intensity by 2020.

- **Recycling and Waste**. The project would contribute toward a Statewide reduction in waste by utilizing the City of Clovis recycling services, which have consistently exceeded State recycling mandates.

Based on Table 17 and the discussion above, the proposed project would not conflict with plans, policies, or regulations adopted for the purpose of reducing the emissions of GHG.

Table 17: Consistency with the SJVAPCD's Climate Change Action Plan Measures

Measure Name	Estimated CO_2e Point Reductions	Measure Description	Discussion
Bicycle/Pedestrian/Transit Measures			
1 – Bike parking	0.625	Non-residential projects provide plentiful short-term and long-term bicycle parking facilities to meet peak season maximum demand. Short term facilities are provided at a minimum ratio of one bike rack space per 20 vehicle spaces. Long-term facilities provide a minimum ratio of one long-term bicycle storage space per 20 employee parking spaces.	***Consistent.*** The proposed project would provide the required parking for bicycles, consistent with City standards.
3 – Bike parking at multi-unit residential	0.625	Long-term bicycle parking is provided at apartment complexes or condominiums without garages. Project provides one long-term bicycle parking space for each unit without a garage. Long-term facilities shall consist of one of the following: a bicycle locker, a locked room with standard racks and access limited to bicyclists only, or a standard rack in a location that is staffed and/or monitored by video surveillance 24 hours per day.	***Consistent.*** The proposed project would provide secured bicycle parking for the residential multi-family apartment project. Specific locations and amenities will be provided in the final design stage of the project.
5 – Pedestrian network	1	The project provides a pedestrian access network that internally links all uses and connects to existing external streets and pedestrian facilities. Existing facilities are defined as those facilities that are physically constructed and ready for use prior to the first 20 percent of the projects occupancy permits being granted.	***Consistent.*** The proposed project includes pedestrian accommodations throughout the project site and connecting off-site to existing external streets and pedestrian facilities.
6 – Pedestrian barriers minimized	1	Site design and building placement minimize barriers to pedestrian access and interconnectivity. Physical barriers such as walls, berms, landscaping, and slopes between residential and nonresidential uses that impede bicycle or pedestrian circulation are eliminated. Barriers to pedestrian access of neighboring facilities and sites are minimized. This measure is not meant to prevent the limited use of barriers to ensure public safety by prohibiting access to hazardous areas, etc.	***Consistent.*** The proposed project would provide pedestrian accommodations throughout the project site and connecting off-site to existing external streets and pedestrian facilities.

ATTACHMENT G

Table 17: Consistency with the SJVAPCD's Climate Change Action Plan Measures

Measure Name	Estimated CO_2e Point Reductions	Measure Description	Discussion
Parking Measures			
13 – Pedestrian pathway through parking	0.5	Provide a parking lot design that includes clearly marked and shaded pedestrian pathways between transit facilities and building entrances. Pathway must connect to all transit facilities internal or adjacent to project site. Site plan should demonstrate how the pathways are clearly marked, shaded, and are placed between transit facilities and building entrances.	***Consistent.*** The proposed project would provide pedestrian accommodations throughout the project site and connecting off-site to existing external streets and pedestrian facilities.
14c – Off street parking	0.1	For 0.1 percent reduction, the project is not among high-density or mixed uses, is not connected to pedestrian or bicycle access ways, or is among uses that do not also hide parking. This point value is reflective of the importance that other pedestrian and density measures be in place in order for this measure to be effective.	***Consistent.*** The proposed project would provide off-street parking and is not located among high-density or mixed uses, is not connected to bicycle access ways, ands among uses that do not also hide parking.
Site Design Measures			
16 – Orientation toward existing transit, bikeway, or pedestrian corridor	0.5	Project is oriented towards existing transit, bicycle, or pedestrian corridor. Setback distance is minimized. Setback distance between project and adjacent uses is reduced to the minimum allowed under jurisdiction code. Setback distance between different buildings on project site is reduced to the minimum allowed under jurisdiction code. Setbacks between project buildings and sidewalks is reduced to the minimum allowed under jurisdiction code. Buildings are oriented towards street frontage. Primary entrances to buildings are located along public street frontage. Project provides bicycle access to existing bicycle corridor. Project provides access to existing pedestrian corridor.	***Consistent.*** The proposed project is not oriented towards existing transit, bicycle, or pedestrian corridor. However, the project site is located in an area with various land uses, including single-family residential, medical, commercial, religious, and school uses, which would facilitate non-motorized traffic. Therefore, the proposed project would minimize barriers for pedestrians and bicyclists.
Mixed-Use Measures			
22 – Urban Mixed-Use Measure	-	Development of projects predominantly characterized by properties on which various uses, such as office, commercial, institutional, and residential are combined in a single building or on a single site in an integrated development project with functional inter-relationships and a coherent physical design. Mitigation points for this measure depend on job to housing ratio.	***Consistent.*** The proposed project would include a variety of uses, including medical-dental office space, a hotel, fast-food restaurants with drive-through windows, a gasoline/service station, shopping center uses, a high-turnover (sit-down) restaurant, general office space, a day care center, a drive-in bank, and residential uses.

Table 17: Consistency with the SJVAPCD's Climate Change Action Plan Measures

Measure Name	Estimated CO_2e Point Reductions	Measure Description	Discussion
Additional GHG Emission Reduction Measures Requiring Additional Investigation			
5 – Site design measures	–	Site design to minimize the need for external trips by including services/facilities for day care, banking/ATM, restaurants, vehicle refueling, and shopping.	***Consistent.*** The proposed project would include a variety of uses, including medical-dental office space, a hotel, fast-food restaurants with drive-through windows, a gasoline/service station, shopping center uses, a high-turnover (sit-down) restaurant, general office space, a day care center, a drive-in bank, and residential uses.
6 – Other Mixed Use	–	All residential units are within 1/4 mile of parks, schools or other civic uses.	***Consistent.*** The project site is located in an area developed with single-family residential, medical, commercial, religious, and school uses. Mercy Medical Center Hospital is located approximately 0.1 mile north of the project site, Merced College is located approximately 0.1 mile west of the project site, and Cruickshank Middle School is located approximately 0.2 mile northeast of the project site.
7 – Mixed-Use	–	Include mixed-use, infill, and higher density in development projects to support the reduction of vehicle trips, promote alternatives to individual vehicle travel, and promote efficient delivery of services and goods.	***Consistent.*** The proposed project would include a variety of uses, including medical-dental office space, a hotel, fast-food restaurants with drive-through windows, a gasoline/service station, shopping center uses, a high-turnover (sit-down) restaurant, general office space, a day care center, a drive-in bank, and residential uses.
9 – Natural Gas Stove	–	Project features only natural gas or electric stoves in residences.	***Consistent.*** The proposed project would include only natural gas or electric stoves in residences.
11 – Vehicle idling	–	Limit idling time for commercial vehicles, including delivery and construction vehicles.	***Consistent.*** The proposed project would comply with rules and regulations for idling time for commercial vehicles, including delivery and construction vehicles.
16 – Energy Efficient Appliances	–	Install energy efficient heating and cooling systems, appliances and equipment, and control systems.	***Consistent.*** The proposed project would comply with the 2019 Building Energy Efficiency Standards, and would install energy efficient heating and cooling systems, appliances and equipment, and control systems.
20 – Tree planting	–	Protect existing trees and encourage the planting of new trees. Adopt a tree protection and replacement ordinance, e.g., requiring that trees larger than a specified diameter that are removed to accommodate development must be replaced at a set ratio.	***Consistent.*** The proposed project would include trees and landscaping throughout the project site consistent with City requirements.

Source: San Joaquin Valley Air Pollution Control District (2009) and LSA (September 2019).

1.8 CONCLUSION

Based on the analysis presented above, construction of the proposed project would not result in the generation of criteria air pollutants that would exceed SJVAPCD thresholds of significance. Implementation of Mitigation Measure AIR-1 would further reduce construction dust impacts. As discussed above, the proposed project's construction emissions of criteria pollutants are estimated to be well below the emissions threshold established for the region. Operational emissions associated with the proposed project would also not exceed SJVAPCD established significance thresholds. With implementation of Mitigation Measure AIR-2, the proposed project is not expected to produce significant emissions that would affect nearby sensitive receptors. The proposed project would also not result in objectionable odors affecting a substantial number of people. GHG emissions released during construction and operation of the project are estimated to be lower than significance thresholds, and would not be cumulatively considerable. Additionally, the project would not conflict with the goals and objectives of the SJVAPCD's CCAP or any other State or regional plan, policy or regulation of an agency adopted for the purpose of reducing GHG emissions.

APPENDIX A

CALEEMOD OUTPUT SHEETS

Yosemite Crossing

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
Bank (with Drive-Through)	3.56	1000sqft	0.08	3,560.00	0
General Office Building	12.00	1000sqft	0.28	12,000.00	0
Medical Office Building	66.47	1000sqft	1.53	66,465.00	0
Day-Care Center	4.80	1000sqft	0.11	4,804.00	0
Parking Lot	912.00	1000sqft	12.97	912,000.00	0
Fast Food Restaurant with Drive Thru	7.90	1000sqft	0.18	7,898.00	0
High Turnover (Sit Down Restaurant)	5.00	1000sqft	0.11	5,000.00	0
Hotel	128.00	Room	2.99	80,104.00	0
Apartments Low Rise	48.00	Dwelling Unit	2.69	48,000.00	152
Gasoline/Service Station	12.00	Pump	0.04	3,130.00	0
Regional Shopping Center	18.22	1000sqft	0.42	18,222.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

ATTACHMENT G

Project Characteristics - CO2 intensity factor based on 5-year average (PG&E 2015)

Land Use - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Construction Phase - Default construction schedule with September 2020 start date

Vehicle Trips - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Mobile Land Use Mitigation -

Area Mitigation - Assuming only natural gas hearth

Energy Mitigation - The project would be consistent with California's 2019 Building Energy Efficiency Standards, which will take effect on January 1, 2020

Water Mitigation - Compliance with the Water Efficient Landscape Ordinance will reduce outdoor water use by 20 percent.

Waste Mitigation - The CalRecycle Waste Diversion and Recycling Mandate will reduce solid waste production by 25 percent.

Fleet Mix - Revised fleet mix percentages based on data for a similar shopping center project in the central valley. LDA was revised to 0.64486, LHD2 was revised to 0.001, MHD was revised to 0.003, and HHD was revised to 0.001. All other fleet mix percentages are default.

Table Name	Column Name	Default Value	New Value
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	LDA	0.51	0.64
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66

tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003

tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblLandUse	LandUseSquareFeet	66,470.00	66,465.00
tblLandUse	LandUseSquareFeet	4,800.00	4,804.00
tblLandUse	LandUseSquareFeet	7,900.00	7,898.00
tblLandUse	LandUseSquareFeet	185,856.00	80,104.00
tblLandUse	LandUseSquareFeet	1,694.10	3,130.00
tblLandUse	LandUseSquareFeet	18,220.00	18,222.00
tblLandUse	LotAcreage	20.94	12.97
tblLandUse	LotAcreage	4.27	2.99
tblLandUse	LotAcreage	3.00	2.69
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblVehicleTrips	ST_TR	7.16	6.15
tblVehicleTrips	ST_TR	86.32	85.00
tblVehicleTrips	ST_TR	6.21	47.67
tblVehicleTrips	ST_TR	722.03	296.72
tblVehicleTrips	ST_TR	168.56	124.17
tblVehicleTrips	ST_TR	2.46	8.17
tblVehicleTrips	ST_TR	158.37	95.37
tblVehicleTrips	ST_TR	8.19	7.02
tblVehicleTrips	ST_TR	8.96	29.23
tblVehicleTrips	ST_TR	49.97	26.32
tblVehicleTrips	SU_TR	6.07	6.15
tblVehicleTrips	SU_TR	31.90	85.00
tblVehicleTrips	SU_TR	5.83	47.67
tblVehicleTrips	SU_TR	542.72	296.72
tblVehicleTrips	SU_TR	168.56	124.17

tblVehicleTrips	SU_TR	1.05	8.17
tblVehicleTrips	SU_TR	131.84	95.37
tblVehicleTrips	SU_TR	5.95	7.02
tblVehicleTrips	SU_TR	1.55	29.23
tblVehicleTrips	SU_TR	25.24	26.32
tblVehicleTrips	WD_TR	6.59	6.15
tblVehicleTrips	WD_TR	148.15	85.00
tblVehicleTrips	WD_TR	74.06	47.67
tblVehicleTrips	WD_TR	496.12	296.72
tblVehicleTrips	WD_TR	168.56	124.17
tblVehicleTrips	WD_TR	11.03	8.17
tblVehicleTrips	WD_TR	127.15	95.37
tblVehicleTrips	WD_TR	8.17	7.02
tblVehicleTrips	WD_TR	36.13	29.23
tblVehicleTrips	WD_TR	42.70	26.32

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1965	1.9397	1.3726	3.6400e-003	0.3466	0.0738	0.4205	0.1409	0.0685	0.2094	0.0000	328.2532	328.2532	0.0571	0.0000	329.6818
2021	0.5772	5.1438	4.3548	0.0154	0.6760	0.1362	0.8122	0.1834	0.1282	0.3116	0.0000	1,403.5291	1,403.5291	0.1348	0.0000	1,406.8991
2022	2.2152	1.4010	1.3010	4.3900e-003	0.1903	0.0376	0.2279	0.0516	0.0353	0.0869	0.0000	400.6888	400.6888	0.0420	0.0000	401.7395
Maximum	**2.2152**	**5.1438**	**4.3548**	**0.0154**	**0.6760**	**0.1362**	**0.8122**	**0.1834**	**0.1282**	**0.3116**	**0.0000**	**1,403.5291**	**1,403.5291**	**0.1348**	**0.0000**	**1,406.8991**

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	0.1965	1.9397	1.3726	3.6400e-003	0.3466	0.0738	0.4205	0.1409	0.0685	0.2094	0.0000	328.2530	328.2530	0.0571	0.0000	329.6816
2021	0.5772	5.1438	4.3548	0.0154	0.6760	0.1362	0.8122	0.1834	0.1282	0.3116	0.0000	1,403.5288	1,403.5288	0.1348	0.0000	1,406.8988
2022	2.2152	1.4010	1.3010	4.3900e-003	0.1903	0.0376	0.2279	0.0516	0.0353	0.0869	0.0000	400.6887	400.6887	0.0420	0.0000	401.7394
Maximum	**2.2152**	**5.1438**	**4.3548**	**0.0154**	**0.6760**	**0.1362**	**0.8122**	**0.1834**	**0.1282**	**0.3116**	**0.0000**	**1,403.5288**	**1,403.5288**	**0.1348**	**0.0000**	**1,406.8988**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-7-2020**	**12-6-2020**	1.6804	1.6804
2	**12-7-2020**	**3-6-2021**	1.4571	1.4571
3	**3-7-2021**	**6-6-2021**	1.4398	1.4398
4	**6-7-2021**	**9-6-2021**	1.4370	1.4370
5	**9-7-2021**	**12-6-2021**	1.4288	1.4288
6	**12-7-2021**	**3-6-2022**	1.3357	1.3357
7	**3-7-2022**	**6-6-2022**	2.6796	2.6796
		Highest	2.6796	2.6796

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	1.3048	0.0303	0.8731	1.7600e-003		0.0847	0.0847		0.0847	0.0847	10.8749	21.3970	32.2720	0.0519	3.8000e-004	33.6819
Energy	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	741.8625	741.8625	0.0401	0.0136	746.9077
Mobile	1.9750	2.8834	17.0080	0.0448	4.3309	0.0404	4.3712	1.1573	0.0375	1.1949	0.0000	4,067.7520	4,067.7520	0.1623	0.0000	4,071.8088
Waste						0.0000	0.0000		0.0000	0.0000	204.3835	0.0000	204.3835	12.0787	0.0000	506.3514
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.9177	29.0938	0.7390	0.0178	52.8738
Total	**3.3169**	**3.2492**	**18.1500**	**0.0486**	**4.3309**	**0.1507**	**4.4816**	**1.1573**	**0.1479**	**1.3052**	**222.4345**	**4,852.9293**	**5,075.3638**	**13.0719**	**0.0318**	**5,411.6235**

ATTACHMENT G

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	1.2500	0.0222	0.3752	1.3000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	21.3970	21.3970	1.0200e-003	3.8000e-004	21.5360
Energy	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	649.1885	649.1885	0.0361	0.0119	653.6284
Mobile	1.9279	2.6575	15.7214	0.0399	3.8198	0.0366	3.8564	1.0208	0.0340	1.0548	0.0000	3,615.9194	3,615.9194	0.1477	0.0000	3,619.6113
Waste						0.0000	0.0000		0.0000	0.0000	153.2876	0.0000	153.2876	9.0590	0.0000	379.7636
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.1849	28.3610	0.7389	0.0178	52.1354
Total	**3.2089**	**2.9600**	**16.3220**	**0.0417**	**3.8198**	**0.0615**	**3.8813**	**1.0208**	**0.0589**	**1.0797**	**160.4637**	**4,307.6899**	**4,468.1536**	**9.9827**	**0.0300**	**4,726.6747**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**3.26**	**8.90**	**10.07**	**14.26**	**11.80**	**59.21**	**13.39**	**11.80**	**60.18**	**17.28**	**27.86**	**11.24**	**11.96**	**23.63**	**5.39**	**12.66**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/7/2020	9/18/2020	5	10	
2	Grading	Grading	9/19/2020	11/6/2020	5	35	
3	Building Construction	Building Construction	11/7/2020	4/8/2022	5	370	
4	Paving	Paving	4/9/2022	5/6/2022	5	20	
5	Architectural Coating	Architectural Coating	5/7/2022	6/3/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 12.97

Residential Indoor: 97,200; Residential Outdoor: 32,400; Non-Residential Indoor: 301,775; Non-Residential Outdoor: 100,592; Striped Parking Area: 54,720 (Architectural Coating – sqft)

OffRoad Equipment

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	492.00	188.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	98.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

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	3.8000e-004	2.6000e-004	2.6200e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6461	0.6461	2.0000e-005	0.0000	0.6466
Total	**3.8000e-004**	**2.6000e-004**	**2.6200e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6461**	**0.6461**	**2.0000e-005**	**0.0000**	**0.6466**

3.2 Site Preparation - 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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

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	3.8000e-004	2.6000e-004	2.6200e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6461	0.6461	2.0000e-005	0.0000	0.6466
Total	**3.8000e-004**	**2.6000e-004**	**2.6200e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6461**	**0.6461**	**2.0000e-005**	**0.0000**	**0.6466**

3.3 Grading - 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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0779	0.8785	0.5593	1.0900e-003		0.0380	0.0380		0.0350	0.0350	0.0000	95.3475	95.3475	0.0308	0.0000	96.1185
Total	**0.0779**	**0.8785**	**0.5593**	**1.0900e-003**	**0.1518**	**0.0380**	**0.1898**	**0.0629**	**0.0350**	**0.0979**	**0.0000**	**95.3475**	**95.3475**	**0.0308**	**0.0000**	**96.1185**

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	1.4800e-003	1.0000e-003	0.0102	3.0000e-005	2.8000e-003	2.0000e-005	2.8200e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.5128	2.5128	7.0000e-005	0.0000	2.5146
Total	**1.4800e-003**	**1.0000e-003**	**0.0102**	**3.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8200e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.5128**	**2.5128**	**7.0000e-005**	**0.0000**	**2.5146**

3.3 Grading - 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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0779	0.8785	0.5593	1.0900e-003		0.0380	0.0380		0.0350	0.0350	0.0000	95.3474	95.3474	0.0308	0.0000	96.1183
Total	**0.0779**	**0.8785**	**0.5593**	**1.0900e-003**	**0.1518**	**0.0380**	**0.1898**	**0.0629**	**0.0350**	**0.0979**	**0.0000**	**95.3474**	**95.3474**	**0.0308**	**0.0000**	**96.1183**

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	1.4800e-003	1.0000e-003	0.0102	3.0000e-005	2.8000e-003	2.0000e-005	2.8200e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.5128	2.5128	7.0000e-005	0.0000	2.5146
Total	**1.4800e-003**	**1.0000e-003**	**0.0102**	**3.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8200e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.5128**	**2.5128**	**7.0000e-005**	**0.0000**	**2.5146**

3.4 Building Construction - 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	0.0413	0.3741	0.3286	5.2000e-004		0.0218	0.0218		0.0205	0.0205	0.0000	45.1640	45.1640	0.0110	0.0000	45.4394
Total	**0.0413**	**0.3741**	**0.3286**	**5.2000e-004**		**0.0218**	**0.0218**		**0.0205**	**0.0205**	**0.0000**	**45.1640**	**45.1640**	**0.0110**	**0.0000**	**45.4394**

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	0.0145	0.4462	0.0846	1.0400e-003	0.0243	2.4600e-003	0.0268	7.0200e-003	2.3500e-003	9.3700e-003	0.0000	98.9892	98.9892	7.8200e-003	0.0000	99.1846
Worker	0.0406	0.0275	0.2798	7.6000e-004	0.0767	5.5000e-004	0.0773	0.0204	5.0000e-004	0.0209	0.0000	68.8783	68.8783	1.9700e-003	0.0000	68.9276
Total	**0.0551**	**0.4738**	**0.3644**	**1.8000e-003**	**0.1010**	**3.0100e-003**	**0.1040**	**0.0274**	**2.8500e-003**	**0.0303**	**0.0000**	**167.8675**	**167.8675**	**9.7900e-003**	**0.0000**	**168.1123**

3.4 Building Construction - 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	0.0413	0.3741	0.3286	5.2000e-004		0.0218	0.0218		0.0205	0.0205	0.0000	45.1639	45.1639	0.0110	0.0000	45.4394
Total	**0.0413**	**0.3741**	**0.3286**	**5.2000e-004**		**0.0218**	**0.0218**		**0.0205**	**0.0205**	**0.0000**	**45.1639**	**45.1639**	**0.0110**	**0.0000**	**45.4394**

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	0.0145	0.4462	0.0846	1.0400e-003	0.0243	2.4600e-003	0.0268	7.0200e-003	2.3500e-003	9.3700e-003	0.0000	98.9892	98.9892	7.8200e-003	0.0000	99.1846
Worker	0.0406	0.0275	0.2798	7.6000e-004	0.0767	5.5000e-004	0.0773	0.0204	5.0000e-004	0.0209	0.0000	68.8783	68.8783	1.9700e-003	0.0000	68.9276
Total	**0.0551**	**0.4738**	**0.3644**	**1.8000e-003**	**0.1010**	**3.0100e-003**	**0.1040**	**0.0274**	**2.8500e-003**	**0.0303**	**0.0000**	**167.8675**	**167.8675**	**9.7900e-003**	**0.0000**	**168.1123**

3.4 Building Construction - 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	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

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	0.0791	2.7051	0.4935	6.9100e-003	0.1626	7.6100e-003	0.1703	0.0470	7.2800e-003	0.0543	0.0000	656.3118	656.3118	0.0501	0.0000	657.5646
Worker	0.2500	0.1638	1.6982	4.9200e-003	0.5133	3.5300e-003	0.5168	0.1364	3.2500e-003	0.1397	0.0000	444.9307	444.9307	0.0118	0.0000	445.2247
Total	**0.3291**	**2.8689**	**2.1917**	**0.0118**	**0.6760**	**0.0111**	**0.6871**	**0.1834**	**0.0105**	**0.1940**	**0.0000**	**1,101.2425**	**1,101.2425**	**0.0619**	**0.0000**	**1,102.7893**

ATTACHMENT G

3.4 Building Construction - 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	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

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	0.0791	2.7051	0.4935	6.9100e-003	0.1626	7.6100e-003	0.1703	0.0470	7.2800e-003	0.0543	0.0000	656.3118	656.3118	0.0501	0.0000	657.5646
Worker	0.2500	0.1638	1.6982	4.9200e-003	0.5133	3.5300e-003	0.5168	0.1364	3.2500e-003	0.1397	0.0000	444.9307	444.9307	0.0118	0.0000	445.2247
Total	**0.3291**	**2.8689**	**2.1917**	**0.0118**	**0.6760**	**0.0111**	**0.6871**	**0.1834**	**0.0105**	**0.1940**	**0.0000**	**1,101.2425**	**1,101.2425**	**0.0619**	**0.0000**	**1,102.7893**

ATTACHMENT G

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0597	0.5466	0.5727	9.4000e-004		0.0283	0.0283		0.0266	0.0266	0.0000	81.1038	81.1038	0.0194	0.0000	81.5896
Total	**0.0597**	**0.5466**	**0.5727**	**9.4000e-004**		**0.0283**	**0.0283**		**0.0266**	**0.0266**	**0.0000**	**81.1038**	**81.1038**	**0.0194**	**0.0000**	**81.5896**

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	0.0197	0.6873	0.1221	1.8400e-003	0.0436	1.7700e-003	0.0454	0.0126	1.6900e-003	0.0143	0.0000	174.3877	174.3877	0.0130	0.0000	174.7117
Worker	0.0621	0.0392	0.4150	1.2700e-003	0.1377	9.2000e-004	0.1386	0.0366	8.5000e-004	0.0374	0.0000	115.0657	115.0657	2.8100e-003	0.0000	115.1360
Total	**0.0818**	**0.7265**	**0.5371**	**3.1100e-003**	**0.1813**	**2.6900e-003**	**0.1840**	**0.0492**	**2.5400e-003**	**0.0517**	**0.0000**	**289.4534**	**289.4534**	**0.0158**	**0.0000**	**289.8477**

3.4 Building Construction - 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	0.0597	0.5466	0.5727	9.4000e-004		0.0283	0.0283		0.0266	0.0266	0.0000	81.1037	81.1037	0.0194	0.0000	81.5895
Total	**0.0597**	**0.5466**	**0.5727**	**9.4000e-004**		**0.0283**	**0.0283**		**0.0266**	**0.0266**	**0.0000**	**81.1037**	**81.1037**	**0.0194**	**0.0000**	**81.5895**

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	0.0197	0.6873	0.1221	1.8400e-003	0.0436	1.7700e-003	0.0454	0.0126	1.6900e-003	0.0143	0.0000	174.3877	174.3877	0.0130	0.0000	174.7117
Worker	0.0621	0.0392	0.4150	1.2700e-003	0.1377	9.2000e-004	0.1386	0.0366	8.5000e-004	0.0374	0.0000	115.0657	115.0657	2.8100e-003	0.0000	115.1360
Total	**0.0818**	**0.7265**	**0.5371**	**3.1100e-003**	**0.1813**	**2.6900e-003**	**0.1840**	**0.0492**	**2.5400e-003**	**0.0517**	**0.0000**	**289.4534**	**289.4534**	**0.0158**	**0.0000**	**289.8477**

3.5 Paving - 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	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0280**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

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	5.4000e-004	3.4000e-004	3.6200e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0023	1.0023	2.0000e-005	0.0000	1.0029
Total	**5.4000e-004**	**3.4000e-004**	**3.6200e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0023**	**1.0023**	**2.0000e-005**	**0.0000**	**1.0029**

3.5 Paving - 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	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0280**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

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	5.4000e-004	3.4000e-004	3.6200e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0023	1.0023	2.0000e-005	0.0000	1.0029
Total	**5.4000e-004**	**3.4000e-004**	**3.6200e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0023**	**1.0023**	**2.0000e-005**	**0.0000**	**1.0029**

3.6 Architectural Coating - 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	2.0395					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	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**2.0415**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

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	3.5300e-003	2.2300e-003	0.0236	7.0000e-005	7.8300e-003	5.0000e-005	7.8900e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.5485	6.5485	1.6000e-004	0.0000	6.5525
Total	**3.5300e-003**	**2.2300e-003**	**0.0236**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8900e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.5485**	**6.5485**	**1.6000e-004**	**0.0000**	**6.5525**

3.6 Architectural Coating - 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	2.0395					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	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**2.0415**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

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	3.5300e-003	2.2300e-003	0.0236	7.0000e-005	7.8300e-003	5.0000e-005	7.8900e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.5485	6.5485	1.6000e-004	0.0000	6.5525
Total	**3.5300e-003**	**2.2300e-003**	**0.0236**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8900e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.5485**	**6.5485**	**1.6000e-004**	**0.0000**	**6.5525**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Increase Transit Accessibility

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	1.9279	2.6575	15.7214	0.0399	3.8198	0.0366	3.8564	1.0208	0.0340	1.0548	0.0000	3,615.9194	3,615.9194	0.1477	0.0000	3,619.6113
Unmitigated	1.9750	2.8834	17.0080	0.0448	4.3309	0.0404	4.3712	1.1573	0.0375	1.1949	0.0000	4,067.7520	4,067.7520	0.1623	0.0000	4,071.8088

4.2 Trip Summary Information

ATTACHMENT G

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	295.20	295.20	295.20	855,436	754,494
Bank (with Drive-Through)	302.60	302.60	302.60	279,898	246,870
Day-Care Center	228.82	228.82	228.82	269,460	237,664
Fast Food Restaurant with Drive Thru	2,344.09	2,344.09	2344.09	2,190,140	1,931,704
Gasoline/Service Station	1,490.04	1,490.04	1490.04	858,514	757,209
General Office Building	98.04	98.04	98.04	234,291	206,645
High Turnover (Sit Down Restaurant)	476.85	476.85	476.85	553,272	487,986
Hotel	898.56	898.56	898.56	1,707,202	1,505,752
Medical Office Building	1,942.92	1,942.92	1942.92	3,802,776	3,354,049
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	479.55	479.55	479.55	840,798	741,584
Total	8,556.66	8,556.66	8,556.66	11,591,787	10,223,956

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3
Bank (with Drive-Through)	9.50	7.30	7.30	6.60	74.40	19.00	27	26	47
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Medical Office Building	9.50	7.30	7.30	29.60	51.40	19.00	60	30	10
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.644860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Bank (with Drive-Through)	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Day-Care Center	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Fast Food Restaurant with Drive Thru	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Gasoline/Service Station	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
General Office Building	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
High Turnover (Sit Down Restaurant)	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Hotel	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Medical Office Building	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Parking Lot	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Regional Shopping Center	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	342.3176	342.3176	0.0302	6.2500e-003	344.9339
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	374.3804	374.3804	0.0330	6.8300e-003	377.2418
NaturalGas Mitigated	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.8709	306.8709	5.8800e-003	5.6300e-003	308.6945
NaturalGas Unmitigated	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	367.4821	367.4821	7.0400e-003	6.7400e-003	369.6659

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					
Apartments Low Rise	678550	3.6600e-003	0.0313	0.0133	2.0000e-004		2.5300e-003	2.5300e-003		2.5300e-003	2.5300e-003	0.0000	36.2100	36.2100	6.9000e-004	6.6000e-004	36.4252
Bank (with Drive-Through)	74297.2	4.0000e-004	3.6400e-003	3.0600e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9648	3.9648	8.0000e-005	7.0000e-005	3.9883
Day-Care Center	120628	6.5000e-004	5.9100e-003	4.9700e-003	4.0000e-005		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	6.4372	6.4372	1.2000e-004	1.2000e-004	6.4755
Fast Food Restaurant with Drive Thru	1.6619e+006	8.9600e-003	0.0815	0.0684	4.9000e-004		6.1900e-003	6.1900e-003		6.1900e-003	6.1900e-003	0.0000	88.6852	88.6852	1.7000e-003	1.6300e-003	89.2122
Gasoline/Service Station	65323.1	3.5000e-004	3.2000e-003	2.6900e-003	2.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	3.4859	3.4859	7.0000e-005	6.0000e-005	3.5066
General Office Building	156600	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3568	8.3568	1.6000e-004	1.5000e-004	8.4064
High Turnover (Sit Down Restaurant)	1.0521e+006	5.6700e-003	0.0516	0.0433	3.1000e-004		3.9200e-003	3.9200e-003		3.9200e-003	3.9200e-003	0.0000	56.1441	56.1441	1.0800e-003	1.0300e-003	56.4777
Hotel	2.01462e+006	0.0109	0.0988	0.0830	5.9000e-004		7.5100e-003	7.5100e-003		7.5100e-003	7.5100e-003	0.0000	107.5076	107.5076	2.0600e-003	1.9700e-003	108.1464
Medical Office Building	867368	4.6800e-003	0.0425	0.0357	2.6000e-004		3.2300e-003	3.2300e-003		3.2300e-003	3.2300e-003	0.0000	46.2861	46.2861	8.9000e-004	8.5000e-004	46.5611
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	194975	1.0500e-003	9.5600e-003	8.0300e-003	6.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	10.4046	10.4046	2.0000e-004	1.9000e-004	10.4665
Total		**0.0371**	**0.3356**	**0.2689**	**2.0400e-003**		**0.0257**	**0.0257**		**0.0257**	**0.0257**	**0.0000**	**367.4821**	**367.4821**	**7.0500e-003**	**6.7300e-003**	**369.6659**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Low Rise	528596	2.8500e-003	0.0244	0.0104	1.6000e-004		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	28.2079	28.2079	5.4000e-004	5.2000e-004	28.3755
Bank (with Drive-Through)	56109.2	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9942	2.9942	6.0000e-005	5.0000e-005	3.0120
Day-Care Center	87207	4.7000e-004	4.2700e-003	3.5900e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6537	4.6537	9.0000e-005	9.0000e-005	4.6814
Fast Food Restaurant with Drive Thru	1.57726e+006	8.5000e-003	0.0773	0.0650	4.6000e-004		5.8800e-003	5.8800e-003		5.8800e-003	5.8800e-003	0.0000	84.1687	84.1687	1.6100e-003	1.5400e-003	84.6689
Gasoline/Service Station	49331.9	2.7000e-004	2.4200e-003	2.0300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6325	2.6325	5.0000e-005	5.0000e-005	2.6482
General Office Building	110628	6.0000e-004	5.4200e-003	4.5600e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.9035	5.9035	1.1000e-004	1.1000e-004	5.9386
High Turnover (Sit Down Restaurant)	998520	5.3800e-003	0.0490	0.0411	2.9000e-004		3.7200e-003	3.7200e-003		3.7200e-003	3.7200e-003	0.0000	53.2848	53.2848	1.0200e-003	9.8000e-004	53.6015
Hotel	1.58229e+006	8.5300e-003	0.0776	0.0652	4.7000e-004		5.8900e-003	5.8900e-003		5.8900e-003	5.8900e-003	0.0000	84.4373	84.4373	1.6200e-003	1.5500e-003	84.9390
Medical Office Building	612741	3.3000e-003	0.0300	0.0252	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003	0.0000	32.6982	32.6982	6.3000e-004	6.0000e-004	32.8925
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	147853	8.0000e-004	7.2500e-003	6.0900e-003	4.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	7.8900	7.8900	1.5000e-004	1.4000e-004	7.9369
Total		**0.0310**	**0.2803**	**0.2254**	**1.6900e-003**		**0.0214**	**0.0214**		**0.0214**	**0.0214**	**0.0000**	**306.8709**	**306.8709**	**5.8800e-003**	**5.6300e-003**	**308.6944**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	224521	33.4853	2.9500e-003	6.1000e-004	33.7413
Bank (with Drive-Through)	31399.2	4.6829	4.1000e-004	9.0000e-005	4.7187
Day-Care Center	33724.1	5.0297	4.4000e-004	9.0000e-005	5.0681
Fast Food Restaurant with Drive Thru	228805	34.1243	3.0100e-003	6.2000e-004	34.3851
Gasoline/Service Station	27606.6	4.1173	3.6000e-004	8.0000e-005	4.1488
General Office Building	109440	16.3220	1.4400e-003	3.0000e-004	16.4468
High Turnover (Sit Down Restaurant)	144850	21.6031	1.9100e-003	3.9000e-004	21.7682
Hotel	636026	94.8576	8.3700e-003	1.7300e-003	95.5826
Medical Office Building	606161	90.4035	7.9700e-003	1.6500e-003	91.0945
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	148509	22.1489	1.9500e-003	4.0000e-004	22.3181
Total		**374.3804**	**0.0330**	**6.8300e-003**	**377.2418**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	214522	31.9940	2.8200e-003	5.8000e-004	32.2385
Bank (with Drive-Through)	29305.9	4.3707	3.9000e-004	8.0000e-005	4.4041
Day-Care Center	30639.9	4.5697	4.0000e-004	8.0000e-005	4.6046
Fast Food Restaurant with Drive Thru	213285	31.8097	2.8100e-003	5.8000e-004	32.0528
Gasoline/Service Station	25766.2	3.8428	3.4000e-004	7.0000e-005	3.8722
General Office Building	100008	14.9153	1.3200e-003	2.7000e-004	15.0293
High Turnover (Sit Down Restaurant)	135025	20.1378	1.7800e-003	3.7000e-004	20.2917
Hotel	536777	80.0555	7.0600e-003	1.4600e-003	80.6674
Medical Office Building	553919	82.6122	7.2900e-003	1.5100e-003	83.2436
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	136811	20.4041	1.8000e-003	3.7000e-004	20.5601
Total		**342.3176**	**0.0302**	**6.2400e-003**	**344.9340**

6.0 Area Detail

6.1 Mitigation Measures Area

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	1.2500	0.0222	0.3752	1.3000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	21.3970	21.3970	1.0200e-003	3.8000e-004	21.5360
Unmitigated	1.3048	0.0303	0.8731	1.7600e-003		0.0847	0.0847		0.0847	0.0847	10.8749	21.3970	32.2720	0.0519	3.8000e-004	33.6819

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0569	0.0261	0.5055	1.7400e-003		0.0827	0.0827		0.0827	0.0827	10.8749	20.7940	31.6689	0.0512	3.8000e-004	33.0634
Landscaping	0.0118	4.2100e-003	0.3676	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.2000e-004	0.0000	0.6185
Total	**1.3048**	**0.0303**	**0.8731**	**1.7600e-003**		**0.0847**	**0.0847**		**0.0847**	**0.0847**	**10.8749**	**21.3970**	**32.2720**	**0.0519**	**3.8000e-004**	**33.6819**

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0118	4.2100e-003	0.3676	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.2000e-004	0.0000	0.6185
Total	**1.2500**	**0.0222**	**0.3752**	**1.3000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**21.3970**	**21.3970**	**1.0200e-003**	**3.8000e-004**	**21.5360**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	28.3610	0.7389	0.0178	52.1354
Unmitigated	29.0938	0.7390	0.0178	52.8738

ATTACHMENT G

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.97162	4.5452	0.1022	2.4700e-003	7.8370
Bank (with Drive-Through)	0.141058 / 0.0864546	0.2037	4.6100e-003	1.1000e-004	0.3522
Day-Care Center	0.20587 / 0.52938	0.5078	6.7500e-003	1.7000e-004	0.7261
Fast Food Restaurant with Drive Thru	2.39792 / 0.153058	2.7758	0.0783	1.8800e-003	5.2944
Gasoline/Service Station	0.159383 / 0.0976861	0.2302	5.2100e-003	1.3000e-004	0.3979
General Office Building	2.1328 / 1.3072	3.0802	0.0697	1.6800e-003	5.3250
High Turnover (Sit Down Restaurant)	1.51767 / 0.0968725	1.7568	0.0496	1.1900e-003	3.3509
Hotel	3.24695 / 0.360772	3.8387	0.1061	2.5500e-003	7.2497
Medical Office Building	8.34069 / 1.5887	10.2064	0.2725	6.5600e-003	18.9711
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.827175	1.9491	0.0441	1.0700e-003	3.3696
Total		**29.0938**	**0.7390**	**0.0178**	**52.8738**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.57729	4.3393	0.1022	2.4700e-003	7.6296
Bank (with Drive-Through)	0.141058 / 0.0691637	0.1947	4.6100e-003	1.1000e-004	0.3431
Day-Care Center	0.20587 / 0.423504	0.4525	6.7400e-003	1.7000e-004	0.6704
Fast Food Restaurant with Drive Thru	2.39792 / 0.122447	2.7598	0.0783	1.8800e-003	5.2783
Gasoline/Service Station	0.159383 / 0.0781489	0.2200	5.2100e-003	1.3000e-004	0.3877
General Office Building	2.1328 / 1.04576	2.9437	0.0697	1.6800e-003	5.1875
High Turnover (Sit Down Restaurant)	1.51767 / 0.077498	1.7467	0.0496	1.1900e-003	3.3407
Hotel	3.24695 / 0.288617	3.8011	0.1061	2.5500e-003	7.2118
Medical Office Building	8.34069 / 1.27096	10.0405	0.2724	6.5500e-003	18.8039
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.66174	1.8627	0.0441	1.0600e-003	3.2826
Total		**28.3610**	**0.7389**	**0.0178**	**52.1354**

8.0 Waste Detail

8.1 Mitigation Measures Waste

ATTACHMENT G

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	153.2876	9.0590	0.0000	379.7636
Unmitigated	204.3835	12.0787	0.0000	506.3514

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	22.08	4.4820	0.2649	0.0000	11.1041
Bank (with Drive-Through)	3.32	0.6739	0.0398	0.0000	1.6696
Day-Care Center	6.24	1.2667	0.0749	0.0000	3.1381
Fast Food Restaurant with Drive Thru	91	18.4722	1.0917	0.0000	45.7640
Gasoline/Service Station	6.47	1.3134	0.0776	0.0000	3.2538
General Office Building	11.16	2.2654	0.1339	0.0000	5.6124
High Turnover (Sit Down Restaurant)	59.5	12.0780	0.7138	0.0000	29.9226
Hotel	70.08	14.2256	0.8407	0.0000	35.2433
Medical Office Building	717.88	145.7232	8.6120	0.0000	361.0229
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.13	3.8832	0.2295	0.0000	9.6205
Total		**204.3835**	**12.0787**	**0.0000**	**506.3514**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	16.56	3.3615	0.1987	0.0000	8.3281
Bank (with Drive-Through)	2.49	0.5055	0.0299	0.0000	1.2522
Day-Care Center	4.68	0.9500	0.0561	0.0000	2.3536
Fast Food Restaurant with Drive Thru	68.25	13.8541	0.8188	0.0000	34.3230
Gasoline/Service Station	4.8525	0.9850	0.0582	0.0000	2.4403
General Office Building	8.37	1.6990	0.1004	0.0000	4.2093
High Turnover (Sit Down Restaurant)	44.625	9.0585	0.5353	0.0000	22.4420
Hotel	52.56	10.6692	0.6305	0.0000	26.4325
Medical Office Building	538.41	109.2924	6.4590	0.0000	270.7672
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	14.3475	2.9124	0.1721	0.0000	7.2154
Total		**153.2876**	**9.0590**	**0.0000**	**379.7636**

9.0 Operational Offroad

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

ATTACHMENT G

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

Yosemite Crossing - Mitigated Construction

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
Bank (with Drive-Through)	3.56	1000sqft	0.08	3,560.00	0
General Office Building	12.00	1000sqft	0.28	12,000.00	0
Medical Office Building	66.47	1000sqft	1.53	66,465.00	0
Day-Care Center	4.80	1000sqft	0.11	4,804.00	0
Parking Lot	912.00	1000sqft	12.97	912,000.00	0
Fast Food Restaurant with Drive Thru	7.90	1000sqft	0.18	7,898.00	0
High Turnover (Sit Down Restaurant)	5.00	1000sqft	0.11	5,000.00	0
Hotel	128.00	Room	2.99	80,104.00	0
Apartments Low Rise	48.00	Dwelling Unit	2.69	48,000.00	152
Gasoline/Service Station	12.00	Pump	0.04	3,130.00	0
Regional Shopping Center	18.22	1000sqft	0.42	18,222.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2022
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

ATTACHMENT G

Project Characteristics - CO2 intensity factor based on 5-year average (PG&E 2015)

Land Use - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Construction Phase - Default construction schedule with September 2020 start date

Vehicle Trips - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Construction Off-road Equipment Mitigation - Tier 2 construction equipment with level 3 diesel particulate filters

Mobile Land Use Mitigation -

Area Mitigation - Assuming only natural gas hearth

Energy Mitigation - The project would be consistent with California's 2019 Building Energy Efficiency Standards, which will take effect on January 1, 2020

Water Mitigation - Compliance with the Water Efficient Landscape Ordinance will reduce outdoor water use by 20 percent.

Waste Mitigation - The CalRecycle Waste Diversion and Recycling Mandate will reduce solid waste production by 25 percent.

Table Name	Column Name	Default Value	New Value
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	DPF	No Change	Level 3
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00

tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	3.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	9.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003

tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	HHD	0.11	1.0000e-003
tblFleetMix	LDA	0.51	0.64
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LDA	0.51	0.66
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003

tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	LHD2	5.0970e-003	1.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblFleetMix	MHD	0.02	3.0000e-003
tblLandUse	LandUseSquareFeet	66,470.00	66,465.00
tblLandUse	LandUseSquareFeet	4,800.00	4,804.00
tblLandUse	LandUseSquareFeet	7,900.00	7,898.00
tblLandUse	LandUseSquareFeet	185,856.00	80,104.00
tblLandUse	LandUseSquareFeet	1,694.10	3,130.00
tblLandUse	LandUseSquareFeet	18,220.00	18,222.00
tblLandUse	LotAcreage	20.94	12.97
tblLandUse	LotAcreage	4.27	2.99
tblLandUse	LotAcreage	3.00	2.69
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblVehicleTrips	ST_TR	7.16	6.15
tblVehicleTrips	ST_TR	86.32	85.00
tblVehicleTrips	ST_TR	6.21	47.67

tblVehicleTrips	ST_TR	722.03	296.72
tblVehicleTrips	ST_TR	168.56	124.17
tblVehicleTrips	ST_TR	2.46	8.17
tblVehicleTrips	ST_TR	158.37	95.37
tblVehicleTrips	ST_TR	8.19	7.02
tblVehicleTrips	ST_TR	8.96	29.23
tblVehicleTrips	ST_TR	49.97	26.32
tblVehicleTrips	SU_TR	6.07	6.15
tblVehicleTrips	SU_TR	31.90	85.00
tblVehicleTrips	SU_TR	5.83	47.67
tblVehicleTrips	SU_TR	542.72	296.72
tblVehicleTrips	SU_TR	168.56	124.17
tblVehicleTrips	SU_TR	1.05	8.17
tblVehicleTrips	SU_TR	131.84	95.37
tblVehicleTrips	SU_TR	5.95	7.02
tblVehicleTrips	SU_TR	1.55	29.23
tblVehicleTrips	SU_TR	25.24	26.32
tblVehicleTrips	WD_TR	6.59	6.15
tblVehicleTrips	WD_TR	148.15	85.00
tblVehicleTrips	WD_TR	74.06	47.67
tblVehicleTrips	WD_TR	496.12	296.72
tblVehicleTrips	WD_TR	168.56	124.17
tblVehicleTrips	WD_TR	11.03	8.17
tblVehicleTrips	WD_TR	127.15	95.37
tblVehicleTrips	WD_TR	8.17	7.02
tblVehicleTrips	WD_TR	36.13	29.23
tblVehicleTrips	WD_TR	42.70	26.32

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1965	1.9397	1.3726	3.6400e-003	0.3466	0.0738	0.4205	0.1409	0.0685	0.2094	0.0000	328.2532	328.2532	0.0571	0.0000	329.6818
2021	0.5772	5.1438	4.3548	0.0154	0.6760	0.1362	0.8122	0.1834	0.1282	0.3116	0.0000	1,403.5291	1,403.5291	0.1348	0.0000	1,406.8991
2022	2.2152	1.4010	1.3010	4.3900e-003	0.1903	0.0376	0.2279	0.0516	0.0353	0.0869	0.0000	400.6888	400.6888	0.0420	0.0000	401.7395
Maximum	**2.2152**	**5.1438**	**4.3548**	**0.0154**	**0.6760**	**0.1362**	**0.8122**	**0.1834**	**0.1282**	**0.3116**	**0.0000**	**1,403.5291**	**1,403.5291**	**0.1348**	**0.0000**	**1,406.8991**

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	0.1158	1.9996	1.4832	3.6400e-003	0.3466	9.8800e-003	0.3565	0.1409	9.7300e-003	0.1507	0.0000	328.2530	328.2530	0.0571	0.0000	329.6816
2021	0.4702	5.9427	4.5242	0.0154	0.6760	0.0288	0.7048	0.1834	0.0282	0.2116	0.0000	1,403.5288	1,403.5288	0.1348	0.0000	1,406.8988
2022	2.1907	1.7782	1.3812	4.3900e-003	0.1903	8.6300e-003	0.1990	0.0516	8.4800e-003	0.0601	0.0000	400.6887	400.6887	0.0420	0.0000	401.7394
Maximum	**2.1907**	**5.9427**	**4.5242**	**0.0154**	**0.6760**	**0.0288**	**0.7048**	**0.1834**	**0.0282**	**0.2116**	**0.0000**	**1,403.5288**	**1,403.5288**	**0.1348**	**0.0000**	**1,406.8988**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**7.10**	**-14.57**	**-5.13**	**0.00**	**0.00**	**80.88**	**13.71**	**0.00**	**79.98**	**30.51**	**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	**9-7-2020**	**12-6-2020**	1.6804	1.6385
2	**12-7-2020**	**3-6-2021**	1.4571	1.6099
3	**3-7-2021**	**6-6-2021**	1.4398	1.6140
4	**6-7-2021**	**9-6-2021**	1.4370	1.6112
5	**9-7-2021**	**12-6-2021**	1.4288	1.6011
6	**12-7-2021**	**3-6-2022**	1.3357	1.5528
7	**3-7-2022**	**6-6-2022**	2.6796	2.8625
		Highest	2.6796	2.8625

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	1.3048	0.0303	0.8731	1.7600e-003		0.0847	0.0847		0.0847	0.0847	10.8749	21.3970	32.2720	0.0519	3.8000e-004	33.6819
Energy	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	741.8625	741.8625	0.0401	0.0136	746.9077
Mobile	1.9750	2.8834	17.0080	0.0448	4.3309	0.0404	4.3712	1.1573	0.0375	1.1949	0.0000	4,067.7520	4,067.7520	0.1623	0.0000	4,071.8088
Waste						0.0000	0.0000		0.0000	0.0000	204.3835	0.0000	204.3835	12.0787	0.0000	506.3514
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.9177	29.0938	0.7390	0.0178	52.8738
Total	**3.3169**	**3.2492**	**18.1500**	**0.0486**	**4.3309**	**0.1507**	**4.4816**	**1.1573**	**0.1479**	**1.3052**	**222.4345**	**4,852.9293**	**5,075.3638**	**13.0719**	**0.0318**	**5,411.6235**

ATTACHMENT G

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	1.2500	0.0222	0.3752	1.3000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	21.3970	21.3970	1.0200e-003	3.8000e-004	21.5360
Energy	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	649.1885	649.1885	0.0361	0.0119	653.6284
Mobile	1.9279	2.6575	15.7214	0.0399	3.8198	0.0366	3.8564	1.0208	0.0340	1.0548	0.0000	3,615.9194	3,615.9194	0.1477	0.0000	3,619.6113
Waste						0.0000	0.0000		0.0000	0.0000	153.2876	0.0000	153.2876	9.0590	0.0000	379.7636
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.1849	28.3610	0.7389	0.0178	52.1354
Total	**3.2089**	**2.9600**	**16.3220**	**0.0417**	**3.8198**	**0.0615**	**3.8813**	**1.0208**	**0.0589**	**1.0797**	**160.4637**	**4,307.6899**	**4,468.1536**	**9.9827**	**0.0300**	**4,726.6747**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**3.26**	**8.90**	**10.07**	**14.26**	**11.80**	**59.21**	**13.39**	**11.80**	**60.18**	**17.28**	**27.86**	**11.24**	**11.96**	**23.63**	**5.39**	**12.66**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/7/2020	9/18/2020	5	10	
2	Grading	Grading	9/19/2020	11/6/2020	5	35	
3	Building Construction	Building Construction	11/7/2020	4/8/2022	5	370	
4	Paving	Paving	4/9/2022	5/6/2022	5	20	
5	Architectural Coating	Architectural Coating	5/7/2022	6/3/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 12.97

Residential Indoor: 97,200; Residential Outdoor: 32,400; Non-Residential Indoor: 301,775; Non-Residential Outdoor: 100,592; Striped Parking Area: 54,720 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	492.00	188.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	98.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

3.2 Site Preparation - 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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

ATTACHMENT G

3.2 Site Preparation - 2020

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	3.8000e-004	2.6000e-004	2.6200e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6461	0.6461	2.0000e-005	0.0000	0.6466
Total	**3.8000e-004**	**2.6000e-004**	**2.6200e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6461**	**0.6461**	**2.0000e-005**	**0.0000**	**0.6466**

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.0500e-003	0.1686	0.1148	1.9000e-004		7.1000e-004	7.1000e-004		7.1000e-004	7.1000e-004	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**6.0500e-003**	**0.1686**	**0.1148**	**1.9000e-004**	**0.0903**	**7.1000e-004**	**0.0910**	**0.0497**	**7.1000e-004**	**0.0504**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.2 Site Preparation - 2020

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	3.8000e-004	2.6000e-004	2.6200e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.2000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6461	0.6461	2.0000e-005	0.0000	0.6466
Total	**3.8000e-004**	**2.6000e-004**	**2.6200e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6461**	**0.6461**	**2.0000e-005**	**0.0000**	**0.6466**

3.3 Grading - 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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0779	0.8785	0.5593	1.0900e-003		0.0380	0.0380		0.0350	0.0350	0.0000	95.3475	95.3475	0.0308	0.0000	96.1185
Total	**0.0779**	**0.8785**	**0.5593**	**1.0900e-003**	**0.1518**	**0.0380**	**0.1898**	**0.0629**	**0.0350**	**0.0979**	**0.0000**	**95.3475**	**95.3475**	**0.0308**	**0.0000**	**96.1185**

3.3 Grading - 2020

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	1.4800e-003	1.0000e-003	0.0102	3.0000e-005	2.8000e-003	2.0000e-005	2.8200e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.5128	2.5128	7.0000e-005	0.0000	2.5146
Total	**1.4800e-003**	**1.0000e-003**	**0.0102**	**3.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8200e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.5128**	**2.5128**	**7.0000e-005**	**0.0000**	**2.5146**

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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0317	0.8967	0.6426	1.0900e-003		3.5000e-003	3.5000e-003		3.5000e-003	3.5000e-003	0.0000	95.3474	95.3474	0.0308	0.0000	96.1183
Total	**0.0317**	**0.8967**	**0.6426**	**1.0900e-003**	**0.1518**	**3.5000e-003**	**0.1553**	**0.0629**	**3.5000e-003**	**0.0664**	**0.0000**	**95.3474**	**95.3474**	**0.0308**	**0.0000**	**96.1183**

3.3 Grading - 2020

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	1.4800e-003	1.0000e-003	0.0102	3.0000e-005	2.8000e-003	2.0000e-005	2.8200e-003	7.4000e-004	2.0000e-005	7.6000e-004	0.0000	2.5128	2.5128	7.0000e-005	0.0000	2.5146
Total	**1.4800e-003**	**1.0000e-003**	**0.0102**	**3.0000e-005**	**2.8000e-003**	**2.0000e-005**	**2.8200e-003**	**7.4000e-004**	**2.0000e-005**	**7.6000e-004**	**0.0000**	**2.5128**	**2.5128**	**7.0000e-005**	**0.0000**	**2.5146**

3.4 Building Construction - 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	0.0413	0.3741	0.3286	5.2000e-004		0.0218	0.0218		0.0205	0.0205	0.0000	45.1640	45.1640	0.0110	0.0000	45.4394
Total	**0.0413**	**0.3741**	**0.3286**	**5.2000e-004**		**0.0218**	**0.0218**		**0.0205**	**0.0205**	**0.0000**	**45.1640**	**45.1640**	**0.0110**	**0.0000**	**45.4394**

3.4 Building Construction - 2020

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	0.0145	0.4462	0.0846	1.0400e-003	0.0243	2.4600e-003	0.0268	7.0200e-003	2.3500e-003	9.3700e-003	0.0000	98.9892	98.9892	7.8200e-003	0.0000	99.1846
Worker	0.0406	0.0275	0.2798	7.6000e-004	0.0767	5.5000e-004	0.0773	0.0204	5.0000e-004	0.0209	0.0000	68.8783	68.8783	1.9700e-003	0.0000	68.9276
Total	**0.0551**	**0.4738**	**0.3644**	**1.8000e-003**	**0.1010**	**3.0100e-003**	**0.1040**	**0.0274**	**2.8500e-003**	**0.0303**	**0.0000**	**167.8675**	**167.8675**	**9.7900e-003**	**0.0000**	**168.1123**

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	0.0211	0.4593	0.3485	5.2000e-004		2.6400e-003	2.6400e-003		2.6400e-003	2.6400e-003	0.0000	45.1639	45.1639	0.0110	0.0000	45.4394
Total	**0.0211**	**0.4593**	**0.3485**	**5.2000e-004**		**2.6400e-003**	**2.6400e-003**		**2.6400e-003**	**2.6400e-003**	**0.0000**	**45.1639**	**45.1639**	**0.0110**	**0.0000**	**45.4394**

3.4 Building Construction - 2020

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	0.0145	0.4462	0.0846	1.0400e-003	0.0243	2.4600e-003	0.0268	7.0200e-003	2.3500e-003	9.3700e-003	0.0000	98.9892	98.9892	7.8200e-003	0.0000	99.1846
Worker	0.0406	0.0275	0.2798	7.6000e-004	0.0767	5.5000e-004	0.0773	0.0204	5.0000e-004	0.0209	0.0000	68.8783	68.8783	1.9700e-003	0.0000	68.9276
Total	**0.0551**	**0.4738**	**0.3644**	**1.8000e-003**	**0.1010**	**3.0100e-003**	**0.1040**	**0.0274**	**2.8500e-003**	**0.0303**	**0.0000**	**167.8675**	**167.8675**	**9.7900e-003**	**0.0000**	**168.1123**

3.4 Building Construction - 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	0.2481	2.2749	2.1631	3.5100e-003		0.1251	0.1251		0.1176	0.1176	0.0000	302.2867	302.2867	0.0729	0.0000	304.1099
Total	**0.2481**	**2.2749**	**2.1631**	**3.5100e-003**		**0.1251**	**0.1251**		**0.1176**	**0.1176**	**0.0000**	**302.2867**	**302.2867**	**0.0729**	**0.0000**	**304.1099**

3.4 Building Construction - 2021

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	0.0791	2.7051	0.4935	6.9100e-003	0.1626	7.6100e-003	0.1703	0.0470	7.2800e-003	0.0543	0.0000	656.3118	656.3118	0.0501	0.0000	657.5646
Worker	0.2500	0.1638	1.6982	4.9200e-003	0.5133	3.5300e-003	0.5168	0.1364	3.2500e-003	0.1397	0.0000	444.9307	444.9307	0.0118	0.0000	445.2247
Total	**0.3291**	**2.8689**	**2.1917**	**0.0118**	**0.6760**	**0.0111**	**0.6871**	**0.1834**	**0.0105**	**0.1940**	**0.0000**	**1,101.2425**	**1,101.2425**	**0.0619**	**0.0000**	**1,102.7893**

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	0.1411	3.0739	2.3325	3.5100e-003		0.0177	0.0177		0.0177	0.0177	0.0000	302.2863	302.2863	0.0729	0.0000	304.1095
Total	**0.1411**	**3.0739**	**2.3325**	**3.5100e-003**		**0.0177**	**0.0177**		**0.0177**	**0.0177**	**0.0000**	**302.2863**	**302.2863**	**0.0729**	**0.0000**	**304.1095**

3.4 Building Construction - 2021

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	0.0791	2.7051	0.4935	6.9100e-003	0.1626	7.6100e-003	0.1703	0.0470	7.2800e-003	0.0543	0.0000	656.3118	656.3118	0.0501	0.0000	657.5646
Worker	0.2500	0.1638	1.6982	4.9200e-003	0.5133	3.5300e-003	0.5168	0.1364	3.2500e-003	0.1397	0.0000	444.9307	444.9307	0.0118	0.0000	445.2247
Total	**0.3291**	**2.8689**	**2.1917**	**0.0118**	**0.6760**	**0.0111**	**0.6871**	**0.1834**	**0.0105**	**0.1940**	**0.0000**	**1,101.2425**	**1,101.2425**	**0.0619**	**0.0000**	**1,102.7893**

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0597	0.5466	0.5727	9.4000e-004		0.0283	0.0283		0.0266	0.0266	0.0000	81.1038	81.1038	0.0194	0.0000	81.5896
Total	**0.0597**	**0.5466**	**0.5727**	**9.4000e-004**		**0.0283**	**0.0283**		**0.0266**	**0.0266**	**0.0000**	**81.1038**	**81.1038**	**0.0194**	**0.0000**	**81.5896**

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0197	0.6873	0.1221	1.8400e-003	0.0436	1.7700e-003	0.0454	0.0126	1.6900e-003	0.0143	0.0000	174.3877	174.3877	0.0130	0.0000	174.7117
Worker	0.0621	0.0392	0.4150	1.2700e-003	0.1377	9.2000e-004	0.1386	0.0366	8.5000e-004	0.0374	0.0000	115.0657	115.0657	2.8100e-003	0.0000	115.1360
Total	**0.0818**	**0.7265**	**0.5371**	**3.1100e-003**	**0.1813**	**2.6900e-003**	**0.1840**	**0.0492**	**2.5400e-003**	**0.0517**	**0.0000**	**289.4534**	**289.4534**	**0.0158**	**0.0000**	**289.8477**

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	0.0378	0.8244	0.6256	9.4000e-004		4.7400e-003	4.7400e-003		4.7400e-003	4.7400e-003	0.0000	81.1037	81.1037	0.0194	0.0000	81.5895
Total	**0.0378**	**0.8244**	**0.6256**	**9.4000e-004**		**4.7400e-003**	**4.7400e-003**		**4.7400e-003**	**4.7400e-003**	**0.0000**	**81.1037**	**81.1037**	**0.0194**	**0.0000**	**81.5895**

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0197	0.6873	0.1221	1.8400e-003	0.0436	1.7700e-003	0.0454	0.0126	1.6900e-003	0.0143	0.0000	174.3877	174.3877	0.0130	0.0000	174.7117
Worker	0.0621	0.0392	0.4150	1.2700e-003	0.1377	9.2000e-004	0.1386	0.0366	8.5000e-004	0.0374	0.0000	115.0657	115.0657	2.8100e-003	0.0000	115.1360
Total	**0.0818**	**0.7265**	**0.5371**	**3.1100e-003**	**0.1813**	**2.6900e-003**	**0.1840**	**0.0492**	**2.5400e-003**	**0.0517**	**0.0000**	**289.4534**	**289.4534**	**0.0158**	**0.0000**	**289.8477**

3.5 Paving - 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	0.0110	0.1113	0.1458	2.3000e-004		5.6800e-003	5.6800e-003		5.2200e-003	5.2200e-003	0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0280**	**0.1113**	**0.1458**	**2.3000e-004**		**5.6800e-003**	**5.6800e-003**		**5.2200e-003**	**5.2200e-003**	**0.0000**	**20.0276**	**20.0276**	**6.4800e-003**	**0.0000**	**20.1895**

3.5 Paving - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	3.4000e-004	3.6200e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0023	1.0023	2.0000e-005	0.0000	1.0029
Total	**5.4000e-004**	**3.4000e-004**	**3.6200e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0023**	**1.0023**	**2.0000e-005**	**0.0000**	**1.0029**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	9.3100e-003	0.2012	0.1730	2.3000e-004		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0263**	**0.2012**	**0.1730**	**2.3000e-004**		**1.0000e-003**	**1.0000e-003**		**1.0000e-003**	**1.0000e-003**	**0.0000**	**20.0275**	**20.0275**	**6.4800e-003**	**0.0000**	**20.1895**

3.5 Paving - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	3.4000e-004	3.6200e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2100e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	1.0023	1.0023	2.0000e-005	0.0000	1.0029
Total	**5.4000e-004**	**3.4000e-004**	**3.6200e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2100e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**1.0023**	**1.0023**	**2.0000e-005**	**0.0000**	**1.0029**

3.6 Architectural Coating - 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	2.0395					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	0.0141	0.0181	3.0000e-005		8.2000e-004	8.2000e-004		8.2000e-004	8.2000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**2.0415**	**0.0141**	**0.0181**	**3.0000e-005**		**8.2000e-004**	**8.2000e-004**		**8.2000e-004**	**8.2000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

3.6 Architectural Coating - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5300e-003	2.2300e-003	0.0236	7.0000e-005	7.8300e-003	5.0000e-005	7.8900e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.5485	6.5485	1.6000e-004	0.0000	6.5525
Total	**3.5300e-003**	**2.2300e-003**	**0.0236**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8900e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.5485**	**6.5485**	**1.6000e-004**	**0.0000**	**6.5525**

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	2.0395					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1400e-003	0.0235	0.0183	3.0000e-005		1.4000e-004	1.4000e-004		1.4000e-004	1.4000e-004	0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total	**2.0406**	**0.0235**	**0.0183**	**3.0000e-005**		**1.4000e-004**	**1.4000e-004**		**1.4000e-004**	**1.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.7000e-004**	**0.0000**	**2.5574**

3.6 Architectural Coating - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.5300e-003	2.2300e-003	0.0236	7.0000e-005	7.8300e-003	5.0000e-005	7.8900e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.5485	6.5485	1.6000e-004	0.0000	6.5525
Total	**3.5300e-003**	**2.2300e-003**	**0.0236**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8900e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.5485**	**6.5485**	**1.6000e-004**	**0.0000**	**6.5525**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Increase Transit Accessibility

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	1.9279	2.6575	15.7214	0.0399	3.8198	0.0366	3.8564	1.0208	0.0340	1.0548	0.0000	3,615.9194	3,615.9194	0.1477	0.0000	3,619.6113
Unmitigated	1.9750	2.8834	17.0080	0.0448	4.3309	0.0404	4.3712	1.1573	0.0375	1.1949	0.0000	4,067.7520	4,067.7520	0.1623	0.0000	4,071.8088

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	295.20	295.20	295.20	855,436	754,494
Bank (with Drive-Through)	302.60	302.60	302.60	279,898	246,870
Day-Care Center	228.82	228.82	228.82	269,460	237,664
Fast Food Restaurant with Drive Thru	2,344.09	2,344.09	2344.09	2,190,140	1,931,704
Gasoline/Service Station	1,490.04	1,490.04	1490.04	858,514	757,209
General Office Building	98.04	98.04	98.04	234,291	206,645
High Turnover (Sit Down Restaurant)	476.85	476.85	476.85	553,272	487,986
Hotel	898.56	898.56	898.56	1,707,202	1,505,752
Medical Office Building	1,942.92	1,942.92	1942.92	3,802,776	3,354,049
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	479.55	479.55	479.55	840,798	741,584
Total	8,556.66	8,556.66	8,556.66	11,591,787	10,223,956

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3
Bank (with Drive-Through)	9.50	7.30	7.30	6.60	74.40	19.00	27	26	47
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Medical Office Building	9.50	7.30	7.30	29.60	51.40	19.00	60	30	10
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.644860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Bank (with Drive-Through)	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Day-Care Center	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Fast Food Restaurant with Drive Thru	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Gasoline/Service Station	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
General Office Building	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
High Turnover (Sit Down Restaurant)	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Hotel	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Medical Office Building	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Parking Lot	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741
Regional Shopping Center	0.664860	0.031902	0.170344	0.119204	0.018408	0.001000	0.003000	0.001000	0.001794	0.001564	0.005229	0.000954	0.000741

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	342.3176	342.3176	0.0302	6.2500e-003	344.9339
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	374.3804	374.3804	0.0330	6.8300e-003	377.2418
NaturalGas Mitigated	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.8709	306.8709	5.8800e-003	5.6300e-003	308.6945
NaturalGas Unmitigated	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	367.4821	367.4821	7.0400e-003	6.7400e-003	369.6659

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					
Apartments Low Rise	678550	3.6600e-003	0.0313	0.0133	2.0000e-004		2.5300e-003	2.5300e-003		2.5300e-003	2.5300e-003	0.0000	36.2100	36.2100	6.9000e-004	6.6000e-004	36.4252
Bank (with Drive-Through)	74297.2	4.0000e-004	3.6400e-003	3.0600e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9648	3.9648	8.0000e-005	7.0000e-005	3.9883
Day-Care Center	120628	6.5000e-004	5.9100e-003	4.9700e-003	4.0000e-005		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	6.4372	6.4372	1.2000e-004	1.2000e-004	6.4755
Fast Food Restaurant with Drive Thru	1.6619e+006	8.9600e-003	0.0815	0.0684	4.9000e-004		6.1900e-003	6.1900e-003		6.1900e-003	6.1900e-003	0.0000	88.6852	88.6852	1.7000e-003	1.6300e-003	89.2122
Gasoline/Service Station	65323.1	3.5000e-004	3.2000e-003	2.6900e-003	2.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	3.4859	3.4859	7.0000e-005	6.0000e-005	3.5066
General Office Building	156600	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3568	8.3568	1.6000e-004	1.5000e-004	8.4064
High Turnover (Sit Down Restaurant)	1.0521e+006	5.6700e-003	0.0516	0.0433	3.1000e-004		3.9200e-003	3.9200e-003		3.9200e-003	3.9200e-003	0.0000	56.1441	56.1441	1.0800e-003	1.0300e-003	56.4777
Hotel	2.01462e+006	0.0109	0.0988	0.0830	5.9000e-004		7.5100e-003	7.5100e-003		7.5100e-003	7.5100e-003	0.0000	107.5076	107.5076	2.0600e-003	1.9700e-003	108.1464
Medical Office Building	867368	4.6800e-003	0.0425	0.0357	2.6000e-004		3.2300e-003	3.2300e-003		3.2300e-003	3.2300e-003	0.0000	46.2861	46.2861	8.9000e-004	8.5000e-004	46.5611
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	194975	1.0500e-003	9.5600e-003	8.0300e-003	6.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	10.4046	10.4046	2.0000e-004	1.9000e-004	10.4665
Total		**0.0371**	**0.3356**	**0.2689**	**2.0400e-003**		**0.0257**	**0.0257**		**0.0257**	**0.0257**	**0.0000**	**367.4821**	**367.4821**	**7.0500e-003**	**6.7300e-003**	**369.6659**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Low Rise	528596	2.8500e-003	0.0244	0.0104	1.6000e-004		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	28.2079	28.2079	5.4000e-004	5.2000e-004	28.3755
Bank (with Drive-Through)	56109.2	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9942	2.9942	6.0000e-005	5.0000e-005	3.0120
Day-Care Center	87207	4.7000e-004	4.2700e-003	3.5900e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6537	4.6537	9.0000e-005	9.0000e-005	4.6814
Fast Food Restaurant with Drive Thru	1.57726e+006	8.5000e-003	0.0773	0.0650	4.6000e-004		5.8800e-003	5.8800e-003		5.8800e-003	5.8800e-003	0.0000	84.1687	84.1687	1.6100e-003	1.5400e-003	84.6689
Gasoline/Service Station	49331.9	2.7000e-004	2.4200e-003	2.0300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6325	2.6325	5.0000e-005	5.0000e-005	2.6482
General Office Building	110628	6.0000e-004	5.4200e-003	4.5600e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.9035	5.9035	1.1000e-004	1.1000e-004	5.9386
High Turnover (Sit Down Restaurant)	998520	5.3800e-003	0.0490	0.0411	2.9000e-004		3.7200e-003	3.7200e-003		3.7200e-003	3.7200e-003	0.0000	53.2848	53.2848	1.0200e-003	9.8000e-004	53.6015
Hotel	1.58229e+006	8.5300e-003	0.0776	0.0652	4.7000e-004		5.8900e-003	5.8900e-003		5.8900e-003	5.8900e-003	0.0000	84.4373	84.4373	1.6200e-003	1.5500e-003	84.9390
Medical Office Building	612741	3.3000e-003	0.0300	0.0252	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003	0.0000	32.6982	32.6982	6.3000e-004	6.0000e-004	32.8925
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	147853	8.0000e-004	7.2500e-003	6.0900e-003	4.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	7.8900	7.8900	1.5000e-004	1.4000e-004	7.9369
Total		**0.0310**	**0.2803**	**0.2254**	**1.6900e-003**		**0.0214**	**0.0214**		**0.0214**	**0.0214**	**0.0000**	**306.8709**	**306.8709**	**5.8800e-003**	**5.6300e-003**	**308.6944**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	224521	33.4853	2.9500e-003	6.1000e-004	33.7413
Bank (with Drive-Through)	31399.2	4.6829	4.1000e-004	9.0000e-005	4.7187
Day-Care Center	33724.1	5.0297	4.4000e-004	9.0000e-005	5.0681
Fast Food Restaurant with Drive Thru	228805	34.1243	3.0100e-003	6.2000e-004	34.3851
Gasoline/Service Station	27606.6	4.1173	3.6000e-004	8.0000e-005	4.1488
General Office Building	109440	16.3220	1.4400e-003	3.0000e-004	16.4468
High Turnover (Sit Down Restaurant)	144850	21.6031	1.9100e-003	3.9000e-004	21.7682
Hotel	636026	94.8576	8.3700e-003	1.7300e-003	95.5826
Medical Office Building	606161	90.4035	7.9700e-003	1.6500e-003	91.0945
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	148509	22.1489	1.9500e-003	4.0000e-004	22.3181
Total		**374.3804**	**0.0330**	**6.8300e-003**	**377.2418**

ATTACHMENT G

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	214522	31.9940	2.8200e-003	5.8000e-004	32.2385
Bank (with Drive-Through)	29305.9	4.3707	3.9000e-004	8.0000e-005	4.4041
Day-Care Center	30639.9	4.5697	4.0000e-004	8.0000e-005	4.6046
Fast Food Restaurant with Drive Thru	213285	31.8097	2.8100e-003	5.8000e-004	32.0528
Gasoline/Service Station	25766.2	3.8428	3.4000e-004	7.0000e-005	3.8722
General Office Building	100008	14.9153	1.3200e-003	2.7000e-004	15.0293
High Turnover (Sit Down Restaurant)	135025	20.1378	1.7800e-003	3.7000e-004	20.2917
Hotel	536777	80.0555	7.0600e-003	1.4600e-003	80.6674
Medical Office Building	553919	82.6122	7.2900e-003	1.5100e-003	83.2436
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	136811	20.4041	1.8000e-003	3.7000e-004	20.5601
Total		**342.3176**	**0.0302**	**6.2400e-003**	**344.9340**

6.0 Area Detail

6.1 Mitigation Measures Area

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	1.2500	0.0222	0.3752	1.3000e-004		3.4600e-003	3.4600e-003		3.4600e-003	3.4600e-003	0.0000	21.3970	21.3970	1.0200e-003	3.8000e-004	21.5360
Unmitigated	1.3048	0.0303	0.8731	1.7600e-003		0.0847	0.0847		0.0847	0.0847	10.8749	21.3970	32.2720	0.0519	3.8000e-004	33.6819

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0569	0.0261	0.5055	1.7400e-003		0.0827	0.0827		0.0827	0.0827	10.8749	20.7940	31.6689	0.0512	3.8000e-004	33.0634
Landscaping	0.0118	4.2100e-003	0.3676	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.2000e-004	0.0000	0.6185
Total	**1.3048**	**0.0303**	**0.8731**	**1.7600e-003**		**0.0847**	**0.0847**		**0.0847**	**0.0847**	**10.8749**	**21.3970**	**32.2720**	**0.0519**	**3.8000e-004**	**33.6819**

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0118	4.2100e-003	0.3676	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.2000e-004	0.0000	0.6185
Total	**1.2500**	**0.0222**	**0.3752**	**1.3000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**21.3970**	**21.3970**	**1.0200e-003**	**3.8000e-004**	**21.5360**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	28.3610	0.7389	0.0178	52.1354
Unmitigated	29.0938	0.7390	0.0178	52.8738

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.97162	4.5452	0.1022	2.4700e-003	7.8370
Bank (with Drive-Through)	0.141058 / 0.0864546	0.2037	4.6100e-003	1.1000e-004	0.3522
Day-Care Center	0.20587 / 0.52938	0.5078	6.7500e-003	1.7000e-004	0.7261
Fast Food Restaurant with Drive Thru	2.39792 / 0.153058	2.7758	0.0783	1.8800e-003	5.2944
Gasoline/Service Station	0.159383 / 0.0976861	0.2302	5.2100e-003	1.3000e-004	0.3979
General Office Building	2.1328 / 1.3072	3.0802	0.0697	1.6800e-003	5.3250
High Turnover (Sit Down Restaurant)	1.51767 / 0.0968725	1.7568	0.0496	1.1900e-003	3.3509
Hotel	3.24695 / 0.360772	3.8387	0.1061	2.5500e-003	7.2497
Medical Office Building	8.34069 / 1.5887	10.2064	0.2725	6.5600e-003	18.9711
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.827175	1.9491	0.0441	1.0700e-003	3.3696
Total		**29.0938**	**0.7390**	**0.0178**	**52.8738**

ATTACHMENT G

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.57729	4.3393	0.1022	2.4700e-003	7.6296
Bank (with Drive-Through)	0.141058 / 0.0691637	0.1947	4.6100e-003	1.1000e-004	0.3431
Day-Care Center	0.20587 / 0.423504	0.4525	6.7400e-003	1.7000e-004	0.6704
Fast Food Restaurant with Drive Thru	2.39792 / 0.122447	2.7598	0.0783	1.8800e-003	5.2783
Gasoline/Service Station	0.159383 / 0.0781489	0.2200	5.2100e-003	1.3000e-004	0.3877
General Office Building	2.1328 / 1.04576	2.9437	0.0697	1.6800e-003	5.1875
High Turnover (Sit Down Restaurant)	1.51767 / 0.077498	1.7467	0.0496	1.1900e-003	3.3407
Hotel	3.24695 / 0.288617	3.8011	0.1061	2.5500e-003	7.2118
Medical Office Building	8.34069 / 1.27096	10.0405	0.2724	6.5500e-003	18.8039
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.66174	1.8627	0.0441	1.0600e-003	3.2826
Total		**28.3610**	**0.7389**	**0.0178**	**52.1354**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	153.2876	9.0590	0.0000	379.7636
Unmitigated	204.3835	12.0787	0.0000	506.3514

ATTACHMENT G

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	22.08	4.4820	0.2649	0.0000	11.1041
Bank (with Drive-Through)	3.32	0.6739	0.0398	0.0000	1.6696
Day-Care Center	6.24	1.2667	0.0749	0.0000	3.1381
Fast Food Restaurant with Drive Thru	91	18.4722	1.0917	0.0000	45.7640
Gasoline/Service Station	6.47	1.3134	0.0776	0.0000	3.2538
General Office Building	11.16	2.2654	0.1339	0.0000	5.6124
High Turnover (Sit Down Restaurant)	59.5	12.0780	0.7138	0.0000	29.9226
Hotel	70.08	14.2256	0.8407	0.0000	35.2433
Medical Office Building	717.88	145.7232	8.6120	0.0000	361.0229
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.13	3.8832	0.2295	0.0000	9.6205
Total		**204.3835**	**12.0787**	**0.0000**	**506.3514**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	16.56	3.3615	0.1987	0.0000	8.3281
Bank (with Drive-Through)	2.49	0.5055	0.0299	0.0000	1.2522
Day-Care Center	4.68	0.9500	0.0561	0.0000	2.3536
Fast Food Restaurant with Drive Thru	68.25	13.8541	0.8188	0.0000	34.3230
Gasoline/Service Station	4.8525	0.9850	0.0582	0.0000	2.4403
General Office Building	8.37	1.6990	0.1004	0.0000	4.2093
High Turnover (Sit Down Restaurant)	44.625	9.0585	0.5353	0.0000	22.4420
Hotel	52.56	10.6692	0.6305	0.0000	26.4325
Medical Office Building	538.41	109.2924	6.4590	0.0000	270.7672
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	14.3475	2.9124	0.1721	0.0000	7.2154
Total		**153.2876**	**9.0590**	**0.0000**	**379.7636**

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

Yosemite Crossing - 2008 BAU

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
Bank (with Drive-Through)	3.56	1000sqft	0.08	3,560.00	0
General Office Building	12.00	1000sqft	0.28	12,000.00	0
Medical Office Building	66.47	1000sqft	1.53	66,465.00	0
Day-Care Center	4.80	1000sqft	0.11	4,804.00	0
Parking Lot	912.00	Space	12.97	364,800.00	0
Fast Food Restaurant with Drive Thru	7.90	1000sqft	0.18	7,898.00	0
High Turnover (Sit Down Restaurant)	5.00	1000sqft	0.11	5,000.00	0
Hotel	128.00	Room	2.99	185,856.00	0
Apartments Low Rise	48.00	Dwelling Unit	2.69	48,000.00	152
Gasoline/Service Station	12.00	Pump	0.04	3,130.00	0
Regional Shopping Center	18.22	1000sqft	0.42	18,222.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2010
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

ATTACHMENT G

Project Characteristics - CalEEMod does not have 2008 operational year, therefore 2010 was selected to be conservative.

Land Use - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Construction Phase - Operational run only

Energy Use - Using historical data

Vehicle Trips -

Table Name	Column Name	Default Value	New Value
tblLandUse	LandUseSquareFeet	66,470.00	66,465.00
tblLandUse	LandUseSquareFeet	4,800.00	4,804.00
tblLandUse	LandUseSquareFeet	7,900.00	7,898.00
tblLandUse	LandUseSquareFeet	1,694.10	3,130.00
tblLandUse	LandUseSquareFeet	18,220.00	18,222.00
tblLandUse	LotAcreage	8.21	12.97
tblLandUse	LotAcreage	4.27	2.99
tblLandUse	LotAcreage	3.00	2.69
tblWoodstoves	NumberCatalytic	2.69	0.00
tblWoodstoves	NumberNoncatalytic	2.69	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2006	0.5880	3.8838	2.7180	0.0269	0.3098	0.2075	0.5173	0.1309	0.2064	0.3373	0.0000	307.6835	307.6835	0.0591	0.0000	309.1596
2007	2.1114	11.2582	11.1915	0.0826	0.4188	0.6149	1.0337	0.1136	0.6077	0.7213	0.0000	1,105.0216	1,105.0216	0.2452	0.0000	1,111.1521
2008	5.0361	3.4477	3.2712	0.0249	0.1168	0.1929	0.3097	0.0317	0.1910	0.2227	0.0000	325.3758	325.3758	0.0710	0.0000	327.1510
Maximum	**5.0361**	**11.2582**	**11.1915**	**0.0826**	**0.4188**	**0.6149**	**1.0337**	**0.1309**	**0.6077**	**0.7213**	**0.0000**	**1,105.0216**	**1,105.0216**	**0.2452**	**0.0000**	**1,111.1521**

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					
2006	0.5880	3.8838	2.7180	0.0269	0.3098	0.2075	0.5173	0.1309	0.2064	0.3373	0.0000	307.6833	307.6833	0.0590	0.0000	309.1594
2007	2.1114	11.2582	11.1915	0.0826	0.4188	0.6149	1.0337	0.1136	0.6077	0.7213	0.0000	1,105.0212	1,105.0212	0.2452	0.0000	1,111.1517
2008	5.0361	3.4477	3.2712	0.0249	0.1168	0.1929	0.3097	0.0317	0.1910	0.2227	0.0000	325.3756	325.3756	0.0710	0.0000	327.1508
Maximum	**5.0361**	**11.2582**	**11.1915**	**0.0826**	**0.4188**	**0.6149**	**1.0337**	**0.1309**	**0.6077**	**0.7213**	**0.0000**	**1,105.0212**	**1,105.0212**	**0.2452**	**0.0000**	**1,111.1517**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-4-2006**	**12-3-2006**	3.4751	3.4751
2	**12-4-2006**	**3-3-2007**	3.3259	3.3259
3	**3-4-2007**	**6-3-2007**	3.3537	3.3537
4	**6-4-2007**	**9-3-2007**	3.3335	3.3335
5	**9-4-2007**	**12-3-2007**	3.3434	3.3434
6	**12-4-2007**	**3-3-2008**	3.3628	3.3628
7	**3-4-2008**	**6-3-2008**	6.1292	6.1292
		Highest	6.1292	6.1292

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	1.8652	0.0226	0.3989	1.3000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003	0.0000	21.3970	21.3970	1.1800e-003	3.8000e-004	21.5402
Energy	0.0554	0.5016	0.4070	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	1,661.5933	1,661.5933	0.0609	0.0205	1,669.2140
Mobile	11.0889	47.9125	86.1430	0.1102	5.5512	1.2665	6.8177	1.4960	1.2096	2.7056	0.0000	10,096.0645	10,096.0645	2.3664	0.0000	10,155.2238
Waste						0.0000	0.0000		0.0000	0.0000	204.3835	0.0000	204.3835	12.0787	0.0000	506.3514
Water						0.0000	0.0000		0.0000	0.0000	7.1761	42.7522	49.9283	0.7390	0.0178	73.7083
Total	**13.0095**	**48.4367**	**86.9489**	**0.1133**	**5.5512**	**1.3082**	**6.8594**	**1.4960**	**1.2513**	**2.7473**	**211.5596**	**11,821.8070**	**12,033.3665**	**15.2461**	**0.0387**	**12,426.0376**

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	1.8652	0.0226	0.3989	1.3000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003	0.0000	21.3970	21.3970	1.1800e-003	3.8000e-004	21.5402
Energy	0.0554	0.5016	0.4070	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	1,661.5933	1,661.5933	0.0609	0.0205	1,669.2140
Mobile	11.0889	47.9125	86.1430	0.1102	5.5512	1.2665	6.8177	1.4960	1.2096	2.7056	0.0000	10,096.0645	10,096.0645	2.3664	0.0000	10,155.2238
Waste						0.0000	0.0000		0.0000	0.0000	204.3835	0.0000	204.3835	12.0787	0.0000	506.3514
Water						0.0000	0.0000		0.0000	0.0000	7.1761	42.7522	49.9283	0.7390	0.0178	73.7083
Total	**13.0095**	**48.4367**	**86.9489**	**0.1133**	**5.5512**	**1.3082**	**6.8594**	**1.4960**	**1.2513**	**2.7473**	**211.5596**	**11,821.8070**	**12,033.3665**	**15.2461**	**0.0387**	**12,426.0376**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/4/2006	9/15/2006	5	10	
2	Grading	Grading	9/16/2006	11/3/2006	5	35	
3	Building Construction	Building Construction	11/4/2006	4/4/2008	5	370	
4	Paving	Paving	4/5/2008	5/2/2008	5	20	
5	Architectural Coating	Architectural Coating	5/3/2008	5/30/2008	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 12.97

Residential Indoor: 97,200; Residential Outdoor: 32,400; Non-Residential Indoor: 460,403; Non-Residential Outdoor: 153,468; Striped Parking Area: 21,888 (Architectural Coating – sqft)

OffRoad Equipment

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	306.00	115.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	61.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2006

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0467	0.3496	0.1316	2.2500e-003		0.0216	0.0216		0.0216	0.0216	0.0000	20.0023	20.0023	3.8000e-003	0.0000	20.0974
Total	**0.0467**	**0.3496**	**0.1316**	**2.2500e-003**	**0.0903**	**0.0216**	**0.1119**	**0.0497**	**0.0216**	**0.0712**	**0.0000**	**20.0023**	**20.0023**	**3.8000e-003**	**0.0000**	**20.0974**

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	1.4200e-003	1.4100e-003	0.0132	1.0000e-005	7.2000e-004	2.0000e-005	7.4000e-004	1.9000e-004	2.0000e-005	2.1000e-004	0.0000	0.7805	0.7805	1.0000e-004	0.0000	0.7830
Total	**1.4200e-003**	**1.4100e-003**	**0.0132**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.7805**	**0.7805**	**1.0000e-004**	**0.0000**	**0.7830**

3.2 Site Preparation - 2006

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0467	0.3496	0.1316	2.2500e-003		0.0216	0.0216		0.0216	0.0216	0.0000	20.0023	20.0023	3.8000e-003	0.0000	20.0974
Total	**0.0467**	**0.3496**	**0.1316**	**2.2500e-003**	**0.0903**	**0.0216**	**0.1119**	**0.0497**	**0.0216**	**0.0712**	**0.0000**	**20.0023**	**20.0023**	**3.8000e-003**	**0.0000**	**20.0974**

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	1.4200e-003	1.4100e-003	0.0132	1.0000e-005	7.2000e-004	2.0000e-005	7.4000e-004	1.9000e-004	2.0000e-005	2.1000e-004	0.0000	0.7805	0.7805	1.0000e-004	0.0000	0.7830
Total	**1.4200e-003**	**1.4100e-003**	**0.0132**	**1.0000e-005**	**7.2000e-004**	**2.0000e-005**	**7.4000e-004**	**1.9000e-004**	**2.0000e-005**	**2.1000e-004**	**0.0000**	**0.7805**	**0.7805**	**1.0000e-004**	**0.0000**	**0.7830**

3.3 Grading - 2006

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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2108	1.8019	0.8065	0.0120		0.0916	0.0916		0.0916	0.0916	0.0000	114.5135	114.5135	0.0172	0.0000	114.9428
Total	**0.2108**	**1.8019**	**0.8065**	**0.0120**	**0.1518**	**0.0916**	**0.2434**	**0.0629**	**0.0916**	**0.1545**	**0.0000**	**114.5135**	**114.5135**	**0.0172**	**0.0000**	**114.9428**

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	5.5100e-003	5.4700e-003	0.0515	3.0000e-005	2.8000e-003	7.0000e-005	2.8700e-003	7.4000e-004	6.0000e-005	8.1000e-004	0.0000	3.0353	3.0353	3.9000e-004	0.0000	3.0450
Total	**5.5100e-003**	**5.4700e-003**	**0.0515**	**3.0000e-005**	**2.8000e-003**	**7.0000e-005**	**2.8700e-003**	**7.4000e-004**	**6.0000e-005**	**8.1000e-004**	**0.0000**	**3.0353**	**3.0353**	**3.9000e-004**	**0.0000**	**3.0450**

3.3 Grading - 2006

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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2108	1.8019	0.8065	0.0120		0.0916	0.0916		0.0916	0.0916	0.0000	114.5134	114.5134	0.0172	0.0000	114.9427
Total	**0.2108**	**1.8019**	**0.8065**	**0.0120**	**0.1518**	**0.0916**	**0.2434**	**0.0629**	**0.0916**	**0.1545**	**0.0000**	**114.5134**	**114.5134**	**0.0172**	**0.0000**	**114.9427**

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	5.5100e-003	5.4700e-003	0.0515	3.0000e-005	2.8000e-003	7.0000e-005	2.8700e-003	7.4000e-004	6.0000e-005	8.1000e-004	0.0000	3.0353	3.0353	3.9000e-004	0.0000	3.0450
Total	**5.5100e-003**	**5.4700e-003**	**0.0515**	**3.0000e-005**	**2.8000e-003**	**7.0000e-005**	**2.8700e-003**	**7.4000e-004**	**6.0000e-005**	**8.1000e-004**	**0.0000**	**3.0353**	**3.0353**	**3.9000e-004**	**0.0000**	**3.0450**

3.4 Building Construction - 2006

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	0.1503	0.8289	0.4078	6.0800e-003		0.0696	0.0696		0.0696	0.0696	0.0000	52.5722	52.5722	0.0123	0.0000	52.8789
Total	**0.1503**	**0.8289**	**0.4078**	**6.0800e-003**		**0.0696**	**0.0696**		**0.0696**	**0.0696**	**0.0000**	**52.5722**	**52.5722**	**0.0123**	**0.0000**	**52.8789**

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	0.0770	0.8008	0.4071	5.9700e-003	0.0153	0.0234	0.0387	4.4100e-003	0.0224	0.0268	0.0000	63.7062	63.7062	0.0185	0.0000	64.1695
Worker	0.0963	0.0957	0.9004	6.0000e-004	0.0489	1.2100e-003	0.0501	0.0130	1.1200e-003	0.0141	0.0000	53.0735	53.0735	6.7800e-003	0.0000	53.2432
Total	**0.1733**	**0.8965**	**1.3074**	**6.5700e-003**	**0.0642**	**0.0247**	**0.0888**	**0.0174**	**0.0235**	**0.0410**	**0.0000**	**116.7798**	**116.7798**	**0.0253**	**0.0000**	**117.4126**

3.4 Building Construction - 2006

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	0.1503	0.8289	0.4078	6.0800e-003		0.0696	0.0696		0.0696	0.0696	0.0000	52.5721	52.5721	0.0123	0.0000	52.8788
Total	**0.1503**	**0.8289**	**0.4078**	**6.0800e-003**		**0.0696**	**0.0696**		**0.0696**	**0.0696**	**0.0000**	**52.5721**	**52.5721**	**0.0123**	**0.0000**	**52.8788**

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	0.0770	0.8008	0.4071	5.9700e-003	0.0153	0.0234	0.0387	4.4100e-003	0.0224	0.0268	0.0000	63.7062	63.7062	0.0185	0.0000	64.1695
Worker	0.0963	0.0957	0.9004	6.0000e-004	0.0489	1.2100e-003	0.0501	0.0130	1.1200e-003	0.0141	0.0000	53.0735	53.0735	6.7800e-003	0.0000	53.2432
Total	**0.1733**	**0.8965**	**1.3074**	**6.5700e-003**	**0.0642**	**0.0247**	**0.0888**	**0.0174**	**0.0235**	**0.0410**	**0.0000**	**116.7798**	**116.7798**	**0.0253**	**0.0000**	**117.4126**

3.4 Building Construction - 2007

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	0.9808	5.4086	2.6607	0.0397		0.4541	0.4541		0.4541	0.4541	0.0000	343.0336	343.0336	0.0801	0.0000	345.0348
Total	**0.9808**	**5.4086**	**2.6607**	**0.0397**		**0.4541**	**0.4541**		**0.4541**	**0.4541**	**0.0000**	**343.0336**	**343.0336**	**0.0801**	**0.0000**	**345.0348**

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	0.5021	5.2250	2.6560	0.0390	0.0995	0.1529	0.2524	0.0288	0.1463	0.1750	0.0000	415.6832	415.6832	0.1209	0.0000	418.7057
Worker	0.6285	0.6247	5.8748	3.9200e-003	0.3193	7.9000e-003	0.3272	0.0849	7.3300e-003	0.0922	0.0000	346.3048	346.3048	0.0443	0.0000	347.4116
Total	**1.1306**	**5.8496**	**8.5308**	**0.0429**	**0.4188**	**0.1608**	**0.5796**	**0.1136**	**0.1536**	**0.2672**	**0.0000**	**761.9880**	**761.9880**	**0.1652**	**0.0000**	**766.1173**

ATTACHMENT G

3.4 Building Construction - 2007

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	0.9808	5.4086	2.6607	0.0397		0.4541	0.4541		0.4541	0.4541	0.0000	343.0332	343.0332	0.0801	0.0000	345.0344
Total	**0.9808**	**5.4086**	**2.6607**	**0.0397**		**0.4541**	**0.4541**		**0.4541**	**0.4541**	**0.0000**	**343.0332**	**343.0332**	**0.0801**	**0.0000**	**345.0344**

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	0.5021	5.2250	2.6560	0.0390	0.0995	0.1529	0.2524	0.0288	0.1463	0.1750	0.0000	415.6832	415.6832	0.1209	0.0000	418.7057
Worker	0.6285	0.6247	5.8748	3.9200e-003	0.3193	7.9000e-003	0.3272	0.0849	7.3300e-003	0.0922	0.0000	346.3048	346.3048	0.0443	0.0000	347.4116
Total	**1.1306**	**5.8496**	**8.5308**	**0.0429**	**0.4188**	**0.1608**	**0.5796**	**0.1136**	**0.1536**	**0.2672**	**0.0000**	**761.9880**	**761.9880**	**0.1652**	**0.0000**	**766.1173**

3.4 Building Construction - 2008

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	0.2593	1.4299	0.7034	0.0105		0.1201	0.1201		0.1201	0.1201	0.0000	90.6871	90.6871	0.0212	0.0000	91.2161
Total	**0.2593**	**1.4299**	**0.7034**	**0.0105**		**0.1201**	**0.1201**		**0.1201**	**0.1201**	**0.0000**	**90.6871**	**90.6871**	**0.0212**	**0.0000**	**91.2161**

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	0.1328	1.3813	0.7022	0.0103	0.0263	0.0404	0.0667	7.6000e-003	0.0387	0.0463	0.0000	109.8933	109.8933	0.0320	0.0000	110.6923
Worker	0.1662	0.1651	1.5531	1.0400e-003	0.0844	2.0900e-003	0.0865	0.0224	1.9400e-003	0.0244	0.0000	91.5518	91.5518	0.0117	0.0000	91.8445
Total	**0.2989**	**1.5465**	**2.2553**	**0.0113**	**0.1107**	**0.0425**	**0.1532**	**0.0300**	**0.0406**	**0.0706**	**0.0000**	**201.4451**	**201.4451**	**0.0437**	**0.0000**	**202.5368**

ATTACHMENT G

3.4 Building Construction - 2008

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	0.2593	1.4299	0.7034	0.0105		0.1201	0.1201		0.1201	0.1201	0.0000	90.6869	90.6869	0.0212	0.0000	91.2160
Total	**0.2593**	**1.4299**	**0.7034**	**0.0105**		**0.1201**	**0.1201**		**0.1201**	**0.1201**	**0.0000**	**90.6869**	**90.6869**	**0.0212**	**0.0000**	**91.2160**

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	0.1328	1.3813	0.7022	0.0103	0.0263	0.0404	0.0667	7.6000e-003	0.0387	0.0463	0.0000	109.8933	109.8933	0.0320	0.0000	110.6923
Worker	0.1662	0.1651	1.5531	1.0400e-003	0.0844	2.0900e-003	0.0865	0.0224	1.9400e-003	0.0244	0.0000	91.5518	91.5518	0.0117	0.0000	91.8445
Total	**0.2989**	**1.5465**	**2.2553**	**0.0113**	**0.1107**	**0.0425**	**0.1532**	**0.0300**	**0.0406**	**0.0706**	**0.0000**	**201.4451**	**201.4451**	**0.0437**	**0.0000**	**202.5368**

ATTACHMENT G

3.5 Paving - 2008

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	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2176
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.4167**	**0.1800**	**2.7000e-003**		**0.0264**	**0.0264**		**0.0264**	**0.0264**	**0.0000**	**24.0995**	**24.0995**	**4.7200e-003**	**0.0000**	**24.2176**

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	2.3600e-003	2.3500e-003	0.0221	1.0000e-005	1.2000e-003	3.0000e-005	1.2300e-003	3.2000e-004	3.0000e-005	3.5000e-004	0.0000	1.3008	1.3008	1.7000e-004	0.0000	1.3050
Total	**2.3600e-003**	**2.3500e-003**	**0.0221**	**1.0000e-005**	**1.2000e-003**	**3.0000e-005**	**1.2300e-003**	**3.2000e-004**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**1.3008**	**1.3008**	**1.7000e-004**	**0.0000**	**1.3050**

3.5 Paving - 2008

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	0.0579	0.4167	0.1800	2.7000e-003		0.0264	0.0264		0.0264	0.0264	0.0000	24.0995	24.0995	4.7200e-003	0.0000	24.2175
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0749**	**0.4167**	**0.1800**	**2.7000e-003**		**0.0264**	**0.0264**		**0.0264**	**0.0264**	**0.0000**	**24.0995**	**24.0995**	**4.7200e-003**	**0.0000**	**24.2175**

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	2.3600e-003	2.3500e-003	0.0221	1.0000e-005	1.2000e-003	3.0000e-005	1.2300e-003	3.2000e-004	3.0000e-005	3.5000e-004	0.0000	1.3008	1.3008	1.7000e-004	0.0000	1.3050
Total	**2.3600e-003**	**2.3500e-003**	**0.0221**	**1.0000e-005**	**1.2000e-003**	**3.0000e-005**	**1.2300e-003**	**3.2000e-004**	**3.0000e-005**	**3.5000e-004**	**0.0000**	**1.3008**	**1.3008**	**1.7000e-004**	**0.0000**	**1.3050**

3.6 Architectural Coating - 2008

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	4.3836					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5200e-003	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686
Total	**4.3911**	**0.0428**	**0.0208**	**3.0000e-004**		**3.8400e-003**	**3.8400e-003**		**3.8400e-003**	**3.8400e-003**	**0.0000**	**2.5533**	**2.5533**	**6.2000e-004**	**0.0000**	**2.5686**

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	9.6000e-003	9.5400e-003	0.0897	6.0000e-005	4.8800e-003	1.2000e-004	5.0000e-003	1.3000e-003	1.1000e-004	1.4100e-003	0.0000	5.2900	5.2900	6.8000e-004	0.0000	5.3069
Total	**9.6000e-003**	**9.5400e-003**	**0.0897**	**6.0000e-005**	**4.8800e-003**	**1.2000e-004**	**5.0000e-003**	**1.3000e-003**	**1.1000e-004**	**1.4100e-003**	**0.0000**	**5.2900**	**5.2900**	**6.8000e-004**	**0.0000**	**5.3069**

3.6 Architectural Coating - 2008

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	4.3836					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.5200e-003	0.0428	0.0208	3.0000e-004		3.8400e-003	3.8400e-003		3.8400e-003	3.8400e-003	0.0000	2.5533	2.5533	6.2000e-004	0.0000	2.5686
Total	**4.3911**	**0.0428**	**0.0208**	**3.0000e-004**		**3.8400e-003**	**3.8400e-003**		**3.8400e-003**	**3.8400e-003**	**0.0000**	**2.5533**	**2.5533**	**6.2000e-004**	**0.0000**	**2.5686**

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	9.6000e-003	9.5400e-003	0.0897	6.0000e-005	4.8800e-003	1.2000e-004	5.0000e-003	1.3000e-003	1.1000e-004	1.4100e-003	0.0000	5.2900	5.2900	6.8000e-004	0.0000	5.3069
Total	**9.6000e-003**	**9.5400e-003**	**0.0897**	**6.0000e-005**	**4.8800e-003**	**1.2000e-004**	**5.0000e-003**	**1.3000e-003**	**1.1000e-004**	**1.4100e-003**	**0.0000**	**5.2900**	**5.2900**	**6.8000e-004**	**0.0000**	**5.3069**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	11.0889	47.9125	86.1430	0.1102	5.5512	1.2665	6.8177	1.4960	1.2096	2.7056	0.0000	10,096.0645	10,096.0645	2.3664	0.0000	10,155.2238
Unmitigated	11.0889	47.9125	86.1430	0.1102	5.5512	1.2665	6.8177	1.4960	1.2096	2.7056	0.0000	10,096.0645	10,096.0645	2.3664	0.0000	10,155.2238

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	316.32	343.68	291.36	917,631	917,631
Bank (with Drive-Through)	527.41	307.30	113.56	404,073	404,073
Day-Care Center	355.49	29.81	27.98	308,746	308,746
Fast Food Restaurant with Drive Thru	3,919.35	5,704.04	4287.49	3,949,294	3,949,294
Gasoline/Service Station	2,022.72	2,022.72	2022.72	1,165,427	1,165,427
General Office Building	132.36	29.52	12.60	240,314	240,314
High Turnover (Sit Down Restaurant)	635.75	791.85	659.20	767,399	767,399
Hotel	1,045.76	1,048.32	761.60	1,910,440	1,910,440
Medical Office Building	2,401.56	595.57	103.03	3,552,801	3,552,801
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	777.99	910.45	459.87	1,317,558	1,317,558
Total	12,134.72	11,783.26	8,739.42	14,533,683	14,533,683

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3
Bank (with Drive-Through)	9.50	7.30	7.30	6.60	74.40	19.00	27	26	47
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Medical Office Building	9.50	7.30	7.30	29.60	51.40	19.00	60	30	10
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Bank (with Drive-Through)	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Day-Care Center	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Fast Food Restaurant with Drive Thru	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Gasoline/Service Station	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
General Office Building	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
High Turnover (Sit Down Restaurant)	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Hotel	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Medical Office Building	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Parking Lot	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647
Regional Shopping Center	0.422984	0.052650	0.154628	0.194025	0.043720	0.008834	0.019253	0.089962	0.001921	0.002254	0.007059	0.001063	0.001647

5.0 Energy Detail

Historical Energy Use: Y

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	1,113.1808	1,113.1808	0.0503	0.0104	1,117.5426
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1,113.1808	1,113.1808	0.0503	0.0104	1,117.5426
NaturalGas Mitigated	0.0554	0.5016	0.4070	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	548.4125	548.4125	0.0105	0.0101	551.6714
NaturalGas Unmitigated	0.0554	0.5016	0.4070	3.0200e-003		0.0383	0.0383		0.0383	0.0383	0.0000	548.4125	548.4125	0.0105	0.0101	551.6714

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					
Apartments Low Rise	751960	4.0500e-003	0.0347	0.0147	2.2000e-004		2.8000e-003	2.8000e-003		2.8000e-003	2.8000e-003	0.0000	40.1274	40.1274	7.7000e-004	7.4000e-004	40.3659
Bank (with Drive-Through)	84621.2	4.6000e-004	4.1500e-003	3.4800e-003	2.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.5157	4.5157	9.0000e-005	8.0000e-005	4.5425
Day-Care Center	139989	7.5000e-004	6.8600e-003	5.7600e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	7.4703	7.4703	1.4000e-004	1.4000e-004	7.5147
Fast Food Restaurant with Drive Thru	1.68812e+006	9.1000e-003	0.0828	0.0695	5.0000e-004		6.2900e-003	6.2900e-003		6.2900e-003	6.2900e-003	0.0000	90.0844	90.0844	1.7300e-003	1.6500e-003	90.6198
Gasoline/Service Station	74400.1	4.0000e-004	3.6500e-003	3.0600e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9703	3.9703	8.0000e-005	7.0000e-005	3.9939
General Office Building	187920	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004	0.0000	10.0281	10.0281	1.9000e-004	1.8000e-004	10.0877
High Turnover (Sit Down Restaurant)	1.0687e+006	5.7600e-003	0.0524	0.0440	3.1000e-004		3.9800e-003	3.9800e-003		3.9800e-003	3.9800e-003	0.0000	57.0299	57.0299	1.0900e-003	1.0500e-003	57.3688
Hotel	5.01254e+006	0.0270	0.2457	0.2064	1.4700e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.4880	267.4880	5.1300e-003	4.9000e-003	269.0776
Medical Office Building	1.04084e+006	5.6100e-003	0.0510	0.0429	3.1000e-004		3.8800e-003	3.8800e-003		3.8800e-003	3.8800e-003	0.0000	55.5433	55.5433	1.0600e-003	1.0200e-003	55.8734
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	227775	1.2300e-003	0.0112	9.3800e-003	7.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	12.1549	12.1549	2.3000e-004	2.2000e-004	12.2272
Total		**0.0554**	**0.5016**	**0.4069**	**3.0200e-003**		**0.0383**	**0.0383**		**0.0383**	**0.0383**	**0.0000**	**548.4125**	**548.4125**	**0.0105**	**0.0101**	**551.6714**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Low Rise	751960	4.0500e-003	0.0347	0.0147	2.2000e-004		2.8000e-003	2.8000e-003		2.8000e-003	2.8000e-003	0.0000	40.1274	40.1274	7.7000e-004	7.4000e-004	40.3659
Bank (with Drive-Through)	84621.2	4.6000e-004	4.1500e-003	3.4800e-003	2.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.5157	4.5157	9.0000e-005	8.0000e-005	4.5425
Day-Care Center	139989	7.5000e-004	6.8600e-003	5.7600e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004	0.0000	7.4703	7.4703	1.4000e-004	1.4000e-004	7.5147
Fast Food Restaurant with Drive Thru	1.68812e+006	9.1000e-003	0.0828	0.0695	5.0000e-004		6.2900e-003	6.2900e-003		6.2900e-003	6.2900e-003	0.0000	90.0844	90.0844	1.7300e-003	1.6500e-003	90.6198
Gasoline/Service Station	74400.1	4.0000e-004	3.6500e-003	3.0600e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9703	3.9703	8.0000e-005	7.0000e-005	3.9939
General Office Building	187920	1.0100e-003	9.2100e-003	7.7400e-003	6.0000e-005		7.0000e-004	7.0000e-004		7.0000e-004	7.0000e-004	0.0000	10.0281	10.0281	1.9000e-004	1.8000e-004	10.0877
High Turnover (Sit Down Restaurant)	1.0687e+006	5.7600e-003	0.0524	0.0440	3.1000e-004		3.9800e-003	3.9800e-003		3.9800e-003	3.9800e-003	0.0000	57.0299	57.0299	1.0900e-003	1.0500e-003	57.3688
Hotel	5.01254e+006	0.0270	0.2457	0.2064	1.4700e-003		0.0187	0.0187		0.0187	0.0187	0.0000	267.4880	267.4880	5.1300e-003	4.9000e-003	269.0776
Medical Office Building	1.04084e+006	5.6100e-003	0.0510	0.0429	3.1000e-004		3.8800e-003	3.8800e-003		3.8800e-003	3.8800e-003	0.0000	55.5433	55.5433	1.0600e-003	1.0200e-003	55.8734
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	227775	1.2300e-003	0.0112	9.3800e-003	7.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	12.1549	12.1549	2.3000e-004	2.2000e-004	12.2272
Total		**0.0554**	**0.5016**	**0.4069**	**3.0200e-003**		**0.0383**	**0.0383**		**0.0383**	**0.0383**	**0.0000**	**548.4125**	**548.4125**	**0.0105**	**0.0101**	**551.6714**

ATTACHMENT G

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	189132	55.0207	2.4900e-003	5.1000e-004	55.2363
Bank (with Drive-Through)	35706.8	10.3875	4.7000e-004	1.0000e-004	10.4282
Day-Care Center	40305.6	11.7254	5.3000e-004	1.1000e-004	11.7713
Fast Food Restaurant with Drive Thru	254395	74.0063	3.3500e-003	6.9000e-004	74.2963
Gasoline/Service Station	31393.9	9.1329	4.1000e-004	9.0000e-005	9.1686
General Office Building	127320	37.0389	1.6700e-003	3.5000e-004	37.1840
High Turnover (Sit Down Restaurant)	161050	46.8513	2.1200e-003	4.4000e-004	47.0349
Hotel	1.78608e+006	519.5900	0.0235	4.8600e-003	521.6259
Medical Office Building	705194	205.1489	9.2800e-003	1.9200e-003	205.9528
Parking Lot	321024	93.3896	4.2200e-003	8.7000e-004	93.7555
Regional Shopping Center	174931	50.8895	2.3000e-003	4.8000e-004	51.0889
Total		**1,113.1808**	**0.0503**	**0.0104**	**1,117.5426**

ATTACHMENT G

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	189132	55.0207	2.4900e-003	5.1000e-004	55.2363
Bank (with Drive-Through)	35706.8	10.3875	4.7000e-004	1.0000e-004	10.4282
Day-Care Center	40305.6	11.7254	5.3000e-004	1.1000e-004	11.7713
Fast Food Restaurant with Drive Thru	254395	74.0063	3.3500e-003	6.9000e-004	74.2963
Gasoline/Service Station	31393.9	9.1329	4.1000e-004	9.0000e-005	9.1686
General Office Building	127320	37.0389	1.6700e-003	3.5000e-004	37.1840
High Turnover (Sit Down Restaurant)	161050	46.8513	2.1200e-003	4.4000e-004	47.0349
Hotel	1.78608e+006	519.5900	0.0235	4.8600e-003	521.6259
Medical Office Building	705194	205.1489	9.2800e-003	1.9200e-003	205.9528
Parking Lot	321024	93.3896	4.2200e-003	8.7000e-004	93.7555
Regional Shopping Center	174931	50.8895	2.3000e-003	4.8000e-004	51.0889
Total		**1,113.1808**	**0.0503**	**0.0104**	**1,117.5426**

6.0 Area Detail

6.1 Mitigation Measures Area

ATTACHMENT G

	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	1.8652	0.0226	0.3989	1.3000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003	0.0000	21.3970	21.3970	1.1800e-003	3.8000e-004	21.5402
Unmitigated	1.8652	0.0226	0.3989	1.3000e-004		3.3700e-003	3.3700e-003		3.3700e-003	3.3700e-003	0.0000	21.3970	21.3970	1.1800e-003	3.8000e-004	21.5402

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	0.4384					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.4098					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0149	4.6600e-003	0.3913	2.0000e-005		1.9200e-003	1.9200e-003		1.9200e-003	1.9200e-003	0.0000	0.6031	0.6031	7.8000e-004	0.0000	0.6227
Total	**1.8652**	**0.0226**	**0.3989**	**1.3000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**	**0.0000**	**21.3970**	**21.3970**	**1.1800e-003**	**3.8000e-004**	**21.5402**

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	0.4384					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.4098					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0149	4.6600e-003	0.3913	2.0000e-005		1.9200e-003	1.9200e-003		1.9200e-003	1.9200e-003	0.0000	0.6031	0.6031	7.8000e-004	0.0000	0.6227
Total	**1.8652**	**0.0226**	**0.3989**	**1.3000e-004**		**3.3700e-003**	**3.3700e-003**		**3.3700e-003**	**3.3700e-003**	**0.0000**	**21.3970**	**21.3970**	**1.1800e-003**	**3.8000e-004**	**21.5402**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	49.9283	0.7390	0.0178	73.7083
Unmitigated	49.9283	0.7390	0.0178	73.7083

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.97162	7.9226	0.1022	2.4700e-003	11.2144
Bank (with Drive-Through)	0.141058 / 0.0864546	0.3548	4.6100e-003	1.1000e-004	0.5033
Day-Care Center	0.20587 / 0.52938	0.9284	6.7500e-003	1.7000e-004	1.1467
Fast Food Restaurant with Drive Thru	2.39792 / 0.153058	4.6912	0.0783	1.8800e-003	7.2098
Gasoline/Service Station	0.159383 / 0.0976861	0.4009	5.2100e-003	1.3000e-004	0.5687
General Office Building	2.1328 / 1.3072	5.3649	0.0697	1.6800e-003	7.6097
High Turnover (Sit Down Restaurant)	1.51767 / 0.0968725	2.9691	0.0496	1.1900e-003	4.5632
Hotel	3.24695 / 0.360772	6.5085	0.1061	2.5500e-003	9.9195
Medical Office Building	8.34069 / 1.5887	17.3930	0.2725	6.5600e-003	26.1577
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.827175	3.3948	0.0441	1.0700e-003	4.8153
Total		**49.9283**	**0.7390**	**0.0178**	**73.7083**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.97162	7.9226	0.1022	2.4700e-003	11.2144
Bank (with Drive-Through)	0.141058 / 0.0864546	0.3548	4.6100e-003	1.1000e-004	0.5033
Day-Care Center	0.20587 / 0.52938	0.9284	6.7500e-003	1.7000e-004	1.1467
Fast Food Restaurant with Drive Thru	2.39792 / 0.153058	4.6912	0.0783	1.8800e-003	7.2098
Gasoline/Service Station	0.159383 / 0.0976861	0.4009	5.2100e-003	1.3000e-004	0.5687
General Office Building	2.1328 / 1.3072	5.3649	0.0697	1.6800e-003	7.6097
High Turnover (Sit Down Restaurant)	1.51767 / 0.0968725	2.9691	0.0496	1.1900e-003	4.5632
Hotel	3.24695 / 0.360772	6.5085	0.1061	2.5500e-003	9.9195
Medical Office Building	8.34069 / 1.5887	17.3930	0.2725	6.5600e-003	26.1577
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.827175	3.3948	0.0441	1.0700e-003	4.8153
Total		**49.9283**	**0.7390**	**0.0178**	**73.7083**

8.0 Waste Detail

8.1 Mitigation Measures Waste

ATTACHMENT G

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	204.3835	12.0787	0.0000	506.3514
Unmitigated	204.3835	12.0787	0.0000	506.3514

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	22.08	4.4820	0.2649	0.0000	11.1041
Bank (with Drive-Through)	3.32	0.6739	0.0398	0.0000	1.6696
Day-Care Center	6.24	1.2667	0.0749	0.0000	3.1381
Fast Food Restaurant with Drive Thru	91	18.4722	1.0917	0.0000	45.7640
Gasoline/Service Station	6.47	1.3134	0.0776	0.0000	3.2538
General Office Building	11.16	2.2654	0.1339	0.0000	5.6124
High Turnover (Sit Down Restaurant)	59.5	12.0780	0.7138	0.0000	29.9226
Hotel	70.08	14.2256	0.8407	0.0000	35.2433
Medical Office Building	717.88	145.7232	8.6120	0.0000	361.0229
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.13	3.8832	0.2295	0.0000	9.6205
Total		**204.3835**	**12.0787**	**0.0000**	**506.3514**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	22.08	4.4820	0.2649	0.0000	11.1041
Bank (with Drive-Through)	3.32	0.6739	0.0398	0.0000	1.6696
Day-Care Center	6.24	1.2667	0.0749	0.0000	3.1381
Fast Food Restaurant with Drive Thru	91	18.4722	1.0917	0.0000	45.7640
Gasoline/Service Station	6.47	1.3134	0.0776	0.0000	3.2538
General Office Building	11.16	2.2654	0.1339	0.0000	5.6124
High Turnover (Sit Down Restaurant)	59.5	12.0780	0.7138	0.0000	29.9226
Hotel	70.08	14.2256	0.8407	0.0000	35.2433
Medical Office Building	717.88	145.7232	8.6120	0.0000	361.0229
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.13	3.8832	0.2295	0.0000	9.6205
Total		**204.3835**	**12.0787**	**0.0000**	**506.3514**

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

Yosemite Crossing - 2030

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
Bank (with Drive-Through)	3.56	1000sqft	0.08	3,560.00	0
General Office Building	12.00	1000sqft	0.28	12,000.00	0
Medical Office Building	66.47	1000sqft	1.53	66,465.00	0
Day-Care Center	4.80	1000sqft	0.11	4,804.00	0
Parking Lot	912.00	1000sqft	12.97	912,000.00	0
Fast Food Restaurant with Drive Thru	7.90	1000sqft	0.18	7,898.00	0
High Turnover (Sit Down Restaurant)	5.00	1000sqft	0.11	5,000.00	0
Hotel	128.00	Room	2.99	80,104.00	0
Apartments Low Rise	48.00	Dwelling Unit	2.69	48,000.00	152
Gasoline/Service Station	12.00	Pump	0.04	3,130.00	0
Regional Shopping Center	18.22	1000sqft	0.42	18,222.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.7	**Precipitation Freq (Days)**	45
Climate Zone	3			**Operational Year**	2030
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	328.8	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

ATTACHMENT G

Project Characteristics - CO2 intensity factor based on 5-year average (PG&E 2015)

Land Use - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Construction Phase - Operational run only

Vehicle Trips - Based on site plan dated 07/24/19 and Traffic Impact Analysis dated 08/06/19

Woodstoves -

Energy Use -

Mobile Land Use Mitigation -

Area Mitigation - Assuming only natural gas hearth

Energy Mitigation - The project would be consistent with California's 2019 Building Energy Efficiency Standards, which will take effect on January 1, 2020

Water Mitigation - Compliance with the Water Efficient Landscape Ordinance will reduce outdoor water use by 20 percent.

Waste Mitigation - The CalRecycle Waste Diversion and Recycling Mandate will reduce solid waste production by 25 percent.

Fleet Mix - Revised fleet mix percentages based on data for a similar shopping center project in the central valley. LDA was revised to 0.571634, LHD2 was revised to 0.001, MHD was revised to 0.003, and HHD was revised to 0.001. All other fleet mix percentages are default.

Table Name	Column Name	Default Value	New Value
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LDA	0.54	0.57
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003

tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD1	0.01	1.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	LHD2	3.7490e-003	3.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003

tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblFleetMix	MHD	0.02	1.0000e-003
tblLandUse	LandUseSquareFeet	66,470.00	66,465.00
tblLandUse	LandUseSquareFeet	4,800.00	4,804.00
tblLandUse	LandUseSquareFeet	7,900.00	7,898.00
tblLandUse	LandUseSquareFeet	185,856.00	80,104.00
tblLandUse	LandUseSquareFeet	1,694.10	3,130.00
tblLandUse	LandUseSquareFeet	18,220.00	18,222.00
tblLandUse	LotAcreage	20.94	12.97
tblLandUse	LotAcreage	4.27	2.99
tblLandUse	LotAcreage	3.00	2.69
tblProjectCharacteristics	CO2IntensityFactor	641.35	328.8
tblVehicleTrips	ST_TR	7.16	6.15
tblVehicleTrips	ST_TR	86.32	85.00
tblVehicleTrips	ST_TR	6.21	47.67
tblVehicleTrips	ST_TR	722.03	296.72
tblVehicleTrips	ST_TR	168.56	124.17
tblVehicleTrips	ST_TR	2.46	8.17
tblVehicleTrips	ST_TR	158.37	95.37
tblVehicleTrips	ST_TR	8.19	7.02
tblVehicleTrips	ST_TR	8.96	29.23
tblVehicleTrips	ST_TR	49.97	26.32
tblVehicleTrips	SU_TR	6.07	6.15
tblVehicleTrips	SU_TR	31.90	85.00
tblVehicleTrips	SU_TR	5.83	47.67

tblVehicleTrips	SU_TR	542.72	296.72
tblVehicleTrips	SU_TR	168.56	124.17
tblVehicleTrips	SU_TR	1.05	8.17
tblVehicleTrips	SU_TR	131.84	95.37
tblVehicleTrips	SU_TR	5.95	7.02
tblVehicleTrips	SU_TR	1.55	29.23
tblVehicleTrips	SU_TR	25.24	26.32
tblVehicleTrips	WD_TR	6.59	6.15
tblVehicleTrips	WD_TR	148.15	85.00
tblVehicleTrips	WD_TR	74.06	47.67
tblVehicleTrips	WD_TR	496.12	296.72
tblVehicleTrips	WD_TR	168.56	124.17
tblVehicleTrips	WD_TR	11.03	8.17
tblVehicleTrips	WD_TR	127.15	95.37
tblVehicleTrips	WD_TR	8.17	7.02
tblVehicleTrips	WD_TR	36.13	29.23
tblVehicleTrips	WD_TR	42.70	26.32
tblWoodstoves	NumberCatalytic	2.69	0.00
tblWoodstoves	NumberNoncatalytic	2.69	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2028	0.1225	1.1688	1.0740	3.4200e-003	0.3492	0.0365	0.3857	0.1416	0.0338	0.1755	0.0000	307.9820	307.9820	0.0535	0.0000	309.3196
2029	0.3688	3.5898	3.3010	0.0137	0.6760	0.0732	0.7492	0.1834	0.0689	0.2523	0.0000	1,250.4913	1,250.4913	0.1120	0.0000	1,253.2921
2030	2.1665	0.8690	1.0497	4.0900e-003	0.1877	9.7700e-003	0.1975	0.0509	9.7000e-003	0.0606	0.0000	370.9072	370.9072	0.0157	0.0000	371.2999
Maximum	**2.1665**	**3.5898**	**3.3010**	**0.0137**	**0.6760**	**0.0732**	**0.7492**	**0.1834**	**0.0689**	**0.2523**	**0.0000**	**1,250.4913**	**1,250.4913**	**0.1120**	**0.0000**	**1,253.2921**

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					
2028	0.1225	1.1688	1.0740	3.4200e-003	0.3492	0.0365	0.3857	0.1416	0.0338	0.1755	0.0000	307.9818	307.9818	0.0535	0.0000	309.3194
2029	0.3688	3.5898	3.3010	0.0137	0.6760	0.0732	0.7492	0.1834	0.0689	0.2523	0.0000	1,250.4909	1,250.4909	0.1120	0.0000	1,253.2918
2030	2.1665	0.8690	1.0497	4.0900e-003	0.1877	9.7700e-003	0.1975	0.0509	9.7000e-003	0.0606	0.0000	370.9071	370.9071	0.0157	0.0000	371.2997
Maximum	**2.1665**	**3.5898**	**3.3010**	**0.0137**	**0.6760**	**0.0732**	**0.7492**	**0.1834**	**0.0689**	**0.2523**	**0.0000**	**1,250.4909**	**1,250.4909**	**0.1120**	**0.0000**	**1,253.2918**

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

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-4-2028**	**12-3-2028**	0.9889	0.9889
2	**12-4-2028**	**3-3-2029**	0.9805	0.9805
3	**3-4-2029**	**6-3-2029**	0.9973	0.9973
4	**6-4-2029**	**9-3-2029**	0.9962	0.9962
5	**9-4-2029**	**12-3-2029**	0.9878	0.9878
6	**12-4-2029**	**3-3-2030**	0.8712	0.8712
7	**3-4-2030**	**6-3-2030**	2.4567	2.4567
		Highest	2.4567	2.4567

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	1.2498	0.0222	0.3738	1.3000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	21.3970	21.3970	1.0100e-003	3.8000e-004	21.5358
Energy	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	741.8625	741.8625	0.0401	0.0136	746.9077
Mobile	1.3716	16.4213	10.6715	0.0676	4.3796	0.0309	4.4105	1.1717	0.0288	1.2005	0.0000	6,313.6522	6,313.6522	0.5559	0.0000	6,327.5499
Waste						0.0000	0.0000		0.0000	0.0000	204.3835	0.0000	204.3835	12.0787	0.0000	506.3514
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.9177	29.0938	0.7390	0.0178	52.8738
Total	**2.6586**	**16.7790**	**11.3143**	**0.0698**	**4.3796**	**0.0600**	**4.4396**	**1.1717**	**0.0579**	**1.2296**	**211.5596**	**7,098.8295**	**7,310.3890**	**13.4147**	**0.0318**	**7,655.2186**

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	1.2498	0.0222	0.3738	1.3000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	21.3970	21.3970	1.0100e-003	3.8000e-004	21.5358
Energy	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	649.1885	649.1885	0.0361	0.0119	653.6284
Mobile	1.3317	16.1060	9.8600	0.0621	3.8628	0.0280	3.8909	1.0335	0.0261	1.0596	0.0000	5,798.3540	5,798.3540	0.5465	0.0000	5,812.0176
Waste						0.0000	0.0000		0.0000	0.0000	153.2876	0.0000	153.2876	9.0590	0.0000	379.7636
Water						0.0000	0.0000		0.0000	0.0000	7.1761	21.1849	28.3610	0.7389	0.0178	52.1354
Total	**2.6125**	**16.4084**	**10.4592**	**0.0639**	**3.8628**	**0.0529**	**3.9158**	**1.0335**	**0.0510**	**1.0845**	**160.4637**	**6,490.1245**	**6,650.5881**	**10.3816**	**0.0300**	**6,919.0808**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**1.73**	**2.21**	**7.56**	**8.44**	**11.80**	**11.80**	**11.80**	**11.80**	**11.90**	**11.80**	**24.15**	**8.57**	**9.03**	**22.61**	**5.39**	**9.62**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/4/2028	9/15/2028	5	10	
2	Grading	Grading	9/16/2028	11/3/2028	5	35	
3	Building Construction	Building Construction	11/4/2028	4/5/2030	5	370	
4	Paving	Paving	4/6/2030	5/3/2030	5	20	
5	Architectural Coating	Architectural Coating	5/4/2030	5/31/2030	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 12.97

Residential Indoor: 97,200; Residential Outdoor: 32,400; Non-Residential Indoor: 301,775; Non-Residential Outdoor: 100,592; Striped Parking Area: 54,720 (Architectural Coating – sqft)

OffRoad Equipment

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

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	492.00	188.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	98.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Site Preparation - 2028

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	**0.0124**	**0.1262**	**0.0896**	**1.9000e-004**	**0.0903**	**5.4300e-003**	**0.0958**	**0.0497**	**5.0000e-003**	**0.0547**	**0.0000**	**16.7335**	**16.7335**	**5.4100e-003**	**0.0000**	**16.8688**

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	2.2000e-004	1.1000e-004	1.3600e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.4835	0.4835	1.0000e-005	0.0000	0.4837
Total	**2.2000e-004**	**1.1000e-004**	**1.3600e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.4835**	**0.4835**	**1.0000e-005**	**0.0000**	**0.4837**

3.2 Site Preparation - 2028

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					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0124	0.1262	0.0896	1.9000e-004		5.4300e-003	5.4300e-003		5.0000e-003	5.0000e-003	0.0000	16.7335	16.7335	5.4100e-003	0.0000	16.8688
Total	**0.0124**	**0.1262**	**0.0896**	**1.9000e-004**	**0.0903**	**5.4300e-003**	**0.0958**	**0.0497**	**5.0000e-003**	**0.0547**	**0.0000**	**16.7335**	**16.7335**	**5.4100e-003**	**0.0000**	**16.8688**

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	2.2000e-004	1.1000e-004	1.3600e-003	1.0000e-005	7.2000e-004	0.0000	7.2000e-004	1.9000e-004	0.0000	1.9000e-004	0.0000	0.4835	0.4835	1.0000e-005	0.0000	0.4837
Total	**2.2000e-004**	**1.1000e-004**	**1.3600e-003**	**1.0000e-005**	**7.2000e-004**	**0.0000**	**7.2000e-004**	**1.9000e-004**	**0.0000**	**1.9000e-004**	**0.0000**	**0.4835**	**0.4835**	**1.0000e-005**	**0.0000**	**0.4837**

3.3 Grading - 2028

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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.4890	0.4608	1.0900e-003		0.0198	0.0198		0.0182	0.0182	0.0000	95.3859	95.3859	0.0309	0.0000	96.1571
Total	**0.0508**	**0.4890**	**0.4608**	**1.0900e-003**	**0.1518**	**0.0198**	**0.1716**	**0.0629**	**0.0182**	**0.0812**	**0.0000**	**95.3859**	**95.3859**	**0.0309**	**0.0000**	**96.1571**

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	8.5000e-004	4.4000e-004	5.2900e-003	2.0000e-005	2.8000e-003	1.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	1.8802	1.8802	3.0000e-005	0.0000	1.8809
Total	**8.5000e-004**	**4.4000e-004**	**5.2900e-003**	**2.0000e-005**	**2.8000e-003**	**1.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**1.8802**	**1.8802**	**3.0000e-005**	**0.0000**	**1.8809**

3.3 Grading - 2028

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					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0508	0.4890	0.4608	1.0900e-003		0.0198	0.0198		0.0182	0.0182	0.0000	95.3858	95.3858	0.0309	0.0000	96.1570
Total	**0.0508**	**0.4890**	**0.4608**	**1.0900e-003**	**0.1518**	**0.0198**	**0.1716**	**0.0629**	**0.0182**	**0.0812**	**0.0000**	**95.3858**	**95.3858**	**0.0309**	**0.0000**	**96.1570**

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	8.5000e-004	4.4000e-004	5.2900e-003	2.0000e-005	2.8000e-003	1.0000e-005	2.8100e-003	7.4000e-004	1.0000e-005	7.6000e-004	0.0000	1.8802	1.8802	3.0000e-005	0.0000	1.8809
Total	**8.5000e-004**	**4.4000e-004**	**5.2900e-003**	**2.0000e-005**	**2.8000e-003**	**1.0000e-005**	**2.8100e-003**	**7.4000e-004**	**1.0000e-005**	**7.6000e-004**	**0.0000**	**1.8802**	**1.8802**	**3.0000e-005**	**0.0000**	**1.8809**

3.4 Building Construction - 2028

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	0.0274	0.2494	0.3217	5.4000e-004		0.0106	0.0106		9.9300e-003	9.9300e-003	0.0000	46.3839	46.3839	0.0109	0.0000	46.6565
Total	**0.0274**	**0.2494**	**0.3217**	**5.4000e-004**		**0.0106**	**0.0106**		**9.9300e-003**	**9.9300e-003**	**0.0000**	**46.3839**	**46.3839**	**0.0109**	**0.0000**	**46.6565**

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	6.9500e-003	0.2913	0.0466	9.9000e-004	0.0249	2.8000e-004	0.0252	7.2000e-003	2.7000e-004	7.4700e-003	0.0000	94.2558	94.2558	5.4200e-003	0.0000	94.3914
Worker	0.0240	0.0124	0.1487	5.8000e-004	0.0787	4.2000e-004	0.0791	0.0209	3.9000e-004	0.0213	0.0000	52.8593	52.8593	8.8000e-004	0.0000	52.8813
Total	**0.0310**	**0.3037**	**0.1953**	**1.5700e-003**	**0.1036**	**7.0000e-004**	**0.1043**	**0.0281**	**6.6000e-004**	**0.0288**	**0.0000**	**147.1151**	**147.1151**	**6.3000e-003**	**0.0000**	**147.2726**

3.4 Building Construction - 2028

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	0.0274	0.2494	0.3217	5.4000e-004		0.0106	0.0106		9.9300e-003	9.9300e-003	0.0000	46.3838	46.3838	0.0109	0.0000	46.6564
Total	**0.0274**	**0.2494**	**0.3217**	**5.4000e-004**		**0.0106**	**0.0106**		**9.9300e-003**	**9.9300e-003**	**0.0000**	**46.3838**	**46.3838**	**0.0109**	**0.0000**	**46.6564**

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	6.9500e-003	0.2913	0.0466	9.9000e-004	0.0249	2.8000e-004	0.0252	7.2000e-003	2.7000e-004	7.4700e-003	0.0000	94.2558	94.2558	5.4200e-003	0.0000	94.3914
Worker	0.0240	0.0124	0.1487	5.8000e-004	0.0787	4.2000e-004	0.0791	0.0209	3.9000e-004	0.0213	0.0000	52.8593	52.8593	8.8000e-004	0.0000	52.8813
Total	**0.0310**	**0.3037**	**0.1953**	**1.5700e-003**	**0.1036**	**7.0000e-004**	**0.1043**	**0.0281**	**6.6000e-004**	**0.0288**	**0.0000**	**147.1151**	**147.1151**	**6.3000e-003**	**0.0000**	**147.2726**

3.4 Building Construction - 2029

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	0.0447	1.8887	0.2962	6.4500e-003	0.1627	1.8300e-003	0.1645	0.0470	1.7500e-003	0.0487	0.0000	612.6343	612.6343	0.0357	0.0000	613.5259
Worker	0.1457	0.0738	0.9058	3.7000e-003	0.5133	2.5600e-003	0.5159	0.1364	2.3500e-003	0.1388	0.0000	335.2021	335.2021	5.2300e-003	0.0000	335.3327
Total	**0.1903**	**1.9625**	**1.2020**	**0.0102**	**0.6760**	**4.3900e-003**	**0.6804**	**0.1834**	**4.1000e-003**	**0.1875**	**0.0000**	**947.8364**	**947.8364**	**0.0409**	**0.0000**	**948.8586**

3.4 Building Construction - 2029

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	0.0447	1.8887	0.2962	6.4500e-003	0.1627	1.8300e-003	0.1645	0.0470	1.7500e-003	0.0487	0.0000	612.6343	612.6343	0.0357	0.0000	613.5259
Worker	0.1457	0.0738	0.9058	3.7000e-003	0.5133	2.5600e-003	0.5159	0.1364	2.3500e-003	0.1388	0.0000	335.2021	335.2021	5.2300e-003	0.0000	335.3327
Total	**0.1903**	**1.9625**	**1.2020**	**0.0102**	**0.6760**	**4.3900e-003**	**0.6804**	**0.1834**	**4.1000e-003**	**0.1875**	**0.0000**	**947.8364**	**947.8364**	**0.0409**	**0.0000**	**948.8586**

3.4 Building Construction - 2030

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	0.0452	0.2737	0.5574	1.0700e-003		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	90.6871	90.6871	3.6400e-003	0.0000	90.7780
Total	**0.0452**	**0.2737**	**0.5574**	**1.0700e-003**		**5.1100e-003**	**5.1100e-003**		**5.1100e-003**	**5.1100e-003**	**0.0000**	**90.6871**	**90.6871**	**3.6400e-003**	**0.0000**	**90.7780**

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	0.0117	0.4965	0.0767	1.7000e-003	0.0430	4.8000e-004	0.0435	0.0124	4.6000e-004	0.0129	0.0000	161.4687	161.4687	9.4900e-003	0.0000	161.7059
Worker	0.0357	0.0179	0.2242	9.5000e-004	0.1357	6.3000e-004	0.1363	0.0361	5.8000e-004	0.0367	0.0000	86.3502	86.3502	1.2600e-003	0.0000	86.3817
Total	**0.0473**	**0.5143**	**0.3009**	**2.6500e-003**	**0.1787**	**1.1100e-003**	**0.1798**	**0.0485**	**1.0400e-003**	**0.0495**	**0.0000**	**247.8189**	**247.8189**	**0.0108**	**0.0000**	**248.0876**

3.4 Building Construction - 2030

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	0.0452	0.2737	0.5574	1.0700e-003		5.1100e-003	5.1100e-003		5.1100e-003	5.1100e-003	0.0000	90.6869	90.6869	3.6400e-003	0.0000	90.7779
Total	**0.0452**	**0.2737**	**0.5574**	**1.0700e-003**		**5.1100e-003**	**5.1100e-003**		**5.1100e-003**	**5.1100e-003**	**0.0000**	**90.6869**	**90.6869**	**3.6400e-003**	**0.0000**	**90.7779**

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	0.0117	0.4965	0.0767	1.7000e-003	0.0430	4.8000e-004	0.0435	0.0124	4.6000e-004	0.0129	0.0000	161.4687	161.4687	9.4900e-003	0.0000	161.7059
Worker	0.0357	0.0179	0.2242	9.5000e-004	0.1357	6.3000e-004	0.1363	0.0361	5.8000e-004	0.0367	0.0000	86.3502	86.3502	1.2600e-003	0.0000	86.3817
Total	**0.0473**	**0.5143**	**0.3009**	**2.6500e-003**	**0.1787**	**1.1100e-003**	**0.1798**	**0.0485**	**1.0400e-003**	**0.0495**	**0.0000**	**247.8189**	**247.8189**	**0.0108**	**0.0000**	**248.0876**

3.5 Paving - 2030

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	0.0139	0.0712	0.1585	2.8000e-004		3.3100e-003	3.3100e-003		3.3100e-003	3.3100e-003	0.0000	24.0995	24.0995	1.1300e-003	0.0000	24.1278
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0308**	**0.0712**	**0.1585**	**2.8000e-004**		**3.3100e-003**	**3.3100e-003**		**3.3100e-003**	**3.3100e-003**	**0.0000**	**24.0995**	**24.0995**	**1.1300e-003**	**0.0000**	**24.1278**

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	3.2000e-004	1.6000e-004	1.9800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.7631	0.7631	1.0000e-005	0.0000	0.7634
Total	**3.2000e-004**	**1.6000e-004**	**1.9800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.7631**	**0.7631**	**1.0000e-005**	**0.0000**	**0.7634**

3.5 Paving - 2030

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	0.0139	0.0712	0.1585	2.8000e-004		3.3100e-003	3.3100e-003		3.3100e-003	3.3100e-003	0.0000	24.0995	24.0995	1.1300e-003	0.0000	24.1277
Paving	0.0170					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0308**	**0.0712**	**0.1585**	**2.8000e-004**		**3.3100e-003**	**3.3100e-003**		**3.3100e-003**	**3.3100e-003**	**0.0000**	**24.0995**	**24.0995**	**1.1300e-003**	**0.0000**	**24.1277**

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	3.2000e-004	1.6000e-004	1.9800e-003	1.0000e-005	1.2000e-003	1.0000e-005	1.2000e-003	3.2000e-004	1.0000e-005	3.2000e-004	0.0000	0.7631	0.7631	1.0000e-005	0.0000	0.7634
Total	**3.2000e-004**	**1.6000e-004**	**1.9800e-003**	**1.0000e-005**	**1.2000e-003**	**1.0000e-005**	**1.2000e-003**	**3.2000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**0.7631**	**0.7631**	**1.0000e-005**	**0.0000**	**0.7634**

3.6 Architectural Coating - 2030

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	2.0395					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3100e-003	8.5600e-003	0.0180	3.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.5533	2.5533	1.0000e-004	0.0000	2.5558
Total	**2.0408**	**8.5600e-003**	**0.0180**	**3.0000e-005**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.0000e-004**	**0.0000**	**2.5558**

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	2.0600e-003	1.0300e-003	0.0129	6.0000e-005	7.8300e-003	4.0000e-005	7.8700e-003	2.0800e-003	3.0000e-005	2.1200e-003	0.0000	4.9855	4.9855	7.0000e-005	0.0000	4.9873
Total	**2.0600e-003**	**1.0300e-003**	**0.0129**	**6.0000e-005**	**7.8300e-003**	**4.0000e-005**	**7.8700e-003**	**2.0800e-003**	**3.0000e-005**	**2.1200e-003**	**0.0000**	**4.9855**	**4.9855**	**7.0000e-005**	**0.0000**	**4.9873**

3.6 Architectural Coating - 2030

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	2.0395					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3100e-003	8.5600e-003	0.0180	3.0000e-005		2.0000e-004	2.0000e-004		2.0000e-004	2.0000e-004	0.0000	2.5533	2.5533	1.0000e-004	0.0000	2.5558
Total	**2.0408**	**8.5600e-003**	**0.0180**	**3.0000e-005**		**2.0000e-004**	**2.0000e-004**		**2.0000e-004**	**2.0000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.0000e-004**	**0.0000**	**2.5558**

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	2.0600e-003	1.0300e-003	0.0129	6.0000e-005	7.8300e-003	4.0000e-005	7.8700e-003	2.0800e-003	3.0000e-005	2.1200e-003	0.0000	4.9855	4.9855	7.0000e-005	0.0000	4.9873
Total	**2.0600e-003**	**1.0300e-003**	**0.0129**	**6.0000e-005**	**7.8300e-003**	**4.0000e-005**	**7.8700e-003**	**2.0800e-003**	**3.0000e-005**	**2.1200e-003**	**0.0000**	**4.9855**	**4.9855**	**7.0000e-005**	**0.0000**	**4.9873**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Increase Diversity

Increase Transit Accessibility

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	1.3317	16.1060	9.8600	0.0621	3.8628	0.0280	3.8909	1.0335	0.0261	1.0596	0.0000	5,798.3540	5,798.3540	0.5465	0.0000	5,812.0176
Unmitigated	1.3716	16.4213	10.6715	0.0676	4.3796	0.0309	4.4105	1.1717	0.0288	1.2005	0.0000	6,313.6522	6,313.6522	0.5559	0.0000	6,327.5499

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	295.20	295.20	295.20	855,436	754,494
Bank (with Drive-Through)	302.60	302.60	302.60	279,898	246,870
Day-Care Center	228.82	228.82	228.82	269,460	237,664
Fast Food Restaurant with Drive Thru	2,344.09	2,344.09	2344.09	2,190,140	1,931,704
Gasoline/Service Station	1,490.04	1,490.04	1490.04	858,514	757,209
General Office Building	98.04	98.04	98.04	234,291	206,645
High Turnover (Sit Down Restaurant)	476.85	476.85	476.85	553,272	487,986
Hotel	898.56	898.56	898.56	1,707,202	1,505,752
Medical Office Building	1,942.92	1,942.92	1942.92	3,802,776	3,354,049
Parking Lot	0.00	0.00	0.00		
Regional Shopping Center	479.55	479.55	479.55	840,798	741,584
Total	8,556.66	8,556.66	8,556.66	11,591,787	10,223,956

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Low Rise	10.80	7.30	7.50	45.60	19.00	35.40	86	11	3
Bank (with Drive-Through)	9.50	7.30	7.30	6.60	74.40	19.00	27	26	47
Day-Care Center	9.50	7.30	7.30	12.70	82.30	5.00	28	58	14
Fast Food Restaurant with Drive	9.50	7.30	7.30	2.20	78.80	19.00	29	21	50
Gasoline/Service Station	9.50	7.30	7.30	2.00	79.00	19.00	14	27	59
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
High Turnover (Sit Down	9.50	7.30	7.30	8.50	72.50	19.00	37	20	43
Hotel	9.50	7.30	7.30	19.40	61.60	19.00	58	38	4
Medical Office Building	9.50	7.30	7.30	29.60	51.40	19.00	60	30	10
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Regional Shopping Center	9.50	7.30	7.30	16.30	64.70	19.00	54	35	11

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Low Rise	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Bank (with Drive-Through)	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Day-Care Center	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Fast Food Restaurant with Drive Thru	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Gasoline/Service Station	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
General Office Building	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
High Turnover (Sit Down Restaurant)	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Hotel	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Medical Office Building	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Parking Lot	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500
Regional Shopping Center	0.571634	0.029508	0.177727	0.096034	0.001000	0.003000	0.001000	0.110957	0.001737	0.001254	0.004794	0.000855	0.000500

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	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	342.3176	342.3176	0.0302	6.2500e-003	344.9339
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	374.3804	374.3804	0.0330	6.8300e-003	377.2418
NaturalGas Mitigated	0.0310	0.2803	0.2254	1.6900e-003		0.0214	0.0214		0.0214	0.0214	0.0000	306.8709	306.8709	5.8800e-003	5.6300e-003	308.6945
NaturalGas Unmitigated	0.0371	0.3356	0.2689	2.0300e-003		0.0257	0.0257		0.0257	0.0257	0.0000	367.4821	367.4821	7.0400e-003	6.7400e-003	369.6659

ATTACHMENT G

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					
Apartments Low Rise	678550	3.6600e-003	0.0313	0.0133	2.0000e-004		2.5300e-003	2.5300e-003		2.5300e-003	2.5300e-003	0.0000	36.2100	36.2100	6.9000e-004	6.6000e-004	36.4252
Bank (with Drive-Through)	74297.2	4.0000e-004	3.6400e-003	3.0600e-003	2.0000e-005		2.8000e-004	2.8000e-004		2.8000e-004	2.8000e-004	0.0000	3.9648	3.9648	8.0000e-005	7.0000e-005	3.9883
Day-Care Center	120628	6.5000e-004	5.9100e-003	4.9700e-003	4.0000e-005		4.5000e-004	4.5000e-004		4.5000e-004	4.5000e-004	0.0000	6.4372	6.4372	1.2000e-004	1.2000e-004	6.4755
Fast Food Restaurant with Drive Thru	1.6619e+006	8.9600e-003	0.0815	0.0684	4.9000e-004		6.1900e-003	6.1900e-003		6.1900e-003	6.1900e-003	0.0000	88.6852	88.6852	1.7000e-003	1.6300e-003	89.2122
Gasoline/Service Station	65323.1	3.5000e-004	3.2000e-003	2.6900e-003	2.0000e-005		2.4000e-004	2.4000e-004		2.4000e-004	2.4000e-004	0.0000	3.4859	3.4859	7.0000e-005	6.0000e-005	3.5066
General Office Building	156600	8.4000e-004	7.6800e-003	6.4500e-003	5.0000e-005		5.8000e-004	5.8000e-004		5.8000e-004	5.8000e-004	0.0000	8.3568	8.3568	1.6000e-004	1.5000e-004	8.4064
High Turnover (Sit Down Restaurant)	1.0521e+006	5.6700e-003	0.0516	0.0433	3.1000e-004		3.9200e-003	3.9200e-003		3.9200e-003	3.9200e-003	0.0000	56.1441	56.1441	1.0800e-003	1.0300e-003	56.4777
Hotel	2.01462e+006	0.0109	0.0988	0.0830	5.9000e-004		7.5100e-003	7.5100e-003		7.5100e-003	7.5100e-003	0.0000	107.5076	107.5076	2.0600e-003	1.9700e-003	108.1464
Medical Office Building	867368	4.6800e-003	0.0425	0.0357	2.6000e-004		3.2300e-003	3.2300e-003		3.2300e-003	3.2300e-003	0.0000	46.2861	46.2861	8.9000e-004	8.5000e-004	46.5611
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	194975	1.0500e-003	9.5600e-003	8.0300e-003	6.0000e-005		7.3000e-004	7.3000e-004		7.3000e-004	7.3000e-004	0.0000	10.4046	10.4046	2.0000e-004	1.9000e-004	10.4665
Total		**0.0371**	**0.3356**	**0.2689**	**2.0400e-003**		**0.0257**	**0.0257**		**0.0257**	**0.0257**	**0.0000**	**367.4821**	**367.4821**	**7.0500e-003**	**6.7300e-003**	**369.6659**

5.2 Energy by Land Use - NaturalGas

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					
Apartments Low Rise	528596	2.8500e-003	0.0244	0.0104	1.6000e-004		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	28.2079	28.2079	5.4000e-004	5.2000e-004	28.3755
Bank (with Drive-Through)	56109.2	3.0000e-004	2.7500e-003	2.3100e-003	2.0000e-005		2.1000e-004	2.1000e-004		2.1000e-004	2.1000e-004	0.0000	2.9942	2.9942	6.0000e-005	5.0000e-005	3.0120
Day-Care Center	87207	4.7000e-004	4.2700e-003	3.5900e-003	3.0000e-005		3.2000e-004	3.2000e-004		3.2000e-004	3.2000e-004	0.0000	4.6537	4.6537	9.0000e-005	9.0000e-005	4.6814
Fast Food Restaurant with Drive Thru	1.57726e+006	8.5000e-003	0.0773	0.0650	4.6000e-004		5.8800e-003	5.8800e-003		5.8800e-003	5.8800e-003	0.0000	84.1687	84.1687	1.6100e-003	1.5400e-003	84.6689
Gasoline/Service Station	49331.9	2.7000e-004	2.4200e-003	2.0300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	2.6325	2.6325	5.0000e-005	5.0000e-005	2.6482
General Office Building	110628	6.0000e-004	5.4200e-003	4.5600e-003	3.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	5.9035	5.9035	1.1000e-004	1.1000e-004	5.9386
High Turnover (Sit Down Restaurant)	998520	5.3800e-003	0.0490	0.0411	2.9000e-004		3.7200e-003	3.7200e-003		3.7200e-003	3.7200e-003	0.0000	53.2848	53.2848	1.0200e-003	9.8000e-004	53.6015
Hotel	1.58229e+006	8.5300e-003	0.0776	0.0652	4.7000e-004		5.8900e-003	5.8900e-003		5.8900e-003	5.8900e-003	0.0000	84.4373	84.4373	1.6200e-003	1.5500e-003	84.9390
Medical Office Building	612741	3.3000e-003	0.0300	0.0252	1.8000e-004		2.2800e-003	2.2800e-003		2.2800e-003	2.2800e-003	0.0000	32.6982	32.6982	6.3000e-004	6.0000e-004	32.8925
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	147853	8.0000e-004	7.2500e-003	6.0900e-003	4.0000e-005		5.5000e-004	5.5000e-004		5.5000e-004	5.5000e-004	0.0000	7.8900	7.8900	1.5000e-004	1.4000e-004	7.9369
Total		**0.0310**	**0.2803**	**0.2254**	**1.6900e-003**		**0.0214**	**0.0214**		**0.0214**	**0.0214**	**0.0000**	**306.8709**	**306.8709**	**5.8800e-003**	**5.6300e-003**	**308.6944**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	224521	33.4853	2.9500e-003	6.1000e-004	33.7413
Bank (with Drive-Through)	31399.2	4.6829	4.1000e-004	9.0000e-005	4.7187
Day-Care Center	33724.1	5.0297	4.4000e-004	9.0000e-005	5.0681
Fast Food Restaurant with Drive Thru	228805	34.1243	3.0100e-003	6.2000e-004	34.3851
Gasoline/Service Station	27606.6	4.1173	3.6000e-004	8.0000e-005	4.1488
General Office Building	109440	16.3220	1.4400e-003	3.0000e-004	16.4468
High Turnover (Sit Down Restaurant)	144850	21.6031	1.9100e-003	3.9000e-004	21.7682
Hotel	636026	94.8576	8.3700e-003	1.7300e-003	95.5826
Medical Office Building	606161	90.4035	7.9700e-003	1.6500e-003	91.0945
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	148509	22.1489	1.9500e-003	4.0000e-004	22.3181
Total		**374.3804**	**0.0330**	**6.8300e-003**	**377.2418**

ATTACHMENT G

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Low Rise	214522	31.9940	2.8200e-003	5.8000e-004	32.2385
Bank (with Drive-Through)	29305.9	4.3707	3.9000e-004	8.0000e-005	4.4041
Day-Care Center	30639.9	4.5697	4.0000e-004	8.0000e-005	4.6046
Fast Food Restaurant with Drive Thru	213285	31.8097	2.8100e-003	5.8000e-004	32.0528
Gasoline/Service Station	25766.2	3.8428	3.4000e-004	7.0000e-005	3.8722
General Office Building	100008	14.9153	1.3200e-003	2.7000e-004	15.0293
High Turnover (Sit Down Restaurant)	135025	20.1378	1.7800e-003	3.7000e-004	20.2917
Hotel	536777	80.0555	7.0600e-003	1.4600e-003	80.6674
Medical Office Building	553919	82.6122	7.2900e-003	1.5100e-003	83.2436
Parking Lot	319200	47.6059	4.2000e-003	8.7000e-004	47.9697
Regional Shopping Center	136811	20.4041	1.8000e-003	3.7000e-004	20.5601
Total		**342.3176**	**0.0302**	**6.2400e-003**	**344.9340**

6.0 Area Detail

6.1 Mitigation Measures Area

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	1.2498	0.0222	0.3738	1.3000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	21.3970	21.3970	1.0100e-003	3.8000e-004	21.5358
Unmitigated	1.2498	0.0222	0.3738	1.3000e-004		3.4700e-003	3.4700e-003		3.4700e-003	3.4700e-003	0.0000	21.3970	21.3970	1.0100e-003	3.8000e-004	21.5358

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0116	4.1900e-003	0.3662	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.1000e-004	0.0000	0.6183
Total	**1.2498**	**0.0222**	**0.3738**	**1.3000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**21.3970**	**21.3970**	**1.0100e-003**	**3.8000e-004**	**21.5358**

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	0.2040					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.0321					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	2.1000e-003	0.0180	7.6400e-003	1.1000e-004		1.4500e-003	1.4500e-003		1.4500e-003	1.4500e-003	0.0000	20.7940	20.7940	4.0000e-004	3.8000e-004	20.9175
Landscaping	0.0116	4.1900e-003	0.3662	2.0000e-005		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	0.6031	0.6031	6.1000e-004	0.0000	0.6183
Total	**1.2498**	**0.0222**	**0.3738**	**1.3000e-004**		**3.4600e-003**	**3.4600e-003**		**3.4600e-003**	**3.4600e-003**	**0.0000**	**21.3970**	**21.3970**	**1.0100e-003**	**3.8000e-004**	**21.5358**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	28.3610	0.7389	0.0178	52.1354
Unmitigated	29.0938	0.7390	0.0178	52.8738

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.97162	4.5452	0.1022	2.4700e-003	7.8370
Bank (with Drive-Through)	0.141058 / 0.0864546	0.2037	4.6100e-003	1.1000e-004	0.3522
Day-Care Center	0.20587 / 0.52938	0.5078	6.7500e-003	1.7000e-004	0.7261
Fast Food Restaurant with Drive Thru	2.39792 / 0.153058	2.7758	0.0783	1.8800e-003	5.2944
Gasoline/Service Station	0.159383 / 0.0976861	0.2302	5.2100e-003	1.3000e-004	0.3979
General Office Building	2.1328 / 1.3072	3.0802	0.0697	1.6800e-003	5.3250
High Turnover (Sit Down Restaurant)	1.51767 / 0.0968725	1.7568	0.0496	1.1900e-003	3.3509
Hotel	3.24695 / 0.360772	3.8387	0.1061	2.5500e-003	7.2497
Medical Office Building	8.34069 / 1.5887	10.2064	0.2725	6.5600e-003	18.9711
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.827175	1.9491	0.0441	1.0700e-003	3.3696
Total		**29.0938**	**0.7390**	**0.0178**	**52.8738**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Low Rise	3.12739 / 1.57729	4.3393	0.1022	2.4700e-003	7.6296
Bank (with Drive-Through)	0.141058 / 0.0691637	0.1947	4.6100e-003	1.1000e-004	0.3431
Day-Care Center	0.20587 / 0.423504	0.4525	6.7400e-003	1.7000e-004	0.6704
Fast Food Restaurant with Drive Thru	2.39792 / 0.122447	2.7598	0.0783	1.8800e-003	5.2783
Gasoline/Service Station	0.159383 / 0.0781489	0.2200	5.2100e-003	1.3000e-004	0.3877
General Office Building	2.1328 / 1.04576	2.9437	0.0697	1.6800e-003	5.1875
High Turnover (Sit Down Restaurant)	1.51767 / 0.077498	1.7467	0.0496	1.1900e-003	3.3407
Hotel	3.24695 / 0.288617	3.8011	0.1061	2.5500e-003	7.2118
Medical Office Building	8.34069 / 1.27096	10.0405	0.2724	6.5500e-003	18.8039
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	1.3496 / 0.66174	1.8627	0.0441	1.0600e-003	3.2826
Total		**28.3610**	**0.7389**	**0.0178**	**52.1354**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	153.2876	9.0590	0.0000	379.7636
Unmitigated	204.3835	12.0787	0.0000	506.3514

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	22.08	4.4820	0.2649	0.0000	11.1041
Bank (with Drive-Through)	3.32	0.6739	0.0398	0.0000	1.6696
Day-Care Center	6.24	1.2667	0.0749	0.0000	3.1381
Fast Food Restaurant with Drive Thru	91	18.4722	1.0917	0.0000	45.7640
Gasoline/Service Station	6.47	1.3134	0.0776	0.0000	3.2538
General Office Building	11.16	2.2654	0.1339	0.0000	5.6124
High Turnover (Sit Down Restaurant)	59.5	12.0780	0.7138	0.0000	29.9226
Hotel	70.08	14.2256	0.8407	0.0000	35.2433
Medical Office Building	717.88	145.7232	8.6120	0.0000	361.0229
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	19.13	3.8832	0.2295	0.0000	9.6205
Total		**204.3835**	**12.0787**	**0.0000**	**506.3514**

ATTACHMENT G

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Low Rise	16.56	3.3615	0.1987	0.0000	8.3281
Bank (with Drive-Through)	2.49	0.5055	0.0299	0.0000	1.2522
Day-Care Center	4.68	0.9500	0.0561	0.0000	2.3536
Fast Food Restaurant with Drive Thru	68.25	13.8541	0.8188	0.0000	34.3230
Gasoline/Service Station	4.8525	0.9850	0.0582	0.0000	2.4403
General Office Building	8.37	1.6990	0.1004	0.0000	4.2093
High Turnover (Sit Down Restaurant)	44.625	9.0585	0.5353	0.0000	22.4420
Hotel	52.56	10.6692	0.6305	0.0000	26.4325
Medical Office Building	538.41	109.2924	6.4590	0.0000	270.7672
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Regional Shopping Center	14.3475	2.9124	0.1721	0.0000	7.2154
Total		**153.2876**	**9.0590**	**0.0000**	**379.7636**

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

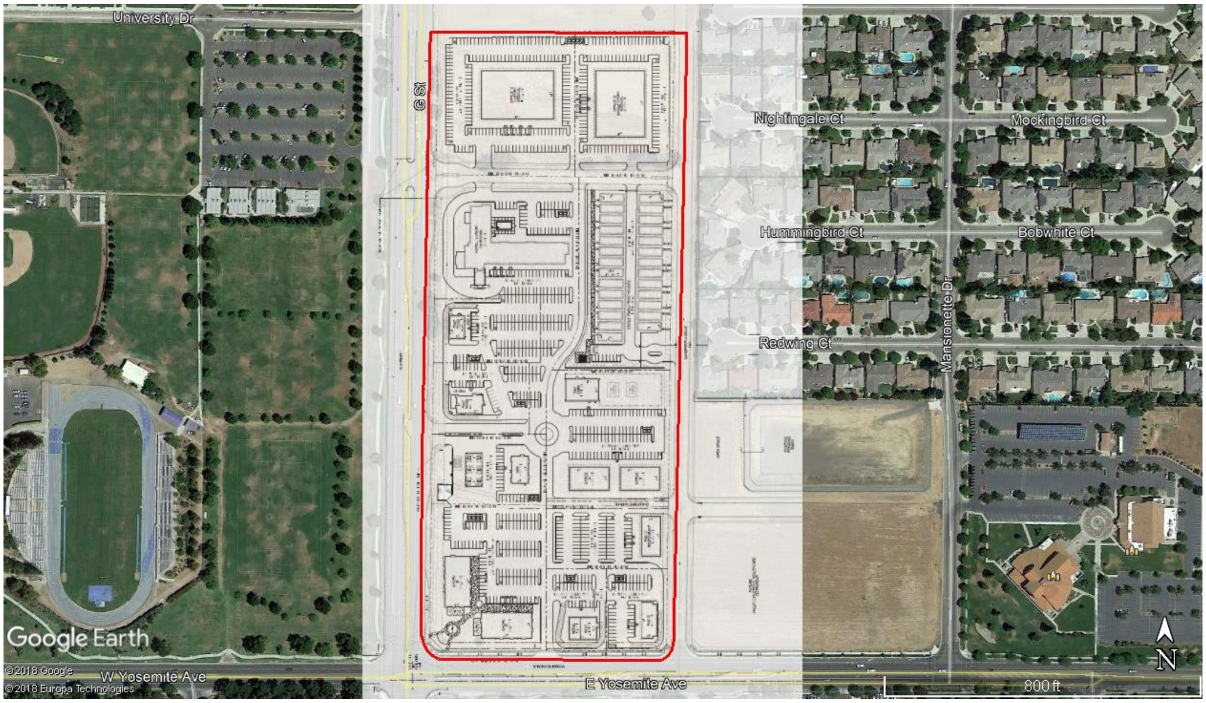
This page intentionally left blank

APPENDIX B

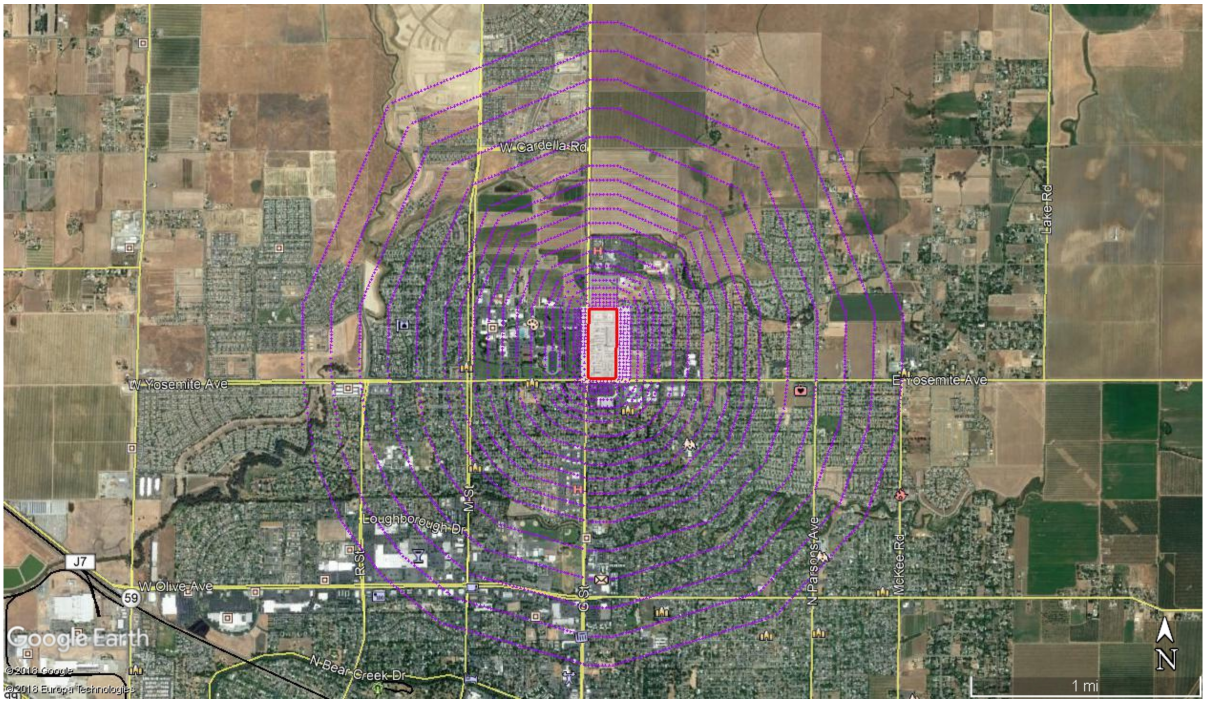
HRA MODEL OUTPUT

ATTACHMENT G

Project Site Plan

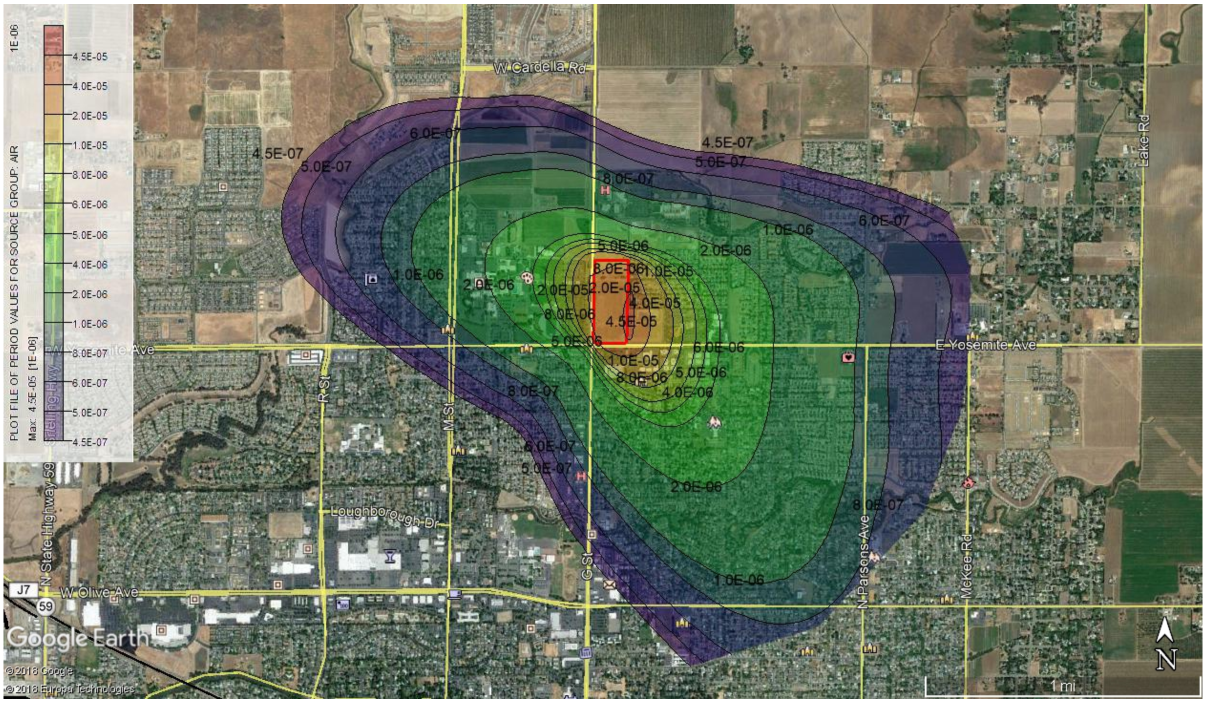


Sensitive Receptors

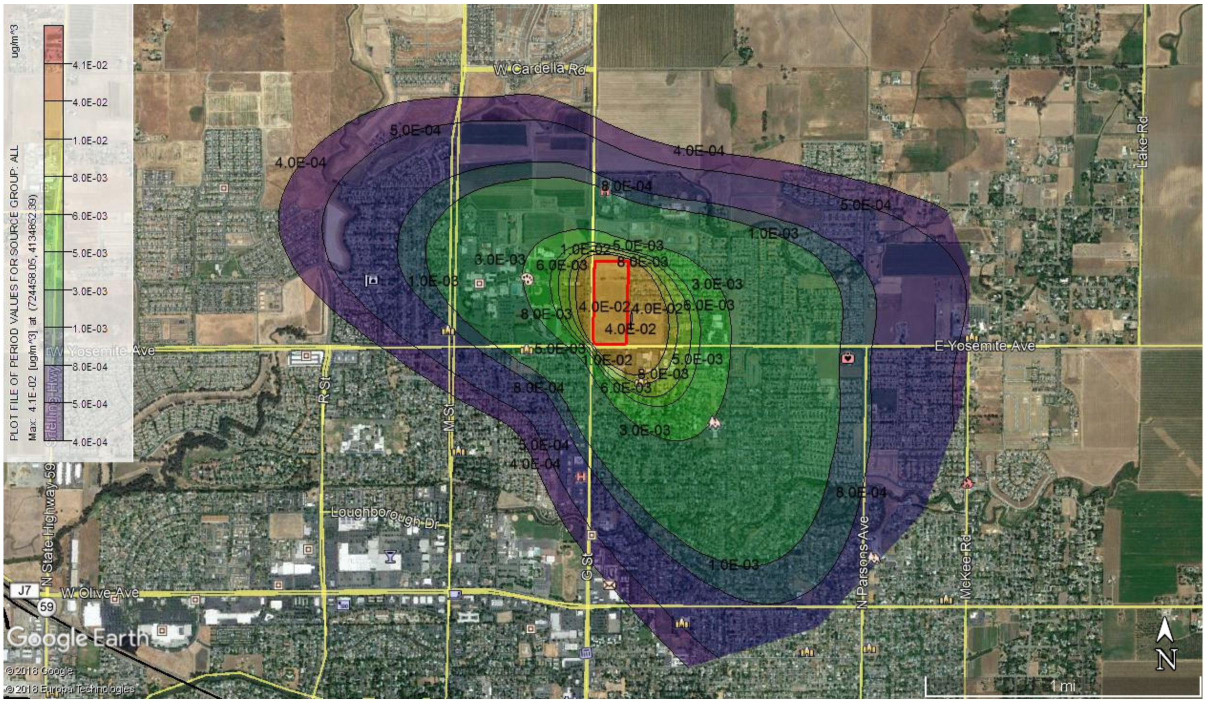


ATTACHMENT G

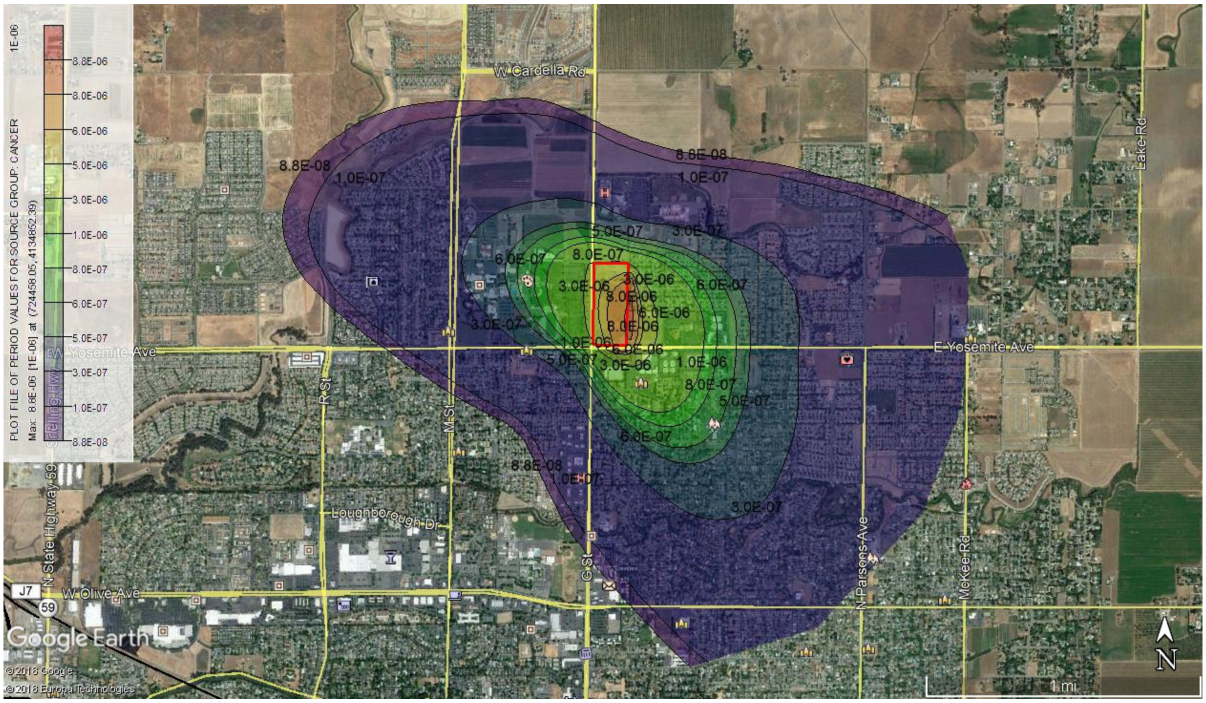
Unmitigated Cancer Risk



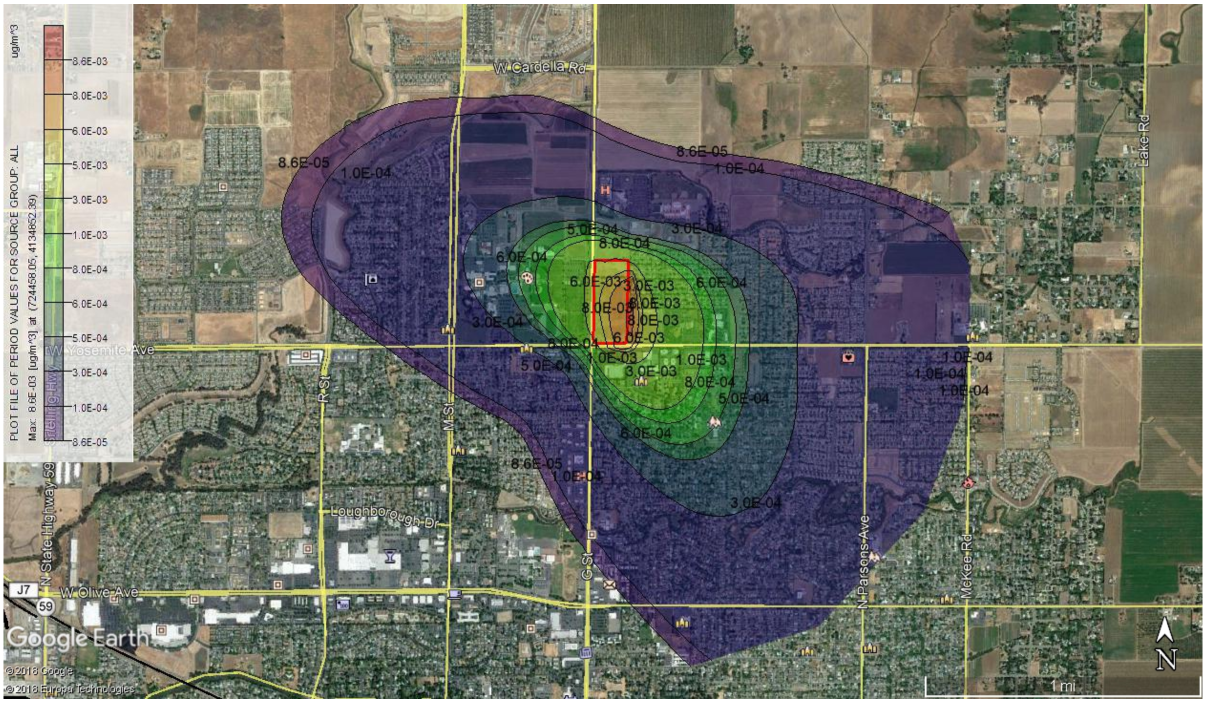
Unmitigated Chronic Inhalation Hazard Index



Mitigated Cancer Risk



Mitigated Chronic Inhalation Hazard Index



This page intentionally left blank

Traffic Impact Analysis

Merced
Mixed-Use Development

Located on the Northeast Corner of "G" Street and Yosemite Avenue

In the City of Merced, California

Prepared for:

Yosemite and G, LLC
1155 W. Shaw Ave., Ste. 104
Fresno, CA 93711

September 24, 2019

JLB Project No. 035-003

Traffic Engineering, Transportation Planning, & Parking Solutions

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

APPENDIX B TO IS #19-28

ATTACHMENT G

Traffic Engineering, Transportation Planning, & Parking Solutions

Traffic Impact Analysis

For the Merced Mixed-Use Development located on the Northeast Corner of "G" Street and Yosemite Avenue

In the City of Merced, CA

September 24, 2019

This 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:

Jose Luis Benavides, PE, TE

President

REGISTERED PROFESSIONAL ENGINEER
JOSE LUIS BENAVIDES
No.T 2328
Exp:06/30/21
TRAFFIC
STATE OF CALIFORNIA

Traffic Engineering, Transportation Planning, & Parking Solutions
516 W. Shaw Ave., Ste. 103
Fresno, CA 93704
Phone: (559) 570-8991
www.JLBtraffic.com

Z:\01 Projects\035 Merced\035-003 Yosemite at G TIA\Report\R09242019 Merced Mixed-Use Development TIA.docx

ATTACHMENT G

Table of Contents

ATTACHMENT G

ATTACHMENT G

List of Figures

List of Tables

List of Appendices

ATTACHMENT G

Introduction and Summary

Introduction

This report describes a Traffic Impact Analysis (TIA) prepared by JLB Traffic Engineering, Inc. (JLB) for the proposed Merced Mixed-Use Development (Project) located on the northeast corner of "G" Street and Yosemite Avenue in the City of Merced. The Project proposes to develop 66,465 square feet of medical-dental office space, a 128-room hotel, 11,458 square feet of fast-food restaurant with drive-through window, a gasoline/service station with convenience market (12 fueling positions), 18,222 square feet of shopping center, 5,000 square feet high-turnover (sit-down) restaurant, 12,000 square feet of general office space, 4,804 square feet of day care center, and 44 multifamily units. Per information provided to JLB, the Project will undergo a General Plan Amendment through the City of Merced. 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 Merced, County of Merced 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 Merced, County of Merced and Caltrans.

Existing Traffic Conditions

- At present, all study intersections operate at an acceptable LOS during both peak periods.

Existing plus Project Traffic Conditions

- It is recommended that the Project Driveway 1 have a minimum throat depth of 150 feet before any vehicular openings to the north.
- At buildout, the latest Project Site Plan is estimated to generate a maximum of 13,160 daily trips, 1,009 AM peak hour trips and 1,059 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). Whereas the prior Project Site Plan is anticipated to generate a maximum of 13,741 daily trips, 1,092 AM peak hour trips and 1,074 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account).
- Compared to the prior Project Site Plan, the latest Project Site Plan is estimated to yield less traffic by 581 daily trips, 83 AM peak hour trips and 15 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). Therefore, in order to provide a conservative analysis of the Project's traffic impacts, this TIA assumed the trip generation of the prior Project Site Plan.
- It is recommended that the Project implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to "G" Street.
- It is recommended that the Project implement a Class II Bike Lane along its frontage to "G" Street.

ATTACHMENT G

- To promote alternative modes of transportation to El Capitan High School, it is recommended that the MUHSD work with the City of Merced and County of Merced to implement a Safe Routes to School plan and to seek grant funding to help build walkways where they are lacking within a 2.5-mile radius of the existing school site.
- As the Project is within a defined service area, it is likely that the Project would not add VMT per capita of service population to the region. Additionally, the Project site is located near transit services and pedestrian and bicycle networks.
- Under this scenario, the intersection of “G” Street and Project Driveway 1 is projected to exceed its LOS threshold during one peak period. To improve the LOS at this intersection, it is recommended that this intersection be signalized with protective left-turn phasing in all directions. Additional details as to the recommended improvements for this intersection are presented later in this Report.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Projects by year 2025 is 76,956 daily trips, 4,228 AM peak hour trips and 7,565 PM peak hour trips.
- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue and “G” Street and Project Driveway 1 are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, the addition of lanes and modification of traffic control mechanisms is recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.
- Between the Existing Traffic Conditions and the Near Term plus Project Traffic Conditions, the Project accounts for 11.6 percent of the daily trips, 13.6 percent of the AM peak hour trips and 7.1 percent of the PM peak hour trips of growth in traffic while the rest can be attributable to the Near Term Projects. Therefore, one can deduce that the majority of the mitigation measures presented under this scenario may not be necessary immediately upon completion of the proposed Project.

Cumulative Year 2039 No Project Traffic Conditions

- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, “G” Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, the addition of lanes and modification of traffic control mechanisms is recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.

Cumulative Year 2039 plus Project Traffic Conditions

- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, “G” Street and Project Driveway 1, “G” Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, the addition of lanes and modification of traffic control mechanisms is recommended. Additional details as to the recommended improvements for these intersections are presented later in this Report.

ATTACHMENT G

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project's Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table XV for the future improvements necessary to maintain an acceptable LOS.

ATTACHMENT G

Scope of Work

The study focused on evaluating traffic conditions at the existing study intersections that may potentially be impacted by the Project. On February 22, 2019, a Draft Scope of Work for the preparation of a TIA for this Project was provided to the City of Merced for their review and comment. The Draft Scope of Work was based on a conference call with City of Merced staff on February 20, 2019. City of Merced staff responded to the Draft Scope of Work via phone call and requested that the TIA include a qualitative discussion on vehicle miles traveled (VMT).

On March 26, 2019, a Draft Scope of Work for the preparation of a TIA for this Project was provided to the City of Merced, County of Merced and Caltrans for their review and comment. The Draft Scope of Work was based on communication with City of Merced staff. On April 2, 2019, Caltrans requested a clearer version of the Project Site Plan presented within Exhibit A. JLB provided Caltrans with the requested site plan on April 3, 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 counts were conducted at the study intersections in April 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. “G” Street / Mercy Avenue
2. Sandpiper Avenue / Mercy Avenue
3. “G” Street / Project Driveway 1
4. “G” Street / Project Driveway 2
5. “G” Street / Yosemite Avenue
6. Sandpiper Avenue / Yosemite Avenue
7. Mansionette Drive / Yosemite Avenue
8. Paulson Road / Yosemite Avenue

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 April 2019.

Existing plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Existing plus Project Traffic Conditions. The Existing plus Project traffic volumes were obtained by adding the Net New Project Only Trips to the Existing Traffic Conditions scenario. The Net New Project Only Trips to the study intersections were developed based on existing travel patterns, the existing roadway network, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the Merced Vision 2030 General Plan Transportation and Circulation Element in the vicinity of the Project.

Near Term plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Near Term plus Project Traffic Conditions. The Near Term plus Project traffic volumes were obtained by adding the Near Term (Year 2025) related trips to the Existing plus Project Traffic Conditions scenario.

Cumulative Year 2039 No Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2039 No Project Traffic Conditions. The Cumulative Year 2039 No Project traffic volumes were obtained by subtracting the Net New Project Only Trips from the Cumulative Year 2039 plus Project Traffic Conditions scenario.

Cumulative Year 2039 plus Project Traffic Conditions

This scenario evaluates total traffic volumes and roadway conditions based on the Cumulative Year 2039 plus Project Traffic Conditions. The Cumulative Year 2039 plus Project traffic volumes were obtained by expanding Existing traffic volumes by an average annual growth rate of 3.0 percent, assuming full buildout of all Near Term Projects, and utilizing the greater of the two volumes. The average annual growth rate of 3.0 percent was approved by City of Merced staff.

ATTACHMENT G

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 does not allow the analysis of U-turns or some shared turn lane movements. Synchro software was used to define LOS in this study. Details regarding these calculations are included in Appendix C.

Criteria of Significance

The Merced Vision 2030 General Plan has established LOS D as the acceptable level of traffic congestion on new and upgraded intersections and road segments. However, the City of Merced Vision 2030 General Plan recognizes that this may not always be feasible, appropriate or necessary. For those cases in which a LOS criterion for a roadway segment differs from that of the established LOS, such criteria are identified in the roadway description. Most study intersections within the City of Merced SOI utilize LOS D to evaluate the potential significance of LOS impacts pursuant to the Merced Vision 2030 General Plan.

The 2030 Merced County General Plan has established LOS C or better for roadways located within rural areas, LOS D or better for roadways located outside Urban Communities that serve as connectors between Urban Communities, and LOS D or better for roadways located within Urban Communities. Since all study intersections fall within the City of Merced SOI, the City of Merced LOS is utilized.

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. In this TIA, however, all study facilities fall within the City of Merced. Therefore, the City of Merced LOS thresholds are utilized.

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 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
- Flashing Don't Walk based on 3.5 feet/second walking speed with yellow plus all-red clearance subtracted and 2.0 seconds added
- All new or modified signals utilize protective left-turn phasing
- An average 3 percent heavy vehicle factor
- An average of 3 pedestrian calls per hour at signalized intersections
- The number of observed pedestrians at existing intersections was utilized under all study scenarios
- The observed approach Peak Hour Factor (PHF) at existing intersections was utilized in the Existing and Existing plus Project scenarios
- The intersections of "G" Street and Project Driveway 1 and 2 utilized the following PHFs:
    - A PHF of 0.78 (the average PHF between the intersections of "G" Street and Mercy Avenue and "G" Street and Yosemite Avenue) during the AM peak hour.
    - A PHF of 0.92 during the PM peak hour.
- A PHF of 0.88, or the existing PHF, if higher, is utilized for all intersections in the Near Term plus Project scenario
- A PHF of 0.92, or the existing PHF, if higher, is utilized for all intersections in the Cumulative Year 2039 scenarios

ATTACHMENT G

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.

"G" Street is an existing north-south four- to six-lane divided arterial adjacent to the proposed Project. In this area, "G" Street is a two-lane undivided minor arterial north of Farmland Road and between Cardella Road and Mercy Avenue, a four- to six-lane divided arterial between Farmland Road and 15th Street and becomes a two-lane undivided collector street south of 15th Street. The Merced Vision 2030 General Plan designates "G" Street as a major arterial between Old Lake Road and Yosemite Avenue, a divided arterial north of Old Lake Road and between Olive Avenue and 15th Street, a minor arterial between Yosemite Avenue and Olive Avenue and a collector street south of 15th Street.

Sandpiper Avenue is a proposed north-south two-lane undivided local roadway adjacent to the proposed Project. The Merced Vision 2030 General Plan does not include Sandpiper Avenue.

Mansionette Drive is an existing north-south two-lane undivided collector street in the vicinity of the proposed Project. In this area, Mansionette Drive is a two-lane undivided collector between Mercy Avenue and Yosemite Avenue. The Merced Vision 2030 General Plan designates Mansionette Drive as a two-lane collector street between Cardella Road and Yosemite Avenue and a conceptual collector street between Cardella Road and Bellevue Road.

Paulson Road is an existing north-south two-lane undivided collector street in the vicinity of the proposed Project. In this area, Paulson Road is a two-lane undivided collector between Dunn Road and Donna Drive. The Merced Vision 2030 General Plan designates Paulson Road as a collector street north of Bellevue Road and between Cardella Road and Donna Drive and a conceptual collector between Bellevue Road and Cardella Road.

Mercy Avenue is an existing east-west two-lane undivided collector street in the vicinity of the proposed Project. In this area, Mercy Avenue is a two-lane undivided collector east of "G" Street. The Merced Vision 2030 General Plan designates Mercy Avenue as a collector street east of "G" Street.

Yosemite Avenue is an existing east-west four-lane divided arterial adjacent to the proposed Project. In this area, Yosemite Avenue is a four-lane divided arterial between san Augustine Avenue and Parsons Avenue, a two- to four-lane divided arterial between Parsons and Lake Road and a two-lane undivided minor arterial east of Lake Road. The Merced Vision 2030 General Plan designates Yosemite Avenue as a divided arterial between "R" Street and Parsons Avenue and east of Lake Road, a major arterial west of "R" Street and classified as a special street section between Parsons Avenue and Lake Road. Furthermore, the Merced Vision 2030 General Plan acknowledged that Yosemite Avenue would exceed LOS D as a four-lane divided arterial between "R" Street and Parsons Avenue. However, City Council made appropriate findings to designate LOS F as the criteria of significance for Yosemite Avenue as four-lane facility between "R" Street and Parsons Avenue.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the Existing Traffic Conditions scenario. These warrants are found in Appendix I. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized intersections satisfy the peak hour signal warrant during either peak period.

Results of Existing Level of Service Analysis

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

At present, all study intersections operate at an acceptable LOS during both peak periods.

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	"G" Street / Mercy Avenue	Signalized	27.0	C	26.2	C
2	Sandpiper Avenue / Mercy Avenue	Two-Way Stop	28.0	D	14.2	B
3	"G" Street / Project Driveway 1	Does Not Exist	N/A	N/A	N/A	N/A
4	"G" Street / Project Driveway 2	Does Not Exist	N/A	N/A	N/A	N/A
5	"G" Street / Yosemite Avenue	Signalized	36.9	D	36.2	D
6	Sandpiper Avenue / Yosemite Avenue	One-Way Stop	11.2	B	11.8	B
7	Mansionette Drive / Yosemite Avenue	Signalized	7.5	A	6.3	A
8	Paulson Road / Yosemite Avenue	Signalized	45.5	D	33.0	C

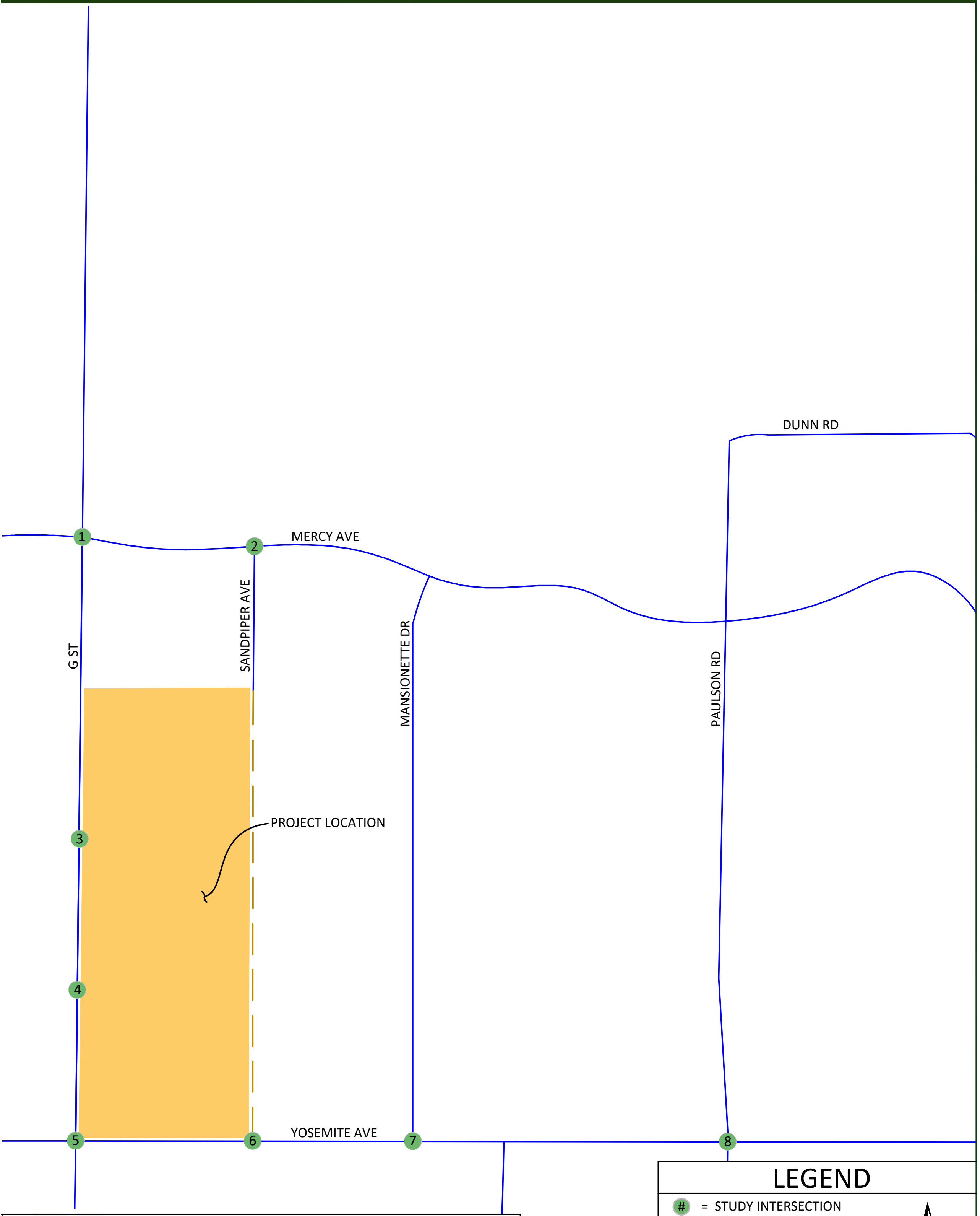
Note: LOS = Level of Service based on average delay on signalized intersections and All-Way STOP Controls.
LOS for two-way STOP controlled intersections are based on the worst approach/movement of the minor street.

ATTACHMENT G

Merced Mixed-Use Development - City of Merced

Vicinity Map

Figure 1



LEGEND

● = STUDY INTERSECTION

– – – = FUTURE ROADWAY

Not To Scale

JLB TRAFFIC ENGINEERING, INC.

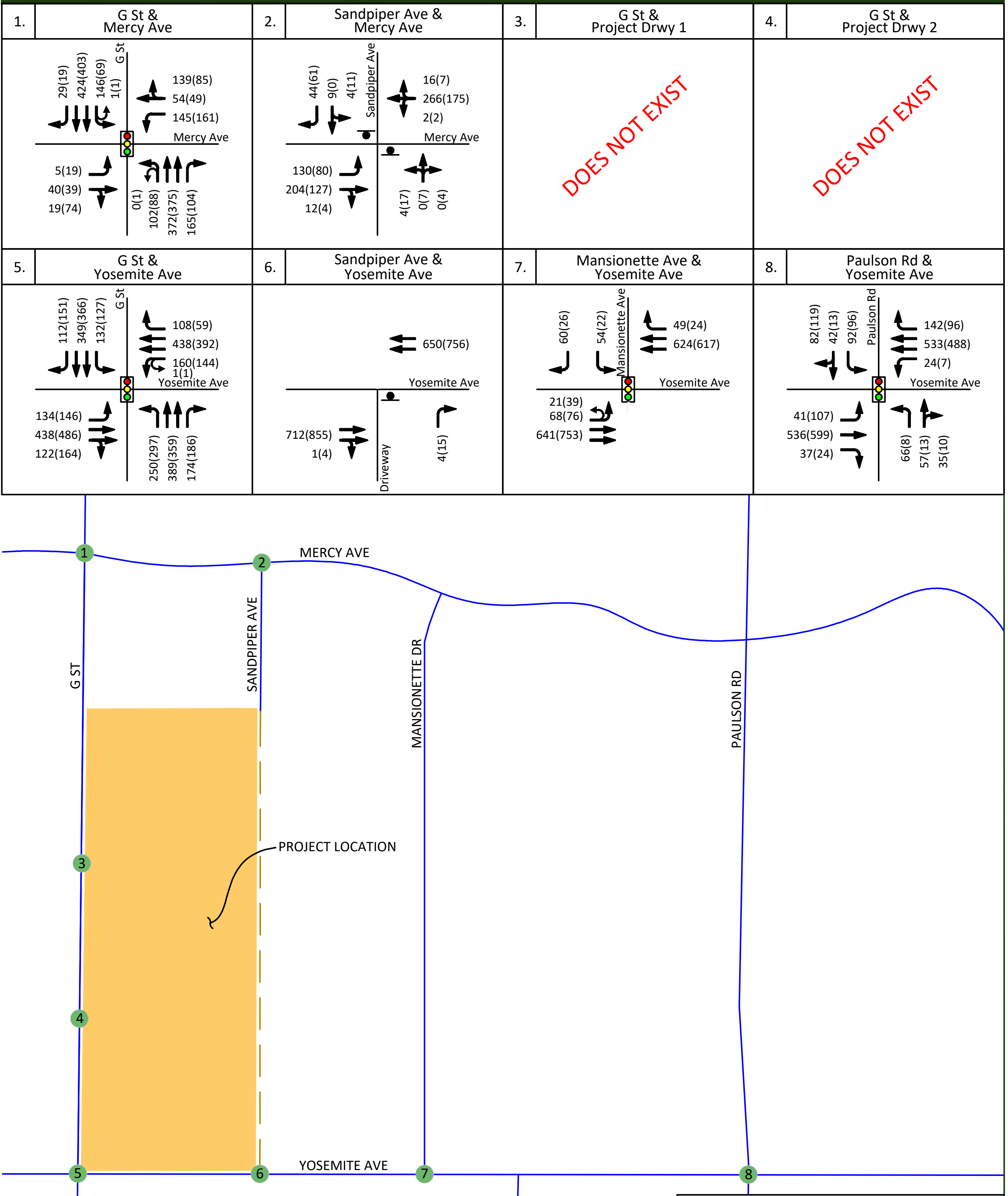
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

035-003 - 09/24/19 - JB/AB/MA

ATTACHMENT G

Merced Mixed-Use Development - City of Merced
Existing - Traffic Volumes, Geometrics and Controls

Figure 2



LEGEND

- ● = STUDY INTERSECTION
- – – – = FUTURE ROADWAY
- XX = AM PEAK HOUR TRIPS
- (XX) = PM PEAK HOUR TRIPS
- 🚦 = SIGNALIZED INTERSECTION
- ● = STOP SIGN

Not To Scale

JLB TRAFFIC
ENGINEERING, INC.

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

035-003 - 09/24/19 - JB/AB/MA

ATTACHMENT G

Existing plus Project Traffic Conditions

Project Description

The Project proposes to develop 66,465 square feet of medical-dental office space, a 128-room hotel, 11,458 square feet of fast-food restaurant with drive-through window, a gasoline/service station with convenience market (12 fueling positions), 18,222 square feet of shopping center, 5,000 square feet high-turnover (sit-down) restaurant, 12,000 square feet of general office space, 4,804 square feet of day care center, and 44 multifamily units. Per information provided to JLB, the Project will undergo a General Plan Amendment through the City of Merced. Figure 3 illustrates the latest Project Site Plan provided to JLB by the developer.

Project Access

Based on the latest Project Site Plan, access to and from the Project site will be from five (5) access driveways located along Mercy Avenue, "G" Street, and Yosemite Avenue. The access point to Mercy Avenue is located at Sandpiper Avenue and is proposed as a full access. Two (2) access points are proposed to be located along the east side of "G" Street. One is located approximately 1,250 south of Mercy Avenue and is proposed as a full access. The other is located approximately 625 feet north of Yosemite Avenue and is proposed as left-in, right-in and right-out access only. The remaining two (2) access points are proposed to be located along the north side of Yosemite Avenue. One is located at Sandpiper Avenue and is limited to right-in and right-out access only. The other access point is located approximately 300 feet east of "G" Street and is also limited to right-in and right-out access only.

JLB analyzed the location of the proposed driveways relative to the existing local roads and driveways in the Project's vicinity. Based on this review, it is recommended that the Project incorporate the recommendations presented in more detail within the Queuing Analysis for the intersections of "G" Street and Project Driveway 1 and 2. It is recommended that Project Driveway 1 have a minimum throat depth of 150 feet before any vehicular openings to the north. By incorporating the recommendations presented in the Queuing Analysis, onsite and offsite traffic operations and circulation along with pedestrian safety should be improved.

Walkways

Currently, walkways exist in the vicinity of the proposed Project site along "G" Street, Yosemite Avenue and Mercy Avenue. The Merced Vision 2030 General Plan recommends that walkways be implemented during all phases of a Project to guarantee adequate and safe pedestrian facilities at all times. Therefore, it is recommended that the Project implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to "G" Street.

ATTACHMENT G

Bikeways

Currently, bikeways exist in the vicinity of the proposed Project site along “G” Street, Yosemite Avenue, Mercy Avenue and Mansionette Drive. The Merced Vision 2030 General Plan recommends that a Class II Bike Lane be implemented on “G” Street north of Yosemite Avenue and a Class I Bike Lane beginning on “G” Street and extending approximately 950 feet north of Mercy Avenue. Therefore, it is recommended that the Project implement a Class II Bike Lane along its frontage to “G” Street.

Transit

The Bus, Merced’s Regional Transit System, is the single public transportation service provider for all of Merced County. At present, there are three routes - M3, M4 and UC - that have stops adjacent to the proposed Project and two more - M1 and M2 - that stop approximately 0.5 miles from the Project. Retention of the existing and expansion of future transit routes is dependent on transit ridership demand and available funding.

Route M3 runs on “G” Street and Yosemite Avenue adjacent to the proposed Project. Its nearest stops to the Project are located along the south side of Yosemite Avenue approximately 100 feet east of “G” Street and along the west side of “G” Street approximately 1,600 feet north of Yosemite Avenue. Route M3 operates at 30-minute intervals on weekdays and 90-minute intervals on weekends. This route provides a direct connection to County Administration, Police Department, Target, Walmart, Merced Mall, Merced College, Social Security, Mercy Hospital, and Raley’s.

Route M4 runs on “G” Street and Yosemite Avenue adjacent to the proposed Project. Its nearest stops to the Project are located along the south side of Yosemite Avenue approximately 100 feet east of “G” Street and along the west side of “G” Street approximately 1,600 feet north of Yosemite Avenue. Route M4 operates at 30-minute intervals on weekdays and 90-minute intervals on weekends. This route provides a direct connection to East Campus, Savemart, Raley’s, Merced College, Mercy Medical, Health Department, Family Care Clinic, Fairgrounds, and Mental Health.

Route UC runs on “G” Street adjacent to the proposed Project. Its nearest stop to the Project is located along the west side of “G” Street approximately 1,600 feet north of Yosemite Avenue. Route UC operates at 40-minute intervals on weekdays and weekends. This route provides a direct connection to Merced College, Amtrak, Mercy Medical, Promenade, UC Merced, Social Security, Downtown area, and University Medical.

Trip Generation

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 II presents the trip generation for the proposed Project site with trip generation rates for Medical-Dental Office Building, Hotel, Fast-Food Restaurant with Drive-Through Window, Gasoline/Service Station with Convenience Market, Shopping Center, High-Turnover (Sit-Down) Restaurant, General Office Building, Day Care Center, and Apartments. The Project buildout is estimated to generate a maximum of 13,160 daily trips, 1,009 AM peak hour trips and 1,059 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account).

ATTACHMENT G

JLB also analyzed the estimated maximum trip generation of a prior version of the Project Site Plan. Due to a lack of secured users for the site, the exact square footages of the pads shown on the latest Project Site Plan may differ. This TIA provides an analysis of potential traffic impacts based on the best knowledge available to the developer as to the mix of land uses and square footages that can be accommodated within the Project site. Table III presents the trip generation for a prior Project Site Plan with trip generation rates for Medical Dental Office Building, Hotel, Fast-Food Restaurant with Drive-Through Window, Gasoline/Service Station with Convenience Market, Shopping Center, Coffee/Donut Shop with Drive-Through Window, Automated Car Wash, General Office Building, Day Care Center and Apartments. At buildout, the prior Project Site Plan is anticipated to generate a maximum of 13,741 daily trips, 1,092 AM peak hour trips and 1,074 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account).

Compared to the prior Project Site Plan, the latest Project Site Plan is estimated to yield less traffic by 581 daily trips, 83 AM peak hour trips and 15 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). Therefore, in order to provide a conservative analysis of the Project's traffic impacts, this TIA assumed the trip generation of the prior Project Site Plan. The difference in trip generation is summarized in Table IV.

Table II: Project Trip Generation based on Latest Project Site Plan

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*
						%						*%*				
Medical-Dental Office Building (720)	66.465	k.s.f.	34.8	2,313	2.78	78	22	144	41	185	3.46	28	72	64	166	230
Hotel (310)	128	o.r.	8.36	1,070	0.47	59	41	35	25	60	0.60	51	49	39	38	77
Fast-Food Restaurant with Drive-Through Window (934)	11.458	k.s.f.	470.95	5,396	40.19	51	49	235	225	460	32.67	52	48	194	180	374
Gasoline/Service Station with Convenience Market (945)	12	f.p.	205.36	2,464	12.47	51	49	77	73	150	13.99	51	49	86	82	168
Shopping Center (820)	18.222	k.s.f.	37.75	688	0.94	62	38	11	6	17	3.81	48	52	33	36	69
High-Turnover (Sit-Down) Restaurant (932)	5.000	k.s.f.	112.18	561	9.94	55	45	28	22	50	9.77	62	38	30	19	49
General Office Building (710)	12.000	k.s.f.	9.74	117	1.16	86	14	12	2	14	1.15	16	84	2	12	14
Day Care Center (565)	4.804	k.s.f.	47.62	229	11.00	53	47	28	25	53	11.12	47	53	25	28	53
Apartment (220)	44	d.u.	7.32	322	0.46	23	77	5	15	20	0.56	63	37	16	9	25
Total Project Trip Generation				**13,160**				**575**	**434**	**1,009**				**489**	**570**	**1,059**

Note: * = Daily Rate assumed to be 12 times the PM peak hour rate. AM peak hour rate assumed to be the equal to the PM peak hour rate.
k.s.f. = Thousand Square Feet
o.r. = Occupied Rooms
f.p. = Fueling Positions
d.u. = Dwelling Units

Table III: Project Trip Generation based on Prior Project Site Plan

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***
						%						***%***				
Medical-Dental Office Building (720)	66.465	k.s.f.	34.8	2,313	2.78	78	22	144	41	185	3.46	28	72	64	166	230
Hotel (310)	107	o.r.	8.36	895	0.47	59	41	30	20	50	0.60	51	49	33	31	64
Fast-Food Restaurant with Drive-Through Window (934)	9.066	k.s.f.	470.95	4,270	40.19	51	49	186	178	364	32.67	52	48	154	142	296
Gasoline/Service Station with Convenience Market (945)	12	f.p.	205.36	2,464	12.47	51	49	77	73	150	13.99	51	49	86	82	168
Shopping Center (820)	20.896	k.s.f.	37.75	789	0.94	62	38	12	8	20	3.81	48	52	38	42	80
Coffee/Donut Shop with Drive-Through Window (937)	2.016	k.s.f.	820.38	1,654	88.99	51	49	91	88	179	43.38	50	50	44	43	87
Automated Car Wash (948)*	3.866	k.s.f.	170.40	659	14.20	50	50	28	27	55	14.20	50	50	28	27	55
General Office Building (710)	12.000	k.s.f.	9.74	117	1.16	86	14	12	2	14	1.15	16	84	2	12	14
Day Care Center (565)	4.804	k.s.f.	47.62	229	11.00	53	47	28	25	53	11.12	47	53	25	28	53
Apartment (220)	48	d.u.	7.32	351	0.46	23	77	5	17	22	0.56	63	37	17	10	27
Total Project Trip Generation				**13,741**				**613**	**479**	**1,092**				**491**	**583**	**1,074**

Note: * = Daily Rate assumed to be 12 times the PM peak hour rate. AM peak hour rate assumed to be the equal to the PM peak hour rate.
k.s.f. = Thousand Square Feet
o.r. = Occupied Rooms
f.p. = Fueling Positions
d.u. = Dwelling Units

Table IV: Difference in Trip Generation

	Daily	***AM (7-9) Peak Hour***			***PM (4-6) Peak Hour***		
	Total	***In***	***Out***	***Total***	***In***	***Out***	***Total***
Latest Project Site Plan	13,160	575	434	1,009	489	570	1,059
Prior Project Site Plan	13,741	613	479	1,092	491	583	1,074
Difference in Trip Generation	**-581**	**-38**	**-45**	**-83**	**-2**	**-13**	**-15**

The TIA takes into account reductions in trip generation as a result of internal capture. Internal capture rates were prepared pursuant to the NCHRP 684 Internal Trip Capture procedure. Internal capture trip reductions are applied to account for the interaction between various individual land uses assumed for the trip generation of the Project. For example, in a mixed-use development containing offices and shops, trips made by the office workers to the shops within the site are defined as internal, or captured, trips within the site. Table V presents the results of the internal capture trip analysis for the proposed Project. Captured trips are presented as negative numbers because they are deducted from the total number of trips presented in Table III. Table VI presents the adjusted trip generation resulting from the internal capture reductions.

Table V: Internal Capture Trip Reductions

Land Use (ITE Code)	*Daily*	*AM (7-9) Peak Hour*			*PM (4-6) Peak Hour*		
	Total	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Medical-Dental Office Building (720)	-370	-30	-37	-67	-8	-14	-22
Hotel (310)	-143	-1	-10	-11	-19	-12	-31
Fast-Food Restaurant with Drive-Through Window (934)	-683	-29	-20	-49	-40	-64	-104
Gasoline/Service Station with Convenience Market (945)	-394	-19	-15	-34	-54	-34	-88
Shopping Center (820)	-126	-3	-2	-5	-24	-18	-42
Coffee/Donut Shop with Drive-Through Window (937)	-265	-14	-10	-24	-12	-20	-32
Automated Car Wash (948)	0	0	0	0	0	0	0
General Office Building (710)	-19	-3	-2	-5	0	-1	-1
Day Care Center (565)	0	0	0	0	0	0	0
Apartment (220)	56	0	-3	-3	-12	-6	-18
Internal Capture Trip Reductions	**-2,056**	**-99**	**-99**	**-198**	**-169**	**-169**	**-338**

Table VI: Project Trip Generation Adjusted for Internal Capture Trip Reductions

Land Use (ITE Code)	*Daily*	*AM (7-9) Peak Hour*			*PM (4-6) Peak Hour*		
	Total	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Medical-Dental Office Building (720)	1,943	114	4	118	56	152	208
Hotel (310)	752	29	10	39	14	19	33
Fast-Food Restaurant with Drive-Through Window (934)	3,587	157	158	315	114	78	192
Gasoline/Service Station with Convenience Market (945)	2,070	58	58	116	32	48	80
Shopping Center (820)	663	9	6	15	14	24	38
Coffee/Donut Shop with Drive-Through Window (937)	1,389	77	78	155	32	23	55
Automated Car Wash (948)	659	28	27	55	28	27	55
General Office Building (710)	98	9	0	9	2	11	13
Day Care Center (565)	229	28	25	53	25	28	53
Apartment (220)	295	5	14	19	5	4	9
Adjusted Project Trip Generation	**11,685**	**514**	**380**	**894**	**322**	**414**	**736**

ATTACHMENT G

In addition to internal capture trip reductions, the TIA also applies pass-by trip reductions pursuant to the 3rd Edition of the Trip Generation handbook published by ITE. Pass-by trip reductions are applied to vehicles already on the road that the Project may attract. Table VII presents the results of the pass-by trip reduction analysis for the proposed Project. Pass-by trips are presented as negative numbers because they are deducted from the total number of trips presented in Table VI. Table VIII presents the adjusted trip generation resulting from the pass-by trip reductions. As can be seen from Table VIII, the maximum net new trips that the Project is estimated to generate are 10,096 daily trips, 664 AM peak hour trips and 582 PM peak hour trips.

Table VII: Pass-By Trip Reductions

Land Use (ITE Code)	***Daily***	***AM (7-9) Peak Hour***			***PM (4-6) Peak Hour***		
	Total	***In***	***Out***	***Total***	***In***	***Out***	***Total***
Medical-Dental Office Building (720)	0	0	0	0	0	0	0
Hotel (310)	0	0	0	0	0	0	0
Fast-Food Restaurant with Drive-Through Window (934)	-897	-77	-77	-154	-48	-48	-96
Gasoline/Service Station with Convenience Market (945)	-580	-38	-38	-76	-22	-22	-44
Shopping Center (820)	-113	0	0	0	-7	-7	-14
Coffee/Donut Shop with Drive-Through Window (937)	0	0	0	0	0	0	0
Automated Car Wash (948)	0	0	0	0	0	0	0
General Office Building (710)	0	0	0	0	0	0	0
Day Care Center (565)	0	0	0	0	0	0	0
Apartment (220)	0	0	0	0	0	0	0
Pass-By Trip Reductions	**-1,589**	**-115**	**-115**	**-230**	**-77**	**-77**	**-154**

Table VIII: Project Trip Generation Adjusted for Pass-By Trip Reductions

Land Use (ITE Code)	*Daily*	*AM (7-9) Peak Hour*			*PM (4-6) Peak Hour*		
	Total	*In*	*Out*	*Total*	*In*	*Out*	*Total*
Medical-Dental Office Building (720)	1,943	114	4	118	56	152	208
Hotel (310)	752	29	10	39	14	19	33
Fast-Food Restaurant with Drive-Through Window (934)	3,587	80	81	161	66	30	96
Gasoline/Service Station with Convenience Market (945)	2,070	20	20	40	10	26	36
Shopping Center (820)	663	9	6	15	7	17	24
Coffee/Donut Shop with Drive-Through Window (937)	1,389	77	78	155	32	23	55
Automated Car Wash (948)	659	28	27	55	28	27	55
General Office Building (710)	98	9	0	9	2	11	13
Day Care Center (565)	229	28	25	53	25	28	53
Apartment (220)	295	5	14	19	5	4	9
Adjusted Project Trip Generation	**10,096**	**399**	**265**	**664**	**245**	**337**	**582**

Trip Distribution

The Total Project Only Trips to the study intersections were developed based on existing travel patterns, the existing roadway network, engineering judgment, data provided by the developer, knowledge of the study area, existing residential and commercial densities, and the Merced Vision 2030 General Plan Transportation and Circulation Element in the vicinity of the Project. Figure 4 presents the Project Only Trips to the study intersections, Figure 5 presents the Project's Pass-By Trip Reductions at the study intersections, and Figure 6 presents the Net New Project Only Trips at the study intersections.

Safe Routes to School

Kindergarten through 8th grade students from the Project will be served by the Merced City School District (MCSD) and 9th through 12th grade students will be served by the Merced Union High School District (MUHSD). The MUHSD provides transportation for students who live in excess of an established radius (2.5 miles) zone.

Based on attendance area boundaries at the time of the preparation of this TIA, elementary school students would attend Peterson Elementary School located on the southwest corner of the intersection of Paulson Road and Donna Drive. Peterson Elementary School is located 0.56 and 0.65 miles from the nearest and farthest future home on the Project. Therefore, it is anticipated that the majority of elementary school students will need to walk, bike or be driven to school.

The most direct path from the Project to the Peterson Elementary School campus would begin from the intersection of Sandpiper Avenue and Yosemite Avenue. The intersection of Sandpiper Avenue and Yosemite Avenue will be controlled by a one-way stop on Sandpiper Avenue and contained a marked crosswalk on the southbound approach. Students would proceed to cross Sandpiper Avenue along the north side of Yosemite Avenue and continue east along the north side of Yosemite Avenue toward the intersection of Mansionette Drive and Yosemite Avenue. The intersection of Mansionette Drive and Yosemite Avenue is signalized and contains crosswalks on the westbound and southbound approaches. Students would proceed to cross Mansionette Drive and Yosemite Avenue and continue east along the south side of Yosemite Avenue toward the intersection of Cordova Avenue and Yosemite Avenue. The intersection of Cordova Avenue and Yosemite Avenue is controlled by a one-way stop on Cordova Avenue and contains unmarked crosswalks. Students may proceed south along the west side of Cordova Avenue toward the intersection of Cordova Avenue and Donna Drive. The intersection of Cordova Avenue and Donna Drive is controlled by an all-way stop and contains marked crosswalks on all approaches. Students may proceed to cross Donna Drive along the west side of Cordova Avenue and then cross Cordova Avenue along the south side of Donna Drive. Students may then continue east along the south side of Donna Drive until reaching the nearest campus entrance.

Based on attendance area boundaries at the time of the preparation of this TIA, middle school students would attend Cruickshank Middle School located north of the intersection of Mansionette Drive and Mercy Avenue. Cruickshank Middle School is located 0.30 and 0.39 miles from the nearest and farthest future home on the Project. Therefore, it is anticipated that the majority of middle school students will need to walk, bike or be driven to school.

The most direct path from the Project to the Cruickshank Middle School campus would begin from the intersection of Sandpiper Avenue and Mercy Avenue. The intersection of Sandpiper Avenue and Mercy Avenue is controlled by a two-way stop on Sandpiper Avenue and the driveway located immediately to the north and contains a marked crosswalk on the northbound approach. Students would proceed to cross Sandpiper Avenue along the south side of Mercy Avenue and continue east along the south side of Mercy Avenue toward the intersection of Mansionette Drive and Mercy Avenue. The intersection of Mansionette Drive and Mercy Avenue is controlled by an all-way stop and contains high-visibility crosswalks across the westbound and northbound approaches. Students may proceed to cross Mansionette Drive and Yosemite Avenue to reach the nearest campus entrance.

Based on attendance area boundaries at the time of the preparation of this TIA, high school students would attend El Capitan High School located on the southwest corner of the intersection of “G” Street and Farmland Road. El Capitan High School is located 2.17 and 2.25 miles from the nearest and farthest future home on the Project. Therefore, it is anticipated that most students will need to walk, bike or be driven to school. Based on the distance between the Project site and the high school campus, it is estimated that the majority of high school students will be driven to school.

The most direct path from the Project to the El Capitan High School campus would begin from the intersection of “G” Street and Mercy Avenue. The intersection of “G” Street and Mercy Avenue is signalized and contains marked crosswalks across the eastbound, westbound and southbound approaches. Students would proceed to cross Mercy Avenue and “G” Street. Although there is a lack of walkways along the west side of “G” Street, students would proceed north along the west side of “G” Street toward the intersection of “G” Street and Cardella Road. The intersection of “G” Street and Cardella Road is signalized and contains unmarked crosswalks on all approaches. Students would proceed to cross Cardella Road, however, to do so it would be necessary to add a pedestrian phase across the west approach of Cardella Road. Students would then continue north along the west side of “G” Street toward the intersection of “G” Street and Noble Drive. The intersection of “G” Street and Noble Drive is controlled by a one-way stop on Noble Drive and contains a marked crosswalk on the eastbound approach. Students would proceed to cross Noble Drive and continue north along the west side of “G” Street toward the intersection of “G” Street and Foothill Drive. The intersection of “G” Street and Foothill Drive is signalized and contains a marked crosswalk on the eastbound approach. Students would proceed to cross Foothill Drive and continue north along the west side of “G” Street toward the intersection of “G” Street and Mandeville Lane. The intersection of “G” Street and Mandeville Lane is controlled by a one-way stop on Mandeville Lane and contains a marked crosswalk on the eastbound approach. Students would proceed to cross Mandeville Lane and continue north along the west side of “G” Street toward the intersection of “G” Street and Bellevue Road. The intersection of “G” Street and Bellevue Road is signalized and contains marked crosswalks across the eastbound and southbound approaches. Students would proceed to cross Bellevue Road and continue north along the west side of “G” Street toward the intersection of “G” Street and Farmland Avenue to reach the nearest campus entrance.

Since the walking distance between the Project and the El Capitan High School campus is approximately 2.25 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 El Capitan High School, it is recommended that the MUHSD work with the City of Merced and County of Merced to implement a Safe Routes to School plan and to seek grant funding to help build walkways where they are lacking within a 2.5-mile radius of the existing school site.

ATTACHMENT G

Vehicle Miles Traveled

Senate Bill (SB) 743 (Steinberg 2013) was approved by then Governor Brown on September 27, 2013. SB 743 created a path to revise the definition of transportation impacts according to CEQA. The revised CEQA Guidelines requiring VMT analysis became effective December 28, 2018; however, agencies have until July 1, 2020 to finalize their local guidelines on VMT analysis. Therefore, as agencies finalize their VMT analysis protocol, CEQA transportation impacts are to be determined using LOS of intersections and roadways, which is a measure of congestion. The intent of SB 743 is to align CEQA transportation study methodology with and promote the statewide goals and policies of reducing vehicle miles traveled (VMT) and greenhouse gases (GHG). Three objectives of SB 743 related to development are to reduce GHG, diversify land uses, and focus on creating a multimodal environment. It is hoped that this will spur infill development.

The Technical Advisory on Evaluating Transportation Impacts in CEQA published by the Governor's Office of Planning and Research (OPR) dated December 2018 acknowledges that lead agencies should set criteria and thresholds for VMT and transportation impacts. However, the Technical Advisory provides guidance to residential, office and retail uses, citing these as the most common land uses. Beyond these three land uses, there is no guidance provided for any other land use type. The Technical Advisory also notes that land uses may have a less than significant impact if located within low VMT areas of a region. Screening maps are suggested for this determination.

VMT is simply the product of a number of trips and the length of those trips. The first step in a VMT analysis is to establish the baseline average VMT, which requires the definition of a region. The Technical Advisory states that existing VMT may be measured at the regional or city level. On the contrary, the Technical Advisory also notes that VMT analyses should not be truncated due to "jurisdictional or other boundaries."

As the Project is within a defined service area, it is likely that the Project would not add VMT per capita of service population to the region. Additionally, the Project site is located near transit services and pedestrian and bicycle networks. In the near future, the City may wish to coordinate with the regional agency (MCAG) and develop criteria and thresholds that balance the direction from OPR and the goals of sB743 with the vision for Merced and economic development, affordable housing, access to goods and services, and overall quality of life.

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the Existing plus Project Traffic Conditions scenario. These warrants are found in Appendix I. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of "G" Street and Project Driveway 1 is projected to satisfy the peak hour signal warrant during both peak periods. Based on the signal warrant and engineering judgment, signalization of this intersection is recommended.

Results of Existing plus Project Level of Service Analysis

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

Under this scenario, the intersection of "G" Street and Project Driveway 1 is projected to exceed its LOS threshold during the AM peak period only. To improve the LOS at this intersection, it is recommended that the following improvements be implemented.

- "G" Street / Project Driveway 1
    - Signalize the intersection with protective left-turn phasing in all directions.

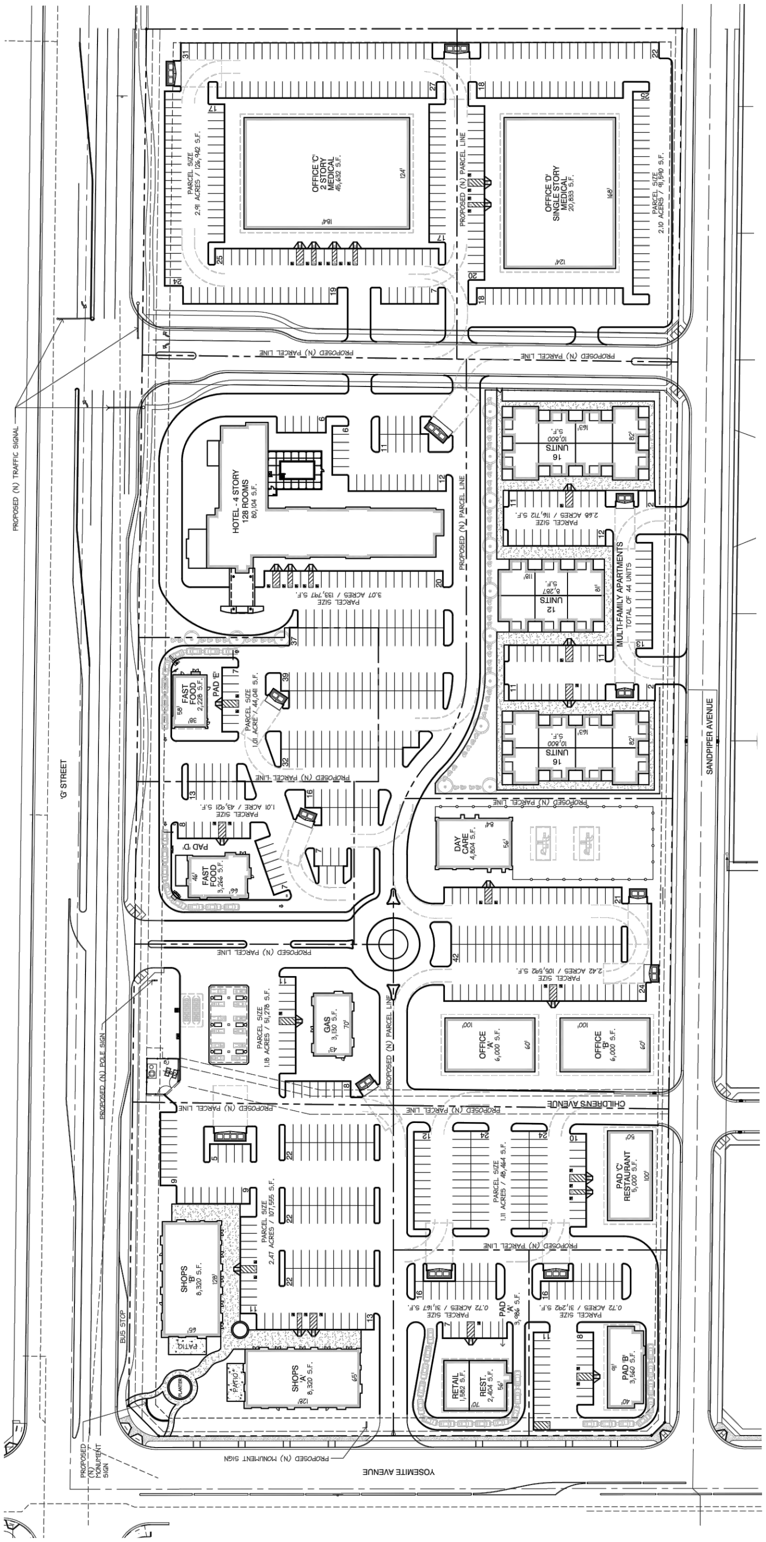
Table IX: Existing plus Project Intersection LOS Results

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	"G" Street / Mercy Avenue	Signalized	35.4	D	27.9	C
2	Sandpiper Avenue / Mercy Avenue	Two-Way Stop	24.9	C	15.0	C
3	"G" Street / Project Driveway 1	One-Way Stop	**51.9**	**F**	31.7	D
		Signalized (Mitigated)	15.3	B	8.9	A
4	"G" Street / Project Driveway 2	One-Way Stop	12.2	B	10.7	B
5	"G" Street / Yosemite Avenue	Signalized	46.4	D	47.1	D
6	Sandpiper Avenue / Yosemite Avenue	One-Way Stop	11.4	B	12.2	B
7	Mansionette Drive / Yosemite Avenue	Signalized	8.2	A	6.7	A
8	Paulson Road / Yosemite Avenue	Signalized	46.2	D	31.0	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.

Merced Mixed-Use Development - City of Merced
Project Site Plan

Figure 3



JLB TRAFFIC ENGINEERING, INC.

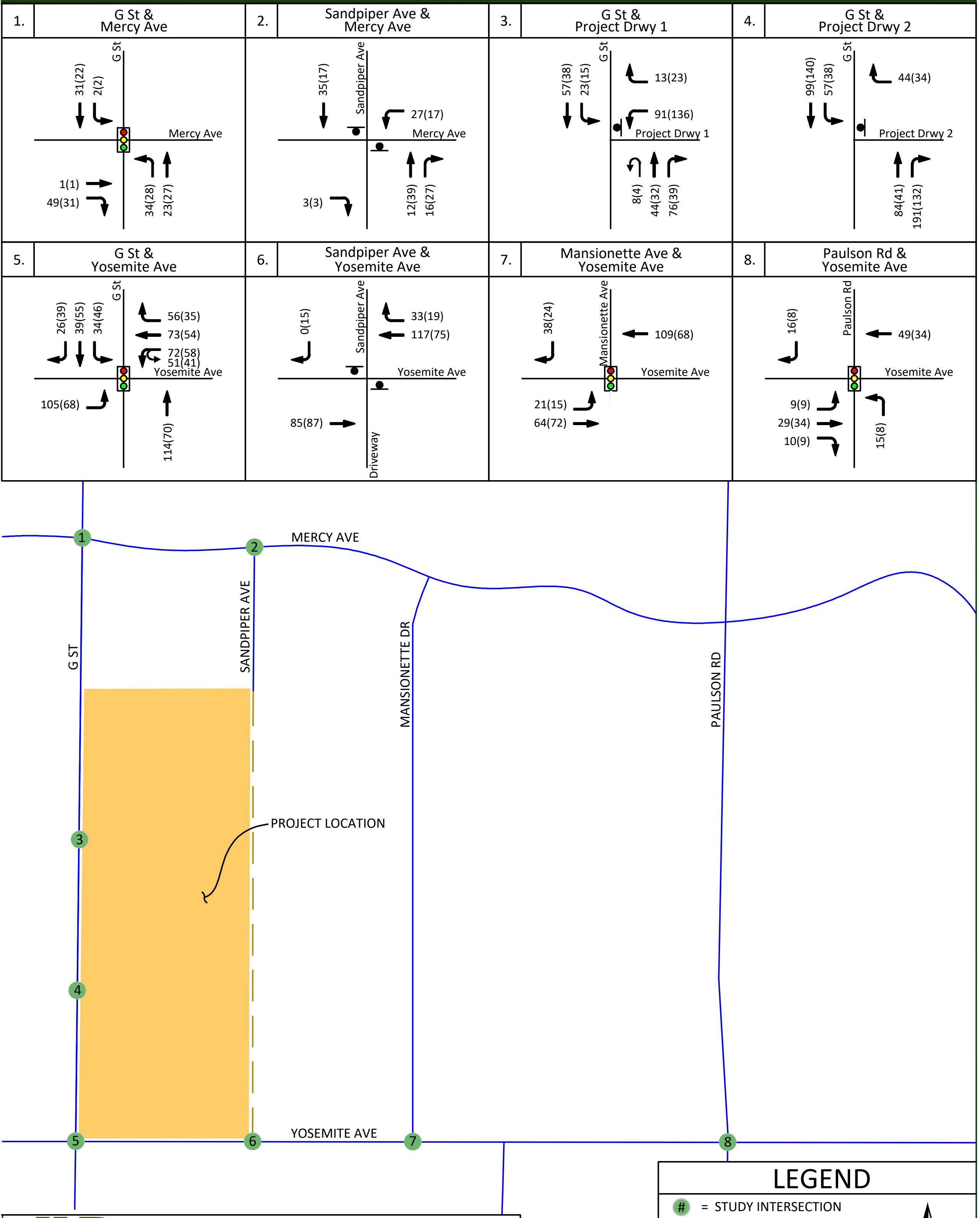
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

Not To Scale

ATTACHMENT G

Merced Mixed-Use Development - City of Merced
Total Project Only Trips

Figure 4



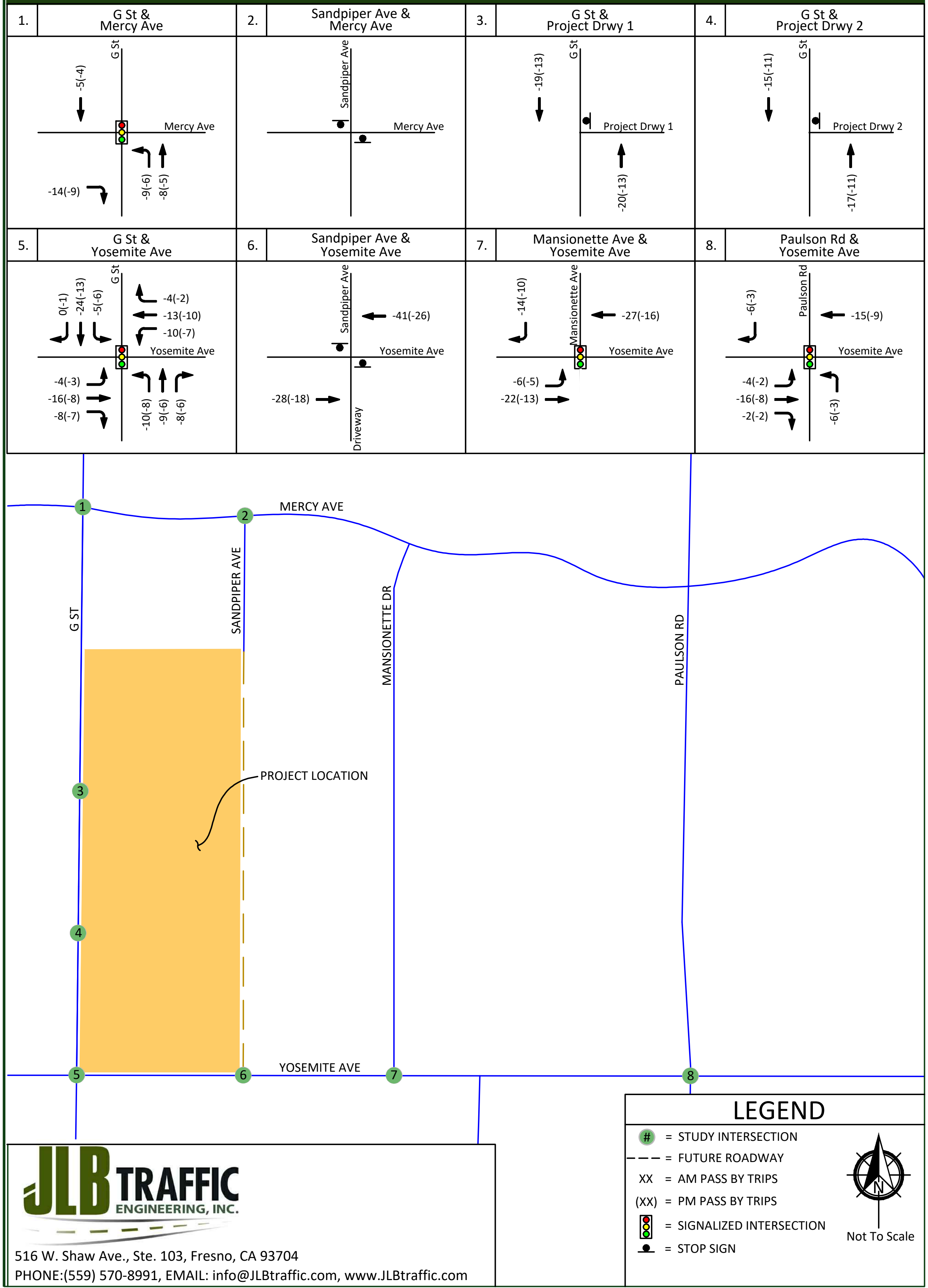
JLB TRAFFIC ENGINEERING, INC.

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

ATTACHMENT G

Merced Mixed-Use Development - City of Merced
Pass-By Trip Reductions

Figure 5



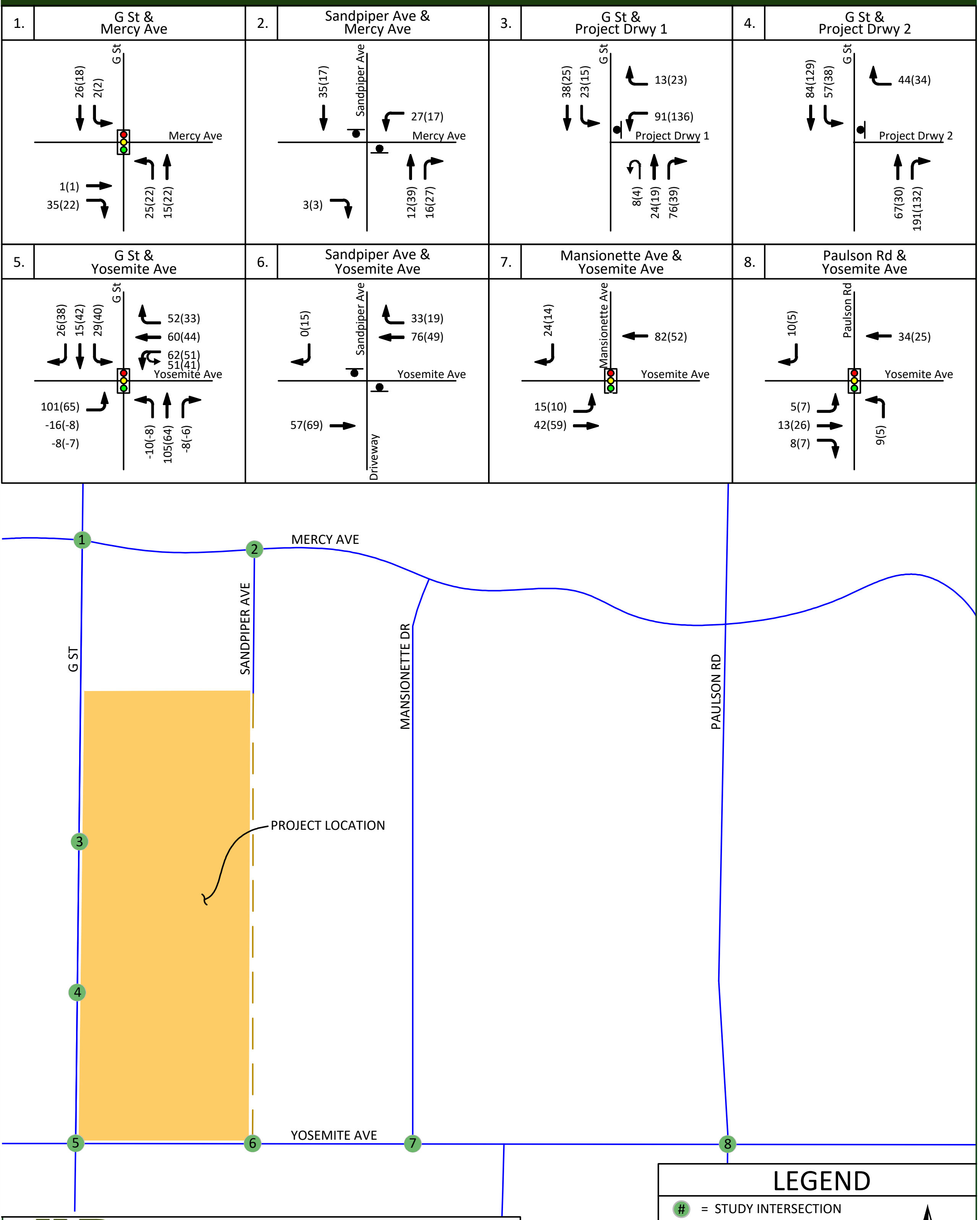
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

035-003 - 09/24/19 - JB/AB/MA

ATTACHMENT G

Merced Mixed-Use Development - City of Merced
Net New Project Only Trips

Figure 6



LEGEND

- ● # = STUDY INTERSECTION
- – – – = FUTURE ROADWAY
- XX = AM NET NEW PROJECT TRIPS
- (XX) = PM NET NEW PROJECT TRIPS
- 🚦 = SIGNALIZED INTERSECTION
- ● = STOP SIGN

N

Not To Scale

JLB TRAFFIC ENGINEERING, INC.

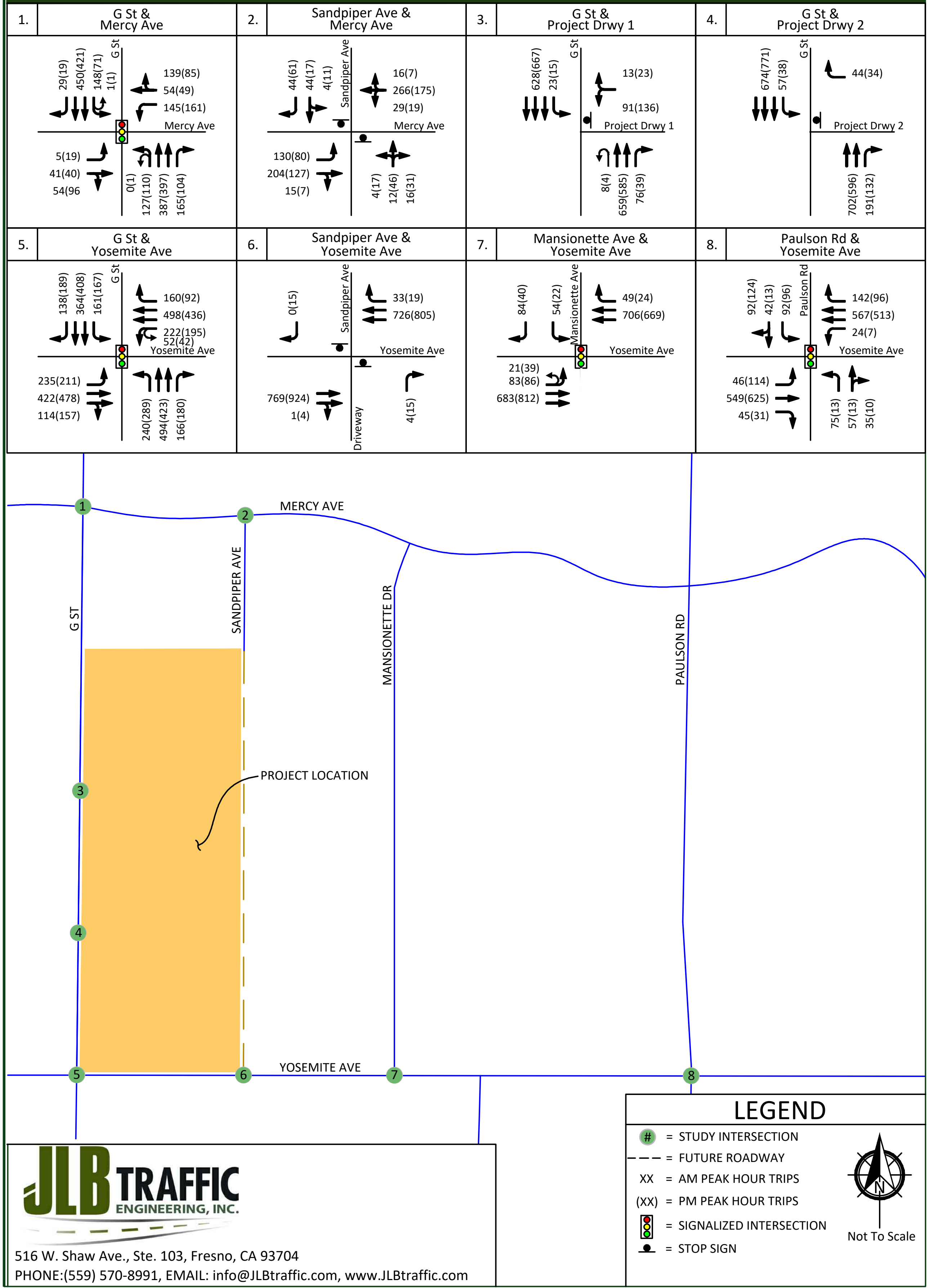
516 W. Shaw Ave., Ste. 103, Fresno, CA 93704
PHONE:(559) 570-8991, EMAIL: info@JLBtraffic.com, www.JLBtraffic.com

035-003 - 09/24/19 - JG/AB/MA

ATTACHMENT G

Merced Mixed-Use Development - City of Merced
Existing plus Project - Traffic Volumes, Geometrics and Controls

Figure 7



JLB TRAFFIC ENGINEERING, INC.

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

035-003 - 09/24/19 - AB/MA

ATTACHMENT G

Near Term plus Project 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. The City of Merced, County of Merced and Caltrans staff were consulted throughout the preparation of this TIA regarding approved and/or known projects that could potentially impact the study intersections. JLB staff conducted a reconnaissance of the surrounding area to confirm the Near Term Projects. Subsequently, it was agreed that the projects listed in Table X were 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 five years after build-out of the Project estimated to be year 2025. As shown in Table X, the total trip generation for the Near Term Projects by year 2025 is 76,956 daily trips, 4,228 AM peak hour trips and 7,565 PM peak hour trips. Figure 8 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 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	Bellevue Ranch 2, Phases 3 & 4[1]	274	21	29
B	Bellevue Ranch North, Village 23[1]	548	43	57
C	Bellevue Ranch West, Villages 17 & 18[1]	2,351	184	247
D	Bellevue Ranch East, Village 15 (Phase I) (portion of)[1]	66	5	7
E	Bellevue Ranch East, Village 14 (Phase 2) (portion of)[1]	94	7	10
F	Bellevue Ranch West, Village 12[1]	2,284	179	240
G	Bellevue Ranch West, Village 10 (portion of)[1]	972	76	102
H	Bellevue Ranch East, Village 8 (Phase I) (portion of)[1]	104	8	11
I	Bellevue Ranch East, Village 8 (Phase 2)[1]	85	7	9
J	Bright Development[1]	1,586	124	166
K	Regency Court Apartments[1]	1,318	83	101
L	Bellevue Ranch East, Lot Q (portion of)[1]	198	16	21
M	Bellevue Ranch East, Village 7 (portion of)[1]	104	8	11
N	Bellevue Ranch West, Village 5 (portion of)[1]	689	54	72
O	Bellevue Ranch West, Village 4 (portion of)[1]	727	57	76
P	Bellevue Ranch West, Village 3 (portion of)[1]	2,058	161	216
Q	Bellevue Ranch West, Village 2 (portion of)[1]	1,576	124	165
R	Latana Estates South, Phase I (portion of)[1]	566	44	59
S	Terrazzo[1]	661	52	69
T	Shadow Creek at Campus Pointe (portion of)[1]	142	11	15
U	Cottages at El Redondo (portion of)[1]	755	59	79
V	Northview Medical Offices[1]	2,312	185	230

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

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

Approved Project Location	*Approved or Pipeline Project Name*	*Daily Trips*	*AM Peak Hour*	*PM Peak Hour*
W	Mansionette Estates, Phase 5[1]	189	15	20
X	University Village Merced Annexation[1]	3,926	190	337
Y	Yosemite & McKee Commercial Center[1]	2,341	58	236
Z	Moraga (Phase I) (portion of)[1]	1,992	156	209
AA	University Village Merced – Lake[1]	1,896	110	151
AB	Campus Vista Unit 2 (portion of)[1]	217	17	23
AC	Camelot 2[1]	179	14	19
AD	Summer Creek[1]	1,331	104	140
AE	Bianchi/Norcal Cajun Annexation[1]	1,586	39	160
AF	Merced Mall Expansion & Redevelopment (Alt. 1)[2]	4,892	47	367
AG	Pro-Lube/Car Wash/Sandwich Shop[1]	593	15	60
AH	Prime Shine[1]	944	79	79
AI	El Capitan Hotel[1]	836	47	60
AJ	Sierra Vista (Phases 2 &3) (portion of)[1]	623	49	65
AK	Tuscany East[1]	444	35	47
AL	PG&E Regional Utility Center[1]	636	111	109
AM	Gas Station/Convenience Market/Car Wash[1]	242	6	24
AN	Towne Place Suites[1]	727	41	52
AO	Salazar[1]	387	30	41
AP	Summer Field[1]	2,379	186	249
AQ	The Crossing at River Oaks[1]	2,615	205	274
AR	Cypress Terrace (Phases 6 & 7)[1]	2,454	192	257
AS	Sandcastle (Phase 3) [1]	859	67	90
AT	Cypress Terrace East (portion of)[1]	746	58	78
AU	Merced Gateway Center[1]	20,964	587	2,081
AV	Mission Ranch (portion of)[1]	1,246	98	131
AW	Stoneridge South[1]	2,242	164	214
Total Approved and Pipeline Project Trips		**76,956**	**4,228**	**7,565**

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

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the Near Term plus Project Traffic Conditions scenario. These warrants are found in Appendix I. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of "G" Street and Project Driveway 1 is projected to satisfy the peak hour signal warrant during both peak periods. Based on the signal warrant and engineering judgment, signalization of this intersection is recommended.

ATTACHMENT G

Results of Near Term plus Project Level of Service Analysis

The Near Term plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 9 illustrates the Near Term plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Near Term plus Project Traffic Conditions scenario are provided in Appendix F. Table XI presents a summary of the Near Term plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue and "G" Street and Project Driveway 1 are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Sandpiper Avenue / Mercy Avenue
  - Stripe a northbound left-turn lane; and
  - Modify the northbound left-through-right lane to a through-right lane.
- "G" Street / Project Driveway 1
  - Signalize the intersection with protective left-turn phasing in all directions.

Between the Existing Traffic Conditions and the Near Term plus Project Traffic Conditions, the Project accounts for 11.6 percent of the daily trips, 13.6 percent of the AM peak hour trips and 7.1 percent of the PM peak hour trips of growth in traffic while the rest can be attributable to the Near Term Projects. Therefore, one can deduce that the majority of the mitigation measures presented under this scenario may not be necessary immediately upon completion of the proposed Project. However, if all of the Near Term Projects are completed close to the completion date of the proposed Project, the detailed recommended improvements presented under this scenario may be necessary in order to improve the LOS to the City's target threshold.

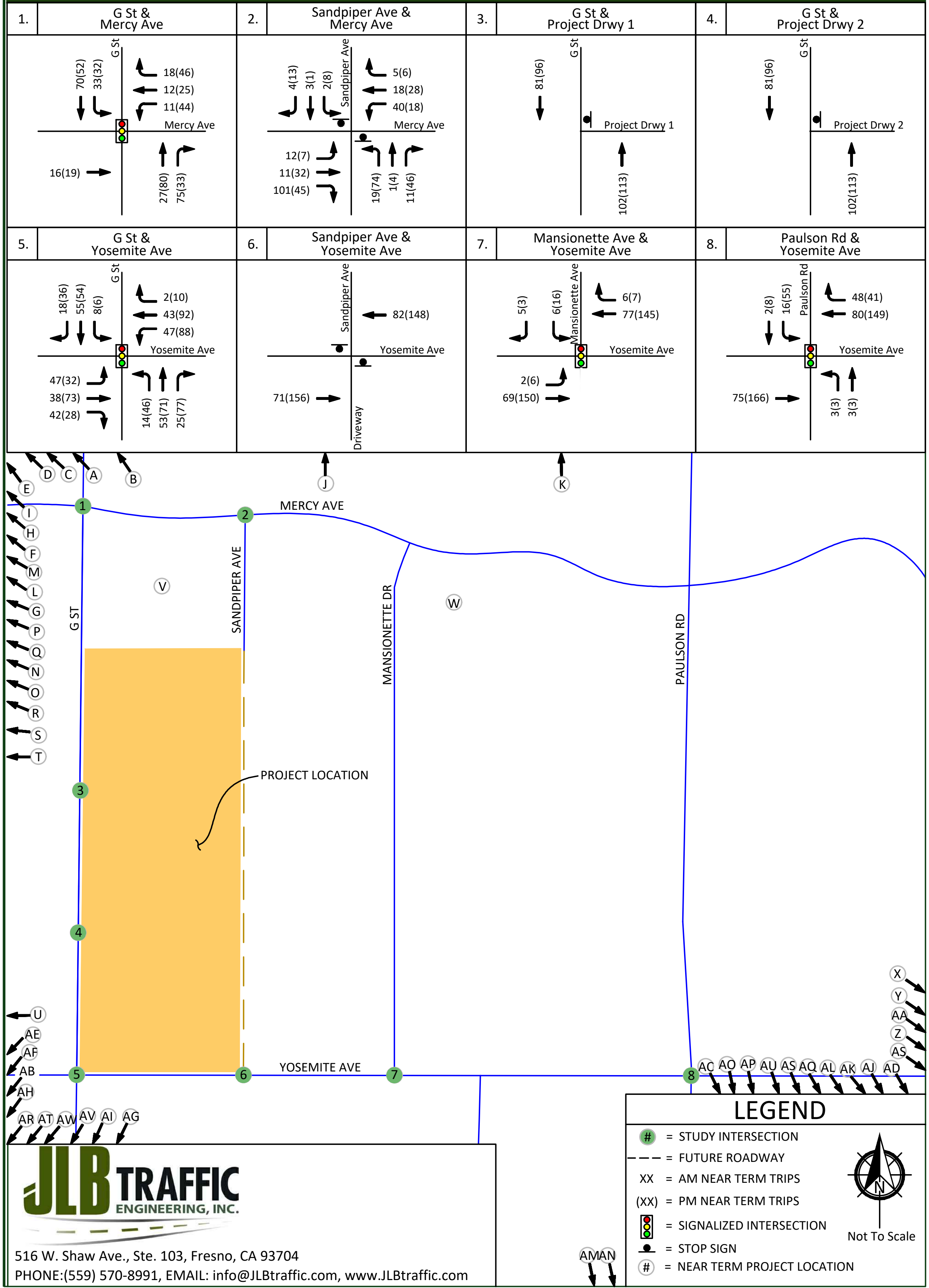
Table XI: Near Term plus Project Intersection LOS Results

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	"G" Street / Mercy Avenue	Signalized	26.9	C	32.3	C
2	Sandpiper Avenue / Mercy Avenue	Two-Way Stop	**39.8**	**E**	34.9	D
		Two-Way Stop (Mitigated)	32.0	D	20.8	C
3	"G" Street / Project Driveway 1	One-Way Stop	**46.1**	**E**	**49.0**	**E**
		Signalized (Mitigated)	10.7	B	8.0	A
4	"G" Street / Project Driveway 2	One-Way Stop	12.2	B	11.3	B
5	"G" Street / Yosemite Avenue	Signalized	53.3	D	59.5	E
6	Sandpiper Avenue / Yosemite Avenue	One-Way Stop	11.8	B	13.1	B
7	Mansionette Drive / Yosemite Avenue	Signalized	10.1	B	8.2	A
8	Paulson Road / Yosemite Avenue	Signalized	47.5	D	41.4	D

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.

Merced Mixed-Use Development - City of Merced
Near Term Projects' Trip Assignment

Figure 8



JLB TRAFFIC ENGINEERING, INC.

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

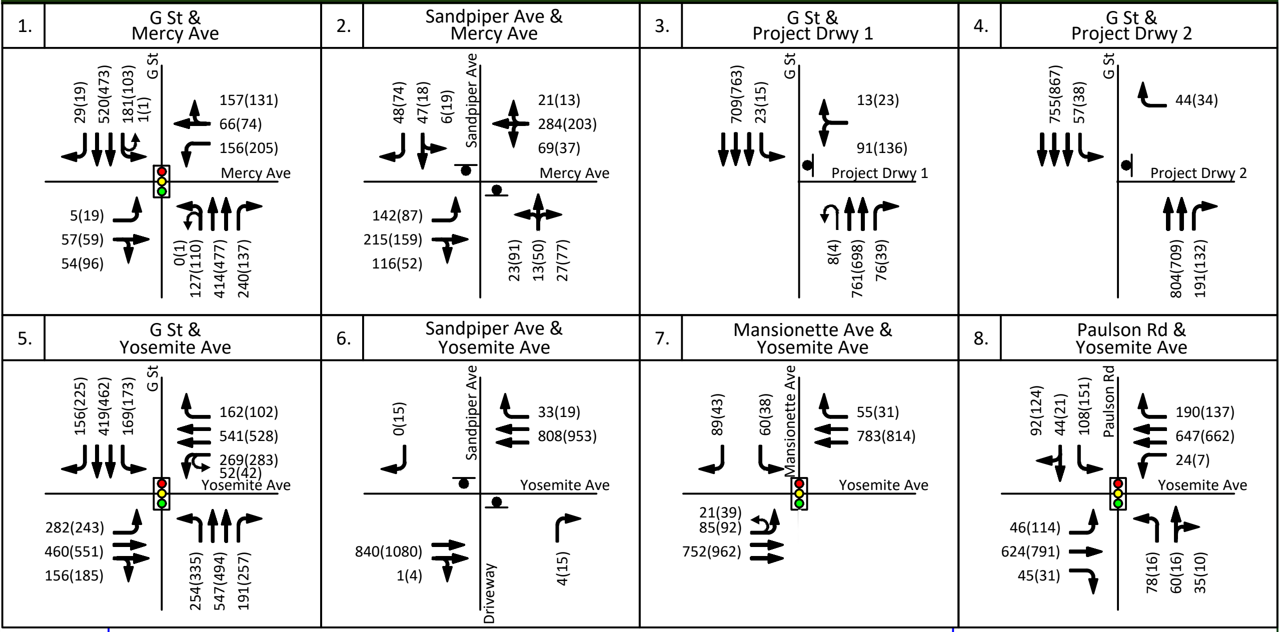
035-003 - 09/24/19 - AB/MA

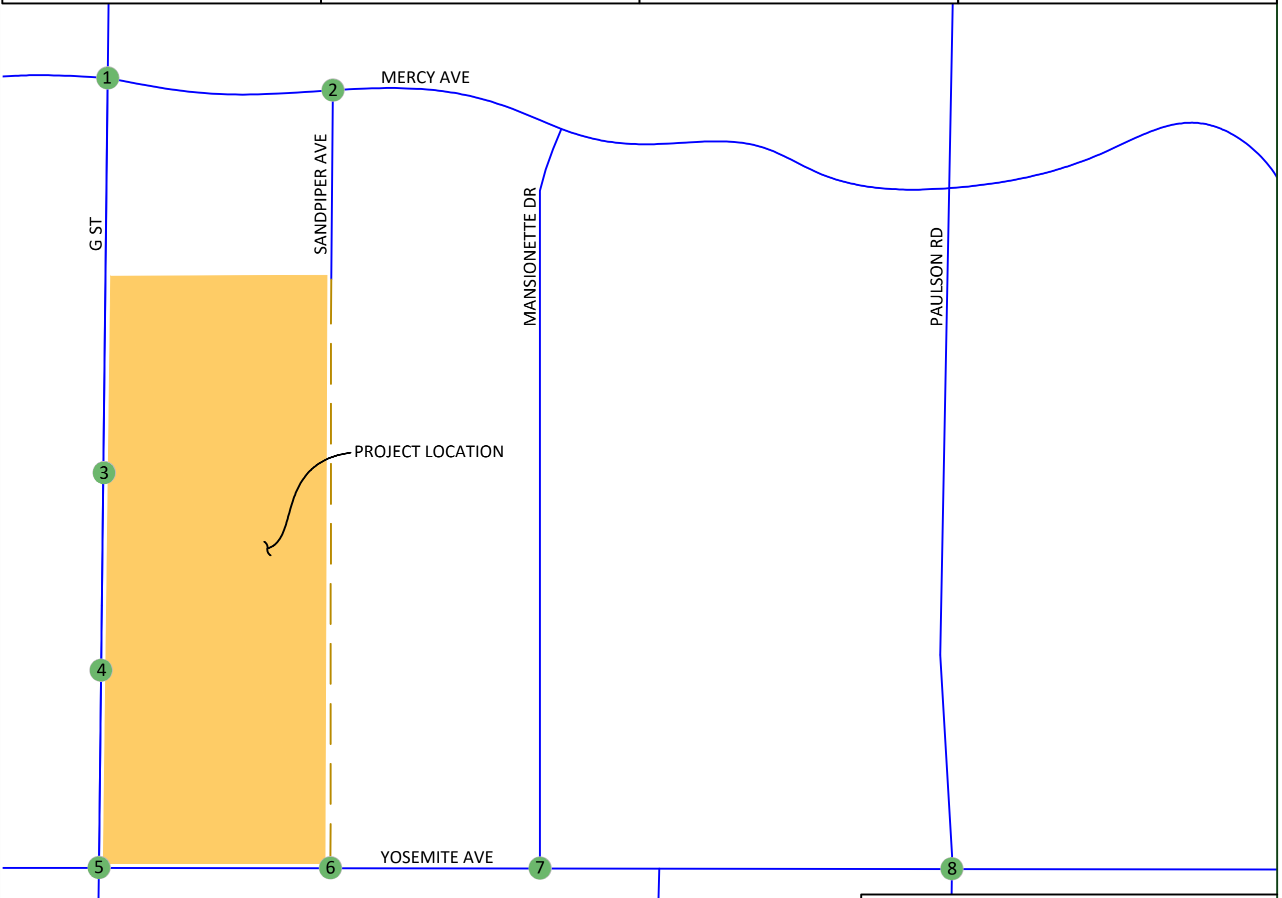
ATTACHMENT G

Merced Mixed-Use Development - City of Merced

Figure 9

Near Term plus Project - Traffic Volumes, Geometrics and Controls





LEGEND

● = STUDY INTERSECTION

— — — = FUTURE ROADWAY

XX = AM PEAK HOUR TRIPS

(XX) = PM PEAK HOUR TRIPS

🚦 = SIGNALIZED INTERSECTION

● = STOP SIGN

Not To Scale

JLB TRAFFIC ENGINEERING, INC.

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

035-003 - 09/24/19 - AB/MA

ATTACHMENT G

Cumulative Year 2039 No Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the Cumulative Year 2039 No Project Traffic Conditions scenario. These warrants are found in Appendix I. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, none of the unsignalized intersections are projected to satisfy the peak hour signal warrant during either peak period.

Results of Cumulative Year 2039 No Project Level of Service Analysis

The Cumulative Year 2039 No Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 10 illustrates the Cumulative Year 2039 No Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2039 No Project Traffic Conditions scenario are provided in Appendix G. Table XII presents a summary of the Cumulative Year 2039 No Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, “G” Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be considered for implementation by the City on a Project by Project assessment as cumulative impacts develop.

- Sandpiper Avenue / Mercy Avenue
  - For the intersection of Sandpiper Avenue and Mercy Avenue, two (2) options for improvement were considered. Option A consists of limiting access from Sandpiper Avenue and the driveway located immediately to the north to Mercy Avenue but maintaining the two-way stop control, while Option B consists of modifying the lane geometrics and implementing an all-way stop control. As can be seen from Table XII, both options provide for an acceptable LOS. However, Option A provides significantly lower delay during the AM peak period when compared to Option B. The recommended improvements for each option are described below.
    - Option A: Two-Way Stop
      - Stripe a westbound left-turn lane;
      - Modify the westbound left-through-right lane to a through-right lane;
      - Modify the northbound left-through-right lane to a right-turn lane; and
      - Remove the southbound left-through lane.
      - To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, northbound left-turns would need to be redirected. Northbound left-turning traffic from Sandpiper Avenue would need to either a) make a westbound right-turn lane onto “G” Street via a future driveway access and then proceed to make their desired movement at the intersection of “G” Street and Mercy Avenue or b) make a northbound left-turn at Mansionette Drive and Mercy Avenue,

proceed through the intersection of Sandpiper Avenue and Mercy Avenue and then proceed to make their desired movement at the intersection of "G" Street and Mercy Avenue. Furthermore, southbound left-turns from the driveway located immediately to the north would need to be redirected. Southbound left-turning traffic from the driveway located immediately to the north would need to use the driveway access located approximately 450 feet east of the Sandpiper alignment to make their desired movement.

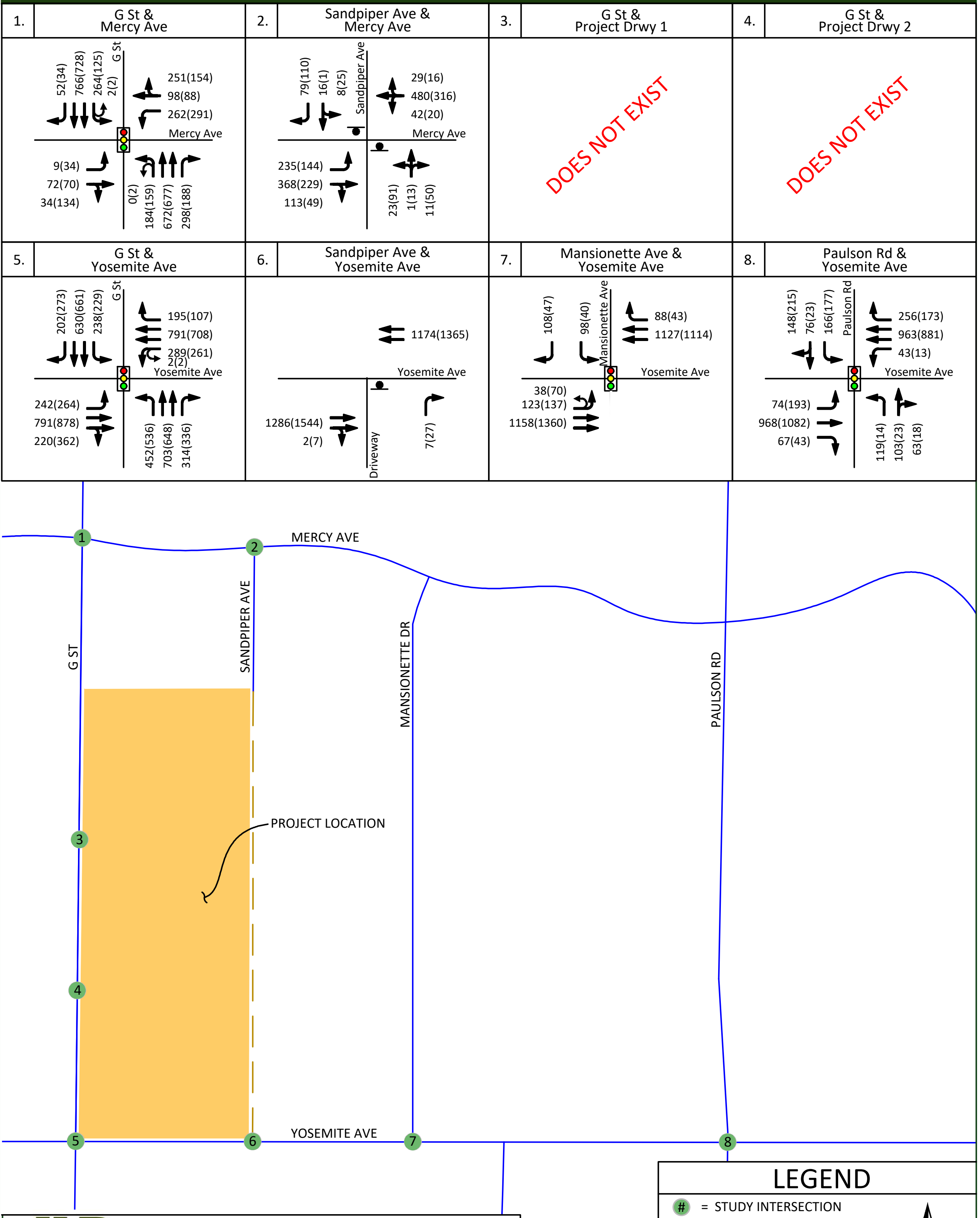
    - Option B: All-Way Stop
        - Add a westbound left-turn lane;
        - Modify the westbound left-through-right lane to a through-right lane;
        - Stripe a northbound left-turn;
        - Modify the northbound left-through-right lane to a through-right lane; and
        - Implement an all-way stop control.
- "G" Street / Yosemite Avenue
    - Add a second southbound left-turn lane; and
    - Modify the traffic signal to implement overlap phasing of the northbound right-turn with the westbound left-turn phase and prohibit westbound to eastbound U-turns.
- Paulson Road / Yosemite Avenue
    - Add an eastbound through-right lane with a receiving lane east of Paulson Road.

Table XII: Cumulative Year 2039 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	"G" Street / Mercy Avenue	Signalized	39.1	D	39.2	D
2	Sandpiper Avenue / Mercy Avenue	Two-Way Stop	**>120.0**	**F**	**72.5**	**F**
		Two-Way Stop (Improved – Option A)	13.2	B	12.1	B
		All-Way Stop (Improved – Option B)	30.7	D	14.9	B
3	"G" Street / Project Driveway 1	Does Not Exist	N/A	N/A	N/A	N/A
4	"G" Street / Project Driveway 2	Does Not Exist	N/A	N/A	N/A	N/A
5	"G" Street / Yosemite Avenue	Signalized	**92.2**	**F**	**112.8**	**F**
		Signalized (Improved)	72.2	E	94.4	F
6	Sandpiper Avenue / Yosemite Avenue	One-Way Stop	14.8	B	17.4	C
7	Mansionette Drive / Yosemite Avenue	Signalized	12.0	B	9.3	A
8	Paulson Road / Yosemite Avenue	Signalized	39.9	D	**97.0**	**F**
		Signalized (Improved)	42.1	D	40.7	D

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.

Merced Mixed-Use Development - City of Merced Figure 10
Cumulative Year 2039 No Project - Traffic Volumes, Geometrics and Controls



LEGEND

● = STUDY INTERSECTION
— — — = FUTURE ROADWAY
XX = AM PEAK HOUR TRIPS
(XX) = PM PEAK HOUR TRIPS
🚦 = SIGNALIZED INTERSECTION
● = STOP SIGN

N
Not To Scale

JLB TRAFFIC ENGINEERING, INC.

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

035-003 - 09/24/19 - AB/MA

ATTACHMENT G

Cumulative Year 2039 plus Project Traffic Conditions

Traffic Signal Warrants

Peak hour traffic signal warrants, as appropriate, were prepared for the Cumulative Year 2039 plus Project Traffic Conditions scenario. These warrants are found in Appendix I. These warrants were prepared pursuant to the CA MUTCD guidelines for the preparation of traffic signal warrants. Under this scenario, the intersection of "G" Street and Project Driveway 1 is projected to satisfy the peak hour signal warrant during both peak periods. Based on the signal warrant and engineering judgment, signalization of this intersection is recommended.

Results of Cumulative Year 2039 plus Project Level of Service Analysis

The Cumulative Year 2039 plus Project Traffic Conditions scenario assumes the same roadway geometrics and traffic controls as those assumed in the Existing Traffic Conditions scenario. Figure 11 illustrates the Cumulative Year 2039 plus Project turning movement volumes, intersection geometrics and traffic controls. LOS worksheets for the Cumulative Year 2039 plus Project Traffic Conditions scenario are provided in Appendix H. Table XIII presents a summary of the Cumulative Year 2039 plus Project peak hour LOS at the study intersections.

Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, "G" Street and Project Driveway 1, "G" Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

- Sandpiper Avenue / Mercy Avenue
  - For the intersection of Sandpiper Avenue and Mercy Avenue, two (2) options for improvement were considered. Option A consists of limiting access from Sandpiper Avenue and the driveway located immediately to the north to Mercy Avenue but maintaining the two-way stop control, while Option B consists of modifying the lane geometrics and implementing an all-way stop control. As can be seen from Table XIII, Option A provides significantly lower delay during the AM peak period when compared to Option B. The recommended improvements for each option are described below.
    - Option A: Two-Way Stop
      - Stripe a westbound left-turn lane;
      - Modify the westbound left-through-right lane to a through-right lane;
      - Modify the northbound left-through-right lane to a right-turn lane; and
      - Remove the southbound left-through lane.
      - To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, northbound left-turns would need to be redirected. Northbound left-turning traffic from Sandpiper Avenue would need to either a) make a westbound right-turn lane onto "G" Street via a future driveway access and then proceed to make their desired movement at the intersection of "G" Street and Mercy Avenue or b) make a northbound left-turn at Mansionette Drive and Mercy Avenue,

ATTACHMENT G

proceed through the intersection of Sandpiper Avenue and Mercy Avenue and then proceed to make their desired movement at the intersection of "G" Street and Mercy Avenue. Furthermore, southbound left-turns from the driveway located immediately to the north would need to be redirected. Southbound left-turning traffic from the driveway located immediately to the north would need to use the driveway access located approximately 450 feet east of the Sandpiper alignment to make their desired movement.

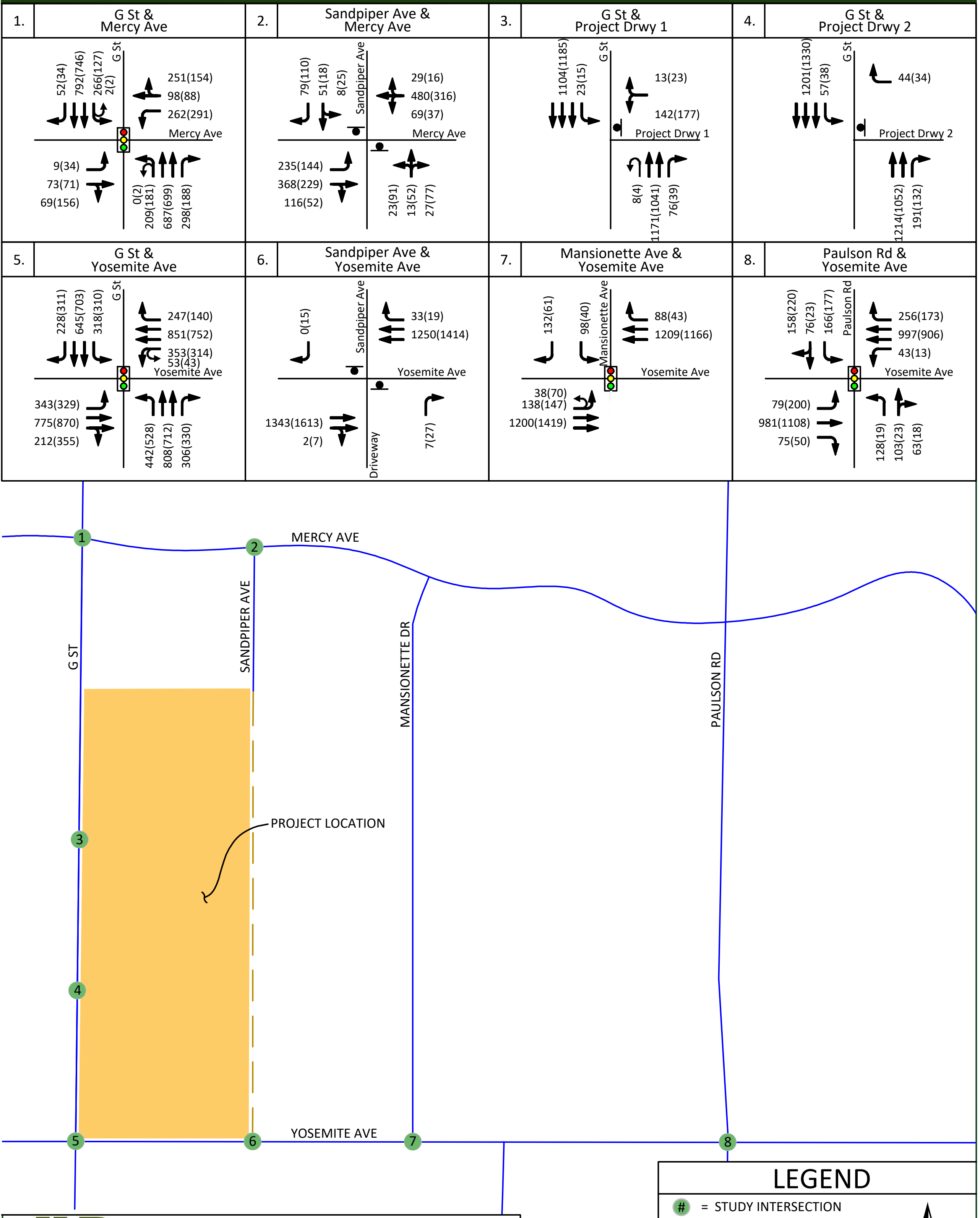
  - Option B: All-Way Stop
    - Stripe a westbound left-turn lane;
    - Modify the westbound left-through-right lane to a through-right lane;
    - Stripe a northbound left-turn;
    - Modify the northbound left-through-right lane to a through-right lane; and
    - Implement an all-way stop control.
- "G" Street / Project Driveway 1
  - Signalize the intersection with protective left-turn phasing in all directions.
- "G" Street / Yosemite Avenue
  - Add a second southbound left-turn lane; and
  - Modify the traffic signal to implement overlap phasing of the northbound right-turn with the westbound left-turn phase and prohibit westbound to eastbound U-turns.
- Paulson Road / Yosemite Avenue
  - Add an eastbound through-right lane with a receiving lane east of Paulson Road.

Table XIII: Cumulative Year 2039 plus 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	"G" Street / Mercy Avenue	Signalized	41.4	D	41.7	D
2	Sandpiper Avenue / Mercy Avenue	Two-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Two-Way Stop (Mitigated – Option A)	13.0	B	11.5	B
		Two-Way Stop (Mitigated – Option B)	**39.7**	**E**	16.5	C
3	"G" Street / Project Driveway 1	One-Way Stop	**>120.0**	**F**	**>120.0**	**F**
		Signalized (Mitigated)	11.1	B	12.4	B
4	"G" Street / Project Driveway 2	One-Way Stop	15.1	C	13.5	B
5	"G" Street / Yosemite Avenue	Signalized	**113.8**	**F**	**>120.0**	**F**
		Signalized (Mitigated)	79.8	E	108.4	F
6	Sandpiper Avenue / Yosemite Avenue	One-Way Stop	15.3	C	18.1	C
7	Mansionette Drive / Yosemite Avenue	Signalized	11.2	B	9.0	A
8	Paulson Road / Yosemite Avenue	Signalized	54.3	D	**60.9**	**E**
		Signalized (Mitigated)	42.4	D	40.5	D

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.

Merced Mixed-Use Development - City of Merced Figure 11
Cumulative Year 2039 plus Project - Traffic Volumes, Geometrics and Controls



LEGEND

\# = STUDY INTERSECTION
– – – = FUTURE ROADWAY
XX = AM PEAK HOUR TRIPS
(XX) = PM PEAK HOUR TRIPS
🚦 = SIGNALIZED INTERSECTION
● = STOP SIGN

Not To Scale

JLB TRAFFIC ENGINEERING, INC.

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

035-003 - 09/24/19 - AB/MA

ATTACHMENT G

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 below.

Based on the SimTraffic output files and engineering judgement, it is recommended that the storage capacity for the following be considered for the Cumulative Year 2039 plus Project Traffic Conditions. At the remaining approaches to the study intersections, the existing storage capacity will be sufficient to accommodate the maximum queue.

- "G" Street / Mercy Avenue
    - The existing storage capacity of the westbound left-turn lane is projected to exceed that available during the Cumulative Year 2039 scenarios. However, increasing the storage capacity of this movement is not possible without impacting the eastbound left-turn pocket at the intersection of Sandpiper Avenue and Mercy Avenue. Therefore, this cumulative impact is considered adverse but not significant.
    - Consider increasing the storage capacity of the northbound left-turn lane to 325 feet.
    - The existing storage capacity of the southbound left-turn lane is projected to exceed that available during the AM peaks in the Cumulative Year 2039 scenarios. While there are no constraints to increasing the storage capacity of this movement, it is recommended that this movement be monitored.
- "G" Street / Project Driveway 1
    - Consider setting the storage capacity of the westbound right-turn lane to 150 feet.
    - Consider setting the storage capacity of the northbound U-turn/left-turn lane to 150 feet.
    - Consider setting the storage capacity of the northbound right-turn lane to 75 feet.
    - Consider setting the storage capacity of the southbound left-turn lane to 150 feet.
- "G" Street / Project Driveway 2
    - Consider setting the storage capacity of the northbound right-turn lane to 75 feet.
    - Consider setting the storage capacity of the southbound left-turn lane to 150 feet.

ATTACHMENT G

- “G” Street / Yosemite Avenue
  - Consider increasing the storage capacity of the eastbound left-turn lane to 300 feet.
  - The existing storage capacity of the westbound left-turn lane is projected to exceed that available during the Cumulative Year 2039 scenarios. However, increasing the storage capacity of this movement is not possible without impacting the westbound left-turn pocket located immediately to the east. Therefore, this cumulative impact is considered adverse but not significant.
  - Consider increasing the storage capacity of the northbound left-turn lane to 250.
  - Consider increasing the storage capacity of the northbound right-turn lane to 250 feet.
  - Consider setting the storage capacity of the southbound dual left-turn lanes to 350 feet.
- Paulson Avenue / Yosemite Avenue
  - Consider increasing the storage capacity of the eastbound left-turn lane to 125 feet.
  - Consider increasing the storage capacity of the westbound left-turn lane to 100 feet.
  - Consider increasing the storage capacity of the westbound right-turn lane to 175 feet.
  - Consider increasing the storage capacity of the northbound left-turn lane to 125.
  - Consider increasing the storage capacity of the southbound left-turn lane to 250 feet.

Table XIV: Queuing Analysis

ID	Intersection	Existing Queue Storage Length (ft.)		Existing		Existing plus Project		Near Term plus Project		Cumulative Year 2039 No Project		Cumulative Year 2039 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1	“G” Street / Mercy Avenue	EB L	250	13	42	9	61	10	49	34	89	34	82
		EB TR	250	89	89	90	162	116	188	172	288	237	280
		WB L	260	110	147	131	188	129	259	364	318	285	333
		WB TR	>500	80	77	81	133	98	213	468	272	344	209
		NB L	250	129	105	101	156	169	129	324	298	329	328
		NB T	>500	176	170	230	239	249	204	358	349	427	446
		NB T	>500	108	85	109	176	204	104	302	308	395	364
		NB R	250	66	71	98	65	112	54	127	165	145	81
		SB L	260	98	80	133	100	122	122	320	176	302	177
		SB T	>500	88	85	104	139	129	173	288	242	296	272
		SB T	>500	106	98	94	146	133	169	293	247	284	276
		SB R	250	43	23	33	38	31	24	35	29	41	31

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		Near Term plus Project		Cumulative Year 2039 No Project		Cumulative Year 2039 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
2	Sandpiper Avenue / Mercy Avenue	EB L	200	46	34	57	35	53	43	89	85	106	49
		EB TR	>500	0	0	0	0	20	11	10	0	19	0
		WB LTR	>500	10	14	31	22	86	46	*	*	*	*
		WB L	*	*	*	*	*	*	*	42	20	57	32
		WB TR	*	*	*	*	*	*	*	9	16	18	0
		NB LTR	>500	14	53	42	58	*	*	*	*	*	*
		NB L	*	*	*	*	*	50	61	*	*	*	*
		NB TR	>500	*	*	*	*	71	85	*	*	*	*
		NB R	*	*	*	*	*	*	*	24	48	46	82
		SB LT	60	30	32	46	47	51	64	*	*	*	*
		SB R	60	48	51	48	53	48	57	63	58	52	54
3	"G" Street / Project Driveway 1	WB LR	*	*	*	70	146	131	167	*	*	*	*
		WB L	*	*	*	*	*	*	*	*	*	175	246
		WB R	*	*	*	*	*	*	*	*	*	53	149
		NB L	*	*	*	26	24	31	17	*	*	41	16
		NB T	>500	*	*	168	116	208	158	*	*	179	213
		NB T	>500	*	*	116	64	148	109	*	*	120	138
		NB R	*	*	*	34	22	36	23	*	*	21	23
		SB L	*	*	*	37	41	63	36	*	*	45	39
		SB T	>500	*	*	81	90	76	67	*	*	224	238
		SB T	>500	*	*	93	92	105	95	*	*	170	219
		SB T	>500	*	*	48	57	50	56	*	*	136	179
4	"G" Street / Project Driveway 2	WB R	*	*	*	40	46	37	43	*	*	41	36
		NB T	>500	*	*	0	0	0	0	*	*	0	0
		NB T	>500	*	*	0	0	0	0	*	*	0	0
		NB R	*	*	*	11	13	24	7	*	*	13	7
		SB L	*	*	*	48	29	63	44	*	*	116	142
		SB T	>500	*	*	0	0	0	0	*	*	283	407
		SB T	>500	*	*	0	0	0	0	*	*	252	333
		SB T	>500	*	*	0	0	0	0	*	*	0	138

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		Near Term plus Project		Cumulative Year 2039 No Project		Cumulative Year 2039 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
5	"G" Street / Yosemite Avenue	EB L	200	171	211	280	278	350	358	409	843	840	876
		EB T	>500	223	263	233	293	531	470	718	1427	1228	3084
		EB TR	>500	197	200	203	223	461	407	760	1422	1180	3065
		WB L	370	188	181	358	326	298	424	402	548	477	535
		WB T	>500	176	122	211	201	260	329	341	605	549	617
		WB T	>500	157	125	171	195	250	204	356	404	489	322
		WB R	>500	48	44	68	47	105	64	98	77	142	81
		NB L	75	210	215	212	205	216	218	818	762	876	855
		NB T	>500	251	453	417	287	363	520	2376	4899	2973	4346
		NB T	>500	159	250	330	291	362	396	2134	4980	2913	4337
		NB R	75	118	111	222	192	229	229	228	243	253	235
		SB L	250	147	167	197	188	275	211	*	*	*	*
		SB LL	*	*	*	*	*	*	*	240	185	363	321
		SB T	>500	129	149	166	191	217	246	476	318	637	601
		SB T	>500	132	160	172	205	189	253	486	313	647	601
		SB R	>500	69	56	64	79	88	128	115	125	276	208
6	Sandpiper Avenue / Yosemite Avenue	EB T	>500	0	0	0	0	0	0	0	0	0	0
		EB T	>500	0	0	0	0	0	0	0	0	0	0
		EB R	60	0	0	0	0	0	0	0	0	0	0
		WB T	>500	0	3	0	0	0	19	32	680	76	844
		WB T	>500	0	0	0	0	0	0	0	648	0	124
		WB R	>500	0	0	0	0	0	0	0	0	0	0
		NB R	100	7	21	17	27	11	28	19	36	17	32
		SB R	>500	0	0	0	38	32	64	0	0	0	96
7	Mansionette Drive / Yosemite Avenue	EB L	375	94	87	113	128	132	162	167	235	230	282
		EB T	>500	147	154	195	122	266	233	89	87	150	88
		EB T	>500	17	0	0	0	16	16	90	93	151	87
		WB T	>500	91	104	103	118	121	265	394	291	224	509
		WB T	>500	75	73	85	112	125	215	389	264	231	403
		WB R	105	32	22	33	21	64	59	117	24	68	28
		SB L	>500	82	54	83	38	108	77	158	62	154	104
		SB R	150	57	51	68	52	52	65	65	52	81	60

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		Near Term plus Project		Cumulative Year 2039 No Project		Cumulative Year 2039 plus Project	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
8	Paulson Avenue / Yosemite Avenue	EB L	50	81	113	94	111	82	111	110	115	105	117
		EB T	>500	285	333	361	550	367	611	306	351	269	334
		EB TR	>500	*	*	*	*	*	*	329	340	305	325
		EB R	110	75	127	29	103	34	103	*	*	*	*
		WB L	50	62	51	80	41	58	66	86	63	80	45
		WB T	>500	133	132	188	166	200	268	467	409	413	613
		WB T	>500	156	117	190	143	212	274	483	419	446	648
		WB R	70	113	65	121	63	128	139	158	146	156	158
		NB L	50	83	18	99	35	97	34	125	53	115	60
		NB TR	>500	109	46	112	42	138	52	368	69	451	58
		SB L	115	118	112	139	119	148	173	235	222	243	254
		SB TR	>500	110	85	133	92	123	171	206	233	233	295

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

Project’s Pro-Rata Fair Share of Future Transportation Improvements

The Project’s fair share percentage impact to study intersections projected to fall below their LOS threshold and which are not covered by an existing impact fee program is provided in Table XV. The Project’s fair share percentage impacts were calculated pursuant to the Caltrans Guide for the Preparation of Traffic Impact Studies. The Project’s pro-rata fair shares were calculated utilizing the Existing volumes, Net New Project Only Trips and Cumulative Year 2039 plus Project volumes. Figure 2 illustrates the Existing traffic volumes, Figure 6 illustrates the Net New Project Only Trips, and Figure 11 illustrates the Cumulative Year 2039 plus Project traffic volumes. Since the critical peak period for the study facilities was determined to be during the AM peak, the AM peak volumes are utilized to determine the Project’s pro-rata fair share.

It is recommended that the Project contribute its equitable fair share as listed in Table XV for the future improvements necessary to maintain an acceptable LOS. However, fair share contributions should 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. For those improvements not presently covered by local and regional roadway impact fee programs or grant funding, it is recommended that the Project contribute its equitable fair share. Payment of the Project’s equitable fair share in addition to the local and regional impact fee programs would satisfy the Project’s cumulative traffic impacts.

This study does not provide construction costs for the recommended mitigation measures; therefore, if the recommended mitigation measures are implemented, it is recommended that the developer work with the City of Merced to develop the estimated construction cost.

Table XV: Project’s Fair Share of Future Roadway Improvements

ID	*Intersection*	*Existing Traffic Volumes (AM Peak)*	*Cumulative Year 2039 plus Project Traffic Volumes (AM Peak)*	*Net New Project Only Trips (AM Peak)*	*Project's Fair Share (%)*
1	“G” Street / Mercy Avenue	1,641	3,068	104	7.29
2	Sandpiper Avenue / Mercy Avenue	691	1,498	93	11.52
5	“G” Street / Yosemite Avenue	2,807	5,528	459	16.87
6	Sandpiper Avenue / Yosemite Avenue	1,367	2,635	166	13.09
7	Mansionette Drive / Yosemite Avenue	1,517	2,903	163	11.76
8	Paulson Road / Yosemite Avenue	1,687	3,125	79	5.49

Note: Project Fair Share = ((Net New Project Only Trips) / (Cumulative Year 2039 + Project Traffic Volumes - Existing Traffic Volumes)) x 100

ATTACHMENT G

Conclusions and Recommendations

Conclusions and recommendations regarding the proposed Project are presented below.

Existing Traffic Conditions

- At present, all study intersections operate at an acceptable LOS during both peak periods.

Existing plus Project Traffic Conditions

- It is recommended that the Project Driveway 1 have a minimum throat depth of 150 feet before any vehicular openings to the north.
- The Project buildout is estimated to generate a maximum of 13,160 daily trips, 1,009 AM peak hour trips and 1,059 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). At buildout, the prior Project Site Plan is anticipated to generate a maximum of 13,741 daily trips, 1,092 AM peak hour trips and 1,074 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account).
- Compared to the prior Project Site Plan, the latest Project Site Plan is estimated to yield less traffic by 581 daily trips, 83 AM peak hour trips and 15 PM peak hour trips (before internal capture and pass-by rate reductions are taken into account). Therefore, in order to provide a conservative analysis of the Project's traffic impacts, this TIA assumed the trip generation of the prior Project Site Plan.
- It is recommended that the Project implement a walkway along its frontage to Sandpiper Avenue and complete the walkway along its frontage to “G” Street.
- It is recommended that the Project implement a Class II Bike Lane along its frontage to “G” Street.
- To promote alternative modes of transportation to El Capitan High School, it is recommended that the MUHSD work with the City of Merced and County of Merced to implement a Safe Routes to School plan and to seek grant funding to help build walkways where they are lacking within a 2.5-mile radius of the existing school site.
- As the Project is within a defined service area, it is likely that the Project would not add VMT per capita of service population to the region. Additionally, the Project site is located near transit services and pedestrian and bicycle networks.
- Under this scenario, the intersection of “G” Street and Project Driveway 1 is projected to exceed its LOS threshold during one peak period. To improve the LOS at this intersection, it is recommended that the following improvements be implemented.
    - “G” Street / Project Driveway 1
        - Signalize the intersection with protective left-turn phasing in all directions.

Near Term plus Project Traffic Conditions

- The total trip generation for the Near Term Projects by year 2025 is 76,956 daily trips, 4,228 AM peak hour trips and 7,565 PM peak hour trips.
- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue and “G” Street and Project Driveway 1 are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.

  - Sandpiper Avenue / Mercy Avenue
    - Stripe a northbound left-turn lane; and
    - Modify the northbound left-through-right lane to a through-right lane.
  - "G" Street / Project Driveway 1
    - Signalize the intersection with protective left-turn phasing in all directions.
- Between the Existing Traffic Conditions and the Near Term plus Project Traffic Conditions, the Project accounts for 11.6 percent of the daily trips, 13.6 percent of the AM peak hour trips and 7.1 percent of the PM peak hour trips of growth in traffic while the rest can be attributable to the Near Term Projects. Therefore, one can deduce that the majority of the mitigation measures presented under this scenario may not be necessary immediately upon completion of the proposed Project. However, if all of the Near Term Projects are completed close to the completion date of the proposed Project, the detailed recommended improvements presented under this scenario may be necessary in order to improve the LOS to the City's target threshold.

Cumulative Year 2039 No Project Traffic Conditions

- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, "G" Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be considered for implementation by the City on a Project by Project assessment as cumulative impacts develop.
  - Sandpiper Avenue / Mercy Avenue
    - For the intersection of Sandpiper Avenue and Mercy Avenue, two (2) options for improvement were considered. Option A consists of limiting access from Sandpiper Avenue and the driveway located immediately to the north to Mercy Avenue but maintaining the two-way stop control, while Option B consists of modifying the lane geometrics and implementing an all-way stop control. As can be seen from Table X, both options provide for an acceptable LOS. However, Option A provides significantly lower delay during the AM peak period when compared to Option B. The recommended improvements for each option are described below.
      - Option A: Two-Way Stop
        - Stripe a westbound left-turn lane;
        - Modify the westbound left-through-right lane to a through-right lane;
        - Modify the northbound left-through-right lane to a right-turn lane; and
        - Remove the southbound left-through lane.
        - To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, northbound left-turns would need to be redirected. Northbound left-turning traffic from Sandpiper Avenue would need to either a) make a westbound right-turn lane onto "G" Street via a future driveway access and then proceed to make their desired movement at the intersection of "G" Street and Mercy Avenue or b) make a northbound left-turn at Mansionette Drive and Mercy Avenue, proceed through the intersection of Sandpiper Avenue and Mercy Avenue and then proceed to make their desired movement at the intersection of "G"

        Street and Mercy Avenue. Furthermore, southbound left-turns from the driveway located immediately to the north would need to be redirected. Southbound left-turning traffic from the driveway located immediately to the north would need to use the driveway access located approximately 450 feet east of the Sandpiper alignment to make their desired movement.

      - Option B: All-Way Stop
        - Stripe a westbound left-turn lane;
        - Modify the westbound left-through-right lane to a through-right lane;
        - Stripe a northbound left-turn;
        - Modify the northbound left-through-right lane to a through-right lane; and
        - Implement an all-way stop control.
  - "G" Street / Yosemite Avenue
    - Add a second southbound left-turn lane; and
    - Modify the traffic signal to implement overlap phasing of the northbound right-turn with the westbound left-turn phase and prohibit westbound to eastbound U-turns.
  - Paulson Road / Yosemite Avenue
    - Add an eastbound through-right lane with a receiving lane east of Paulson Road.

Cumulative Year 2039 plus Project Traffic Conditions

- Under this scenario, the intersections of Sandpiper Avenue and Mercy Avenue, "G" Street and Project Driveway 1, "G" Street and Yosemite Avenue, and Paulson Road and Yosemite Avenue are projected to exceed their LOS threshold during one or both peak periods. To improve the LOS at these intersections, it is recommended that the following improvements be implemented.
  - Sandpiper Avenue / Mercy Avenue
    - For the intersection of Sandpiper Avenue and Mercy Avenue, two (2) options for improvement were considered. Option A consists of limiting access from Sandpiper Avenue and the driveway located immediately to the north to Mercy Avenue but maintaining the two-way stop control, while Option B consists of modifying the lane geometrics and implementing an all-way stop control. As can be seen from Table XI, Option A provides significantly lower delay during the AM peak period when compared to Option B. The recommended improvements for each option are described below.
      - Option A: Two-Way Stop
        - Stripe a westbound left-turn lane;
        - Modify the westbound left-through-right lane to a through-right lane;
        - Modify the northbound left-through-right lane to a right-turn lane; and
        - Remove the southbound left-through lane.
        - To accomplish this, it is recommended that a raised median island be implemented. With the introduction of the raised median island, northbound left-turns would need to be redirected. Northbound left-turning traffic from Sandpiper Avenue would need to either a) make a westbound right-turn lane onto "G" Street via a future driveway access and then proceed to make their desired movement at the intersection of "G" Street and Mercy Avenue or b) make a northbound left-turn at Mansionette Drive and

Mercy Avenue, proceed through the intersection of Sandpiper Avenue and Mercy Avenue and then proceed to make their desired movement at the intersection of “G” Street and Mercy Avenue. Furthermore, southbound left-turns from the driveway located immediately to the north would need to be redirected. Southbound left-turning traffic from the driveway located immediately to the north would need to use the driveway access located approximately 450 feet east of the Sandpiper alignment to make their desired movement.

    - Option B: All-Way Stop
        - Stripe a westbound left-turn lane;
        - Modify the westbound left-through-right lane to a through-right lane;
        - Stripe a northbound left-turn;
        - Modify the northbound left-through-right lane to a through-right lane; and
        - Implement an all-way stop control.
- “G” Street / Project Driveway 1
    - Signalize the intersection with protective left-turn phasing in all directions.
- “G” Street / Yosemite Avenue
    - Add a second southbound left-turn lane; and
    - Modify the traffic signal to implement overlap phasing of the northbound right-turn with the westbound left-turn phase and prohibit westbound to eastbound U-turns.
- Paulson Road / Yosemite Avenue
    - Add an eastbound through-right lane with a receiving lane east of Paulson Road.

Queuing Analysis

- It is recommended that the City consider left-turn and right-turn lane storage lengths as indicated in the Queuing Analysis.

Project’s Equitable Fair Share

- It is recommended that the Project contribute its equitable fair share as listed in Table XV for the future improvements necessary to maintain an acceptable LOS.

Study Participants

JLB Traffic Engineering, Inc. Personnel:

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

Persons Consulted:

Neil Angelillo	True North Properties
Kim Espinosa	City of Merced
Michael Hren	City of Merced
Steven Rough	County of Merced
Vu Nguyen	Caltrans

References

1. City of Merced, *Merced Vision 2030 General Plan*, adopted January 2, 2012.
2. County of Merced, *2030 General Plan,* adopted December 10, 2013.
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.

Appendix A: Scope of Work

ATTACHMENT G

February 21, 2019

Ms. Kim Espinosa
Merced City of Merced
Planning and Zoning Department
678 West 18th Street
Merced, California, 95340

Via Email Only: espinosak@cityofmerced.org

Subject: ***Draft Scope of Work for the Preparation of a Traffic Impact Analysis for the Development of the Northeast Corner of "G" Street and Yosemite Avenue in the City of Merced***

Dear Ms. Espinoza,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Project described below. The Project proposes to develop the northeast corner of "G" Street and Yosemite Avenue with a mix of commercial, office, hotel and multi-family residential land uses. Per information provided to JLB, the Project will undergo a General Plan Amendment through the City of Merced. The Project site plan and aerial of the Project vicinity are shown in Exhibits A and B respectively.

The purpose of this TIA is to evaluate the potential on- 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- and off-site traffic impacts of the proposed Project, JLB proposes the following Draft Scope of Work.

Scope of Work

- JLB will obtain recent (less than 18 months old) or schedule and conduct new traffic counts at the study facility(ies) as necessary.
- 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 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, school boundaries and knowledge of the existing and planned circulation network in the vicinity of the Project.
- JLB will conduct a qualitative safe routes to school evaluation from the Project site to the K-12 school(s) which would most likely serve the residential component of the Project on opening day.
- To arrive at the future year forecast volumes, JLB proposes to utilize the base Year 2008 and Cumulative Year 2035 traffic forecasting models from the Merced County Association of Governments (MCAG). Based on these models, JLB will calculate the anticipated annual growth rate

ATTACHMENT G

in traffic. Once the annual growth rate in traffic has been calculated, JLB will present the findings to City Staff for its review and approval. Upon approval of the annual growth rate factor, JLB proposes to utilize the annual growth rate to expand the existing traffic volumes by 20 years to arrive at the Cumulative Year 2039 plus Project scenario.

- JLB will evaluate existing and forecasted levels of service (LOS) at the study intersection(s) and/or segment(s). JLB will use HCM 6 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 proposed improvement measures (if any)
2. Existing plus Project Traffic Conditions with proposed mitigation measures (if any)
3. Near Term Plus Project (2025) Traffic Conditions with proposed mitigation measures (if any)
4. Cumulative Year 2039 No Project Traffic Conditions with proposed improvement measures (if any)
5. Cumulative Year 2039 plus Project Traffic Conditions with proposed mitigation measures (if any)

Weekday peak hours to be analyzed:

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

Study Intersections:

1. "G" Street / Mercy Avenue
2. Sandpiper Avenue / Mercy Avenue
3. "G" Street / Driveway One (future signal)
4. "G" Street / Driveway Two (left in, right-in and right-out)
5. "G" Street / Yosemite Avenue
6. Sandpiper Avenue / Yosemite Avenue
7. Mansionette Avenue / Yosemite Avenue
8. Paulson Road / Yosemite Avenue

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- and right-turn lanes at all study intersections.

Study Segments:

1. None

Trip Generation

Trip generation will be prepared for both the Proposed Project and Existing General Plan Land Use designations. JLB will utilize trip generation rates from the 10th Edition of the Trip Generation Manual published by the Institute of Transportation Engineers (ITE). Trip generation rates will be presented in written format and in table format for the City's review and approval. Further JLB proposes to utilize internal capture and pass-by rate reductions to reflect net new traffic to the study facilities. Internal capture and pass-by rate reductions will be prepared pursuant to ITE methodologies.

ATTACHMENT G

Near Term Projects to be Included

JLB proposes to work with the City of Merced Planning staff to identify Near Term Projects in the vicinity of the proposed Project. The Near Term Projects would then be included under the Near Term plus Project analysis. At this point, JLB is unaware of Near term projects that need to be included, but JLB will include in the Near Term plus Project scenario Near Term Projects provided to us by the City of Merced or other responsible agencies. These would include Near Term Projects the City of Merced, County of Merced or Caltrans has knowledge of and for which it is anticipated that said Project(s) is/are projected to be whole or partially built by the Year 2025, and for which the City of Merced, County of Merced and Caltrans, as appropriate, provides JLB with Near Term Project details. Near Term Project details include Project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The above scope of work is based on our understanding of this Project and our experience with similar Traffic Impact Analysis Projects.

If you have any questions or require additional information, please contact me by phone at (559) 570-8991 or by e-mail at jbenavides@jlbtraffic.com.

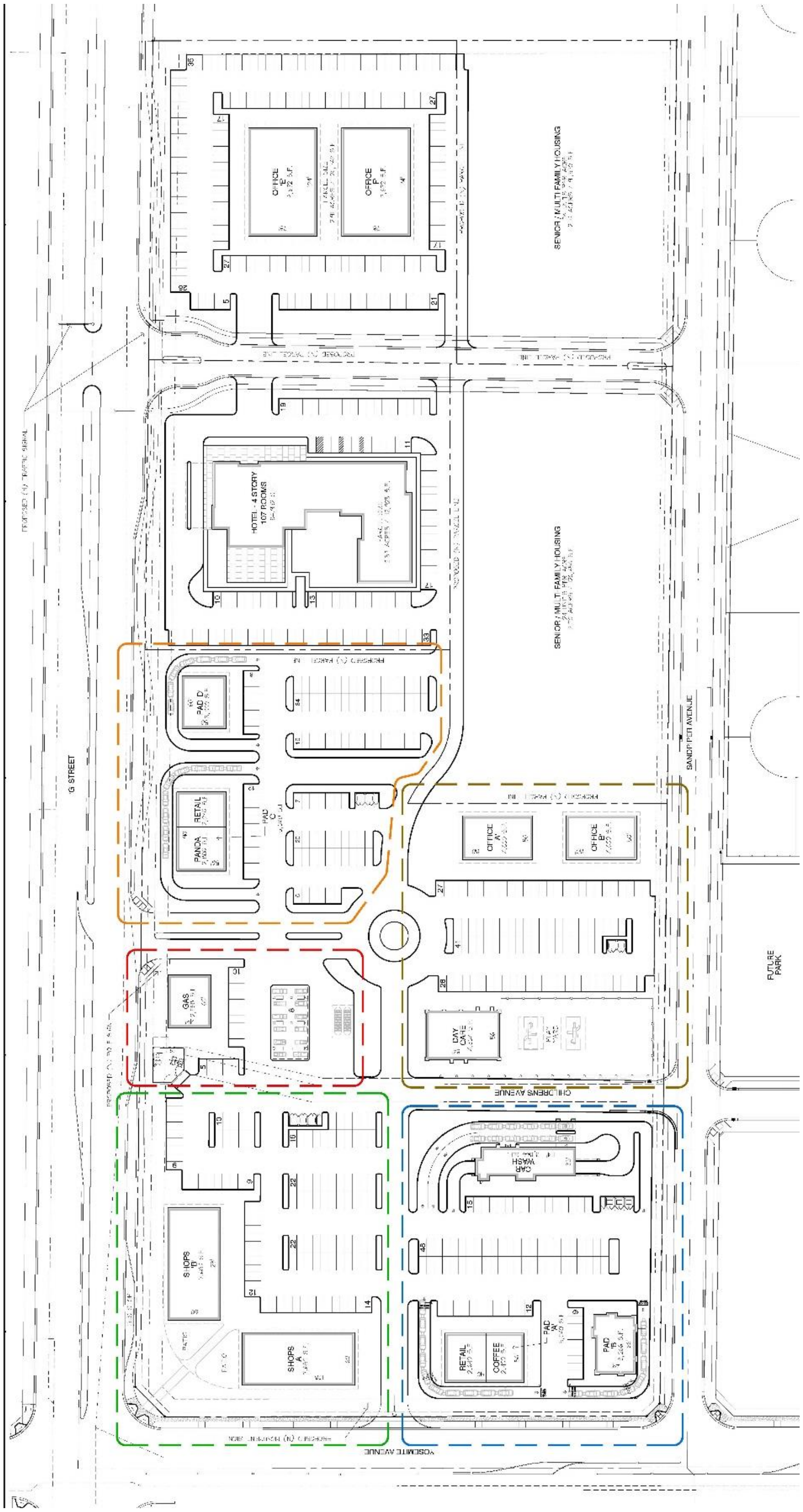
Sincerely,

Jose Luis Benavides, P.E., T.E.
President

P:\Proposals\Merced\True North Yosemite and G TIA\Draft Scope of Work\L02212019 Draft Scope of Work.docx

ATTACHMENT G

Exhibit A – Site Plan



ATTACHMENT G

Exhibit B - Aerial

March 26, 2019

Ms. Kim Espinosa
Merced City of Merced
Planning and Zoning Department
678 West 18th Street
Merced, California, 95340

Via Email Only: espinosak@cityofmerced.org

Subject: ***Draft Scope of Work for the Preparation of a Traffic Impact Analysis for the Development of the Northeast Corner of "G" Street and Yosemite Avenue in the City of Merced***

Dear Ms. Espinoza,

JLB Traffic Engineering, Inc. (JLB) hereby submits this Draft Scope of Work for the preparation of a Traffic Impact Analysis (TIA) for the Project described below. The Project proposes to develop the northeast corner of "G" Street and Yosemite Avenue with a mix of commercial, office, hotel and multi-family residential land uses. Per information provided to JLB, the Project will undergo a General Plan Amendment through the City of Merced. The Project site plan and aerial of the Project vicinity are shown in Exhibits A and B respectively.

The purpose of this TIA is to evaluate the potential on- 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- and off-site traffic impacts of the proposed Project, JLB proposes the following Draft Scope of Work.

Scope of Work

- JLB will obtain recent (less than 18 months old) or schedule and conduct new traffic counts at the study facility(ies) as necessary.
- 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 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, school boundaries and knowledge of the existing and planned circulation network in the vicinity of the Project.
- JLB will conduct a qualitative safe routes to school evaluation from the Project site to the K-12 school(s) which would most likely serve the residential component of the Project on opening day.
- To arrive at the future year forecast volumes, JLB proposes to utilize the base Year 2008 and Cumulative Year 2035 traffic forecasting models from the Merced County Association of Governments (MCAG). Based on these models, JLB will calculate the anticipated annual growth rate

in traffic. Once the annual growth rate in traffic has been calculated, JLB will present the findings to City Staff for its review and approval. Upon approval of the annual growth rate factor, JLB proposes to utilize the annual growth rate to expand the existing traffic volumes by 20 years to arrive at the Cumulative Year 2039 plus Project scenario.

- JLB will evaluate existing and forecasted levels of service (LOS) at the study intersection(s) and/or segment(s). JLB will use HCM 6 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 proposed improvement measures (if any)
2. Existing plus Project Traffic Conditions with proposed mitigation measures (if any)
3. Near Term Plus Project (2025) Traffic Conditions with proposed mitigation measures (if any)
4. Cumulative Year 2039 No Project Traffic Conditions with proposed improvement measures (if any)
5. Cumulative Year 2039 plus Project Traffic Conditions with proposed mitigation measures (if any)

Weekday peak hours to be analyzed:

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

Study Intersections:

1. "G" Street / Mercy Avenue
2. Sandpiper Avenue / Mercy Avenue
3. "G" Street / Driveway One (future signal)
4. "G" Street / Driveway Two (left in, right-in and right-out)
5. "G" Street / Yosemite Avenue
6. Sandpiper Avenue / Yosemite Avenue
7. Mansionette Avenue / Yosemite Avenue
8. Paulson Road / Yosemite Avenue

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- and right-turn lanes at all study intersections.

Study Segments:

1. None

Trip Generation

Table I presents the baseline trip generation for the proposed Project while Table II presents the trip generation of the project site based on the previously approved land uses in 2011. The trip generation has been prepared pursuant to the 10th Edition of the ITE Trip Generation Manual before internal capture and pass-by rate reductions are taken into account. Prior to accounting for internal capture and pass-by rate reductions the, at build-out the Project is estimated to generate a maximum of 13,014 daily trips, 1,031 AM peak hour trips and 997 PM peak hour trips.

Further JLB proposes to utilize internal capture and pass-by rate reductions to reflect net new traffic to the study facilities. Internal capture and pass-by rate reductions will be prepared pursuant to ITE methodologies.

Table I: Project Only Baseline Trip Generation (Before Internal Capture and Pass-by)

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***
Medical Dental Office Building (720)	43.649	k.s.f.	34.8	1,519	2.78	78	22	94	27	121	3.46	28	72	42	109	151
Hotel (310)	107	Occupied Rooms	8.36	895	0.47	59	41	30	20	50	0.60	51	49	33	31	64
Fast-Food Restaurant without Drive-Through Window (934)	9.066	k.s.f.	470.95	4,270	40.19	51	49	186	178	364	32.67	52	48	154	142	296
Gasoline/Service Station with Convenience Market (945)	12	f.p.	205.36	2,464	12.47	51	49	77	73	150	13.99	51	49	86	82	168
Shopping Center (820)	19.616	k.s.f.	37.75	741	0.94	62	38	11	7	18	3.81	48	52	36	39	75
Coffee/Donut Shop with Drive-Through Window (937)	2.016	k.s.f.	820.38	1,654	88.99	51	49	91	88	179	43.38	50	50	44	43	87
Automated Car Wash (948)	3.866	k.s.f.	170.40	659	14.20	50	50	28	27	55	14.20	50	50	28	27	55
General Off\ice Building (710)	8.000	k.s.f.	9.74	78	1.16	86	14	8	1	9	1.15	16	84	1	8	9
Day Care Center (565)	4.804	k.s.f.	47.62	229	11.00	53	47	28	25	53	11.12	47	53	25	28	53
Apartment (220)	69	d.u.	7.32	505	0.46	23	77	7	25	32	0.56	63	37	25	14	39
Total Project Trips				**13,014**				**560**	**471**	**1,031**				**474**	**523**	**997**

Note: f.p. = Fueling Positions
d.u. = Dwelling Unit
k.s.f. = Thousand Square Feet

At build-out, the 2011 previously approved project, is estimated to generate a maximum of 5,368 daily trips, 343 AM peak hour trips and 528 PM peak hour trips prior to accounting for internal capture and pass-by rate reductions.

Table II: Previously Approved Land Use Baseline Trip Generation (Before Internal Capture and Pass-by)

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*
						%						*%*				
Hotel (310)	84	Occupied Rooms	8.36	702	0.47	59	41	23	16	39	0.60	51	49	26	24	50
High Turnover Sit-Down Restaurant (932)	5.883	k.s.f.	112.18	660	9.94	55	45	32	26	58	9.77	62	38	35	22	57
Pharmacy/Drugstore with Drive-Through Window (881)	17.340	k.s.f.	109.16	1,893	3.84	53	47	36	31	67	10.29	50	50	89	89	178
Drive-in Bank (912)	4.536	k.s.f.	100.03	454	9.5	58	42	25	18	43	20.45	50	50	47	46	93
General Off\ice Building (710)	57.560	k.s.f.	9.74	561	1.16	86	14	58	9	67	1.15	16	84	11	55	66
Apartment (220)	150	d.u.	7.32	1,098	0.46	23	77	16	53	69	0.56	63	37	53	31	84
Total Project Trips				**5,368**				**190**	**153**	**343**				**261**	**267**	**528**

Note: d.u. = Dwelling Unit
k.s.f. = Thousand Square Feet

Near Term Projects to be Included

JLB proposes to work with the City of Merced Planning staff to identify Near Term Projects in the vicinity of the proposed Project. The Near Term Projects would then be included under the Near Term plus Project analysis. At this point, JLB is unaware of Near term projects that need to be included, but JLB will include in the Near Term plus Project scenario Near Term Projects provided to us by the City of Merced or other responsible agencies. These would include Near Term Projects the City of Merced, County of Merced or Caltrans has knowledge of and for which it is anticipated that said Project(s) is/are projected to be whole or partially built by the Year 2025, and for which the City of Merced, County of Merced and Caltrans, as appropriate, provides JLB with Near Term Project details. Near Term Project details include Project description, location, proposed land uses with breakdowns and type of residential units and amount of square footages for non-residential uses.

The above scope of work is based on our understanding of this Project and our experience with similar Traffic Impact Analysis Projects.

If you have any questions or require additional information, please contact me by phone at (559) 570-8991 or by e-mail at jbenavides@jlbtraffic.com.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

Steven Rough, srough@co.merced.ca.us County of Merced
Vu Nguyen, vu.h.nguyen@dot.ca.gov Caltrans District 10
Z:\01 Projects\035 Merced\035-003 Yosemite at G TIA\Draft Scope of Work\L03282019 Draft Scope of Work.docx

ATTACHMENT G

Exhibit A – Site Plan

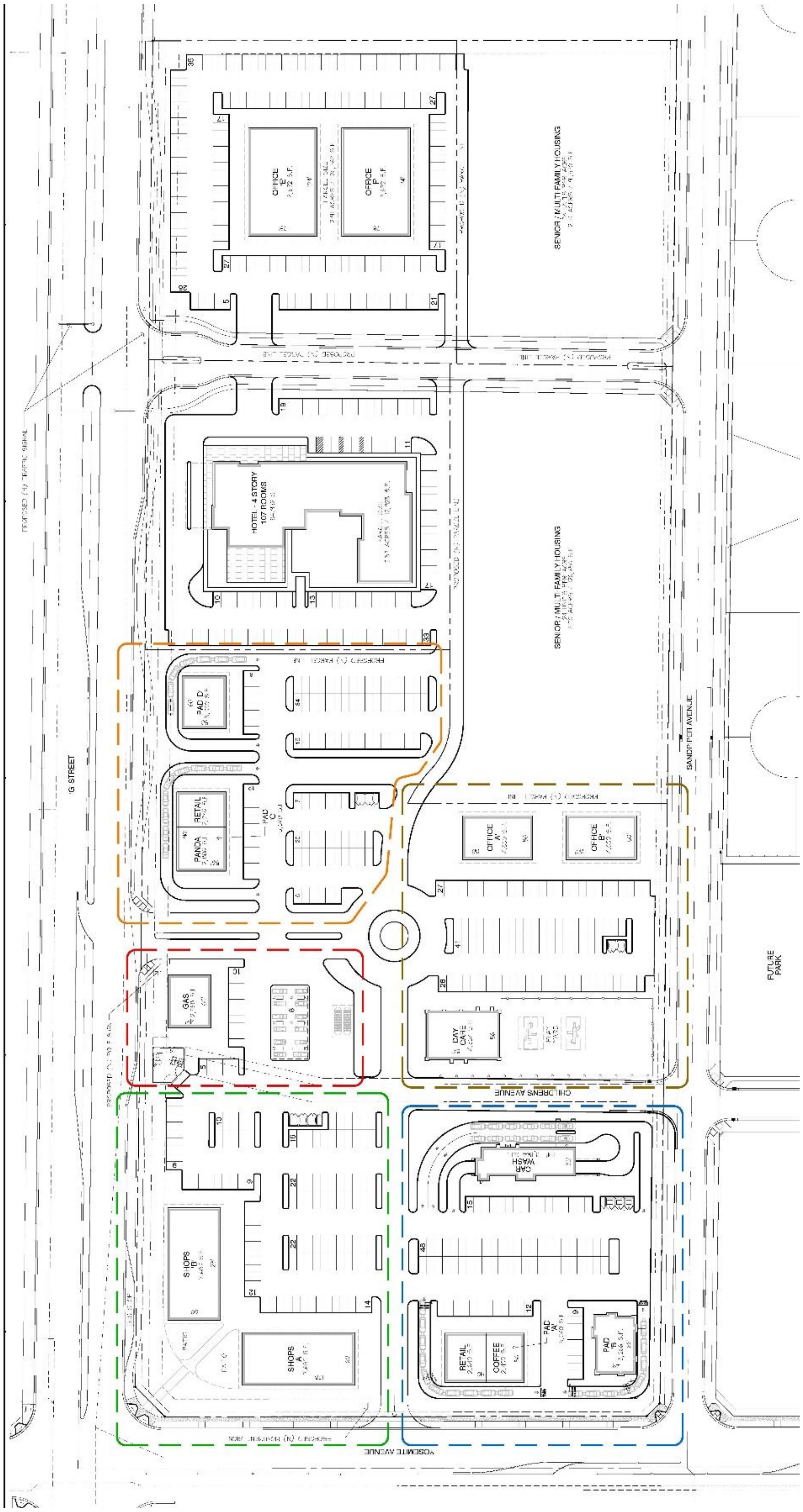
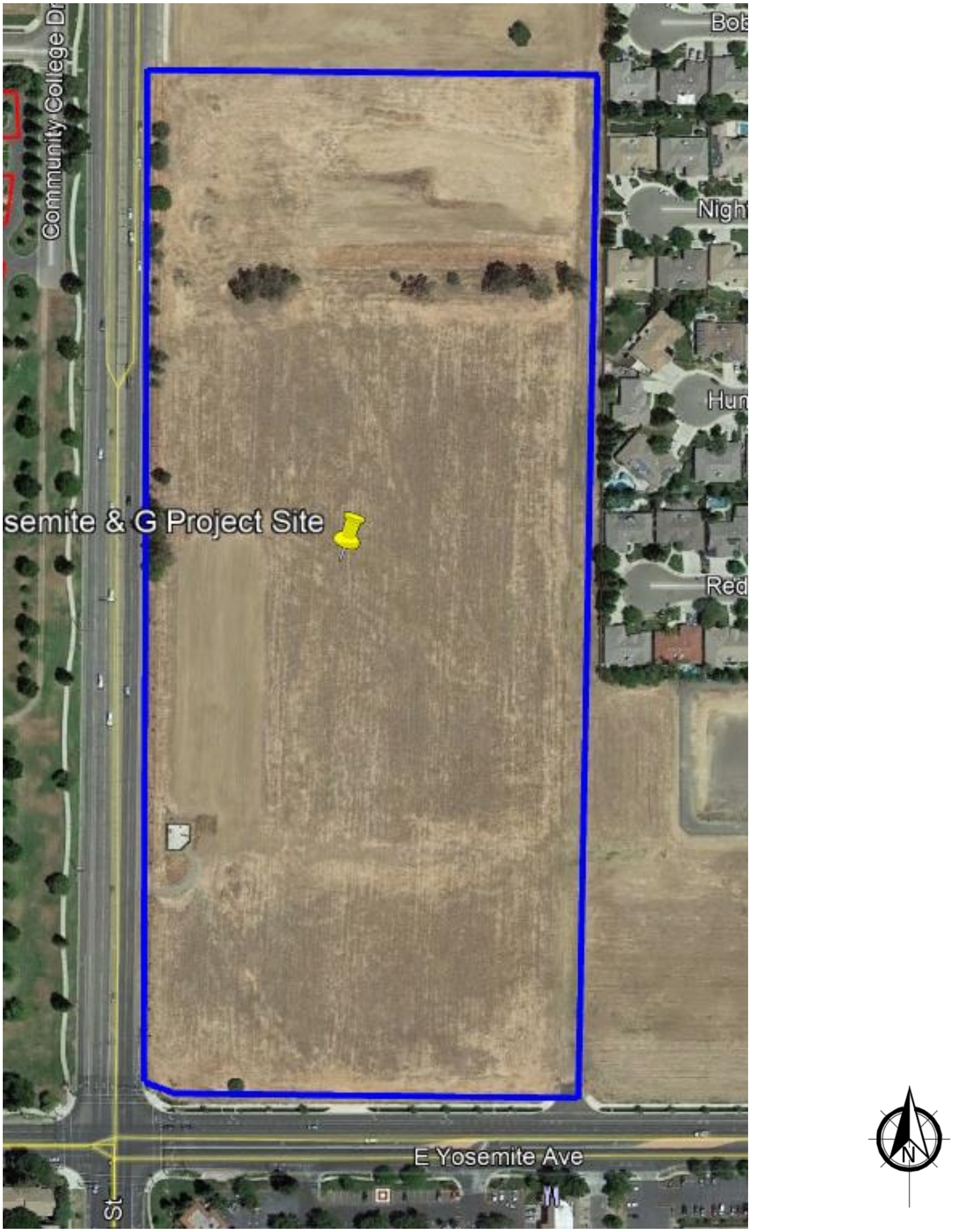


Exhibit B - Aerial



ATTACHMENT G

Jose Benavides

From: Espinosa, Kim <ESPINOSAK@cityofmerced.org>
Sent: Wednesday, February 27, 2019 4:57 PM
To: Jose Benavides
Cc: Neil Angelillo; Hren, Michael
Subject: RE: TIA Draft Scope of Work (NEC of G Street and Yosemite)
Attachments: L02212019 Draft Scope of Work.pdf

Jose,
This looks fine to me. Neil, please note that we will also need a Greenhouse Gas analysis and Air Quality Analysis. Jose, can you recommend some firms for those to Neil? Thanks!
--Kim

From: Jose Benavides <jbenavides@jlbtraffic.com>
Sent: Friday, February 22, 2019 2:08 PM
To: Espinosa, Kim <ESPINOSAK@cityofmerced.org>
Cc: Neil Angelillo <neil@truenorthprops.com>
Subject: TIA Draft Scope of Work (NEC of G Street and Yosemite)

Good afternoon Kim,

Attached you will find a proposed draft scope of work for the preparation of the TIA in support of the development project proposed for the NE corner of G Street and Yosemite in the City of Merced. The scope of work has been prepared based on the conference call we had this Wednesday.

Thank you're your help on this project and we look forward to hearing back from you on the attached scope of work.

Sincerely,

Jose Luis Benavides, P.E., T.E.
President

JLB Traffic Engineering, Inc.

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) 317-6249
Main: (559) 570-8991
Cell: (559) 694-6000
Fax: (559) 317-6854
www.JLBtraffic.com

From: Sousa, Hilda@DOT <Hilda.Sousa@dot.ca.gov>
Sent: Tuesday, April 2, 2019 2:46 PM
To: Jose Benavides
Cc: Huynh, Sang K@DOT
Subject: Yosemite and G Street TIA Scope of Work

Good Afternoon Jose,
We are currently reviewing the draft scope of work submitted and Exhibit A – Site Plan in the attachment is not clear. Could you please resend a clearer one?

Thank You,

Hilda Sousa
District 10 Planning
(209)942-6184

Appendix B: Traffic Counts

ATTACHMENT G

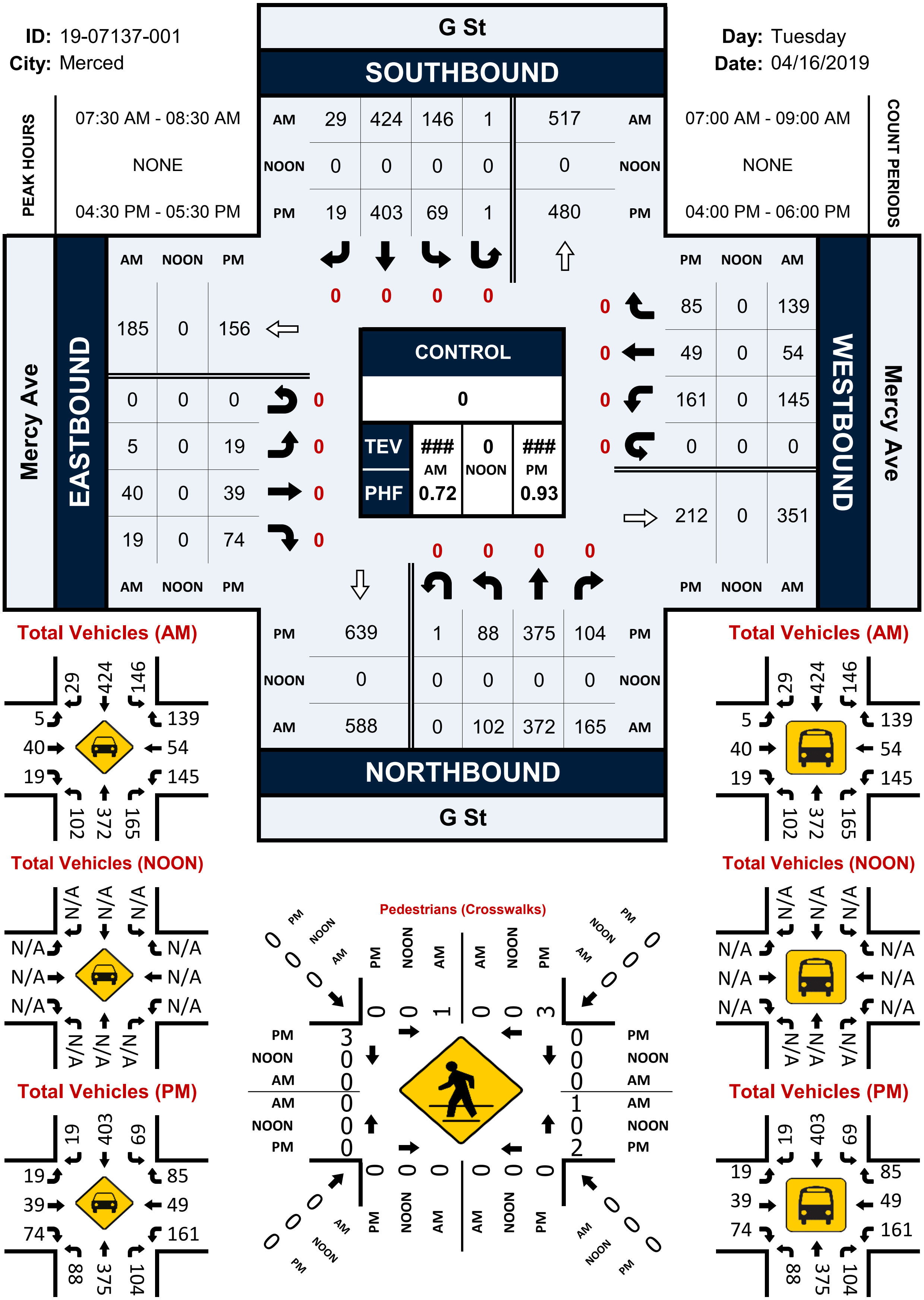
Prepared by National Data & Surveying Services

G St & Mercy Ave

Peak Hour Turning Movement Count

ID: 19-07137-001
City: Merced

Day: Tuesday
Date: 04/16/2019



ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: G St & Mercy Ave
City: Merced
Control:

Project ID: 19-07137-001
Date: 4/16/2019

Total

NS/EW Streets:	G St				G St				Mercy Ave				Mercy Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	6	57	21	0	14	55	2	0	1	2	1	0	16	2	10	0	187
7:15 AM	19	67	29	0	13	56	2	1	0	1	1	0	20	5	19	0	233
7:30 AM	27	92	26	0	32	100	6	0	1	7	5	0	55	14	50	0	415
7:45 AM	43	135	52	0	55	143	15	0	0	14	3	0	27	23	63	0	573
8:00 AM	18	63	30	0	37	117	5	1	3	10	6	0	30	13	15	0	348
8:15 AM	14	82	57	0	22	64	3	0	1	9	5	0	33	4	11	0	305
8:30 AM	7	81	55	0	14	53	3	0	1	17	5	0	51	15	12	0	314
8:45 AM	6	72	57	0	24	72	2	0	0	11	3	0	63	13	20	0	343
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	140	649	327	0	211	660	38	2	7	71	29	0	295	89	200	0	2718
APPROACH %'s :	12.54%	58.15%	29.30%	0.00%	23.16%	72.45%	4.17%	0.22%	6.54%	66.36%	27.10%	0.00%	50.51%	15.24%	34.25%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	102	372	165	0	146	424	29	1	5	40	19	0	145	54	139	0	1641
PEAK HR FACTOR :	0.593	0.689	0.724	0.000	0.664	0.741	0.483	0.250	0.417	0.714	0.792	0.000	0.659	0.587	0.552	0.000	0.716
	0.695				0.704				0.842				0.710				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	16	83	27	2	23	84	1	0	1	10	21	0	52	14	20	0	354
4:15 PM	7	77	27	0	23	83	2	0	2	12	20	0	30	6	19	0	308
4:30 PM	8	89	22	0	12	119	0	0	5	9	22	0	57	10	22	0	375
4:45 PM	21	80	20	1	20	96	2	1	6	10	23	0	34	12	15	0	341
5:00 PM	17	93	36	0	14	95	9	0	4	8	14	0	39	16	27	0	372
5:15 PM	42	113	26	0	23	93	8	0	4	12	15	0	31	11	21	0	399
5:30 PM	17	83	24	0	21	129	2	0	1	9	14	0	28	9	14	0	351
5:45 PM	35	76	26	1	15	101	6	0	1	11	19	0	24	12	16	0	343
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	163	694	208	4	151	800	30	1	24	81	148	0	295	90	154	0	2843
APPROACH %'s :	15.25%	64.92%	19.46%	0.37%	15.38%	81.47%	3.05%	0.10%	9.49%	32.02%	58.50%	0.00%	54.73%	16.70%	28.57%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	88	375	104	1	69	403	19	1	19	39	74	0	161	49	85	0	1487
PEAK HR FACTOR :	0.524	0.830	0.722	0.250	0.750	0.847	0.528	0.250	0.792	0.813	0.804	0.000	0.706	0.766	0.787	0.000	0.932
	0.785				0.939				0.846				0.829				

ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: G St & Mercy Ave
Project ID: 19-07137-001
City: Merced
Date: 4/16/2019

Pedestrians (Crosswalks)

NS/EW Streets:	G St		G St		Mercy Ave		Mercy Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	1	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0
8:15 AM	1	0	0	0	0	0	0	0	1
8:30 AM	2	0	0	0	0	0	0	0	2
8:45 AM	1	2	0	0	0	0	0	2	5
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	5	2	0	0	1	0	0	2	10
APPROACH %'s :	71.43%	28.57%			100.00%	0.00%	0.00%	100.00%	
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	1	0	0	0	1	0	0	0	2
PEAK HR FACTOR :	0.250				0.250				0.500
	0.250				0.250				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	0	3	0	0	2	0	0	2	7
5:15 PM	0	0	0	0	0	0	0	1	1
5:30 PM	0	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	4	0	0	2	0	0	3	9
APPROACH %'s :	0.00%	100.00%			100.00%	0.00%	0.00%	100.00%	
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	3	0	0	2	0	0	3	8
PEAK HR FACTOR :		0.250			0.250			0.375	0.286
	0.250				0.250		0.375		

ATTACHMENT G

Prepared by National Data & Surveying Services

Sandpiper Ave & Mercy Ave

Peak Hour Turning Movement Count

ID: 19-07137-002
City: Merced

Day: Tuesday
Date: 04/16/2019

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

Sandpiper Ave

SOUTHBOUND

	↲	↓	↳	U	⇧
AM	44	9	4	0	146
NOON	0	0	0	0	0
PM	61	0	11	0	94
	0	0	0	0	

Mercy Ave

EASTBOUND

	AM	NOON	PM	
⇦	314	0	253	
U	0	0	0	0
↰	130	0	80	0
→	204	0	127	0
↴	12	0	4	0

WESTBOUND

Mercy Ave

		PM	NOON	AM
0	↰	7	0	16
0	←	175	0	266
0	↙	2	0	2
0	U	0	0	0
	⇨	142	0	208

CONTROL

0

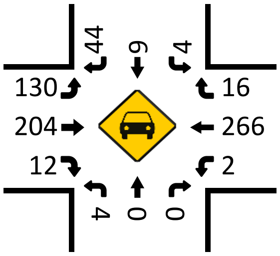
	AM	NOON	PM
TEV	691	0	495
PHF	0.75		0.91

	⇩	U	↰	↑	↱
		0	0	0	0
PM	6	0	17	7	4
NOON	0	0	0	0	0
AM	23	0	4	0	0

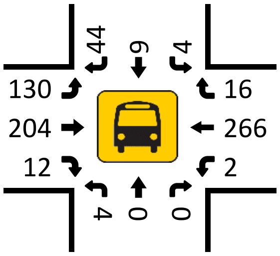
NORTHBOUND

Sandpiper Ave

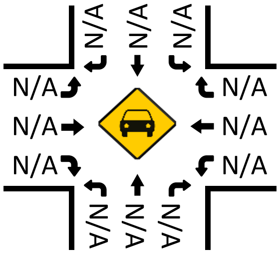
Total Vehicles (AM)



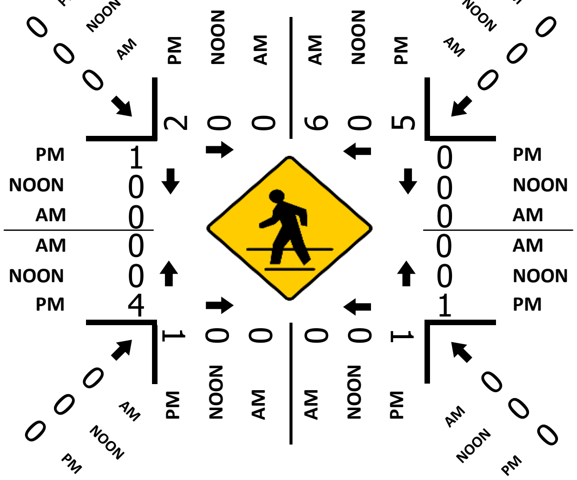
Total Vehicles (AM)



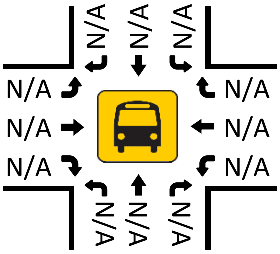
Total Vehicles (NOON)



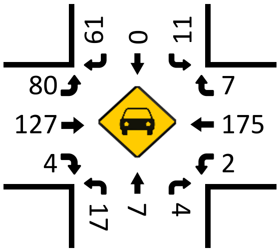
Pedestrians (Crosswalks)



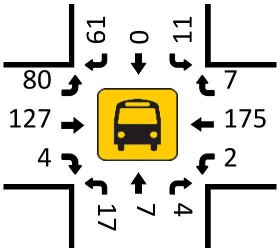
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sandpiper Ave & Mercy Ave
City: Merced
Control:

Project ID: 19-07137-002
Date: 4/16/2019

Total

NS/EW Streets:	Sandpiper Ave				Sandpiper Ave				Mercy Ave				Mercy Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	1	2	8	0	17	15	5	0	0	20	2	0	70
7:15 AM	0	0	0	0	1	3	6	0	31	11	1	0	0	31	2	0	86
7:30 AM	1	0	0	0	0	0	16	0	28	35	2	0	0	91	6	0	179
7:45 AM	0	0	0	0	2	2	16	0	40	71	6	0	0	92	2	0	231
8:00 AM	1	0	0	0	1	2	7	0	25	55	2	0	2	42	3	0	140
8:15 AM	2	0	0	0	1	5	5	0	37	43	2	0	0	41	5	0	141
8:30 AM	1	0	0	0	1	2	12	0	31	51	6	0	0	67	4	0	175
8:45 AM	2	1	0	0	0	0	7	0	37	50	4	0	3	71	4	0	179
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	1	0	0	7	16	77	0	246	331	28	0	5	455	28	0	1201
APPROACH %'s :	87.50%	12.50%	0.00%	0.00%	7.00%	16.00%	77.00%	0.00%	40.66%	54.71%	4.63%	0.00%	1.02%	93.24%	5.74%	0.00%	
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	4	0	0	0	4	9	44	0	130	204	12	0	2	266	16	0	691
PEAK HR FACTOR :	0.500	0.000	0.000	0.000	0.500	0.450	0.688	0.000	0.813	0.718	0.500	0.000	0.250	0.723	0.667	0.000	0.748
	0.500				0.713				0.739				0.732				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	2	1	0	6	0	14	0	21	36	2	0	1	43	5	0	135
4:15 PM	3	2	0	0	5	0	12	0	20	42	1	0	0	32	2	0	119
4:30 PM	5	3	2	0	8	0	17	0	19	22	2	0	0	51	2	0	131
4:45 PM	0	2	0	0	2	0	16	0	20	29	1	0	1	34	2	0	107
5:00 PM	8	1	1	0	1	0	15	0	27	32	0	0	1	48	2	0	136
5:15 PM	4	1	1	0	0	0	13	0	14	44	1	0	0	42	1	0	121
5:30 PM	2	1	0	0	5	0	14	0	17	38	0	0	1	34	1	0	113
5:45 PM	1	0	1	0	3	0	16	0	18	34	0	0	0	31	1	0	105
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	27	12	6	0	30	0	117	0	156	277	7	0	4	315	16	0	967
APPROACH %'s :	60.00%	26.67%	13.33%	0.00%	20.41%	0.00%	79.59%	0.00%	35.45%	62.95%	1.59%	0.00%	1.19%	94.03%	4.78%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	17	7	4	0	11	0	61	0	80	127	4	0	2	175	7	0	495
PEAK HR FACTOR :	0.531	0.583	0.500	0.000	0.344	0.000	0.897	0.000	0.741	0.722	0.500	0.000	0.500	0.858	0.875	0.000	0.910
	0.700				0.720				0.894				0.868				

ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Sandpiper Ave & Mercy Ave
City: Merced

Project ID: 19-07137-002
Date: 4/16/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Sandpiper Ave		Sandpiper Ave		Mercy Ave		Mercy Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	2	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0
8:00 AM	0	5	0	0	0	0	0	0	5
8:15 AM	0	1	0	0	0	0	0	0	1
8:30 AM	3	2	0	0	0	0	0	0	5
8:45 AM	0	1	0	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	5	9	0	0	0	0	0	0	14
APPROACH %'s :	35.71%	64.29%							
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	6	0	0	0	0	0	0	6
PEAK HR FACTOR :		0.300							0.300
	0.300								

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	1	1	0	0	0	0	0	0	2
4:15 PM	0	2	0	0	1	0	0	0	3
4:30 PM	0	1	0	0	0	0	0	0	1
4:45 PM	1	1	0	0	1	0	0	0	3
5:00 PM	1	1	0	1	0	0	0	0	3
5:15 PM	0	2	1	0	0	0	4	1	8
5:30 PM	0	0	1	0	0	0	0	1	2
5:45 PM	0	0	0	2	0	0	2	0	4
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	3	8	2	3	2	0	6	2	26
APPROACH %'s :	27.27%	72.73%	40.00%	60.00%	100.00%	0.00%	75.00%	25.00%	
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	2	5	1	1	1	0	4	1	15
PEAK HR FACTOR :	0.500	0.625	0.250	0.250	0.250		0.250	0.250	0.469
	0.875		0.500		0.250		0.250		

ATTACHMENT G

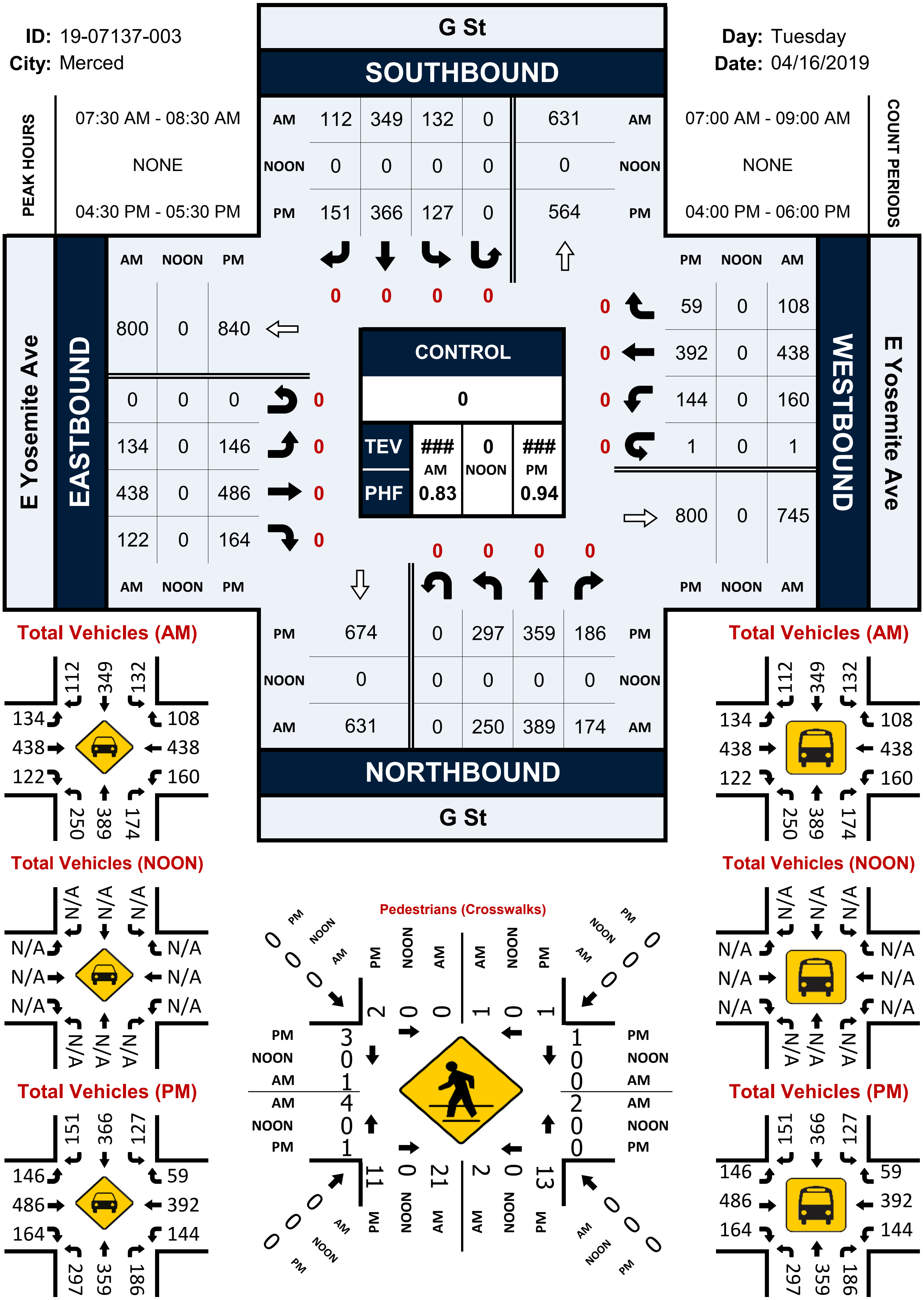
Prepared by National Data & Surveying Services

G St & E Yosemite Ave

Peak Hour Turning Movement Count

ID: 19-07137-003
City: Merced

Day: Tuesday
Date: 04/16/2019



ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: G St & E Yosemite Ave
City: Merced
Control:

Project ID: 19-07137-003
Date: 4/16/2019

Total

NS/EW Streets:	G St				G St				E Yosemite Ave				E Yosemite Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	26	50	18	0	22	36	16	0	16	42	21	0	21	63	12	0	343
7:15 AM	33	79	17	0	14	47	13	0	26	64	22	0	27	72	14	1	429
7:30 AM	61	78	37	0	30	103	34	0	30	54	25	0	39	118	30	0	639
7:45 AM	91	148	45	0	45	89	35	0	41	90	35	0	49	137	43	0	848
8:00 AM	46	78	48	0	39	91	27	0	20	139	32	0	40	104	15	0	679
8:15 AM	52	85	44	0	18	66	16	0	43	155	30	0	32	79	20	1	641
8:30 AM	30	93	35	0	15	78	22	0	49	97	29	0	38	98	22	0	606
8:45 AM	38	78	48	0	21	91	23	0	34	117	27	0	41	76	6	1	601
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	377	689	292	0	204	601	186	0	259	758	221	0	287	747	162	3	4786
APPROACH %'s :	27.76%	50.74%	21.50%	0.00%	20.59%	60.65%	18.77%	0.00%	20.92%	61.23%	17.85%	0.00%	23.94%	62.30%	13.51%	0.25%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	250	389	174	0	132	349	112	0	134	438	122	0	160	438	108	1	2807
PEAK HR FACTOR :	0.687	0.657	0.906	0.000	0.733	0.847	0.800	0.000	0.779	0.706	0.871	0.000	0.816	0.799	0.628	0.250	0.828
	0.716				0.877				0.761				0.772				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	62	75	37	0	35	92	37	0	33	132	45	0	42	81	12	0	683
4:15 PM	50	82	38	0	27	77	37	0	26	130	52	0	41	87	10	1	658
4:30 PM	68	82	48	0	25	120	39	0	32	103	48	0	48	73	9	0	695
4:45 PM	77	68	46	0	36	90	36	0	26	126	48	0	31	102	15	0	701
5:00 PM	71	103	40	0	33	85	27	0	37	131	41	0	32	95	18	0	713
5:15 PM	81	106	52	0	33	71	49	0	51	126	27	0	33	122	17	1	769
5:30 PM	81	96	34	0	39	89	33	0	21	109	29	0	31	94	18	0	674
5:45 PM	64	92	49	0	24	79	38	1	22	100	26	0	27	98	22	1	643
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	554	704	344	0	252	703	296	1	248	957	316	0	285	752	121	3	5536
APPROACH %'s :	34.58%	43.95%	21.47%	0.00%	20.13%	56.15%	23.64%	0.08%	16.31%	62.92%	20.78%	0.00%	24.55%	64.77%	10.42%	0.26%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	297	359	186	0	127	366	151	0	146	486	164	0	144	392	59	1	2878
PEAK HR FACTOR :	0.917	0.847	0.894	0.000	0.882	0.763	0.770	0.000	0.716	0.927	0.854	0.000	0.750	0.803	0.819	0.250	0.936
	0.881				0.875				0.952				0.861				

ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: G St & E Yosemite Ave
Project ID: 19-07137-003
City: Merced
Date: 4/16/2019

Pedestrians (Crosswalks)

NS/EW Streets:	G St		G St		E Yosemite Ave		E Yosemite Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	1	5	0	1	0	0	0	7
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	3	1	0	0	1	0	5
7:45 AM	0	0	9	0	0	0	0	0	9
8:00 AM	0	1	5	1	1	0	2	1	11
8:15 AM	0	0	4	0	1	0	1	0	6
8:30 AM	1	1	7	2	0	0	1	1	13
8:45 AM	0	0	6	1	0	0	0	4	11
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	3	39	5	3	0	5	6	62
APPROACH %'s :	25.00%	75.00%	88.64%	11.36%	100.00%	0.00%	45.45%	54.55%	
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	1	21	2	2	0	4	1	31
PEAK HR FACTOR :		0.250	0.583	0.500	0.500		0.500	0.250	0.705
	0.250		0.639		0.500		0.417		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	2	2	1	2	0	0	10	17
4:15 PM	0	2	1	3	0	0	0	1	7
4:30 PM	0	0	1	0	0	0	0	2	3
4:45 PM	1	0	0	1	0	1	0	0	3
5:00 PM	1	1	5	6	0	0	0	1	14
5:15 PM	0	0	5	6	0	0	1	0	12
5:30 PM	0	0	1	2	0	0	0	0	3
5:45 PM	0	0	1	2	0	0	0	3	6
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	2	5	16	21	2	1	1	17	65
APPROACH %'s :	28.57%	71.43%	43.24%	56.76%	66.67%	33.33%	5.56%	94.44%	
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	2	1	11	13	0	1	1	3	32
PEAK HR FACTOR :	0.500	0.250	0.550	0.542		0.250	0.250	0.375	0.571
	0.375		0.545		0.250		0.500		

ATTACHMENT G

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Sandpiper at Yosemite
Site Code : 00000000
Start Date : 4/3/2019
Page No : 1

Groups Printed- Unshifted - Bank 1

	SANDPIPER Southbound		**YOSEMITE Westbound**				**DRIVEWAY Northbound**		**YOSEMITE Eastbound**			
Start Time	Right	Peds	Left	Thru	Right	Peds	Right	Peds	Thru	Right	Peds	Int. Total
07:00 AM	0	0	17	102	0	0	0	0	75	2	0	196
07:15 AM	0	0	16	108	0	0	0	0	79	6	1	210
07:30 AM	0	0	19	161	0	0	0	0	120	0	3	303
07:45 AM	0	0	22	165	0	1	0	0	160	3	10	361
Total	0	0	74	536	0	1	0	0	434	11	14	1070
08:00 AM	0	0	20	112	0	1	1	0	174	0	6	314
08:15 AM	0	0	26	130	0	0	3	0	199	1	5	364
08:30 AM	0	0	33	142	0	2	0	0	166	0	5	348
08:45 AM	0	0	37	150	0	0	0	0	173	0	5	365
Total	0	0	116	534	0	3	4	0	712	1	21	1391
******												
04:00 PM	0	0	29	133	0	2	2	0	186	0	3	355
04:15 PM	0	0	21	127	0	0	4	0	203	1	1	357
04:30 PM	0	0	36	143	0	0	3	0	188	0	2	372
04:45 PM	0	0	38	146	0	2	2	1	185	0	1	375
Total	0	0	124	549	0	4	11	1	762	1	7	1459
05:00 PM	0	0	36	165	0	0	6	0	209	4	4	424
05:15 PM	0	0	37	163	0	1	2	0	218	0	4	425
05:30 PM	0	0	57	120	0	2	2	0	221	0	1	403
05:45 PM	0	0	48	130	0	4	5	0	207	0	2	396
Total	0	0	178	578	0	7	15	0	855	4	11	1648
Grand Total	0	0	492	2197	0	15	30	1	2763	17	53	5568
Apprch %	0	0	18.2	81.2	0	0.6	96.8	3.2	97.5	0.6	1.9	
Total %	0	0	8.8	39.5	0	0.3	0.5	0	49.6	0.3	1	
Unshifted	0	0	419	2197	0	15	30	0	2763	17	53	5494
% Unshifted	0	0	85.2	100	0	100	100	0	100	100	100	98.7
Bank 1	0	0	73	0	0	0	0	1	0	0	0	74
% Bank 1	0	0	14.8	0	0	0	0	100	0	0	0	1.3

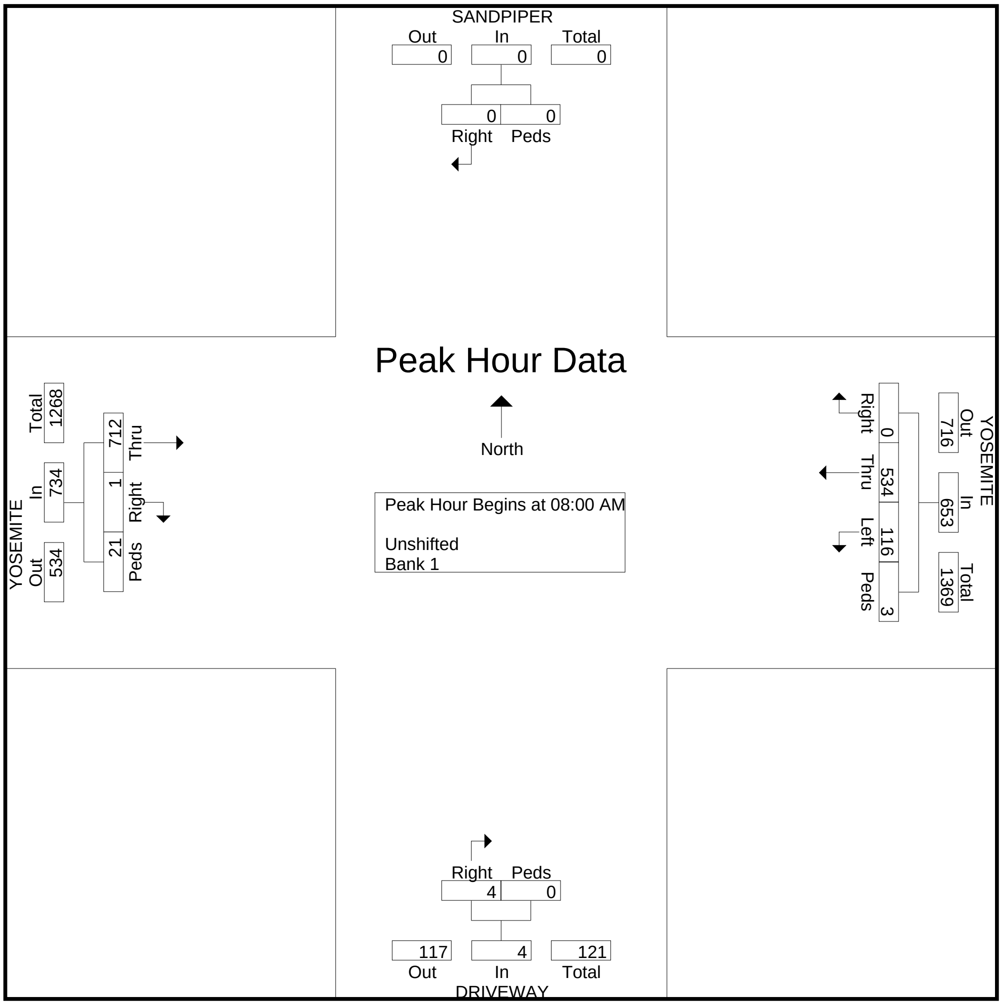
ATTACHMENT G

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Sandpiper at Yosemite
Site Code : 00000000
Start Date : 4/3/2019
Page No : 2

	SANDPIPER Southbound			YOSEMITE Westbound					DRIVEWAY Northbound			YOSEMITE Eastbound				
Start Time	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 08:00 AM to 08:45 AM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 08:00 AM																
08:00 AM	0	0	0	20	112	0	1	133	1	0	1	174	0	**6**	180	314
08:15 AM	0	0	0	26	130	0	0	156	**3**	0	**3**	**199**	**1**	5	**205**	364
08:30 AM	0	0	0	33	142	0	**2**	177	0	0	0	166	0	5	171	348
08:45 AM	0	0	0	**37**	**150**	0	0	**187**	0	0	0	173	0	5	178	**365**
Total Volume	0	0	0	116	534	0	3	653	4	0	4	712	1	21	734	1391
% App. Total	0	0		17.8	81.8	0	0.5		100	0		97	0.1	2.9		
PHF	.000	.000	.000	.784	.890	.000	.375	.873	.333	.000	.333	.894	.250	.875	.895	.953



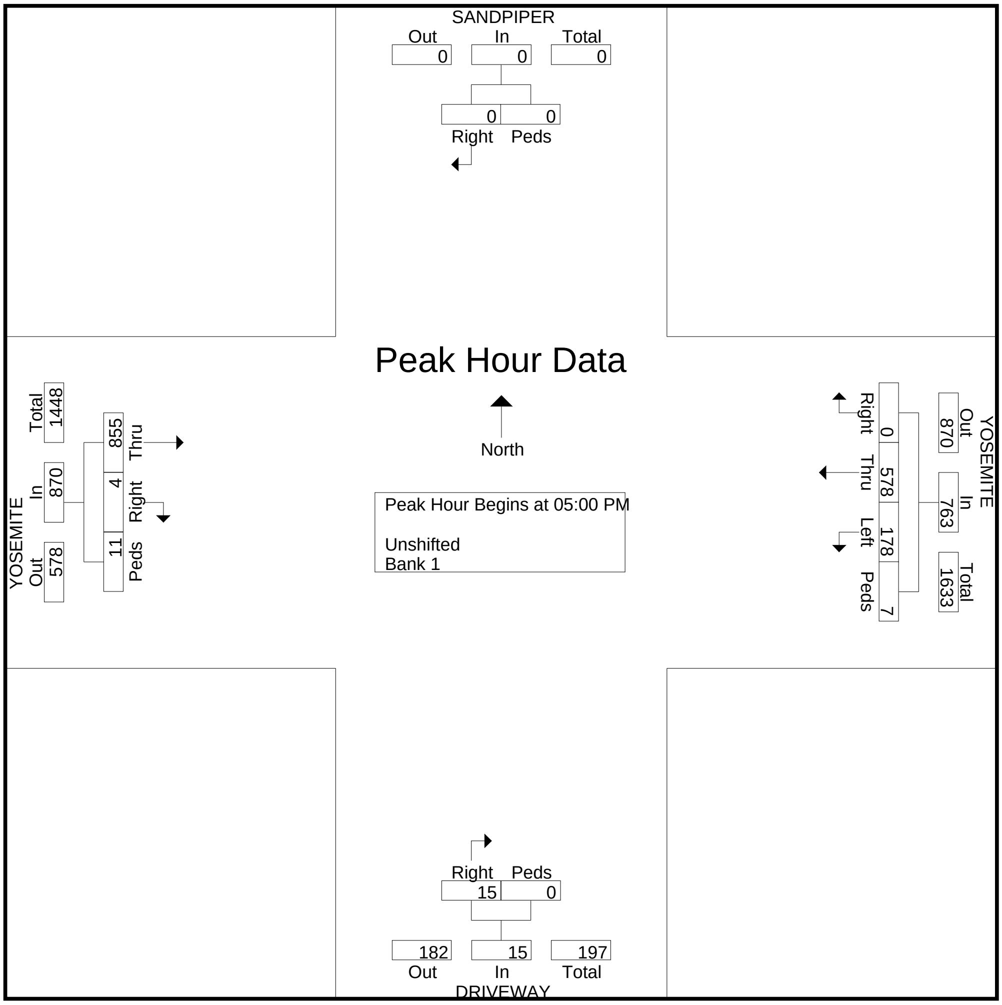
ATTACHMENT G

JLB Traffic Engineering, Inc.

1300 E. Shaw Ave., Ste. 103
Fresno, CA 93710
(559) 570-8991
Traffic Engineering, Transportation Planning & Parking Solutions
www.JLBtraffic.com

File Name : Sandpiper at Yosemite
Site Code : 00000000
Start Date : 4/3/2019
Page No : 3

	SANDPIPER Southbound			YOSEMITE Westbound					DRIVEWAY Northbound			YOSEMITE Eastbound				
Start Time	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Right	Peds	App. Total	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 05:00 PM to 05:45 PM - Peak 1 of 1																
Peak Hour for Entire Intersection Begins at 05:00 PM																
05:00 PM	0	0	0	36	**165**	0	0	**201**	**6**	0	**6**	209	**4**	**4**	217	424
05:15 PM	0	0	0	37	163	0	1	201	2	0	2	218	0	4	**222**	**425**
05:30 PM	0	0	0	**57**	120	0	2	179	2	0	2	**221**	0	1	222	403
05:45 PM	0	0	0	48	130	0	**4**	182	5	0	5	207	0	2	209	396
Total Volume	0	0	0	178	578	0	7	763	15	0	15	855	4	11	870	1648
% App. Total	0	0		23.3	75.8	0	0.9		100	0		98.3	0.5	1.3		
PHF	.000	.000	.000	.781	.876	.000	.438	.949	.625	.000	.625	.967	.250	.688	.980	.969



Prepared by National Data & Surveying Services

Mansionette Dr & E Yosemite Ave

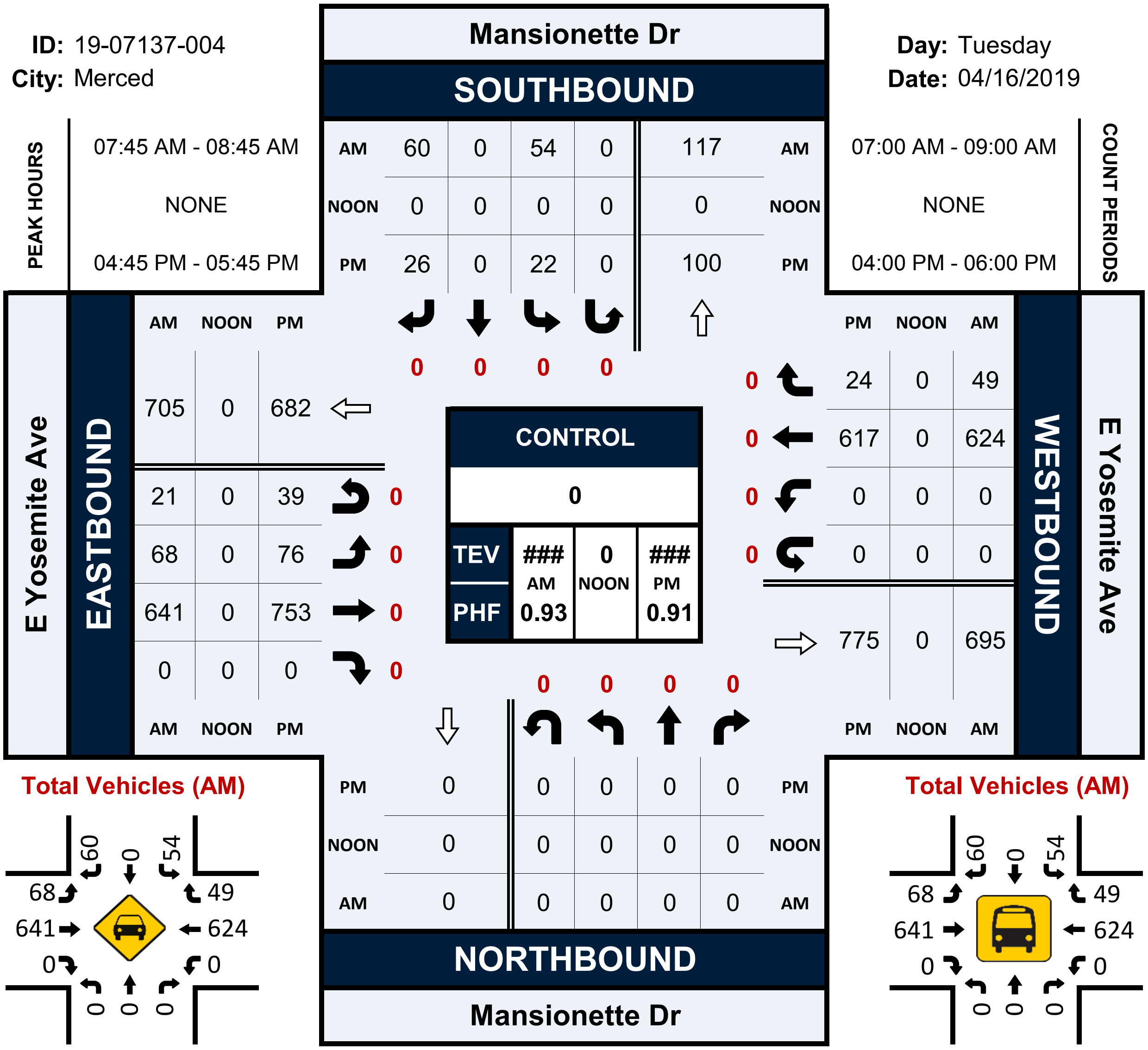
Peak Hour Turning Movement Count

ID: 19-07137-004
City: Merced

Day: Tuesday
Date: 04/16/2019

PEAK HOURS
07:45 AM - 08:45 AM
NONE
04:45 PM - 05:45 PM

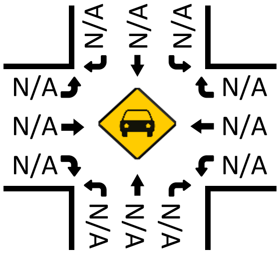
COUNT PERIODS
07:00 AM - 09:00 AM
NONE
04:00 PM - 06:00 PM



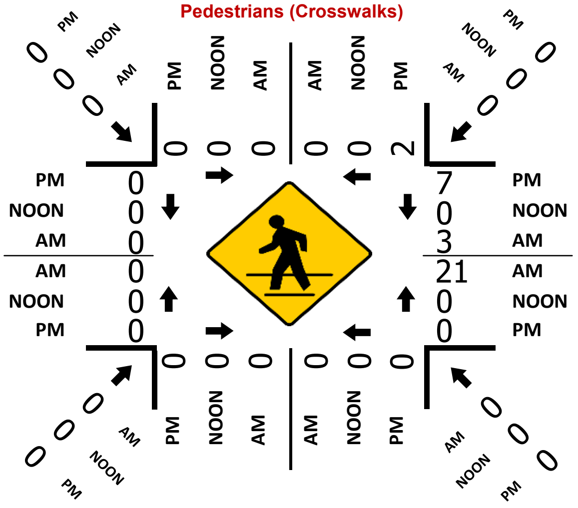
Total Vehicles (AM)

Total Vehicles (AM)

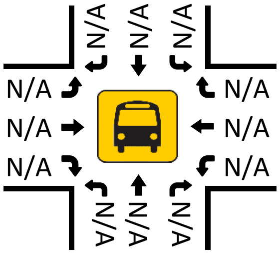
Total Vehicles (NOON)



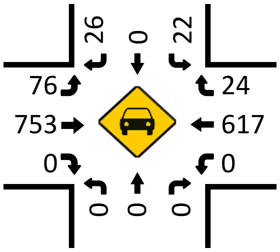
Pedestrians (Crosswalks)



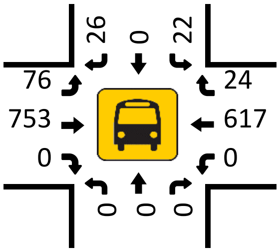
Total Vehicles (NOON)



Total Vehicles (PM)



Total Vehicles (PM)



ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mansionette Dr & E Yosemite Ave
City: Merced
Control:

Project ID: 19-07137-004
Date: 4/16/2019

Total

NS/EW Streets:	Mansionette Dr				Mansionette Dr				E Yosemite Ave				E Yosemite Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	5	0	13	0	8	80	0	2	0	74	6	0	188
7:15 AM	0	0	0	0	5	0	14	0	9	80	0	2	0	110	9	0	229
7:30 AM	0	0	0	0	8	0	16	0	10	116	0	3	0	170	17	0	340
7:45 AM	0	0	0	0	7	0	17	0	9	143	0	6	0	212	16	0	410
8:00 AM	0	0	0	0	13	0	11	0	12	191	0	7	0	133	11	0	378
8:15 AM	0	0	0	0	13	0	9	0	18	158	0	6	0	132	14	0	350
8:30 AM	0	0	0	0	21	0	23	0	29	149	0	2	0	147	8	0	379
8:45 AM	0	0	0	0	25	0	22	0	19	132	0	5	0	117	14	0	334
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	97	0	125	0	114	1049	0	33	0	1095	95	0	2608
APPROACH %'s :					43.69%	0.00%	56.31%	0.00%	9.53%	87.71%	0.00%	2.76%	0.00%	92.02%	7.98%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	0	0	0	54	0	60	0	68	641	0	21	0	624	49	0	1517
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.643	0.000	0.652	0.000	0.586	0.839	0.000	0.750	0.000	0.736	0.766	0.000	0.925
					0.648				0.869				0.738				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	4	0	11	0	12	183	0	15	0	131	4	0	360
4:15 PM	0	0	0	0	6	0	10	0	15	197	0	9	0	174	8	0	419
4:30 PM	0	0	0	0	8	0	6	0	12	171	0	12	0	141	7	0	357
4:45 PM	0	0	0	0	4	0	7	0	14	187	0	15	0	138	4	0	369
5:00 PM	0	0	0	0	8	0	6	0	25	197	0	6	0	153	8	0	403
5:15 PM	0	0	0	0	7	0	4	0	18	200	0	12	0	179	6	0	426
5:30 PM	0	0	0	0	3	0	9	0	19	169	0	6	0	147	6	0	359
5:45 PM	0	0	0	0	5	0	12	0	21	156	0	10	0	141	10	0	355
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	45	0	65	0	136	1460	0	85	0	1204	53	0	3048
APPROACH %'s :					40.91%	0.00%	59.09%	0.00%	8.09%	86.85%	0.00%	5.06%	0.00%	95.78%	4.22%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	22	0	26	0	76	753	0	39	0	617	24	0	1557
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.688	0.000	0.722	0.000	0.760	0.941	0.000	0.650	0.000	0.862	0.750	0.000	0.914
					0.857				0.943				0.866				

ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Mansionette Dr & E Yosemite Ave
Project ID: 19-07137-004
City: Merced
Date: 4/16/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Mansionette Dr		Mansionette Dr		E Yosemite Ave		E Yosemite Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	1	1	0	0	2
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	2	2	0	0	4
8:00 AM	0	0	0	0	3	1	0	0	4
8:15 AM	0	0	0	0	8	0	0	0	8
8:30 AM	0	0	0	0	8	0	0	0	8
8:45 AM	0	0	0	0	4	0	0	0	4
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	26	4	0	0	30
APPROACH %'s :					86.67%	13.33%			
PEAK HR :	07:45 AM - 08:45 AM								TOTAL
PEAK HR VOL :	0	0	0	0	21	3	0	0	24
PEAK HR FACTOR :					0.656	0.375			0.750
					0.750				

	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
PM	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	1	0	0	2	3	0	0	6
4:15 PM	2	0	0	0	2	4	0	0	8
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	2	0	0	0	4	0	0	6
5:00 PM	0	0	0	0	0	2	0	0	2
5:15 PM	0	0	0	0	0	1	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	1	1	0	0	3
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	2	4	0	0	5	15	0	0	26
APPROACH %'s :	33.33%	66.67%			25.00%	75.00%			
PEAK HR :	04:45 PM - 05:45 PM								TOTAL
PEAK HR VOL :	0	2	0	0	0	7	0	0	9
PEAK HR FACTOR :		0.250				0.438			0.375
	0.250				0.438				

ATTACHMENT G

Prepared by National Data & Surveying Services

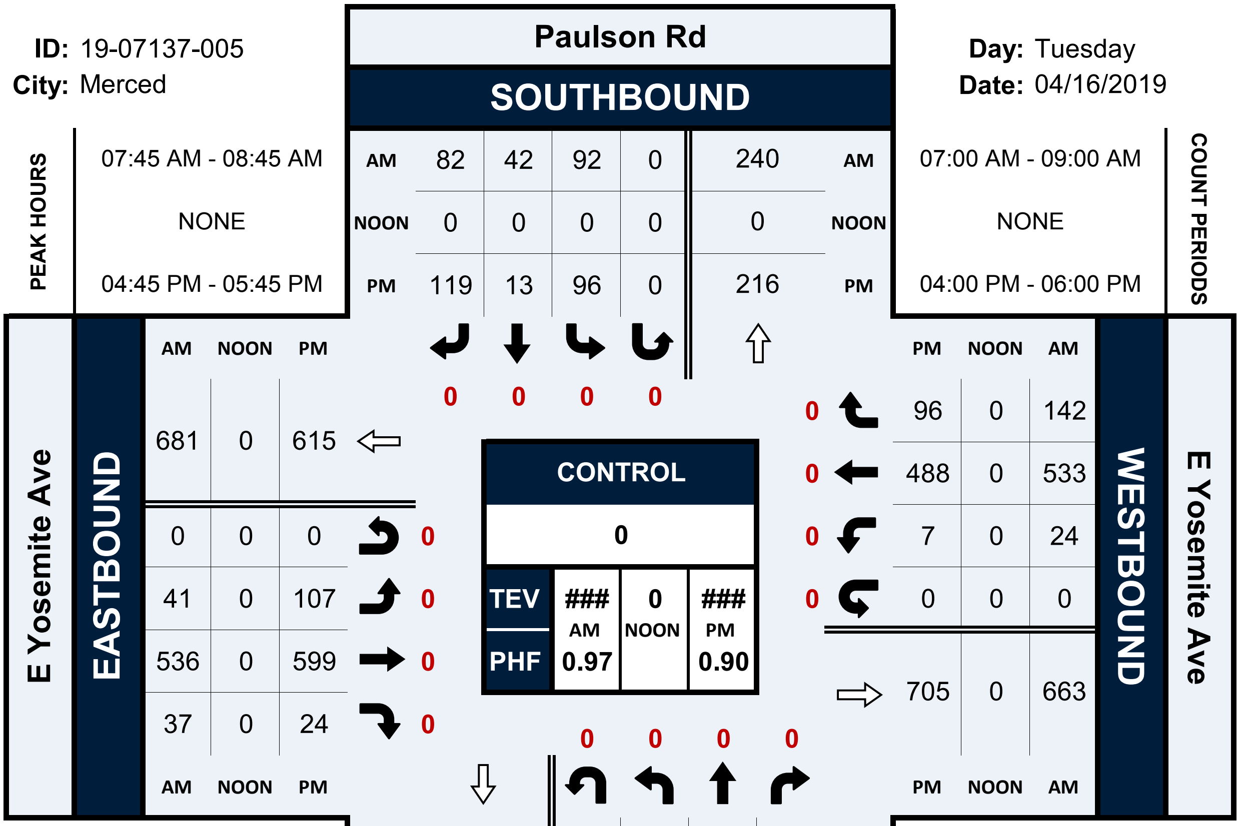
Paulson Rd & E Yosemite Ave

Peak Hour Turning Movement Count

ID: 19-07137-005
City: Merced

Day: Tuesday
Date: 04/16/2019

PEAK HOURS		COUNT PERIODS
07:45 AM - 08:45 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM



Paulson Rd — SOUTHBOUND

AM	82	42	92	0	240
NOON	0	0	0	0	0
PM	119	13	96	0	216
	0	0	0	0	

E Yosemite Ave — EASTBOUND

AM	NOON	PM	
681	0	615	
0	0	0	0
41	0	107	0
536	0	599	0
37	0	24	0

E Yosemite Ave — WESTBOUND

	PM	NOON	AM
0	96	0	142
0	488	0	533
0	7	0	24
0	0	0	0
	705	0	663

Paulson Rd — NORTHBOUND

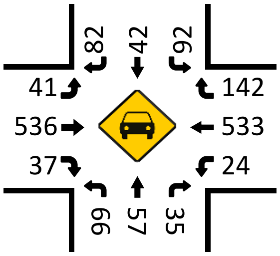
		0	0	0	0
PM	44	0	8	13	10
NOON	0	0	0	0	0
AM	103	0	66	57	35

CONTROL

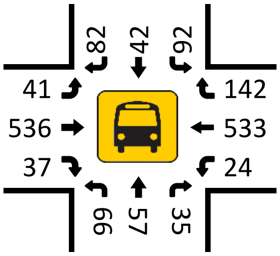
0

	AM	NOON	PM
TEV	###	0	###
PHF	0.97		0.90

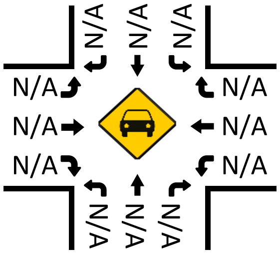
Total Vehicles (AM)



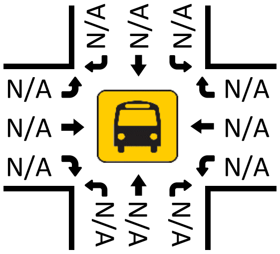
Total Vehicles (AM)



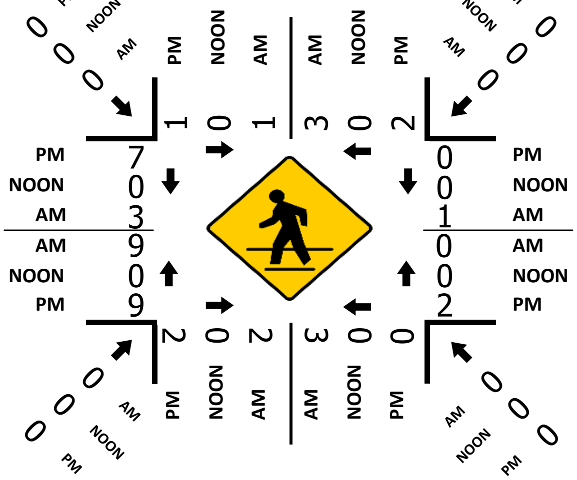
Total Vehicles (NOON)



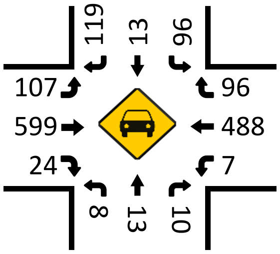
Total Vehicles (NOON)



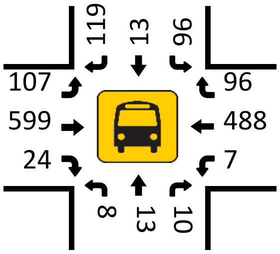
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Paulson Rd & E Yosemite Ave
City: Merced
Control:

Project ID: 19-07137-005
Date: 4/16/2019

Total

NS/EW Streets:	Paulson Rd				Paulson Rd				E Yosemite Ave				E Yosemite Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	5	2	0	0	7	2	19	0	5	82	2	0	0	49	5	0	178
7:15 AM	3	0	0	0	16	1	19	0	4	66	0	0	1	102	11	0	223
7:30 AM	6	2	0	0	27	2	32	0	3	101	5	0	3	148	31	0	360
7:45 AM	7	4	1	0	21	5	28	0	10	121	3	0	2	194	40	0	436
8:00 AM	10	11	12	0	22	13	16	0	9	160	10	0	5	122	32	0	422
8:15 AM	15	19	10	0	28	14	16	0	7	126	16	0	11	114	35	0	411
8:30 AM	34	23	12	0	21	10	22	0	15	129	8	0	6	103	35	0	418
8:45 AM	4	11	5	0	15	1	20	0	13	135	4	0	1	97	45	0	351
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	84	72	40	0	157	48	172	0	66	920	48	0	29	929	234	0	2799
APPROACH %'s :	42.86%	36.73%	20.41%	0.00%	41.64%	12.73%	45.62%	0.00%	6.38%	88.97%	4.64%	0.00%	2.43%	77.94%	19.63%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	66	57	35	0	92	42	82	0	41	536	37	0	24	533	142	0	1687
PEAK HR FACTOR :	0.485	0.620	0.729	0.000	0.821	0.750	0.732	0.000	0.683	0.838	0.578	0.000	0.545	0.687	0.888	0.000	0.967
	0.572				0.931				0.858				0.740				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	4	1	2	0	29	6	25	0	26	144	7	0	3	116	11	0	374
4:15 PM	5	9	5	0	18	3	26	0	19	143	7	0	4	96	13	0	348
4:30 PM	2	3	2	0	20	3	34	0	36	138	1	0	0	100	16	0	355
4:45 PM	2	2	4	0	25	0	29	0	30	137	5	0	2	110	26	0	372
5:00 PM	3	6	2	0	26	5	24	0	28	153	9	0	2	110	14	0	382
5:15 PM	2	3	2	0	30	4	39	0	23	157	7	0	1	140	30	0	438
5:30 PM	1	2	2	0	15	4	27	0	26	152	3	0	2	128	26	0	388
5:45 PM	1	3	0	0	19	2	30	0	32	119	6	0	3	114	25	0	354
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	20	29	19	0	182	27	234	0	220	1143	45	0	17	914	161	0	3011
APPROACH %'s :	29.41%	42.65%	27.94%	0.00%	41.08%	6.09%	52.82%	0.00%	15.63%	81.18%	3.20%	0.00%	1.56%	83.70%	14.74%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	8	13	10	0	96	13	119	0	107	599	24	0	7	488	96	0	1580
PEAK HR FACTOR :	0.667	0.542	0.625	0.000	0.800	0.650	0.763	0.000	0.892	0.954	0.667	0.000	0.875	0.871	0.800	0.000	0.902
	0.705				0.781				0.961				0.864				

ATTACHMENT G

National Data & Surveying Services

Intersection Turning Movement Count

Location: Paulson Rd & E Yosemite Ave
Project ID: 19-07137-005
City: Merced
Date: 4/16/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Paulson Rd		Paulson Rd		E Yosemite Ave		E Yosemite Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	1	1	0	0	1	1	1	0	5
7:30 AM	0	0	0	0	0	0	1	0	1
7:45 AM	0	0	1	0	0	0	1	2	4
8:00 AM	0	0	0	0	0	0	3	1	4
8:15 AM	0	0	0	0	0	1	3	0	4
8:30 AM	1	3	1	3	0	0	2	0	10
8:45 AM	0	1	0	0	1	0	2	0	4
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	2	5	2	3	2	2	13	3	32
APPROACH %'s :	28.57%	71.43%	40.00%	60.00%	50.00%	50.00%	81.25%	18.75%	
PEAK HR :	07:45 AM - 08:45 AM								TOTAL
PEAK HR VOL :	1	3	2	3	0	1	9	3	22
PEAK HR FACTOR :	0.250	0.250	0.500	0.250		0.250	0.750	0.375	0.550
	0.250		0.313		0.250		0.750		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	1	0	4	0	0	0	0	1	6
4:15 PM	0	1	2	0	0	0	0	1	4
4:30 PM	0	2	1	0	2	0	1	2	8
4:45 PM	0	0	0	0	0	0	3	1	4
5:00 PM	1	0	2	0	0	0	2	3	8
5:15 PM	0	0	0	0	0	0	2	2	4
5:30 PM	0	2	0	0	2	0	2	1	7
5:45 PM	0	2	0	1	0	0	2	6	11
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	2	7	9	1	4	0	12	17	52
APPROACH %'s :	22.22%	77.78%	90.00%	10.00%	100.00%	0.00%	41.38%	58.62%	
PEAK HR :	04:45 PM - 05:45 PM								TOTAL
PEAK HR VOL :	1	2	2	0	2	0	9	7	23
PEAK HR FACTOR :	0.250	0.250	0.250		0.250		0.750	0.583	0.719
	0.375		0.250		0.250		0.800		

ATTACHMENT G

Appendix C: Methodology

ATTACHMENT G

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.

ATTACHMENT G

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.

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 i ndividual 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 ≤ 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.

ATTACHMENT G

Appendix D: Existing Traffic Conditions

ATTACHMENT G

HCM Signalized Intersection Capacity Analysis

1: "G" Street & Mercy Avenue

Existing AM Peak

05/15/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		↰	↑↑
Traffic Volume (vph)	5	40	19	145	54	139	102	372	165	1	146	424
Future Volume (vph)	5	40	19	145	54	139	102	372	165	1	146	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.95		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1757		1752	1631		1752	3505	1534		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1757		1752	1631		1752	3505	1534		1752	3505
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	7	56	26	201	75	193	142	517	229	1	203	589
RTOR Reduction (vph)	0	18	0	0	98	0	0	0	176	0	0	0
Lane Group Flow (vph)	7	64	0	201	170	0	142	517	53	0	204	589
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	0.7	11.0		14.2	24.5		7.5	17.4	17.4		14.0	23.9
Effective Green, g (s)	0.7	11.0		14.2	24.5		7.5	17.4	17.4		14.0	23.9
Actuated g/C Ratio	0.01	0.15		0.19	0.33		0.10	0.23	0.23		0.19	0.32
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	16	257		331	532		175	813	355		327	1116
v/s Ratio Prot	0.00	0.04		c0.11	c0.10		c0.08	c0.15			c0.12	0.17
v/s Ratio Perm									0.03			
v/c Ratio	0.44	0.25		0.61	0.32		0.81	0.64	0.15		0.62	0.53
Uniform Delay, d1	37.0	28.3		27.8	19.0		33.1	25.9	22.9		28.1	20.9
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	18.0	0.5		3.1	0.4		24.0	1.6	0.2		3.7	0.5
Delay (s)	54.9	28.9		31.0	19.3		57.1	27.6	23.1		31.8	21.4
Level of Service	D	C		C	B		E	C	C		C	C
Approach Delay (s)		30.9			24.3			31.1				23.7
Approach LOS		C			C			C				C

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.72
Adj. Flow (vph)	40
RTOR Reduction (vph)	27
Lane Group Flow (vph)	13
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	23.9
Effective Green, g (s)	23.9
Actuated g/C Ratio	0.32
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	499
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.03
Uniform Delay, d1	17.6
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	17.6
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

ATTACHMENT G

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	130	204	12	2	266	16	4	0	0	4	9	44
Future Vol, veh/h	130	204	12	2	266	16	4	0	0	4	9	44
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	173	272	16	3	355	21	5	0	0	5	12	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	382	0	0	288	0	0	1033	1014	280	1004	1012	372
Stage 1	-	-	-	-	-	-	626	626	-	378	378	-
Stage 2	-	-	-	-	-	-	407	388	-	626	634	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1171	-	-	1268	-	-	210	238	756	220	238	672
Stage 1	-	-	-	-	-	-	470	475	-	642	613	-
Stage 2	-	-	-	-	-	-	619	607	-	470	471	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1164	-	-	1268	-	-	162	201	756	193	201	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	162	201	-	193	201	-
Stage 1	-	-	-	-	-	-	400	404	-	544	607	-
Stage 2	-	-	-	-	-	-	552	602	-	400	401	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.1	28	14.1
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	162	1164	-	-	1268	-	-	198	668
HCM Lane V/C Ratio	0.033	0.149	-	-	0.002	-	-	0.088	0.088
HCM Control Delay (s)	28	8.6	-	-	7.8	0	-	24.9	10.9
HCM Lane LOS	D	A	-	-	A	A	-	C	B
HCM 95th %tile Q(veh)	0.1	0.5	-	-	0	-	-	0.3	0.3

	↗	→	↘	↩	↙	←	↖	↖	↑	↗	↘	↓
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	134	438	122	1	160	438	108	250	389	174	132	349
Future Volume (vph)	134	438	122	1	160	438	108	250	389	174	132	349
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.97			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3368			1752	3505	1548	1752	3505	1546	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3368			1752	3505	1548	1752	3505	1546	1752	3505
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	161	528	147	1	193	528	130	301	469	210	159	420
RTOR Reduction (vph)	0	24	0	0	0	0	92	0	0	115	0	0
Lane Group Flow (vph)	161	651	0	0	194	528	38	301	469	95	159	420
Confl. Peds. (#/hr)			23				1			2		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	10.2	23.7			13.0	26.5	26.5	18.3	23.8	23.8	12.3	17.1
Effective Green, g (s)	10.2	23.7			13.0	26.5	26.5	18.3	23.8	23.8	12.3	17.1
Actuated g/C Ratio	0.11	0.26			0.14	0.29	0.29	0.20	0.26	0.26	0.13	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	194	869			248	1011	446	349	908	400	234	652
v/s Ratio Prot	0.09	c0.19			c0.11	c0.15		c0.17	0.13		0.09	c0.12
v/s Ratio Perm							0.02			0.06		
v/c Ratio	0.83	0.75			0.78	0.52	0.08	0.86	0.52	0.24	0.68	0.64
Uniform Delay, d1	40.0	31.3			38.0	27.3	23.8	35.5	29.1	26.8	37.9	34.5
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	24.4	3.6			14.8	0.5	0.1	19.2	0.5	0.3	7.6	2.2
Delay (s)	64.4	34.9			52.8	27.8	23.9	54.7	29.6	27.1	45.5	36.7
Level of Service	E	C			D	C	C	D	C	C	D	D
Approach Delay (s)		40.6				32.9			36.8			37.6
Approach LOS		D				C			D			D

Intersection Summary			
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	19.7
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	112
Future Volume (vph)	112
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1541
Flt Permitted	1.00
Satd. Flow (perm)	1541
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	135
RTOR Reduction (vph)	110
Lane Group Flow (vph)	25
Confl. Peds. (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	17.1
Effective Green, g (s)	17.1
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	287
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.09
Uniform Delay, d1	30.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	31.0
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	712	1	0	650	0	0	0	4	0	0	0
Future Vol, veh/h	0	712	1	0	650	0	0	0	4	0	0	0
Conflicting Peds, #/hr	0	0	21	21	0	3	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	749	1	0	684	0	0	0	4	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	396	-	-	345
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	600	0	0	648
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	588	-	-	646
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	588	-	-	-	-	-
HCM Lane V/C Ratio	0.007	-	-	-	-	-
HCM Control Delay (s)	11.2	-	-	-	-	0
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	21	68	641	624	49	54	60
Future Volume (vph)	21	68	641	624	49	54	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
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	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1568	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1568	1752	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	23	73	689	671	53	58	65
RTOR Reduction (vph)	0	0	0	0	18	0	57
Lane Group Flow (vph)	0	96	689	671	35	58	8
Confl. Peds. (#/hr)						24	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		8.9	69.7	56.6	56.6	10.8	10.8
Effective Green, g (s)		8.9	69.7	56.6	56.6	10.8	10.8
Actuated g/C Ratio		0.10	0.77	0.63	0.63	0.12	0.12
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		173	2714	2204	986	210	188
v/s Ratio Prot		c0.05	0.20	c0.19		c0.03	
v/s Ratio Perm					0.02		0.00
v/c Ratio		0.55	0.25	0.30	0.04	0.28	0.04
Uniform Delay, d1		38.7	2.8	7.7	6.3	36.0	35.0
Progression Factor		1.00	1.00	0.26	0.03	1.00	1.00
Incremental Delay, d2		3.8	0.2	0.3	0.1	0.7	0.1
Delay (s)		42.5	3.1	2.4	0.3	36.8	35.1
Level of Service		D	A	A	A	D	D
Approach Delay (s)			7.9	2.2		35.9	
Approach LOS			A	A		D	

Intersection Summary			
HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	37.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
8: Paulson Road & Yosemite Avenue

Existing AM Peak
05/15/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	41	536	37	24	533	142	66	57	35	92	42	82
Future Volume (veh/h)	41	536	37	24	533	142	66	57	35	92	42	82
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	553	38	25	549	146	68	59	36	95	43	85
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	704	583	490	516	732	323	87	140	85	116	75	149
Arrive On Green	0.40	0.31	0.31	0.29	0.21	0.21	0.05	0.13	0.13	0.07	0.14	0.14
Sat Flow, veh/h	1767	1856	1560	1767	3526	1557	1767	1077	657	1767	547	1080
Grp Volume(v), veh/h	42	553	38	25	549	146	68	0	95	95	0	128
Grp Sat Flow(s),veh/h/ln	1767	1856	1560	1767	1763	1557	1767	0	1734	1767	0	1627
Q Serve(g_s), s	1.3	26.2	1.5	0.9	13.2	5.8	3.4	0.0	4.5	4.8	0.0	6.6
Cycle Q Clear(g_c), s	1.3	26.2	1.5	0.9	13.2	5.8	3.4	0.0	4.5	4.8	0.0	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		0.66
Lane Grp Cap(c), veh/h	704	583	490	516	732	323	87	0	225	116	0	225
V/C Ratio(X)	0.06	0.95	0.08	0.05	0.75	0.45	0.78	0.00	0.42	0.82	0.00	0.57
Avail Cap(c_a), veh/h	704	586	492	516	1058	467	122	0	636	116	0	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	30.1	21.7	22.9	33.5	19.2	42.3	0.0	36.1	41.5	0.0	36.3
Incr Delay (d2), s/veh	0.0	26.5	0.3	0.0	6.9	4.5	18.9	0.0	1.3	35.4	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	0.5	15.0	0.6	0.4	6.0	3.0	2.0	0.0	2.0	3.1	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	56.7	22.0	22.9	40.4	23.7	61.2	0.0	37.3	76.9	0.0	38.6
LnGrp LOS	B	E	C	C	D	C	E	A	D	E	A	D
Approach Vol, veh/h		633			720			163			223	
Approach Delay, s/veh		51.9			36.4			47.3			54.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.1	15.9	30.5	33.6	8.6	17.3	40.1	24.0
Change Period (Y+Rc), s	* 4.2	* 4.2	4.2	* 5.3	4.2	* 4.9	4.2	* 5.3
Max Green Setting (Gmax), s	* 5.9	* 33	5.0	* 28	6.2	* 32	6.4	* 27
Max Q Clear Time (g_c+I1), s	6.8	6.5	2.9	28.2	5.4	8.6	3.3	15.2
Green Ext Time (p_c), s	0.0	0.5	0.0	0.1	0.0	0.6	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	45.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↰	↑↑	↱		↰
Traffic Volume (vph)	19	39	74	161	49	85	1	88	375	104	1	69
Future Volume (vph)	19	39	74	161	49	85	1	88	375	104	1	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.90		1.00	0.91			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1663		1752	1656			1752	3505	1532		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1663		1752	1656			1752	3505	1532		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	42	80	173	53	91	1	95	403	112	1	74
RTOR Reduction (vph)	0	67	0	0	61	0	0	0	0	76	0	0
Lane Group Flow (vph)	20	55	0	173	83	0	0	96	403	36	0	75
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	0.6	10.8		12.2	22.4			7.6	21.5	21.5		4.9
Effective Green, g (s)	0.6	10.8		12.2	22.4			7.6	21.5	21.5		4.9
Actuated g/C Ratio	0.01	0.16		0.18	0.33			0.11	0.32	0.32		0.07
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	15	264		315	547			196	1111	485		126
v/s Ratio Prot	0.01	c0.03		c0.10	0.05			c0.05	c0.11			0.04
v/s Ratio Perm										0.02		
v/c Ratio	1.33	0.21		0.55	0.15			0.49	0.36	0.07		0.60
Uniform Delay, d1	33.6	24.8		25.3	16.0			28.3	17.9	16.2		30.5
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	353.6	0.4		2.0	0.1			1.9	0.2	0.1		7.4
Delay (s)	387.2	25.2		27.3	16.1			30.2	18.1	16.2		37.8
Level of Service	F	C		C	B			C	B	B		D
Approach Delay (s)		76.2			22.2				19.6			
Approach LOS		E			C				B			

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	67.8	Sum of lost time (s)	18.4
Intersection Capacity Utilization	46.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	403	19
Future Volume (vph)	403	19
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1546
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1546
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	433	20
RTOR Reduction (vph)	0	14
Lane Group Flow (vph)	433	6
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	18.8	18.8
Effective Green, g (s)	18.8	18.8
Actuated g/C Ratio	0.28	0.28
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	971	428
v/s Ratio Prot	c0.12	
v/s Ratio Perm		0.00
v/c Ratio	0.45	0.01
Uniform Delay, d1	20.2	17.8
Progression Factor	1.00	1.00
Incremental Delay, d2	0.3	0.0
Delay (s)	20.5	17.8
Level of Service	C	B
Approach Delay (s)	22.9	
Approach LOS	C	
Intersection Summary		

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	80	127	4	2	175	7	17	7	4	11	0	61
Future Vol, veh/h	80	127	4	2	175	7	17	7	4	11	0	61
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	88	140	4	2	192	8	19	8	4	12	0	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	146	0	0	559	531	145	532	529	208
Stage 1	-	-	-	-	-	-	320	320	-	207	207	-
Stage 2	-	-	-	-	-	-	239	211	-	325	322	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1358	-	-	1430	-	-	438	453	900	457	454	830
Stage 1	-	-	-	-	-	-	690	651	-	793	729	-
Stage 2	-	-	-	-	-	-	762	726	-	685	649	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1349	-	-	1427	-	-	379	419	897	422	420	821
Mov Cap-2 Maneuver	-	-	-	-	-	-	379	419	-	422	420	-
Stage 1	-	-	-	-	-	-	644	607	-	737	722	-
Stage 2	-	-	-	-	-	-	695	719	-	629	606	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0.1	14.2	10.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	424	1349	-	-	1427	-	-	422	821
HCM Lane V/C Ratio	0.073	0.065	-	-	0.002	-	-	0.029	0.082
HCM Control Delay (s)	14.2	7.9	-	-	7.5	0	-	13.8	9.8
HCM Lane LOS	B	A	-	-	A	A	-	B	A
HCM 95th %tile Q(veh)	0.2	0.2	-	-	0	-	-	0.1	0.3

HCM Signalized Intersection Capacity Analysis
5: "G" Street & Yosemite Avenue

Existing PM Peak
05/16/2019

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	146	486	164	1	144	392	59	297	359	186	127	366
Future Volume (vph)	146	486	164	1	144	392	59	297	359	186	127	366
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3346			1752	3505	1546	1752	3505	1548	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3346			1752	3505	1546	1752	3505	1548	1752	3505
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)	155	517	174	1	153	417	63	316	382	198	135	389
RTOR Reduction (vph)	0	32	0	0	0	0	45	0	0	133	0	0
Lane Group Flow (vph)	155	659	0	0	154	417	18	316	382	65	135	389
Confl. Peds. (#/hr)			24				3			1		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	8.9	23.5			10.9	25.5	25.5	18.1	24.1	24.1	10.9	16.2
Effective Green, g (s)	8.9	23.5			10.9	25.5	25.5	18.1	24.1	24.1	10.9	16.2
Actuated g/C Ratio	0.10	0.27			0.12	0.29	0.29	0.20	0.27	0.27	0.12	0.18
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	176	889			216	1011	445	358	955	422	216	642
v/s Ratio Prot	c0.09	c0.20			0.09	0.12		c0.18	0.11		0.08	c0.11
v/s Ratio Perm							0.01			0.04		
v/c Ratio	0.88	0.74			0.71	0.41	0.04	0.88	0.40	0.15	0.62	0.61
Uniform Delay, d1	39.2	29.7			37.2	25.4	22.6	34.1	26.2	24.4	36.8	33.2
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	36.4	3.4			10.6	0.3	0.0	21.7	0.3	0.2	5.5	1.6
Delay (s)	75.6	33.0			47.8	25.7	22.7	55.8	26.5	24.6	42.3	34.8
Level of Service	E	C			D	C	C	E	C	C	D	C
Approach Delay (s)		40.8				30.8			36.4			35.2
Approach LOS		D				C			D			D

Intersection Summary			
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	19.7
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	151
Future Volume (vph)	151
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1543
Flt Permitted	1.00
Satd. Flow (perm)	1543
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	161
RTOR Reduction (vph)	131
Lane Group Flow (vph)	30
Confl. Peds. (#/hr)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	16.2
Effective Green, g (s)	16.2
Actuated g/C Ratio	0.18
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	282
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.10
Uniform Delay, d1	30.1
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	30.2
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	855	4	0	756	0	0	0	15	0	0	0
Future Vol, veh/h	0	855	4	0	756	0	0	0	15	0	0	0
Conflicting Peds, #/hr	0	0	11	0	0	7	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	881	4	0	779	0	0	0	15	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	452	-	-	397
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	552	0	0	600
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	546	-	-	596
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	546	-	-	-	-	-
HCM Lane V/C Ratio	0.028	-	-	-	-	-
HCM Control Delay (s)	11.8	-	-	-	-	0
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

HCM Signalized Intersection Capacity Analysis
7: Yosemite Avenue & Mansionette Drive

Existing PM Peak
05/16/2019

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	39	76	753	617	24	22	26
Future Volume (vph)	39	76	753	617	24	22	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1531	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1531	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	84	827	678	26	24	29
RTOR Reduction (vph)	0	0	0	0	9	0	26
Lane Group Flow (vph)	0	127	827	678	17	24	3
Confl. Peds. (#/hr)					2	7	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		11.3	67.9	52.4	52.4	8.6	8.6
Effective Green, g (s)		11.3	67.9	52.4	52.4	8.6	8.6
Actuated g/C Ratio		0.13	0.79	0.61	0.61	0.10	0.10
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		230	2767	2135	932	175	156
v/s Ratio Prot		c0.07	0.24	c0.19		c0.01	
v/s Ratio Perm					0.01		0.00
v/c Ratio		0.55	0.30	0.32	0.02	0.14	0.02
Uniform Delay, d1		35.0	2.5	8.1	6.6	35.3	34.9
Progression Factor		1.00	1.00	0.28	0.07	1.00	1.00
Incremental Delay, d2		2.9	0.3	0.4	0.0	0.4	0.0
Delay (s)		37.8	2.8	2.7	0.5	35.7	34.9
Level of Service		D	A	A	A	D	C
Approach Delay (s)			7.4	2.6		35.3	
Approach LOS			A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	42.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	107	599	24	7	488	96	8	13	10	96	13	119
Future Volume (veh/h)	107	599	24	7	488	96	8	13	10	96	13	119
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		0.99	1.00		0.99	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	119	666	27	8	542	107	9	14	11	107	14	132
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	689	1106	936	18	718	318	20	117	92	103	25	233
Arrive On Green	0.39	0.60	0.60	0.01	0.20	0.20	0.01	0.12	0.12	0.06	0.17	0.17
Sat Flow, veh/h	1767	1856	1570	1767	3526	1561	1767	959	754	1767	149	1404
Grp Volume(v), veh/h	119	666	27	8	542	107	9	0	25	107	0	146
Grp Sat Flow(s),veh/h/ln	1767	1856	1570	1767	1763	1561	1767	0	1713	1767	0	1553
Q Serve(g_s), s	3.8	19.4	0.6	0.4	12.4	5.0	0.4	0.0	1.1	5.0	0.0	7.4
Cycle Q Clear(g_c), s	3.8	19.4	0.6	0.4	12.4	5.0	0.4	0.0	1.1	5.0	0.0	7.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.90
Lane Grp Cap(c), veh/h	689	1106	936	18	718	318	20	0	208	103	0	258
V/C Ratio(X)	0.17	0.60	0.03	0.45	0.75	0.34	0.45	0.00	0.12	1.04	0.00	0.57
Avail Cap(c_a), veh/h	689	1106	936	103	1037	459	103	0	657	103	0	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	10.9	7.1	42.3	32.2	29.3	42.3	0.0	33.7	40.5	0.0	33.0
Incr Delay (d2), s/veh	0.1	2.4	0.1	16.5	7.2	2.8	15.2	0.0	0.3	100.4	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	1.4	7.1	0.2	0.2	5.7	2.0	0.3	0.0	0.5	5.0	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	13.4	7.2	58.9	39.5	32.1	57.5	0.0	33.9	140.9	0.0	34.9
LnGrp LOS	B	B	A	E	D	C	E	A	C	F	A	C
Approach Vol, veh/h		812			657			34			253	
Approach Delay, s/veh		13.7			38.5			40.2			79.8	
Approach LOS		B			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	14.5	5.1	56.6	5.2	19.2	38.8	22.8
Change Period (Y+Rc), s	4.9	* 4	* 4.2	5.3	* 4.2	4.9	5.3	* 5.3
Max Green Setting (Gmax), s	5.0	* 33	* 5	25.3	* 5	32.1	5.0	* 25
Max Q Clear Time (g_c+I1), s	7.0	3.1	2.4	21.4	2.4	9.4	5.8	14.4
Green Ext Time (p_c), s	0.0	0.1	0.0	1.5	0.0	0.8	0.0	2.7

Intersection Summary			
HCM 6th Ctrl Delay			33.0
HCM 6th LOS			C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	28	140	135	91	160	202	141	72	142	107	150	51
Average Queue (ft)	2	39	62	47	70	96	35	33	55	44	50	16
95th Queue (ft)	13	89	110	80	129	176	108	66	98	88	106	43
Link Distance (ft)	268	268		602		1116	1116			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LT	R
Maximum Queue (ft)	50	29	30	31	67
Average Queue (ft)	23	1	2	8	24
95th Queue (ft)	46	10	14	30	48
Link Distance (ft)		654		198	198
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

ATTACHMENT G

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	184	324	307	246	218	170	77	184	287	200	185	170
Average Queue (ft)	97	143	104	119	100	93	23	148	141	105	56	80
95th Queue (ft)	171	223	197	188	176	157	48	210	251	159	118	147
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	0	2						47	16	28	0	
Queuing Penalty (veh)	0	2						92	40	49	1	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	166	147	112
Average Queue (ft)	71	79	34
95th Queue (ft)	129	132	69
Link Distance (ft)	1207	1207	1207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	22
Average Queue (ft)	1
95th Queue (ft)	7
Link Distance (ft)	228
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

ATTACHMENT G

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	UL	T	T	T	T	R	L	R
Maximum Queue (ft)	118	296	50	101	96	50	98	77
Average Queue (ft)	50	52	2	37	31	8	42	27
95th Queue (ft)	94	147	17	91	75	32	82	57
Link Distance (ft)		589	589	303	303		1902	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	375					105		150
Storage Blk Time (%)					0			
Queuing Penalty (veh)					0			

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	426	200	100	158	200	120	99	167	146	132
Average Queue (ft)	42	141	13	25	73	77	47	43	45	66	56
95th Queue (ft)	81	285	75	62	133	156	113	83	109	118	110
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	11	26		4	19	7	0	21	7	3	2
Queuing Penalty (veh)	65	20		11	5	10	1	19	5	3	2

Zone Summary

Zone wide Queuing Penalty: 327

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	T	R	UL	T	T	R
Maximum Queue (ft)	51	116	197	86	132	230	132	78	96	86	113	25
Average Queue (ft)	16	50	80	44	62	88	25	35	37	49	53	6
95th Queue (ft)	42	89	147	77	105	170	85	71	80	85	98	23
Link Distance (ft)	268	268		602		1116	1116			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)												
Queuing Penalty (veh)												

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LT	R
Maximum Queue (ft)	49	29	69	31	55
Average Queue (ft)	11	2	24	9	33
95th Queue (ft)	34	14	53	32	51
Link Distance (ft)		654		198	198
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	244	283	235	215	155	151	62	185	475	322	181	219
Average Queue (ft)	126	165	116	114	69	80	17	165	221	120	54	94
95th Queue (ft)	211	263	200	181	122	125	44	215	453	250	111	167
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	4	4						62	15	19	2	
Queuing Penalty (veh)	10	6						111	46	35	3	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	163	197	64
Average Queue (ft)	95	99	29
95th Queue (ft)	149	160	56
Link Distance (ft)	1207	1207	1207
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	NB
Directions Served	T	R
Maximum Queue (ft)	8	22
Average Queue (ft)	0	5
95th Queue (ft)	3	21
Link Distance (ft)	589	228
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	UL	T	T	T	R	L	R
Maximum Queue (ft)	96	317	118	114	31	73	71
Average Queue (ft)	53	41	48	30	5	22	21
95th Queue (ft)	87	154	104	73	22	54	51
Link Distance (ft)		589	303	303		1902	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375				105		150
Storage Blk Time (%)				0			
Queuing Penalty (veh)				0			

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	420	210	98	156	139	114	24	64	135	111
Average Queue (ft)	82	152	28	14	77	50	22	4	18	62	38
95th Queue (ft)	113	333	127	51	132	117	65	18	46	112	85
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	53	13		1	17	2	0		2	3	0
Queuing Penalty (veh)	328	17		3	1	2	0		0	4	0

Zone Summary

Zone wide Queuing Penalty: 566

Appendix E: Existing plus Project Traffic Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		⮌	↑↑
Traffic Volume (vph)	5	41	54	145	54	139	127	387	165	1	148	450
Future Volume (vph)	5	41	54	145	54	139	127	387	165	1	148	450
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.91		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1687		1752	1631		1752	3505	1534		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1687		1752	1631		1752	3505	1534		1752	3505
Peak-hour factor, PHF	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Adj. Flow (vph)	7	57	75	201	75	193	176	538	229	1	206	625
RTOR Reduction (vph)	0	48	0	0	94	0	0	0	177	0	0	0
Lane Group Flow (vph)	7	84	0	201	174	0	176	538	52	0	207	625
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	0.7	14.6		14.3	28.2		7.2	18.0	18.0		14.1	24.9
Effective Green, g (s)	0.7	14.6		14.3	28.2		7.2	18.0	18.0		14.1	24.9
Actuated g/C Ratio	0.01	0.18		0.18	0.36		0.09	0.23	0.23		0.18	0.31
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	15	310		315	579		158	794	347		311	1099
v/s Ratio Prot	0.00	0.05		c0.11	c0.11		c0.10	c0.15			c0.12	0.18
v/s Ratio Perm									0.03			
v/c Ratio	0.47	0.27		0.64	0.30		1.11	0.68	0.15		0.67	0.57
Uniform Delay, d1	39.2	27.8		30.2	18.5		36.1	28.0	24.6		30.5	22.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	21.2	0.5		4.2	0.3		105.4	2.3	0.2		5.3	0.7
Delay (s)	60.4	28.3		34.4	18.8		141.5	30.4	24.8		35.7	23.4
Level of Service	E	C		C	B		F	C	C		D	C
Approach Delay (s)		29.9			25.5			49.8				26.2
Approach LOS		C			C			D				C

Intersection Summary			
HCM 2000 Control Delay	35.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	79.4	Sum of lost time (s)	18.4
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.72
Adj. Flow (vph)	40
RTOR Reduction (vph)	27
Lane Group Flow (vph)	13
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	24.9
Effective Green, g (s)	24.9
Actuated g/C Ratio	0.31
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	491
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.03
Uniform Delay, d1	18.9
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	18.9
Level of Service	B
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	5.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	130	204	15	29	266	16	4	12	16	4	44	44
Future Vol, veh/h	130	204	15	29	266	16	4	12	16	4	44	44
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	173	272	20	39	355	21	5	16	21	5	59	59

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	382	0	0	292	0	0	1131	1088	282	1097	1088	372
Stage 1	-	-	-	-	-	-	628	628	-	450	450	-
Stage 2	-	-	-	-	-	-	503	460	-	647	638	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1171	-	-	1264	-	-	180	215	755	190	215	672
Stage 1	-	-	-	-	-	-	469	474	-	587	570	-
Stage 2	-	-	-	-	-	-	549	564	-	458	469	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1164	-	-	1264	-	-	105	175	755	147	175	668
Mov Cap-2 Maneuver	-	-	-	-	-	-	105	175	-	147	175	-
Stage 1	-	-	-	-	-	-	399	403	-	497	544	-
Stage 2	-	-	-	-	-	-	429	539	-	364	399	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.7	22.3	24.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	250	1164	-	-	1264	-	-	172	668
HCM Lane V/C Ratio	0.171	0.149	-	-	0.031	-	-	0.372	0.088
HCM Control Delay (s)	22.3	8.6	-	-	7.9	0	-	37.8	10.9
HCM Lane LOS	C	A	-	-	A	A	-	E	B
HCM 95th %tile Q(veh)	0.6	0.5	-	-	0.1	-	-	1.6	0.3

ATTACHMENT G

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↶	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	91	13	8	659	76	23	628
Future Vol, veh/h	91	13	8	659	76	23	628
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	-	150	-	250	250	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	78	78	78	78	78	78	78
Heavy Vehicles, %	3	3	3	3	3	3	3
Mvmt Flow	117	17	10	845	97	29	805

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1245	423	588	0	0	942	0
Stage 1	865	-	-	-	-	-	-
Stage 2	380	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	195	577	737	-	-	717	-
Stage 1	361	-	-	-	-	-	-
Stage 2	623	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	185	577	737	-	-	717	-
Mov Cap-2 Maneuver	185	-	-	-	-	-	-
Stage 1	342	-	-	-	-	-	-
Stage 2	623	-	-	-	-	-	-

Approach	WB		NB			SB	
HCM Control Delay, s	51.9		0.1			0.4	
HCM LOS	F						

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	737	-	-	202	717	-
HCM Lane V/C Ratio	0.014	-	-	0.66	0.041	-
HCM Control Delay (s)	10	-	-	51.9	10.2	-
HCM Lane LOS	A	-	-	F	B	-
HCM 95th %tile Q(veh)	0	-	-	4	0.1	-

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	44	702	191	57	674
Future Vol, veh/h	0	44	702	191	57	674
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	-	250	150	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	56	900	245	73	864

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	450	0	0	1145	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	554	-	-	600	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	554	-	-	600	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	554	600	-
HCM Lane V/C Ratio	-	-	0.102	0.122	-
HCM Control Delay (s)	-	-	12.2	11.8	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	235	422	114	52	222	498	160	240	494	166	161	364
Future Volume (vph)	235	422	114	52	222	498	160	240	494	166	161	364
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.97			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3369			1752	3505	1548	1752	3505	1546	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3369			1752	3505	1548	1752	3505	1546	1752	3505
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	283	508	137	63	267	600	193	289	595	200	194	439
RTOR Reduction (vph)	0	21	0	0	0	0	141	0	0	80	0	0
Lane Group Flow (vph)	283	624	0	0	330	600	52	289	595	120	194	439
Confl. Peds. (#/hr)			23				1			2		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	19.0	25.1			22.0	28.1	28.1	19.0	24.5	24.5	14.3	19.1
Effective Green, g (s)	19.0	25.1			22.0	28.1	28.1	19.0	24.5	24.5	14.3	19.1
Actuated g/C Ratio	0.18	0.24			0.21	0.27	0.27	0.18	0.23	0.23	0.14	0.18
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	317	806			367	938	414	317	818	361	238	638
v/s Ratio Prot	0.16	c0.19			c0.19	c0.17		c0.16	c0.17		0.11	0.13
v/s Ratio Perm							0.03			0.08		
v/c Ratio	0.89	0.77			0.90	0.64	0.12	0.91	0.73	0.33	0.82	0.69
Uniform Delay, d1	42.0	37.2			40.4	33.9	29.1	42.1	37.1	33.4	44.0	40.1
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	25.5	4.7			23.7	1.4	0.1	29.0	3.2	0.5	18.9	3.1
Delay (s)	67.4	41.9			64.1	35.4	29.2	71.1	40.4	34.0	62.9	43.2
Level of Service	E	D			E	D	C	E	D	C	E	D
Approach Delay (s)		49.7				42.7			47.4			46.5
Approach LOS		D				D			D			D

Intersection Summary			
HCM 2000 Control Delay	46.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	104.9	Sum of lost time (s)	19.7
Intersection Capacity Utilization	78.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	138
Future Volume (vph)	138
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1540
Flt Permitted	1.00
Satd. Flow (perm)	1540
Peak-hour factor, PHF	0.83
Adj. Flow (vph)	166
RTOR Reduction (vph)	136
Lane Group Flow (vph)	30
Confl. Peds. (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	19.1
Effective Green, g (s)	19.1
Actuated g/C Ratio	0.18
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	280
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.11
Uniform Delay, d1	35.8
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	36.0
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

6: Sandpiper Avenue & Yosemite Avenue

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	769	1	0	726	33	0	0	4	0	0	0
Future Vol, veh/h	0	769	1	0	726	33	0	0	4	0	0	0
Conflicting Peds, #/hr	0	0	21	0	0	3	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	809	1	0	764	35	0	0	4	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	426	-	-	385
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	574	0	0	610
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	563	-	-	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	563	-	-	-	-	-
HCM Lane V/C Ratio	0.007	-	-	-	-	-
HCM Control Delay (s)	11.4	-	-	-	-	0
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-	-

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	21	83	683	706	49	54	84
Future Volume (vph)	21	83	683	706	49	54	84
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
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	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1568	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1568	1752	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	23	89	734	759	53	58	90
RTOR Reduction (vph)	0	0	0	0	17	0	79
Lane Group Flow (vph)	0	112	734	759	36	58	11
Confl. Peds. (#/hr)						24	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		9.4	69.7	56.1	56.1	10.8	10.8
Effective Green, g (s)		9.4	69.7	56.1	56.1	10.8	10.8
Actuated g/C Ratio		0.10	0.77	0.62	0.62	0.12	0.12
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		182	2714	2184	977	210	188
v/s Ratio Prot		c0.06	0.21	c0.22		c0.03	
v/s Ratio Perm					0.02		0.01
v/c Ratio		0.62	0.27	0.35	0.04	0.28	0.06
Uniform Delay, d1		38.6	2.9	8.1	6.5	36.0	35.1
Progression Factor		1.00	1.00	0.31	0.04	1.00	1.00
Incremental Delay, d2		6.1	0.2	0.4	0.1	0.7	0.1
Delay (s)		44.6	3.1	3.0	0.3	36.8	35.2
Level of Service		D	A	A	A	D	D
Approach Delay (s)			8.6	2.8		35.8	
Approach LOS			A	A		D	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	46	549	45	24	567	142	75	57	35	92	42	92
Future Volume (veh/h)	46	549	45	24	567	142	75	57	35	92	42	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	47	566	46	25	585	146	77	59	36	95	43	95
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	667	588	494	490	764	337	99	154	94	114	73	160
Arrive On Green	0.38	0.32	0.32	0.28	0.22	0.22	0.06	0.14	0.14	0.06	0.14	0.14
Sat Flow, veh/h	1767	1856	1560	1767	3526	1558	1767	1077	657	1767	505	1116
Grp Volume(v), veh/h	47	566	46	25	585	146	77	0	95	95	0	138
Grp Sat Flow(s),veh/h/ln	1767	1856	1560	1767	1763	1558	1767	0	1735	1767	0	1621
Q Serve(g_s), s	1.5	27.0	1.9	0.9	14.0	5.7	3.9	0.0	4.5	4.8	0.0	7.2
Cycle Q Clear(g_c), s	1.5	27.0	1.9	0.9	14.0	5.7	3.9	0.0	4.5	4.8	0.0	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		0.69
Lane Grp Cap(c), veh/h	667	588	494	490	764	337	99	0	248	114	0	233
V/C Ratio(X)	0.07	0.96	0.09	0.05	0.77	0.43	0.78	0.00	0.38	0.83	0.00	0.59
Avail Cap(c_a), veh/h	667	588	494	490	1050	464	132	0	636	114	0	562
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.9	30.2	21.7	23.8	33.1	18.7	41.9	0.0	35.0	41.6	0.0	36.1
Incr Delay (d2), s/veh	0.0	29.1	0.4	0.0	7.2	4.0	19.0	0.0	1.0	38.7	0.0	2.4
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	0.6	15.8	0.7	0.4	6.4	2.9	2.2	0.0	2.0	3.2	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	59.3	22.0	23.9	40.3	22.7	61.0	0.0	36.0	80.4	0.0	38.5
LnGrp LOS	B	E	C	C	D	C	E	A	D	F	A	D
Approach Vol, veh/h		659			756			172			233	
Approach Delay, s/veh		53.8			36.4			47.2			55.5	
Approach LOS		D			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	17.1	29.1	33.8	9.2	17.8	38.2	24.8
Change Period (Y+Rc), s	* 4.2	* 4.2	4.2	* 5.3	4.2	* 4.9	4.2	* 5.3
Max Green Setting (Gmax), s	* 5.8	* 33	5.0	* 29	6.7	* 31	6.7	* 27
Max Q Clear Time (g_c+I1), s	6.8	6.5	2.9	29.0	5.9	9.2	3.5	16.0
Green Ext Time (p_c), s	0.0	0.5	0.0	0.0	0.0	0.7	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	46.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↶	↑↑	↱		↶
Traffic Volume (vph)	19	40	96	161	49	85	1	110	397	104	1	71
Future Volume (vph)	19	40	96	161	49	85	1	110	397	104	1	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.98		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.89		1.00	0.91			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1649		1752	1656			1752	3505	1532		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1649		1752	1656			1752	3505	1532		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	43	103	173	53	91	1	118	427	112	1	76
RTOR Reduction (vph)	0	83	0	0	58	0	0	0	0	82	0	0
Lane Group Flow (vph)	20	63	0	173	86	0	0	119	427	30	0	77
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	0.6	13.8		12.1	25.3			8.1	18.7	18.7		6.8
Effective Green, g (s)	0.6	13.8		12.1	25.3			8.1	18.7	18.7		6.8
Actuated g/C Ratio	0.01	0.20		0.17	0.36			0.12	0.27	0.27		0.10
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	15	326		303	600			203	939	410		170
v/s Ratio Prot	0.01	c0.04		c0.10	0.05			c0.07	0.12			0.04
v/s Ratio Perm										0.02		
v/c Ratio	1.33	0.19		0.57	0.14			0.59	0.45	0.07		0.45
Uniform Delay, d1	34.6	23.4		26.5	15.0			29.3	21.3	19.1		29.7
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Incremental Delay, d2	353.6	0.3		2.6	0.1			4.3	0.4	0.1		1.9
Delay (s)	388.2	23.7		29.1	15.1			33.5	21.7	19.2		31.7
Level of Service	F	C		C	B			C	C	B		C
Approach Delay (s)		67.6			22.7				23.4			
Approach LOS		E			C				C			

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	69.8	Sum of lost time (s)	18.4
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	421	19
Future Volume (vph)	421	19
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.99
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1546
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1546
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	453	20
RTOR Reduction (vph)	0	15
Lane Group Flow (vph)	453	5
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	17.4	17.4
Effective Green, g (s)	17.4	17.4
Actuated g/C Ratio	0.25	0.25
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	873	385
v/s Ratio Prot	c0.13	
v/s Ratio Perm		0.00
v/c Ratio	0.52	0.01
Uniform Delay, d1	22.6	19.7
Progression Factor	1.00	1.00
Incremental Delay, d2	0.5	0.0
Delay (s)	23.1	19.7
Level of Service	C	B
Approach Delay (s)	24.2	
Approach LOS	C	

Intersection Summary

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	80	127	7	19	175	7	17	46	31	11	17	61
Future Vol, veh/h	80	127	7	19	175	7	17	46	31	11	17	61
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	88	140	8	21	192	8	19	51	34	12	19	67

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	207	0	0	150	0	0	608	571	147	609	571	208
Stage 1	-	-	-	-	-	-	322	322	-	245	245	-
Stage 2	-	-	-	-	-	-	286	249	-	364	326	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1358	-	-	1425	-	-	406	429	897	406	429	830
Stage 1	-	-	-	-	-	-	688	649	-	756	702	-
Stage 2	-	-	-	-	-	-	719	699	-	653	647	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1349	-	-	1422	-	-	335	391	894	328	391	821
Mov Cap-2 Maneuver	-	-	-	-	-	-	335	391	-	328	391	-
Stage 1	-	-	-	-	-	-	642	606	-	702	685	-
Stage 2	-	-	-	-	-	-	628	682	-	538	604	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.9	0.7	15	11.7
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	463	1349	-	-	1422	-	-	364	821
HCM Lane V/C Ratio	0.223	0.065	-	-	0.015	-	-	0.085	0.082
HCM Control Delay (s)	15	7.9	-	-	7.6	0	-	15.8	9.8
HCM Lane LOS	C	A	-	-	A	A	-	C	A
HCM 95th %tile Q(veh)	0.8	0.2	-	-	0	-	-	0.3	0.3

Intersection	
Int Delay, s/veh	3.6

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		⮌	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	136	23	4	585	39	15	667
Future Vol, veh/h	136	23	4	585	39	15	667
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	-	150	-	250	250	-
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	148	25	4	636	42	16	725

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	966	318	529	0	0	678	0
Stage 1	644	-	-	-	-	-	-
Stage 2	322	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	283	675	794	-	-	903	-
Stage 1	468	-	-	-	-	-	-
Stage 2	668	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	276	675	794	-	-	903	-
Mov Cap-2 Maneuver	276	-	-	-	-	-	-
Stage 1	457	-	-	-	-	-	-
Stage 2	668	-	-	-	-	-	-

Approach	WB		NB			SB
HCM Control Delay, s	31.7		0.1			0.2
HCM LOS	D					

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	794	-	-	302	903	-
HCM Lane V/C Ratio	0.005	-	-	0.572	0.018	-
HCM Control Delay (s)	9.6	-	-	31.7	9.1	-
HCM Lane LOS	A	-	-	D	A	-
HCM 95th %tile Q(veh)	0	-	-	3.3	0.1	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	34	596	132	38	771
Future Vol, veh/h	0	34	596	132	38	771
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	-	250	150	-
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	3	3
Mvmt Flow	0	37	648	143	41	838

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	324	0	0	791	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	669	-	-	819	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	669	-	-	819	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	669	819	-
HCM Lane V/C Ratio	-	-	0.055	0.05	-
HCM Control Delay (s)	-	-	10.7	9.6	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	211	478	157	42	195	436	92	289	423	180	167	408
Future Volume (vph)	211	478	157	42	195	436	92	289	423	180	167	408
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3349			1752	3505	1546	1752	3505	1548	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3349			1752	3505	1546	1752	3505	1548	1752	3505
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)	224	509	167	45	207	464	98	307	450	191	178	434
RTOR Reduction (vph)	0	32	0	0	0	0	71	0	0	109	0	0
Lane Group Flow (vph)	224	644	0	0	252	464	27	307	450	82	178	434
Confl. Peds. (#/hr)			24				3			1		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	12.0	23.4			13.0	24.4	24.4	15.1	23.9	23.9	9.0	17.1
Effective Green, g (s)	12.0	23.4			13.0	24.4	24.4	15.1	23.9	23.9	9.0	17.1
Actuated g/C Ratio	0.14	0.27			0.15	0.28	0.28	0.17	0.27	0.27	0.10	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	238	887			257	968	427	299	948	418	178	678
v/s Ratio Prot	0.13	c0.19			c0.14	0.13		c0.18	0.13		0.10	c0.12
v/s Ratio Perm							0.02			0.05		
v/c Ratio	0.94	0.73			0.98	0.48	0.06	1.03	0.47	0.20	1.00	0.64
Uniform Delay, d1	37.8	29.5			37.5	26.7	23.5	36.6	26.9	24.8	39.6	32.8
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	42.2	3.0			50.5	0.4	0.1	59.1	0.4	0.2	67.5	2.1
Delay (s)	80.0	32.5			88.0	27.0	23.6	95.7	27.3	25.0	107.1	34.8
Level of Service	E	C			F	C	C	F	C	C	F	C
Approach Delay (s)		44.3				45.5			49.0			49.4
Approach LOS		D				D			D			D

Intersection Summary			
HCM 2000 Control Delay	47.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	19.7
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	189
Future Volume (vph)	189
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1543
Flt Permitted	1.00
Satd. Flow (perm)	1543
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	201
RTOR Reduction (vph)	162
Lane Group Flow (vph)	39
Confl. Peds. (#/hr)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	17.1
Effective Green, g (s)	17.1
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	298
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.13
Uniform Delay, d1	29.5
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	29.7
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	924	4	0	805	19	0	0	15	0	0	15
Future Vol, veh/h	0	924	4	0	805	19	0	0	15	0	0	15
Conflicting Peds, #/hr	0	0	11	0	0	7	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	953	4	0	830	20	0	0	15	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	488	-	-	422
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	523	0	0	577
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	518	-	-	573
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.2	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	518	-	-	-	-	573
HCM Lane V/C Ratio	0.03	-	-	-	-	0.027
HCM Control Delay (s)	12.2	-	-	-	-	11.5
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

7: Yosemite Avenue & Mansionette Drive

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	39	86	812	669	24	22	40
Future Volume (vph)	39	86	812	669	24	22	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1531	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1531	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	95	892	735	26	24	44
RTOR Reduction (vph)	0	0	0	0	9	0	40
Lane Group Flow (vph)	0	138	892	735	17	24	4
Confl. Peds. (#/hr)					2	7	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		11.4	67.9	52.3	52.3	8.6	8.6
Effective Green, g (s)		11.4	67.9	52.3	52.3	8.6	8.6
Actuated g/C Ratio		0.13	0.79	0.61	0.61	0.10	0.10
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		232	2767	2131	931	175	156
v/s Ratio Prot		c0.08	0.25	c0.21		c0.01	
v/s Ratio Perm					0.01		0.00
v/c Ratio		0.59	0.32	0.34	0.02	0.14	0.03
Uniform Delay, d1		35.1	2.6	8.4	6.7	35.3	34.9
Progression Factor		1.00	1.00	0.28	0.08	1.00	1.00
Incremental Delay, d2		4.1	0.3	0.4	0.0	0.4	0.1
Delay (s)		39.2	2.9	2.8	0.6	35.7	35.0
Level of Service		D	A	A	A	D	D
Approach Delay (s)			7.7	2.7		35.2	
Approach LOS			A	A		D	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	86.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	42.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	114	625	31	7	513	96	13	13	10	96	13	124
Future Volume (veh/h)	114	625	31	7	513	96	13	13	10	96	13	124
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		0.99	1.00		0.99	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	127	694	34	8	570	107	14	14	11	107	14	138
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	664	1094	926	18	744	330	29	117	92	114	24	236
Arrive On Green	0.38	0.59	0.59	0.01	0.21	0.21	0.02	0.12	0.12	0.06	0.17	0.17
Sat Flow, veh/h	1767	1856	1570	1767	3526	1561	1767	959	754	1767	143	1410
Grp Volume(v), veh/h	127	694	34	8	570	107	14	0	25	107	0	152
Grp Sat Flow(s),veh/h/ln	1767	1856	1570	1767	1763	1561	1767	0	1713	1767	0	1553
Q Serve(g_s), s	4.2	21.1	0.8	0.4	13.1	5.0	0.7	0.0	1.1	5.2	0.0	7.8
Cycle Q Clear(g_c), s	4.2	21.1	0.8	0.4	13.1	5.0	0.7	0.0	1.1	5.2	0.0	7.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.91
Lane Grp Cap(c), veh/h	664	1094	926	18	744	330	29	0	209	114	0	260
V/C Ratio(X)	0.19	0.63	0.04	0.45	0.77	0.32	0.48	0.00	0.12	0.94	0.00	0.59
Avail Cap(c_a), veh/h	664	1094	926	103	1037	459	103	0	657	114	0	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.0	11.6	7.4	42.3	31.9	28.7	41.9	0.0	33.7	40.1	0.0	33.0
Incr Delay (d2), s/veh	0.1	2.8	0.1	16.5	7.4	2.6	11.7	0.0	0.3	65.5	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	1.6	7.8	0.2	0.2	6.0	2.0	0.4	0.0	0.5	4.2	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.2	14.4	7.5	58.9	39.3	31.3	53.6	0.0	33.9	105.6	0.0	35.1
LnGrp LOS	B	B	A	E	D	C	D	A	C	F	A	D
Approach Vol, veh/h		855			685			39			259	
Approach Delay, s/veh		14.7			38.3			41.0			64.2	
Approach LOS		B			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	14.5	5.1	56.0	5.6	19.3	37.6	23.5
Change Period (Y+Rc), s	4.9	* 4	* 4.2	5.3	* 4.2	4.9	5.3	* 5.3
Max Green Setting (Gmax), s	5.0	* 33	* 5	25.3	* 5	32.1	5.0	* 25
Max Q Clear Time (g_c+I1), s	7.2	3.1	2.4	23.1	2.7	9.8	6.2	15.1
Green Ext Time (p_c), s	0.0	0.1	0.0	1.0	0.0	0.8	0.0	2.8

Intersection Summary	
HCM 6th Ctrl Delay	31.0
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

ATTACHMENT G

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	91	13	8	659	76	23	628
Future Volume (vph)	91	13	8	659	76	23	628
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00	0.91
Frt	0.98		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1737		1752	3505	1568	1752	5036
Flt Permitted	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1737		1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Adj. Flow (vph)	117	17	10	845	97	29	805
RTOR Reduction (vph)	10	0	0	0	48	0	0
Lane Group Flow (vph)	124	0	10	845	49	29	805
Turn Type	Prot		Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases					2		
Actuated Green, G (s)	10.9		0.6	26.7	26.7	0.6	26.7
Effective Green, g (s)	10.9		0.6	26.7	26.7	0.6	26.7
Actuated g/C Ratio	0.21		0.01	0.51	0.51	0.01	0.51
Clearance Time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	359		19	1779	795	19	2556
v/s Ratio Prot	c0.07		0.01	c0.24		c0.02	0.16
v/s Ratio Perm					0.03		
v/c Ratio	0.35		0.53	0.47	0.06	1.53	0.31
Uniform Delay, d1	17.8		25.9	8.4	6.6	26.0	7.6
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.6		23.9	0.2	0.0	399.7	0.1
Delay (s)	18.4		49.7	8.6	6.6	425.7	7.7
Level of Service	B		D	A	A	F	A
Approach Delay (s)	18.4			8.8			22.2
Approach LOS	B			A			C

Intersection Summary			
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	52.6	Sum of lost time (s)	14.4
Intersection Capacity Utilization	33.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	136	23	4	585	39	15	667
Future Volume (vph)	136	23	4	585	39	15	667
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00	0.91
Frt	0.98		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1734		1752	3505	1568	1752	5036
Flt Permitted	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1734		1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	25	4	636	42	16	725
RTOR Reduction (vph)	7	0	0	0	14	0	0
Lane Group Flow (vph)	166	0	4	636	28	16	725
Turn Type	Prot		Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases					2		
Actuated Green, G (s)	20.5		1.3	81.2	81.2	3.9	83.8
Effective Green, g (s)	20.5		1.3	81.2	81.2	3.9	83.8
Actuated g/C Ratio	0.17		0.01	0.68	0.68	0.03	0.70
Clearance Time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	296		18	2371	1061	56	3516
v/s Ratio Prot	c0.10		0.00	c0.18		c0.01	0.14
v/s Ratio Perm					0.02		
v/c Ratio	0.56		0.22	0.27	0.03	0.29	0.21
Uniform Delay, d1	45.6		58.8	7.7	6.4	56.7	6.4
Progression Factor	1.00		1.35	0.28	0.08	1.12	0.61
Incremental Delay, d2	2.4		5.6	0.3	0.0	2.7	0.1
Delay (s)	48.1		85.0	2.4	0.5	66.2	4.0
Level of Service	D		F	A	A	E	A
Approach Delay (s)	48.1			2.8			5.4
Approach LOS	D			A			A

Intersection Summary			
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.33		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

ATTACHMENT G

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	27	97	154	109	115	270	170	116	166	124	101	49
Average Queue (ft)	1	46	78	49	61	137	41	51	68	58	52	10
95th Queue (ft)	9	90	131	81	101	230	109	98	133	104	94	33
Link Distance (ft)	268	268		602		1172	1172			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)						0						
Queuing Penalty (veh)						0						

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LT	R
Maximum Queue (ft)	86	72	52	52	54
Average Queue (ft)	23	5	15	25	26
95th Queue (ft)	57	31	42	46	48
Link Distance (ft)		654	2325	198	198
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	U	T	T	R	L	T	T	T
Maximum Queue (ft)	84	31	322	182	52	44	116	159	74
Average Queue (ft)	38	7	55	40	10	12	28	30	14
95th Queue (ft)	70	26	168	116	34	37	81	93	48
Link Distance (ft)	595		566	566			1172	1172	1172
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		150			250	250			
Storage Blk Time (%)			1						
Queuing Penalty (veh)			0						

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB
Directions Served	R	R	L
Maximum Queue (ft)	70	22	70
Average Queue (ft)	17	1	20
95th Queue (ft)	40	11	48
Link Distance (ft)	581		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	299	278	257	376	255	176	83	184	497	406	185	243
Average Queue (ft)	177	165	129	229	128	107	37	154	231	209	101	128
95th Queue (ft)	280	233	203	358	211	171	68	212	417	330	222	197
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	6	2		0				57	37	44	1	0
Queuing Penalty (veh)	12	4		1				141	88	74	2	0

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	175	173	86
Average Queue (ft)	104	110	32
95th Queue (ft)	166	172	64
Link Distance (ft)	536	536	536
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	NB
Directions Served	R
Maximum Queue (ft)	22
Average Queue (ft)	4
95th Queue (ft)	17
Link Distance (ft)	228
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	UL	T	T	T	R	L	R
Maximum Queue (ft)	140	405	144	110	52	116	89
Average Queue (ft)	69	63	44	39	9	42	38
95th Queue (ft)	113	195	103	85	33	83	68
Link Distance (ft)		589	303	303		1902	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375				105		150
Storage Blk Time (%)		0		0			
Queuing Penalty (veh)		0		0			

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	508	30	100	185	222	120	99	130	197	139
Average Queue (ft)	41	176	8	33	108	102	55	56	55	72	68
95th Queue (ft)	94	361	29	80	188	190	121	99	112	139	133
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	4	28		5	24	12	0	24	8	6	2
Queuing Penalty (veh)	25	26		15	6	18	0	22	6	8	2

Zone Summary

Zone wide Queuing Penalty: 450

ATTACHMENT G

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	T	R	UL	T	T	R
Maximum Queue (ft)	72	242	234	174	174	309	294	76	105	148	156	70
Average Queue (ft)	25	80	110	63	77	121	63	26	46	79	83	10
95th Queue (ft)	61	162	188	133	156	239	176	65	100	139	146	38
Link Distance (ft)	268	268		602		1172	1172			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)						1	0					
Queuing Penalty (veh)						1	0					

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	NB	SB	SB
Directions Served	L	LTR	LTR	LT	R
Maximum Queue (ft)	46	51	72	52	55
Average Queue (ft)	12	4	36	21	30
95th Queue (ft)	35	22	58	47	53
Link Distance (ft)		654	2325	198	198
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	U	T	T	R	L	T	T	T
Maximum Queue (ft)	174	30	233	159	28	52	120	131	74
Average Queue (ft)	85	6	43	14	6	14	34	40	20
95th Queue (ft)	146	24	116	64	22	41	90	92	57
Link Distance (ft)	595		579	579			1172	1172	1172
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		150			250	250			
Storage Blk Time (%)			1						
Queuing Penalty (veh)			0						

ATTACHMENT G

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB
Directions Served	R	R	L
Maximum Queue (ft)	59	23	29
Average Queue (ft)	21	2	9
95th Queue (ft)	46	13	29
Link Distance (ft)	583		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	299	379	224	366	217	216	61	185	320	380	185	235
Average Queue (ft)	164	190	145	186	122	123	21	161	181	179	86	111
95th Queue (ft)	278	293	223	326	201	195	47	205	287	291	192	188
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	6	5		0				57	37	47	1	0
Queuing Penalty (veh)	14	11		0				121	107	85	3	0

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	219	241	104
Average Queue (ft)	110	124	41
95th Queue (ft)	191	205	79
Link Distance (ft)	524	524	524
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	22	50
Average Queue (ft)	9	12
95th Queue (ft)	27	38
Link Distance (ft)	228	2325
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	WB	WB	WB	SB	SB
Directions Served	UL	T	T	T	R	L	R
Maximum Queue (ft)	181	206	137	142	44	52	64
Average Queue (ft)	66	38	53	47	3	13	23
95th Queue (ft)	128	122	118	112	21	38	52
Link Distance (ft)		589	303	303		1902	
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	375				105		150
Storage Blk Time (%)				1			
Queuing Penalty (veh)				0			

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	749	210	65	255	199	120	46	62	130	133
Average Queue (ft)	70	230	17	12	91	67	25	10	16	63	43
95th Queue (ft)	111	550	103	41	166	143	63	35	42	119	92
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	41	16		2	19	8	0	6	1	6	0
Queuing Penalty (veh)	271	23		4	1	7	0	1	0	8	0

Zone Summary

Zone wide Queuing Penalty: 657

Appendix F: Near Term plus Project Traffic Conditions

ATTACHMENT G

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		↰	↑↑
Traffic Volume (vph)	5	57	54	156	66	157	127	414	240	1	181	520
Future Volume (vph)	5	57	54	156	66	157	127	414	240	1	181	520
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.93		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1711		1752	1635		1752	3505	1534		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1711		1752	1635		1752	3505	1534		1752	3505
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)	6	65	61	177	75	178	144	470	273	1	206	591
RTOR Reduction (vph)	0	36	0	0	89	0	0	0	212	0	0	0
Lane Group Flow (vph)	6	90	0	177	164	0	144	470	61	0	207	591
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	0.7	12.0		13.2	24.5		7.5	16.8	16.8		14.2	23.5
Effective Green, g (s)	0.7	12.0		13.2	24.5		7.5	16.8	16.8		14.2	23.5
Actuated g/C Ratio	0.01	0.16		0.18	0.33		0.10	0.23	0.23		0.19	0.32
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	16	275		310	536		176	789	345		333	1104
v/s Ratio Prot	0.00	0.05		c0.10	c0.10		c0.08	0.13			c0.12	c0.17
v/s Ratio Perm									0.04			
v/c Ratio	0.38	0.33		0.57	0.31		0.82	0.60	0.18		0.62	0.54
Uniform Delay, d1	36.7	27.7		28.1	18.7		32.9	25.9	23.3		27.7	21.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	14.1	0.7		2.5	0.3		24.6	1.2	0.2		3.6	0.5
Delay (s)	50.9	28.4		30.6	19.0		57.5	27.1	23.6		31.3	21.6
Level of Service	D	C		C	B		E	C	C		C	C
Approach Delay (s)		29.4			23.8			30.9				23.8
Approach LOS		C			C			C				C

Intersection Summary			
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	74.6	Sum of lost time (s)	18.4
Intersection Capacity Utilization	49.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	29
Future Volume (vph)	29
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	33
RTOR Reduction (vph)	23
Lane Group Flow (vph)	10
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	23.5
Effective Green, g (s)	23.5
Actuated g/C Ratio	0.32
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	493
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.02
Uniform Delay, d1	17.6
Progression Factor	1.00
Incremental Delay, d2	0.0
Delay (s)	17.6
Level of Service	B
Approach Delay (s)	
Approach LOS	
Intersection Summary	

ATTACHMENT G

2: Sandpiper Avenue & Mercy Avenue

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✣			✣			↰	↱
Traffic Vol, veh/h	142	215	116	69	284	21	23	13	27	6	47	48
Future Vol, veh/h	142	215	116	69	284	21	23	13	27	6	47	48
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	-	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	161	244	132	78	323	24	26	15	31	7	53	55

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	353	0	0	376	0	0	1177	1141	310	1152	1195	341
Stage 1	-	-	-	-	-	-	632	632	-	497	497	-
Stage 2	-	-	-	-	-	-	545	509	-	655	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1200	-	-	1177	-	-	167	200	728	174	186	699
Stage 1	-	-	-	-	-	-	467	472	-	553	543	-
Stage 2	-	-	-	-	-	-	521	536	-	453	441	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1193	-	-	1177	-	-	94	158	728	130	147	695
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	158	-	130	147	-
Stage 1	-	-	-	-	-	-	404	408	-	476	495	-
Stage 2	-	-	-	-	-	-	393	489	-	362	381	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	1.5	39.8	29.4
HCM LOS			E	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	173	1193	-	-	1177	-	-	145	695
HCM Lane V/C Ratio	0.414	0.135	-	-	0.067	-	-	0.415	0.078
HCM Control Delay (s)	39.8	8.5	-	-	8.3	0	-	46.4	10.6
HCM Lane LOS	E	A	-	-	A	A	-	E	B
HCM 95th %tile Q(veh)	1.8	0.5	-	-	0.2	-	-	1.8	0.3

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		⮌	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	91	13	8	761	76	23	709
Future Vol, veh/h	91	13	8	761	76	23	709
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	-	150	-	250	250	-
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	103	15	9	865	86	26	806

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1257	433	588	0	0	951	0
Stage 1	883	-	-	-	-	-	-
Stage 2	374	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	192	568	737	-	-	712	-
Stage 1	353	-	-	-	-	-	-
Stage 2	627	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	183	568	737	-	-	712	-
Mov Cap-2 Maneuver	183	-	-	-	-	-	-
Stage 1	336	-	-	-	-	-	-
Stage 2	627	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46.1	0.1	0.3
HCM LOS	E		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	737	-	-	200	712	-
HCM Lane V/C Ratio	0.012	-	-	0.591	0.037	-
HCM Control Delay (s)	9.9	-	-	46.1	10.2	-
HCM Lane LOS	A	-	-	E	B	-
HCM 95th %tile Q(veh)	0	-	-	3.3	0.1	-

4: "G" Street & Project Driveway 2

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	44	804	191	57	755
Future Vol, veh/h	0	44	804	191	57	755
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	-	250	150	-
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	3	3
Mvmt Flow	0	50	914	217	65	858

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	457	0	0	1131	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	548	-	-	608	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	548	-	-	608	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	12.2		0		0.8	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	548	608	-
HCM Lane V/C Ratio	-	-	0.091	0.107	-
HCM Control Delay (s)	-	-	12.2	11.6	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.4	-

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	282	460	156	52	269	541	162	254	547	191	169	419
Future Volume (vph)	282	460	156	52	269	541	162	254	547	191	169	419
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3343			1752	3505	1548	1752	3505	1546	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3343			1752	3505	1548	1752	3505	1546	1752	3505
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)	320	523	177	59	306	615	184	289	622	217	192	476
RTOR Reduction (vph)	0	29	0	0	0	0	134	0	0	82	0	0
Lane Group Flow (vph)	320	671	0	0	365	615	50	289	622	135	192	476
Confl. Peds. (#/hr)			23				1			2		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	20.0	27.1			22.0	29.1	29.1	18.0	25.5	25.5	13.6	20.4
Effective Green, g (s)	20.0	27.1			22.0	29.1	29.1	18.0	25.5	25.5	13.6	20.4
Actuated g/C Ratio	0.19	0.25			0.21	0.27	0.27	0.17	0.24	0.24	0.13	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	326	845			359	951	420	294	833	367	222	666
v/s Ratio Prot	0.18	c0.20			c0.21	0.18		c0.16	c0.18		0.11	0.14
v/s Ratio Perm							0.03			0.09		
v/c Ratio	0.98	0.79			1.02	0.65	0.12	0.98	0.75	0.37	0.86	0.71
Uniform Delay, d1	43.4	37.4			42.6	34.5	29.4	44.4	37.9	34.1	45.9	40.7
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	44.6	5.2			51.8	1.5	0.1	47.5	3.7	0.6	27.7	3.6
Delay (s)	88.0	42.6			94.4	36.0	29.5	92.0	41.5	34.8	73.6	44.3
Level of Service	F	D			F	D	C	F	D	C	E	D
Approach Delay (s)		56.9				53.3			53.2			49.2
Approach LOS		E				D			D			D

Intersection Summary			
HCM 2000 Control Delay	53.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	19.7
Intersection Capacity Utilization	84.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	156
Future Volume (vph)	156
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1540
Flt Permitted	1.00
Satd. Flow (perm)	1540
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	177
RTOR Reduction (vph)	143
Lane Group Flow (vph)	34
Confl. Peds. (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	20.4
Effective Green, g (s)	20.4
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	293
v/s Ratio Prot	
v/s Ratio Perm	0.02
v/c Ratio	0.11
Uniform Delay, d1	35.9
Progression Factor	1.00
Incremental Delay, d2	0.2
Delay (s)	36.1
Level of Service	D
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	840	1	0	808	33	0	0	4	0	0	0
Future Vol, veh/h	0	840	1	0	808	33	0	0	4	0	0	0
Conflicting Peds, #/hr	0	0	21	0	0	3	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	884	1	0	851	35	0	0	4	0	0	11

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	463	-	-	429
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	543	0	0	571
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	532	-	-	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	11.8	11.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	532	-	-	-	-	569
HCM Lane V/C Ratio	0.008	-	-	-	-	0.018
HCM Control Delay (s)	11.8	-	-	-	-	11.4
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	-	0.1

7: Yosemite Avenue & Mansionette Drive

	↶	↗	→	←	↖	↘	↙
Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	21	85	752	783	55	60	89
Future Volume (vph)	21	85	752	783	55	60	89
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
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	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1568	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1568	1752	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	23	91	809	842	59	65	96
RTOR Reduction (vph)	0	0	0	0	15	0	85
Lane Group Flow (vph)	0	114	809	842	44	65	11
Confl. Peds. (#/hr)						24	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		11.7	79.2	63.3	63.3	11.3	11.3
Effective Green, g (s)		11.7	79.2	63.3	63.3	11.3	11.3
Actuated g/C Ratio		0.12	0.79	0.63	0.63	0.11	0.11
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		204	2775	2218	992	197	177
v/s Ratio Prot		c0.07	0.23	c0.24		c0.04	
v/s Ratio Perm					0.03		0.01
v/c Ratio		0.56	0.29	0.38	0.04	0.33	0.06
Uniform Delay, d1		41.7	2.8	8.9	6.9	40.9	39.6
Progression Factor		1.00	1.00	0.69	0.72	1.00	1.00
Incremental Delay, d2		3.3	0.3	0.5	0.1	1.0	0.1
Delay (s)		45.0	3.1	6.6	5.1	41.8	39.8
Level of Service		D	A	A	A	D	D
Approach Delay (s)			8.3	6.5		40.6	
Approach LOS			A	A		D	

Intersection Summary			
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	46	624	45	24	647	190	78	60	35	108	44	92
Future Volume (veh/h)	46	624	45	24	647	190	78	60	35	108	44	92
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		1.00	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	47	643	46	25	667	196	80	62	36	111	45	95
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	664	674	567	447	846	374	102	145	84	129	73	155
Arrive On Green	0.38	0.36	0.36	0.25	0.24	0.24	0.06	0.13	0.13	0.07	0.14	0.14
Sat Flow, veh/h	1767	1856	1562	1767	3526	1559	1767	1099	638	1767	522	1101
Grp Volume(v), veh/h	47	643	46	25	667	196	80	0	98	111	0	140
Grp Sat Flow(s),veh/h/ln	1767	1856	1562	1767	1763	1559	1767	0	1738	1767	0	1623
Q Serve(g_s), s	1.7	33.8	1.9	1.1	17.7	8.5	4.5	0.0	5.2	6.2	0.0	8.1
Cycle Q Clear(g_c), s	1.7	33.8	1.9	1.1	17.7	8.5	4.5	0.0	5.2	6.2	0.0	8.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.37	1.00		0.68
Lane Grp Cap(c), veh/h	664	674	567	447	846	374	102	0	230	129	0	228
V/C Ratio(X)	0.07	0.95	0.08	0.06	0.79	0.52	0.78	0.00	0.43	0.86	0.00	0.61
Avail Cap(c_a), veh/h	664	687	578	447	1234	546	129	0	573	129	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	31.0	20.9	28.3	35.6	20.0	46.5	0.0	39.9	45.8	0.0	40.4
Incr Delay (d2), s/veh	0.0	25.2	0.3	0.1	7.4	5.2	21.2	0.0	1.3	40.8	0.0	2.7
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	0.7	18.6	0.7	0.4	8.1	3.4	2.6	0.0	2.3	4.1	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	56.2	21.2	28.4	43.0	25.2	67.7	0.0	41.2	86.6	0.0	43.1
LnGrp LOS	C	E	C	C	D	C	E	A	D	F	A	D
Approach Vol, veh/h		736			888			178			251	
Approach Delay, s/veh		51.7			38.6			53.1			62.3	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	17.4	29.5	41.6	10.0	18.9	41.8	29.3				
Change Period (Y+Rc), s	* 4.2	* 4.2	4.2	* 5.3	4.2	* 4.9	4.2	* 5.3				
Max Green Setting (Gmax), s	* 7.3	* 33	5.0	* 37	7.3	* 32	7.0	* 35				
Max Q Clear Time (g_c+I1), s	8.2	7.2	3.1	35.8	6.5	10.1	3.7	19.7				
Green Ext Time (p_c), s	0.0	0.5	0.0	0.5	0.0	0.7	0.0	4.3				
Intersection Summary												
HCM 6th Ctrl Delay			47.5									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

ATTACHMENT G

HCM Signalized Intersection Capacity Analysis
1: "G" Street & Mercy Avenue

Near Term plus Project PM Peak
06/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↰	↑↑	↱		↰
Traffic Volume (vph)	19	59	96	205	74	131	1	110	477	137	1	103
Future Volume (vph)	19	59	96	205	74	131	1	110	477	137	1	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.91		1.00	0.90			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1673		1752	1652			1752	3505	1528		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1673		1752	1652			1752	3505	1528		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	20	63	103	220	80	141	1	118	513	147	1	111
RTOR Reduction (vph)	0	47	0	0	54	0	0	0	0	85	0	0
Lane Group Flow (vph)	20	119	0	220	167	0	0	119	513	62	0	112
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	2.7	16.5		21.6	35.4			14.0	54.9	54.9		18.6
Effective Green, g (s)	2.7	16.5		21.6	35.4			14.0	54.9	54.9		18.6
Actuated g/C Ratio	0.02	0.13		0.17	0.27			0.11	0.42	0.42		0.14
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	36	212		291	449			188	1480	645		250
v/s Ratio Prot	0.01	c0.07		c0.13	0.10			c0.07	c0.15			c0.06
v/s Ratio Perm										0.04		
v/c Ratio	0.56	0.56		0.76	0.37			0.63	0.35	0.10		0.45
Uniform Delay, d1	63.1	53.3		51.7	38.3			55.5	25.4	22.6		51.0
Progression Factor	1.00	1.00		1.00	1.00			0.92	0.42	0.70		1.00
Incremental Delay, d2	17.3	3.4		10.7	0.5			5.7	0.5	0.2		1.3
Delay (s)	80.3	56.7		62.3	38.8			56.9	11.1	16.0		52.3
Level of Service	F	E		E	D			E	B	B		D
Approach Delay (s)		59.2			50.6				19.0			
Approach LOS		E			D				B			

Intersection Summary			
HCM 2000 Control Delay	32.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	473	19
Future Volume (vph)	473	19
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1544
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1544
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	509	20
RTOR Reduction (vph)	0	11
Lane Group Flow (vph)	509	9
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	59.5	59.5
Effective Green, g (s)	59.5	59.5
Actuated g/C Ratio	0.46	0.46
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1604	706
v/s Ratio Prot	0.15	
v/s Ratio Perm		0.01
v/c Ratio	0.32	0.01
Uniform Delay, d1	22.4	19.2
Progression Factor	1.00	1.00
Incremental Delay, d2	0.5	0.0
Delay (s)	22.9	19.3
Level of Service	C	B
Approach Delay (s)	27.9	
Approach LOS	C	

Intersection Summary

Intersection	
Int Delay, s/veh	11.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↰↑↱			↰↑↱			↰↑	↱
Traffic Vol, veh/h	87	159	52	37	203	13	91	50	77	19	18	74
Future Vol, veh/h	87	159	52	37	203	13	91	50	77	19	18	74
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	96	175	57	41	223	14	100	55	85	21	20	81

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	244	0	0	234	0	0	766	724	207	786	745	242
Stage 1	-	-	-	-	-	-	398	398	-	319	319	-
Stage 2	-	-	-	-	-	-	368	326	-	467	426	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1316	-	-	1328	-	-	318	351	831	309	341	794
Stage 1	-	-	-	-	-	-	626	601	-	690	651	-
Stage 2	-	-	-	-	-	-	650	647	-	574	584	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1325	-	-	247	311	829	219	302	785
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	311	-	219	302	-
Stage 1	-	-	-	-	-	-	579	556	-	635	623	-
Stage 2	-	-	-	-	-	-	541	619	-	430	540	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	1.1	34.9	14
HCM LOS			D	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	350	1307	-	-	1325	-	-	253	785
HCM Lane V/C Ratio	0.684	0.073	-	-	0.031	-	-	0.161	0.104
HCM Control Delay (s)	34.9	8	-	-	7.8	0	-	21.9	10.1
HCM Lane LOS	D	A	-	-	A	A	-	C	B
HCM 95th %tile Q(veh)	4.8	0.2	-	-	0.1	-	-	0.6	0.3

Intersection	
Int Delay, s/veh	4.8

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↖↗		↶	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	136	23	4	698	39	15	763
Future Vol, veh/h	136	23	4	698	39	15	763
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	-	150	-	250	250	-
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	148	25	4	759	42	16	829

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1131	380	605	0	0	801	0
Stage 1	767	-	-	-	-	-	-
Stage 2	364	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	227	615	721	-	-	812	-
Stage 1	405	-	-	-	-	-	-
Stage 2	635	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	221	615	721	-	-	812	-
Mov Cap-2 Maneuver	221	-	-	-	-	-	-
Stage 1	394	-	-	-	-	-	-
Stage 2	635	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	49	0.1	0.2
HCM LOS	E		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	721	-	-	244	812	-
HCM Lane V/C Ratio	0.006	-	-	0.708	0.02	-
HCM Control Delay (s)	10	-	-	49	9.5	-
HCM Lane LOS	B	-	-	E	A	-
HCM 95th %tile Q(veh)	0	-	-	4.7	0.1	-

4: "G" Street & Project Driveway 2

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	34	709	132	38	867
Future Vol, veh/h	0	34	709	132	38	867
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	-	250	150	-
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	3	3
Mvmt Flow	0	37	771	143	41	942

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	386	0	0	914	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	610	-	-	735	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	610	-	-	735	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.3	0	0.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	610	735	-
HCM Lane V/C Ratio	-	-	0.061	0.056	-
HCM Control Delay (s)	-	-	11.3	10.2	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.2	0.2	-

	↗	→	↘	⮌	↙	←	↖	↖	↑	↗	↘	↓
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			⮌	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	243	551	185	42	283	528	102	335	494	257	173	462
Future Volume (vph)	243	551	185	42	283	528	102	335	494	257	173	462
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3339			1752	3505	1544	1752	3505	1547	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3339			1752	3505	1544	1752	3505	1547	1752	3505
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)	259	586	197	45	301	562	109	356	526	273	184	491
RTOR Reduction (vph)	0	24	0	0	0	0	74	0	0	111	0	0
Lane Group Flow (vph)	259	759	0	0	346	562	35	356	526	162	184	491
Confl. Peds. (#/hr)			24				3			1		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	20.8	36.5			25.8	41.5	41.5	24.8	32.1	32.1	16.6	23.2
Effective Green, g (s)	20.8	36.5			25.8	41.5	41.5	24.8	32.1	32.1	16.6	23.2
Actuated g/C Ratio	0.16	0.28			0.20	0.32	0.32	0.19	0.25	0.25	0.13	0.18
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	280	937			347	1118	492	334	865	381	223	625
v/s Ratio Prot	c0.15	c0.23			c0.20	0.16		c0.20	0.15		0.10	c0.14
v/s Ratio Perm							0.02			0.10		
v/c Ratio	0.93	0.81			1.00	0.50	0.07	1.07	0.61	0.43	0.83	0.79
Uniform Delay, d1	53.8	43.5			52.1	35.9	30.8	52.6	43.4	41.2	55.3	51.0
Progression Factor	1.00	1.00			0.81	0.76	1.59	1.00	1.00	1.00	0.98	0.93
Incremental Delay, d2	34.3	7.5			46.6	1.6	0.3	67.8	1.2	0.8	20.6	6.2
Delay (s)	88.1	51.0			88.7	28.8	49.4	120.4	44.6	42.0	74.8	53.6
Level of Service	F	D			F	C	D	F	D	D	E	D
Approach Delay (s)		60.2				51.4			67.3			57.9
Approach LOS		E				D			E			E

Intersection Summary			
HCM 2000 Control Delay	59.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	94.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	225
Future Volume (vph)	225
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1540
Flt Permitted	1.00
Satd. Flow (perm)	1540
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	239
RTOR Reduction (vph)	196
Lane Group Flow (vph)	43
Confl. Peds. (#/hr)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	23.2
Effective Green, g (s)	23.2
Actuated g/C Ratio	0.18
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	274
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.16
Uniform Delay, d1	45.1
Progression Factor	1.19
Incremental Delay, d2	0.3
Delay (s)	53.9
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1080	4	0	953	19	0	0	15	0	0	15
Future Vol, veh/h	0	1080	4	0	953	19	0	0	15	0	0	15
Conflicting Peds, #/hr	0	0	11	0	0	7	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1113	4	0	982	20	0	0	15	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	568	-	-	498
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	464	0	0	515
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	459	-	-	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.1	12.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	459	-	-	-	-	512
HCM Lane V/C Ratio	0.034	-	-	-	-	0.115
HCM Control Delay (s)	13.1	-	-	-	-	12.3
HCM Lane LOS	B	-	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	-	0.1

ATTACHMENT G

7: Yosemite Avenue & Mansionette Drive

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	39	92	962	814	31	38	43
Future Volume (vph)	39	92	962	814	31	38	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1528	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1528	1752	1568
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	43	101	1057	895	34	42	47
RTOR Reduction (vph)	0	0	0	0	6	0	43
Lane Group Flow (vph)	0	144	1057	895	28	42	4
Confl. Peds. (#/hr)					2	7	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		16.0	109.6	89.4	89.4	10.9	10.9
Effective Green, g (s)		16.0	109.6	89.4	89.4	10.9	10.9
Actuated g/C Ratio		0.12	0.84	0.69	0.69	0.08	0.08
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		215	2954	2410	1050	146	131
v/s Ratio Prot		c0.08	0.30	c0.26		c0.02	
v/s Ratio Perm					0.02		0.00
v/c Ratio		0.67	0.36	0.37	0.03	0.29	0.03
Uniform Delay, d1		54.5	2.3	8.5	6.5	55.9	54.7
Progression Factor		1.07	0.73	0.21	0.12	1.00	1.00
Incremental Delay, d2		5.9	0.3	0.4	0.0	1.1	0.1
Delay (s)		64.1	1.9	2.2	0.8	57.0	54.8
Level of Service		E	A	A	A	E	D
Approach Delay (s)			9.4	2.2		55.8	
Approach LOS			A	A		E	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	114	791	31	7	662	137	16	16	10	151	21	124
Future Volume (veh/h)	114	791	31	7	662	137	16	16	10	151	21	124
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		0.99	1.00		0.99	1.00		0.97
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	127	879	34	8	736	152	18	18	11	168	23	138
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	714	1215	1028	17	890	394	73	107	65	174	34	202
Arrive On Green	0.40	0.65	0.65	0.01	0.25	0.25	0.04	0.10	0.10	0.10	0.15	0.15
Sat Flow, veh/h	1767	1856	1570	1767	3526	1563	1767	1074	656	1767	223	1339
Grp Volume(v), veh/h	127	879	34	8	736	152	18	0	29	168	0	161
Grp Sat Flow(s),veh/h/ln	1767	1856	1570	1767	1763	1563	1767	0	1730	1767	0	1563
Q Serve(g_s), s	6.0	40.4	0.7	0.6	25.6	8.1	1.3	0.0	2.0	12.3	0.0	12.7
Cycle Q Clear(g_c), s	6.0	40.4	0.7	0.6	25.6	8.1	1.3	0.0	2.0	12.3	0.0	12.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		0.86
Lane Grp Cap(c), veh/h	714	1215	1028	17	890	394	73	0	172	174	0	236
V/C Ratio(X)	0.18	0.72	0.03	0.47	0.83	0.39	0.25	0.00	0.17	0.97	0.00	0.68
Avail Cap(c_a), veh/h	714	1215	1028	68	1326	588	76	0	439	174	0	472
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.9	14.7	3.5	64.0	45.9	23.9	60.4	0.0	53.6	58.4	0.0	52.2
Incr Delay (d2), s/veh	0.1	3.8	0.1	18.7	8.7	2.8	1.7	0.0	0.5	57.9	0.0	3.5
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	2.5	16.1	0.3	0.3	12.0	3.2	0.6	0.0	0.9	8.2	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	18.5	3.6	82.7	54.6	26.7	62.1	0.0	54.1	116.3	0.0	55.7
LnGrp LOS	C	B	A	F	D	C	E	A	D	F	A	E
Approach Vol, veh/h		1040			896			47			329	
Approach Delay, s/veh		18.8			50.2			57.2			86.6	
Approach LOS		B			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	17.1	5.5	90.4	9.6	24.5	57.8	38.1				
Change Period (Y+Rc), s	* 4.2	* 4.2	* 4.2	5.3	4.2	* 4.9	5.3	* 5.3				
Max Green Setting (Gmax), s	* 13	* 33	* 5	61.5	5.6	* 39	17.6	* 49				
Max Q Clear Time (g_c+I1), s	14.3	4.0	2.6	42.4	3.3	14.7	8.0	27.6				
Green Ext Time (p_c), s	0.0	0.1	0.0	6.1	0.0	0.9	0.2	5.2				
Intersection Summary												
HCM 6th Ctrl Delay			41.4									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱			↰↑↱		↰	↑↱			↰↑	↱
Traffic Vol, veh/h	142	215	116	69	284	21	23	13	27	6	47	48
Future Vol, veh/h	142	215	116	69	284	21	23	13	27	6	47	48
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	75	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	161	244	132	78	323	24	26	15	31	7	53	55

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	353	0	0	376	0	0	1177	1141	310	1152	1195	341
Stage 1	-	-	-	-	-	-	632	632	-	497	497	-
Stage 2	-	-	-	-	-	-	545	509	-	655	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1200	-	-	1177	-	-	167	200	728	174	186	699
Stage 1	-	-	-	-	-	-	467	472	-	553	543	-
Stage 2	-	-	-	-	-	-	521	536	-	453	441	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1193	-	-	1177	-	-	94	158	728	130	147	695
Mov Cap-2 Maneuver	-	-	-	-	-	-	94	158	-	130	147	-
Stage 1	-	-	-	-	-	-	404	408	-	476	495	-
Stage 2	-	-	-	-	-	-	393	489	-	362	381	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.5	1.5	32	29.4
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	94	335	1193	-	-	1177	-	-	145	695
HCM Lane V/C Ratio	0.278	0.136	0.135	-	-	0.067	-	-	0.415	0.078
HCM Control Delay (s)	57.4	17.4	8.5	-	-	8.3	0	-	46.4	10.6
HCM Lane LOS	F	C	A	-	-	A	A	-	E	B
HCM 95th %tile Q(veh)	1	0.5	0.5	-	-	0.2	-	-	1.8	0.3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	91	13	8	761	76	23	709
Future Volume (vph)	91	13	8	761	76	23	709
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00	0.91
Frt	0.98		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1737		1752	3505	1568	1752	5036
Flt Permitted	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1737		1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	103	15	9	865	86	26	806
RTOR Reduction (vph)	6	0	0	0	28	0	0
Lane Group Flow (vph)	112	0	9	865	58	26	806
Turn Type	Prot		Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases					2		
Actuated Green, G (s)	17.6		1.5	81.4	81.4	6.6	86.5
Effective Green, g (s)	17.6		1.5	81.4	81.4	6.6	86.5
Actuated g/C Ratio	0.15		0.01	0.68	0.68	0.05	0.72
Clearance Time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	254		21	2377	1063	96	3630
v/s Ratio Prot	c0.06		0.01	c0.25		c0.01	0.16
v/s Ratio Perm					0.04		
v/c Ratio	0.44		0.43	0.36	0.05	0.27	0.22
Uniform Delay, d1	46.7		58.8	8.2	6.4	54.4	5.6
Progression Factor	1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.2		13.4	0.4	0.1	1.5	0.1
Delay (s)	47.9		72.3	8.7	6.5	55.9	5.7
Level of Service	D		E	A	A	E	A
Approach Delay (s)	47.9			9.1			7.3
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	0.37		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	35.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✣		↰	↱			↰	↱
Traffic Vol, veh/h	87	159	52	37	203	13	91	50	77	19	18	74
Future Vol, veh/h	87	159	52	37	203	13	91	50	77	19	18	74
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	75	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	96	175	57	41	223	14	100	55	85	21	20	81

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	244	0	0	234	0	0	766	724	207	786	745	242
Stage 1	-	-	-	-	-	-	398	398	-	319	319	-
Stage 2	-	-	-	-	-	-	368	326	-	467	426	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1316	-	-	1328	-	-	318	351	831	309	341	794
Stage 1	-	-	-	-	-	-	626	601	-	690	651	-
Stage 2	-	-	-	-	-	-	650	647	-	574	584	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1307	-	-	1325	-	-	247	311	829	219	302	785
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	311	-	219	302	-
Stage 1	-	-	-	-	-	-	579	556	-	635	623	-
Stage 2	-	-	-	-	-	-	541	619	-	430	540	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	1.1	20.8	14
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	247	501	1307	-	-	1325	-	-	253	785
HCM Lane V/C Ratio	0.405	0.279	0.073	-	-	0.031	-	-	0.161	0.104
HCM Control Delay (s)	29.1	14.9	8	-	-	7.8	0	-	21.9	10.1
HCM Lane LOS	D	B	A	-	-	A	A	-	C	B
HCM 95th %tile Q(veh)	1.9	1.1	0.2	-	-	0.1	-	-	0.6	0.3

	↙	↖	↶	↑	↗	↘	↓
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	136	23	4	698	39	15	763
Future Volume (vph)	136	23	4	698	39	15	763
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00		1.00	0.95	1.00	1.00	0.91
Frt	0.98		1.00	1.00	0.85	1.00	1.00
Flt Protected	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1734		1752	3505	1568	1752	5036
Flt Permitted	0.96		0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1734		1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	148	25	4	759	42	16	829
RTOR Reduction (vph)	7	0	0	0	13	0	0
Lane Group Flow (vph)	166	0	4	759	29	16	829
Turn Type	Prot		Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases					2		
Actuated Green, G (s)	20.9		1.3	86.8	86.8	3.9	89.4
Effective Green, g (s)	20.9		1.3	86.8	86.8	3.9	89.4
Actuated g/C Ratio	0.17		0.01	0.69	0.69	0.03	0.71
Clearance Time (s)	4.2		4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	287		18	2414	1080	54	3573
v/s Ratio Prot	c0.10		0.00	c0.22		c0.01	0.16
v/s Ratio Perm					0.02		
v/c Ratio	0.58		0.22	0.31	0.03	0.30	0.23
Uniform Delay, d1	48.5		61.8	7.8	6.2	59.7	6.4
Progression Factor	1.00		1.20	0.35	0.06	0.64	0.43
Incremental Delay, d2	2.8		5.0	0.3	0.0	2.9	0.1
Delay (s)	51.3		79.4	3.0	0.4	41.2	2.9
Level of Service	D		E	A	A	D	A
Approach Delay (s)	51.3			3.3			3.6
Approach LOS	D			A			A

Intersection Summary			
HCM 2000 Control Delay	8.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.36		
Actuated Cycle Length (s)	126.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	36.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	29	154	137	112	221	289	314	138	150	133	150	51
Average Queue (ft)	1	57	83	51	87	151	71	62	67	73	79	9
95th Queue (ft)	10	116	129	98	169	249	204	112	122	129	133	31
Link Distance (ft)	268	268		602		1172	1172			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)						2						
Queuing Penalty (veh)						2						

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	LT	R
Maximum Queue (ft)	70	36	177	52	115	55	54
Average Queue (ft)	22	5	29	23	32	27	25
95th Queue (ft)	53	20	86	50	71	51	48
Link Distance (ft)		602	655		2325	198	198
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200			75			
Storage Blk Time (%)					0		
Queuing Penalty (veh)					0		

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	U	T	T	R	L	T	T	T
Maximum Queue (ft)	186	51	255	232	53	90	94	178	72
Average Queue (ft)	71	8	86	57	11	26	27	37	17
95th Queue (ft)	131	31	208	148	36	63	76	105	50
Link Distance (ft)	595		566	566			1172	1172	1172
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		150			250	250			
Storage Blk Time (%)			4	0					
Queuing Penalty (veh)			0	0					

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB
Directions Served	R	R	L
Maximum Queue (ft)	46	54	121
Average Queue (ft)	17	5	24
95th Queue (ft)	37	24	63
Link Distance (ft)	581		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	300	513	469	300	288	300	121	185	398	370	185	314
Average Queue (ft)	267	335	245	215	162	151	57	168	232	219	118	142
95th Queue (ft)	350	531	461	298	260	250	105	216	363	362	229	275
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	52	5						64	33	48	3	5
Queuing Penalty (veh)	121	15						176	83	92	7	10

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	292	194	124
Average Queue (ft)	126	131	41
95th Queue (ft)	217	189	88
Link Distance (ft)	536	536	536
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	NB	SB
Directions Served	R	R
Maximum Queue (ft)	23	31
Average Queue (ft)	2	9
95th Queue (ft)	11	32
Link Distance (ft)	229	2325
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	SB	SB
Directions Served	UL	T	T	T	T	R	L	R
Maximum Queue (ft)	161	450	49	162	162	164	139	54
Average Queue (ft)	72	97	2	58	53	13	59	29
95th Queue (ft)	132	266	16	121	125	64	108	52
Link Distance (ft)		585	585	303	303		1902	
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	375					105		150
Storage Blk Time (%)		1			2		0	
Queuing Penalty (veh)		1			1		0	

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	425	52	98	246	309	120	99	214	171	154
Average Queue (ft)	36	186	8	23	111	110	58	50	67	85	63
95th Queue (ft)	82	367	34	58	200	212	128	97	138	148	123
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	5	31		5	27	17	0	23	12	9	1
Queuing Penalty (veh)	35	28		15	7	31	1	22	10	12	1

Zone Summary

Zone wide Queuing Penalty: 670

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	T	R	UL	T	T	R
Maximum Queue (ft)	90	200	279	259	135	240	158	74	143	204	196	28
Average Queue (ft)	14	105	163	102	78	108	36	21	61	92	86	6
95th Queue (ft)	49	188	259	213	129	204	104	54	122	173	169	24
Link Distance (ft)	268	268		602		1172	1172			440	440	
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)			1	0		0						
Queuing Penalty (veh)			1	0		0						

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	EB	WB	NB	NB	SB	SB
Directions Served	L	TR	LTR	L	TR	LT	R
Maximum Queue (ft)	53	26	71	82	106	79	67
Average Queue (ft)	16	1	14	37	48	31	33
95th Queue (ft)	43	11	46	61	85	64	57
Link Distance (ft)		602	655		2325	198	198
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)	200			75			
Storage Blk Time (%)				1	1		
Queuing Penalty (veh)				2	1		

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	LR	U	T	T	R	L	T	T	T
Maximum Queue (ft)	198	31	206	178	28	52	118	155	74
Average Queue (ft)	92	3	71	41	6	11	23	38	18
95th Queue (ft)	167	17	158	109	23	36	67	95	56
Link Distance (ft)	595		579	579			1172	1172	1172
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)		150			250	250			
Storage Blk Time (%)			2						
Queuing Penalty (veh)			0						

ATTACHMENT G

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB
Directions Served	R	R	L
Maximum Queue (ft)	70	22	53
Average Queue (ft)	16	1	19
95th Queue (ft)	43	7	44
Link Distance (ft)	583		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	150
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	UL	T	T	R	L	T	T	R	L
Maximum Queue (ft)	300	487	417	437	441	284	103	185	515	412	185	257
Average Queue (ft)	238	296	255	306	165	116	25	174	329	248	124	134
95th Queue (ft)	358	470	407	424	329	204	64	218	520	396	229	211
Link Distance (ft)		2524	2524		441	441	441		4875	4875		
Upstream Blk Time (%)				0	0							
Queuing Penalty (veh)				0	0							
Storage Bay Dist (ft)	200			370				75			75	250
Storage Blk Time (%)	21	25		5				65	44	49	9	0
Queuing Penalty (veh)	57	60		12				161	146	127	21	0

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	260	273	191
Average Queue (ft)	166	171	61
95th Queue (ft)	246	253	128
Link Distance (ft)	524	524	524
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	NB	SB
Directions Served	T	R	R
Maximum Queue (ft)	52	23	78
Average Queue (ft)	3	10	35
95th Queue (ft)	19	28	64
Link Distance (ft)	585	229	2325
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	B17	B17	SB	SB
Directions Served	UL	T	T	T	T	R	T	T	L	R
Maximum Queue (ft)	206	347	47	367	367	165	132	67	95	97
Average Queue (ft)	79	79	2	99	76	9	4	2	34	27
95th Queue (ft)	162	233	16	265	215	59	43	22	77	65
Link Distance (ft)		585	585	303	303		865	865	1902	
Upstream Blk Time (%)				1	1					
Queuing Penalty (veh)				5	3					
Storage Bay Dist (ft)	375					105				150
Storage Blk Time (%)					5					
Queuing Penalty (veh)					1					

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	906	210	99	369	345	120	52	62	214	217
Average Queue (ft)	71	348	17	17	158	152	65	11	25	109	87
95th Queue (ft)	111	611	103	66	268	274	139	34	52	173	171
Link Distance (ft)		865			1498	1498			1233		2033
Upstream Blk Time (%)		1									
Queuing Penalty (veh)		6									
Storage Bay Dist (ft)	50		110	50			70	50		115	
Storage Blk Time (%)	30	27		0	41	22	0	2	1	8	7
Queuing Penalty (veh)	244	39		0	3	30	0	1	0	12	11

Zone Summary

Zone wide Queuing Penalty: 947

Appendix G: Cumulative Year 2039 No Project Traffic Conditions

ATTACHMENT G

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		↶	↑↑
Traffic Volume (vph)	9	72	34	262	98	251	184	672	298	2	264	766
Future Volume (vph)	9	72	34	262	98	251	184	672	298	2	264	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.95		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1756		1752	1631		1752	3505	1532		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1756		1752	1631		1752	3505	1532		1752	3505
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)	10	78	37	285	107	273	200	730	324	2	287	833
RTOR Reduction (vph)	0	13	0	0	69	0	0	0	206	0	0	0
Lane Group Flow (vph)	10	102	0	285	311	0	200	730	118	0	289	833
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	2.0	12.1		29.0	39.1		23.6	49.6	49.6		26.9	52.9
Effective Green, g (s)	2.0	12.1		29.0	39.1		23.6	49.6	49.6		26.9	52.9
Actuated g/C Ratio	0.01	0.09		0.21	0.29		0.17	0.36	0.36		0.20	0.39
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	25	156		373	468		304	1278	558		346	1363
v/s Ratio Prot	0.01	c0.06		c0.16	0.19		0.11	0.21			c0.16	c0.24
v/s Ratio Perm									0.08			
v/c Ratio	0.40	0.66		0.76	0.66		0.66	0.57	0.21		0.84	0.61
Uniform Delay, d1	66.4	59.9		50.3	42.7		52.4	34.7	29.7		52.4	33.3
Progression Factor	1.00	1.00		1.00	1.00		0.90	0.56	0.71		1.00	1.00
Incremental Delay, d2	10.2	9.5		9.0	3.5		3.1	1.1	0.5		15.8	2.1
Delay (s)	76.6	69.4		59.3	46.2		50.3	20.6	21.6		68.2	35.4
Level of Service	E	E		E	D		D	C	C		E	D
Approach Delay (s)		70.0			51.8			25.6				43.0
Approach LOS		E			D			C				D

Intersection Summary			
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	66.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	57
RTOR Reduction (vph)	35
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	52.9
Effective Green, g (s)	52.9
Actuated g/C Ratio	0.39
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	609
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	25.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	25.9
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	235	368	113	42	480	29	23	1	11	8	16	79
Future Vol, veh/h	235	368	113	42	480	29	23	1	11	8	16	79
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	-	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	123	46	522	32	25	1	12	9	17	86

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	560	0	0	523	0	0	1654	1624	462	1614	1669	544
Stage 1	-	-	-	-	-	-	972	972	-	636	636	-
Stage 2	-	-	-	-	-	-	682	652	-	978	1033	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1006	-	-	1038	-	-	78	102	598	83	96	537
Stage 1	-	-	-	-	-	-	302	329	-	464	470	-
Stage 2	-	-	-	-	-	-	438	463	-	300	308	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1000	-	-	1038	-	-	41	71	598	61	67	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	41	71	-	61	67	-
Stage 1	-	-	-	-	-	-	225	245	-	344	437	-
Stage 2	-	-	-	-	-	-	330	431	-	218	229	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	0.7	141.3	31.8
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	59	1000	-	-	1038	-	-	65	534
HCM Lane V/C Ratio	0.645	0.255	-	-	0.044	-	-	0.401	0.161
HCM Control Delay (s)	141.3	9.8	-	-	8.6	0	-	93.5	13
HCM Lane LOS	F	A	-	-	A	A	-	F	B
HCM 95th %tile Q(veh)	2.7	1	-	-	0.1	-	-	1.5	0.6

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	242	791	220	2	289	791	195	452	703	314	238	630
Future Volume (vph)	242	791	220	2	289	791	195	452	703	314	238	630
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.97			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3361			1752	3505	1547	1752	3505	1545	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3361			1752	3505	1547	1752	3505	1545	1752	3505
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)	263	860	239	2	314	860	212	491	764	341	259	685
RTOR Reduction (vph)	0	19	0	0	0	0	137	0	0	95	0	0
Lane Group Flow (vph)	263	1080	0	0	316	860	75	491	764	246	259	685
Confl. Peds. (#/hr)			23				1			2		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	21.2	40.7			19.8	39.3	39.3	29.8	35.2	35.2	21.3	26.0
Effective Green, g (s)	21.2	40.7			19.8	39.3	39.3	29.8	35.2	35.2	21.3	26.0
Actuated g/C Ratio	0.16	0.30			0.15	0.29	0.29	0.22	0.26	0.26	0.16	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	273	1005			255	1012	447	383	907	399	274	670
v/s Ratio Prot	0.15	c0.32			c0.18	0.25		c0.28	c0.22		0.15	c0.20
v/s Ratio Perm							0.05			0.16		
v/c Ratio	0.96	1.07			1.24	0.85	0.17	1.28	0.84	0.62	0.95	1.02
Uniform Delay, d1	57.0	47.6			58.1	45.6	36.1	53.1	47.8	44.5	56.8	55.0
Progression Factor	1.00	1.00			0.88	0.86	1.36	1.00	1.00	1.00	0.88	0.99
Incremental Delay, d2	44.1	50.7			134.8	8.3	0.8	145.5	7.2	2.8	34.3	36.9
Delay (s)	101.1	98.4			185.9	47.5	49.8	198.6	54.9	47.3	84.2	91.4
Level of Service	F	F			F	D	D	F	D	D	F	F
Approach Delay (s)		98.9				79.4			97.5			92.3
Approach LOS		F				E			F			F

Intersection Summary			
HCM 2000 Control Delay	92.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	105.0%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	202
Future Volume (vph)	202
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1537
Flt Permitted	1.00
Satd. Flow (perm)	1537
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	220
RTOR Reduction (vph)	177
Lane Group Flow (vph)	43
Confl. Peds. (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.0
Effective Green, g (s)	26.0
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	293
v/s Ratio Prot	
v/s Ratio Perm	0.03
v/c Ratio	0.15
Uniform Delay, d1	45.8
Progression Factor	2.28
Incremental Delay, d2	0.2
Delay (s)	104.6
Level of Service	F
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1286	2	0	1174	0	0	0	7	0	0	0
Future Vol, veh/h	0	1286	2	0	1174	0	0	0	7	0	0	0
Conflicting Peds, #/hr	0	0	21	0	0	3	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1354	2	0	1236	0	0	0	7	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	698	-	-	621
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	381	0	0	428
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	373	-	-	427
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	14.8	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	373	-	-	-	-	-
HCM Lane V/C Ratio	0.02	-	-	-	-	-
HCM Control Delay (s)	14.8	-	-	-	-	0
HCM Lane LOS	B	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

7: Yosemite Avenue & Mansionette Drive

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	38	123	1158	1127	88	98	108
Future Volume (vph)	38	123	1158	1127	88	98	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
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	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1568	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1568	1752	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	132	1245	1212	95	105	116
RTOR Reduction (vph)	0	0	0	0	14	0	103
Lane Group Flow (vph)	0	173	1245	1212	81	105	13
Confl. Peds. (#/hr)						24	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		18.7	111.0	88.1	88.1	15.5	15.5
Effective Green, g (s)		18.7	111.0	88.1	88.1	15.5	15.5
Actuated g/C Ratio		0.14	0.82	0.65	0.65	0.11	0.11
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		240	2860	2270	1015	199	178
v/s Ratio Prot		c0.10	0.36	c0.35		c0.06	
v/s Ratio Perm					0.05		0.01
v/c Ratio		0.72	0.44	0.53	0.08	0.53	0.07
Uniform Delay, d1		56.2	3.6	12.9	8.9	56.8	53.8
Progression Factor		0.87	0.54	0.62	0.60	1.00	1.00
Incremental Delay, d2		4.1	0.2	0.8	0.1	2.5	0.2
Delay (s)		52.8	2.1	8.8	5.5	59.3	54.0
Level of Service		D	A	A	A	E	D
Approach Delay (s)			8.3	8.6		56.5	
Approach LOS			A	A		E	

Intersection Summary

HCM 2000 Control Delay	12.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	58.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

8: Paulson Road & Yosemite Avenue

06/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	74	968	67	43	963	256	119	103	63	166	76	148
Future Volume (veh/h)	74	968	67	43	963	256	119	103	63	166	76	148
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		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	998	69	44	993	264	123	106	65	171	78	153
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	96	1070	903	56	1954	868	146	154	94	199	95	186
Arrive On Green	0.05	0.58	0.58	0.03	0.55	0.55	0.08	0.14	0.14	0.11	0.17	0.17
Sat Flow, veh/h	1767	1856	1566	1767	3526	1567	1767	1075	659	1767	552	1082
Grp Volume(v), veh/h	76	998	69	44	993	264	123	0	171	171	0	231
Grp Sat Flow(s),veh/h/ln	1767	1856	1566	1767	1763	1567	1767	0	1734	1767	0	1633
Q Serve(g_s), s	5.8	67.0	2.7	3.4	23.8	7.1	9.3	0.0	12.7	12.9	0.0	18.6
Cycle Q Clear(g_c), s	5.8	67.0	2.7	3.4	23.8	7.1	9.3	0.0	12.7	12.9	0.0	18.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		0.66
Lane Grp Cap(c), veh/h	96	1070	903	56	1954	868	146	0	248	199	0	281
V/C Ratio(X)	0.79	0.93	0.08	0.78	0.51	0.30	0.84	0.00	0.69	0.86	0.00	0.82
Avail Cap(c_a), veh/h	162	1070	903	65	1954	868	173	0	421	199	0	381
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.5	26.4	12.8	65.4	18.8	5.4	61.5	0.0	55.4	59.2	0.0	54.3
Incr Delay (d2), s/veh	13.5	15.5	0.2	39.7	0.9	0.9	25.9	0.0	3.4	29.0	0.0	10.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	31.4	0.9	2.1	9.4	4.1	5.3	0.0	5.9	7.3	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.0	41.8	12.9	105.1	19.8	6.3	87.4	0.0	58.7	88.3	0.0	64.5
LnGrp LOS	E	D	B	F	B	A	F	A	E	F	A	E
Approach Vol, veh/h		1143			1301			294			402	
Approach Delay, s/veh		42.4			19.9			70.7			74.6	
Approach LOS		D			B			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.2	23.5	8.5	83.7	15.5	28.3	11.6	80.7
Change Period (Y+Rc), s	4.9	* 4	* 4.2	5.3	* 4.2	4.9	* 4.2	5.3
Max Green Setting (Gmax), s	12.9	* 33	* 5	67.4	* 13	31.7	* 13	59.9
Max Q Clear Time (g_c+I1), s	14.9	14.7	5.4	69.0	11.3	20.6	7.8	25.8
Green Ext Time (p_c), s	0.0	0.9	0.0	0.0	0.1	0.9	0.0	8.9

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↰	↑↑	↱		↰
Traffic Volume (vph)	34	70	134	291	88	154	2	159	677	188	2	125
Future Volume (vph)	34	70	134	291	88	154	2	159	677	188	2	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.90		1.00	0.90			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1663		1752	1653			1752	3505	1527		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1663		1752	1653			1752	3505	1527		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	75	144	313	95	166	2	171	728	202	2	134
RTOR Reduction (vph)	0	51	0	0	49	0	0	0	0	127	0	0
Lane Group Flow (vph)	37	168	0	313	212	0	0	173	728	75	0	136
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	5.7	18.0		30.4	42.7			18.2	51.9	51.9		21.3
Effective Green, g (s)	5.7	18.0		30.4	42.7			18.2	51.9	51.9		21.3
Actuated g/C Ratio	0.04	0.13		0.22	0.31			0.13	0.37	0.37		0.15
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	71	213		380	504			227	1299	566		266
v/s Ratio Prot	0.02	c0.10		c0.18	0.13			c0.10	0.21			0.08
v/s Ratio Perm										0.05		
v/c Ratio	0.52	0.79		0.82	0.42			0.76	0.56	0.13		0.51
Uniform Delay, d1	65.8	59.1		52.2	38.8			58.8	35.0	29.1		54.6
Progression Factor	1.00	1.00		1.00	1.00			0.83	0.40	1.02		1.00
Incremental Delay, d2	6.7	17.2		13.5	0.6			9.2	1.1	0.3		1.7
Delay (s)	72.6	76.4		65.7	39.4			57.8	15.2	30.2		56.2
Level of Service	E	E		E	D			E	B	C		E
Approach Delay (s)		75.8			53.7				24.6			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	79.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↓	↲
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	728	34
Future Volume (vph)	728	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1543
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1543
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	783	37
RTOR Reduction (vph)	0	22
Lane Group Flow (vph)	783	15
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	55.0	55.0
Effective Green, g (s)	55.0	55.0
Actuated g/C Ratio	0.39	0.39
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1376	606
v/s Ratio Prot	c0.22	
v/s Ratio Perm		0.01
v/c Ratio	0.57	0.02
Uniform Delay, d1	33.2	26.0
Progression Factor	1.00	1.00
Incremental Delay, d2	1.7	0.1
Delay (s)	34.9	26.1
Level of Service	C	C
Approach Delay (s)	37.6	
Approach LOS	D	
Intersection Summary		

Intersection	
Int Delay, s/veh	13.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	144	229	49	20	316	16	91	13	50	25	1	110
Future Vol, veh/h	144	229	49	20	316	16	91	13	50	25	1	110
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	53	22	343	17	99	14	54	27	1	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	367	0	0	304	0	0	1053	1003	279	1028	1021	364
Stage 1	-	-	-	-	-	-	592	592	-	403	403	-
Stage 2	-	-	-	-	-	-	461	411	-	625	618	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1186	-	-	1251	-	-	203	241	757	211	235	679
Stage 1	-	-	-	-	-	-	491	492	-	622	598	-
Stage 2	-	-	-	-	-	-	579	593	-	471	479	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1178	-	-	1249	-	-	146	202	755	163	197	671
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	202	-	163	197	-
Stage 1	-	-	-	-	-	-	425	426	-	536	581	-
Stage 2	-	-	-	-	-	-	462	576	-	366	414	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.9	0.5	72.5	15.3
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	204	1178	-	-	1249	-	-	164	671
HCM Lane V/C Ratio	0.821	0.133	-	-	0.017	-	-	0.172	0.178
HCM Control Delay (s)	72.5	8.5	-	-	7.9	0	-	31.5	11.5
HCM Lane LOS	F	A	-	-	A	A	-	D	B
HCM 95th %tile Q(veh)	6	0.5	-	-	0.1	-	-	0.6	0.6

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	264	878	362	2	261	708	107	536	648	336	229	661
Future Volume (vph)	264	878	362	2	261	708	107	536	648	336	229	661
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3310			1752	3505	1544	1752	3505	1547	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3310			1752	3505	1544	1752	3505	1547	1752	3505
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)	281	934	385	2	278	753	114	570	689	357	244	703
RTOR Reduction (vph)	0	32	0	0	0	0	81	0	0	100	0	0
Lane Group Flow (vph)	281	1287	0	0	280	753	33	570	689	257	244	703
Confl. Peds. (#/hr)			24				3			1		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	23.0	47.7			15.8	40.5	40.5	30.8	35.0	35.0	22.5	26.0
Effective Green, g (s)	23.0	47.7			15.8	40.5	40.5	30.8	35.0	35.0	22.5	26.0
Actuated g/C Ratio	0.16	0.34			0.11	0.29	0.29	0.22	0.25	0.25	0.16	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	287	1127			197	1013	446	385	876	386	281	650
v/s Ratio Prot	0.16	c0.39			c0.16	0.21		c0.33	c0.20		0.14	c0.20
v/s Ratio Perm							0.02			0.17		
v/c Ratio	0.98	1.14			1.42	0.74	0.07	1.48	0.79	0.67	0.87	1.08
Uniform Delay, d1	58.3	46.1			62.1	45.0	36.1	54.6	49.0	47.2	57.3	57.0
Progression Factor	1.00	1.00			0.86	0.86	1.94	1.00	1.00	1.00	0.90	0.90
Incremental Delay, d2	46.8	74.7			214.2	4.5	0.3	229.8	4.7	4.3	19.7	56.0
Delay (s)	105.1	120.9			267.8	43.0	70.3	284.4	53.7	51.6	71.2	107.1
Level of Service	F	F			F	D	E	F	D	D	E	F
Approach Delay (s)		118.1				100.6			134.6			88.6
Approach LOS		F				F			F			F

Intersection Summary			
HCM 2000 Control Delay	112.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	115.9%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	273
Future Volume (vph)	273
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1539
Flt Permitted	1.00
Satd. Flow (perm)	1539
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	290
RTOR Reduction (vph)	221
Lane Group Flow (vph)	69
Confl. Peds. (#/hr)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.0
Effective Green, g (s)	26.0
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	285
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.24
Uniform Delay, d1	48.6
Progression Factor	1.20
Incremental Delay, d2	0.4
Delay (s)	58.5
Level of Service	E
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1544	7	0	1365	0	0	0	27	0	0	0
Future Vol, veh/h	0	1544	7	0	1365	0	0	0	27	0	0	0
Conflicting Peds, #/hr	0	0	11	0	0	7	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1592	7	0	1407	0	0	0	28	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	807	-	-	711
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	322	0	0	373
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	319	-	-	371
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	17.4	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	319	-	-	-	-	-
HCM Lane V/C Ratio	0.087	-	-	-	-	-
HCM Control Delay (s)	17.4	-	-	-	-	0
HCM Lane LOS	C	-	-	-	-	A
HCM 95th %tile Q(veh)	0.3	-	-	-	-	-

	↶	↗	→	←	↖	↘	↙
Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	70	137	1360	1114	43	40	47
Future Volume (vph)	70	137	1360	1114	43	40	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1528	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1528	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	149	1478	1211	47	43	51
RTOR Reduction (vph)	0	0	0	0	7	0	47
Lane Group Flow (vph)	0	225	1478	1211	40	43	4
Confl. Peds. (#/hr)					2	7	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		23.2	119.4	92.0	92.0	11.1	11.1
Effective Green, g (s)		23.2	119.4	92.0	92.0	11.1	11.1
Actuated g/C Ratio		0.17	0.85	0.66	0.66	0.08	0.08
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		290	2989	2303	1004	138	124
v/s Ratio Prot		c0.13	0.42	c0.35		c0.02	
v/s Ratio Perm					0.03		0.00
v/c Ratio		0.78	0.49	0.53	0.04	0.31	0.03
Uniform Delay, d1		55.9	2.6	12.6	8.5	60.8	59.5
Progression Factor		1.02	0.55	0.33	0.11	1.00	1.00
Incremental Delay, d2		6.0	0.3	0.7	0.1	1.3	0.1
Delay (s)		62.8	1.7	4.9	1.0	62.1	59.6
Level of Service		E	A	A	A	E	E
Approach Delay (s)			9.8	4.7		60.8	
Approach LOS			A	A		E	

Intersection Summary			
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	57.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary
Cumulative Year 2039 No Project PM Peak
8: Paulson Road & Yosemite Avenue
06/21/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	193	1082	43	13	881	173	14	23	18	177	23	215
Future Volume (veh/h)	193	1082	43	13	881	173	14	23	18	177	23	215
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		0.99	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	210	1176	47	14	958	188	15	25	20	192	25	234
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	605	948	802	260	1114	495	28	112	89	162	29	272
Arrive On Green	0.34	0.51	0.51	0.15	0.32	0.32	0.02	0.12	0.12	0.09	0.19	0.19
Sat Flow, veh/h	1767	1856	1569	1767	3526	1565	1767	951	760	1767	151	1409
Grp Volume(v), veh/h	210	1176	47	14	958	188	15	0	45	192	0	259
Grp Sat Flow(s),veh/h/ln	1767	1856	1569	1767	1763	1565	1767	0	1711	1767	0	1560
Q Serve(g_s), s	12.4	71.5	1.8	1.0	35.7	10.0	1.2	0.0	3.3	12.8	0.0	22.5
Cycle Q Clear(g_c), s	12.4	71.5	1.8	1.0	35.7	10.0	1.2	0.0	3.3	12.8	0.0	22.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.90
Lane Grp Cap(c), veh/h	605	948	802	260	1114	495	28	0	201	162	0	301
V/C Ratio(X)	0.35	1.24	0.06	0.05	0.86	0.38	0.54	0.00	0.22	1.19	0.00	0.86
Avail Cap(c_a), veh/h	605	948	802	260	1393	618	69	0	403	162	0	439
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.4	34.3	11.9	51.3	45.0	21.9	68.4	0.0	56.0	63.6	0.0	54.6
Incr Delay (d2), s/veh	0.3	117.5	0.1	0.1	8.7	2.2	15.1	0.0	0.6	130.4	0.0	11.1
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	5.3	60.9	0.8	0.4	16.5	3.9	0.7	0.0	1.5	11.5	0.0	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	151.7	12.0	51.4	53.7	24.1	83.5	0.0	56.5	194.0	0.0	65.7
LnGrp LOS	C	F	B	D	D	C	F	A	E	F	A	E
Approach Vol, veh/h		1433			1160			60			451	
Approach Delay, s/veh		130.0			48.9			63.3			120.3	
Approach LOS		F			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	21.4	24.8	76.8	6.4	32.0	52.1	49.5
Change Period (Y+Rc), s	* 4.2	* 4.9	4.2	* 5.3	* 4.2	4.9	4.2	* 5.3
Max Green Setting (Gmax), s	* 13	* 33	5.0	* 72	* 5.5	39.4	21.2	* 55
Max Q Clear Time (g_c+I1), s	14.8	5.3	3.0	73.5	3.2	24.5	14.4	37.7
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	1.3	0.3	6.5

Intersection Summary	
HCM 6th Ctrl Delay	97.0
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		↰	↑↑
Traffic Volume (vph)	9	72	34	262	95	243	187	680	298	2	264	766
Future Volume (vph)	9	72	34	262	95	243	187	680	298	2	264	766
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.95		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1756		1752	1630		1752	3505	1532		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1756		1752	1630		1752	3505	1532		1752	3505
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)	10	78	37	285	103	264	203	739	324	2	287	833
RTOR Reduction (vph)	0	13	0	0	69	0	0	0	209	0	0	0
Lane Group Flow (vph)	10	102	0	285	298	0	203	739	115	0	289	833
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	2.0	12.1		29.0	39.1		20.5	48.1	48.1		28.4	56.0
Effective Green, g (s)	2.0	12.1		29.0	39.1		20.5	48.1	48.1		28.4	56.0
Actuated g/C Ratio	0.01	0.09		0.21	0.29		0.15	0.35	0.35		0.21	0.41
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	25	156		373	468		264	1239	541		365	1443
v/s Ratio Prot	0.01	c0.06		c0.16	0.18		c0.12	0.21			c0.16	c0.24
v/s Ratio Perm									0.07			
v/c Ratio	0.40	0.66		0.76	0.64		0.77	0.60	0.21		0.79	0.58
Uniform Delay, d1	66.4	59.9		50.3	42.3		55.5	36.0	30.7		51.0	30.9
Progression Factor	1.00	1.00		1.00	1.00		0.90	0.59	1.09		1.00	1.00
Incremental Delay, d2	10.2	9.5		9.0	2.8		9.2	1.5	0.6		11.2	1.7
Delay (s)	76.6	69.4		59.3	45.1		59.2	22.7	34.2		62.2	32.6
Level of Service	E	E		E	D		E	C	C		E	C
Approach Delay (s)		70.0			51.3			31.5				39.4
Approach LOS		E			D			C				D

Intersection Summary			
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	57
RTOR Reduction (vph)	34
Lane Group Flow (vph)	23
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	56.0
Effective Green, g (s)	56.0
Actuated g/C Ratio	0.41
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	645
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	23.9
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	24.0
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱				↱			↱
Traffic Vol, veh/h	235	368	113	58	492	29	0	0	12	0	0	79
Future Vol, veh/h	235	368	113	58	492	29	0	0	12	0	0	79
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	75	-	-	-	-	0	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	123	63	535	32	0	0	13	0	0	86

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	573	0	0	523	0	0	-	-	462	-	-	557
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.13	-	-	4.13	-	-	-	-	6.23	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	-	-	3.327	-	-	3.327
Pot Cap-1 Maneuver	995	-	-	1038	-	-	0	0	598	0	0	528
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	989	-	-	1038	-	-	-	-	598	-	-	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.3	0.9	11.2	13.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	598	989	-	-	1038	-	-	525
HCM Lane V/C Ratio	0.022	0.258	-	-	0.061	-	-	0.164
HCM Control Delay (s)	11.2	9.9	-	-	8.7	-	-	13.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.1	1	-	-	0.2	-	-	0.6

Intersection	
Intersection Delay, s/veh	30.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱			↰	↱
Traffic Vol, veh/h	235	368	113	42	480	29	23	1	11	8	16	79
Future Vol, veh/h	235	368	113	42	480	29	23	1	11	8	16	79
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
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	123	46	522	32	25	1	12	9	17	86
Number of Lanes	1	1	0	1	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	24.7	43.4	11.4	11.3
HCM LOS	C	E	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	33%	0%
Vol Thru, %	0%	8%	0%	77%	0%	94%	67%	0%
Vol Right, %	0%	92%	0%	23%	0%	6%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	12	235	481	42	509	24	79
LT Vol	23	0	235	0	42	0	8	0
Through Vol	0	1	0	368	0	480	16	0
RT Vol	0	11	0	113	0	29	0	79
Lane Flow Rate	25	13	255	523	46	553	26	86
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.059	0.027	0.451	0.826	0.084	0.931	0.058	0.169
Departure Headway (Hd)	8.565	7.386	6.362	5.69	6.605	6.059	7.972	7.08
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	417	482	565	633	541	598	448	505
Service Time	6.347	5.167	4.113	3.44	4.36	3.813	5.741	4.848
HCM Lane V/C Ratio	0.06	0.027	0.451	0.826	0.085	0.925	0.058	0.17
HCM Control Delay	11.9	10.4	14.3	29.8	10	46.2	11.2	11.3
HCM Lane LOS	B	B	B	D	A	E	B	B
HCM 95th-tile Q	0.2	0.1	2.3	8.7	0.3	12	0.2	0.6

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	242	791	220	291	791	195	452	703	314	238	630	202
Future Volume (veh/h)	242	791	220	291	791	195	452	703	314	238	630	202
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1856	1856	1856	1856	1856	1856	1930	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	263	860	239	316	860	212	491	764	341	259	685	220
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	278	831	231	647	1846	823	376	1121	1075	312	674	298
Arrive On Green	0.16	0.31	0.31	0.49	0.70	0.70	0.20	0.32	0.32	0.03	0.06	0.06
Sat Flow, veh/h	1767	2710	752	1767	3526	1572	1838	3526	1570	3428	3526	1560
Grp Volume(v), veh/h	263	559	540	316	860	212	491	764	341	259	685	220
Grp Sat Flow(s),veh/h/ln	1767	1763	1700	1767	1763	1572	1838	1763	1570	1714	1763	1560
Q Serve(g_s), s	20.0	41.7	41.7	16.4	14.9	6.8	27.8	25.7	4.6	10.2	26.0	18.8
Cycle Q Clear(g_c), s	20.0	41.7	41.7	16.4	14.9	6.8	27.8	25.7	4.6	10.2	26.0	18.8
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	278	540	521	647	1846	823	376	1121	1075	312	674	298
V/C Ratio(X)	0.95	1.03	1.04	0.49	0.47	0.26	1.31	0.68	0.32	0.83	1.02	0.74
Avail Cap(c_a), veh/h	278	540	521	647	1846	823	376	1121	1075	353	674	298
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.7	47.1	47.2	26.3	12.1	10.9	54.1	40.4	11.7	64.9	63.7	59.9
Incr Delay (d2), s/veh	39.5	47.9	49.0	0.6	0.8	0.8	156.2	1.7	0.2	13.9	38.8	9.3
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	11.8	24.8	24.1	6.2	4.9	2.3	28.8	11.1	4.2	5.2	15.9	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	96.2	95.0	96.2	26.9	12.9	11.6	210.3	42.1	11.8	78.8	102.5	69.2
LnGrp LOS	F	F	F	C	B	B	F	D	B	E	F	E
Approach Vol, veh/h		1362			1388			1596			1164	
Approach Delay, s/veh		95.7			15.9			87.4			91.0	
Approach LOS		F			B			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.6	48.5	55.1	47.0	33.1	32.0	25.6	76.5
Change Period (Y+Rc), s	* 4.2	5.3	5.3	* 5.3	5.3	* 6	* 4.2	5.3
Max Green Setting (Gmax), s	* 14	40.5	20.8	* 42	27.8	* 26	* 21	41.1
Max Q Clear Time (g_c+I1), s	12.2	27.7	18.4	43.7	29.8	28.0	22.0	16.9
Green Ext Time (p_c), s	0.2	4.9	0.2	0.0	0.0	0.0	0.0	6.6

Intersection Summary			
HCM 6th Ctrl Delay			72.2
HCM 6th LOS			E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	74	968	67	43	963	256	119	103	63	166	76	148
Future Volume (veh/h)	74	968	67	43	963	256	119	103	63	166	76	148
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		0.99	1.00		1.00	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	76	998	69	44	993	264	123	106	65	171	78	153
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	487	1923	133	57	1139	505	148	161	99	197	95	187
Arrive On Green	0.28	0.57	0.57	0.03	0.32	0.32	0.08	0.15	0.15	0.11	0.17	0.17
Sat Flow, veh/h	1767	3344	231	1767	3526	1563	1767	1076	660	1767	552	1082
Grp Volume(v), veh/h	76	526	541	44	993	264	123	0	171	171	0	231
Grp Sat Flow(s),veh/h/ln	1767	1763	1813	1767	1763	1563	1767	0	1735	1767	0	1634
Q Serve(g_s), s	4.4	24.6	24.6	3.4	36.1	13.7	9.3	0.0	12.6	12.9	0.0	18.5
Cycle Q Clear(g_c), s	4.4	24.6	24.6	3.4	36.1	13.7	9.3	0.0	12.6	12.9	0.0	18.5
Prop In Lane	1.00		0.13	1.00		1.00	1.00		0.38	1.00		0.66
Lane Grp Cap(c), veh/h	487	1013	1042	57	1139	505	148	0	260	197	0	282
V/C Ratio(X)	0.16	0.52	0.52	0.78	0.87	0.52	0.83	0.00	0.66	0.87	0.00	0.82
Avail Cap(c_a), veh/h	487	1013	1042	117	1312	581	231	0	421	288	0	438
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.3	17.5	17.5	65.3	43.4	20.1	61.4	0.0	54.5	59.4	0.0	54.2
Incr Delay (d2), s/veh	0.1	1.9	1.8	20.0	9.2	3.8	13.7	0.0	2.8	16.9	0.0	6.8
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	1.9	9.9	10.2	1.8	16.7	5.3	4.8	0.0	5.8	6.6	0.0	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	19.4	19.4	85.3	52.6	23.9	75.1	0.0	57.3	76.3	0.0	61.0
LnGrp LOS	D	B	B	F	D	C	E	A	E	E	A	E
Approach Vol, veh/h		1143			1301			294			402	
Approach Delay, s/veh		20.6			47.9			64.8			67.5	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.4	24.6	8.6	83.5	15.6	28.4	42.8	49.2
Change Period (Y+Rc), s	* 4.2	* 4.2	* 4.2	5.3	4.2	* 4.9	5.3	* 5.3
Max Green Setting (Gmax), s	* 22	* 33	* 9	54.1	17.8	* 37	12.5	* 51
Max Q Clear Time (g_c+I1), s	14.9	14.6	5.4	26.6	11.3	20.5	6.4	38.1
Green Ext Time (p_c), s	0.2	0.9	0.0	7.1	0.1	1.1	0.1	5.9

Intersection Summary			
HCM 6th Ctrl Delay			42.1
HCM 6th LOS			D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↰	↑↑	↱		↰
Traffic Volume (vph)	34	70	134	291	72	125	2	175	706	188	2	125
Future Volume (vph)	34	70	134	291	72	125	2	175	706	188	2	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.90		1.00	0.90			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1663		1752	1653			1752	3505	1527		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1663		1752	1653			1752	3505	1527		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	75	144	313	77	134	2	188	759	202	2	134
RTOR Reduction (vph)	0	51	0	0	48	0	0	0	0	127	0	0
Lane Group Flow (vph)	37	168	0	313	163	0	0	190	759	75	0	136
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	5.7	18.0		30.1	42.4			19.4	52.1	52.1		21.4
Effective Green, g (s)	5.7	18.0		30.1	42.4			19.4	52.1	52.1		21.4
Actuated g/C Ratio	0.04	0.13		0.22	0.30			0.14	0.37	0.37		0.15
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	71	213		376	500			242	1304	568		267
v/s Ratio Prot	0.02	c0.10		c0.18	0.10			c0.11	0.22			0.08
v/s Ratio Perm										0.05		
v/c Ratio	0.52	0.79		0.83	0.33			0.79	0.58	0.13		0.51
Uniform Delay, d1	65.8	59.1		52.5	37.7			58.3	35.2	29.0		54.5
Progression Factor	1.00	1.00		1.00	1.00			0.92	0.58	0.69		1.00
Incremental Delay, d2	6.7	17.2		14.5	0.4			11.8	1.4	0.4		1.5
Delay (s)	72.6	76.4		67.1	38.1			65.6	21.8	20.4		56.0
Level of Service	E	E		E	D			E	C	C		E
Approach Delay (s)		75.8			55.4				28.8			
Approach LOS		E			E				C			

Intersection Summary			
HCM 2000 Control Delay	40.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	80.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

1: "G" Street & Mercy Avenue

	↓	↲
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	728	34
Future Volume (vph)	728	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1543
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1543
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	783	37
RTOR Reduction (vph)	0	23
Lane Group Flow (vph)	783	14
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	54.1	54.1
Effective Green, g (s)	54.1	54.1
Actuated g/C Ratio	0.39	0.39
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1354	596
v/s Ratio Prot	c0.22	
v/s Ratio Perm		0.01
v/c Ratio	0.58	0.02
Uniform Delay, d1	33.9	26.6
Progression Factor	1.00	1.00
Incremental Delay, d2	1.8	0.1
Delay (s)	35.7	26.7
Level of Service	D	C
Approach Delay (s)	38.3	
Approach LOS	D	

Intersection Summary

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱				↱			↱
Traffic Vol, veh/h	144	229	49	21	362	16	0	0	63	0	0	110
Future Vol, veh/h	144	229	49	21	362	16	0	0	63	0	0	110
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	75	-	-	-	-	0	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	53	23	393	17	0	0	68	0	0	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	417	0	0	304	0	0	-	-	279	-	-	414
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.13	-	-	4.13	-	-	-	-	6.23	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	-	-	3.327	-	-	3.327
Pot Cap-1 Maneuver	1137	-	-	1251	-	-	0	0	757	0	0	636
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1129	-	-	1249	-	-	-	-	755	-	-	629
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0.4	10.2	12.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	755	1129	-	-	1249	-	-	629
HCM Lane V/C Ratio	0.091	0.139	-	-	0.018	-	-	0.19
HCM Control Delay (s)	10.2	8.7	-	-	7.9	-	-	12.1
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0.5	-	-	0.1	-	-	0.7

ATTACHMENT G

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱			↰↑	↱
Traffic Vol, veh/h	144	229	49	20	316	16	91	13	50	25	1	110
Future Vol, veh/h	144	229	49	20	316	16	91	13	50	25	1	110
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
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	53	22	343	17	99	14	54	27	1	120
Number of Lanes	1	1	0	1	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	14.1	18.6	11.7	11.2
HCM LOS	B	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	96%	0%
Vol Thru, %	0%	21%	0%	82%	0%	95%	4%	0%
Vol Right, %	0%	79%	0%	18%	0%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	63	144	278	20	332	26	110
LT Vol	91	0	144	0	20	0	25	0
Through Vol	0	13	0	229	0	316	1	0
RT Vol	0	50	0	49	0	16	0	110
Lane Flow Rate	99	68	157	302	22	361	28	120
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.211	0.126	0.292	0.51	0.041	0.628	0.061	0.217
Departure Headway (Hd)	7.688	6.608	6.706	6.073	6.803	6.261	7.74	6.531
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	464	538	534	589	524	574	460	545
Service Time	5.482	4.401	4.478	3.845	4.576	4.034	5.537	4.327
HCM Lane V/C Ratio	0.213	0.126	0.294	0.513	0.042	0.629	0.061	0.22
HCM Control Delay	12.6	10.4	12.2	15.1	9.9	19.1	11	11.2
HCM Lane LOS	B	B	B	C	A	C	B	B
HCM 95th-tile Q	0.8	0.4	1.2	2.9	0.1	4.3	0.2	0.8

HCM 6th Signalized Intersection Summary
5: "G" Street & Yosemite Avenue

Cumulative Year 2039 No Project PM Peak

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	264	878	362	263	708	107	536	648	336	229	661	273
Future Volume (veh/h)	264	878	362	263	708	107	536	648	336	229	661	273
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1856	1856	1856	1856	1856	1856	1930	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	281	934	385	280	753	114	570	689	357	244	703	290
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	295	844	344	546	1754	781	378	1117	984	299	655	290
Arrive On Green	0.17	0.35	0.35	0.62	1.00	1.00	0.21	0.32	0.32	0.03	0.06	0.06
Sat Flow, veh/h	1767	2426	990	1767	3526	1570	1838	3526	1571	3428	3526	1562
Grp Volume(v), veh/h	281	676	643	280	753	114	570	689	357	244	703	290
Grp Sat Flow(s),veh/h/ln	1767	1763	1653	1767	1763	1570	1838	1763	1571	1714	1763	1562
Q Serve(g_s), s	22.0	48.7	48.7	12.4	0.2	0.1	28.8	23.2	4.8	9.9	26.0	24.9
Cycle Q Clear(g_c), s	22.0	48.7	48.7	12.4	0.2	0.1	28.8	23.2	4.8	9.9	26.0	24.9
Prop In Lane	1.00		0.60	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	295	613	575	546	1754	781	378	1117	984	299	655	290
V/C Ratio(X)	0.95	1.10	1.12	0.51	0.43	0.15	1.51	0.62	0.36	0.81	1.07	1.00
Avail Cap(c_a), veh/h	295	613	575	546	1754	781	378	1117	984	407	655	290
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.7	45.7	45.7	20.8	0.2	0.2	55.6	40.6	14.7	66.9	65.7	60.1
Incr Delay (d2), s/veh	39.3	67.7	74.4	0.8	0.8	0.4	241.8	1.0	0.2	8.9	56.6	52.7
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	12.9	32.0	31.1	4.1	0.2	0.1	38.4	10.0	5.3	4.8	17.4	14.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.1	113.4	120.0	21.7	0.9	0.6	297.4	41.6	14.9	75.8	122.3	112.8
LnGrp LOS	F	F	F	C	A	A	F	D	B	E	F	F
Approach Vol, veh/h		1600			1147			1616			1237	
Approach Delay, s/veh		113.2			6.0			125.9			110.9	
Approach LOS		F			A			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.4	49.7	48.6	54.0	34.1	32.0	27.6	75.0
Change Period (Y+Rc), s	* 4.2	5.3	5.3	* 5.3	5.3	* 6	* 4.2	5.3
Max Green Setting (Gmax), s	* 17	38.9	16.8	* 49	28.8	* 26	* 23	42.1
Max Q Clear Time (g_c+I1), s	11.9	25.2	14.4	50.7	30.8	28.0	24.0	2.2
Green Ext Time (p_c), s	0.3	4.7	0.2	0.0	0.0	0.0	0.0	5.8

Intersection Summary	
HCM 6th Ctrl Delay	94.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary — Cumulative Year 2039 No Project PM Peak

8: Paulson Road & Yosemite Avenue — 06/26/2019

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	193	1082	43	13	881	173	14	23	18	177	23	215
Future Volume (veh/h)	193	1082	43	13	881	173	14	23	18	177	23	215
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		0.99	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	210	1176	47	14	958	188	15	25	20	192	25	234
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	581	2154	86	26	1064	472	63	96	77	216	29	274
Arrive On Green	0.33	0.62	0.62	0.01	0.30	0.30	0.04	0.10	0.10	0.12	0.19	0.19
Sat Flow, veh/h	1767	3455	138	1767	3526	1565	1767	952	761	1767	151	1409
Grp Volume(v), veh/h	210	600	623	14	958	188	15	0	45	192	0	259
Grp Sat Flow(s),veh/h/ln	1767	1763	1830	1767	1763	1565	1767	0	1713	1767	0	1560
Q Serve(g_s), s	12.7	27.2	27.2	1.1	36.5	9.6	1.2	0.0	3.4	15.0	0.0	22.5
Cycle Q Clear(g_c), s	12.7	27.2	27.2	1.1	36.5	9.6	1.2	0.0	3.4	15.0	0.0	22.5
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.44	1.00		0.90
Lane Grp Cap(c), veh/h	581	1099	1141	26	1064	472	63	0	174	216	0	303
V/C Ratio(X)	0.36	0.55	0.55	0.53	0.90	0.40	0.24	0.00	0.26	0.89	0.00	0.85
Avail Cap(c_a), veh/h	581	1099	1141	63	1151	511	63	0	404	254	0	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.8	15.0	15.0	68.5	46.9	20.1	65.6	0.0	58.1	60.5	0.0	54.5
Incr Delay (d2), s/veh	0.4	1.9	1.9	15.3	12.1	2.5	1.9	0.0	0.8	26.7	0.0	6.8
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	5.4	10.7	11.1	0.6	17.3	3.7	0.6	0.0	1.5	8.2	0.0	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	17.0	16.9	83.8	58.9	22.6	67.6	0.0	58.8	87.2	0.0	61.3
LnGrp LOS	D	B	B	F	E	C	E	A	E	F	A	E
Approach Vol, veh/h		1433			1160			60			451	
Approach Delay, s/veh		19.8			53.3			61.0			72.3	
Approach LOS		B			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	19.1	6.3	92.6	9.0	32.1	51.3	47.5
Change Period (Y+Rc), s	4.9	* 4.9	* 4.2	5.3	4.0	4.9	5.3	* 5.3
Max Green Setting (Gmax), s	20.1	* 33	* 5	63.5	5.0	48.1	22.8	* 46
Max Q Clear Time (g_c+I1), s	17.0	5.4	3.1	29.2	3.2	24.5	14.7	38.5
Green Ext Time (p_c), s	0.1	0.2	0.0	9.1	0.0	1.6	0.3	3.8

Intersection Summary	
HCM 6th Ctrl Delay	40.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	49	242	360	595	380	402	373	217	358	363	374	50
Average Queue (ft)	10	88	221	235	169	194	122	56	195	184	184	12
95th Queue (ft)	34	172	364	468	324	358	302	127	320	288	293	35
Link Distance (ft)	268	268		614		1172	1172			440	440	
Upstream Blk Time (%)				0								
Queuing Penalty (veh)				0								
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)			12	6	2	9	2		4	1	2	
Queuing Penalty (veh)			39	15	7	17	5		15	3	1	

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	96	22	49	20	31	94
Average Queue (ft)	49	1	16	1	5	34
95th Queue (ft)	89	10	42	9	24	63
Link Distance (ft)		614		654		198
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		75			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	749	785	846	415	398	389	112	750	2599	2586	185	204
Average Queue (ft)	210	502	532	294	221	239	48	734	1395	869	131	110
95th Queue (ft)	409	718	760	402	341	356	98	818	2376	2134	228	175
Link Distance (ft)		2519	2519		439	439	439		4875	4875		
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	600			370				600			75	250
Storage Blk Time (%)		9		4	2			78	1	43	12	
Queuing Penalty (veh)		21		16	5			275	5	135	41	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	370	545	540	144
Average Queue (ft)	151	275	287	55
95th Queue (ft)	304	476	486	115
Link Distance (ft)		536	536	536
Upstream Blk Time (%)		1	1	
Queuing Penalty (veh)		3	2	
Storage Bay Dist (ft)	250			
Storage Blk Time (%)		20		
Queuing Penalty (veh)		49		

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	NB
Directions Served	T	R
Maximum Queue (ft)	97	22
Average Queue (ft)	3	4
95th Queue (ft)	32	19
Link Distance (ft)	589	228
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	B17	B17	SB	SB
Directions Served	UL	T	T	T	T	R	T	T	L	R
Maximum Queue (ft)	203	141	163	367	367	164	189	164	182	71
Average Queue (ft)	95	27	32	175	173	29	15	13	85	37
95th Queue (ft)	167	89	90	394	389	117	81	71	158	65
Link Distance (ft)		589	589	303	303		865	865	1902	
Upstream Blk Time (%)				5	5					
Queuing Penalty (veh)				29	29					
Storage Bay Dist (ft)	375					105				150
Storage Blk Time (%)					12				5	
Queuing Penalty (veh)					10				5	

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	370	413	100	580	674	120	100	405	257	240
Average Queue (ft)	63	175	192	38	272	275	85	76	197	141	128
95th Queue (ft)	110	306	329	86	467	483	158	125	368	235	206
Link Distance (ft)		865	865		1498	1498			1234		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50			50			70	50		600	
Storage Blk Time (%)	30	30		21	41	35	1	46	45		
Queuing Penalty (veh)	144	22		102	18	89	3	77	54		

Zone Summary

Zone wide Queuing Penalty: 1237

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	T	R	UL	T	T	R
Maximum Queue (ft)	117	290	348	351	380	511	426	370	186	223	274	48
Average Queue (ft)	34	162	205	128	165	203	131	55	97	138	149	8
95th Queue (ft)	89	288	318	272	298	349	308	165	176	242	247	29
Link Distance (ft)	268	268		614		1172	1172			440	440	
Upstream Blk Time (%)		3										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)			8	0	8	7	2				0	
Queuing Penalty (veh)			16	1	28	12	3				0	

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	WB	NB	SB
Directions Served	L	L	TR	R	R
Maximum Queue (ft)	143	25	49	54	90
Average Queue (ft)	34	5	2	30	37
95th Queue (ft)	85	20	16	48	58
Link Distance (ft)			654		198
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)	200	75			
Storage Blk Time (%)					
Queuing Penalty (veh)					

ATTACHMENT G

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	749	1668	1665	439	494	456	89	750	4531	4458	185	213
Average Queue (ft)	495	735	756	381	397	235	38	748	2849	2628	145	90
95th Queue (ft)	843	1427	1422	548	605	404	77	762	4899	4980	243	156
Link Distance (ft)		2519	2519		439	439	439		4875	4875		
Upstream Blk Time (%)				41	53	0						
Queuing Penalty (veh)				0	216	2						
Storage Bay Dist (ft)	600			370				600			75	250
Storage Blk Time (%)	0	30		71	5			83		41	10	
Queuing Penalty (veh)	0	78		252	13			270		139	32	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	368	386	339	193
Average Queue (ft)	110	235	244	65
95th Queue (ft)	214	318	313	125
Link Distance (ft)		524	524	524
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	250			
Storage Blk Time (%)		4		
Queuing Penalty (veh)		9		

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	WB	NB
Directions Served	T	T	R
Maximum Queue (ft)	589	631	44
Average Queue (ft)	313	259	15
95th Queue (ft)	680	648	36
Link Distance (ft)	589	589	228
Upstream Blk Time (%)	2	0	
Queuing Penalty (veh)	9	1	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

ATTACHMENT G

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	B17	B17	SB	SB
Directions Served	UL	T	T	T	T	R	T	T	L	R
Maximum Queue (ft)	271	175	207	367	367	31	143	116	73	53
Average Queue (ft)	140	20	24	131	106	6	12	5	27	29
95th Queue (ft)	235	87	93	291	264	24	72	40	62	52
Link Distance (ft)		589	589	303	303		865	865	1902	
Upstream Blk Time (%)				1	1					
Queuing Penalty (veh)				8	7					
Storage Bay Dist (ft)	375					105				150
Storage Blk Time (%)					8					
Queuing Penalty (veh)					4					

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	371	356	99	519	482	120	54	74	241	303
Average Queue (ft)	93	235	232	22	239	238	63	23	35	137	110
95th Queue (ft)	115	351	340	63	409	419	146	53	69	222	233
Link Distance (ft)		865	865		1498	1498			1234		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50			50			70	50		600	
Storage Blk Time (%)	51	24		3	41	32	1	8	12		
Queuing Penalty (veh)	276	46		13	5	56	6	3	2		

Zone Summary

Zone wide Queuing Penalty: 1508

Appendix H: Cumulative Year 2039 plus Project Traffic Conditions

HCM Signalized Intersection Capacity Analysis — Cumulative Year 2039 plus Project AM Peak

1: "G" Street & Mercy Avenue — 06/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		⮌	↑↑
Traffic Volume (vph)	9	73	69	262	98	251	209	687	298	2	266	792
Future Volume (vph)	9	73	69	262	98	251	209	687	298	2	266	792
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.93		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1710		1752	1630		1752	3505	1532		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1710		1752	1630		1752	3505	1532		1752	3505
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)	10	79	75	285	107	273	227	747	324	2	289	861
RTOR Reduction (vph)	0	25	0	0	65	0	0	0	214	0	0	0
Lane Group Flow (vph)	10	129	0	285	315	0	227	747	110	0	291	861
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	1.0	14.1		30.3	43.4		22.4	47.6	47.6		29.6	54.8
Effective Green, g (s)	1.0	14.1		30.3	43.4		22.4	47.6	47.6		29.6	54.8
Actuated g/C Ratio	0.01	0.10		0.22	0.31		0.16	0.34	0.34		0.21	0.39
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	12	172		379	505		280	1191	520		370	1371
v/s Ratio Prot	0.01	c0.08		c0.16	0.19		c0.13	0.21			c0.17	c0.25
v/s Ratio Perm									0.07			
v/c Ratio	0.83	0.75		0.75	0.62		0.81	0.63	0.21		0.79	0.63
Uniform Delay, d1	69.4	61.2		51.3	41.3		56.8	38.8	32.9		52.2	34.4
Progression Factor	1.00	1.00		1.00	1.00		1.04	0.66	0.41		1.00	1.00
Incremental Delay, d2	168.3	16.3		8.2	2.4		5.8	0.8	0.3		10.5	2.2
Delay (s)	237.7	77.5		59.5	43.7		64.7	26.4	13.9		62.7	36.6
Level of Service	F	E		E	D		E	C	B		E	D
Approach Delay (s)		87.3			50.5			30.0				42.4
Approach LOS		F			D			C				D

Intersection Summary			
HCM 2000 Control Delay	41.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	57
RTOR Reduction (vph)	35
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	54.8
Effective Green, g (s)	54.8
Actuated g/C Ratio	0.39
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	613
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	26.3
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	26.4
Level of Service	C
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	103.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	235	368	116	69	480	29	23	13	27	8	51	79
Future Vol, veh/h	235	368	116	69	480	29	23	13	27	8	51	79
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	-	-	-	-	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	126	75	522	32	25	14	29	9	55	86

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	560	0	0	526	0	0	1732	1683	463	1689	1730	544
Stage 1	-	-	-	-	-	-	973	973	-	694	694	-
Stage 2	-	-	-	-	-	-	759	710	-	995	1036	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1006	-	-	1036	-	-	69	94	597	74	88	537
Stage 1	-	-	-	-	-	-	302	329	-	432	443	-
Stage 2	-	-	-	-	-	-	397	435	-	294	307	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1000	-	-	1036	-	-	~ 6	62	597	43	58	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 6	62	-	43	58	-
Stage 1	-	-	-	-	-	-	225	245	-	320	394	-
Stage 2	-	-	-	-	-	-	256	387	-	196	229	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	1	$ 2113.3	134.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	15	1000	-	-	1036	-	-	55	534
HCM Lane V/C Ratio	4.565	0.255	-	-	0.072	-	-	1.166	0.161
HCM Control Delay (s)	$ 2113.3	9.8	-	-	8.7	0	-	296.9	13
HCM Lane LOS	F	A	-	-	A	A	-	F	B
HCM 95th %tile Q(veh)	9.4	1	-	-	0.2	-	-	5.5	0.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	10.7

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		⮌	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	91	13	8	1171	76	23	1104
Future Vol, veh/h	91	13	8	1171	76	23	1104
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	-	150	-	250	250	-
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	99	14	9	1273	83	25	1200

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1821	637	876	0	0	1356	0
Stage 1	1291	-	-	-	-	-	-
Stage 2	530	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 89	418	511	-	-	498	-
Stage 1	215	-	-	-	-	-	-
Stage 2	519	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 83	418	511	-	-	498	-
Mov Cap-2 Maneuver	~ 83	-	-	-	-	-	-
Stage 1	201	-	-	-	-	-	-
Stage 2	519	-	-	-	-	-	-

Approach	WB		NB			SB	
HCM Control Delay, s	251.4		0.1			0.3	
HCM LOS	F						

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	511	-	-	92	498	-
HCM Lane V/C Ratio	0.017	-	-	1.229	0.05	-
HCM Control Delay (s)	12.2	-	-	251.4	12.6	-
HCM Lane LOS	B	-	-	F	B	-
HCM 95th %tile Q(veh)	0.1	-	-	8	0.2	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	44	1214	191	57	1150
Future Vol, veh/h	0	44	1214	191	57	1150
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	-	250	150	-
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	3	3
Mvmt Flow	0	48	1320	208	62	1250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	660	0	0	1528	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	403	-	-	427	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	403	-	-	427	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	0.7
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	403	427	-
HCM Lane V/C Ratio	-	-	0.119	0.145	-
HCM Control Delay (s)	-	-	15.1	14.9	-
HCM Lane LOS	-	-	C	B	-
HCM 95th %tile Q(veh)	-	-	0.4	0.5	-

HCM Signalized Intersection Capacity Analysis — Cumulative Year 2039 plus Project AM Peak
5: "G" Street & Yosemite Avenue

06/25/2019

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	343	775	212	53	351	851	247	442	808	306	267	645
Future Volume (vph)	343	775	212	53	351	851	247	442	808	306	267	645
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	1.00	1.00	0.99	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	0.97			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3362			1752	3505	1547	1752	3505	1545	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3362			1752	3505	1547	1752	3505	1545	1752	3505
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)	373	842	230	58	382	925	268	480	878	333	290	701
RTOR Reduction (vph)	0	18	0	0	0	0	156	0	0	95	0	0
Lane Group Flow (vph)	373	1054	0	0	440	925	112	480	878	238	290	701
Confl. Peds. (#/hr)			23				1			2		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	21.8	40.7			25.8	44.7	44.7	27.8	33.7	33.7	20.8	26.0
Effective Green, g (s)	21.8	40.7			25.8	44.7	44.7	27.8	33.7	33.7	20.8	26.0
Actuated g/C Ratio	0.16	0.29			0.18	0.32	0.32	0.20	0.24	0.24	0.15	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	272	977			322	1119	493	347	843	371	260	650
v/s Ratio Prot	c0.21	c0.31			c0.25	0.26		c0.27	c0.25		0.17	c0.20
v/s Ratio Perm							0.07			0.15		
v/c Ratio	1.37	1.08			1.37	0.83	0.23	1.38	1.04	0.64	1.12	1.08
Uniform Delay, d1	59.1	49.6			57.1	44.1	35.0	56.1	53.1	47.7	59.6	57.0
Progression Factor	1.00	1.00			0.79	0.72	0.58	1.00	1.00	1.00	0.83	0.85
Incremental Delay, d2	188.7	52.6			182.5	6.6	1.0	189.5	42.3	3.8	85.5	55.4
Delay (s)	247.8	102.2			227.6	38.5	21.1	245.6	95.5	51.5	135.1	103.6
Level of Service	F	F			F	D	C	F	F	D	F	F
Approach Delay (s)		139.8				86.6			129.4			98.1
Approach LOS		F				F			F			F

Intersection Summary			
HCM 2000 Control Delay	113.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.25		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	110.4%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

	↲
Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	228
Future Volume (vph)	228
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1537
Flt Permitted	1.00
Satd. Flow (perm)	1537
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	248
RTOR Reduction (vph)	190
Lane Group Flow (vph)	58
Confl. Peds. (#/hr)	5
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	26.0
Effective Green, g (s)	26.0
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	285
v/s Ratio Prot	
v/s Ratio Perm	0.04
v/c Ratio	0.20
Uniform Delay, d1	48.2
Progression Factor	0.81
Incremental Delay, d2	0.3
Delay (s)	39.2
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

6: Sandpiper Avenue & Yosemite Avenue

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1343	2	0	1250	33	0	0	7	0	0	0
Future Vol, veh/h	0	1343	2	0	1250	33	0	0	7	0	0	0
Conflicting Peds, #/hr	0	0	21	0	0	3	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1414	2	0	1316	35	0	0	7	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	728	-	-	661
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	364	0	0	403
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	357	-	-	402
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	15.3	0
HCM LOS			C	A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	357	-	-	-	-	-
HCM Lane V/C Ratio	0.021	-	-	-	-	-
HCM Control Delay (s)	15.3	-	-	-	-	0
HCM Lane LOS	C	-	-	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-	-

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	38	138	1200	1209	88	98	132
Future Volume (vph)	38	138	1200	1209	88	98	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
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	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1568	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1568	1752	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	41	148	1290	1300	95	105	142
RTOR Reduction (vph)	0	0	0	0	13	0	126
Lane Group Flow (vph)	0	189	1290	1300	82	105	16
Confl. Peds. (#/hr)						24	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		20.0	114.8	90.6	90.6	15.7	15.7
Effective Green, g (s)		20.0	114.8	90.6	90.6	15.7	15.7
Actuated g/C Ratio		0.14	0.82	0.65	0.65	0.11	0.11
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		250	2874	2268	1014	196	175
v/s Ratio Prot		c0.11	0.37	c0.37		c0.06	
v/s Ratio Perm					0.05		0.01
v/c Ratio		0.76	0.45	0.57	0.08	0.54	0.09
Uniform Delay, d1		57.7	3.6	13.9	9.2	58.7	55.7
Progression Factor		0.89	0.60	0.33	0.16	1.00	1.00
Incremental Delay, d2		3.7	0.1	0.9	0.1	2.8	0.2
Delay (s)		55.1	2.3	5.4	1.6	61.5	56.0
Level of Service		E	A	A	A	E	E
Approach Delay (s)			9.0	5.2		58.3	
Approach LOS			A	A		E	

Intersection Summary			
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	79	981	75	43	997	256	128	103	63	166	76	158
Future Volume (veh/h)	79	981	75	43	997	256	128	103	63	166	76	158
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		0.99	1.00		1.00	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	81	1011	77	44	1028	264	132	106	65	171	78	163
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	447	1062	896	56	1210	537	155	186	114	168	92	193
Arrive On Green	0.25	0.57	0.57	0.03	0.34	0.34	0.09	0.17	0.17	0.09	0.18	0.18
Sat Flow, veh/h	1767	1856	1566	1767	3526	1563	1767	1075	659	1767	527	1102
Grp Volume(v), veh/h	81	1011	77	44	1028	264	132	0	171	171	0	241
Grp Sat Flow(s),veh/h/ln	1767	1856	1566	1767	1763	1563	1767	0	1735	1767	0	1630
Q Serve(g_s), s	5.0	71.7	2.0	3.5	37.8	14.0	10.3	0.0	12.7	13.3	0.0	20.0
Cycle Q Clear(g_c), s	5.0	71.7	2.0	3.5	37.8	14.0	10.3	0.0	12.7	13.3	0.0	20.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.38	1.00		0.68
Lane Grp Cap(c), veh/h	447	1062	896	56	1210	537	155	0	300	168	0	285
V/C Ratio(X)	0.18	0.95	0.09	0.78	0.85	0.49	0.85	0.00	0.57	1.02	0.00	0.84
Avail Cap(c_a), veh/h	447	1062	896	63	1584	702	181	0	409	168	0	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.9	28.1	5.4	67.3	42.6	20.5	62.9	0.0	53.1	63.4	0.0	55.9
Incr Delay (d2), s/veh	0.2	18.2	0.2	41.6	7.5	3.2	27.2	0.0	1.7	74.4	0.0	13.6
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	34.4	1.1	2.2	17.2	5.4	5.9	0.0	5.7	9.4	0.0	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	46.4	5.6	108.9	50.2	23.7	90.1	0.0	54.8	137.8	0.0	69.5
LnGrp LOS	D	D	A	F	D	C	F	A	D	F	A	E
Approach Vol, veh/h		1169			1336			303			412	
Approach Delay, s/veh		43.3			46.9			70.2			97.9	
Approach LOS		D			D			E			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	28.4	8.7	85.4	16.5	29.4	40.7	53.4
Change Period (Y+Rc), s	* 4.2	* 4.2	* 4.2	5.3	4.2	* 4.9	5.3	* 5.3
Max Green Setting (Gmax), s	* 13	* 33	* 5	71.0	14.3	* 31	13.1	* 63
Max Q Clear Time (g_c+I1), s	15.3	14.7	5.5	73.7	12.3	22.0	7.0	39.8
Green Ext Time (p_c), s	0.0	0.9	0.0	0.0	0.1	0.9	0.1	8.2

Intersection Summary	
HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↰	↑↑	↱		↰
Traffic Volume (vph)	34	71	156	291	88	154	2	181	699	188	2	127
Future Volume (vph)	34	71	156	291	88	154	2	181	699	188	2	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.90		1.00	0.90			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1654		1752	1653			1752	3505	1527		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1654		1752	1653			1752	3505	1527		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	76	168	313	95	166	2	195	752	202	2	137
RTOR Reduction (vph)	0	58	0	0	48	0	0	0	0	130	0	0
Lane Group Flow (vph)	37	186	0	313	213	0	0	197	752	72	0	139
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	5.7	19.2		29.9	43.4			19.7	50.2	50.2		22.3
Effective Green, g (s)	5.7	19.2		29.9	43.4			19.7	50.2	50.2		22.3
Actuated g/C Ratio	0.04	0.14		0.21	0.31			0.14	0.36	0.36		0.16
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	71	226		374	512			246	1256	547		279
v/s Ratio Prot	0.02	c0.11		c0.18	0.13			c0.11	0.21			0.08
v/s Ratio Perm										0.05		
v/c Ratio	0.52	0.82		0.84	0.42			0.80	0.60	0.13		0.50
Uniform Delay, d1	65.8	58.8		52.7	38.3			58.2	36.7	30.2		53.7
Progression Factor	1.00	1.00		1.00	1.00			0.92	0.53	0.73		1.00
Incremental Delay, d2	6.7	21.0		14.9	0.6			9.6	1.1	0.3		1.4
Delay (s)	72.6	79.7		67.7	38.8			63.1	20.6	22.3		55.1
Level of Service	E	E		E	D			E	C	C		E
Approach Delay (s)		78.8			54.5				28.2			
Approach LOS		E			D				C			

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↓	↙
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	746	34
Future Volume (vph)	746	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1543
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1543
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	802	37
RTOR Reduction (vph)	0	23
Lane Group Flow (vph)	802	14
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	52.8	52.8
Effective Green, g (s)	52.8	52.8
Actuated g/C Ratio	0.38	0.38
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1321	581
v/s Ratio Prot	c0.23	
v/s Ratio Perm		0.01
v/c Ratio	0.61	0.02
Uniform Delay, d1	35.2	27.4
Progression Factor	1.00	1.00
Incremental Delay, d2	2.1	0.1
Delay (s)	37.3	27.5
Level of Service	D	C
Approach Delay (s)	39.5	
Approach LOS	D	
Intersection Summary		

Intersection	
Int Delay, s/veh	38.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			✥			✥			↰	↱
Traffic Vol, veh/h	144	229	52	37	316	16	91	52	77	25	18	110
Future Vol, veh/h	144	229	52	37	316	16	91	52	77	25	18	110
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	-	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	57	40	343	17	99	57	84	27	20	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	367	0	0	308	0	0	1101	1041	281	1102	1061	364
Stage 1	-	-	-	-	-	-	594	594	-	439	439	-
Stage 2	-	-	-	-	-	-	507	447	-	663	622	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1186	-	-	1247	-	-	188	229	755	188	223	679
Stage 1	-	-	-	-	-	-	490	491	-	595	576	-
Stage 2	-	-	-	-	-	-	546	572	-	449	477	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1178	-	-	1245	-	-	123	189	753	112	184	671
Mov Cap-2 Maneuver	-	-	-	-	-	-	123	189	-	112	184	-
Stage 1	-	-	-	-	-	-	424	425	-	512	549	-
Stage 2	-	-	-	-	-	-	413	545	-	300	413	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.9	0.8	182.3	21.1
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	197	1178	-	-	1245	-	-	134	671
HCM Lane V/C Ratio	1.214	0.133	-	-	0.032	-	-	0.349	0.178
HCM Control Delay (s)	182.3	8.5	-	-	8	0	-	45.6	11.5
HCM Lane LOS	F	A	-	-	A	A	-	E	B
HCM 95th %tile Q(veh)	12.5	0.5	-	-	0.1	-	-	1.4	0.6

Intersection	
Int Delay, s/veh	21.4

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	Y		↶	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	136	23	4	1041	39	15	1185
Future Vol, veh/h	136	23	4	1041	39	15	1185
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	-	150	-	250	250	-
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	148	25	4	1132	42	16	1288

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	1687	566	940	0	0	1174	0
Stage 1	1140	-	-	-	-	-	-
Stage 2	547	-	-	-	-	-	-
Critical Hdwy	6.31	6.96	5.66	-	-	4.16	-
Critical Hdwy Stg 1	5.86	-	-	-	-	-	-
Critical Hdwy Stg 2	6.06	-	-	-	-	-	-
Follow-up Hdwy	3.68	3.33	2.33	-	-	2.23	-
Pot Cap-1 Maneuver	~ 107	465	470	-	-	585	-
Stage 1	259	-	-	-	-	-	-
Stage 2	509	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	~ 103	465	470	-	-	585	-
Mov Cap-2 Maneuver	~ 103	-	-	-	-	-	-
Stage 1	250	-	-	-	-	-	-
Stage 2	509	-	-	-	-	-	-

Approach	WB		NB			SB	
HCM Control Delay, s	$ 327.8		0			0.1	
HCM LOS	F						

Minor Lane/Major Mvmt		NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)		470	-	-	116	585	-
HCM Lane V/C Ratio		0.009	-	-	1.49	0.028	-
HCM Control Delay (s)		12.7	-	-	$ 327.8	11.3	-
HCM Lane LOS		B	-	-	F	B	-
HCM 95th %tile Q(veh)		0	-	-	12.4	0.1	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

ATTACHMENT G

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑	↱	↰	↑↑↑
Traffic Vol, veh/h	0	34	1052	132	38	1289
Future Vol, veh/h	0	34	1052	132	38	1289
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	-	250	150	-
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	3	3
Mvmt Flow	0	37	1143	143	41	1401

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	572	0	0	1286	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.96	-	-	4.16	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.33	-	-	2.23	-
Pot Cap-1 Maneuver	0	461	-	-	530	-
Stage 1	0	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	461	-	-	530	-
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	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	461	530	-
HCM Lane V/C Ratio	-	-	0.08	0.078	-
HCM Control Delay (s)	-	-	13.5	12.4	-
HCM Lane LOS	-	-	B	B	-
HCM 95th %tile Q(veh)	-	-	0.3	0.3	-

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↰	↑↱			↰	↑↑	↱	↰	↑↑	↱	↰	↑↑
Traffic Volume (vph)	329	870	355	43	312	752	140	528	712	330	269	703
Future Volume (vph)	329	870	355	43	312	752	140	528	712	330	269	703
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
Lane Util. Factor	1.00	0.95			1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.98	1.00	1.00	0.99	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	0.96			1.00	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	1.00	0.95	1.00
Satd. Flow (prot)	1752	3312			1752	3505	1544	1752	3505	1547	1752	3505
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	3312			1752	3505	1544	1752	3505	1547	1752	3505
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)	350	926	378	46	332	800	149	562	757	351	286	748
RTOR Reduction (vph)	0	31	0	0	0	0	100	0	0	90	0	0
Lane Group Flow (vph)	350	1273	0	0	378	800	49	562	757	261	286	748
Confl. Peds. (#/hr)			24				3			1		
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	7	4		3	3	8		5	2		1	6
Permitted Phases							8			2		
Actuated Green, G (s)	19.8	44.7			19.8	44.7	44.7	28.8	38.7	38.7	17.8	27.0
Effective Green, g (s)	19.8	44.7			19.8	44.7	44.7	28.8	38.7	38.7	17.8	27.0
Actuated g/C Ratio	0.14	0.32			0.14	0.32	0.32	0.21	0.28	0.28	0.13	0.19
Clearance Time (s)	4.2	5.3			4.2	5.3	5.3	4.2	5.3	5.3	4.2	6.0
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)	247	1057			247	1119	492	360	968	427	222	675
v/s Ratio Prot	c0.20	c0.38			c0.22	0.23		c0.32	0.22		c0.16	c0.21
v/s Ratio Perm							0.03			0.17		
v/c Ratio	1.42	1.20			1.53	0.71	0.10	1.56	0.78	0.61	1.29	1.11
Uniform Delay, d1	60.1	47.6			60.1	42.0	33.5	55.6	46.8	44.1	61.1	56.5
Progression Factor	1.00	1.00			0.78	0.68	0.88	1.00	1.00	1.00	0.91	0.86
Incremental Delay, d2	209.8	101.0			256.0	3.5	0.4	265.7	4.2	2.6	154.7	65.4
Delay (s)	269.9	148.6			302.8	32.0	29.9	321.3	50.9	46.7	210.6	114.1
Level of Service	F	F			F	C	C	F	D	D	F	F
Approach Delay (s)		174.3				108.9			141.0			115.2
Approach LOS		F				F			F			F

Intersection Summary			
HCM 2000 Control Delay	137.2	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.35		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	19.7
Intersection Capacity Utilization	121.1%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	311
Future Volume (vph)	311
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	0.98
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1539
Flt Permitted	1.00
Satd. Flow (perm)	1539
Peak-hour factor, PHF	0.94
Adj. Flow (vph)	331
RTOR Reduction (vph)	221
Lane Group Flow (vph)	110
Confl. Peds. (#/hr)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	27.0
Effective Green, g (s)	27.0
Actuated g/C Ratio	0.19
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	296
v/s Ratio Prot	
v/s Ratio Perm	0.07
v/c Ratio	0.37
Uniform Delay, d1	49.1
Progression Factor	0.71
Incremental Delay, d2	0.6
Delay (s)	35.4
Level of Service	D
Approach Delay (s)	
Approach LOS	
Intersection Summary	

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱		↑↑	↱			↱			↱
Traffic Vol, veh/h	0	1613	7	0	1414	19	0	0	27	0	0	15
Future Vol, veh/h	0	1613	7	0	1414	19	0	0	27	0	0	15
Conflicting Peds, #/hr	0	0	11	0	0	7	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	-	-	60	-	-	0	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	97	97	97	97	97	97	97	97	97	97	97	97
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	0	1663	7	0	1458	20	0	0	28	0	0	15

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	-	-	0	-	-	843	-	-	736
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	-	-	-	6.96	-	-	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	-	-	-	3.33	-	-	3.33
Pot Cap-1 Maneuver	0	-	-	0	-	-	0	0	305	0	0	359
Stage 1	0	-	-	0	-	-	0	0	-	0	0	-
Stage 2	0	-	-	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	-	-	-	-	-	-	-	-	302	-	-	357
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	18.1	15.5
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT	WBR	SBLn1
Capacity (veh/h)	302	-	-	-	-	357
HCM Lane V/C Ratio	0.092	-	-	-	-	0.043
HCM Control Delay (s)	18.1	-	-	-	-	15.5
HCM Lane LOS	C	-	-	-	-	C
HCM 95th %tile Q(veh)	0.3	-	-	-	-	0.1

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↰	↑↑	↑↑	↱	↰	↱
Traffic Volume (vph)	70	147	1419	1166	43	40	61
Future Volume (vph)	70	147	1419	1166	43	40	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Lane Util. Factor		1.00	0.95	0.95	1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00	1.00	0.97	1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		1752	3505	3505	1528	1752	1568
Flt Permitted		0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		1752	3505	3505	1528	1752	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	160	1542	1267	47	43	66
RTOR Reduction (vph)	0	0	0	0	6	0	61
Lane Group Flow (vph)	0	236	1542	1267	41	43	5
Confl. Peds. (#/hr)					2	7	
Turn Type	Prot	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	7	7	4	8		6	
Permitted Phases					8		6
Actuated Green, G (s)		23.9	119.4	91.3	91.3	11.1	11.1
Effective Green, g (s)		23.9	119.4	91.3	91.3	11.1	11.1
Actuated g/C Ratio		0.17	0.85	0.65	0.65	0.08	0.08
Clearance Time (s)		4.2	5.3	5.3	5.3	4.2	4.2
Vehicle Extension (s)		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)		299	2989	2285	996	138	124
v/s Ratio Prot		c0.13	0.44	c0.36		c0.02	
v/s Ratio Perm					0.03		0.00
v/c Ratio		0.79	0.52	0.55	0.04	0.31	0.04
Uniform Delay, d1		55.6	2.7	13.3	8.7	60.8	59.5
Progression Factor		0.92	0.62	0.31	0.13	1.00	1.00
Incremental Delay, d2		3.8	0.2	0.8	0.1	1.3	0.1
Delay (s)		54.8	1.9	4.9	1.2	62.1	59.7
Level of Service		D	A	A	A	E	E
Approach Delay (s)			8.9	4.8		60.6	
Approach LOS			A	A		E	

Intersection Summary			
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	59.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑	↱	↰	↑↑	↱	↰	↑↱		↰	↑↱	
Traffic Volume (veh/h)	200	1108	50	13	906	173	19	23	18	177	23	220
Future Volume (veh/h)	200	1108	50	13	906	173	19	23	18	177	23	220
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		0.99	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	217	1204	54	14	985	188	21	25	20	192	25	239
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	568	1181	1000	26	1137	505	35	118	94	162	29	276
Arrive On Green	0.32	0.64	0.64	0.01	0.32	0.32	0.02	0.12	0.12	0.09	0.20	0.20
Sat Flow, veh/h	1767	1856	1570	1767	3526	1565	1767	951	761	1767	148	1412
Grp Volume(v), veh/h	217	1204	54	14	985	188	21	0	45	192	0	264
Grp Sat Flow(s),veh/h/ln	1767	1856	1570	1767	1763	1565	1767	0	1711	1767	0	1559
Q Serve(g_s), s	13.3	89.1	1.8	1.1	36.8	9.9	1.7	0.0	3.3	12.8	0.0	23.0
Cycle Q Clear(g_c), s	13.3	89.1	1.8	1.1	36.8	9.9	1.7	0.0	3.3	12.8	0.0	23.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.44	1.00		0.91
Lane Grp Cap(c), veh/h	568	1181	1000	26	1137	505	35	0	212	162	0	305
V/C Ratio(X)	0.38	1.02	0.05	0.53	0.87	0.37	0.60	0.00	0.21	1.19	0.00	0.87
Avail Cap(c_a), veh/h	568	1181	1000	63	1377	612	76	0	403	162	0	433
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.8	25.4	9.6	68.5	44.6	21.4	68.0	0.0	55.2	63.6	0.0	54.5
Incr Delay (d2), s/veh	0.4	31.1	0.1	15.3	8.9	2.1	15.1	0.0	0.5	130.4	0.0	12.3
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	5.7	44.6	0.6	0.6	17.0	3.8	0.9	0.0	1.5	11.5	0.0	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	56.5	9.7	83.8	53.5	23.5	83.1	0.0	55.7	194.0	0.0	66.8
LnGrp LOS	D	F	A	F	D	C	F	A	E	F	A	E
Approach Vol, veh/h		1475			1187			66			456	
Approach Delay, s/veh		51.9			49.1			64.4			120.4	
Approach LOS		D			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	22.3	6.3	94.4	7.0	32.3	50.3	50.5				
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	5.3	* 4.2	4.9	5.3	* 5.3				
Max Green Setting (Gmax), s	* 13	* 33	* 5	71.5	* 6	38.9	21.8	* 55				
Max Q Clear Time (g_c+I1), s	14.8	5.3	3.1	91.1	3.7	25.0	15.3	38.8				
Green Ext Time (p_c), s	0.0	0.2	0.0	0.0	0.0	1.3	0.3	6.4				
Intersection Summary												
HCM 6th Ctrl Delay			60.9									
HCM 6th LOS			E									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Cumulative Year 2039 plus Project AM Peak
1: "G" Street & Mercy Avenue 06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT
Lane Configurations	↰	↱		↰	↱		↰	↑↑	↱		↰	↑↑
Traffic Volume (vph)	9	73	69	262	92	234	215	704	298	2	266	792
Future Volume (vph)	9	73	69	262	92	234	215	704	298	2	266	792
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00		1.00	0.95
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98		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	0.93		1.00	0.89		1.00	1.00	0.85		1.00	1.00
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1752	1710		1752	1631		1752	3505	1532		1752	3505
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1752	1710		1752	1631		1752	3505	1532		1752	3505
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)	10	79	75	285	100	254	234	765	324	2	289	861
RTOR Reduction (vph)	0	25	0	0	67	0	0	0	213	0	0	0
Lane Group Flow (vph)	10	129	0	285	287	0	234	765	111	0	291	861
Confl. Peds. (#/hr)						1			1			
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	Prot	NA
Protected Phases	7	4		3	8		5	2		1	1	6
Permitted Phases									2			
Actuated Green, G (s)	2.0	13.6		28.8	40.4		22.2	46.8	46.8		28.4	53.0
Effective Green, g (s)	2.0	13.6		28.8	40.4		22.2	46.8	46.8		28.4	53.0
Actuated g/C Ratio	0.01	0.10		0.21	0.30		0.16	0.34	0.34		0.21	0.39
Clearance Time (s)	4.2	4.0		4.2	4.0		4.2	6.0	6.0		4.2	6.0
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)	25	171		371	484		285	1206	527		365	1365
v/s Ratio Prot	0.01	c0.08		c0.16	0.18		c0.13	0.22			c0.17	c0.25
v/s Ratio Perm									0.07			
v/c Ratio	0.40	0.75		0.77	0.59		0.82	0.63	0.21		0.80	0.63
Uniform Delay, d1	66.4	59.6		50.5	40.8		55.0	37.4	31.5		51.1	33.6
Progression Factor	1.00	1.00		1.00	1.00		1.08	0.68	2.33		1.00	1.00
Incremental Delay, d2	10.2	17.0		9.2	1.9		15.3	2.3	0.8		11.5	2.2
Delay (s)	76.6	76.6		59.7	42.7		74.8	27.6	74.5		62.5	35.8
Level of Service	E	E		E	D		E	C	E		E	D
Approach Delay (s)		76.6			50.3			47.4				41.8
Approach LOS		E			D			D				D

Intersection Summary			
HCM 2000 Control Delay	47.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

Movement	SBR
Lane Configurations	↱
Traffic Volume (vph)	52
Future Volume (vph)	52
Ideal Flow (vphpl)	1900
Total Lost time (s)	6.0
Lane Util. Factor	1.00
Frpb, ped/bikes	1.00
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1568
Flt Permitted	1.00
Satd. Flow (perm)	1568
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	57
RTOR Reduction (vph)	35
Lane Group Flow (vph)	22
Confl. Peds. (#/hr)	
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Actuated Green, G (s)	53.0
Effective Green, g (s)	53.0
Actuated g/C Ratio	0.39
Clearance Time (s)	6.0
Vehicle Extension (s)	3.0
Lane Grp Cap (vph)	611
v/s Ratio Prot	
v/s Ratio Perm	0.01
v/c Ratio	0.04
Uniform Delay, d1	25.7
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	25.8
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱				↱			↱
Traffic Vol, veh/h	235	368	116	120	480	29	0	0	40	0	0	79
Future Vol, veh/h	235	368	116	120	480	29	0	0	40	0	0	79
Conflicting Peds, #/hr	0	0	0	0	0	6	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	200	-	-	75	-	-	-	-	0	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	126	130	522	32	0	0	43	0	0	86

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	560	0	0	526	0	0	-	-	463	-	-	544
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.13	-	-	4.13	-	-	-	-	6.23	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	-	-	3.327	-	-	3.327
Pot Cap-1 Maneuver	1006	-	-	1036	-	-	0	0	597	0	0	537
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1000	-	-	1036	-	-	-	-	597	-	-	534
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3.2	1.7	11.5	13
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	597	1000	-	-	1036	-	-	534
HCM Lane V/C Ratio	0.073	0.255	-	-	0.126	-	-	0.161
HCM Control Delay (s)	11.5	9.8	-	-	9	-	-	13
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.2	1	-	-	0.4	-	-	0.6

Intersection	
Intersection Delay, s/veh	39.7
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱		↰	↱			↰	↱
Traffic Vol, veh/h	235	368	116	69	480	29	23	13	27	8	51	79
Future Vol, veh/h	235	368	116	69	480	29	23	13	27	8	51	79
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
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	255	400	126	75	522	32	25	14	29	9	55	86
Number of Lanes	1	1	0	1	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	32.5	58.4	11.9	12.1
HCM LOS	D	F	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	14%	0%
Vol Thru, %	0%	32%	0%	76%	0%	94%	86%	0%
Vol Right, %	0%	68%	0%	24%	0%	6%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	23	40	235	484	69	509	59	79
LT Vol	23	0	235	0	69	0	8	0
Through Vol	0	13	0	368	0	480	51	0
RT Vol	0	27	0	116	0	29	0	79
Lane Flow Rate	25	43	255	526	75	553	64	86
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.062	0.096	0.482	0.894	0.148	1.005	0.147	0.178
Departure Headway (Hd)	8.991	7.982	6.909	6.229	7.087	6.538	8.25	7.456
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	400	450	524	584	509	559	436	483
Service Time	6.721	5.711	4.609	3.929	4.787	4.238	5.972	5.178
HCM Lane V/C Ratio	0.063	0.096	0.487	0.901	0.147	0.989	0.147	0.178
HCM Control Delay	12.3	11.6	15.9	40.5	11	64.8	12.4	11.8
HCM Lane LOS	B	B	C	E	B	F	B	B
HCM 95th-tile Q	0.2	0.3	2.6	10.6	0.5	14.6	0.5	0.6

ATTACHMENT G

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	142	36	8	1171	76	23	1104
Future Volume (vph)	142	36	8	1171	76	23	1104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91
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)	1752	1568	1752	3505	1568	1752	5036
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1568	1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	154	39	9	1273	83	25	1200
RTOR Reduction (vph)	0	33	0	0	24	0	0
Lane Group Flow (vph)	154	6	9	1273	59	25	1200
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	20.8	20.8	1.5	94.0	94.0	6.8	99.3
Effective Green, g (s)	20.8	20.8	1.5	94.0	94.0	6.8	99.3
Actuated g/C Ratio	0.15	0.15	0.01	0.69	0.69	0.05	0.73
Clearance Time (s)	4.2	4.2	4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	267	239	19	2422	1083	87	3677
v/s Ratio Prot	c0.09		0.01	c0.36		0.01	c0.24
v/s Ratio Perm		0.00			0.04		
v/c Ratio	0.58	0.02	0.47	0.53	0.05	0.29	0.33
Uniform Delay, d1	53.5	49.0	66.9	10.2	6.7	62.3	6.5
Progression Factor	1.00	1.00	0.93	0.88	1.14	0.78	0.72
Incremental Delay, d2	3.0	0.0	8.7	0.4	0.0	1.4	0.2
Delay (s)	56.5	49.0	70.7	9.4	7.7	49.7	4.9
Level of Service	E	D	E	A	A	D	A
Approach Delay (s)	55.0			9.7			5.8
Approach LOS	D			A			A

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	136.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	343	775	212	353	851	247	442	808	306	318	645	228
Future Volume (veh/h)	343	775	212	353	851	247	442	808	306	318	645	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1856	1856	1856	1856	1856	1856	1930	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	373	842	230	384	925	268	480	878	333	346	701	248
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	518	1114	304	309	996	444	349	993	717	386	674	298
Arrive On Green	0.29	0.41	0.41	0.35	0.56	0.56	0.19	0.28	0.28	0.04	0.06	0.06
Sat Flow, veh/h	1767	2725	744	1767	3526	1571	1838	3526	1569	3428	3526	1560
Grp Volume(v), veh/h	373	544	528	384	925	268	480	878	333	346	701	248
Grp Sat Flow(s),veh/h/ln	1767	1763	1707	1767	1763	1571	1838	1763	1569	1714	1763	1560
Q Serve(g_s), s	25.7	35.9	36.0	23.8	32.7	13.9	25.8	32.4	19.9	13.7	26.0	21.4
Cycle Q Clear(g_c), s	25.7	35.9	36.0	23.8	32.7	13.9	25.8	32.4	19.9	13.7	26.0	21.4
Prop In Lane	1.00		0.44	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	518	720	697	309	996	444	349	993	717	386	674	298
V/C Ratio(X)	0.72	0.76	0.76	1.24	0.93	0.60	1.38	0.88	0.46	0.90	1.04	0.83
Avail Cap(c_a), veh/h	518	720	697	309	1081	482	349	993	717	386	674	298
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	34.4	34.4	44.2	28.3	20.3	55.1	46.7	25.5	64.7	63.7	61.5
Incr Delay (d2), s/veh	4.8	7.3	7.5	133.2	15.8	6.0	186.7	9.6	0.5	22.8	45.5	17.8
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	11.6	16.2	15.8	19.7	11.2	4.6	29.7	15.1	7.3	7.4	16.5	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.9	41.7	41.9	177.4	44.2	26.3	241.8	56.3	26.0	87.5	109.2	79.3
LnGrp LOS	D	D	D	F	D	C	F	E	C	F	F	E
Approach Vol, veh/h		1445			1577			1691			1295	
Approach Delay, s/veh		43.4			73.6			103.0			97.7	
Approach LOS		D			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.5	43.6	28.0	60.9	31.1	32.0	45.2	43.7
Change Period (Y+Rc), s	* 4.2	5.3	* 4.2	5.3	5.3	* 6	5.3	* 5.3
Max Green Setting (Gmax), s	* 15	37.2	* 24	40.7	25.8	* 26	22.8	* 42
Max Q Clear Time (g_c+I1), s	15.7	34.4	25.8	38.0	27.8	28.0	27.7	34.7
Green Ext Time (p_c), s	0.0	1.7	0.0	1.6	0.0	0.0	0.0	3.7

Intersection Summary	
HCM 6th Ctrl Delay	79.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	79	981	75	43	997	256	128	103	63	166	76	158
Future Volume (veh/h)	79	981	75	43	997	256	128	103	63	166	76	158
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		0.99	1.00		1.00	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	81	1011	77	44	1028	264	132	106	65	171	78	163
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	451	1874	143	57	1175	521	157	172	106	197	94	196
Arrive On Green	0.26	0.56	0.56	0.03	0.33	0.33	0.09	0.16	0.16	0.11	0.18	0.18
Sat Flow, veh/h	1767	3319	253	1767	3526	1563	1767	1076	660	1767	528	1103
Grp Volume(v), veh/h	81	537	551	44	1028	264	132	0	171	171	0	241
Grp Sat Flow(s),veh/h/ln	1767	1763	1809	1767	1763	1563	1767	0	1735	1767	0	1630
Q Serve(g_s), s	4.9	25.9	25.9	3.4	37.3	13.4	10.0	0.0	12.5	12.9	0.0	19.4
Cycle Q Clear(g_c), s	4.9	25.9	25.9	3.4	37.3	13.4	10.0	0.0	12.5	12.9	0.0	19.4
Prop In Lane	1.00		0.14	1.00		1.00	1.00		0.38	1.00		0.68
Lane Grp Cap(c), veh/h	451	995	1021	57	1175	521	157	0	278	197	0	290
V/C Ratio(X)	0.18	0.54	0.54	0.78	0.87	0.51	0.84	0.00	0.61	0.87	0.00	0.83
Avail Cap(c_a), veh/h	451	995	1021	114	1340	594	240	0	421	283	0	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.5	18.5	18.5	65.3	42.7	19.3	61.0	0.0	53.2	59.4	0.0	54.0
Incr Delay (d2), s/veh	0.2	2.1	2.0	20.0	9.2	3.5	14.7	0.0	2.2	17.6	0.0	8.9
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	2.1	10.5	10.8	1.8	17.2	5.2	5.2	0.0	5.7	6.7	0.0	8.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.7	20.6	20.6	85.3	51.9	22.8	75.7	0.0	55.4	77.1	0.0	62.8
LnGrp LOS	D	C	C	F	D	C	E	A	E	E	A	E
Approach Vol, veh/h		1169			1336			303			412	
Approach Delay, s/veh		21.9			47.2			64.3			68.7	
Approach LOS		C			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.4	26.0	8.6	82.1	16.3	29.1	40.0	50.6
Change Period (Y+Rc), s	* 4.2	* 4.2	* 4.2	5.3	4.2	* 4.9	5.3	* 5.3
Max Green Setting (Gmax), s	* 22	* 33	* 8.8	54.7	18.5	* 35	11.8	* 52
Max Q Clear Time (g_c+I1), s	14.9	14.5	5.4	27.9	12.0	21.4	6.9	39.3
Green Ext Time (p_c), s	0.2	0.9	0.0	7.2	0.2	1.1	0.1	6.0

Intersection Summary	
HCM 6th Ctrl Delay	42.4
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM Signalized Intersection Capacity Analysis Cumulative Year 2039 plus Project PM Peak
1: "G" Street & Mercy Avenue

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL
Lane Configurations	↰	↱		↰	↱			↶	↑↑	↱		↶
Traffic Volume (vph)	34	71	156	291	55	96	2	214	757	188	2	127
Future Volume (vph)	34	71	156	291	55	96	2	214	757	188	2	127
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	0.95	1.00		1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00	1.00	0.97		1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00	1.00	1.00		1.00
Frt	1.00	0.90		1.00	0.90			1.00	1.00	0.85		1.00
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (prot)	1752	1654		1752	1653			1752	3505	1527		1752
Flt Permitted	0.95	1.00		0.95	1.00			0.95	1.00	1.00		0.95
Satd. Flow (perm)	1752	1654		1752	1653			1752	3505	1527		1752
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	37	76	168	313	59	103	2	230	814	202	2	137
RTOR Reduction (vph)	0	57	0	0	47	0	0	0	0	120	0	0
Lane Group Flow (vph)	37	187	0	313	115	0	0	232	814	82	0	139
Confl. Peds. (#/hr)						3				2		
Turn Type	Prot	NA		Prot	NA		Prot	Prot	NA	Perm	Prot	Prot
Protected Phases	7	4		3	8		5	5	2		1	1
Permitted Phases										2		
Actuated Green, G (s)	5.7	19.9		28.9	43.1			22.4	57.1	57.1		15.7
Effective Green, g (s)	5.7	19.9		28.9	43.1			22.4	57.1	57.1		15.7
Actuated g/C Ratio	0.04	0.14		0.21	0.31			0.16	0.41	0.41		0.11
Clearance Time (s)	4.2	4.0		4.2	4.0			4.2	6.0	6.0		4.2
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0	3.0		3.0
Lane Grp Cap (vph)	71	235		361	508			280	1429	622		196
v/s Ratio Prot	0.02	c0.11		c0.18	0.07			c0.13	0.23			0.08
v/s Ratio Perm										0.05		
v/c Ratio	0.52	0.79		0.87	0.23			0.83	0.57	0.13		0.71
Uniform Delay, d1	65.8	58.1		53.7	36.0			56.9	32.0	25.9		59.9
Progression Factor	1.00	1.00		1.00	1.00			0.84	0.80	2.24		1.00
Incremental Delay, d2	6.7	16.6		19.1	0.2			16.8	1.5	0.4		11.1
Delay (s)	72.6	74.7		72.8	36.3			64.6	27.2	58.5		71.1
Level of Service	E	E		E	D			E	C	E		E
Approach Delay (s)		74.4			60.4				39.2			
Approach LOS		E			E				D			

Intersection Summary			
HCM 2000 Control Delay	47.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	18.4
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

ATTACHMENT G

	↓	↲
Movement	SBT	SBR
Lane Configurations	↑↑	↱
Traffic Volume (vph)	746	34
Future Volume (vph)	746	34
Ideal Flow (vphpl)	1900	1900
Total Lost time (s)	6.0	6.0
Lane Util. Factor	0.95	1.00
Frpb, ped/bikes	1.00	0.98
Flpb, ped/bikes	1.00	1.00
Frt	1.00	0.85
Flt Protected	1.00	1.00
Satd. Flow (prot)	3505	1543
Flt Permitted	1.00	1.00
Satd. Flow (perm)	3505	1543
Peak-hour factor, PHF	0.93	0.93
Adj. Flow (vph)	802	37
RTOR Reduction (vph)	0	24
Lane Group Flow (vph)	802	13
Confl. Peds. (#/hr)		3
Turn Type	NA	Perm
Protected Phases	6	
Permitted Phases		6
Actuated Green, G (s)	50.4	50.4
Effective Green, g (s)	50.4	50.4
Actuated g/C Ratio	0.36	0.36
Clearance Time (s)	6.0	6.0
Vehicle Extension (s)	3.0	3.0
Lane Grp Cap (vph)	1261	555
v/s Ratio Prot	c0.23	
v/s Ratio Perm		0.01
v/c Ratio	0.64	0.02
Uniform Delay, d1	37.2	28.9
Progression Factor	1.00	1.00
Incremental Delay, d2	2.5	0.1
Delay (s)	39.6	29.0
Level of Service	D	C
Approach Delay (s)	43.7	
Approach LOS	D	
Intersection Summary		

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱				↱			↱
Traffic Vol, veh/h	144	229	52	55	316	16	0	0	129	0	0	110
Future Vol, veh/h	144	229	52	55	316	16	0	0	129	0	0	110
Conflicting Peds, #/hr	0	0	2	0	0	7	0	0	1	0	0	5
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	75	-	-	-	-	0	-	-	0
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	57	60	343	17	0	0	140	0	0	120

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	367	0	0	308	0	0	-	-	281	-	-	364
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.13	-	-	4.13	-	-	-	-	6.23	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	-	-	3.327	-	-	3.327
Pot Cap-1 Maneuver	1186	-	-	1247	-	-	0	0	755	0	0	679
Stage 1	-	-	-	-	-	-	0	0	-	0	0	-
Stage 2	-	-	-	-	-	-	0	0	-	0	0	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1178	-	-	1245	-	-	-	-	753	-	-	671
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.9	1.1	10.9	11.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	753	1178	-	-	1245	-	-	671
HCM Lane V/C Ratio	0.186	0.133	-	-	0.048	-	-	0.178
HCM Control Delay (s)	10.9	8.5	-	-	8	-	-	11.5
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0.5	-	-	0.2	-	-	0.6

Intersection	
Intersection Delay, s/veh	16.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↱			↰↑	↱
Traffic Vol, veh/h	144	229	52	37	316	16	91	52	77	25	18	110
Future Vol, veh/h	144	229	52	37	316	16	91	52	77	25	18	110
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
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	157	249	57	40	343	17	99	57	84	27	20	120
Number of Lanes	1	1	0	1	1	0	1	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	2	2	2
HCM Control Delay	15.9	21.3	12.7	11.8
HCM LOS	C	C	B	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	100%	0%	58%	0%
Vol Thru, %	0%	40%	0%	81%	0%	95%	42%	0%
Vol Right, %	0%	60%	0%	19%	0%	5%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	129	144	281	37	332	43	110
LT Vol	91	0	144	0	37	0	25	0
Through Vol	0	52	0	229	0	316	18	0
RT Vol	0	77	0	52	0	16	0	110
Lane Flow Rate	99	140	157	305	40	361	47	120
Geometry Grp	7	7	7	7	7	7	7	7
Degree of Util (X)	0.22	0.275	0.314	0.558	0.081	0.677	0.104	0.232
Departure Headway (Hd)	8.015	7.073	7.224	6.582	7.293	6.749	8.006	6.987
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	448	508	498	550	492	538	448	514
Service Time	5.758	4.815	4.961	4.318	5.029	4.485	5.751	4.732
HCM Lane V/C Ratio	0.221	0.276	0.315	0.555	0.081	0.671	0.105	0.233
HCM Control Delay	13	12.5	13.2	17.3	10.7	22.5	11.7	11.8
HCM Lane LOS	B	B	B	C	B	C	B	B
HCM 95th-tile Q	0.8	1.1	1.3	3.4	0.3	5.1	0.3	0.9

ATTACHMENT G

	↙	↖	↰	↑	↗	↘	↓
Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations	↰	↱	↶	↑↑	↱	↰	↑↑↑
Traffic Volume (vph)	177	114	4	1041	39	15	1185
Future Volume (vph)	177	114	4	1041	39	15	1185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2	4.2	6.0	6.0	4.2	6.0
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	0.91
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)	1752	1568	1752	3505	1568	1752	5036
Flt Permitted	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1752	1568	1752	3505	1568	1752	5036
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	192	124	4	1132	42	16	1288
RTOR Reduction (vph)	0	102	0	0	12	0	0
Lane Group Flow (vph)	192	22	4	1132	30	16	1288
Turn Type	Prot	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	8		5	2		1	6
Permitted Phases		8			2		
Actuated Green, G (s)	23.4	23.4	2.9	98.9	98.9	3.3	99.3
Effective Green, g (s)	23.4	23.4	2.9	98.9	98.9	3.3	99.3
Actuated g/C Ratio	0.17	0.17	0.02	0.71	0.71	0.02	0.71
Clearance Time (s)	4.2	4.2	4.2	6.0	6.0	4.2	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	292	262	36	2476	1107	41	3571
v/s Ratio Prot	c0.11		0.00	c0.32		0.01	c0.26
v/s Ratio Perm		0.01			0.02		
v/c Ratio	0.66	0.08	0.11	0.46	0.03	0.39	0.36
Uniform Delay, d1	54.6	49.2	67.3	8.9	6.2	67.4	7.9
Progression Factor	1.00	1.00	0.72	0.67	0.54	1.09	0.79
Incremental Delay, d2	5.3	0.1	0.7	0.3	0.0	4.5	0.2
Delay (s)	59.8	49.4	49.5	6.3	3.3	78.2	6.5
Level of Service	E	D	D	A	A	E	A
Approach Delay (s)	55.7			6.3			7.4
Approach LOS	E			A			A

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.4
Intersection Capacity Utilization	47.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

5: "G" Street & Yosemite Avenue

06/26/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	329	870	355	314	752	140	528	712	330	310	703	311
Future Volume (veh/h)	329	870	355	314	752	140	528	712	330	310	703	311
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.99
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	1856	1856	1856	1856	1856	1856	1930	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	350	926	378	334	800	149	562	757	351	330	748	331
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	275	794	321	540	1706	760	365	985	919	384	680	301
Arrive On Green	0.16	0.33	0.33	0.61	0.97	0.97	0.20	0.28	0.28	0.07	0.13	0.13
Sat Flow, veh/h	1767	2432	983	1767	3526	1570	1838	3526	1571	3428	3526	1563
Grp Volume(v), veh/h	350	669	635	334	800	149	562	757	351	330	748	331
Grp Sat Flow(s),veh/h/ln	1767	1763	1652	1767	1763	1570	1838	1763	1571	1714	1763	1563
Q Serve(g_s), s	21.8	45.7	45.7	16.6	1.9	0.5	27.8	27.6	5.7	13.3	27.0	27.0
Cycle Q Clear(g_c), s	21.8	45.7	45.7	16.6	1.9	0.5	27.8	27.6	5.7	13.3	27.0	27.0
Prop In Lane	1.00		0.60	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	275	575	539	540	1706	760	365	985	919	384	680	301
V/C Ratio(X)	1.27	1.16	1.18	0.62	0.47	0.20	1.54	0.77	0.38	0.86	1.10	1.10
Avail Cap(c_a), veh/h	275	575	539	540	1706	760	365	985	919	451	680	301
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.1	47.1	47.2	22.1	1.2	1.2	56.1	46.3	13.8	63.7	61.0	61.0
Incr Delay (d2), s/veh	147.7	91.1	97.9	2.2	0.9	0.6	256.3	3.7	0.3	13.7	65.2	80.8
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	20.8	33.9	32.8	5.2	0.6	0.3	38.6	12.3	4.9	6.6	18.3	17.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	206.8	138.2	145.1	24.3	2.1	1.7	312.4	50.0	14.0	77.4	126.1	141.7
LnGrp LOS	F	F	F	C	A	A	F	D	B	E	F	F
Approach Vol, veh/h		1654			1283			1670			1409	
Approach Delay, s/veh		155.4			7.8			130.7			118.4	
Approach LOS		F			A			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.9	45.1	48.1	51.0	32.0	33.0	26.0	73.1
Change Period (Y+Rc), s	* 4.2	* 6	5.3	* 5.3	* 4.2	6.0	* 4.2	5.3
Max Green Setting (Gmax), s	* 18	* 37	19.8	* 46	* 28	27.0	* 22	43.7
Max Q Clear Time (g_c+I1), s	15.3	29.6	18.6	47.7	29.8	29.0	23.8	3.9
Green Ext Time (p_c), s	0.3	3.5	0.1	0.0	0.0	0.0	0.0	6.4

Intersection Summary	
HCM 6th Ctrl Delay	108.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

8: Paulson Road & Yosemite Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↑	↱	↰	↱		↰	↱	
Traffic Volume (veh/h)	200	1108	50	13	906	173	19	23	18	177	23	220
Future Volume (veh/h)	200	1108	50	13	906	173	19	23	18	177	23	220
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		0.99	1.00		0.98
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	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	217	1204	54	14	985	188	21	25	20	192	25	239
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, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	581	2169	97	26	1091	484	35	94	75	216	30	284
Arrive On Green	0.33	0.63	0.63	0.01	0.31	0.31	0.02	0.10	0.10	0.12	0.20	0.20
Sat Flow, veh/h	1767	3436	154	1767	3526	1565	1767	952	761	1767	148	1413
Grp Volume(v), veh/h	217	617	641	14	985	188	21	0	45	192	0	264
Grp Sat Flow(s),veh/h/ln	1767	1763	1828	1767	1763	1565	1767	0	1713	1767	0	1560
Q Serve(g_s), s	13.2	27.8	27.9	1.1	37.5	9.6	1.7	0.0	3.4	15.0	0.0	22.8
Cycle Q Clear(g_c), s	13.2	27.8	27.9	1.1	37.5	9.6	1.7	0.0	3.4	15.0	0.0	22.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.44	1.00		0.91
Lane Grp Cap(c), veh/h	581	1113	1154	26	1091	484	35	0	169	216	0	314
V/C Ratio(X)	0.37	0.55	0.56	0.53	0.90	0.39	0.60	0.00	0.27	0.89	0.00	0.84
Avail Cap(c_a), veh/h	581	1113	1154	63	1176	522	76	0	404	250	0	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.9	14.6	14.7	68.5	46.3	19.9	68.0	0.0	58.4	60.5	0.0	53.8
Incr Delay (d2), s/veh	0.4	2.0	1.9	15.3	12.0	2.3	15.1	0.0	0.8	27.5	0.0	6.7
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	5.6	10.9	11.3	0.6	17.7	3.7	0.9	0.0	1.5	8.3	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	16.6	16.6	83.8	58.3	22.3	83.1	0.0	59.2	88.0	0.0	60.5
LnGrp LOS	D	B	B	F	E	C	F	A	E	F	A	E
Approach Vol, veh/h		1475			1187			66			456	
Approach Delay, s/veh		19.5			52.9			66.8			72.1	
Approach LOS		B			D			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.3	18.7	6.3	93.7	7.0	33.0	51.3	48.6
Change Period (Y+Rc), s	* 4.2	* 4.9	* 4.2	5.3	* 4.2	4.9	5.3	* 5.3
Max Green Setting (Gmax), s	* 20	* 33	* 5	64.5	* 6	45.9	22.8	* 47
Max Q Clear Time (g_c+I1), s	17.0	5.4	3.1	29.9	3.7	24.8	15.2	39.5
Green Ext Time (p_c), s	0.1	0.2	0.0	9.5	0.0	1.5	0.3	3.9

Intersection Summary	
HCM 6th Ctrl Delay	40.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

ATTACHMENT G

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	T	R	UL	T	T	R
Maximum Queue (ft)	49	267	305	374	379	546	492	143	318	369	305	48
Average Queue (ft)	11	141	188	202	202	261	195	82	174	180	180	17
95th Queue (ft)	34	237	285	344	329	427	395	145	302	296	284	41
Link Distance (ft)	268	268		614		1160	1160			440	440	
Upstream Blk Time (%)		0										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)			3	7	4	19	3		5	3	1	
Queuing Penalty (veh)			11	17	13	41	9		18	7	0	

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	EB	WB	WB	NB	SB
Directions Served	L	TR	L	TR	R	R
Maximum Queue (ft)	139	51	67	56	54	54
Average Queue (ft)	56	2	28	2	23	32
95th Queue (ft)	106	19	57	18	46	52
Link Distance (ft)		614		654	2325	198
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		75			
Storage Blk Time (%)			0	0		
Queuing Penalty (veh)			1	0		

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	U	T	T	R	L	T	T	T
Maximum Queue (ft)	213	62	51	224	226	31	53	379	229	206
Average Queue (ft)	103	24	13	74	43	5	16	91	82	54
95th Queue (ft)	175	53	41	179	120	21	45	224	170	136
Link Distance (ft)	596			566	566			1160	1160	1160
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		100	150			250	250			
Storage Blk Time (%)	12			2				1		
Queuing Penalty (veh)	4			0				0		

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB	SB	SB
Directions Served	R	R	L	T	T
Maximum Queue (ft)	60	22	268	436	352
Average Queue (ft)	19	2	33	77	68
95th Queue (ft)	41	13	116	283	252
Link Distance (ft)	574			566	566
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		250	150		
Storage Blk Time (%)				7	
Queuing Penalty (veh)				4	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	750	1441	1395	438	484	448	154	750	3150	3102	185	308
Average Queue (ft)	439	606	601	366	355	329	83	725	1766	1668	155	170
95th Queue (ft)	840	1228	1180	477	549	489	142	876	2973	2913	253	272
Link Distance (ft)		2519	2519		439	439	439		4875	4875		
Upstream Blk Time (%)				8	10	1						
Queuing Penalty (veh)				0	36	4						
Storage Bay Dist (ft)	600			370				600			75	250
Storage Blk Time (%)	2	26		29	9			80	2	66	5	2
Queuing Penalty (veh)	8	90		124	32			325	9	201	21	7

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	370	563	587	465
Average Queue (ft)	276	397	401	101
95th Queue (ft)	453	637	647	276
Link Distance (ft)		536	536	536
Upstream Blk Time (%)		12	12	
Queuing Penalty (veh)		49	47	
Storage Bay Dist (ft)	250			
Storage Blk Time (%)	6	44		
Queuing Penalty (veh)	18	138		

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	NB
Directions Served	T	R
Maximum Queue (ft)	136	22
Average Queue (ft)	16	4
95th Queue (ft)	76	17
Link Distance (ft)	589	228
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	B17	B17	SB	SB
Directions Served	UL	T	T	T	T	R	T	T	L	R
Maximum Queue (ft)	294	200	221	367	367	165	63	127	179	114
Average Queue (ft)	138	55	59	72	81	16	2	4	80	44
95th Queue (ft)	230	150	151	224	231	68	21	42	154	81
Link Distance (ft)		589	589	303	303		865	865	1902	
Upstream Blk Time (%)				1	1					
Queuing Penalty (veh)				4	7					
Storage Bay Dist (ft)	375					105				150
Storage Blk Time (%)					5				2	
Queuing Penalty (veh)					4				3	

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	358	385	100	491	515	120	100	618	292	259
Average Queue (ft)	59	133	160	39	277	305	87	87	210	152	145
95th Queue (ft)	105	269	305	80	413	446	156	115	451	243	233
Link Distance (ft)		865	865		1498	1498			1234		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50			50			70	50		600	
Storage Blk Time (%)	27	27		21	42	35	1	55	44		
Queuing Penalty (veh)	135	22		104	18	90	4	91	57		

Zone Summary

Zone wide Queuing Penalty: 1774

Intersection: 1: "G" Street & Mercy Avenue

Movement	EB	EB	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	TR	L	TR	UL	T	T	R	UL	T	T	R
Maximum Queue (ft)	93	328	348	319	379	561	519	97	207	301	302	26
Average Queue (ft)	34	163	225	98	186	254	141	39	100	185	188	11
95th Queue (ft)	82	280	333	209	328	446	364	81	177	272	276	31
Link Distance (ft)	268	268		614		1160	1160			440	440	
Upstream Blk Time (%)		1										
Queuing Penalty (veh)		0										
Storage Bay Dist (ft)			260		250			250	260			250
Storage Blk Time (%)			6	0	7	11	0			2	2	
Queuing Penalty (veh)			10	0	25	25	0			2	1	

Intersection: 2: Sandpiper Avenue & Mercy Avenue

Movement	EB	WB	NB	SB
Directions Served	L	L	R	R
Maximum Queue (ft)	55	24	103	55
Average Queue (ft)	25	12	45	37
95th Queue (ft)	49	32	82	54
Link Distance (ft)			2325	198
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200	75		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 3: "G" Street & Project Driveway 1

Movement	WB	WB	NB	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	R	U	T	T	R	L	T	T	T
Maximum Queue (ft)	297	200	31	287	205	31	52	369	380	295
Average Queue (ft)	135	59	3	87	47	5	12	92	83	61
95th Queue (ft)	246	149	16	213	138	23	39	238	219	179
Link Distance (ft)	596			579	579			1160	1160	1160
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)		100	150			250	250			
Storage Blk Time (%)	20	1		3				2		
Queuing Penalty (veh)	22	1		0				0		

ATTACHMENT G

Intersection: 4: "G" Street & Project Driveway 2

Movement	WB	NB	SB	SB	SB	SB
Directions Served	R	R	L	T	T	T
Maximum Queue (ft)	42	22	270	608	418	274
Average Queue (ft)	18	1	35	115	91	24
95th Queue (ft)	36	7	142	407	333	138
Link Distance (ft)	576			579	579	579
Upstream Blk Time (%)				0		
Queuing Penalty (veh)				0		
Storage Bay Dist (ft)		250	150			
Storage Blk Time (%)				14		
Queuing Penalty (veh)				5		

Intersection: 5: "G" Street & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	NB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	T	R	L
Maximum Queue (ft)	750	2562	2582	439	527	393	155	750	4364	4356	185	223
Average Queue (ft)	714	1762	1745	384	396	181	31	725	2530	2462	163	123
95th Queue (ft)	876	3084	3065	535	617	322	81	855	4346	4337	235	195
Link Distance (ft)		2519	2519		439	439	439		4875	4875		
Upstream Blk Time (%)		36	22	35	49							
Queuing Penalty (veh)		0	0	0	206							
Storage Bay Dist (ft)	600			370				600			75	250
Storage Blk Time (%)	80	33		69				78	0	52	15	
Queuing Penalty (veh)	347	108		258				277	1	172	52	

Intersection: 5: "G" Street & Yosemite Avenue

Movement	SB	SB	SB	SB
Directions Served	L	T	T	R
Maximum Queue (ft)	370	554	539	262
Average Queue (ft)	246	373	376	116
95th Queue (ft)	446	601	601	208
Link Distance (ft)		524	524	524
Upstream Blk Time (%)		17	17	
Queuing Penalty (veh)		76	77	
Storage Bay Dist (ft)	250			
Storage Blk Time (%)	0	41		
Queuing Penalty (veh)	0	128		

ATTACHMENT G

Intersection: 6: Sandpiper Avenue & Yosemite Avenue

Movement	WB	WB	NB	SB
Directions Served	T	T	R	R
Maximum Queue (ft)	604	276	22	114
Average Queue (ft)	431	22	14	32
95th Queue (ft)	844	124	32	96
Link Distance (ft)	589	589	228	2325
Upstream Blk Time (%)	28			
Queuing Penalty (veh)	123			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: Yosemite Avenue & Mansionette Drive

Movement	EB	EB	EB	WB	WB	WB	B17	B17	SB	SB
Directions Served	UL	T	T	T	T	R	T	T	L	R
Maximum Queue (ft)	330	178	118	385	386	51	883	907	137	72
Average Queue (ft)	159	23	27	294	191	6	352	316	44	31
95th Queue (ft)	282	88	87	509	403	28	938	928	104	60
Link Distance (ft)		589	589	303	303		865	865	1902	
Upstream Blk Time (%)				53	7		6	2		
Queuing Penalty (veh)				301	42		35	13		
Storage Bay Dist (ft)	375					105				150
Storage Blk Time (%)					12				0	
Queuing Penalty (veh)					5				0	

Intersection: 8: Paulson Road & Yosemite Avenue

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	100	332	326	99	702	780	120	89	74	311	440
Average Queue (ft)	89	208	203	12	330	335	79	21	33	158	133
95th Queue (ft)	117	334	325	45	613	648	158	60	58	254	295
Link Distance (ft)		865	865		1498	1498			1234		2033
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (ft)	50			50			70	50		600	
Storage Blk Time (%)	55	23		0	49	41	3	8	11		
Queuing Penalty (veh)	302	46		0	6	71	13	3	2		

Zone Summary

Zone wide Queuing Penalty: 2757

Appendix I: Signal Warrants

ATTACHMENT G

Warrant 3: Peak Hour (Urban)

Existing Traffic Conditions

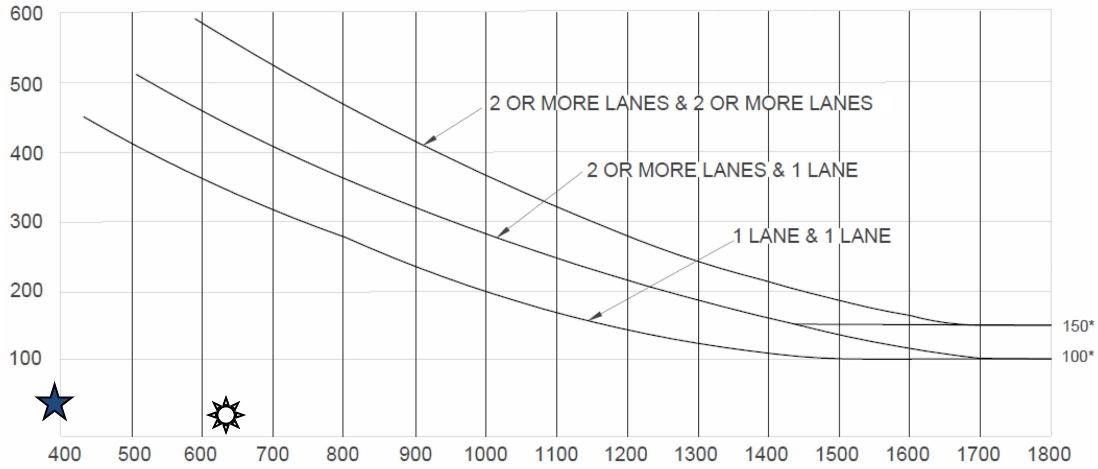
2. Sandpiper Avenue / Mercy Avenue

AM (PM) Peak Hour

Sandpiper Avenue

Highest Approach Volume =

35 (42) VPH



Mercy Avenue Total of Both Approaches =

630 (395) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **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

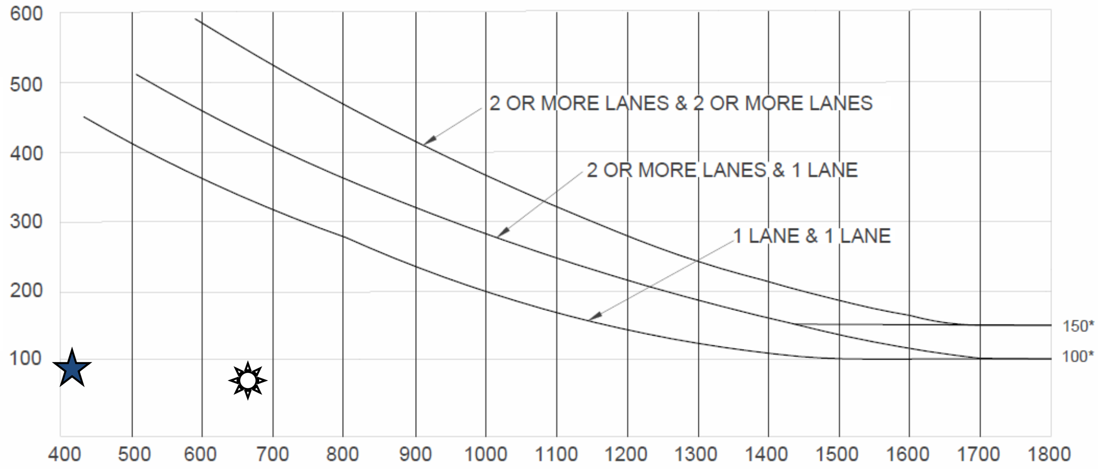
Warrant 3: Peak Hour (Urban)

Existing plus Project Traffic Conditions
2. Sandpiper Avenue / Mercy Avenue
AM (PM) Peak Hour

Sandpiper Avenue

Highest Approach Volume =

70 (79) VPH



Mercy Avenue Total of Both Approaches =

660 (415) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **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

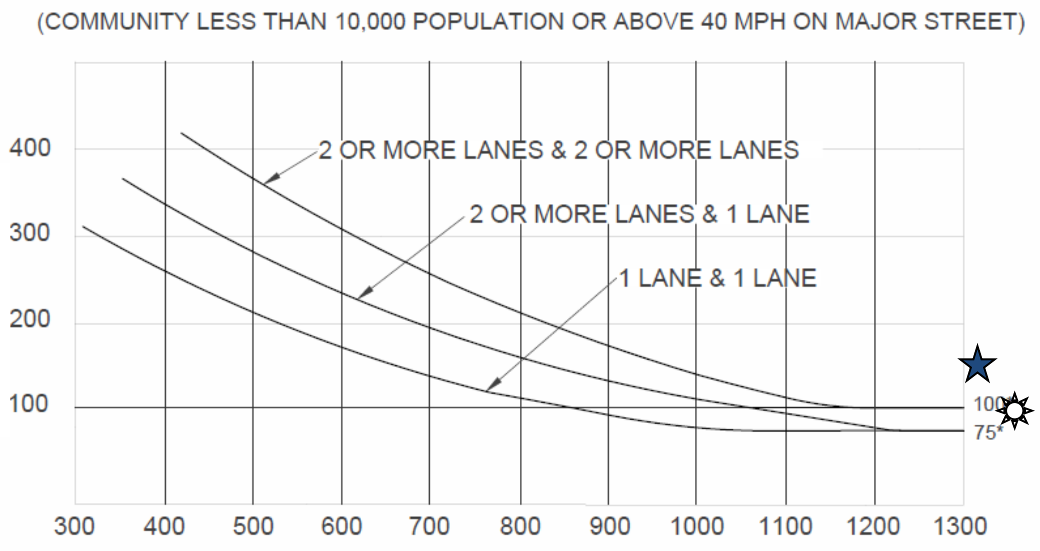
Warrant 3: Peak Hour (Rural)

Existing plus Project Traffic Conditions
3. “G” Street / Project Driveway 1
AM (PM) Peak Hour

Project Driveway 1

Highest Approach Volume =

98 (148) VPH



“G” Street Total of Both Approaches =

1394 (1310) 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
Part 4: Highway Traffic Signals
November 7, 2014

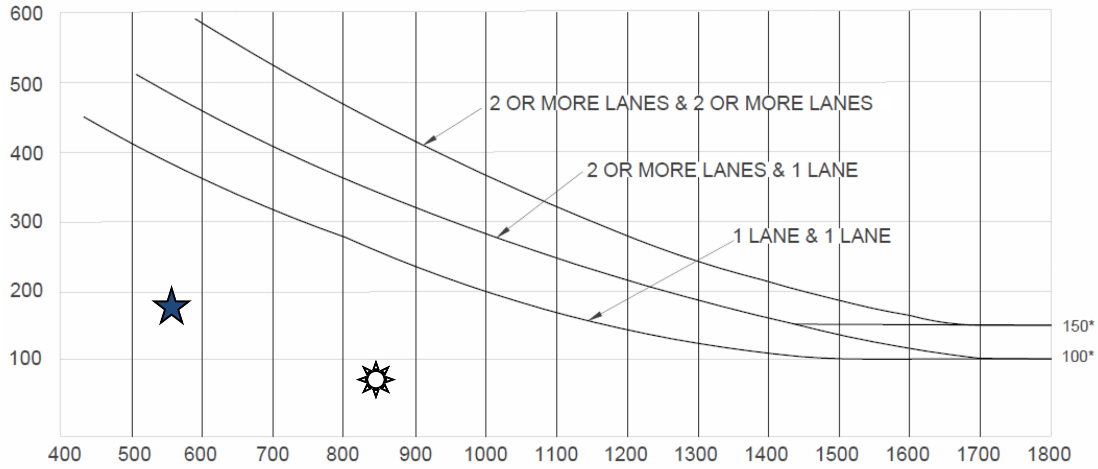
Warrant 3: Peak Hour (Urban)

Near Term plus Project Traffic Conditions
2. Sandpiper Avenue / Mercy Avenue
AM (PM) Peak Hour

Sandpiper Avenue

Highest Approach Volume =

77 (180) VPH



Mercy Avenue Total of Both Approaches =

847 (551) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **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

ATTACHMENT G

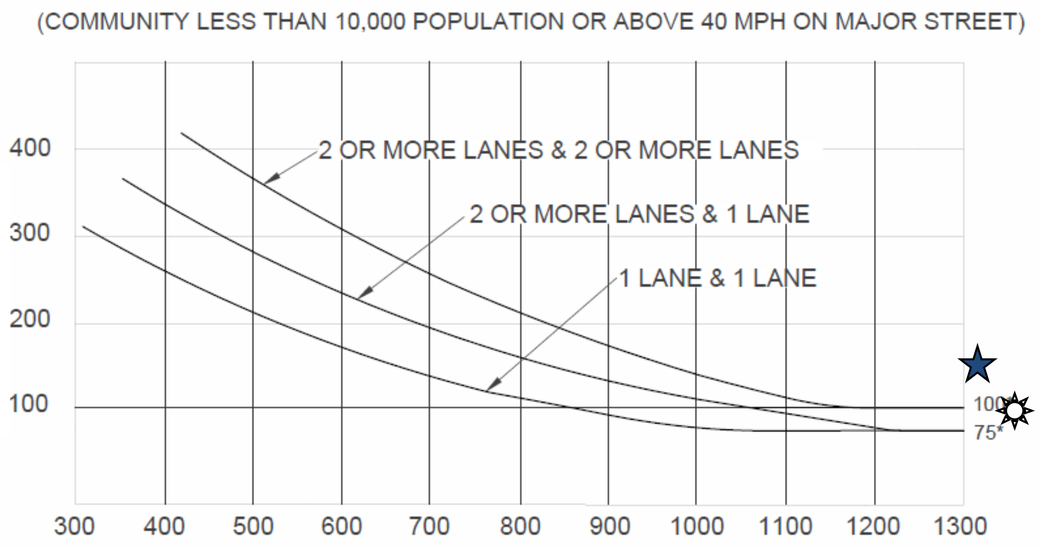
Warrant 3: Peak Hour (Rural)

Near Term plus Project Traffic Conditions
3. "G" Street / Project Driveway 1
AM (PM) Peak Hour

Project Driveway 1

Highest Approach Volume =

98 (148) VPH



"G" Street Total of Both Approaches =

1577 (1519) 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
Part 4: Highway Traffic Signals
November 7, 2014

ATTACHMENT G

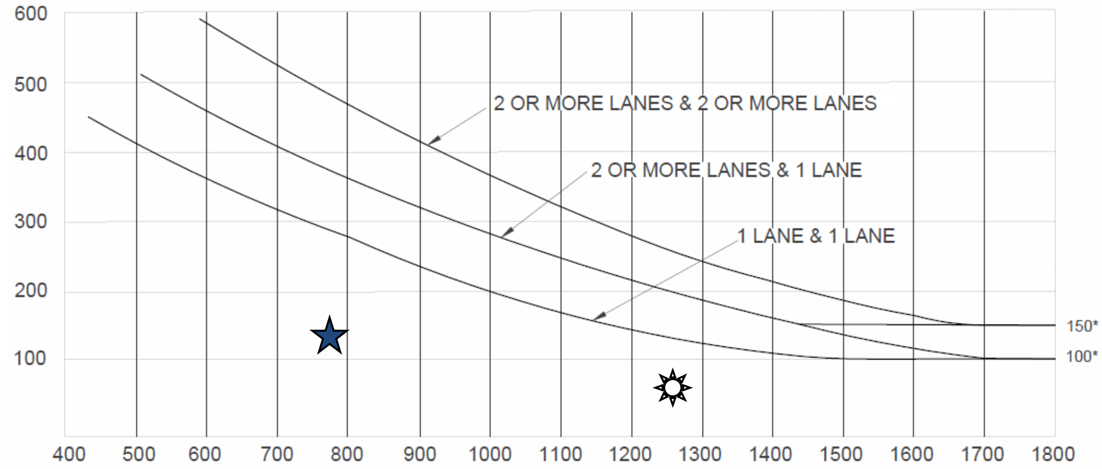
Warrant 3: Peak Hour (Urban)

Cumulative Year 2039 No Project Traffic Conditions
2. Sandpiper Avenue / Mercy Avenue
AM (PM) Peak Hour

Sandpiper Avenue

Highest Approach Volume =

64 (129) VPH



Mercy Avenue Total of Both Approaches =

1267 (774) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **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

Warrant 3: Peak Hour (Urban)

Cumulative Year 2039 plus Project Traffic Conditions

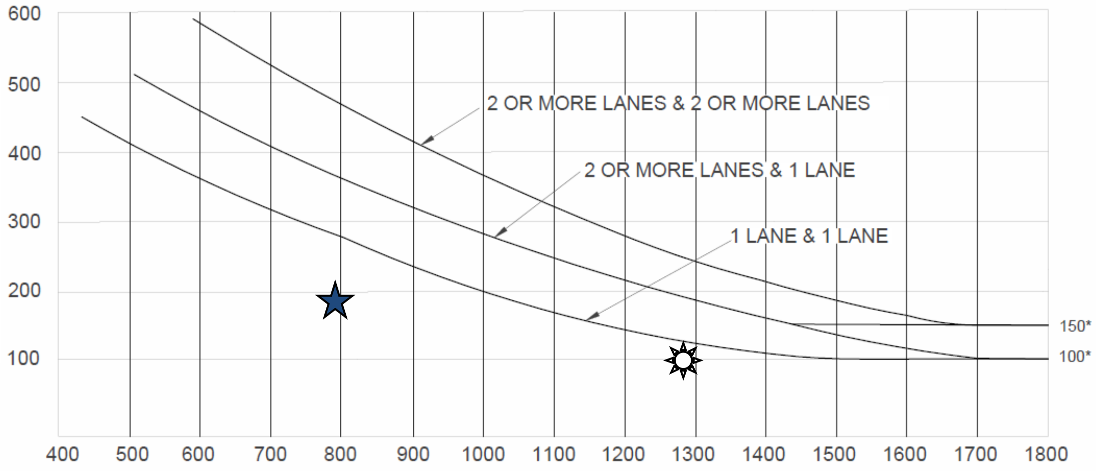
2. Sandpiper Avenue / Mercy Avenue

AM (PM) Peak Hour

Sandpiper Avenue

Highest Approach Volume =

99 (182) VPH



Mercy Avenue Total of Both Approaches =

1297 (794) VPH

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor street approach with one lane.

☼ **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

ATTACHMENT G

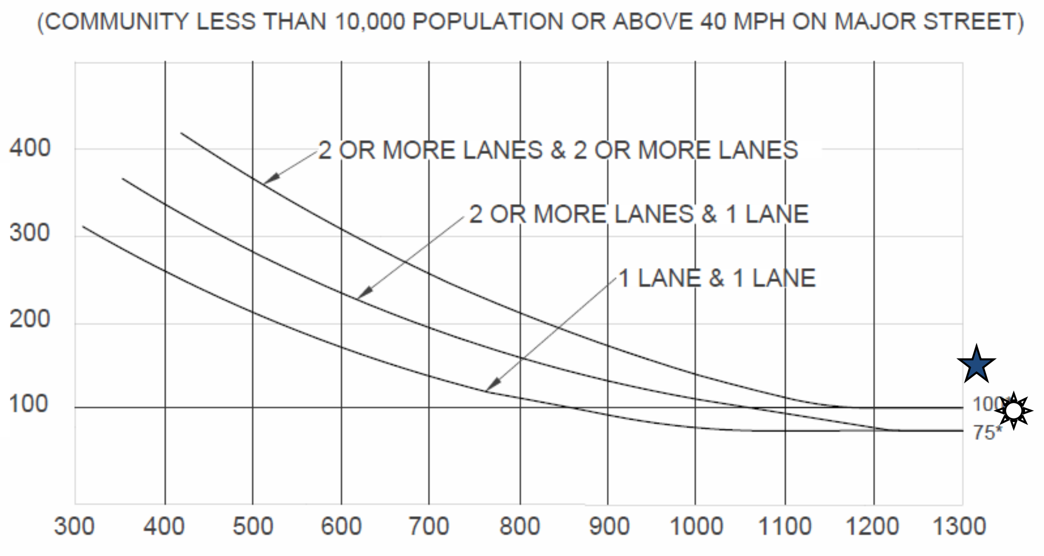
Warrant 3: Peak Hour (Rural)

Cumulative Year 2039 plus Project Traffic Conditions
3. “G” Street / Project Driveway 1
AM (PM) Peak Hour

Project Driveway 1

Highest Approach Volume =

98 (148) VPH



“G” Street Total of Both Approaches =

2382 (2284) 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
Part 4: Highway Traffic Signals
November 7, 2014

Project Specific Mitigation Measures
Environmental Review #10-06

A. Earth

A-1) All regulations, soil compaction tests, and other typical construction methods required for building in expansive soils shall be strictly adhered to. The Inspection Services Department will monitor compliance during the construction of the buildings.

A-2) Prior to approval of a conditional use permit, the City shall review plans for drainage and stormwater run-off control systems and their component facilities to ensure that these systems are non-erosive in design.

A-3) Upon completion of construction, subsequent Projects shall re-vegetate all exposed soil surfaces within 30 days, or as otherwise approved by the City, to minimize potential topsoil erosion. Reasonable alternatives to re-vegetation may be employed, especially during peak high temperature periods, subject to the approval of the City.

A-4) Projects under review shall be required to submit temporary erosion control plans for construction activities.

A-5) Prior to the issuance of building permits, the applicant shall design all structures according to the California Building Code Seismic requirements.

A-6) Prior to the issuance of building permits, the applicant shall retain a qualified geologist to conduct soil samples throughout the Project area to identify expansive soils, and those areas shall be identified on a map for the City.

A-7) Building plans shall be reviewed by a registered engineer specializing in geo-technical assessments to ensure that the soils can support the load.

B. Air

B-1) <u>*SJVAPCD (District)* Driven future Mitigation Measures</u>:

The San Joaquin Valley Air Pollution Control District (SJVAPCD) shall review all phases of the project to assess the impact to air quality and to establish acceptable mitigation measures. Hence, the City recognizes that additional mitigation measures may be applied to subsequent phases of the development of this area. While the action of the SJVAPCD is independent of City reviews and actions, their process allows the City to review proposed mitigation measures that could affect project design and operation. Any proposed changes are subject to approval by the City.

ATTACHMENT G

Regionally, this project will not directly affect air movement, moisture, temperature, or change the climate of the San Joaquin Valley Air Basin. The individual impact of the project is considered less than significant. As Federal and State standards become more stringent upon vehicle emissions, the cumulative impact of the project will decrease.

The SJVAPCD regulates construction emissions during construction of a project through its Regulation VIII. These provisions require:

- Effective dust suppression for land clearing, excavation, land leveling, grading, and similar operations.
- Effective stabilization of all disturbed areas of a construction site, including storage piles, not used for seven or more days.
- Control of on-site fugitive dust from on-site unpaved roads and off-site unpaved access roads.
- Removal of accumulations of mud or dirt at the end of the work day or once every 24 hours from paved public ways, shoulders and access ways adjacent to the site.

District Regulation VIII requires that a dust control plan be prepared, and violations of this the requirements of this regulation are subject to enforcement action. Violations are indicated by the generation of visible dust clouds and/or generation of complaints.

B-2) Construction contracts shall require the primary contractor to prepare and submit a dust control plan to the SJVAPCD that incorporates all the requirements of Regulation VIII and the following additional measures:

- Limit traffic speeds on unpaved surfaces to 15 mph.
- Suspend excavation and grading activities when winds exceed 20 mph.
- Limit the size of areas subject to excavation, grading, or other construction activities at any one time to avoid excessive dust.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Make maximum use of diesel equipment equipped with catalytic converters and particulate traps.
- Curtail construction during “Spare the Air Days” declared by SJVAPCD.
- Equipment not in use for more than 10 minutes should be turned off.
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.

- Whenever feasible and cost effective, use electrically driven equipment (provided they are not run by a portable generator) or alternatively-fueled equipment/vehicles.

B-3) Trees shall be placed near sidewalks to provide shade on the majority of its surface.

B-4) The site plan for phase one shall be modified to include a transit shelter (location to be determined by the Planning Staff with input from the local transit authority).

B-5) On-site sidewalks shall connect with adjacent sidewalk in the public right-of-way and the bike path located on the western boundary of the project.

C. Water

C-1) Prior to approval of conditional use permits, the applicant shall demonstrate to the City that storm drainage facilities are adequate to meet Project demands and that improvements are consistent with the City's Stormwater Master Plan and any updates.

C-2) Prior to approval of subsequent development projects, the applicants shall demonstrate to the City that temporary erosion control measures will be followed during construction.

D/E. Plant/Animal Life

D/E-1) Prior to beginning construction, the developer shall have a certified biologist review the site to insure that no endangered animal and/or plant species are present. If endangered animal and/or plant species, all necessary mitigation measures shall be employed to protect such species. This report shall be submitted to the City of Merced and all proposed mitigation measures shall be approved by the City of Merced.

D/E-2) All landscaping for the site shall incorporate the use of native plants and reasonable efforts shall be made to preserve any existing trees on the site.

F. Noise

F-1) Grading and construction activity shall be limited to daylight hours (between 7 a.m. and 7 p.m.) in areas where noise sensitive receptors are located.

F-2) No individual piece of equipment shall produce a noise level exceeding 83dBA at a distance of twenty-five feet from the source. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible.

F-3) In noise sensitive areas, construction equipment, compressors, and generators shall be fitted with heavy duty mufflers specifically designed to reduce noise impacts.

F-4) The noise level at any point outside of the property plane of the project shall not exceed 86 dBA.

F-5) The applicants shall submit evidence to the City which outlines proposed noise attenuation measures for the residence inn designed to decrease noise impacts prior to issuance of building permits. The City shall review and approve noise mitigation as necessary.

G. Light & Glare

G-1) All lighting in Phase One of the project area shall be shielded, directed downward, and away from adjoining properties and rights-of-way. Light shields shall be installed and maintained consistent with manufacturer's specifications, and shall reduce the spillage of light on to adjacent properties to less than two foot-candles, as measured at the adjacent property line.

G-2) Lighting fixtures shall be designed to produce the minimum amount of light necessary for safety purposes.

G-3) Site landscaping in Phase One of the project shall include vegetation designed to shield adjacent properties-from - light and glare. Exterior glazing shall have a light reflectance our less than 10%.

M. Transportation/Circulation

M-1) Install all necessary road improvements to complete the north half of Yosemite Avenue from the intersection of G Street east to the end of the project frontage.

M-2) Construct Sandpiper Drive with full improvements from Yosemite Avenue north to the end of the project's frontage with a temporary cul-de-sac bulb a the north end until the street is fully constructed with Phases Two and Three.

M-3) Construct all necessary improvements on G Street along the project frontage. This includes a median with a south-bound turn lane and a north bound turn lane into the project site.

M-4) The developer shall work with Merced County Transit (The Bus) to install a minimum of one bus shelter near the project site.

M-5) Provide bike racks throughout the project site. The number bike racks shall be equal a minimum of 10% of the number of vehicle parking spaces provided.

M-6) Provide connectivity throughout the site for pedestrian and bicycle travel. Connectivity shall be provided from all frontages into the project site. The developer shall make every effort to encourage all methods of travel other than single vehicular travel.

M-7) Along with the right-turn-only driveway, the project shall provide a continuous right-turn auxiliary lane along the project's G Street frontage. This will eliminate the undulating curb line that would result with distinct acceleration and deceleration lanes at the driveway and the adjacent intersections. It will accommodate the deceleration and acceleration needs of the driveway and the adjacent intersections. It should not continue through the adjacent intersections, but should terminate at the intersections with a channelizing device that forces all traffic in the lane to turn right at the intersection.

N. *Public Services*

N-1) Prior to the issuance of building permits, the applicant shall be responsible for the payment of school facility impact fees as adopted by the Merced City School District and Merced Union High School District.

P. *Utilities*

P-1) Prior to the issuance of building permits, the applicant shall demonstrate to the City the ability of service providers to accommodate development of the site without service interruptions to existing customers.

R. *Aesthetics*

R-1) Phase one of the project shall be developed as a commercial and office "plaza" with standards for adequate landscaping, screening, buffering, compatible architecture, signing, etc. Particular emphasis shall be paid to the visual appearance along perimeter and interior roadways. For example, dense landscaping shall be provided along all property frontages and within the project area. The corner of Yosemite Avenue and G Street shall be designed so as to create an open and inviting feel for pedestrian and bicycle traffic. All materials shall be of high-quality and all architectural designs and features shall be varied and articulated to provide visual interest. The design shall be pedestrian-oriented and inviting. Because all elevations will be visible from either the public right-of-way, all building elevations shall include a high level of architectural features and design. All subsequent phases shall include high-quality materials. Specific design standards shall be reviewed prior to the start of any other phase of construction.

S. Recreation

S-1 Any approved site plan will incorporate the needs of the City of Merced bike path system, and shall be designed not to detract from the use and enjoyment of the pathways.

T. Cultural Resources

T-1 If evidence of archaeological artifacts is discovered during construction, all operations within an area at and adjacent to the discovered site shall halt until a qualified archaeologist determines the extent of significance of the site.

T-2 On-site preservation of a resource is the preferred alternative. Preserving a cultural deposit maintains the artifacts in context and may prevent inadvertent discovery of, or damage to, human burials. Preservation may be accomplished through a number of means such as capping or covering the site with a layer of soil, fencing the site area, and/or incorporation of the resource in a park area.

Project Specific Mitigation Measures
Environmental Review #10-06

A. Earth

A-1) All regulations, soil compaction tests, and other typical construction methods required for building in expansive soils shall be strictly adhered to. The Inspection Services Department will monitor compliance during the construction of the buildings.

A-2) Prior to approval of a conditional use permit, the City shall review plans for drainage and stormwater run-off control systems and their component facilities to ensure that these systems are non-erosive in design.

A-3) Upon completion of construction, subsequent Projects shall re-vegetate all exposed soil surfaces within 30 days, or as otherwise approved by the City, to minimize potential topsoil erosion. Reasonable alternatives to re-vegetation may be employed, especially during peak high temperature periods, subject to the approval of the City.

A-4) Projects under review shall be required to submit temporary erosion control plans for construction activities.

A-5) Prior to the issuance of building permits, the applicant shall design all structures according to the California Building Code Seismic requirements.

A-6) Prior to the issuance of building permits, the applicant shall retain a qualified geologist to conduct soil samples throughout the Project area to identify expansive soils, and those areas shall be identified on a map for the City.

A-7) Building plans shall be reviewed by a registered engineer specializing in geo-technical assessments to ensure that the soils can support the load.

B. Air

B-1) *SJVAPCD (District)* Driven future Mitigation Measures:

The San Joaquin Valley Air Pollution Control District (SJVAPCD) shall review all phases of the project to assess the impact to air quality and to establish acceptable mitigation measures. Hence, the City recognizes that additional mitigation measures may be applied to subsequent phases of the development of this area. While the action of the SJVAPCD is independent of City reviews and actions, their process allows the City to review proposed mitigation measures that could affect project design and operation. Any proposed changes are subject to approval by the City.

ATTACHMENT G

Regionally, this project will not directly affect air movement, moisture, temperature, or change the climate of the San Joaquin Valley Air Basin. The individual impact of the project is considered less than significant. As Federal and State standards become more stringent upon vehicle emissions, the cumulative impact of the project will decrease.

The SJVAPCD regulates construction emissions during construction of a project through its Regulation VIII. These provisions require:

- Effective dust suppression for land clearing, excavation, land leveling, grading, and similar operations.
- Effective stabilization of all disturbed areas of a construction site, including storage piles, not used for seven or more days.
- Control of on-site fugitive dust from on-site unpaved roads and off-site unpaved access roads.
- Removal of accumulations of mud or dirt at the end of the work day or once every 24 hours from paved public ways, shoulders and access ways adjacent to the site.

District Regulation VIII requires that a dust control plan be prepared, and violations of this the requirements of this regulation are subject to enforcement action. Violations are indicated by the generation of visible dust clouds and/or generation of complaints.

B-2) Construction contracts shall require the primary contractor to prepare and submit a dust control plan to the SJVAPCD that incorporates all the requirements of Regulation VIII and the following additional measures:

- Limit traffic speeds on unpaved surfaces to 15 mph.
- Suspend excavation and grading activities when winds exceed 20 mph.
- Limit the size of areas subject to excavation, grading, or other construction activities at any one time to avoid excessive dust.
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with a slope greater than one percent.
- Make maximum use of diesel equipment equipped with catalytic converters and particulate traps.
- Curtail construction during "Spare the Air Days" declared by SJVAPCD.
- Equipment not in use for more than 10 minutes should be turned off.
- Limit the hours of operation of heavy-duty equipment and/or the amount of equipment in use.

- Whenever feasible and cost effective, use electrically driven equipment (provided they are not run by a portable generator) or alternatively-fueled equipment/vehicles.

B-3) Trees shall be placed near sidewalks to provide shade on the majority of its surface.

B-4) The site plan for phase one shall be modified to include a transit shelter (location to be determined by the Planning Staff with input from the local transit authority).

B-5) On-site sidewalks shall connect with adjacent sidewalk in the public right-of-way and the bike path located on the western boundary of the project.

C. Water

C-1) Prior to approval of conditional use permits, the applicant shall demonstrate to the City that storm drainage facilities are adequate to meet Project demands and that improvements are consistent with the City's Stormwater Master Plan and any updates.

C-2) Prior to approval of subsequent development projects, the applicants shall demonstrate to the City that temporary erosion control measures will be followed during construction.

D/E. Plant/Animal Life

D/E-1) Prior to beginning construction, the developer shall have a certified biologist review the site to insure that no endangered animal and/or plant species are present. If endangered animal and/or plant species, all necessary mitigation measures shall be employed to protect such species. This report shall be submitted to the City of Merced and all proposed mitigation measures shall be approved by the City of Merced.

D/E-2) All landscaping for the site shall incorporate the use of native plants and reasonable efforts shall be made to preserve any existing trees on the site.

F. Noise

F-1) Grading and construction activity shall be limited to daylight hours (between 7 a.m. and 7 p.m.) in areas where noise sensitive receptors are located.

F-2) No individual piece of equipment shall produce a noise level exceeding 83dBA at a distance of twenty-five feet from the source. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to twenty-five feet from the equipment as possible.

F-3) In noise sensitive areas, construction equipment, compressors, and generators shall be fitted with heavy duty mufflers specifically designed to reduce noise impacts.

F-4) The noise level at any point outside of the property plane of the project shall not exceed 86 dBA.

F-5) The applicants shall submit evidence to the City which outlines proposed noise attenuation measures for the residence inn designed to decrease noise impacts prior to issuance of building permits. The City shall review and approve noise mitigation as necessary.

G. Light & Glare

G-1) All lighting in Phase One of the project area shall be shielded, directed downward, and away from adjoining properties and rights-of-way. Light shields shall be installed and maintained consistent with manufacturer's specifications, and shall reduce the spillage of light on to adjacent properties to less than two foot-candles, as measured at the adjacent property line.

G-2) Lighting fixtures shall be designed to produce the minimum amount of light necessary for safety purposes.

G-3) Site landscaping in Phase One of the project shall include vegetation designed to shield adjacent properties-from - light and glare. Exterior glazing shall have a light reflectance our less than 10%.

M. Transportation/Circulation

M-1) Install all necessary road improvements to complete the north half of Yosemite Avenue from the intersection of G Street east to the end of the project frontage.

M-2) Construct Sandpiper Drive with full improvements from Yosemite Avenue north to the end of the project's frontage with a temporary cul-de-sac bulb a the north end until the street is fully constructed with Phases Two and Three.

M-3) Construct all necessary improvements on G Street along the project frontage. This includes a median with a south-bound turn lane and a north bound turn lane into the project site.

M-4) The developer shall work with Merced County Transit (The Bus) to install a minimum of one bus shelter near the project site.

M-5) Provide bike racks throughout the project site. The number bike racks shall be equal a minimum of 10% of the number of vehicle parking spaces provided.

M-6) Provide connectivity throughout the site for pedestrian and bicycle travel. Connectivity shall be provided from all frontages into the project site. The developer shall make every effort to encourage all methods of travel other than single vehicular travel.

M-7) Along with the right-turn-only driveway, the project shall provide a continuous right-turn auxiliary lane along the project's G Street frontage. This will eliminate the undulating curb line that would result with distinct acceleration and deceleration lanes at the driveway and the adjacent intersections. It will accommodate the deceleration and acceleration needs of the driveway and the adjacent intersections. It should not continue through the adjacent intersections, but should terminate at the intersections with a channelizing device that forces all traffic in the lane to turn right at the intersection.

N. Public Services

N-1) Prior to the issuance of building permits, the applicant shall be responsible for the payment of school facility impact fees as adopted by the Merced City School District and Merced Union High School District.

P. Utilities

P-1) Prior to the issuance of building permits, the applicant shall demonstrate to the City the ability of service providers to accommodate development of the site without service interruptions to existing customers.

R. Aesthetics

R-1) Phase one of the project shall be developed as a commercial and office “plaza” with standards for adequate landscaping, screening, buffering, compatible architecture, signing, etc. Particular emphasis shall be paid to the visual appearance along perimeter and interior roadways. For example, dense landscaping shall be provided along all property frontages and within the project area. The corner of Yosemite Avenue and G Street shall be designed so as to create an open and inviting feel for pedestrian and bicycle traffic. All materials shall be of high-quality and all architectural designs and features shall be varied and articulated to provide visual interest. The design shall be pedestrian-oriented and inviting. Because all elevations will be visible from either the public right-of-way, all building elevations shall include a high level of architectural features and design. All subsequent phases shall include high-quality materials. Specific design standards shall be reviewed prior to the start of any other phase of construction.

S. *Recreation*

S-1 Any approved site plan will incorporate the needs of the City of Merced bike path system, and shall be designed not to detract from the use and enjoyment of the pathways.

T. *Cultural Resources*

T-1 If evidence of archaeological artifacts is discovered during construction, all operations within an area at and adjacent to the discovered site shall halt until a qualified archaeologist determines the extent of significance of the site.

T-2 On-site preservation of a resource is the preferred alternative. Preserving a cultural deposit maintains the artifacts in context and may prevent inadvertent discovery of, or damage to, human burials. Preservation may be accomplished through a number of means such as capping or covering the site with a layer of soil, fencing the site area, and/or incorporation of the resource in a park area.