DEPARTMENT OF PLANNING AND COMMUNITY DEVELOPMENT
1010 10TH Street, Suite 3400, Modesto, CA 95354
Planning Phone: (209) 525-6330 Fax: (209) 525-5911
Building Phone: (209) 525-6557 Fax: (209) 525-7759

CEQA Referral Initial Study
And Notice of Intent to
Adopt a Negative Declaration

Date: **May 6, 2021**

To: **Distribution List (See Attachment A)**

From: **Teresa McDonald, Associate Planner, Planning and Community Development**

Subject: **GENERAL PLAN AMENDMENT AND REZONE APPLICATION NO. PLN2018-0081 – LIBITZKY MANAGEMENT CORPORATION**

Comment Period: **May 6, 2021 – June 8, 2021**

Respond By: **June 8, 2021**

Public Hearing Date: **July 1, 2021**

You may have previously received an Early Consultation Notice regarding this project, and your comments, if provided, were incorporated into the Initial Study. Based on all comments received, Stanislaus County anticipates adopting a Negative Declaration for this project. This referral provides notice of a 30-day comment period during which Responsible and Trustee Agencies and other interested parties may provide comments to this Department regarding our proposal to adopt the Negative Declaration.

All applicable project documents are available for review at: Stanislaus County Department of Planning and Community Development, 1010 10th Street, Suite 3400, Modesto, CA 95354. Please provide any additional comments to the above address or call us at (209) 525-6330 if you have any questions. Thank you.

Applicant: **Kevin Perkins dba Libitzky Holdings, LP**

Project Location: **1224 Kiernan Avenue (SR 219), at the southeast corner of Tully Road and Kiernan Avenue, in the Modesto area.**

APN: **046-001-001**

Williamson Act Contract: **N/A**

General Plan: **Urban Transition**

Current Zoning: **A-2-10 (General Agriculture)**

Project Description: **Request to amend the General Plan and zoning designations of a 17.16-acre parcel from Urban Transition and A-2-10 (General Agriculture) to P-D (Planned Development), to allow the construction of a 300,000 square-foot building for various light industrial uses. Jackrabbit, a designer and fabricator of agricultural equipment, is expected to occupy 150,000 square feet of the proposed building, but may not be the final user. No showroom is planned, but there will be an area for parts sales for existing Jackrabbit customers. No other tenants have been**

identified for the remaining 150,000 square feet of building space at this time. However, the remainder of the building may be suited depending on the user. Proposed hours of operation are 24 hours a day, seven days a week, with 250 people on a maximum shift, and three shifts per day. A maximum of 25 daily customers and 1,488 truck/vehicle trips are anticipated per day. The trip generation estimate considers the "worst case" scenario for a variety of light industrial uses in the event Jackrabbit does not occupy either a portion, or all of the building. The project proposes to share access, and to connect to the existing public water system and stormwater basin, located on the adjacent site to the east, which is zoned P-D (131). The proposed building will be served by an on-site septic system. A reciprocal access agreement will be recorded for the adjacent parcel. A six-foot-tall chain link-fence is proposed along the south and east property lines, and a six-foot-tall wrought iron fence is proposed along the north and west property lines along the site's road frontage. The project site has access to County-maintained Tully Road and Kiernan Avenue, via the shared access on the adjacent parcel to the east, and is within the City of Modesto's LAFCO adopted Sphere of Influence. Parking lot lighting, signage, and landscaping will be designed to comply with City of Modesto standards.

Full document with attachments available for viewing at:
http://www.stancounty.com/planning/pl/act-projects.shtm

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GENERAL PLAN AMENDMENT AND REZONE APPLICATION NO. PLN2018-0081 – LIBITZKY MANAGEMENT CORPORATION

Attachment A

Distribution List

X	CA DEPT OF CONSERVATION Land Resources		STAN CO ALUC
X	CA DEPT OF FISH & WILDLIFE		STAN CO ANIMAL SERVICES
	CA DEPT OF FORESTRY (CAL FIRE)	X	STAN CO BUILDING PERMITS DIVISION
X	CA DEPT OF TRANSPORTATION DIST 10	X	STAN CO CEO
X	CA OPR STATE CLEARINGHOUSE		STAN CO CSA
X	CA RWQCB CENTRAL VALLEY REGION	X	STAN CO DER
	CA STATE LANDS COMMISSION	X	STAN CO ERC
	CEMETERY DISTRICT	X	STAN CO FARM BUREAU
	CENTRAL VALLEY FLOOD PROTECTION	X	STAN CO HAZARDOUS MATERIALS
X	CITY OF: MODESTO	X	STAN CO PARKS & RECREATION
	COMMUNITY SERVICES/SANITARY DIST	X	STAN CO PUBLIC WORKS
X	COOPERATIVE EXTENSION		STAN CO RISK MANAGEMENT
	COUNTY OF:	X	STAN CO SHERIFF
X	DER - GROUNDWATER RESOURCES DIVISION	X	STAN CO SUPERVISOR DIST 4: GREWAL
X	FIRE PROTECTION DIST: SALIDA	X	STAN COUNTY COUNSEL
X	GSA: STANISLAUS & TUOLUMNE RIVERS GROUNDWATER BASIN ASSOC.	X	StanCOG
	HOSPITAL DIST:	X	STANISLAUS FIRE PREVENTION BUREAU
X	IRRIGATION DIST: MODESTO	X	STANISLAUS LAFCO
X	MOSQUITO DIST: EAST SIDE	X	STATE OF CA SWRCB – DIV OF DRINKING WATER DIST. 10
X	MOUNTAIN VALLEY EMERGENCY MEDICAL SERVICES	X	SURROUNDING LAND OWNERS
	MUNICIPAL ADVISORY COUNCIL:	X	TELEPHONE COMPANY: AT&T
X	PACIFIC GAS & ELECTRIC	X	TRIBAL CONTACTS (CA Government Code §65352.3)
	POSTMASTER:		US ARMY CORPS OF ENGINEERS
X	RAILROAD: UNION PACIFIC	X	US FISH & WILDLIFE
X	SAN JOAQUIN VALLEY APCD		US MILITARY (SB 1462)
X	SCHOOL DIST 1: STANISLAUS UNION		USDA NRCS
X	SCHOOL DIST 2: MODESTO UNION (MODESTO CITY SCHOOLS)		WATER DIST:
X	WORKFORCE DEVELOPMENT		
X	STAN CO AG COMMISSIONER		

STRIVING TOGETHER TO BE THE BEST!

STANISLAUS COUNTY
CEQA REFERRAL RESPONSE FORM

TO: **Stanislaus County Planning & Community Development**
1010 10th Street, Suite 3400
Modesto, CA 95354

FROM: ____

SUBJECT: **GENERAL PLAN AMENDMENT AND REZONE APPLICATION NO. PLN2018-0081 – LIBITZKY MANAGEMENT CORPORATION**

Based on this agency's particular field(s) of expertise, it is our position the above described project:

______ Will not have a significant effect on the environment.
______ May have a significant effect on the environment.
______ No Comments.

Listed below are specific impacts which support our determination (e.g., traffic general, carrying capacity, soil types, air quality, etc.) – (attach additional sheet if necessary)

1.
2.
3.
4.

Listed below are possible mitigation measures for the above-listed impacts: *PLEASE BE SURE TO INCLUDE WHEN THE MITIGATION OR CONDITION NEEDS TO BE IMPLEMENTED (PRIOR TO RECORDING A MAP, PRIOR TO ISSUANCE OF A BUILDING PERMIT, ETC.):*

1.
2.
3.
4.

In addition, our agency has the following comments (attach additional sheets if necessary).

____

____

Response prepared by:

____

Name Title Date

Stanislaus County

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CEQA INITIAL STUDY

Adapted from CEQA Guidelines APPENDIX G Environmental Checklist Form, Final Text, January 1, 2020

1. **Project title:** General Plan Amendment and Rezone Application No. PLN2018-0081 - Libitzky Management Corporation

2. **Lead agency name and address:**
Stanislaus County
1010 10th Street, Suite 3400
Modesto, CA 95354

3. **Contact person and phone number:**
Teresa McDonald, Associate Planner
(209) 525-6330

4. **Project location:** 1224 Kiernan Avenue (SR 219), at the southeast corner of Tully Road and Kiernan Avenue, in the Modesto area. (APN: 046-001-001)

5. **Project sponsor's name and address:**
Kevin Perkins dba Libitzky Holdings, LP
1475 Powell Street, Suite 201
Emeryville, CA 94608

6. **General Plan designation:** Urban Transition

7. **Zoning:** A-2-10 (General Agriculture)

8. **Description of project:**

Request to amend the General Plan and zoning designations of a 17.16-acre parcel from Urban Transition and A-2-10 (General Agriculture) to P-D (Planned Development), to allow the construction of a 300,000 square-foot building for various light industrial uses. Jackrabbit, a designer and fabricator of agricultural equipment, is expected to occupy 150,000 square feet of the proposed building. No showroom is planned, but there will be an area for parts sales for existing Jackrabbit customers. No other tenants have been identified for the remaining 150,000 square feet of building space at this time. However, the remainder of the building may be suited depending on the user. Proposed hours of operation are 24 hours a day, seven days a week, with 250 people on a maximum shift, and three shifts per day. A maximum of 25 daily customers and 1,488 truck/vehicle trips are anticipated per day. The trip generation estimate considers the "worst case" scenario for a variety of light industrial uses in the event Jackrabbit does not occupy either a portion, or all of the building. The project proposes to share access, and to connect to the existing public water system and stormwater basin, located on the adjacent site to the east, which is zoned P-D (131). The proposed building will be served by an on-site septic system. A reciprocal access agreement will be recorded for the adjacent parcel. A six-foot-tall chain link-fence is proposed along the south and east property lines, and a six-foot-tall wrought iron fence is proposed along the north and west property lines along the site's road frontage. The project also includes a monument sign at the corner of the Kiernan Avenue and Tully Road frontage, which may be up to 24 square-feet in size and a maximum height of six feet. Landscaping in planters and one shade tree per eight parking spaces is proposed in the parking areas along with light poles, and a perimeter landscape strip is proposed along Kiernan Avenue and Tully Road, which will include large-species trees. Trees are also proposed along the southern property line. Signage, landscaping, and parking lot lighting will be designed to comply with City of Modesto standards. The project site has access to County-maintained Tully Road and Kiernan Avenue, via the shared access on the adjacent parcel to the east, and is within the City of Modesto's LAFCO adopted Sphere of Influence.

9.	**Surrounding land uses and setting:**	Kiernan Avenue, orchards, and ranchettes to the north; industrial uses and RV storage to the east; an orchard to the south; Tully Road, a church, and a MID substation to the west.
10.	**Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):**	CalTrans City of Modesto Stanislaus County Department of Public Works San Joaquin Valley Air Pollution Control District Department of Environmental Resources
11.	**Attachments:**	Air Quality and Greenhouse Gas Analysis, prepared by Mitchell Air Quality Consulting, March 5, 2021. Transportation Impact Analysis, prepared by KD Anderson & Associates, Inc., February 19, 2021.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

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

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

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

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

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

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

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

Signature on file.
Prepared by Teresa McDonald, Associate Planner

May 6, 2021
Date

EVALUATION OF ENVIRONMENTAL IMPACTS:

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

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

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

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

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration.

Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

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

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

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

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

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

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

9) The explanation of each issue should identify:

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

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

ISSUES

I. AESTHETICS – Except as provided in Public Resources Code Section 21099, could the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?			X	
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?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Discussion: The site itself is not considered to be a scenic resource or unique scenic vista and currently consists of an almond orchard. The buildings and elevations proposed for this site are industrial in nature, as they are light industrial/warehouse uses, which is consistent with other development in the area. Additionally, building elevations will be required to be approved by the City of Modesto for consistency with the City's Commercial and Industrial Guidelines. The project also includes a monument sign at the corner of the Kiernan Avenue and Tully Road frontage, which may be up to 24 square-feet in size and a maximum height of six feet. Landscaping in planters and one shade tree per eight parking spaces is proposed in the parking areas along with light poles, and a perimeter landscape strip is proposed along Kiernan Avenue and Tully Road, which will include large-species trees. Trees are also proposed along the southern property line. The applicant has also requested the use of parking lighting fixtures that do not exceed 32 feet above grade, instead of the County's standard allowance for 15 feet. The project is located within the City of Modesto's Local Agency Formation Commission's (LAFCO) Sphere of Influence and, as such, is subject to the City's standards. The City's standard is 15 feet; however, it does allow for a greater height if City's standards change in the future. Regardless of the height, a photometric light plan, along with light design and shielding, will be required to prevent light spill and trespass. Signage and landscaping will also be designed to comply with City of Modesto standards. No adverse impacts to the existing visual character of the site or its surroundings are anticipated.

Mitigation: None.

References: Application information; Stanislaus County Zoning Ordinance; the Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The California Department of Conservation's Farmland Mapping and Monitoring Program lists approximately 2.25 acres the project site's soil as comprised of Rural Residential Land with remaining acreage as Prime Farmland. The United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Web Soil Survey indicates that approximately 83.8% of the soil consists of Grade 2 Tujunga loamy sand, 0 to 3 percent slopes, Storie Index rating 67, which does not qualify as Prime Farmland, and 16.2% of the soil consists of Grade 1 Hanford sandy loam, 0 to 3 percent slopes, Storie Index rating 93, which qualifies as Prime Farmland.

The project site is currently planted in almonds. The closest actively farmed parcel, which is enrolled in a Williamson Act Contract, is directly to the south of the site. According to Appendix VII-A of the Stanislaus County General Plan – Buffer and Setback Guidelines, all projects shall incorporate a 150-foot wide buffer setback, and the proposed project meets this requirement. The project proposes a six-foot-high chain link fence and trees along the southern property line in order to prevent trespassing onto adjacent agricultural land. Additionally, the majority of the people intensive uses are to occur indoors, and parking lots are a permitted use within the agricultural buffer setback area. The project also meets the 150-foot buffer to the north and west, and no buffer is required to the east.

The project site is designated Urban Transition in the Land Use element of the General Plan and is zoned A-2-10 (General Agriculture). Goal 2, Policy 2.7 of the Agricultural Element states that, "Proposed amendments to the General Plan Diagram (map) that would allow the conversion of agricultural land to non-agricultural uses shall be approved only if they are consistent with the County's conversion criteria." Implementation 1, of the Agricultural Element's Policy 2.7 describes the procedures for processing amendments to the General Plan land use designation:

> *<u>Conversion Consequences</u>. The direct and indirect effects, as well as the cumulative effects, of the proposed conversion of agricultural land shall be fully evaluated.*
>
> *<u>Conversion Considerations</u>. In evaluating the consequences of a proposed amendment, the following factors shall be considered: plan designation; soil type; adjacent uses; proposed method of sewage treatment; availability of water, transportation, public utilities, fire and police protection, and other public services; proximity to existing airports and airstrips; impacts on air and water quality, wildlife habitat, endangered species and sensitive lands; and any other factors that may aid the evaluation process.*
>
> *<u>Conversion Criteria</u>. Proposed amendments to the General Plan Diagram (map) that would allow the conversion of agricultural land to urban uses shall be approved only if the Board of Supervisors makes the following findings:*
>
> *A. Overall, the proposal is consistent with the goals and policies of the General Plan.*
>
> *B. There is evidence on the record to show a demonstrated need for the proposed project based on population projections, past growth rates, and other pertinent data.*
>
> *C. No feasible alternative site exists in areas already designated for the proposed uses.*
>
> *D. Approval of the proposal will not constitute a part of, or encourage, piecemeal conversion of a larger agricultural area to non-agricultural uses and will not be growth-inducing (as used in the California Environmental Quality Act).*
>
> *E. The proposed project is designed to minimize conflict and will not interfere with agricultural operations on surrounding agricultural lands or adversely affect agricultural water supplies.*
>
> *F. Adequate and necessary public services and facilities are available or will be made available as a result of the development.*
>
> *G. The design of the proposed project has incorporated all reasonable measures, as determined during the CEQA review process, to mitigate impacts to agricultural lands, fish and wildlife resources, air quality, water quality and quantity, or other natural resources.*

According to Goal Two, Policy 2.5, Implementation Measure 1, of the General Plan's Agricultural Element, when defining the County's most productive agricultural areas, it is important to recognize that soil types alone should not be the determining factor. With modern management techniques, almost any soil type in Stanislaus County can be extremely productive. Although soil types should be considered, the designation of "most productive agricultural areas" also should be based on existing uses and their contributions to the agricultural sector of our economy. Additionally, areas considered to be "Most Productive Agricultural Areas" will not include any land within LAFCO-approved Spheres of Influence of cities. The project site is not considered to be a most productive agricultural area as it is located within the City of Modesto's Local Agency Formation Commission (LAFCO) adopted Sphere of Influence and is designated as Business Park in the City of Modesto's General Plan Land Use Diagram. Generally, urban development will only occur upon annexation to a city, but such development may be appropriate prior to annexation provided the development is not inconsistent with the land use designation of the general plan of the affected city.

A referral response was received from the Department of Conservation (DOC) requesting the use of permanent agricultural conservation easements, on land of at least equal quality and size, to compensate for the loss of agricultural land. Goal Two, Policy 2.15, Implementation Measure 1, of the Stanislaus County General Plan's Agricultural Element states that farmland mitigation should be applied consistent with the Farmland Mitigation Program Guidelines presented in Appendix "B". According to Appendix B, the Farmland Mitigation Program shall apply to any development project requiring a General Plan or Community Plan amendment from 'Agriculture' to a residential land use designation of the Stanislaus County General Plan. Accordingly, the Farmland Mitigation Program is not applicable to the proposed project as it does not include a request to amend the General Plan designation to residential.

There is no indication that this project will result in the removal of adjacent contracted land from agricultural use. There are no forest lands on or near the project site. Impacts to agriculture and forest resources are considered to be less than significant.

Mitigation: None.

References: Application information; referral response from the Department of Conservation (DOC), dated January 13, 2021; Natural Resources Conservation Service Soil Survey; Stanislaus Soil Survey (1957); California State Department of Conservation Farmland Mapping and Monitoring Program - Stanislaus County Farmland 2018; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The proposed project is located within the San Joaquin Valley Air Basin (SJVAB) and, therefore, falls under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). In conjunction with the Stanislaus Council of Governments (StanCOG), the SJVAPCD is responsible for formulating and implementing air pollution control strategies. The SJVAPCD's most recent air quality plans are the 2007 PM10 (respirable particulate matter) Maintenance Plan, the 2008 PM2.5 (fine particulate matter) Plan, and the 2007 Ozone Plan. These plans establish a comprehensive air pollution control program leading to the attainment of state and federal air quality standards in the SJVAB, which has been classified as "extreme non-attainment" for ozone, "attainment" for respirable particulate matter (PM-10), and "non-attainment" for PM 2.5, as defined by the Federal Clean Air Act. Mobile emission sources are generally regulated by the Air Resources Board of the California EPA which sets emissions for vehicles and acts on issues regarding cleaner burning fuels and alternative fuel technologies. As such, the District has addressed most criteria air pollutants through basin wide programs and policies to prevent cumulative deterioration of air quality within the Basin.

A referral response was received from the San Joaquin Valley Air Pollution Control District (SJVAPCD) indicating that emissions resulting from construction and/or operation of the project may exceed the District's thresholds of significance for carbon monoxide (CO), oxides of nitrogen (NOx), reactive organic gases (ROG), oxides of sulfur (Sox), and particulate matter (PM) and recommended a more detailed review of the project be conducted. Further, the Air District recommended that other potential air impacts related to Toxic Air Contaminants, Ambient Air Quality Standards, and Hazards and Odors be addressed.

The Air District recommended that the more detailed review of potential air impacts consider criteria pollutants for both construction and operational emissions, with a recommendation of utilizing the California Emissions Estimator Model (CalEEMod) for the basis of project analysis, health risk screening/assessment (HRA), an ambient air quality analysis (AAQA), and cumulative air impacts. The Air District response also indicated that the project is subject to District Rule 9510, which requires the development of an Air Impact Assessment (AIA), District Rule 2010 (Permits Required), Rule 2201 (New and Modified Stationary Source Review), (Rule 2301) implementation of Emission Reduction Credit Banking, District Rule 9410 (Employer Based Trip Reduction), and other applicable District permits and rules, which must be met as part of the District's Authority to Construct (ATC) permitting process.

In response to the Air District comment letter an Air Quality and Greenhouse Gas Analysis (AQA/GHG analysis) was prepared by Mitchell Air Quality Consulting, dated March 5, 2021. The AQA/GHG analysis analyzed whether the estimated criteria air pollutant and GHG emissions generated from a light industrial warehouse building of approximately 300,000 square-feet would cause significant impacts to air resources in the project area. This AQA/GHG analysis considered existing air quality conditions, construction period air quality impacts, and operational air quality impacts. The project's potential impacts on air quality during construction and operation were assessed per the San Joaquin Valley Air Pollution Control District's *Guide for Assessing and Mitigating Air Quality Impacts* (GAMAQI). The AQA/GHG analysis considered the closest sensitive receptors to be a residence located approximately 341 feet southeast the project site across Tully Road.

The project construction activities are anticipated to take place over an approximate 12-month period beginning in Fall 2021 and concluding in Fall 2022. Construction emissions result from on-site and off-site activities. On-site emissions principally consist of exhaust emissions from the activity levels of heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM10) from disturbed soil. Additionally, paving operations and application of architectural coatings would release VOC emissions. Off-site emissions are caused by motor vehicle exhaust from delivery vehicles, worker traffic, and road dust (PM10 and PM2.5). Operational or long-term emissions occur over the life of the project. Sources of emissions may include motor vehicles and trucks, energy usage, water usage, and waste generation, and area sources such as consumer products and landscaping activities. The primary pollutants of concern during project construction and operation are ROG, NOX, PM10, and PM2.5. The SJVAPCD GAMAQI adopted in 2015 contains thresholds for CO, NOX, ROG, SOX, PM10, and PM2.5. The AQA/GHG analysis found construction and operational emissions do not exceed the SJVAPCD significance thresholds for any criteria pollutant and, therefore, would result in a less than significant impact.

Regulation VIII essentially prohibits the emissions of visible dust (limited to 20-percent opacity) and requires that disturbed areas or soils be stabilized. Prior to construction, the applicant would be required to submit a dust control plan that meets the regulation requirements. These plans are reviewed by SJVAPCD and construction cannot begin until District approval is obtained. The provisions of Regulation VIII and its constituent rules pertaining to construction activities generally require effective dust suppression, stabilization of all disturbed areas of a construction site, control of fugitive dust and the tracking of mud or dirt off-site, ceasing outdoor construction and grading activities that disturb soils during periods with high winds, erosion control measures, and record keeping. Anyone who prepares or implements a Dust Control Plan must attend a training course conducted by the District. Construction sites are subject to SJVAPCD inspections under this regulation. Compliance with Regulation VIII, including the effective implementation of a Dust Control Plan that has been reviewed and approved by the SJVAPCD, would reduce dust and PM10 emissions to a less-than significant level.

Both criteria air pollutant exhaust and fugitive dust (i.e., PM10 and PM2.5) impacts from construction equipment were computed by CalEEMod, which considered the use of construction equipment, worker vehicle travel, on-site vehicle and truck use, and off-site truck travel by vendors or equipment/material deliveries. The CalEEMod default worker trip length and default vehicle fleet (LD Mix) was used for employee trips. Vendor trips for the building construction phase are calculated from a study performed by the Sacramento Metropolitan Air Quality Management District based on land use and size. The CalEEMod defaults for vendor trip length, and vehicle fleet (Heavy Duty Truck Vehicle Fleet Mix) were used.

The CalEEMod model was also used to estimate annual emissions from the operation of the project, including emissions from area, energy, mobile, and off road equipment sources. The modeling follows District guidance where applicable from its GAMAQI. The models used in this analysis are CalEEMod, version 2016.3.2 for construction and operational emissions, the SJVAPCD Health Risk Prioritization Tool, and EMFAC 2017.

Construction of the project would result in minor increases in traffic for the surrounding road network during the duration of construction. Motor vehicles accessing the site when it becomes operational would result in a relatively minor increase in daily trips that would not substantially impacts the existing level of service (LOS). The project is located in a rural location with very little traffic congestion. No congested conditions that would result in a CO hotspot were identified. In addition, the highest background eight-hour average of carbon monoxide during the latest year CO was monitored is 2.06 ppm, which is 78 percent lower than the state ambient air quality standard of 9.0 ppm. Therefore, the project would not significantly contribute to an exceedance of state or federal CO standards.

The SJVAPCD recommended preparation of a screening analysis using its health risk prioritization tool to estimate the impacts of Toxic Air Contaminants (TAC) emissions on sensitive receptors. The project will generate TAC emissions from truck travel and idling on the project site for incoming materials for fabrication and outgoing delivery trucks for finished products. The nearest off-site sensitive receptor is a residence located approximately 104 meters (341 feet) southwest of the closest truck loading dock on the project site. At this distance, the TAC emissions have dispersed to the point that concentrations and health risk are below SJVAPCD health risk thresholds. The screening tool provides results at incremental distances from the source of emissions to the receptor. The analysis conservatively assumes that all TAC sources are located within 100 meters of the sensitive receptor location even though most a substantial amount of activity would occur more distant from the receptors. The results of the screening analysis found that the total risk score is below the SJVAPCD threshold for requiring a health risk assessment using dispersion modeling.

The project is expected to have a painting/coating operation and is located within one mile of sensitive receptors. The project could generate odors from operation of diesel trucks and equipment on the project site. The nearest off-site sensitive receptor is located approximately 341 feet southwest of the project site. The project site is currently used as an almond orchard where the use of diesel equipment and organic chemicals are common and accepted as part of the existing environment. The area surrounding the project site is sparsely populated. The expected project tenant (Jackrabbit) currently operates an agricultural equipment designing and fabricating facility in Modesto and Ripon. Both operations will be relocating to the project site. The existing facility does not have a history of odor complaints; therefore, it is unlikely to generate odor complaints at its new location. In addition, the project site is in a growing industrial area where this type of use is typical. Therefore, the project would not expose substantial numbers of people to objectionable odors. During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and not likely to be noticeable for extended periods of time much beyond the project site's boundaries. The potential for diesel odor impacts is, therefore, less-than significant.

The Air Quality and Greenhouse Gas Analysis did not identify any mitigation measures beyond compliance with mandatory regulations and found that the project would have less than significant for air quality, health risk, and GHG impacts.

Mitigation: None.

References: Application information; referral response received from the San Joaquin Air Pollution Control District (SJVAPCD), dated January 26, 2021; San Joaquin Valley Air Pollution Control District - Regulation VIII Fugitive Dust/PM-10 Synopsis; www.valleyair.org; Air Quality and Greenhouse Gas Analysis conducted by Mitchell Air Quality Consulting, dated March 5, 2021; and the Stanislaus County General Plan and Support Documentation.[1]

IV. BIOLOGICAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			**X**	
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?			**X**	
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?			**X**	
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			**X**	

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?			X	

Discussion: The project is located within the Salida Quad of the California Natural Diversity Database (CNDDB). There are six species which are state or federally listed, threatened, or identified as species of special concern within the Salida California Natural Diversity Database Quad. These species include the California tiger salamander, Swainson's hawk, tricolored blackbird, steelhead, Crotch bumble bee, and valley elderberry longhorn beetle. There is a low likelihood that these species are present on the project site as the land is vacant/disturbed and developed with an orchard and the surrounding area has been disturbed/developed.

The project will not conflict with a Habitat Conservation Plan, a Natural Community Conservation Plan, or other locally approved conservation plans. Impacts to endangered species or habitats, locally designated species, or wildlife dispersal or mitigation corridors are considered to be less than significant.

An early consultation was referred to the California Department of Fish and Wildlife (formerly the Department of Fish and Game) and no response was received.

Mitigation: None.

References: Application information; California Department of Fish and Wildlife's Natural Diversity Database Quad Species List; Stanislaus County General Plan and Support Documentation.[1]

V. CULTURAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a historical resource pursuant to in § 15064.5?			X	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?			X	
c) Disturb any human remains, including those interred outside of formal cemeteries?			X	

Discussion: It does not appear this project will result in significant impacts to any archaeological or cultural resources. A records search formulated by the Central California Information Center (CCIC) indicated that there was a low probability of discovery of historical resources on-site; nor have any cultural resources been discovered or reported in the immediate vicinity. The project was referred to tribal governments, as required by SB 18, and no responses have been received to date. No Tribes have requested project consultations, as regulated by and AB 52. A development standard regarding the discovery of cultural resources during the construction process will be added to the project.

Mitigation: None.

References: Application information; Central California Information Center Report for the project site, dated August 10, 2018; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The CEQA Guidelines Appendix F states that energy consuming equipment and processes, which will be used during construction or operation such as: energy requirements of the project by fuel type and end use, energy conservation equipment and design features, energy supplies that would serve the project, total estimated daily vehicle trips to be generated by the project, and the additional energy consumed per trip by mode, shall be taken into consideration when evaluating energy impacts. Additionally, the project's compliance with applicable state or local energy legislation, policies, and standards must be considered.

The request includes the construction of a 300,000 square-foot building for various light industrial uses. The proposed hours of operation are 24 hours a day, seven days a week, with 250 people on a maximum shift, and three shifts per day. A maximum of 25 daily customers and 1,488 truck/vehicle trips are anticipated per day. The trip generation estimate considers the "worst case" scenario for a variety of light industrial uses.

SB 350 requires utilities to subject to the legislation will be required to increase their renewable energy mix from 33% in 2020 to 50% in 2030 (now 60% under SB 100) and the project will purchase electricity from a utility subject to the SB 350 Renewable Mandate.

The state's regulatory program is able to target both new and existing development because the two most important strategies—motor vehicle fuel efficiency and emissions from electricity generation— obtain reductions equally from existing and new sources. This is because all vehicle operators use cleaner low carbon fuels and buy vehicles subject to the fuel efficiency regulations, and all building owners or operators purchase cleaner energy from the grid that is produced by increasing percentages of renewable fuels. This includes regulations on mobile sources, such as the Pavley standards, that apply to all vehicles purchased in California; the LCFS that applies to all fuel used in California; and the Renewable Portfolio Standard and Renewable Energy Standard that apply to utilities providing electricity to all California homes and businesses. The project building would be constructed after 2020 and would be required to comply with 2019 Title 24 standards, which will be applied as a development standard.

An Air Quality and Greenhouse Gas Analysis (AQA/GHG analysis) was prepared by Mitchell Air Quality Consulting, dated March 5, 2021, and found that the maximum daily operational emissions for the area of energy would not exceed the SJVAPCD significance thresholds for localized criteria pollutant impacts and would result in a less than significant impact.

Mitigation: None.

References: Application information; Air Quality and Greenhouse Gas Analysis conducted by Mitchell Air Quality Consulting, dated March 5, 2021; referral response from the San Joaquin Valley Air Pollution Control District (SJVAPCD), dated January 26, 2021; 2016 California Green Building Standards Code Title 24, Part 11(Cal Green); and 2016 California Energy Code Title 24, Part 6.

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

Discussion: The United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Web Soil Survey indicates that the soil consists of Delhi sand, 0 to 3 percent slopes and Tujunga loamy sand, 0 to 3 percent slopes. As contained in Chapter 5 of the General Plan Support Documentation, the areas of the County subject to significant geologic hazard are located in the Diablo Range, west of Interstate 5; however, as per the California Building Code, all of Stanislaus County is located within a geologic hazard zone (Seismic Design Category D, E, or F), and a soils test may be required at building permit application. Results from the soils test will determine if unstable or expansive soils are present. If such soils are present, special engineering of the structure will be required to compensate for the soil deficiency. Any structures resulting from this project will be designed and built according to building standards appropriate to withstand shaking for the area in which they are constructed.

A referral response was received from the Department of Public Works indicated that a grading, drainage, and erosion/sediment control plan for the project will be required, subject to Public Works review and Standards and Specifications. A referral response was also received from the Department of Environmental Resources (DER), regarding requirements for the on-site wastewater treatment system. These comments will be added as development standards.

The project site is not located near an active fault or within a high earthquake zone. Landslides are not likely due to the flat terrain of the area.

DER, Public Works, and the Building Permits Division review and approve any building or grading permits to ensure their standards are met.

Mitigation: None.

References: Referral response from the Department of Environmental Resources (DER), dated January 20, 2021; referral response from the Department of Public Works, dated January 11, 2021 and revised on April 19, 2021; USDA National Resources Conservation District Web Soil Survey; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The principal Greenhouse Gasses (GHGs) are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), and water vapor (H2O). CO2 is the reference gas for climate change because it is the predominant greenhouse gas emitted. To account for the varying warming potential of different GHGs, GHG emissions are often quantified and reported as CO2 equivalents (CO2e). In 2006, California passed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] No. 32), which requires the California Air Resources Board (ARB) design and implement emission limits, regulations, and other measures, such that feasible and cost-effective statewide GHG emissions are reduced to 1990 levels by 2020. Two additional bills, SB 350 and SB32, were passed in 2015 further amending the states Renewables Portfolio Standard (RPS) for electrical generation and amending the reduction targets to 40% of 1990 levels by 2030.

Under its mandate to provide local agencies with assistance in complying with CEQA in climate change matters, the SJVAPCD developed its Guidance for Valley Land-Use Agencies in Addressing GHG Emissions Impacts for New Projects under CEQA. As a general principal to be applied in determining whether a proposed project would be deemed to have a less-than significant impact on global climate change, a project must be in compliance with an approved GHG emission reduction plan that is supported by a CEQA-compliant environmental document or be determined to have reduced or mitigated GHG emissions by 29 percent relative to Business-As-Usual conditions, consistent with GHG emission reduction targets established in ARB's Scoping Plan for AB 32 implementation. The SJVAPCD guidance is intended to streamline the process of determining if project specific GHG emissions would have a significant effect. The proposed approach relies on the use of performance-based standards and their associated pre-quantified GHG emission reduction effectiveness (Best Performance Standards, or BPS). Establishing BPS is intended to help project proponents, lead agencies, and the public by proactively identifying effective, feasible mitigation measures. Emission reductions achieved through implementation of BPS would be pre-quantified, thus reducing the need for project specific quantification of GHG emissions. For land use development projects, BPS would include emissions reduction credits for such project features as bicycle racks, pedestrian access to public transit, and so forth.

A referral response was received from the San Joaquin Valley Air Pollution Control District (SJVAPCD) requested that air impacts from the project be further evaluated. In response to the SJVAPCD comment letter an Air Quality and Greenhouse Gas Analysis (AQA/GHG analysis) was prepared by Mitchell Air Quality Consulting, dated March 5, 2021, which included an analysis of the greenhouse gas impacts from the proposed project. CalEEMod was used to quantify GHG emissions from project operations-related activities in 2022 and 2030. The project land use types and size and other project-specific information were input to the model. The use of this model for evaluating emissions from land use projects is recommended by the Air District. CalEEMod provides emissions for transportation, areas sources, electricity consumption, natural gas combustion, electricity usage associated with water usage and wastewater discharge, and solid waste land filling and transport. Annual GHG emissions associated with construction were computed at 243.3 and 852.7 metric tons (MT) of CO2e for 2021 and 2022, respectively. These are the emissions from on-site operation of construction equipment, vendor and hauling truck trips, and worker trips. Neither the County nor SJVAPCD have an adopted threshold of significance for construction related GHG emissions. However, other air districts, account for construction GHG emissions by amortizing them over a 30-year period (i.e., adding 1/30th of construction emissions to annual operational emissions). This amortization method was applied in the calculation of project GHG emissions. The CalEEMod model predicted annual emissions associated with operation of the fully developed project. In 2022, annual emissions are calculated to be 2,269.96 MT of CO2e, and 2030 project emissions are calculated to be 1,735.72 MT of CO2e. The project would achieve a reduction of 22.3 percent from BAU by the year 2022 with regulations incorporated. This is 0.6 percent above the 21.7 percent average reduction from all sources of GHG emissions now required to achieve AB 32 targets. The ARB originally identified a reduction of 29 percent from BAU as needed to achieve AB 32 targets and used to develop the SJVAPCD BAU threshold. The 2008 recession and slower growth in the years since 2008 have reduced the growth forecasted for 2020, and the amount needed to be reduced to achieve 1990 levels as required by AB 32. The results show that the project would achieve a 40.6 percent reduction from BAU by 2030. This is 18.9 percent beyond the average reduction required by the state from all sources to achieve the AB 32 target.

The 2016 California Green Building Standards Code (CALGreen Code) went into effect on January 1, 2017, and includes mandatory provisions applicable to all new residential, commercial, and school buildings. The intent of the CALGreen Code is to establish minimum statewide standards to significantly reduce the greenhouse gas emissions from new construction. The Code includes provisions to reduce water use, wastewater generation, and solid waste generation, as well as requirements for bicycle parking and designated parking for fuel-efficient and carpool/vanpool vehicles in commercial development. The code also requires mandatory inspections of building energy systems for non-residential buildings over 10,000 square-feet to ensure that they are operating at their design efficiencies. It is the intent of the CALGreen Code that buildings constructed pursuant to the Code achieve at least a 15 percent reduction in energy usage when compared to the state's mandatory energy efficiency standards contained in Title 24. The Code also sets limits on VOCs (volatile organic compounds) and formaldehyde content of various building materials, architectural coatings, and adhesives. With the requirements of meeting the Title 24, Green Building Code energy impacts from the project are considered to be less-than significant. A development standard will be added to this project to address compliance with Title 24, Green Building Code, which includes energy efficiency requirements.

Senate Bill 743 (SB743) requires that the transportation impacts under the California Environmental Quality Act (CEQA) evaluate impacts by using Vehicle Miles Traveled (VMT) as a metric. Stanislaus County has currently not adopted any significance thresholds for VMT, and projects are treated on a case-by-case basis for evaluation under CEQA. However, the State of California - Office of Planning and Research (OPR) has issued guidelines regarding VMT significance under CEQA. One of the guidelines, presented in the December 2018 document Technical Advisory on Evaluating Transportation Impacts in CEQA, states that locally serving retail would generally redistribute trips from other local uses, rather than generate new trips. The expected project tenant (Jackrabbit) currently operates an agricultural equipment designing and fabricating facility in Modesto and Ripon. Both operations that will be relocated to the project site. The proposed project fits this description of locally-serving retail and therefore is presumed to create a less-than significant transportation impact related to VMT.

Impacts associated with Greenhouse Gas Emissions are expected to have a less-than significant impact.

Mitigation: None.

References: Referral response from the San Joaquin Valley Air Pollution Control District (SJVAPCD), dated January 26, 2021; Air Quality and Greenhouse Gas Analysis conducted by Mitchell Air Quality Consulting, dated March 5, 2021; Stanislaus County General Plan and Support Documentation.[1]

IX. HAZARDS AND HAZARDOUS MATERIALS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			**X**	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			**X**	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			**X**	

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?				X
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?			X	

Discussion: Jack Rabbit, a designer and fabricator of agricultural equipment, is the expected tenant but may not be the end user. Regardless, Chapter 6.95 of the California Health and Safety Code requires businesses that use, handle, or store hazardous materials above an identified threshold to submit a Hazardous Materials Business Plan. The applicant is required to use, store, and dispose of any hazardous materials in accordance with all applicable federal, state, and local regulations. The Hazardous Materials (Haz Mat) Division of the Department of Environmental Resources (DER) conducts routine inspections at businesses required to submit Business Plans in order to ensure compliance with existing laws and regulations. Permitting and compliance with Haz Mat's requirements will be applied as a development standard for the project.

Pesticide exposure is a risk in areas located in the vicinity of agriculture. Sources of exposure include contaminated groundwater, which is consumed, and drift from spray applications. Application of sprays is strictly controlled by the Agricultural Commissioner and can only be accomplished after first obtaining permits. Additionally, agricultural buffers are intended to reduce the risk of spray exposure to surrounding people. The project was referred to the Stanislaus County Agricultural Commissioner, and no comments have been received to date.

The project site is not listed on the EnviroStor database managed by the CA Department of Toxic Substances Control or within the vicinity of any airport. The groundwater is not known to be contaminated in this area. The project does not interfere with the Stanislaus County Local Hazard Mitigation Plan, which identifies risks posed by disasters and identifies ways to minimize damage from those disasters. The site is located in a Local Responsibility Area (LRA) for fire protection and is served by Salida Fire Protection District. The project was referred to the District, who responded with comments which will be added as development standards.

As a result of the development standards required for this project, impacts associated with Hazards and Hazardous Materials are expected to have a less-than significant impact.

Mitigation: None.

References: Application information; referral response from the Stanislaus County Environmental Review Committee (ERC), dated January 14, 2021; referral response from the Salida Fire Protection District, dated January 21, 2021; Department of Toxic Substances Control's data management system (EnviroStar); California Health and Safety Code; Stanislaus County Airport Land Use Compatibility Plan; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: Areas subject to flooding have been identified in accordance with the Federal Emergency Management Act (FEMA). The project site is located in FEMA Flood Zone X, which includes areas determined to be outside the 0.2% annual chance floodplains. All flood zone requirements will be addressed by the Building Permits Division during the building permit process. On-site areas subject to flooding have not been identified by the Federal Emergency Management Agency and/or County designated flood areas.

By virtue of the proposed construction, the current absorption patterns of water upon this property will be altered; however, current standards require that all of a project's storm water be maintained on-site. The project is proposing to utilize an existing drainage basin on the adjacent parcel to the east and, as such, a drainage easement, as requested by the Department of Public Works, will be included in this project's development standards.

A referral response received from the Central Valley Regional Water Quality Control Board (RWQCB) provided a list of the Board's permits and programs that may be applicable to the proposed project. The developer will be required to contact RWQCB to determine which permits/standards must be met prior to construction as a development standard.

The Sustainable Groundwater Management Act (SGMA) was passed in 2014 with the goal of ensuring the long-term sustainable management of California's groundwater resources. SGMA requires agencies throughout California to meet certain requirements including forming Groundwater Sustainability Agencies (GSA), developing Groundwater Sustainability Plans (GSP), and achieving balanced groundwater levels within 20 years. The site is located in the Modesto Sub-basin under the jurisdiction of the Stanislaus and Tuolumne Rivers Groundwater Basin Association (STRGBA) GSA. The STRGBA GSA and Tuolumne GSA are collaboratively developing one GSP for the Modesto Sub-basin. As the Modesto Sub-basin is considered a high and medium priority basin not currently in overdraft, the GSP has not been drafted and is not required to be adopted until January 31, 2022.

Stanislaus County adopted a Groundwater Ordinance in November 2014 (Chapter 9.37 of the County Code, hereinafter, the "Ordinance") that codifies requirements, prohibitions, and exemptions intended to help promote sustainable groundwater extraction in unincorporated areas of the County. The Ordinance prohibits the unsustainable extraction of groundwater and makes issuing permits for new wells, which are not exempt from this prohibition, discretionary. For unincorporated areas covered in an adopted GSP pursuant to SGMA, the County can require holders of permits for wells it reasonably concludes are withdrawing groundwater unsustainably to provide substantial evidence that continued operation of such wells does not constitute unsustainable extraction and has the authority to regulate future groundwater extraction. The adjacent parcel to the east has an existing Public Water System, which the project is proposing to connect to and will trigger an amendment to the existing Public Water System. Prior the installation of any water infrastructure for the site, the property owner must obtain concurrence from the State of California Water Resources Control Board (SWRCB), Drinking Water Division, in accordance to CHSC, Section 116527 (SB1263) and submit an application for a water supply permit if necessary with the associated technical report to Stanislaus County DER. If the applicant is required to install a water treatment system, it will be required to be approved by the Regional Water Quality Control Board and the Department of Environmental Resources. Additionally, water supply permits require on going testing. Development standards will be placed on the project to address these issues. There are no additional wells proposed as part of this request.

Although no connection to the City of Modesto for water is available, a referral response from the City was received stating that a Will Serve letter and an Outside Service Agreement shall be obtained, and connection fees paid to the City prior to any connection to the City's utility mains, should it become available. These comments will be applied as a development standard.

The project proposes to utilize an on-site septic system. A referral response from DER stated that the project's on-site wastewater treatment system (OWTS) will be required to meet Measure X septic and Local Agency Management Program (LAMP) standards. LAMP standards include minimum setbacks from wells to prevent negative impacts to groundwater quality.

Although the site is located in the Modesto Irrigation District, the site does not currently receive water from the District and will be required to contact MID to request a Sign-Off of Irrigation Facilities form for the parcel.

As a result of the development standards required for this project, impacts associated with drainage, water quality, and runoff are expected to have a less than significant impact.

Mitigation: None.

References: Application information; referral response from the Department of Environmental Resources (DER), dated January 20, 2021; referral response from the Central Valley Regional Water Quality Control Board (RWQCB), dated January 22, 2021; referral response from the City of Modesto, dated February 10, 2021; referral response from the Modesto Irrigation District (MID), dated April 9, 2019; referral response from the Department of Public Works, dated January 11, 2021 and revised on April 19, 2021; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The project is a request to amend the General Plan and zoning designations of a 17.16-acre parcel from Urban Transition and A-2-10 (General Agriculture) to P-D (Planned Development), to allow the construction of a 300,000 square-foot building for various light industrial uses. The proposed hours of operation are 24 hours a day, seven days a week, with 250 people on a maximum shift, and three shifts per day. A maximum of 25 daily customers and 1,488 truck/vehicle trips are anticipated per day. The project proposes to share access, and to connect to the existing public water system and storm water basin, located on the adjacent site to the east, which is zoned P-D (131). The proposed building will be served by an on-site septic system. A reciprocal access agreement will be recorded for the adjacent parcel. A six-foot-tall chain link-fence is proposed along the south and east property lines, and a six-foot-tall wrought iron fence is proposed along the north and west property lines along the site's road frontage. The project also includes a proposed monument sign at the corner of the Kiernan Avenue and Tully Road frontage, which may be up to 24 square-feet in size and a maximum height of six feet. Landscaping in planters and one shade tree per eight parking spaces is proposed in the parking areas along with light poles, and a perimeter landscape strip is proposed along Kiernan Avenue and Tully Road, which will include large-species trees. Trees are also proposed along the southern property line. The applicant has also requested the use of parking lighting fixtures that do not exceed 32 feet above grade, instead of the County's standard allowance for 15 feet. The project is located within the City of Modesto's Local Agency Formation Commission's (LAFCO) Sphere of Influence and, as such, is subject to the City's standards. The City's standard is 15 feet; however, it does allow for a greater height if City's standards change in the future. Regardless of the height, a photometric light plan, along with light design and shielding, will be required to prevent light spill and trespass. Signage and landscaping will also be designed to comply with City of Modesto standards. The project proposes to include parking lot lighting, landscaping, and signage per the City standards. The project site has access to County-maintained Tully Road and Kiernan Avenue, via the shared access on the adjacent parcel to the east.

The project will not physically divide an established community nor conflict with any habitat conservation plans.

The project site is currently planted in almonds. The closest actively farmed parcel, which is enrolled in a Williamson Act Contract, is directly to the south of the site. According to Appendix VII-A of the Stanislaus County General Plan – Buffer and Setback Guidelines, all projects shall incorporate a 150-foot wide buffer setback, and the proposed project meets this requirement. The project proposes a six-foot-high chain link fence and trees along the southern property line in order to prevent trespassing onto adjacent agricultural land. Additionally, the majority of the people intensive uses are to occur indoors, and parking lots are a permitted use within the agricultural buffer setback area. The project also meets the 150-foot buffer to the north and west, and no buffer is required to the east.

The Land Use Element describes the Planned Development designation as a designation intended for land which, because of demonstrably unique characteristics, may be suitable for a variety of uses without detrimental effects on other property. As discussed in Section II – Agriculture and Forest Resources, the Land Use Element also requires that the Agricultural Element's Conversion Criteria (Goal 2, Policy 2.7) be met when converting agricultural land to non-agricultural uses. According to Goal Two, Policy 2.5, Implementation Measure 1, of the General Plan's Agricultural Element, when defining the County's most productive agricultural areas, it is important to recognize that soil types alone should not be the determining factor. With modern management techniques, almost any soil type in Stanislaus County can be extremely productive. Although soil types should be considered, the designation of "most productive agricultural areas" also should be based on existing uses and their contributions to the agricultural sector of our economy. Additionally, areas considered to be "Most Productive Agricultural Areas" will not include any land within LAFCO-approved Spheres of Influence of cities. The project site is not considered to be a most productive agricultural area as it is located within the City of Modesto's Local Agency Formation Commission (LAFCO) adopted Sphere of Influence and is designated as Business Park in the City of Modesto's General Plan Land Use Diagram. Generally, urban development will only occur upon annexation to a city, but such development may be appropriate prior to annexation provided the development is not inconsistent with the land use designation of the general plan of the affected city.

As stated by the Introduction to the General Plan, General Plan Amendments affect the entire County and any evaluation must give primary concern to the County as a whole; therefore, a fundamental question must be asked in each case: "Will this amendment, if adopted, generally improve the economic, physical and social well-being of the County in general?" Additionally, the County in reviewing General Plan amendments shall consider how the levels of public and private service might be affected; as well as how the proposal would advance the long-term goals of the County. In each case, in order to take affirmative action regarding a General Plan Amendment application, it must be found that the General Plan Amendment will maintain a logical land use pattern without detriment to existing and planned land uses and that the County and other affected government agencies will be able to maintain levels of service consistent with the ability of the government agencies to provide a reasonable level of service. In the case of a proposed amendment to the Land Use diagrams of the Land Use Element, an additional finding that the amendment is consistent with the goals and policies of the General Plan must also be made. Additionally, Goal 2 of the Land Use Element aims to ensure compatibility between land uses.

To approve a Rezone, the Planning Commission must find that it is consistent with the General Plan. Pursuant to the General Plan, land within a Planned Development designation should be zoned A-2 (General Agriculture) until development occurs through Planned Development zoning.

The Stanislaus County General Plan Sphere of Influence policy states, that development, other than agricultural uses and churches, which requires discretionary approval from incorporated cities, shall be referred to the that city for preliminary approval. The project shall not be approved by the County unless written communication is received from the city memorializing their approval. If approved by the city, the city should specify what development standards are necessary to ensure that development will comply with city development standards. Approval from a city does not preclude the County's decision-making bodies from exercising discretion, and it may either approve or deny the project.

The project site is located in the LAFCO adopted Sphere of Influence for the City of Modesto. A referral response was received from the City requesting an Outside Service Agreement for connection to City water, a traffic study to confirm the center lane on Tully Road is long enough to accommodate proposed truck traffic, parking lot and signage requirements, and landscaping and screening along perimeter of the site. These requests will be added to the development standards for the project.

Mitigation: None.

References: Application information; referral response from the City of Modesto, dated February 10, 2021; Stanislaus County General Plan and Support Documentation.[1]

XII. MINERAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?			**X**	
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?			**X**	

Discussion: The location of all commercially viable mineral resources in Stanislaus County has been mapped by the State Division of Mines and Geology in Special Report 173. There are no known significant resources on the site, nor is the project site located in a geological area known to produce resources.

Mitigation: None.

References: Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The Stanislaus County General Plan identifies noise levels up to 70 dB Ldn (or CNEL) as the normally acceptable level of noise for industrial, manufacturing, utilities, and agriculture uses. On-site grading and construction resulting from this project may result in a temporary increase in the area's ambient noise levels; however, noise impacts associated with on-site activities and traffic are not anticipated to exceed the normally acceptable level of noise. The site itself is impacted by the noise generated from State Route 219. Additionally, the operational work is to occur indoors. The proposed hours of operation are 24 hours a day, seven days a week, with 250 people on a maximum shift, and three shifts per day. A maximum of 25 daily customers and 1,488 truck/vehicle trips are anticipated per day. Development standards will be placed on the project to ensure compliance with the General Plan's Noise Element and Chapter 10.46 of the County Code – Noise Control. With these development standards in place, noise impacts are expected to be less than significant.

The site is not located within an airport land use plan.

Mitigation: None.

References: Application information; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The site is not included in the vacant sites inventory for the 2016 Stanislaus County Housing Element, which covers the 5th Cycle Regional Housing Needs Allocation (RHNA) for the county and will therefore not impact the County's ability to meet their RHNA. No population growth will be induced, nor will any existing housing be displaced as a result of this project.

Mitigation: None.

References: Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: The County has adopted Public Facilities Fees, as well as Fire Facility Fees on behalf of the appropriate fire district, to address impacts to public services. All adopted public facility fees will be required to be paid at the time of building permit issuance.

This project was circulated to all applicable: school, fire, police, irrigation, public works departments, and districts during the Early Consultation referral period, and no concerns were identified with regard to public services. A referral response was received from Salida Fire indicating that all construction must comply with current adopted Fire Code, including the payment of fire service impact mitigation fees, on-site water supply and infrastructure for fire protection, and emergency vehicle access. Additionally, the applicant is required to form or annex into a Community Services District to provide for operational services.

As stated earlier, the project site is located in the LAFCO adopted Sphere of Influence for the City of Modesto. No connection to the City is currently proposed or available. As part of a referral response, the City requested a Will Serve letter and an Outside Service Agreement for the water connection to City water, and connection fees paid to the City prior to any connection to the City's utility mains when they become available, which will be applied as a development standard.

This project was circulated to all applicable school, fire, police, irrigation, and public works departments and districts during the Early Consultation referral period and no concerns were identified with regard to public services.

Mitigation: None.

References: Referral response from the City of Modesto, dated February 10, 2021; referral response from Salida fire Protection District, dated January 21, 2021; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: This project will not increase demands for recreational facilities, as such impacts typically are associated with residential development.

Mitigation: None.

References: Stanislaus County General Plan and Support Documentation.[1]

XVII. TRANSPORTATION-- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			**X**	
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?			**X**	

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
d) Result in inadequate emergency access?			X	

Discussion: A referral response was received from Stanislaus County Public Works, the California Department of Transportation (Caltrans), and the City of Modesto indicating that potential traffic and transportation impacts should be further evaluated. Accordingly, a Traffic Impact Analysis (TIA) was prepared by KD Anderson & Associates, Inc., dated February 19, 2021.

The Traffic Impact Analysis (TIA) evaluated the potential project impacts associated with the proposed project. The project would have two points of access. An existing driveway on Kiernan Avenue roughly 1,750 feet east of Tully Road is available, and a new driveway at the southern end of the project's Tully Road frontage roughly 600 feet from Kiernan Avenue is proposed. The Kiernan Avenue access will be limited to right turns only. Full access is proposed on Tully Road, recognizing that the City of Modesto will provide direction on access controls and that long-term plans for ultimate Tully Road/Kiernan Avenue improvements under City design standards would limit this access to right turns only.

The TIA estimated that the project would generate a total of approximately 1,488 daily trips, with 210 trips in the a.m. peak hour and 189 trips in the p.m. peak hour. Similarly, while truck traffic will vary with the individual user, trucks are expected to comprise 5% of the peak hour trip generation. This estimate assumed 100% occupancy by light industrial users, and the forecast would be lower if the specific characteristics of the Jackrabbit Manufacturing operation, a designer and fabricator or agricultural equipment, were assumed. Truck trips are currently expected to be about one to two semi-trucks per day for steel delivery, about zero to two semi-trucks per day for large parts delivery, about one to two box trucks per day for parts delivery, and about two to four van deliveries per day from FedEx or UPS. During the harvest season, customer trips could be up to 25 per day. During the off-season, this would be reduced to about zero to two per day. With each truck generating two trips (one inbound and one outbound), truck activity could total 20 daily trips in the off-season and 70 daily trips in the harvest season. Altogether, if 200 employees are at the site, then Jackrabbit Manufacturing likely generates about 420 daily trips in the off season and 470 daily trips during harvest season.

The TIA's evaluation of existing conditions indicates that all intersections in the study area operate LOS C or better during peak hours and satisfy the minimum requirements for locations in Stanislaus County within the City of Modesto Sphere of Influence (i.e., LOS D). Projected peak hour queues can be accommodated within available storage at intersections. The addition of project traffic to the study area street system does not result in any location operating with a Levels of Service that exceed the minimum LOS D standard.

A review of the existing plus project volumes found that the addition of project traffic to the study area street system does not result in any location operating with a Levels of Service that exceed the minimum LOS D standard.

The Project TIA presents an evaluation of future cumulative conditions. Cumulative conditions are typically comprised of existing traffic plus traffic generated by other known future developments. Approved projects that remain to be developed within the study area were identified by City of Modesto and County staff. These projects include an approved 96,000 square feet industrial building adjoining the proposed project that would share access with the proposed project as well as a church on Tully Road and the Woodglen Residential area between Carver Road and Tully Road. Development of these projects would not result in conditions in excess of adopted standards for LOS or queuing. While the addition of trips from the proposed project increase the length of delays, applicable LOS and queuing standards will continue to be satisfied.

The project proposes to make use on an existing 30-foot encroachment on SR 219 (Kiernan Avenue) located roughly 1,750 feet east of Tully Road. This driveway is currently used by an existing industrial use and RV Storage. The RV Storage will be replaced by an approved 96,000 square feet industrial building, as noted in the discussion of Approved projects. That project was conditioned by Stanislaus County to install a raised "pork chop" island in the driveway in order to enforce the existing right turn only limitation. While separate deceleration and acceleration lanes are not provided, the paved shoulder along SR 219 in this area is 12 feet. This area can be used by trucks assuming that the pavement section is adequate for truck traffic, thus mitigating for the absence of dedicated turn lanes. Installing the right turn only driveway median will change the situation slightly. As is evident at the Tunson Road encroachment on the north side of SR 219 directly opposite this location, additional widening is needed to accommodate the turning requirements of trucks outside of the median area. Incorporation of a similar design that is sized to handle the applicable design vehicle is recommended. However, it is likely that this feature could require widening the encroachment beyond the existing 30 feet, and if so, and a modification to the existing encroachment permit or a new permit may be required.

The project also proposes access to Tully Road in a location at the southern property limit roughly 600 feet beyond Kiernan Avenue. A Two-Way Left-Turn (TWLT) lane exists in this area. The driveway is 40 feet wide and proposes 50-foot return radii. Because this portion of Tully Road is within the City's Sphere of influence Stanislaus County generally defers to the City of Modesto for guidance on access design. In this case, the ultimate plan for Tully Road/Kiernan Avenue improvements is guided by standard plan detail No. 361 which indicates the length of turn lanes and transitions. That detail indicates that the combination of northbound left turn lanes and their transition areas will extend for roughly 600 feet. While right turn only access onto Tully Road will ultimately be required, the feasibility of full access on an interim basis has been assessed. Overall, full access will be feasible in the near term because there is room for concurrent northbound and southbound left turns in the TWLT lane.

The development standards required by Public Work's include a limitation of parking, loading, or the unloading of vehicles within the County right-of-way; installation of any signs and/or marking, if determined to be needed by the Department of Public Works; obtainment of encroachment permits; and the recordation of a drainage and access easement. Additionally, prior to the issuance of any building or grading permit associated with this project, a grading, drainage, and erosion/sediment control plan for the project site shall be submitted that includes drainage calculations and enough information to verify that runoff from project will not flow onto adjacent properties and Stanislaus County road right-of-way and is in compliance with the current State of California National Pollutant Discharge Elimination System (NPDES) General Construction Permit. All of these requirements will be applied to the project as development standards.

Senate Bill 743 (SB743) requires that the transportation impacts under the California Environmental Quality Act (CEQA) evaluate impacts by using Vehicle Miles Traveled (VMT) as a metric. Stanislaus County has currently not adopted any significance thresholds for VMT, and projects are treated on a case-by-case basis for evaluation under CEQA. However, the State of California - Office of Planning and Research (OPR) has issued guidelines regarding VMT significance under CEQA. One of the guidelines, presented in the December 2018 document Technical Advisory on Evaluating Transportation Impacts in CEQA, states that locally serving retail would generally redistribute trips from other local uses, rather than generate new trips. With the implementation of SB 743 and the use of VMT as the applicable metric, CEQA analysis no longer considers change to operating Level of Service as a "significance" criteria. However, the TIA asserts that the following can be used for determining consistency with the General Plan on Stanislaus County facilities: A significant project inconsistency is defined to occur at a signalized or un-signalized intersection if the addition of project traffic causes an intersection operating at an acceptable level (LOS D or better) to degrade to an unacceptable level (LOS E or worse); or an increase in control delay of more than five (5.0) seconds at an approach/movement at a signalized or un-signalized intersection that currently operates at an unacceptable level.

The TIA was referred to the City of Modesto, Public Works, and Caltrans for review. No concerns regarding the TIA methodology or findings were raised by Public Works and Caltrans responded with a request for an encroachment permit, if applicable, which will be added as a development standard. No response has been received from the City to date.

The TIA found that the addition of project trips does not result in any location operating with Level of Service that exceeds the LOS D minimum, and while it will increase the length of queues occurring during peak periods in key turn lanes, projected queue lengths are not expected to exceed available storage. Additionally, the project trips are not expected to warrant a new traffic signal. Impacts associated with Transportation are expected to have a less-than significant impact with development standards in place.

Mitigation: None.

References: Referral response from the City of Modesto, dated February 10, 2021; referral response from Caltrans, dated January 27, 2021, and email response dated April 5, 2021; referral response from Public Works, dated January 11, 2021, and revised on April 19, 2021; Traffic Impact Analysis (TIA) prepared by KD Anderson & Associates, Inc., dated February 19, 2021; Stanislaus County General Plan and Support Documentation.[1]

XVIII. TRIBAL CULTURAL RESOURCES -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California native American tribe, and that is:			X	
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			X	
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set for the in subdivision (c) of Public Resource Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.			X	

Discussion: As this project is a General Plan Amendment it was referred to the tribes listed with the Native American Heritage Commission (NAHC), in accordance with SB 18. No tribes responded with a request for consultation or with any project comments. Tribal notification of the project was not referred to any tribes in conjunction with AB 52 requirements, as Stanislaus County has not received any requests for consultation from the tribes listed with the NAHC.

A records search conducted by the Central California Information Center (CCIC) stated that no historical, cultural, or archeological resources have been reported for the site and that the site has a low sensitivity for the discovery of such resources. Additionally, a development standard regarding the discovery of cultural resources during the construction process will be added to the project. Accordingly, impacts to tribal cultural resources is considered to be less-than significant.

Mitigation: None.

References: Central California Information Center Report for the project site, dated August 10, 2018; Stanislaus County General Plan and Support Documentation.[1]

XIX. UTILITIES AND SERVICE SYSTEMS -- Would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			X	
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?			X	

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?			X	
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?			X	

Discussion: Limitations on providing services have not been identified. The project proposes to share access, and to connect to the existing public water system and stormwater basin, located on the adjacent site to the east, which is zoned P-D (131). The proposed building will be served by an on-site septic system. A reciprocal access agreement will be recorded for the adjacent parcel. While the project does not currently propose to connect to the City of Modesto for water, a referral response received from the City stated that a Will Serve letter and an Outside Service Agreement shall be obtained from the City for the water connection to City water, and connection fees paid to the City prior to any connection to the City's utility mains. A referral response from the Department of Environmental Resources (DER) stated that the project's on-site wastewater treatment system (OWTS) will be required to meet Measure X septic and Local Agency Management Program (LAMP) standards. LAMP standards include minimum setbacks from wells to prevent negative impacts to groundwater quality. DER also stated that the project will require an amendment to the existing Public Water System. Prior the installation of any water infrastructure for the site, the property owner must obtain concurrence from the State of California Water Resources Control Board (SWRCB), Drinking Water Division, in accordance to CHSC, Section 116527 (SB1263) and submit an application for a water supply permit if necessary with the associated technical report to Stanislaus County DER. If the applicant is required to install a water treatment system, it will be required to be approved by the Regional Water Quality Control Board and the Department of Environmental Resources. Additionally, water supply permits require on going testing. A referral response from the Modesto Irrigation District (MID) is requiring that the Brown Improvement District pipeline be replaced and for an irrigation easement to be recorded. Additionally, the District's existing electrical facilities are to be protected. Although the site is located in the District, the site does not currently receive irrigation water from the District and will be required to contact MID to request a Sign-Off of Irrigation Facilities form for the parcel.

Development standards will be placed on the project to address these issues.

Mitigation: None.

References: Referral response from the City of Modesto, dated February 10, 2021; referral response from the Department of Environmental Resources (DER), dated January 20, 2021; referral response from the Modesto Irrigation District (MID), dated April 9, 2019; Stanislaus County General Plan and Support Documentation.[1]

XX. WILDFIRE – If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:	**Potentially Significant Impact**	**Less Than Significant With Mitigation Included**	**Less Than Significant Impact**	**No Impact**
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?			X	
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?			X	
c) Require the installation of maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?			X	

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?			X	

Discussion. The Stanislaus County Local Hazard Mitigation Plan identifies risks posed by disasters and identifies ways to minimize damage from those disasters. With the Wildfire Hazard Mitigation Activities of this plan in place, impacts to an adopted emergency response plan or emergency evacuation plan are anticipated to be less than significant. The terrain of the site is relatively flat, and the site has access to a County-maintained road. The site is located in a Local Responsibility Area (LRA) for fire protection and is served by Salida Fire Protection District. The project was referred to the District who responded with comments indicating that all construction must comply with current adopted fire code, including the payment of fire service impact mitigation fees, on-site water supply and infrastructure for fire protection, and emergency vehicle access. These comments will be applied as development standards. Additionally, the applicant is required to form or annex into a Community Services District to provide for operational services. California Building Code establishes minimum standards for the protection of life and property by increasing the ability of a building to resist intrusion of flame and embers. All improvements will be reviewed by the Stanislaus County Fire Prevention Bureau and will be required to meet all state and local fire code requirements.

Wildfire risk and risks associated with postfire land changes are considered to be less than significant.

Mitigation: None.

References: Referral response from the Salida Fire Protection District, dated January 21, 2021; Stanislaus County General Plan and Support Documentation.[1]

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

Discussion: Review of this project has not indicated any features which might significantly impact the environmental quality of the site and/or the surrounding area. The project site is within the City of Modesto's LAFCO adopted Sphere of Influence (SOI). The parcel is bordered by Kiernan Avenue to the north and Tully Road to the west, and the adjacent parcel to the east is already developed with industrial uses. Approved projects that remain to be developed in the area include two additional 48,000 square-foot warehouses on the adjacent parcel to the east, a church two parcels south of the project site, and a residential subdivision southwest of the project site between Tully and Carver Road, within the City of Modesto city limits. Development of these projects would not result in conditions in excess of adopted standards for LOS or queuing. While the addition of trips from the proposed project increase the length of delays, applicable LOS and queuing standards will continue to be satisfied. Developing the adjacent parcel to the south, and the other nearby parcels in the City of Modesto's SOI would require discretionary approval and additional environmental review. Development of parcels outside the SOI would be subject to the A-2 (General Agriculture) zoning ordinance. Rezoning parcels to another designation that would create islands or disregard infilling are not consistent with the General Plan and would likely not be approved. Accordingly, development of the subject parcel would not set a precedent for further development of the surrounding area.

Mitigation: None.

References: Initial Study; Stanislaus County General Plan and Support Documentation.[1]

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[1] Stanislaus County General Plan and Support Documentation adopted in August 23, 2016, as amended. ***Housing Element*** adopted on April 5, 2016.

LIBITSKY MANAGEMENT CORP

GPA REZ
PLN2018-0081

AREA MAP

LEGEND

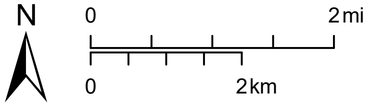
🟥 Project Site

▭ Sphere of Influence

▨ City

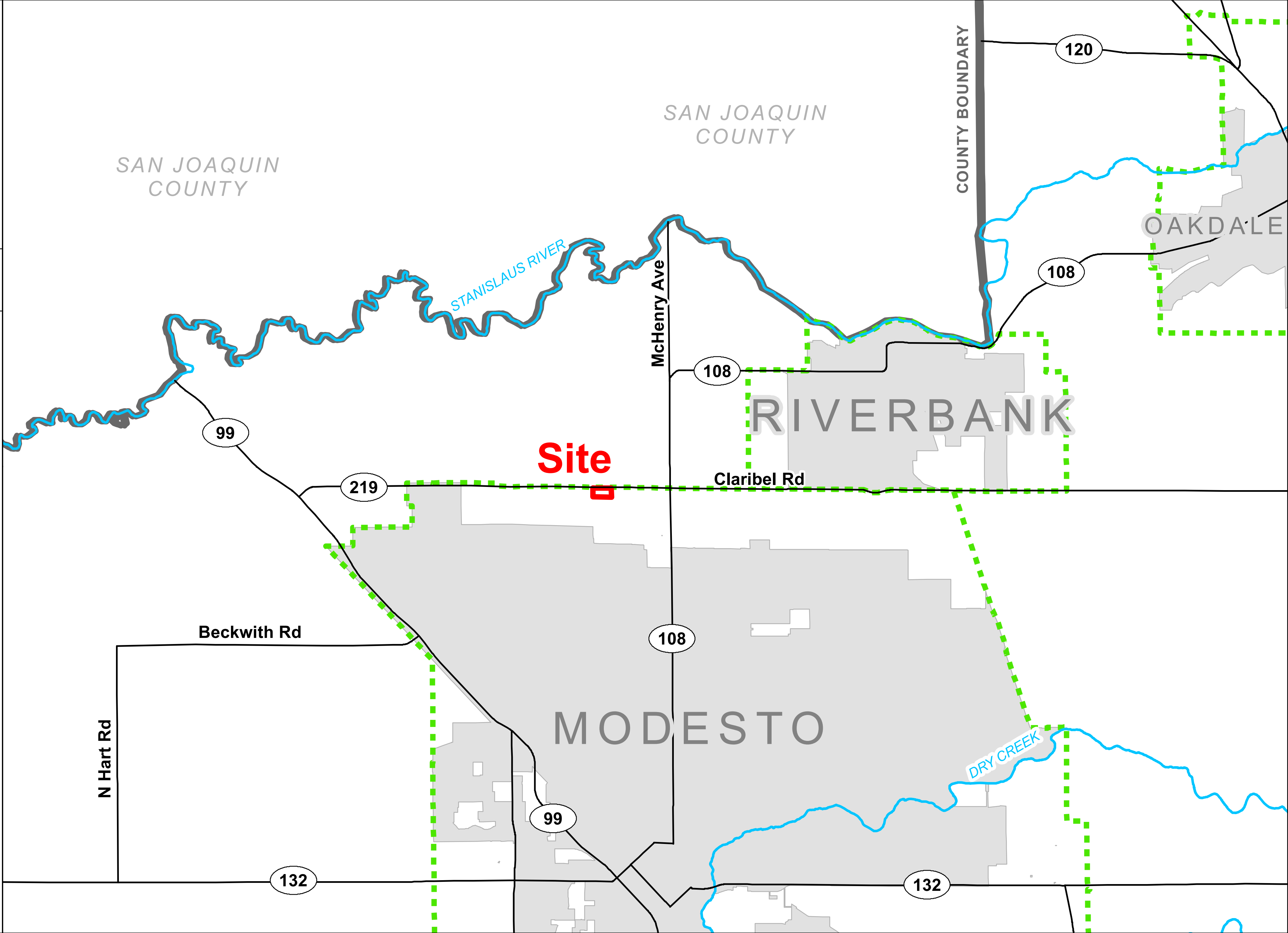
— Road

— River



Source: Planning Department GIS

Date: 12/10/2020



LIBITSKY MANAGEMENT CORP

GPA REZ PLN2018-0081

GENERAL PLAN MAP

LEGEND

🟥 Project Site

🟩 Sphere of Influence

☐ Parcel

— Road

Canal

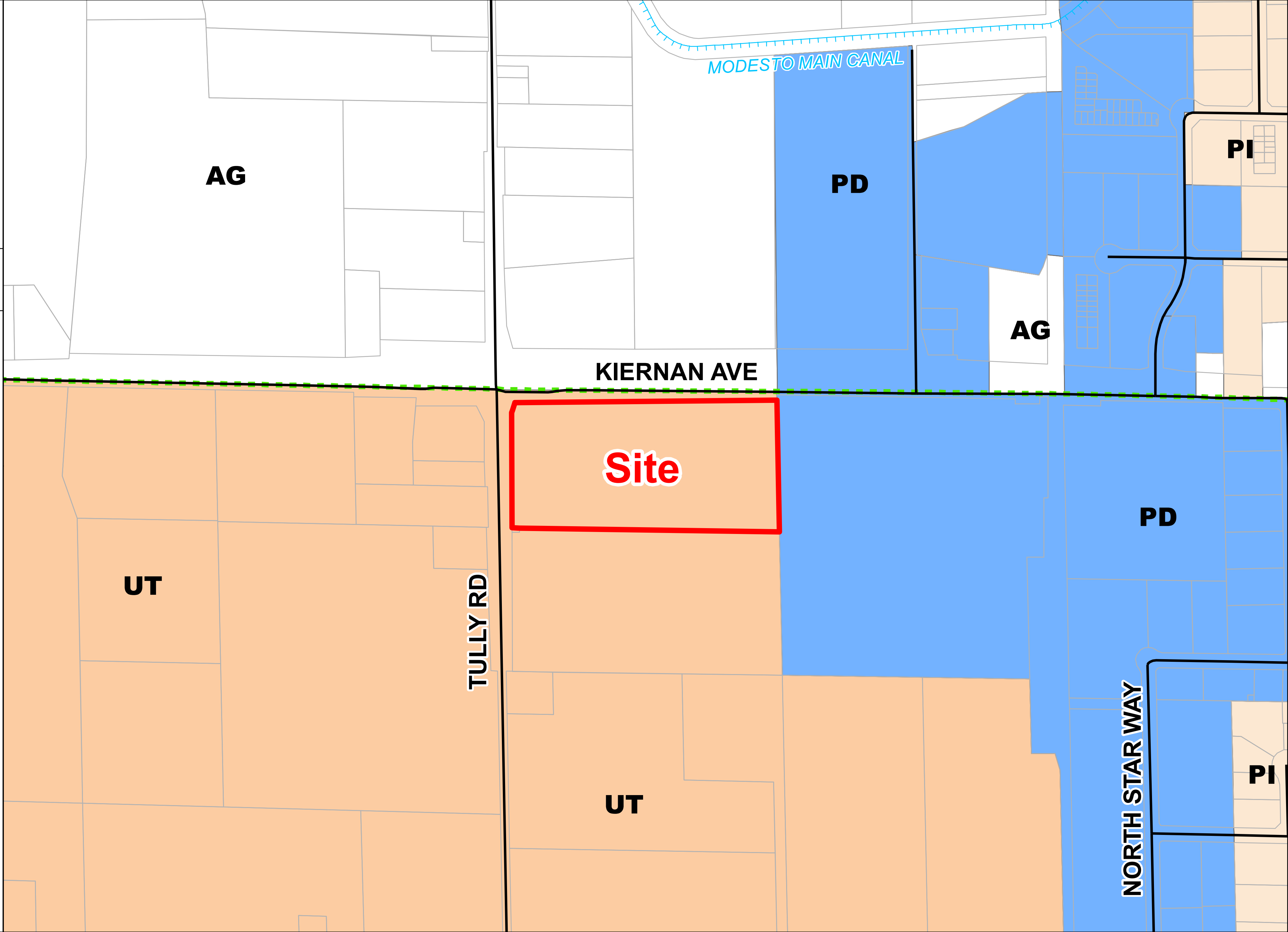
General Plan

☐ Agriculture

🟧 Urban Transition

🟦 Planned Development

▨ Planned Industrial



Source: Planning Department GIS

Date: 12/10/2020

LIBITSKY MANAGEMENT CORP

GPA REZ PLN2018-0081

ZONING MAP

LEGEND

- □ Project Site
- ⬚ Sphere of Influence
- □ Parcel
- — Road
- ┬┬┬ Canal

Zoning Designation

- 🟩 General Agriculture 10 Acre
- 🟩 General Agriculture 40 Acre
- 🟦 Planned Development
- 🟦 Planned Industrial

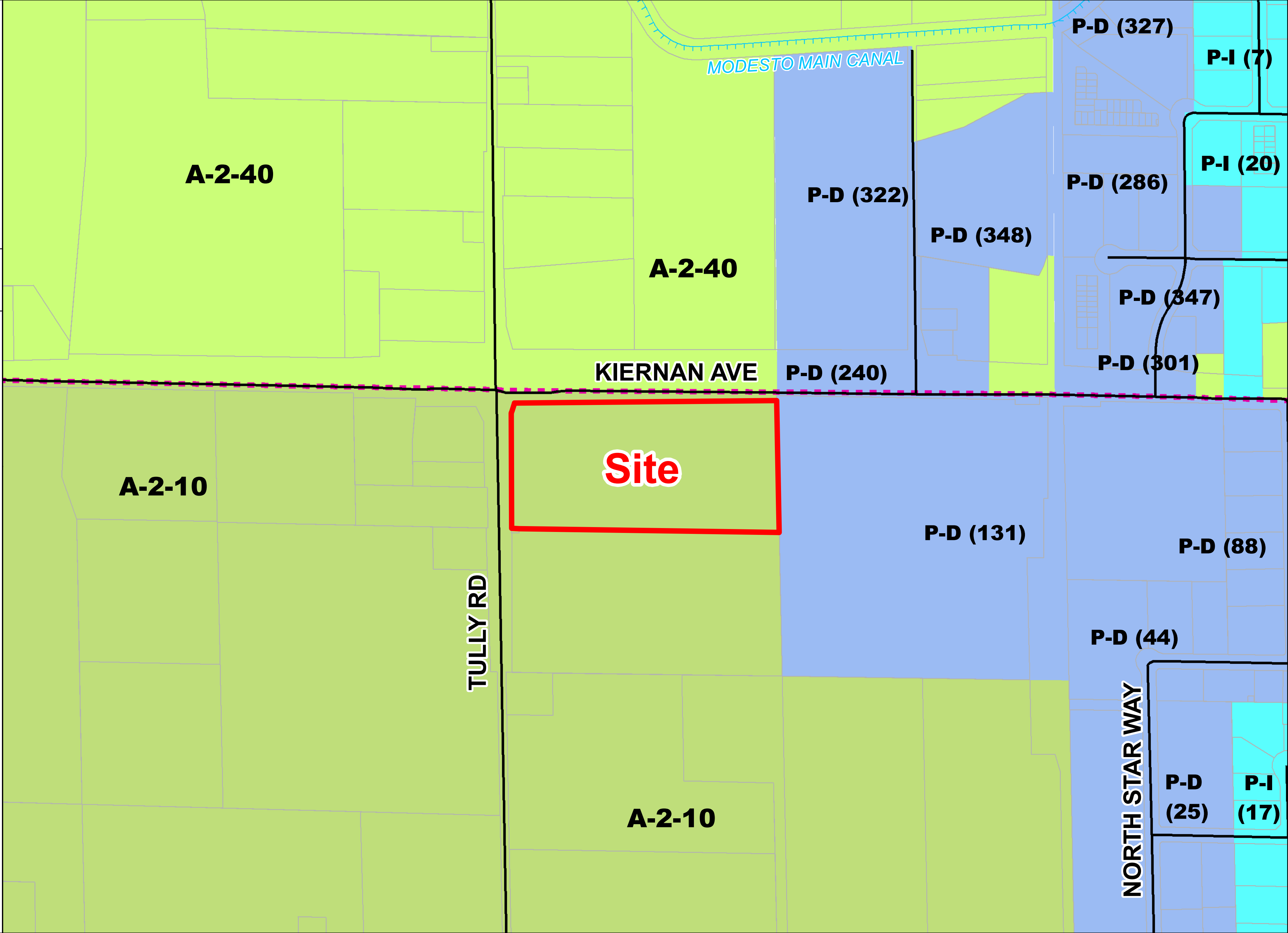
N

0 1,200 ft

0 300 m

Source: Planning Department GIS

Date: 12/10/2020



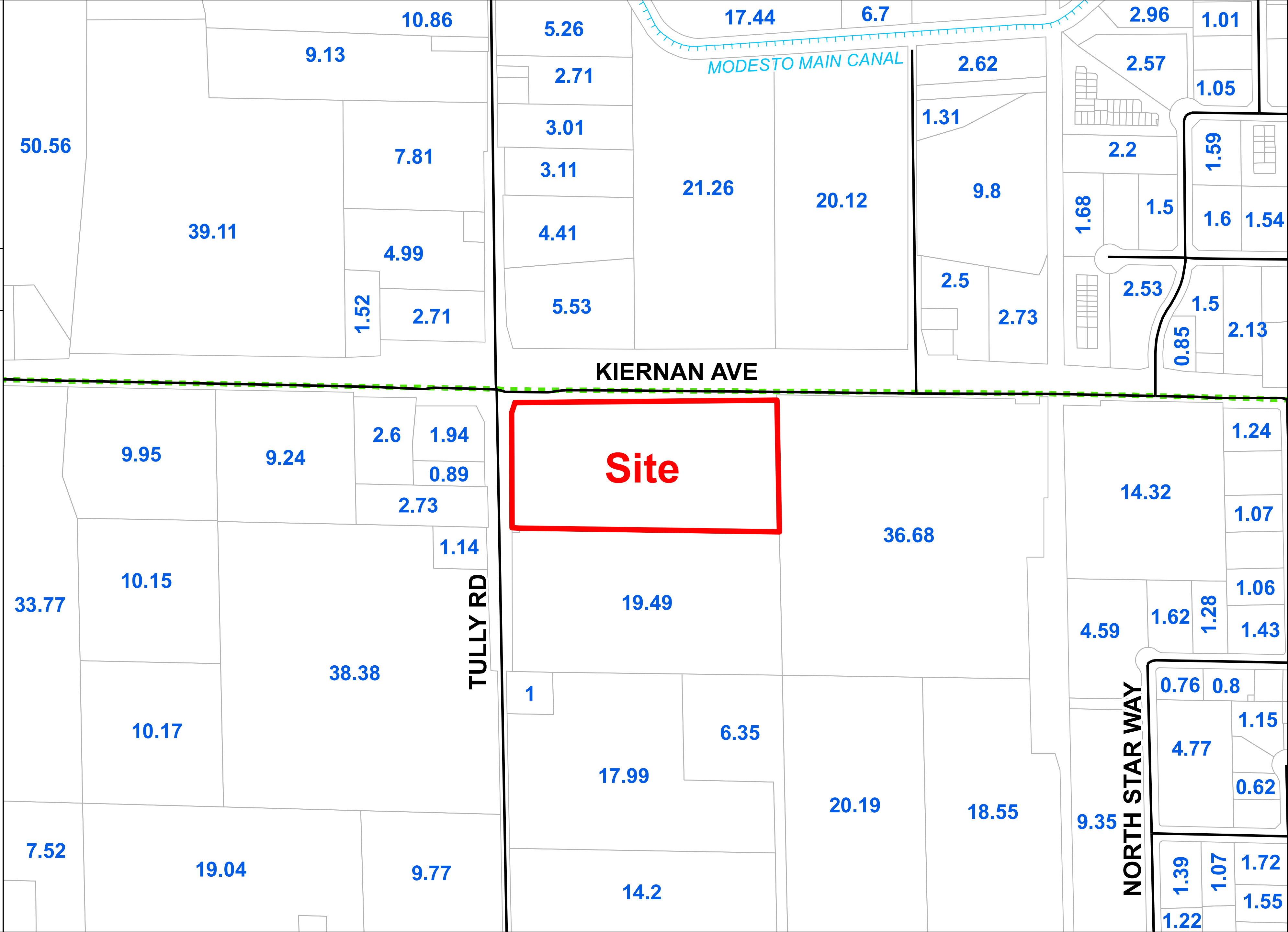
LIBITSKY MANAGEMENT CORP

GPA REZ
PLN2018-0081

ACREAGE MAP

LEGEND

- 🟥 Project Site
- ▨ Sphere of Influence
- # Parcel/Acres
- — Road
- ┬┬┬ Canal



N

0 1,200 ft

0 300 m

Source: Planning Department GIS

Date: 12/10/2020

LIBITSKY MANAGEMENT CORP

GPA REZ PLN2018-0081

2017 AERIAL AREA MAP

LEGEND

- 🟥 Project Site
- 🟩 Sphere of Influence
- — Road
- ┬┬┬ Canal

N

0 1,200 ft

0 300 m

Source: Planning Department GIS

Date: 12/10/2020

LIBITSKY MANAGEMENT CORP

GPA REZ PLN2018-0081

2017 AERIAL SITE MAP

LEGEND

🟥	Project Site
—	Road
┬┬┬┬	Canal

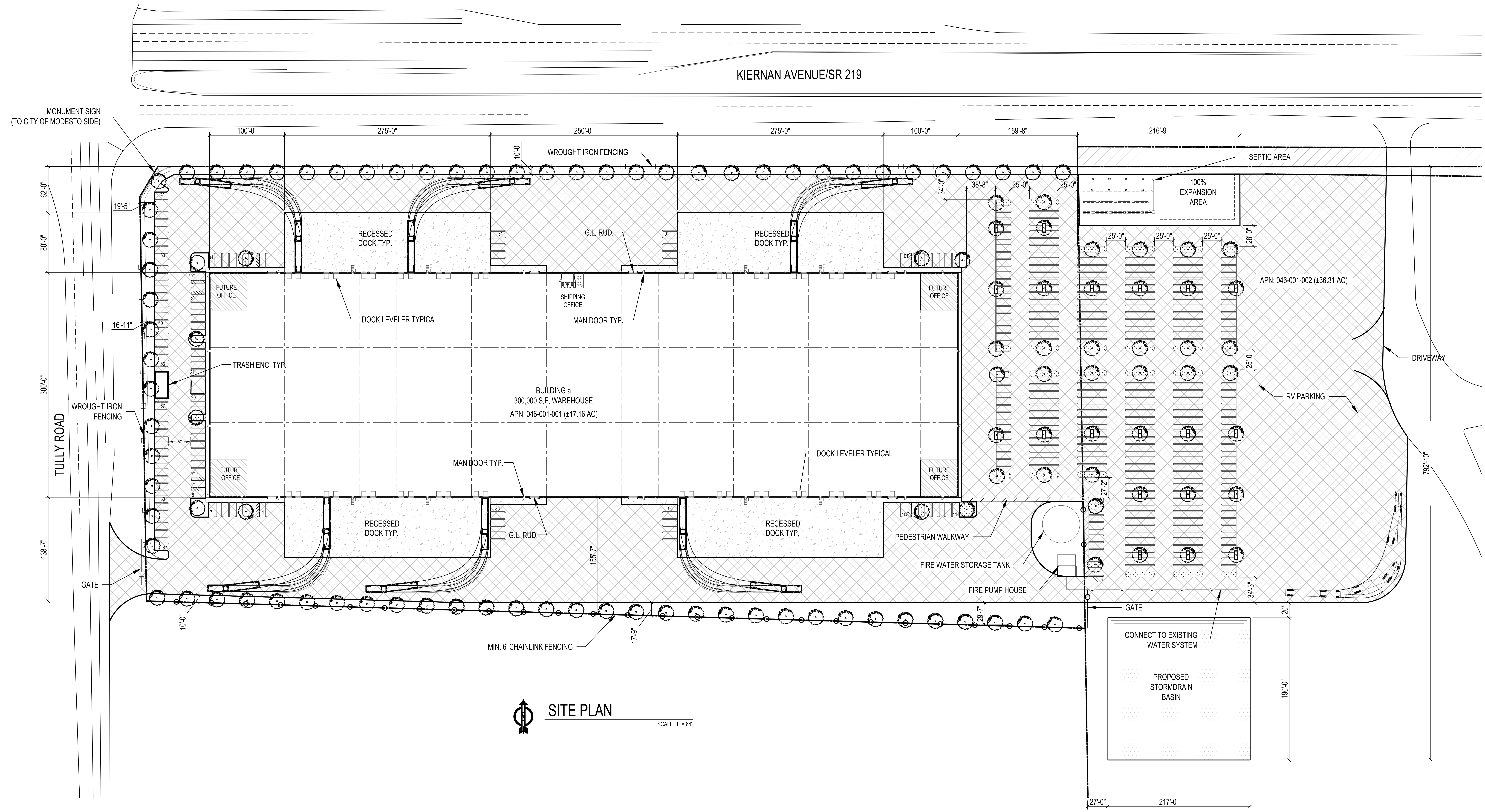
N

0 300 ft

0 90 m

Source: Planning Department GIS

Date: 12/10/2020



SITE PLAN

SCALE: 1" = 64'

SITE DATA

APN:	046-001-001
ADDRESS:	1224 KIERNAN AVE MODESTO, CA 95358-9408
SITE AREA:	±17.2 ACRES
BUILDING TO LOT RATIO:	40%
LANDSCAPE TO LOT RATIO:	6%

BUILDING LEGEND

OCCUPANCY GROUP:	S-1 / B
TYPE OF CONSTRUCTION:	II-B
HEIGHT OF BUILDING:	32' CLEAR
NUMBER OF STORIES:	1
FIRE SPRINKLERS:	EQUIPPED W/ FULLY AUTOMATIC SPRINKLERS - ESFR
LIGHT STANDARDS:	UP TO 32' HIGH (IGHTING TO MEET CITY OF MODESTO STANDARDS)

BUILDING DATA

OFFICE SPACE	10.625 S.F.
WAREHOUSE	289,375 S.F.
TOTAL FLOOR SPACE	300,000 S.F.

PARKING

PARKING ANALYSIS - PER CITY of MODESTO MUNICIPAL CODE, TITLE 10, SEC 5:

OFFICES:	1 Space per 200 sq 10,625 / 200 = 32 stalls
WAREHOUSE:	1 Space per 2,000 sf up to 10,000 sf 1 Space per 5,000 sf after 10,000 sf 10,000 / 2000 = 5 stalls 279,375 / 5000 = 56 stalls
REQUIRED SPACES:	93 PARKING STALLS REQUIRED

ACCESSIBLE STALLS REQ. PER CBC TABLE 11B-208.2 & CAL DOT TABLE A = 2% OF TOTAL SPACE

TOTAL ROPOSED PARKING SPACES:

STANDARD STALL =	480
ACCESSIBLE STALL =	6 (4 VAN)
TOTAL PROPOSED =	486 PARKING STALLS PROVIDED

NOTES:

1. FIRE LANE - RED CURB REQUIRED AT ALL ACCESS ROADS THAT ARE LESS THAN 28 FEET IN WIDTH AND AT ALL CURBS IN FRONT OF HYDRANTS AND DRIVEWAY ENTRANCES.

SURFACE LEGEND:

■	EXISTING BUILDING	▨	PARKING STRIPING	░	CONCRETE
□	NEW BUILDING	░	BIO-RETENTION AREA	☰	DEDICATION LAND
░	LANDSCAPING	░	GRAVEL		

CLIENT:

LIBITZKY PROPERTY HOLDINGS
824 KIERNAN AVE.
MODESTO, CA

ENGINEER:

JUSTIN W. CAPP, Inc.
ENGINEERING + DESIGN
JUSTIN W. CAPP
CE #61393, SE #4813
1003 12th STREET, MODESTO, CA 95354
PO BOX 861, MODESTO, CA 95353
(209) 524-4774.
www.justinwcapp.com

LPC LIBITZKY PROPERTY COMPANIES

LIBITZKY MANAGEMENT CORPORATION
1475 POWELL ST, EMERYVILLE, CA 94608
PHONE: (510) 652-4950
FAX: (510) 652-0588
EMAIL: INFO@LIBITZKY.COM

REVISION HISTORY:

No.	DATE	ISSUANCE
	DATE	PRELIMINARY

USE DISCLAIMER:

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ENGINEER'S SEAL:

JUSTIN W. CAPP
No. 4813
Exp. 06/30/21
12/21/2020

KEY PLAN:

KEY PLAN
NOT TO SCALE

PROJECT NAME:

KIERNAN DEVELOPMENT

PROJECT ADDRESS:
824 KIERNAN AVE.
MODESTO, CA

DRAWING TITLE:

WAREHOUSE / LIGHT INDUSTRIAL CONCEPT

CAD FILE NAME: 17109 – SP1 – MASTER SITE PLAN–300K_EXTRA PARKING.DWG

DRAWING SCALE: AS NOTED

JOB NUMBER:	DRAWN: KL	SHEET NUMBER:
20248	CHK'D: JWC DATE: 07/24/14	SP2

Air Quality and Greenhouse Gas Analysis Report
LPC Industrial Development
Stanislaus County, California

Prepared for:
Newman Romano, LLC
1034 12th Street
Modesto, CA 95354
209.521.9521
Contact: Dave Romano, P.E., AICP

Prepared by:
Mitchell Air Quality Consulting
1164 E. Decatur Avenue
Fresno, CA 93720
559.246.3732
Contact: Dave Mitchell, Senior Air Quality Scientist

March 5, 2021

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ACRONYMS AND ABBREVIATIONS

µg/m^3	micrograms per cubic meter
AB	Assembly Bill
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BAU	Business as Usual
Btu	British thermal unit
CAF	Confined Animal Facility
CalEEMod	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CEQA	California Environmental Quality Act
CO	carbon monoxide
CO_2	carbon dioxide
District	San Joaquin Valley Air Pollution Control District
DPM	diesel particulate matter
EMFAC	EMission FACtors Model
EPA	United States Environmental Protection Agency
GAMAQI	Guidance for Assessing and Mitigating Air Quality Impacts
GHG Rx	Greenhouse Gas Reduction Exchange
GHG	greenhouse gases
IPCC	United Nations Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
MAQC	Mitchell Air Quality Consulting
MID	Modesto Irrigation District
$MMTCO_2e$	million metric tons of carbon dioxide equivalent
$MTCO_2e$	metric tons of carbon dioxide equivalent
NO_X	nitrogen oxides
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
ROG	reactive organic gases
RTP/SCS	Regional Transportation Plan/Sustainable Community Strategy
SB	Senate Bill
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_X	sulfur oxides
StanCOG	Stanislaus Council of Governments
VOC	volatile organic compounds
ZEV	zero emission vehicle

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SECTION 1: EXECUTIVE SUMMARY

1.1—Purpose and Methods of Analysis

The following air quality and greenhouse gas (GHG) analysis was prepared to evaluate whether the estimated criteria air pollutant and GHG emissions generated from the LPC Industrial Development (project) would cause significant impacts to air resources in the project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000, et seq.). The methodology follows the Guidance for Assessing and Mitigating Air Quality Impacts (GAMAQI) prepared by the San Joaquin Valley Air Pollution Control District (SJVAPCD or District) for quantification of emissions and evaluation of potential impacts to air resources (SJVAPCD 2015a). The Greenhouse Gas Analysis follows the SJVAPCD "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA" (adopted in December 2009) to determine significance (SJVAPCD 2009).

1.2—Project Description

The project site is located at the southeast corner of Kiernan Avenue and Tully Road in Stanislaus County within the City of Modesto sphere of influence. The Assessor's Parcel Number is 046-001-001. The project site is 17.18 acres. The project site is currently planted in almonds. The project is the construction of a new Industrial/Light Industrial/Warehouse building of approximately 300,000 square feet. The tenant for the building is expected to be Jackrabbit, an original equipment manufacturer that designs and fabricates agricultural equipment for the permanent crop industries, especially tree nuts such as almonds and walnuts; and manufactures reservoir carts; shuttles; elevators; cold air drains; picking, pruning, and rodent control equipment; and others. Jackrabbit will service its own manufactured equipment at the site. Jackrabbit would occupy approximately 150,000 square feet of the building but is the likely potential user for the remaining 150,000 square feet. The project is expected to commence construction by October 1, 2021 and to be completed by October 1, 2022.

No equipment from other manufacturers will be serviced or repaired. Some public parts sales may occur at the site, but the usage of this service is small, and will only use parts for Jackrabbit-manufactured equipment. A small on-site showroom may be constructed in the future so a few pieces of equipment can be displayed.

Jackrabbit currently has about 100 employees and plans to grow to about 200 over one daytime shift. Typical hours of operation are 6:00 a.m. to 5:00 p.m., although welders may start as early as 5:00 a.m. in the heat of the summer.

Truck trips are currently expected to be about one to two semi-trucks per day for steel delivery, about zero to two semi-trucks per day for large part delivery, about one to two box trucks per day for parts delivery, and about two to four van deliveries per day from FedEx or UPS. During the harvest season, customer trips could be up to 25 per day. During the off-season, this would be reduced to about 0 to 2 per day. The project is expected to employ up to 200 people.

The project's regional vicinity location is shown in Figure 1; an aerial view of the local vicinity is provided in Figure 2; and the site plan is provided in Figure 3.

1.3—Summary of Analysis Results

The following is a summary of the analysis results. As shown below, the project would result in less than significant impacts for all air quality and GHG impact criteria analyzed.

Impact AIR-1: The project would not conflict with or obstruct implementation of the applicable air quality plan. **Less than significant impact.**

Impact AIR-2: The project could result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors). **Less than significant impact.**

Impact AIR-3: The project could expose sensitive receptors to substantial pollutant concentrations. **Less than significant impact.**

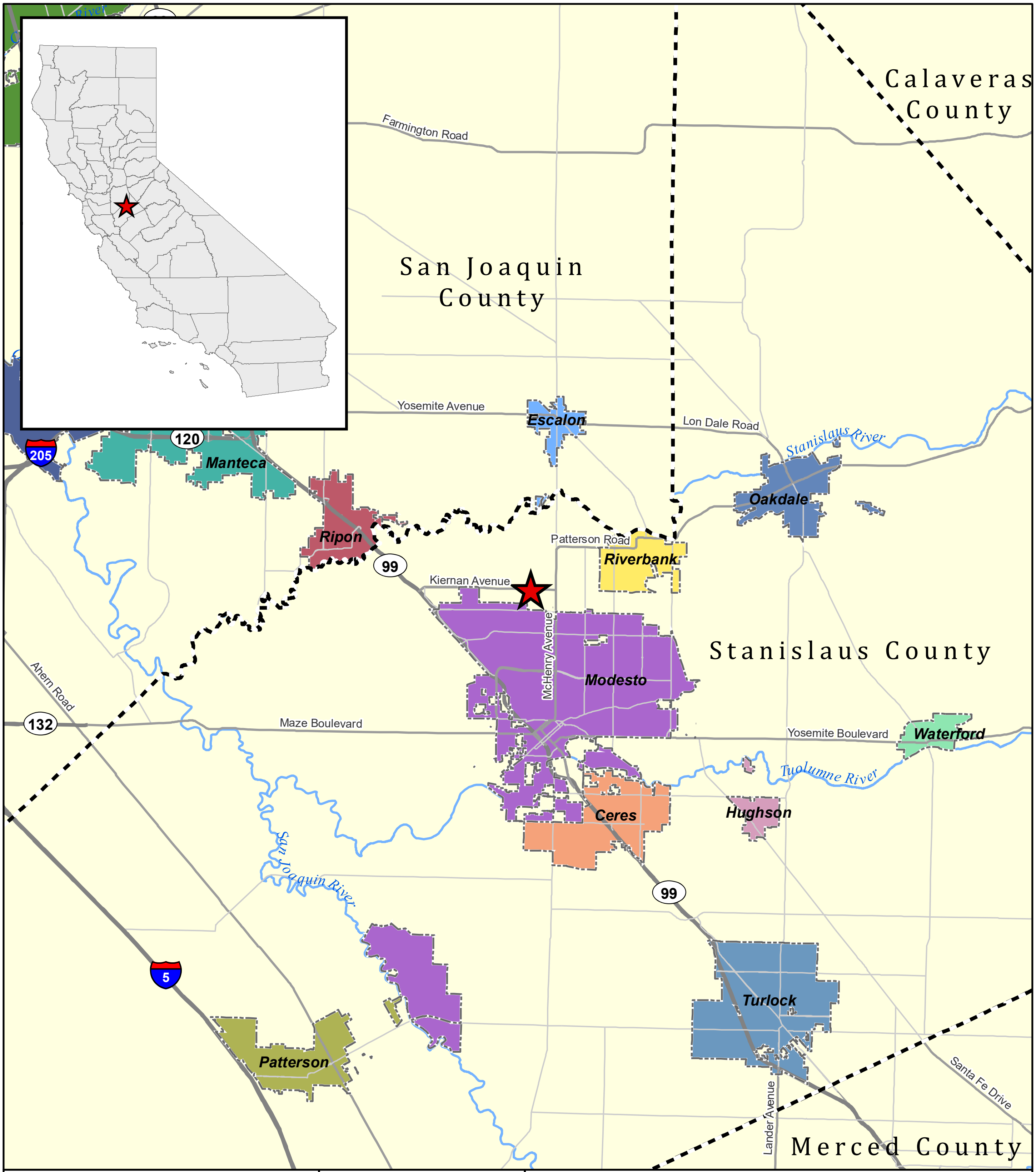
Impact AIR-4: The project would not create objectionable odors affecting a substantial number of people. **Less than significant impact.**

Impact GHG-1: The project would not generate direct or indirect greenhouse gas emissions that would result in a significant impact on the environment. **Less than significant impact.**

Impact GHG-2: The project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases. **Less than significant impact**.

1.4—Standard Conditions and Mitigation Measures Applied to the Project

No mitigation measures beyond compliance with mandatory regulations were required to demonstrate that the project would have less than significant for air quality, health risk, and GHG impacts.



Legend

★ Project Location

▭ Incorporated Area

▭ County Boundary

Sources: California State GeoPortal; Open StreetMap.
Map date: February 27, 2021.

NEWMAN-ROMANO LLC
AIR QUALITY AND GREENHOUSE GAS ANALYSIS REPORT
LPC INDUSTRIAL DEVELOPMENT

Figure 1. Regional Location Map

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Legend

🟥 Project Location

▭ Modest City Boundary

Source: Stanislaus County GIS; ArcGIS Online World Imagery Map Service. Map date: February 26, 2021.

NEWMAN-ROMANO LLC
AIR QUALITY AND GREENHOUSE GAS ANALYSIS REPORT
LPC INDUSTRIAL DEVELOPMENT

Figure 2. Vicinity Map

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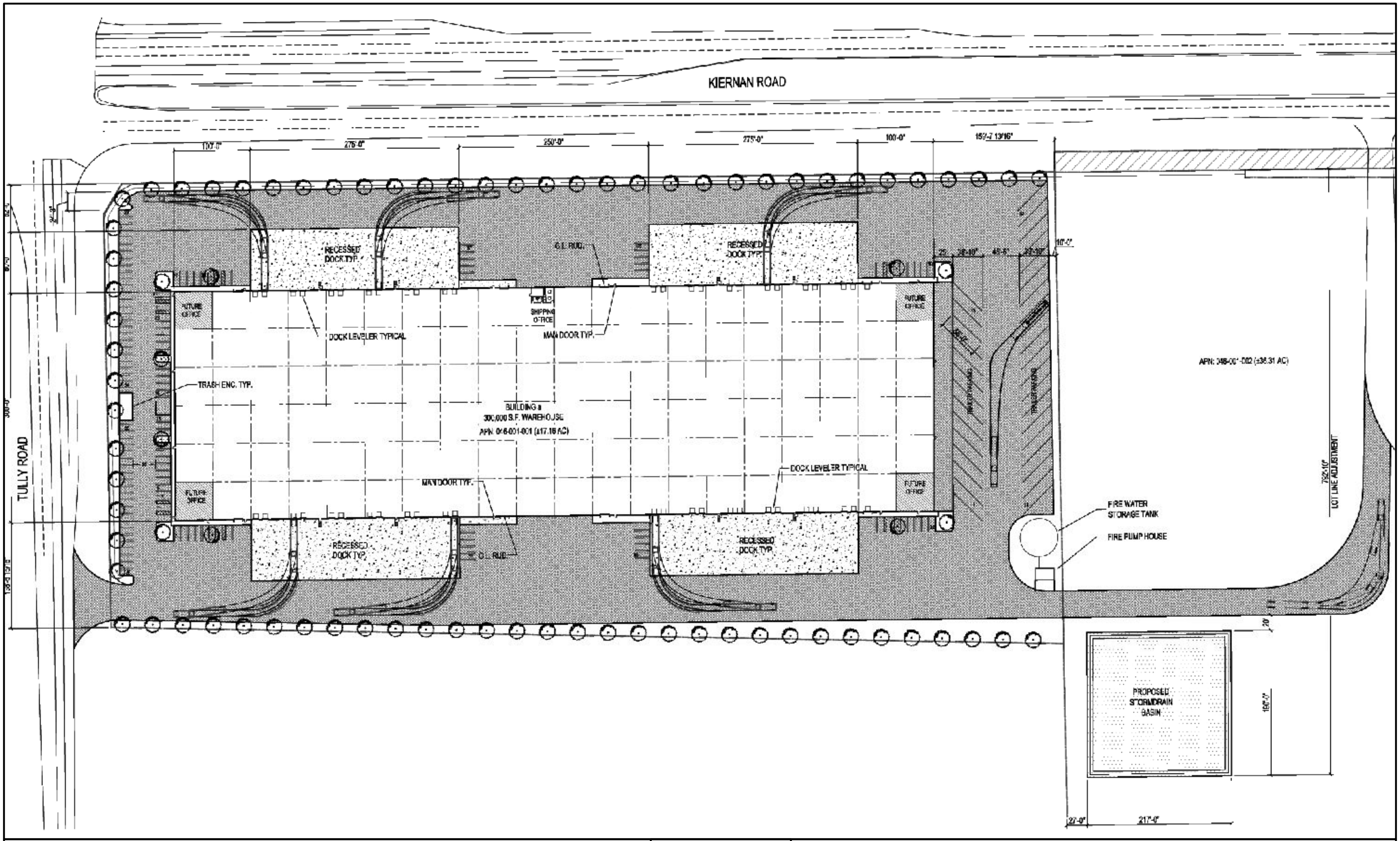

LEGEND

■ Existing Building

▨ Parking Striping

Concrete

☐ New Building

Bio-Retention Area

☰ Dedication Land

Landscaping

Gravel

Source: Justin W. Capp, Inc, 7/24/17. Map date: February 26, 2021.

N

0 50 100

Feet

NEWMAN-ROMANO LLC
AIR QUALITY AND GREENHOUSE GAS ANALYSIS REPORT
LPC INDUSTRIAL DEVELOPMENT

Figure 3. Site Plan

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SECTION 2: AIR QUALITY SETTING

2.1—Environmental Setting

Air quality impacts are both local and regional. Regional and local air quality is impacted by topography, dominant airflows, atmospheric inversions, location, and season. The project is located in the San Joaquin Valley Air Basin, which experiences some of the challenging environmental conditions for air quality in the nation. The following section describes these conditions as they pertain to the Air Basin. The information in this section is primarily from the District's GAMAQI (SJVAPCD 2015a).

2.1.1 - San Joaquin Valley Air Basin

Topography

The topography of a region is important for air quality because mountains can block airflow that would help disperse pollutants, and can channel air from upwind areas that transports pollutants to downwind areas. The SJVAPCD covers the entirety of the Air Basin. The Air Basin is generally shaped like a bowl. It is open in the north and is surrounded by mountain ranges on all other sides. The Sierra Nevada mountains are along the eastern boundary (8,000 to 14,000 feet in elevation), the Coast Ranges are along the western boundary (3,000 feet in elevation), and the Tehachapi Mountains are along the southern boundary (6,000 to 8,000 feet in elevation).

Climate

The climate is important for air quality because of differences in the atmosphere's ability to trap pollutants close to the ground, which creates adverse air quality; inversely, the atmosphere's ability to rapidly disperse pollutants over a wide area prevents high concentrations from accumulating under different climatic conditions. The Air Basin has an "inland Mediterranean" climate and is characterized by long, hot, dry summers and short, foggy winters. Sunlight can be a catalyst in the formation of some air pollutants (such as ozone); the Air Basin averages over 260 sunny days per year.

Inversion layers are significant in determining pollutant concentrations. Concentration levels can be related to the amount of mixing space below the inversion. Temperature inversions that occur on the summer days are usually encountered 2,000 to 2,500 feet above the valley floor. In winter months, overnight inversions occur 500 to 1,500 feet above the valley floor.

Dominant airflows provide the driving mechanism for transport and dispersion of air pollution. The mountains surrounding the Air Basin form natural horizontal barriers to the dispersion of air contaminants. The wind generally flows south-southeast through the valley, through the Tehachapi Pass and into the Mojave Desert Air Basin portion of Kern County. As the wind moves through the Air Basin, it mixes with the air pollution generated locally, generally transporting air pollutants from the north to the south in the summer and in a reverse flow in the winter.

The winds and unstable air conditions experienced during the passage of winter storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the San Joaquin Valley floor. This creates strong, low-level temperature inversions and very stable air conditions, which can lead to Tule fog. Wintertime conditions favorable to fog formation are also conditions favorable to high concentrations of $PM_{2.5}$ and PM_{10}.

2.2—Regulatory Setting

Air pollutants are regulated to protect human health and for secondary effects such as visibility and building soiling. The Clean Air Act of 1970 tasks the United States Environmental Protection Agency (EPA) with setting air quality standards. The State of California also sets air quality standards, which are in some cases more stringent than federal standards, in addition to addressing additional pollutants. The following section describes these federal and state standards and the health effects of the regulated pollutants.

2.2.1 - Clean Air Act

Congress established much of the basic structure of the Clean Air Act (CAA) in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the CAA: particulate matter, ground-level ozone, carbon monoxide (CO), sulfur oxides (SO_X), nitrogen oxides (NO_X), and lead. The EPA labels these pollutants as criteria air pollutants because they are regulated by developing human health-based and/or environmentally based criteria (science-based guidelines), which sets permissible levels. The set of limits based on human health are called primary standards. Another set of limits intended to prevent environmental and property damage are called secondary standards (EPA 2014). The federal standards are called National Ambient Air Quality Standards (NAAQS). The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards. The criteria pollutants are:

- Ozone
- Nitrogen dioxide (NO_2)
- Lead
- Particulate matter (PM_{10} and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide

The federal standards were set to protect public health, including that of sensitive individuals; thus, the EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health (ARB 2016).

2.2.2 - California Clean Air Act

The California Legislature enacted the California Clean Air Act (CCAA) in 1988 to address air quality issues of concern not adequately addressed by the federal CAA at the time. California's air quality problems were and continue to be some of the most severe in the nation, and required additional actions beyond the federal mandates. The California Air Resources Board (ARB) administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the CCAA. The 10 state air pollutants are the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The EPA authorized California to adopt its own regulations for motor vehicles and other sources that are more stringent than similar federal regulations implementing the CAA. Generally, the planning requirements of the CCAA are less stringent than the federal CAA; therefore, consistency with the CAA will also demonstrate consistency with the CCAA.

2.2.3 - Toxic Air Contaminants

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. There are no ambient air quality standards for TAC emissions. TACs are regulated in terms of health risks to individuals and populations exposed to the pollutants. The 1990 Clean Air Act Amendments significantly expanded the EPA's authority to regulate hazardous air pollutants (HAP). Section 112 of the Clean Air Act lists 187 hazardous air pollutants to be regulated by source category. Authority to regulate these pollutants was delegated to individual states. ARB and local air districts regulate TACs and HAPs in California.

2.2.4 - Air Pollutant Description and Health Effects

The federal and state ambient air quality standards, relevant effects, properties, and sources of the pollutants are summarized in Table 1.

Table 1: Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	—	Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO_X, and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO_X) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.070 ppm[f]			
Carbon monoxide (CO)	1 Hour	20 ppm	35 ppm	Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen dioxide[b] (NO_2)	1 Hour	0.18 ppm	0.100 ppm	Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contribution to atmospheric discoloration; increased visits to hospital for respiratory illnesses.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides— NO_X (NO, NO_2, NO_3, N_2O, N_2O_3, N_2O_4, and N_2O_5). NO_X is a precursor to ozone, PM_{10}, and $PM_{2.5}$ formation. NO_X can react with compounds to form nitric acid and related small particles and result in PM-related health effects.	NO_X is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Nitrogen dioxide (NO_2) forms quickly from NO_X emissions. NO_2 concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.
	Annual	0.030 ppm	0.053 ppm			

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur dioxide[c] (SO$_2$)	1 Hour	0.25 ppm	0.075 ppm	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO$_X$) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM$_{10}$.	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards.
	3 Hour	—	0.5 ppm			
	24 Hour	0.04 ppm	0.14 (for certain areas)			
	Annual	—	0.030 ppm (for certain areas)			
Particulate matter (PM$_{10}$)	24 Hour	50 µg/m^3	150 µg/m^3	• Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravates existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias. • Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM$_{10}$ refers to particulate matter that is between 2.5 and 10 microns in diameter (1 micron is one-millionth of a meter). PM$_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.	Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal; and recycling. Mobile or transportation-related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere.
	Mean	20 µg/m^3	—			
Particulate matter (PM$_{2.5}$)	24 Hour	—	35 µg/m^3			
	Annual	12 µg/m^3	12.0 µg/m^3			
Visibility-reducing particles	8 Hour	See note below[d]				

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfates	24 Hour	25 µg/m^3	—	(a) Decrease in ventilatory function; (b) aggravation of asthmatic symptoms; (c) aggravation of cardio-pulmonary disease; (d) vegetation damage; (e) degradation of visibility; (f) property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO_4^{2-}. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.
Lead[e]	30-day	1.5 µg/m^3	—	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQ.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering.
	Quarter	—	1.5 µg/m^3			
	Rolling 3-Gmonth average	—	0.15 µg/m^3			
Vinyl chloride[e]	24 Hour	0.01 ppm	—	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Hydrogen sulfide	1 Hour	0.03 ppm	—	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Hydrogen sulfide (H_2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur-containing fuels (oil and coal).
Volatile organic compounds (VOC)		There are no state or federal standards for VOCs because they are not classified as criteria pollutants.		Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as toxic air contaminants.	Reactive organic gases (ROG), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROG and VOCs, the two terms are often used interchangeably.	Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} and lower visibility.
Diesel particulate matter (DPM)		There are no ambient air quality standards for DPM.		Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk	DPM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.

Table 1 (cont.): Description of Air Pollutants

Air Pollutant	Averaging Time	California Standard	Federal Standard[a]	Most Relevant Effects from Pollutant Exposure	Properties	Sources
				of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.	aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.	

Notes:

ppm = parts per million (concentration) µg/m^3 = micrograms per cubic meter Annual = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3 hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour NO_2 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 parts per billion (ppb) (0.100 ppm).

[c] 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.

[d] Visibility-reducing particles: In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

[e] The ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[f] The EPA Administrator approved a revised 8-hour ozone standard of 0.07 ppb on October 1, 2015. The new standard will go into effect 60 days after publication of the Final Rule in the Federal Register. The Final Rule was published in the Federal Register on October 26, 2015 and became effective on December 28, 2015.

Source of effects, properties, and sources: South Coast Air Quality Management District 2007; California Environmental Protection Agency 2002; California Air Resources Board 2009a; U.S. Environmental Protection Agency 2003, 2010, 2011, 2012 and 2018a; National Toxicology Program 2016.

Source of standards: California Air Resources Board 2013a.

Several pollutants listed in Table 1 are not addressed in this analysis. Analysis of lead is not included in this report because no new sources of lead emissions are anticipated with the project. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed as PM_{10} and $PM_{2.5}$. No components of the project would result in vinyl chloride or hydrogen sulfide emissions in any substantial quantity.

Toxic Air Contaminants Health Effects

A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. The California Almanac of Emissions and Air Quality presents the relevant concentration and cancer risk data for the ten TACs that pose the most substantial health risk in California based on available data. The ten TACs are acetaldehyde, benzene, 1.3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (DPM).

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program (ARB 1998) demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. In addition to increased risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause a cough, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

DPM differs from other TACs in that it is not a single substance, but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on: engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, however, no ambient monitoring data are available for DPM because no routine measurement method currently exists. The ARB has made preliminary concentration estimates based on a DPM exposure method. This method uses the ARB emissions inventory's PM_{10} database, ambient PM_{10} monitoring data, and the results from several studies to estimate concentrations of DPM.

Health risks attributable to the top 10 TACs listed above are available from the ARB as part of its California Almanac of Emissions and Air Quality—2009 Edition (ARB 2009b). As shown therein for data collected at the First Street air monitoring station in Fresno, cancer risks attributable to all of the listed TACs above with the exception of DPM have declined about 70 percent from the mid-1990s to 2007. Risks associated with DPM emissions are provided only for the year 2000 and have not been updated in the Almanac. Although more recent editions of the Almanac do not provide estimated risk, they do provide emission inventories for DPM for later years. The 2013 Almanac provided emission inventory trends for DPM from 2000 through 2035. The same Almanac reports that DPM emissions were reduced in the SJVAB from 16 tons per day in 2000 to 11 tons per day in 2010, a 31 percent decrease. DPM emissions in the San Joaquin Valley are projected to decrease to six tons per day by 2015, a 62 percent reduction from year 2000 levels. ARB predicts a reduction to three tons per day by 2035, which would be an 81 percent reduction from year 2000 levels. Continued implementation of the ARB's Diesel Risk Reduction Plan is expected to provide continued reductions in DPM through 2020 and beyond through regulations on this source (ARB 2013b).

Asbestos

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and crocidolite. Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States. Exposure to asbestos is a health threat; exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease that causes scarring of the lungs). Exposure to asbestos can occur during demolition or remodeling of buildings that were constructed prior to the 1977 ban on asbestos for use in buildings. Exposure to naturally occurring asbestos can occur during soil-disturbing activities in areas with deposits present.

2.3—Existing Air Quality Conditions

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. Table 2 summarizes 2017 through 2019 published monitoring data, which is the most recent three-year period available. The table displays data from the Modesto-14th Street monitoring station approximately 4.7 miles south of the project site and the Turlock-Minaret Street monitoring station located approximately 17.9 miles southeast of the project site. The data show that during the past few years, the project area has exceeded the standards for ozone (state and national), PM_{10} (state), and $PM_{2.5}$ (national). The data in the table reflect the concentration of the pollutants in the air, measured using air monitoring equipment. This differs from emissions, which are calculations of a pollutant being emitted over a certain period. No recent monitoring data for Stanislaus were available for carbon monoxide and SO_2. Generally, no monitoring is conducted for pollutants that are no longer likely to exceed ambient air quality standards. CO is monitored in some San Joaquin Valley locations as a GHG emission, but not for the purpose of criteria pollutant attainment monitoring.

Table 2: Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2017	2018	2019
Ozone[1]	1 Hour	Max 1 Hour (ppm)	**0.111**	**0.103**	**0.102**
		Days > State Standard (0.09 ppm)	3	2	1
Ozone[1]	8 Hour	Max 8 Hour (ppm)	**0.098**	**0.091**	**0.083**
		Days > State Standard (0.07 ppm)	23	14	9
		Days > National Standard (0.070 ppm)	10	5	6

Table 2 (cont.): Air Quality Monitoring Summary

Air Pollutant	Averaging Time	Item	2017	2018	2019
Carbon monoxide (CO)	8 Hour	Max 8 Hour (ppm)	ND	ND	ND
		Days > State Standard (9.0 ppm)	ND	ND	ND
		Days > National Standard (9 ppm)	ND	ND	ND
Nitrogen dioxide (NO_2)[2]	Annual	Annual Average (ppm)	0.070	0.070	0.07
	1 Hour	Max 1 Hour (ppm)	0.0586	0.0672	0.0591
		Days > State Standard (0.18 ppm)	0	0	0
Sulfur dioxide (SO_2)[1]	Annual	Annual Average (ppm)	ND	ND	ND
	24 Hour	Max 24 Hour (ppm)	ND	ND	ND
		Days > State Standard (0.04 ppm)	ND	ND	ND
Inhalable coarse particles (PM_{10})[1]	Annual	Annual Average (µg/m^3)	**31.4**	**32.1**	**27.8**
	24 hour	24 Hour (µg/m^3)	129.3	**224.9**	**309.1**
		Days > State Standard (50 µg/m^3)	**58.2**	ID	ID
		Days > National Standard (150 µg/m^3)	0	4.3	1.1
Fine particulate matter ($PM_{2.5}$)[1]	Annual	Annual Average (12 µg/m^3)	**12.8**	**15.2**	**7.7**
	24 Hour	24 Hour (µg/m^3)	**74.5**	**189.8**	**34.4**
		Days > National Standard (35 µg/m^3)	25.1	21.5	0

Notes:

> = exceed	ppm = parts per million	µg/m^3 = micrograms per cubic meter
ID = insufficient data	ND = no data	max = maximum

Bold = exceedance

State Standard = California Ambient Air Quality Standard

National Standard = National Ambient Air Quality Standard

[1] Modesto-14th Street

[2] Turlock-Minaret Street

Source: California Air Resources Board 2020a.

The health impacts of the various air pollutants of concern can be presented in a number of ways. The clearest of these is comparable with the state and federal ozone standards. If concentrations are below the standard, it is safe to say that no health impact would occur to anyone. When concentrations exceed the standard, impacts will vary based on the amount by which the standard is exceeded. The EPA developed the Air Quality Index (AQI) as an easy-to-understand measure of health impacts compared with concentrations in the air. Table 3 provides a description of the health impacts of ozone at different concentrations.

Table 3: Air Quality Index and Health Effects from Ozone

Air Quality Index/ 8-hour Ozone Concentration	Health Effects Description
AQI—51–100—Moderate	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 55–70 ppb	**Health Effects Statements**: Unusually sensitive individuals may experience respiratory symptoms.
	Cautionary Statements: Unusually sensitive people should consider limiting prolonged outdoor exertion.
AQI—101–150—Unhealthy for Sensitive Groups	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 71–85 ppb	**Health Effects Statements**: Increasing likelihood of respiratory symptoms and breathing discomfort in active children and adults and people with respiratory disease, such as asthma.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.
AQI—151–200—Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 86–105 ppb	**Health Effects Statements**: Greater likelihood of respiratory symptoms and breathing difficulty in active children and adults and people with respiratory disease, such as asthma; possible respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion.
AQI—201–300—Very Unhealthy	**Sensitive Groups**: Children and people with asthma are the groups most at risk.
Concentration 106–200 ppb	**Health Effects Statements**: Increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population.
	Cautionary Statements: Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
Source: Air Now 2015.	

The AQI for the 8-hour ozone standard is based on the current NAAQS of 70 parts per billion (ppb). Based on the AQI scale for the 8-hour ozone standard, the project area experienced five days in the last three years that would be categorized as unhealthy (AQI 151–200) and 37 days categorizes as unhealthy for sensitive groups (AQI 101–150), violating the 70-ppb standard as measured at the Modesto-14th Street monitoring station. The highest reading was 98 parts per billion (ppb) in 2017

(AQI 182), compared with the 105-ppb cutoff point for unhealthy (AQI 200). The most days over the standard were 21 days in 2017.

The other nonattainment pollutant of concern is $PM_{2.5}$. An AQI of 100 or lower is considered moderate and would be triggered by a 24-hour average concentration of 12.1 to 35.4 µg/m^3. An AQI of 101 to 105 or 35.5-55.4 µg/m^3 is considered unhealthful for sensitive groups. When concentrations reach this amount, it is considered an exceedance of the federal $PM_{2.5}$ standard. The monitoring station nearest the project exceeded the standard on approximately 47 days in the three-year period spanning from 2017 to 2019. People with respiratory or heart disease, the elderly and children are the groups most at risk. Unusually sensitive people should consider reducing prolonged or heavy exertion. The AQI of 151 to 200 is classified as unhealthy for everyone. This AQI classification is triggered when $PM_{2.5}$ concentration ranges from 55.4 to 150.4 µg/m^3. At this concentration, there is increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease, and in the elderly. People with respiratory or heart disease, the elderly, and children should limit prolonged exertion. Everyone else should reduce prolonged or heavy exertion. The highest concentration recorded at the Modesto 14th Street monitoring station in the last three years was 189.8 µg/m^3 (AQI 250—Very Unhealthful) in 2018. At this concentration, significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population, increasingly severe symptoms and impaired breathing likely in active children and adults and people with respiratory disease, such as asthma; increasing likelihood of respiratory effects in general population. The relationship of the AQI to health effects in shown Table 4.

Table 4: Air Quality Index and Health Effects of Particulate Pollution

Air Quality Index/ $PM_{2.5}$ Concentration	Health Effects Description
AQI—51–100—Moderate Concentration 12.1–35.4 µg/m^3	**Sensitive Groups**: Some people who may be unusually sensitive to particle.
	Health Effects Statements: Unusually sensitive people should consider reducing prolonged or heavy exertion.
	Cautionary Statements: Unusually sensitive people: Consider reducing prolonged or heavy exertion. Watch for symptoms such as coughing or shortness of breath. These are signs to take it easier.
AQI—101–150—Unhealthy for Sensitive Groups Concentration 35.5–55.4 µg/m^2	**Sensitive Groups**: Sensitive groups include people with heart or lung disease, older adults, children, and teenagers.
	Health Effects Statements: Increasing likelihood of respiratory symptoms in sensitive individuals, aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease, and the elderly.
	If you have heart disease: Symptoms such as palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these, contact your health care provider.

Table 4 (cont.): Air Quality Index and Health Effects of Particulate Pollution

Air Quality Index/ $PM_{2.5}$ Concentration	Health Effects Description
AQI—151–200—Unhealthy Concentration 55.5–150.4 µg/m^3	Sensitive Groups: Everyone
	Health Effects Statements: Increased aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; increased respiratory effects in general population.
	Cautionary Statements: Sensitive groups: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling. Everyone else: Reduce prolonged or heavy exertion. Take more breaks during outdoor activities.
AQI—201–300—Very Unhealthy Concentration 150.5–250.4 µg/m^3	Sensitive Groups: Everyone
	Health Effects Statements: Significant aggravation of heart or lung disease and premature mortality in persons with cardiopulmonary disease and the elderly; significant increase in respiratory effects in general population.
	Cautionary Statements: Sensitive groups: Avoid all physical activity outdoors. Move activities indoors or reschedule to a time when air quality is better. Everyone else: Avoid prolonged or heavy exertion. Consider moving activities indoors or rescheduling to a time when air quality is better.

2.3.1 - Attainment Status

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as “nonattainment” areas. If standards are met, the area is designated as an “attainment” area. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered “unclassified.” National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards.

Each standard has a different definition, or “form” of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the three-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

The current attainment designations for the Air Basin are shown in Table 5. The Air Basin is designated as nonattainment for ozone, PM_{10}, and $PM_{2.5}$.

Table 5: San Joaquin Valley Air Basin Attainment Status

Pollutant	State Status	National Status
Ozone—One Hour	Nonattainment/Severe	No Standard
Ozone—Eight Hour	Nonattainment	Nonattainment/Extreme
Carbon monoxide	Attainment/Unclassified	Merced, Madera, and Kings Counties are unclassified; others are in Attainment
Nitrogen dioxide	Attainment	Attainment/Unclassified
Sulfur dioxide	Attainment	Attainment/Unclassified
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
Lead	Attainment	No Designation/Classification
Source of State status: California Air Resources Board (ARB 2013c). Source of National status: U.S. Environmental Protection Agency (EPA 2016a).		

2.4—Air Quality Plans and Regulations

Air pollutants are regulated at the national, state, and air basin or county level, and each agency has a different level of regulatory responsibility: the EPA regulates at the national level, the ARB at the state level, and the SJVAPCD at the air basin level.

The EPA is responsible for national and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State Implementation Plans, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards—also known as the federal standards described earlier.

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's State Implementation Plan incorporates individual federal attainment plans for regional air districts; specifically, an air district prepares their federal attainment plan, which is sent to ARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms. The ARB then submits the to the EPA for approval. After reviewing submitted SIPs, the EPA proposes to approve or disapprove all or part of each plan. The public has an opportunity to comment on the EPA's proposed action. EPA considers public input before taking final action on a state's plan. If EPA approves all or part of a SIP, those control measures are enforceable in federal court. If a state fails to submit an approvable plan or if EPA disapproves a plan, the EPA is required to develop a federal implementation plan (FIP).

The most recent federally approved attainment plans for the SJVAPCD are the 2007 8-hour Ozone Attainment Plan and the 2012 $PM_{2.5}$ Plan for the 2006 $PM_{2.5}$ standard. The Air Basin is designated as an extreme ozone nonattainment area for the EPA's 2008 8-hour ozone standard of 75 ppb. The plan to address this standard was adopted by the SJVAPCD on June 16, 2016. The ARB approved the attainment demonstration plan for the San Joaquin Valley on July 21, 2016 and transmitted the plan to EPA on August 24, 2016. The plan for areas designated extreme nonattainment must demonstrate attainment of the new ozone standard by December 31, 2031. The 2016 Ozone Plan predicts attainment of the 2008 standard by 2031. On June 30, 2020, the EPA approved portions of the 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standards and the San Joaquin Valley Supplement to the 2016 State Strategy for the State Implementation Plan related to the 2006 24-hour PM2.5 National Ambient Air Quality Standard (NAAQS) of 35 µg/m³. Additionally, EPA granted an extension of the Serious area attainment date for the 2006 PM2.5 NAAQS from December 31, 2019, to December 31, 2024. Federal review of portions of the plan that pertain to the other $PM_{2.5}$ standards will continue in 2020 (SJVAPCD 2020). The EPA Administrator signed the Final Rule revising the 8-hour ozone standard to 70 ppm on October 1, 2015. The SJVAB is expected to be designated nonattainment for this new standard in late 2017.

Areas designated nonattainment must develop air quality plans and regulations to achieve standards by specified dates, depending on the severity of the exceedances. For much of the country, implementation of federal motor vehicle standards and compliance with federal permitting requirements for industrial sources are adequate to attain air quality standards on schedule. For many areas of California, however, additional state and local regulation is required to achieve the standards. Regulations adopted by California are described below.

2.4.1 - California Regulations

Low-Emission Vehicle Program

The ARB first adopted Low-Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the State's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, the more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 State Implementation Plan. In 2012, ARB adopted the LEV III amendments to California's LEV regulations. These amendments, also known as the Advanced Clean Car Program, include more stringent emission standards for model years 2017 through 2025 for both criteria pollutants and GHGs for new passenger vehicles (ARB 2013e).

On-Road Heavy-Duty Vehicle Program

The ARB has adopted standards for emissions from various types of new on-road heavy-duty vehicles. Section 1956.8, Title 13, California Code of Regulations contains California's emission standards for on-road heavy-duty engines and vehicles, as well as test procedures. ARB has also adopted programs to reduce emissions from in-use heavy-duty vehicles including the Heavy-Duty Diesel Vehicle Idling Reduction Program, the Heavy-Duty Diesel In-Use Compliance Program, the Public Bus Fleet Rule and Engine Standards, and the School Bus Program and others (ARB 2013f).

ARB Truck and Bus Regulation

The latest amendments to the Truck and Bus regulation became effective on December 31, 2014. The amended regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent.

The regulation applies to nearly all privately and federally owned diesel-fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. The regulation provides a variety of flexibility options tailored to fleets operating low-use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks (ARB 2015a).

Advanced Clean Truck Regulation.

The Advanced Clean Trucks regulation was approved on June 25, 2020 and has two main components, a manufacturers ZEV sales requirement and a one-time reporting requirement for large entities and fleets. Promoting the development and use of advanced clean trucks will help CARB achieve its emission reduction strategies as outlined in the State Implementation Plan (SIP), Sustainable Freight Action Plan, Senate Bill (SB) 350, and Assembly Bill (AB) 32.

The proposed regulation has two components including a manufacturer sales requirement, and a reporting requirement:

- Zero-emission truck sales: Manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines would be required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales would need to be 55% of Class 2b—3 truck sales, 75% of Class 4 –8 straight truck sales, and 40% of truck tractor sales.
- Company and fleet reporting: Large employers including retailers, manufacturers, brokers, and others would be required to report information about shipments and shuttle services. Fleet owners with 50 or more trucks would be required to report about their existing fleet operations. This information would help identify future strategies to ensure that fleets purchase available zero-emission trucks and place them in service where suitable to meet their needs (ARB 2020b)

ARB Regulation for In-Use Off-Road Diesel Vehicles

On July 26, 2007, the ARB adopted a regulation to reduce DPM and nitrous oxide (NO_X) emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each vehicle in violation. Performance requirements of the rule are based on a fleet's average NO_X emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements, making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501–5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

ARB Airborne Toxic Control Measure for Asbestos

In July 2001, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying, and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. The measure establishes specific testing, notification and engineering controls prior to grading, quarrying, or surface mining in construction zones where naturally occurring asbestos is located on projects of any size. There are additional notification and engineering controls at work sites larger than 1 acre in size. These projects require the submittal of a Dust Mitigation Plan and approval by the air district prior to the start of a project.

Construction sometimes requires the demolition of existing buildings where construction occurs. The project includes no demolition. Buildings often include materials containing asbestos. Asbestos is also found in a natural state, known as naturally occurring asbestos. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers into the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

The ARB has an Air Toxic Control Measure for construction, grading, quarrying, and surface mining operations, requiring the implementation of mitigation measures to minimize emissions of asbestos-laden dust. The measure applies to road construction and maintenance, construction and grading operations, and quarries and surface mines when the activity occurs in an area where naturally occurring asbestos is likely to be found. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The measure also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity. Review of the Department of Conservation maps indicates that no ultramafic rock has been found near Laton.

Diesel Risk Reduction Plan

The ARB's Diesel Risk Reduction Plan has led to the adoption of state regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce DPM emissions by about 90 percent overall from year 2000 levels. The projected emission benefits associated with the full implementation of this plan, including federal measures, are reductions in DPM emissions and associated cancer risks of 75 percent by 2010, and 85 percent by 2020 (ARB 2000).

2.4.2 - San Joaquin Valley Air Pollution Control District

The District is responsible for controlling emissions primarily from stationary sources. The District, in coordination with the eight countywide transportation agencies, is also responsible for developing, updating, and implementing air quality attainment plans for the Air Basin. The District also has roles under CEQA.

Ozone Plans

The Air Basin is designated nonattainment of state and federal health-based air quality standards for ozone. To meet Clean Air Act requirements for the one-hour ozone standard, the District adopted an Extreme Ozone Attainment Demonstration Plan in 2004, with an attainment date of 2010. Although the EPA revoked the federal 1-hour ozone standard effective June 15, 2005 and replaced it with an 8-hour standard, the requirement to submit a plan for that standard remained in effect for the San Joaquin Valley.

The planning requirements for the 1-hour plan remain in effect until replaced by a federal 8-hour ozone attainment plan. On March 8, 2010, the EPA approved the 2004 Extreme Ozone Attainment Demonstration Plan, including revisions to the plan, effective April 7, 2010. However, the Air Basin failed to attain the standard in 2010 and was subject to a $29-million Clean Air Act penalty. The penalty is being collected through an additional $12 motor vehicle registration surcharge for each passenger vehicle registered in the Air Basin that will be applied to pollution reduction programs in the region. The District also instituted a more robust ozone episodic program to reduce emissions on days with the potential to exceed the ozone standards. On July 18, 2016, the EPA published in the Federal Register a final action determining that the San Joaquin Valley has attained the 1-hour ozone national ambient air quality standard. This determination is based on the most recent three-year period (2012-2014) of sufficient, quality-assured, and certified data. The penalty fees remain in place pending submittal of a demonstration that the San Joaquin Valley will maintain the 1-hour standard for 10 years (EPA 2016b).

The EPA originally classified the Air Basin as serious nonattainment for the 1997 federal 8-hour ozone standard with an attainment date of 2013. On April 30, 2007, the District's Governing Board adopted the 2007 Ozone Plan, which contained analysis showing a 2013 attainment target to be infeasible. The 2007 Ozone Plan details the plan for achieving attainment on schedule with an "extreme nonattainment" deadline of 2024. At its adoption of the 2007 Ozone Plan, the District also requested a reclassification to extreme nonattainment. ARB approved the plan in June 2007, and the EPA approved the request for reclassification to extreme nonattainment on April 15, 2010.

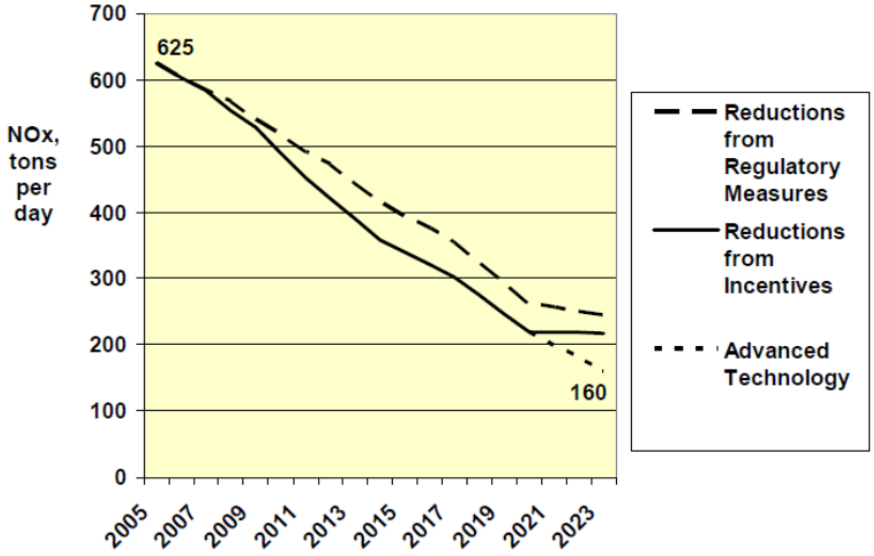
The 2007 Ozone Plan contains measures to reduce ozone and particulate matter precursor emissions to bring the Basin into attainment with the federal 8-hour ozone standard. The 2007 Ozone Plan calls for a 75 percent reduction of NO_X and a 25 percent reduction of reactive organic gases (ROG). Figure 4 displays the anticipated NO_X reductions attributed in the 2007 Ozone Plan. The plan, with innovative measures and a "dual path" strategy, assures expeditious attainment of the federal 8-hour ozone standard for all Air Basin residents. The District Governing Board adopted the 2007 Ozone Plan on April 30, 2007. The ARB approved the plan on June 14, 2007. The 2007 Ozone Plan requires yet to be determined "Advanced Technology" to achieve additional reductions after 2021, in order to attain the standard at all monitoring stations in the Air Basin by 2024 as allowed for areas designated extreme nonattainment by the federal Clean Air Act.

The Air Basin is designated as an extreme ozone nonattainment area for the EPA's 2008 8-hour ozone standard of 75 ppb. The District's Governing Board approved the 2016 Plan for the 2008 8-Hour Ozone Standard on June 16, 2016. The ARB approved the attainment demonstration plan for the San Joaquin Valley on July 21, 2016 and transmitted the plan to EPA on August 24, 2016. The comprehensive strategy in this plan will reduce NO_X emissions by over 60 percent between 2012 and 2031, and will bring the San Joaquin Valley into attainment of the EPA's 2008 8-hour ozone standard as expeditiously as practicable, no later than December 31, 2031. The 2016 Ozone Plan predicts attainment of the 2008 standard by 2031 (SJVAPCD 2018a). To ensure that the plan is approvable with the necessary contingencies, the plan includes a "Black Box" that will require implementation of new advanced technologies and controls prior to the 2031 deadline.

The EPA Administrator signed the Final Rule revising the 8-hour ozone standard to 70 ppm on October 1, 2015. The new standard will require the SJVAPCD to prepare a new attainment to achieve the more stringent emission level within 20 years from the effective date of designation (EPA 2018).

State ozone standards do not have an attainment deadline but require implementation of all feasible measures to achieve attainment at the earliest date possible. This is achieved through compliance with the federal deadlines and control measure requirements.

Figure 4: San Joaquin Valley NO_X Emissions Forecast



(Source: 2007 Ozone Plan)

Particulate Matter Plans

The Air Basin was designated nonattainment of state and federal health-based air quality standards for PM_{10}. The Air Basin is also designated nonattainment of state and federal standards for $PM_{2.5}$.

To meet Clean Air Act requirements for the PM_{10} standard, the District adopted a PM_{10} Attainment Demonstration Plan (Amended 2003 PM_{10} Plan and 2006 PM_{10} Plan), which has an attainment date of 2010. The District adopted the 2007 PM_{10} Maintenance Plan in September 2007 to assure the San Joaquin Valley's continued attainment of the EPA's PM_{10} standard. The EPA designated the valley as an attainment/maintenance area for PM_{10} on September 25, 2008. Although the San Joaquin Valley has exceeded the standard since then, those days were considered exceptional events that are not considered a violation of the standard for attainment purposes.

The 2008 $PM_{2.5}$ Plan builds upon the comprehensive strategy adopted in the 2007 Ozone Plan to bring the Air Basin into attainment of the 1997 national standards for $PM_{2.5}$. The EPA has identified NO_X and SO_2as precursors that must be addressed in air quality plans for the 1997 $PM_{2.5}$ standards. The 2008 $PM_{2.5}$ Plan is a continuation of the District's strategy to improve the air quality in the Air Basin. The EPA issued final approval of the 2008 $PM_{2.5}$ Plan on November 9, 2011, which became effective on January 9, 2012. The EPA approved the emissions inventory, the reasonably available control measures/reasonably available control technology demonstration, reasonable further progress demonstration, attainment demonstration and associated air quality modeling, and the transportation conformity motor vehicle emissions budgets. The EPA also granted California's request to extend the attainment deadline for the San Joaquin Valley to April 5, 2015 and approved commitments to measures and reductions by the District and the ARB. Finally, it disapproved the State Implementation Plan's contingency provisions and issued a protective finding for transportation conformity determinations.

In December 2012, the District adopted the 2012 $PM_{2.5}$ Plan to bring the San Joaquin Valley into attainment of the EPA's 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$. The ARB approved the District's 2012 $PM_{2.5}$ Plan for the 2006 standard at a public hearing on January 24, 2013 (SJVAPCD 2012a). This plan seeks to bring the Valley into attainment with the standard by 2019, with the expectation that most areas will achieve attainment before that time.

The 2015 Plan for the 1997 $PM_{2.5}$ Standard approved by the District Governing Board on April 16, 2015—will bring the Valley into attainment of the EPA's 1997 $PM_{2.5}$ standard as expeditiously as practicable, but no later than December 31, 2020. The plan was required to request reclassification to Serious nonattainment and to extend the attainment date from 2018 to 2020 (SJVAPCD 2015b).

The 2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard was adopted on September 15, 2016. This plan includes an attainment impracticability demonstration and request for reclassification of the Valley from Moderate nonattainment to Serious nonattainment. The 2016 $PM_{2.5}$ Plan is under ARB review (SJVAPCD 2017b).

The SJVAPCD adopted the 2018 Plan for the 1997, 2006, and 2012 $PM_{2.5}$ Standards on November 15, 2018. This plan provides a combined strategy to address the EPA federal 1997 annual $PM_{2.5}$ standard of 15 $\mu g/m^3$ and 24-hour $PM_{2.5}$ standard of 65 $\mu g/m^3$; the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$; and the 2012 annual $PM_{2.5}$ standard of 12 $\mu g/m^3$. This plan demonstrates attainment of the federal $PM_{2.5}$ standards as expeditiously as practicable (SJVAPCD 2018b).

SJVAPCD Rules and Regulations

The SJVAPCD rules and regulations that may apply to the project include, but are not limited to the following:

Rule 2201—New and Modified Stationary Source Review Rule. The review of new and modified Stationary Sources of air pollution and to provide mechanisms including emission trade-offs by which Authorities to Construct such sources may be granted, without interfering with the attainment or maintenance of Ambient Air Quality Standards

Rule 4102—**Nuisance.** The purpose of this rule is to protect the health and safety of the public, and applies to any source operation that emits or may emit air contaminants or other materials. Agricultural activities are exempt from the nuisance rule.

Rule 4601—**Architectural Coatings.** The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling. Only compliant components are available for purchase in the San Joaquin Valley.

Rule 4603—**Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Craft.** The purpose of this rule is to limit the emissions of volatile organic compounds (VOC) from the coating of metal parts and products, large appliances parts or products, metal furniture, plastic parts and products, automotive/transportation and business machine plastic parts and products, and pleasure crafts, and from the organic solvent cleaning and storage and disposal of solvents and waste solvent materials associated with such coating.

Rule 4641—**Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations.** The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641. This regulation is enforced on the asphalt provider

Rule 9410—Employer Based Trip Reduction. The purpose of the rule is to reduce VMT from employee commute trips. Large industrial and commercial projects that employ more than 100 eligible persons with arrival times during peak traffic hours are required to implement an Employer Trip Reduction Implementation Plan (ETRIP) within 180 days of becoming subject to the rule.

Rule 9510—**Indirect Source Review.** This rule reduces the impact of NO_X and PM_{10} emissions from growth within the Air Basin. The rule places application and emission reduction requirements on development projects meeting applicability criteria in order to reduce emissions through on-site mitigation, off-site District-administered projects, or a combination of the two.

Regulation VIII—**Fugitive PM_{10} Prohibitions.** This regulation is a control measure that is one main strategies from the 2006 PM_{10} for reducing the PM_{10} emissions that are part of fugitive dust. Projects over 10 acres are required to file a Dust Control Plan (DCP) containing dust control practices sufficient to comply with Regulation VIII. Rule 8021 regulates construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.

CEQA

The District has three roles under CEQA:

1. **Lead Agency:** Responsible for preparing environmental analyses for its own projects (adoption of rules, regulations, or plans) or permit projects filed with the District where the District has primary approval authority over the project.
2. **Responsible Agency:** The discretionary authority of a responsible agency is more limited than a lead agency; having responsibility for mitigating or avoiding only the environmental effects of those parts of the project which it decides to approve, carry out, or finance. The District defers to the lead agency for preparation of environmental documents for land use projects that also have discretionary air quality permits, unless no document is prepared by the lead agency and potentially significant impacts related to the permit are possible. The District regularly submits comments on documents prepared by lead agencies to ensure that District concerns are addressed.
3. **Commenting Agency:** The District reviews and comments on air quality analyses prepared by other public agencies (such as the project).

The District also provides guidance and thresholds for CEQA air quality and GHG analyses. The result of this guidance, as well as state regulations to control air pollution, is an overall improvement in the Air Basin. In particular, the District's 2015 GAMAQI states the following:

1. The District's Air Quality Attainment Plans include measures to promote air quality elements in county and city general plans as one of the primary indirect source programs. The general plan is the primary long-range planning document used by cities and counties to direct development. Since air districts have no authority over land use decisions, it is up to cities and counties to ensure that their general plans help achieve air quality goals. Section 65302.1 of the California Government Code requires cities and counties in the San Joaquin Valley to amend appropriate elements of their general plans to include data, analysis, comprehensive goals, policies, and feasible implementation strategies to improve air quality in their next housing element revisions.
2. The Air Quality Guidelines for General Plans (AQGGP), adopted by the District in 1994 and amended in 2005, is a guidance document containing goals and policy examples that cities and counties may want to incorporate into their General Plans to satisfy Section 65302.1. When adopted in a general plan and implemented, the suggestions in the AQGGP can reduce vehicle trips and miles traveled and improve air quality. The specific suggestions in the AQGGP are voluntary. The District strongly encourages cities and counties to use their land use and transportation planning authority to help achieve air quality goals by adopting the suggested policies and programs.

2.4.3 - Local

The Stanislaus County General Plan 2015 was adopted on August 23, 2016. The Plan has no goals or policies that directly address air quality or GHG emissions. However, policies aimed at reducing vehicle miles traveled listed in the Circulation Element would also reduce air quality and greenhouse gas impacts (Stanislaus County 2016). Applicable policies and implementation measures are listed below.

- **Policy Two:** The Circulation system shall be designed and maintained to promote safety by combining multiple modes of transportation into a single, cohesive system.

Implementation Measures

10. Traffic control devices (e.g., traffic signals, roundabouts), traffic calming, and other transportation system management techniques shall be utilized to control the flow of traffic, improve traffic safety, and minimize delays. Responsible Department: Public Works
13. Promote the transformation of major transportation corridors into boulevards that are attractive, comfortable, and safe for pedestrians by incorporating wide sidewalks to accommodate pedestrian traffic; amenities and landscaping; on-street parking between sidewalks and travel lanes; enhanced pedestrian street crossings; buildings located at the back of sidewalk; building entrances oriented to the street; transparent ground floor frontage; street trees and furnishings; and pedestrian-scale lighting and signage. Responsible Department: Public Works, Planning
14. A strategy plan should be prepared that includes the identification of areas and/or projects to which new multi-modal transportation guidelines shall apply. New guidelines shall identify strategies for creating communities that increase the convenience, safety, and comfort of people using bicycle, pedestrian, and public transit facilities. Existing policies and standards, such as landscaping, parking, and building setback requirements, may require variations on a case-by-case basis, specifically in Central Business Districts. Responsible Departments: Public Works Transit Division, Planning

- **Policy Six:** The County shall strive to reduce motor vehicle emissions and vehicle miles traveled (VMT) by encouraging the use of alternatives to single occupant vehicles.

Implementation Measures

1. The use of alternative modes of transportation will continue to be encouraged by participating in programs to promote walking, bicycling, ridesharing, and transit use for commuting and recreation. Responsible Departments: Public Works, Planning
2. The County will continue to work with StanCOG, Caltrans, and the cities to identify and secure funding for the development and improvement of bikeways, pedestrian pathways, park-and-ride facilities, transit systems, and other alternatives to the single-occupant vehicles. Responsible Departments: Chief Executive Office, Public Works
3. Facilities to support the use of, and transfer between, alternative modes of transportation (i.e., pedestrian, rideshare, bicycle, bus, rail, and aviation) shall be provided in new development. Responsible Departments: Public Works, Planning

4. The County will continue to work with the Stanislaus Council of Governments and the San Joaquin Valley Air Pollution Control District to develop and implement transportation control measures to improve air quality through reduction in vehicle trips and vehicle miles of travel. Responsible Departments: Chief Executive Office, Public Works, Planning
5. Developers will construct or pay the cost of new pedestrian pathways, bikeways, rideshare facilities, transit amenities, and other improvements necessary to serve the development and to mitigate impacts to the existing circulation system caused by the development. Responsible Departments: Public Works, Planning
6. The County shall continue using Compressed Natural Gas (CNG) or another alternative energy source in its fleet vehicles and will pursue special grants and funding to offset the costs of continued-use of CNG in County-owned buses. Responsible Departments: Public Works Transit Division

- **Policy Eight:** Promote public transit as a viable transportation choice.

Implementation Measures

1. Continue to operate existing transit systems and coordinate with other County transit operators to provide public transit serving Stanislaus County. Responsible Departments: Public Works Transit Division.
2. The County shall continue to work with the Stanislaus Council of Governments (StanCOG) to seek funding to market and promote rideshare programs and where possible, encourage all County employees to use public transit to commute to work. Responsible Departments: Public Works Transit Division, Planning.
3. Ensure that provisions are made in proposed development for access to current and future public transit services. In particular, continuous segments of walls or fences should not impede pedestrian access to Expressways, Principal and Minor Arterials, and Major and Minor Collectors with transit service. Responsible Departments: Public Works, Planning
4. Where appropriate, new development projects shall promote the coordination and continuity of all transportation modes and facilities, including park and ride facilities at major activity centers. Responsible Departments: Public Works Transit Division, Planning
5. Where appropriate, new development projects shall include bus turnouts and site improvements associated with bus stop accessibility for persons with disabilities, including curb cuts for wheel chair access. Where feasible, developments should be encouraged along established or proposed transit routes. The costs associated with site improvements shall be paid by the developer. Responsible Departments: Public Works, Planning
6. Where possible, coordinate public transportation with land use planning, transportation planning, and air quality policies such that transit investments are complementary to land use planning and air quality policies. Responsible Departments: Public Works, Planning
7. Financing mechanisms shall be investigated to recover the cost of providing transit service and infrastructure to support new development. Responsible Departments: Public Works Transit Division, Planning
8. The County shall encourage infill development of vacant parcels and redevelopment projects that will align with and improve the overall effectiveness of the public transit system. Responsible Departments: Public Works Transit Division, Planning

9. Increase transit use through higher-frequency service of at least 15-minute headways in downtown areas and along major transportation corridors. Transit and land use will be interconnected to support increased ridership. Responsible Department: Public Works, Planning.

2.4.4 - Existing Sources of Toxic Emissions

No existing or planned sources of toxic emissions were identified that exceed ARB recommendations in its Air Quality Land Use Handbook for siting sensitive land uses.

2.4.5 - ARB Air Quality Land Use Handbook

The following is a list of land uses that may result in impacts to sensitive land uses when located near specific sources of air pollution (ARB 2005):

- High traffic freeways and roads
- Distribution centers
- Rail yards
- Ports
- Refineries
- Chrome plating facilities
- Dry cleaners
- Large gas dispensing facilities

The project is not among the uses listed; however, a screening analysis is included to ensure that impacts from TACs would be less than significant.

SECTION 3: CLIMATE CHANGE SETTING

3.1—Climate Change

Climate change is a change in the average weather of the earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance, specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fourth Assessment Report, the IPCC predicted that the global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios (IPCC 2007a). The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

An individual project cannot generate enough GHG emissions to cause a discernible change in global climate. However, the project participates in the potential for global climate change by its incremental contribution of GHGs—and when combined with the cumulative increase of all other sources of GHGs—constitute potential influences on global climate change.

3.1.1 - Consequences of Climate Change in California

In California, climate change may result in consequences such as the following (from CCCC 2006 and Moser et al. 2009):

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.

- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.

- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.

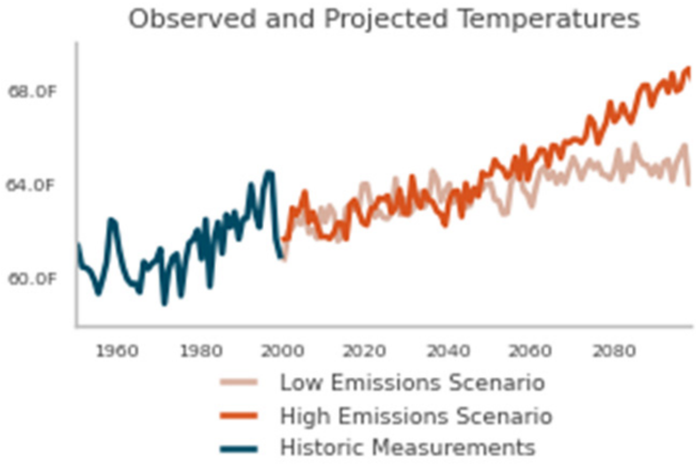
- **An increase in temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.

- **A decrease in the health and productivity of California's forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

Consequences of Climate Change in the Project Area

Figure 5 displays a chart of measured historical and projected annual average maximum temperatures in the project area. As shown in the figure, temperatures are expected to rise in all models used for the analysis. The results indicate that the annual mean temperatures are predicted to increase by 6.4 degrees Fahrenheit (°F) based on the 2070 to 2099 projections from a 1965 to 1990 baseline for the high-emissions scenario (CalAdapt 2019).

Figure 5: Observed and Projected Temperatures for Climate Change in the Project Area



Source: CalAdapt 2019

Water Supply

The project will use an existing water system on a parcel east of the site, but may be connected to the City of Modesto water system in the future. The availability of groundwater could decline if climate change results in reduced precipitation available for recharge.

Wildfires

The project site is in an area with irrigated agricultural and industrial development with limited fuels that would not be subject to a wildfire. The potential for increased temperatures and drought conditions due to climate change would result in increased risk from wildfire in undeveloped areas of Stanislaus County that are distant from the project site.

Human Health Effects of GHG Emissions

GHG emissions from development projects would not result in concentrations that would directly impact public health. However, the cumulative effects of GHG emissions on climate change have the potential to cause adverse effects to human health.

In its report, Global Climate Change Impacts in the U.S. (2009), the U.S. Global Change Research Program has analyzed the degree to which impacts on human health are expected to impact the United States.

Potential effects of climate change on public health include:

- Direct Temperature Effects: Climate change may directly affect human health through increases in average temperatures, which are predicted to increase the incidence of heat waves and hot extremes.
- Extreme Events: Climate change may affect the frequency and severity of extreme weather events, such as hurricanes and extreme heat and floods, which can be destructive to human health and well-being.
- Climate-Sensitive Diseases: Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects, such as malaria, dengue fever, yellow fever, and encephalitis.
- Air Quality: Respiratory disorders may be exacerbated by warming-induced increases in the frequency of smog (ground-level ozone) events and particulate air pollution (EPA 2009a).

Although there could be health effects resulting from changes in the climate and the consequences that can occur, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). The potential health effects of ozone and particulate matter are discussed in criteria pollutant analyses. At very high indoor concentrations (not at levels existing outside), carbon dioxide (CO_2), methane, sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen (CDC 2010 and OSHA 2003).

3.2—Greenhouse Gases

Gases that trap heat in the atmosphere are referred to as GHGs. The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, CO_2, methane, NO_X, chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit GHGs. The presence of GHGs in the atmosphere affects the earth's temperature. It is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Climate change is driven by forcings and feedbacks. Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. Positive forcing tends to warm the surface while negative forcing tends to cool it. Radiative forcing values are typically expressed in watts per square meter. A feedback is a climate process that can strengthen or weaken a forcing. For example, when ice or snow melts, it reveals darker land underneath which absorbs more radiation and causes more warming. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. The global warming potential of a gas is essentially a measurement of the radiative forcing of a GHG compared with the reference gas, CO_2.

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. CO_2, the reference gas for global warming potential, has a global warming potential of one. The global warming potential of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming. To describe how much global warming a given type and amount of GHG may cause, the carbon dioxide equivalent is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, CO_2. For example, CH_4's warming potential of 25 indicates that CH_4 has 25 times greater warming effect than CO_2 on a molecule-per-molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. GHGs defined by Assembly Bill (AB) 32 (see the Climate Change Regulatory Environment section for a description) include CO_2, CH_4, NO_X, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. They are described in Table 6. A seventh GHG, nitrogen trifluoride, was added to Health and Safety Code section 38505(g)(7) as a GHG of concern. The global warming potential amounts are from IPCC Fourth Assessment Report (AR4). The new amounts have been incorporated into the CalEEMod 2016.3.2 used in this analysis. Although the newer IPCC Fifth Assessment Report (AR5) includes new global warming potential amounts, ARB continues to use AR4 rates inventory purposes including the 2018 inventory released on October 19, 2020 to ensure consistency with past inventories. Until such a time as ARB updates its Scoping Plan inventories to utilize AR5 GWPs, it is appropriate to continue using AR4 GWPs for CEQA analyses, which are based on Scoping Plan consistency.

Table 6: Description of Greenhouse Gases

Greenhouse Gas	Description and Physical Properties	Sources
Nitrous oxide	Nitrous oxide (laughing gas) is a colorless GHG. It has a lifetime of 114 years. Its global warming potential is 298.	Microbial processes in soil and water, fuel combustion, and industrial processes.
Methane	Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 25.	Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter.
Carbon dioxide	Carbon dioxide (CO_2) is an odorless, colorless, natural GHG. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960.	Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood.
Chlorofluorocarbons	These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 124 to 14,800.	Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987.
Perfluorocarbons	Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from7,390 to 12,200.	Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing.
Sulfur hexafluoride	Sulfur hexafluoride (SF_6) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential of 22,800.	This gas is man-made and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas.
Nitrogen trifluoride	Nitrogen trifluoride (NF_3) was added to Health and Safety Code section 38505(g)(7) as a GHG of concern. It has a high global warming potential of 17,200.	This gas is used in electronics manufacture for semiconductors and liquid crystal displays.
Sources: Compiled from a variety of sources, primarily Intergovernmental Panel on Climate Change 2007a and 2007b.		

The State has begun the process of addressing pollutants referred to as short-lived climate pollutants. Senate Bill (SB) 605, approved by the governor on September 14, 2014 required the ARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016. ARB was required to complete an emission inventory of these pollutants, identify research needs, identify existing and potential new control measures that offer co-benefits, and coordinated with other state agencies and districts to develop measures. The Short Lived Climate

Pollutant Strategy was approved by the ARB in March 2017. The strategy calls for reductions of 50 percent from black carbon, 40 percent from methane, and 40 percent from HFCs from the 2030 Business as Usual (BAU) inventory for these pollutants (ARB 2017b).

The short-lived climate pollutants include three main components: black carbon, fluorinated gases, and methane. Fluorinated gases and methane are described in Table 6 and are already included in the California GHG inventory. Black carbon has not been included in past GHG inventories; however, ARB will include it in its comprehensive strategy (ARB 2015b).

Ozone is another short-lived climate pollutant that will be part of the strategy. Ozone affects evaporation rates, cloud formation, and precipitation levels. Ozone is not directly emitted, so its precursor emissions—VOC and NO_X on a regional scale and CH_4 on a hemispheric scale—will be subject of the strategy (ARB 2015b).

Black carbon is a component of fine particulate matter. Black carbon is formed by incomplete combustion of fossil fuels, biofuels, and biomass. Sources of black carbon within a jurisdiction may include exhaust from diesel trucks, vehicles, and equipment, as well as smoke from biogenic combustion. Biogenic combustion sources of black carbon include the burning of biofuels used for transportation, the burning of biomass for electricity generation and heating, prescribed burning of agricultural residue, and natural and unnatural wildfires. Black carbon is not a gas but an aerosol—particles or liquid droplets suspended in air. Black carbon only remains in the atmosphere for days to weeks, whereas other GHGs can remain in the atmosphere for years. Black carbon can be deposited on snow, where it absorbs sunlight, reduces sunlight reflectivity, and hastens snowmelt. Direct effects include absorbing incoming and outgoing radiation; indirectly, black carbon can also affect cloud reflectivity, precipitation, and surface dimming (cooling).

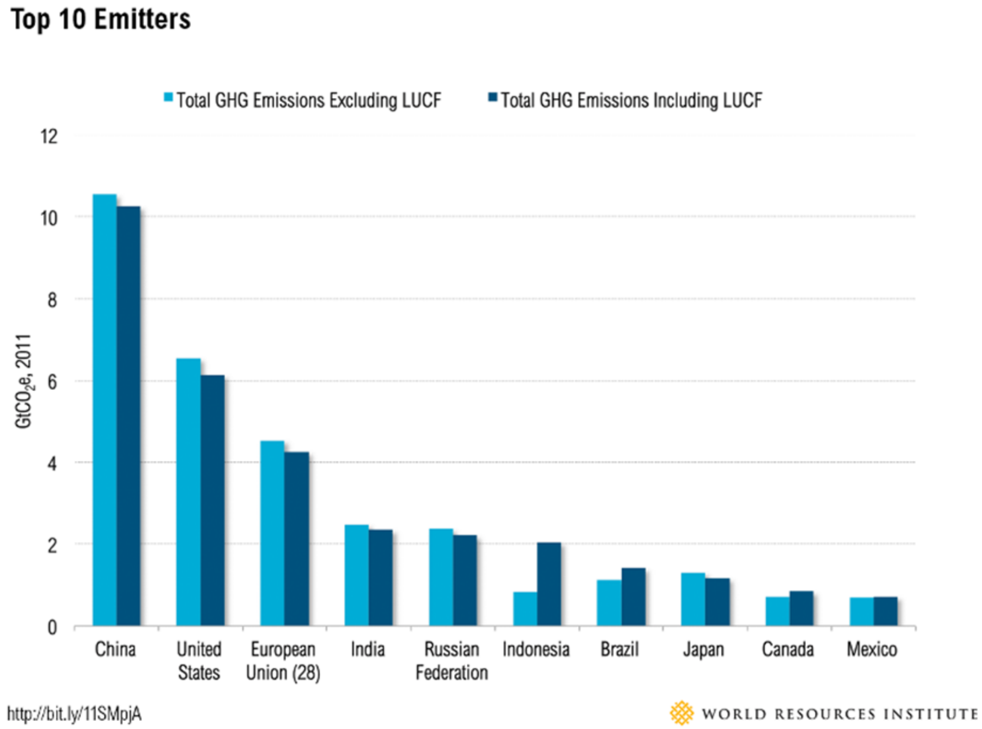
Global warming potentials for black carbon were not defined by the IPCC in its Fourth Assessment Report. The ARB has identified a global warming potential of 3,200 using a 20-year time horizon and 900 using a 100-year time horizon from the IPCC Fifth Assessment. Sources of black carbon are already regulated by ARB, and air district criteria pollutant and toxic regulations that control fine particulate emissions from diesel engines and other combustion sources (ARB 2015b). Additional controls on the sources of black carbon specifically for their GHG impacts beyond those required for toxic and fine particulates are not likely to be needed.

Water vapor is also considered a GHG. Water vapor is an important component of our climate system and is not regulated. Increasing water vapor leads to warmer temperatures, which causes more water vapor to be absorbed into the air. Warming and water absorption increase in a spiraling cycle. Water vapor feedback can also amplify the warming effect of other greenhouse gases, such that the warming brought about by increased CO_2 allows more water vapor to enter the atmosphere (NASA 2015b).

3.2.1 - Emissions Inventories

An emissions inventory is a database that lists, by source, the amount of air pollutants discharged into the atmosphere of a geographic area during a given time period. Emissions worldwide were approximately 43,286 million metric tons of carbon dioxide equivalents ($MMTCO_2e$) in 2012. As shown in Figure 6, China was the largest GHG emitter with over 10 billion metric tons of CO_2e, and the United States was the second largest GHG emitter with over 6 billion metric tons of CO_2e (WRI 2014).

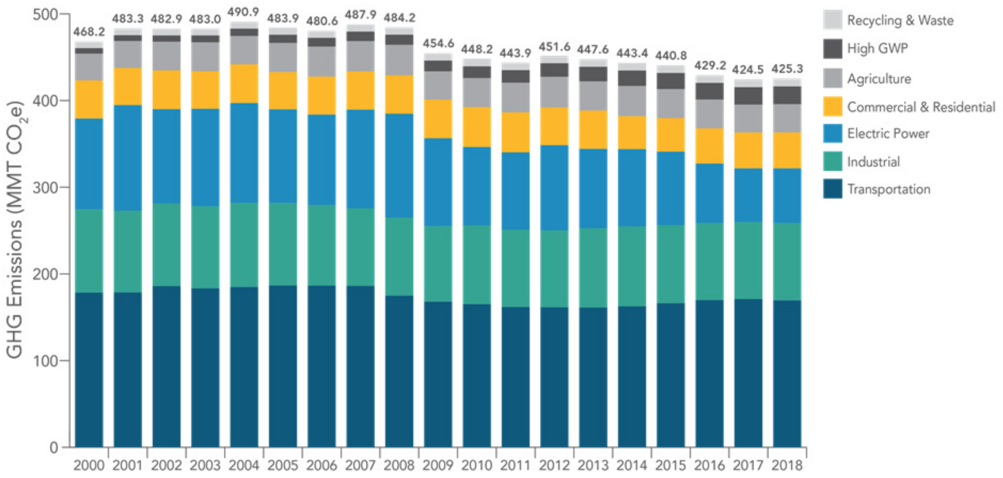
Figure 6: Greenhouse Gas Emissions Trends



Source: WRI 2014.

Figure 7 shows the contributors of GHG emissions in California between years 2000 and 2018 by Scoping Plan category. The main contributor was transportation. The second-highest sector was industrial, which includes sources from refineries, general fuel use, oil and gas extraction, cement plants, and cogeneration heat output. ARB reported that California's GHG emissions inventory was 425.2 MMTCO$_2$e in 2018 (ARB 2020b). This amount is below the State's 2020 emission target of 431 MMTCO$_2$e

Figure 7: Greenhouse Gas Emission Trends by Scoping Plan Category in California



Source: ARB 2020b.

3.3—Regulatory Environment

3.3.1 - International

International organizations, such as the ones discussed below, have made substantial efforts to reduce GHGs. Preventing human-induced climate change will require the participation of all nations in solutions to address the issue.

Intergovernmental Panel on Climate Change. In 1988, the United Nations and the World Meteorological Organization established the Intergovernmental Panel on Climate Change. The panel was tasked with assessing the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

United Nations Framework Convention on Climate Change (Convention). On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

Kyoto Protocol. The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at average of five percent against 1990 levels over the five-year period from 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities.”

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above pre-industrial levels, subject to a review in 2015. The UN Climate Change Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

On September 23, 2014, more than 100 heads of state and government, along with leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Summit, heads of government, business, and civil society announced actions in areas that would have the greatest impact on reducing emissions, including: climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

Paris Agreement. Parties to the United Nations Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12, 2015 in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating in a four-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen those efforts in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts, and undergo international review.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties, or COP 21. Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make "nationally determined contributions" (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and "progress made in implementing and achieving" their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will "represent a progression" beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address "loss and damage" resulting from climate change, which explicitly will not "involve or provide a basis for any liability or compensation;"
- Require parties engaging in international emissions trading to avoid "double counting;" and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country's NDC (C2ES 2015a).

President Biden rejoined the Paris Climate Agreement on January 20, 2021 shortly after taking office (White House 2021).

3.3.2 - Federal Regulations

Prior to the last decade, there were no concrete federal regulations of GHGs or major planning for climate change adaptation. Since then, federal activity has increased. The following are actions regarding the federal government, GHGs, and fuel efficiency.

Greenhouse Gas Endangerment. *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States Supreme Court on November 29, 2006, in which it was petitioned that the EPA regulate four GHGs, including CO_2, under Section 202(a)(1) of the Clean Air Act. A decision was made on April 2, 2007, in which the Supreme Court found that GHGs are air pollutants covered by the Clean Air Act. The Court held that the Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section “Clean Vehicles” below. After a lengthy legal challenge, the United States Supreme Court declined to review an Appeals Court ruling upholding the EPA Administrator findings (EPA 2009b).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light-duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation’s National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile, equivalent to 35.5 miles per gallon; that is, if the automobile industry were to meet this CO_2 level solely through fuel economy improvements. Together, these standards would cut CO_2 emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking, establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012b). The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of CO_2 in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, which became effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that began in the 2014 model year and achieve up to a 20-percent reduction in CO_2 emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles, and a 15-percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10-percent reduction in fuel consumption and CO_2 emissions from the 2014 to 2018 model years.

Mandatory Reporting of Greenhouse Gases. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010 that establishes thresholds for GHGs, which will define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the federal code of regulations, the EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to greenhouse gas sources, starting with the largest greenhouse gas emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for greenhouse gas emissions until at least April 30, 2016.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of CO_2 for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts would be required to meet an output-based standard of 1,000 pounds of CO_2 per megawatt-hour, based on the performance of widely used natural gas combined cycle technology. President Trump signed the Executive Order on Energy Independence (Executive Order 13783), which calls for a review of the Clean Power Plan. On October 16, 2017, the EPA issued the proposed rule Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (EPA 2017).

Cap-and-Trade. Cap-and-Trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. There is no federal GHG Cap-and-Trade Program currently; however, some states have joined to create initiatives to provide a mechanism for Cap-and-Trade.

The Regional Greenhouse Gas Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps CO_2 emissions from power plants, auctions CO_2 emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners are California, British Columbia, Manitoba, Ontario, and Quebec. Currently only California and Quebec are participating in the Cap-and-Trade Program (C2ES 2015).

3.3.3 - California

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark AB 32 California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 32. The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. “Greenhouse gases” as defined under AB 32 include CO_2, methane, NO_X, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The ARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in

> the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

The ARB approved the 1990 GHG emissions level of 427 $MMTCO_2e$ on December 6, 2007 (ARB 2007). Therefore, to meet the State's target, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 in a BAU scenario were estimated to be 596 $MMTCO_2e$, which do not account for reductions from AB 32 regulations (ARB 2008a). At that rate, a 28 percent reduction was required to achieve the 427 $MMTCO_2e$ 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the effects of the 2008 recession and slower forecasted growth. The 2020 inventory without the benefits of adopted regulation is now estimated at 545 $MMTCO_2e$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (ARB 2010).

Progress in Achieving AB 32 Targets and Remaining Reductions Required

The State has fully implemented AB 32 and has made significant progress in achieving targets included in Executive Order S-3-05. The progress is evident in updated emission inventories prepared by ARB, which showed that the State inventory dropped below 1990 levels for the first time in 2016 (ARB 2018b). The GHG State inventories for 2017 and 2018 also remain below the 2020 target. The 2017 Scoping Plan Update includes projections indicating that the State will meet or exceed the 2020 target with adopted regulations (ARB 2017c).

ARB Scoping Plan. The ARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32 (ARB 2008). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California Cap-and-Trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and

- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the proposed Cap-and-Trade Program. The Scoping Plan states that the inclusion of these emissions within the Cap-and-Trade Program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve sufficient reductions by 2020 to achieve the emission target contained in AB 32. Uncapped strategies that will not be subject to the Cap-and-Trade emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions (ARB 2008).

The Scoping Plan included no measures that would apply to agricultural processing operations. Scoping Plan Measure No. A-1—Methane Capture at Large Dairies is the only agricultural measure that was assigned an emission reduction target (1.0 $MMTCO_2e$ in 2020). Emissions of nitrous oxide (N_2O) from nitrogen fertilizers was expected to be the subject of research to understand the variables affecting fertilizer N_2O emissions and based on the findings, the ARB would explore opportunities for reductions.

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities Climate for the next several years. The Update did not set new targets for the State, but described a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050. The Update included an estimate that reductions averaging 5.2 percent per year would be required after 2020 to achieve the 2050 goal.

Cap-and-Trade Program. The Cap-and-Trade Program is a key element of the Scoping Plan. It sets a statewide limit on sources responsible for 85 percent of California's greenhouse gas emissions, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest cost options to reduce emissions. The program conducted its first auction in November 2012. Compliance obligations began for power plants and large industrial sources in January 2013. Other significant milestones include linkage to Quebec's Cap-and-Trade system in January 2014 and starting the compliance obligation for distributors of transportation fuels, natural gas, and other fuels in January 2015 (ARB 2015c).

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade Program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are guaranteed only on an accumulative basis. As summarized by ARB in the First Update:

> The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative (ARB 2015c).

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus, the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by ARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures (ARB 2014).

AB 398. The Governor signed AB 398 on July 25, 2017 to extend the Cap-and-Trade Program to 2030. The legislation includes provisions to ensure that offsets used by sources are limited to 4 percent of their compliance obligation from 2021 through 2025 and 6 percent from 2026 through 2030. AB 398 also prevents Air Districts from adopting or implementing emission reduction rules from stationary sources that are also subject to the Cap-and-Trade Program (CAR 2017).

SB 32. The Governor signed SB 32 on September 8, 2016. SB 32 gives ARB the statutory responsibility to include the 2030 target previously contained in Executive Order B-30-15 in the next Scoping Plan update (now adopted). SB 32 states that "In adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by this division, the state [air resources] board shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030.” The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017. The major elements of the framework proposed to achieve the 2030 target are as follows:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
   - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard (LCFS)
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
   - Improve freight system efficiency.
   - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.
5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
   - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
   - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - ARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. 20 percent reduction in greenhouse gas emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California’s land base as a net carbon sink (ARB 2017c).

SB 375—The Sustainable Communities and Climate Protection Act of 2008. SB 375 was signed into law on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, “Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375—as codified in Public Resources Code Section 21159.28—states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss (1) growth-inducing impacts or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network if the project:

1. Is in an area with an approved Sustainable Communities Strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets;
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies); and
3. Incorporates the mitigation measures required by an applicable prior environmental document.

The ARB has prepared the Proposed Update to the SB 375 Greenhouse Gas Emission Reduction Targets. The update includes an increase in the 2035 target for Stanislaus County from 10 percent to 16 percent (ARB 2017e). However, the 2018 RTP maintains the 10 percent target (StanCOG 2018).

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light-duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the by the U.S. District Court for the District of Columbia in 2011 (ARB 2013d).

The standards are to be phased in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in an approximately 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation, rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant (ARB 2013e).

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will reduce pollutants from gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles, and hydrogen fuel cell cars. The regulations will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California (ARB 2013e).

SB 1368—Emission Performance Standards. In 2006, the State Legislature adopted SB 1368, which was subsequently signed into law by the governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law effectively prevents California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lbs. CO_2 per megawatt-hour (MWh).

SB 1078—Renewable Electricity Standards. On September 12, 2002, Governor Gray Davis signed SB 1078, requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Governor Schwarzenegger also directed the ARB (Executive Order S-21-09) to adopt a regulation by July 31, 2010, requiring the State's load serving entities to meet a 33 percent renewable energy target by 2020. The ARB approved the Renewable Electricity Standard on September 23, 2010 by Resolution 10-23. In 2011, the state legislature adopted this higher standard in SB X1-2. Renewable sources of electricity subject to the legislation include wind, small hydropower, solar, geothermal, biomass, and biogas.

SB 350—Clean Energy and Pollution Reduction Act of 2015. The legislature recently approved and the governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include: an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.

- Reorganize the Independent System Operator (ISO) to develop more regional electricity transmission markets and improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States (California Leginfo 2015).

SB 100 California Renewable Portfolio Standard (2018). The goal of the program is to achieve that 50 percent renewable resources target by December 31, 2026, and to achieve a 60 percent target by December 31, 2030. The bill approved by Governor Brown on September 10, 2018 would require that retail sellers and local publicly owned electric utilities procure a minimum quantity of electricity products from eligible renewable energy resources so that the total kilowatt-hours of those products sold to their retail end-use customers achieve 44 percent of retail sales by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030 (California Leginfo 2018).

SBX 7-7—The Water Conservation Act of 2009. The legislation directs urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this statewide goal of 20 percent decrease in demand will result in a reduction of almost 2 million acre-feet in urban water use in 2020.

Executive Orders Related to GHG Emissions

California's Executive Branch has taken several actions to reduce GHGs through the use of executive orders. Although not regulatory, they set the tone for the State and guide the actions of state agencies.

Executive Order S-3-05. On June 1, 2005, former California Governor Arnold Schwarzenegger announced through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels.
- By 2020, reduce greenhouse gas emissions to 1990 levels.
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

Executive Order B-30-15. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The executive order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of $MMCO_2e$. The executive order also requires the State's climate adaptation plan to be updated every three years and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this executive order is not legally enforceable against local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

Executive Order S-01-07—Low Carbon Fuel Standard. The governor signed Executive Order S 01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the executive order established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The Low Carbon Fuel Standard was subject to legal challenge in 2011. Ultimately, ARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The Office of Administrative Law (OAL) approved the regulation on November 16, 2015 (ARB 2015d). The regulation was last amended in 2018 to increase the reduction required in 2030 to 20 percent.

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2009) was adopted, which is the ". . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Orders B-55-18 Carbon Neutrality by 2045 (2018). This Executive Order signed on September 10, 2018 sets a new statewide goal to achieve carbon neutrality as soon as possible, and no later than 2045, and achieve and maintain net negative emissions thereafter. This goal is in addition to the statewide targets of reducing greenhouse gas emissions (Brown 2018).

California Regulations and Building Codes

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Title 20 Appliance Efficiency Regulations. California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601–1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. Twenty-three categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment (CEC 2018a).

Title 24 Energy Efficiency Standards. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The most current 2016 Building Energy Efficiency Standards approved on January 19, 2016 went into effect on January 1, 2017 (CEC 2016). The CEC adopted the 2019 Building Energy Efficiency Standards on May 9, 2018. The updated standards are effective as of January 1, 2020 (CEC 2018b).

Title 24 California Green Building Standards Code (California Code of Regulations Title 24, Part 11 code) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect January 1, 2011. The code is updated on a regular basis, with the most recent update consisting of the 2016 California Green Building Code Standards that became effective January 1, 2017. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided the ordinances include a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy, which is generally enforced by the local building official.

The California Green Building Standards Code (California Code of Regulations Title 24, Part 11 code) requires:

- **Short-term bicycle parking**. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for five percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- **Long-term bicycle parking**. For buildings with over 10 tenant-occupants, provide secure bicycle parking for five percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.1.2).
- **Designated parking**. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).

- **Recycling by Occupants**. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage, and collection of nonhazardous materials for recycling. (5.410.1).
- **Construction waste**. A minimum 50-percent diversion of construction and demolition waste from landfills, increasing voluntarily to 65 and 80 percent for new homes and 80-percent for commercial projects. (5.408.1, A5.408.3.1 [nonresidential], A5.408.3.1 [residential]). All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled (5.408.3).
- **Wastewater reduction**. Each building shall reduce the generation of wastewater by one of the following methods:

1. The installation of water-conserving fixtures or
2. Using nonpotable water systems (5.303.4).

- **Water use savings**. Twenty percent mandatory reduction in indoor water use with voluntary goal standards for 30, 35, and 40 percent reductions (5.303.2, A5303.2.3 [nonresidential]).
- **Water meters**. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day (5.303.1).
- **Irrigation efficiency**. Moisture-sensing irrigation systems for larger landscaped areas (5.304.3).
- **Materials pollution control**. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard (5.404).
- **Building commissioning**. Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies (5.410.2).

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881 Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected for the ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed DWR to update the ordinance through expedited regulation. The California Water Commission approved the revised ordinance on July 15, 2015, which became effective on December 15, 2015. New development projects that include landscaped areas of 500 square feet or more are subject to the ordinance. The update requires:

- More efficient irrigation systems
- Incentives for graywater usage
- Improvements in on-site stormwater capture
- Limiting the portion of landscapes that can be planted with high water use plants
- Reporting requirements for local agencies.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states: "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)."

Section 21097 was also added to the Public Resources Code. This provided an exemption until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006—in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA. The Natural Resources Agency completed the approval process and the Amendments became effective on March 18, 2010. The Natural Resources Agency adopted additional amendments related to greenhouse gases in the 2018 CEQA Guidelines Update adopted on December 28, 2018.

The 2010 CEQA Amendments along with the 2018 CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

Section 15064.4(b) of the CEQA Guidelines provides direction for lead agencies for assessing the significance of impacts of GHG emissions:

- 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; or
- 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 greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.

Section 15064.4(c) states that a lead agency may use a model or methodology to estimate greenhouse gas emissions resulting from a project. The lead agency has discretion to select the model or methodology it considers most appropriate to enable decision makers to intelligently take into account the project's incremental contribution to climate change. The lead agency must support its selection of a model or methodology with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use.

The 2018 CEQA Guidelines include the following discussion regarding thresholds of significance.

> (d) Using environmental standards as thresholds of significance promotes consistency in significance determinations and integrates environmental review with other environmental program planning and regulation. Any public agency may adopt or use an environmental standard as a threshold of significance. In adopting or using an environmental standard as a threshold of significance, a public agency shall explain how the particular requirements of that environmental standard reduce project impacts, including cumulative impacts, to a level that is less than significant, and why the environmental standard is relevant to the analysis of the project under consideration. For the purposes of this subdivision, an "environmental standard" is a rule of general application that is adopted by a public agency through a public review process and that is all of the following:
>
> (1) a quantitative, qualitative or performance requirement found in an ordinance, resolution, rule, regulation, order, plan or other environmental requirement;
> (2) adopted for the purpose of environmental protection;
> (3) addresses the environmental effect caused by the project; and,
> (4) applies to the project under review.

In addition, the 2018 amendments revised Appendix G Checklist questions to include a new question specifically on energy conservation.

CEQA emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis (see CEQA Guidelines Section 15130(f)).

California Supreme Court GHG Ruling

In a November 30, 2015 ruling, the *California Supreme Court in Center for Biological Diversity (CBD) v. California Department of Fish and Wildlife (CDFW)* on the Newhall Ranch project, concluded that whether the project was consistent with meeting statewide emission reduction goals is a legally permissible criterion of significance, but the significance finding for the project was not supported by a reasoned explanation based on substantial evidence. The Court offered potential solutions on pages 25 to 27 of the ruling to address this issue summarized below.

Specifically, the Court advised that:

- **Substantiation of Project Reductions from BAU.** A lead agency may use a BAU comparison based on the Scoping Plan's methodology if it also substantiates the reduction a particular project must achieve to comply with statewide goals. The Court suggested a lead agency could examine the "data behind the Scoping Plan's business-as-usual model" to determine the necessary project-level reductions from new land use development at the proposed location (p. 25).

- **Compliance with Regulatory Programs or Performance Based Standards.** "A lead agency might assess consistency with A.B. 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities. (See Final Statement of Reasons, supra, at p. 64 [greenhouse gas emissions 'may be best analyzed and mitigated at a programmatic level.'].) To the extent a project's design features comply with or exceed the regulations outlined in the Scoping Plan and adopted by the Air Resources Board or other state agencies, a lead agency could appropriately rely on their use as showing compliance with 'performance based standards' adopted to fulfill 'a statewide . . . plan for the reduction or mitigation of greenhouse gas emissions.' (CEQA Guidelines § 15064.4(a)(2), (b)(3); see also id., § 15064(h)(3) [determination that impact is not cumulatively considerable may rest on compliance with previously adopted plans or regulations, including 'plans or regulations for the reduction of greenhouse gas emissions'].)" (p. 26).
- **Compliance with GHG Reduction Plans or Climate Action Plans (CAPs).** A lead agency may utilize "geographically specific GHG emission reduction plans" such as climate action plans or greenhouse gas emission reduction plans to provide a basis for the tiering or streamlining of project-level CEQA analysis (p. 26).
- **Compliance with Local Air District Thresholds.** A lead agency may rely on "existing numerical thresholds of significance for greenhouse gas emissions" adopted by, for example, local air districts (p. 27).

Therefore, consistent with CEQA Guidelines Appendix G, the three factors identified in CEQA Guidelines Section 15064.4 and the recently issued Newhall Ranch opinion, the GHG impacts would be considered significant if the project would:

- Conflict with a compliant GHG Reduction Plan if adopted by the lead agency;
- Exceed the SJVAPCD GHG Reduction Threshold; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emission of GHGs.

3.3.4 - San Joaquin Valley Air Pollution Control District

Climate Change Action Plan

On August 21, 2008, the SJVAPCD Governing Board approved a proposal called the Climate Change Action Plan (CCAP) (SJVAPCD 2008). The CCAP began with a public process bringing together stakeholders, land use agencies, environmental groups, and business groups to conduct public workshops to develop comprehensive policies for CEQA guidelines, a carbon exchange bank, and voluntary GHG emissions mitigation agreements for the Board's consideration. The CCAP contains the following goals and actions:

- Develop GHG significance thresholds to address CEQA projects with GHG emission increases.
- Develop the San Joaquin Valley Carbon Exchange for banking and trading GHG reductions.
- Authorize use of the SJVAPCD's existing inventory reporting system to allow use for GHG reporting required by AB 32 regulations.
- Develop and administer GHG reduction agreements to mitigate proposed emission increases from new projects.
- Support climate protection measures that reduce greenhouse gas emissions as well as toxic and criteria pollutants. Oppose measures that result in a significant increase in toxic or criteria pollutant emissions in already impacted areas.

On December 17, 2009, the SJVAPCD Governing Board adopted "Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA," and the policy "District Policy—Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency." The SJVAPCD concluded that the existing science is inadequate to support quantification of the impacts that project-specific GHG emissions have on global climatic change. The SJVAPCD found the effects of project-specific emissions to be cumulative, and without mitigation, their incremental contribution to global climatic change could be considered cumulatively considerable. The SJVAPCD found that this cumulative impact is best addressed by requiring all projects to reduce their GHG emissions, whether through project design elements or mitigation (SJVAPCD 2009a).

The SJVAPCD's approach is intended to streamline the process of determining if project-specific GHG emissions would have a significant effect. Projects exempt from the requirements of CEQA, and projects complying with an approved plan or mitigation program would be determined to have a less than significant cumulative impact. Such plans or programs must be specified in law or adopted by the public agency with jurisdiction over the affected resources, and must have a certified final CEQA document.

For non-exempt projects, those projects for which there is no applicable approved plan or program, or those projects not complying with an approved plan or program, the lead agency must evaluate the project against performance-based standards and would require the adoption of design elements, known as Best Performance Standards (BPS), to reduce GHG emissions. The BPS have not yet fully been established, though they must be designed to achieve a 29 percent reduction when compared with the BAU projections identified in ARB's AB 32 Scoping Plan.

BAU represents the emissions that would occur in 2020 if the average baseline emissions during the 2002–2004 period were grown to 2020 levels, without control. Thus, these standards would carry with them pre-quantified emissions reductions, eliminating the need for project-specific quantification. Therefore, projects incorporating BPS would not require specific quantification of GHG emissions, and automatically would be determined to have a less than significant cumulative impact for GHG emissions.

For stationary source permitting projects, BPS means, "The most stringent of the identified alternatives for control of GHG emissions, including type of equipment, design of equipment and operational and maintenance practices, which are achieved-in-practice for the identified service, operation, or emissions unit class." The SJVAPCD has identified BPS for the following sources: boilers; dryers and dehydrators; oil and gas extraction; storage, transportation, and refining operations; cogeneration; gasoline dispensing facilities; volatile organic compound control technology; and steam generators.

For development projects, BPS means, "Any combination of identified GHG emission reduction measures, including project design elements and land use decisions that reduce project-specific GHG emission reductions by at least 29 percent compared with business as usual."

Projects not incorporating BPS would require quantification of GHG emissions and demonstration that BAU GHG emissions have been reduced or mitigated by 29 percent. As stated earlier, ARB's adjusted inventory reduced the amount required by the State to achieve 1990 emission levels from 29 percent to 21.7 percent to account for slower growth experienced since the 2008 recession. According to SJVAPCD guidance, quantification of GHG emissions would be required for all projects for which the lead agency has determined that an environmental impact report is required, regardless of whether the project incorporates BPS. The SJVAPCD has not yet adopted BPS for development projects, so quantification of project emissions is required (SJVAPCD 2009b).

San Joaquin Valley Carbon Exchange

The SJVAPCD initiated work on the San Joaquin Valley Carbon Exchange in November 2008. The purpose of the carbon exchange is to quantify, verify, and track voluntary GHG emissions reductions generated within the San Joaquin Valley. However, the SJVAPCD has pursued an alternative strategy that incorporates the GHG emissions into its existing Rule 2301—Emission Reduction Credit Offset Banking that formerly only addressed criteria pollutants. The SJVAPCD is also participating with the California Air Pollution Control Officers Association (CAPCOA), of which it is a member, in the CAPCOA Greenhouse Gas Reduction Exchange (GHG Rx). The GHG Rx is operated cooperatively by air districts that have elected to participate. Participating districts have signed a Memorandum of Understanding (MOU) with CAPCOA and agree to post only those credits that meet the Rx standards for quality. The objective is to provide a secure, low-cost, high-quality greenhouse gas exchange for credits created in California. The GHG Rx is intended to help fulfill compliance obligations or mitigation needs of local projects subject to environmental review, reducing the uncertainty of using credits generated in distant locations. The SJVAPCD currently has no credits posted to the GHG Rx as of this writing (CAPCOA 2020).

Rule 2301

While the Climate Change Action Plan indicated that the GHG emission reduction program would be called the San Joaquin Valley Carbon Exchange, the District incorporated a method to register voluntary GHG emission reductions into its existing Rule 2301—Emission Reduction Credit Banking through amendments of the rule. Amendments to the rule were adopted on January 19, 2012. The purposes of the amendments to the rule include the following:

- Provide an administrative mechanism for sources to bank voluntary GHG emission reductions for later use.
- Provide an administrative mechanism for sources to transfer banked GHG emission reductions to others for any use.
- Define eligibility standards, quantitative procedures, and administrative practices to ensure that banked GHG emission reductions are real, permanent, quantifiable, surplus, and enforceable.

Stanislaus Council of Governments

Regional Transportation Plan

The Stanislaus Council of Governments (StanCOG) is the Regional Transportation Planning Agency for Stanislaus County. StanCOG adopted the 2014 Regional Transportation Plan/Sustainable Community Strategy (RTP/SCS) that included the County's first Sustainable Community Strategy to comply with SB 375. The RTP is a planning document prepared in cooperation with the Federal Highway Administration, Federal Transit Administration, the California Department of Transportation (Caltrans), and other stakeholders, including transportation system users. The SCS is intended to show how integrated land use and transportation planning can lead to lower GHG emissions from autos and light trucks. SB 375 includes the following four primary findings related to the RTP/SCS development process:

- SB 375 required the ARB to develop regional GHG emission reduction targets for cars and light trucks for each of the 18 MPOs in California, including StanCOG. ARB approved targets for the San Joaquin Valley in January 2013. The target for Stanislaus was a per capita reduction in GHG emissions from passenger vehicle travel of five percent by 2020 and 10 percent by 2035 relative to 2005 levels. However, the 2014 RTP/SCS indicated that the County could exceed these targets (ARB 2015e).
- SB 375 required the preparation of an SCS. StanCOG included an SCS that specifies how the GHG emission reduction target set by ARB will be achieved in the RTP. If the target cannot be met through the SCS, then an Alternative Planning Strategy (APS) shall be prepared by Stan COG. Chapter 3 of the 2018 RTP includes the updated SCS.
- SB 375 streamlines CEQA requirements for specific residential and mixed-use developments that are consistent with the StanCOG SCS or APS (as determined by ARB) to achieve regional GHG emissions reduction target.

The 2018 RTP/SCS was adopted by StanCOG on August 15, 2018 and indicates that the County is expected to exceed the current regional VMT targets of 5 percent by 2020, 10 percent by 2035. The County expects to achieve a reduction of 7.1 percent by 2020 and an 11.1 percent reduction by 2035 (StanCOG 2018).

3.3.5 - Local

Stanislaus County does not currently have formal GHG emissions reduction plans or recommended emissions thresholds for determining significance associated with GHG emissions from development projects.

General Plan

The Stanislaus County General Plan 2015 was adopted on August 23, 2016. The Plan has no goals or policies that directly address GHG emissions or climate change. However, policies aimed at reducing vehicle miles traveled listed in the Circulation Element would also reduce climate change impacts (Stanislaus County 2016). The applicable policies are listed in Section 2.4.3.

Waste Diversion

With the passage of SB 1016, the Per Capita Disposal Measurement System, only per capita disposal rates are measured. Targets are based on the per capita disposal rates. For 2019, the target rate was 6.3 pounds per person and 21.2 pounds per employee. The County's disposal rates were well below the target rate at 3.9 pounds per person and 11.9 pounds per employee per day in 2019 (CalRecycle 2020).

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SECTION 4: MODELING PARAMETERS AND ASSUMPTIONS

4.1—Model Selection and Guidance

Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors are the emission rate of a pollutant given the activity over time; for example, grams of NO_X per horsepower-hour. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

The California Emissions Estimator Model (CalEEMod) version 2016.3.2 was developed by the South Coast Air Quality Management District in cooperation with other air districts throughout the State. CalEEMod is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with construction and operation from a variety of land uses.

The modeling follows District guidance where applicable from its GAMAQI. The models used in this analysis are summarized as follows:

- Construction emissions: CalEEMod, version 2016.3.2
- Operational emissions: CalEEMod, version 2016.3.2
- SJVAPCD Health Risk Prioritization Tool
- EMFAC 2017

4.2—Air Pollutants and GHGs Assessed

4.2.1 - Criteria Pollutants Assessed

The following air pollutants are assessed in this analysis:

- Reactive organic gases (ROG)
- Nitrogen oxides (NO_X)
- Carbon monoxide (CO)
- Sulfur dioxide (SO_2)
- Particulate matter less than 10 microns in diameter (PM_{10})
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)

Note that the project would emit ozone precursors ROG and NO_X. However, the project would not directly emit ozone, since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

As noted previously, the project would emit ultrafine particles. However, there is currently no standard separate from the $PM_{2.5}$ standards for ultrafine particles and there is no accepted methodology to quantify or assess the significance of such particles.

4.2.2 - Greenhouse Gases Assessed

This analysis is restricted to GHGs identified by AB 32, which include: CO_2, methane, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The project would generate a variety of GHGs, including several defined by AB 32 such as CO_2, methane, and NO_X.

The project may emit GHGs that are not defined by AB 32. For example, the project may generate aerosols through emissions of DPM from the vehicles and trucks that would access the project site. Aerosols are short-lived particles, as they remain in the atmosphere for about one week. Black carbon is a component of aerosol. Studies have indicated that black carbon has a high global warming potential; however, the Intergovernmental Panel on Climate Change states that it has a low level of scientific certainty (IPCC 2007a).

Water vapor could be emitted from evaporated water used for landscaping, but this is not a significant impact because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks rather than emissions from project-related activities.

The project would emit NO_X and VOC, which are ozone precursors. Ozone is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and can be reduced in the troposphere on a daily basis. Stratospheric ozone can be reduced through reactions with other pollutants.

Certain GHGs defined by AB 32 would not be emitted by the project. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the project. Therefore, it is not anticipated that the project would emit perfluorocarbons or sulfur hexafluoride.

4.3—Construction Modeling Assumptions

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from on-site and off-site activities. On-site emissions principally consist of exhaust emissions from the activity levels of heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM_{10}) from disturbed soil. Additionally, paving operations and application of architectural coatings would release VOC emissions. Off-site emissions are caused by motor vehicle exhaust from delivery vehicles, worker traffic, and road dust (PM_{10} and $PM_{2.5}$).

The project was assumed to begin construction as early as October 2021 with operations commencing in October 2022. CalEEMod includes default equipment lists and construction schedules for industrial projects, but not specifically for manufacturing and warehouse projects.

The analysis primarily used default construction equipment assumptions. The detailed modeling assumptions can be reviewed in Appendix A of this report.

4.3.1 - Construction Equipment Emission Factors

CalEEMod contains an inventory of construction equipment that incorporates estimates of the number of equipment, age, horsepower, and equipment tier from which rates of emissions are developed. The CalEEMod default equipment assumptions were used in this analysis for the estimation of emissions from on-site construction equipment used in paving, building construction, and architectural coatings. The equipment types used for site preparation and grading are CalEEMod defaults, but the number of equipment was adjusted as described below. CalEEMod's off-road emission factors and load factors are from the ARB OFFROAD model.

4.3.2 - Demolition

No demolition is required.

4.3.3 - Site Preparation

The project will require removal of an existing almond orchard during site preparation.

4.3.4 - Grading

During grading activities, fugitive dust can be generated from the movement of dirt on the project site. CalEEMod estimates dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading dirt into haul trucks. Each activity is calculated differently in CalEEMod, based on the number of acres traversed by the grading equipment.

Only some pieces of equipment generate fugitive dust in CalEEMod. The CalEEMod manual identifies various equipment and the acreage disturbed in an 8-hour day:

- Crawler tractors, graders, and rubber-tired dozers: 0.5 acre per 8-hour day
- Scrapers: 1 acre per 8-hour day

Default number of days and equipment assumptions were used in the analysis.

It was assumed that soil would be balanced on-site, and, therefore, there would be no material imported or exported from the project site for site leveling.

4.3.5 - Building Construction, and Paving

The analysis uses project specific modeling assumptions in CalEEMod for construction equipment during building construction, and paving. As previously discussed, the number of equipment used for the building construction phases were increased to reflect the developer's schedule while maintaining default hours of use.

4.3.6 - Construction Off-site Trips

Worker trips are accounted for during the construction phases. The default trips are based on 1.25 trips per piece of equipment. The CalEEMod default worker trip length of 16.8 miles was retained. The CalEEMod default vehicle fleet (LD Mix) was used for employee trips.

Vendor trips for the building construction phase are calculated from a study performed by the Sacramento Metropolitan Air Quality Management District based on land use and size. The

CalEEMod defaults for vendor trip length, and vehicle fleet (Heavy Duty Truck Vehicle Fleet Mix) were used.

4.4—Operation

Operational emissions are those emissions that occur when the project is occupied by the tenant. The major sources of emissions are summarized below.

4.4.1 - Motor Vehicles

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles and trucks that would travel to and from the project site. The project operational statement includes the number of employees and customers that will be accessing the site each day. At full operation, the project will have up to 200 employees. The current operation at the owner's current site employs 100 people. This is expected to gradually increase to 200 employees as the business grows. Truck trips are expected to be approximately one to two semi-trucks per day for steel delivery, zero to two semi-trucks per day for large part delivery, one to two box trucks per day for parts delivery, and about two to four van deliveries per day from FedEx or UPS. During the harvest season (July through September), customer trips may be up to 25 per day. During the off-season, this would be reduced to about zero to two per day. For analysis purposes, the highest estimates were used as conservative assumptions. The trip rates are based on two-way trips with one trip for incoming vehicles and one trip for outgoing vehicles. The truck trips include trucks used for incoming material for fabrication, shipping outgoing product, parts and supply deliveries, and solid waste hauling. A complete breakdown of truck trips and employee trips by season is provided in Appendix A.

The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline and diesel-powered vehicles). The CalEEMod default vehicle fleet mix was adjusted to include the fractions for each truck classification based on the estimated truck trip generation. For detailed modeling assumptions see Appendix A.

4.4.2 - Architectural Coatings (Painting)

Paints release VOC emissions during application and drying. The buildings in the project would be repainted on occasion. The project is required to comply with the SJVAPCD Rule 4601—Architectural Coatings. The rule required flat paints to meet a standard of 50 grams per liter (g/l) and gloss paints 100 g/l by 2012 for an average rate of 65 g/l. Most of the coatings used for industrial building painting are flat paints or are prefinished.

4.4.3 - Consumer Products

Consumer products are various solvents used in non-industrial applications, which emit VOCs during their product use. "Consumer Product" means a chemically formulated product used by household and institutional consumers, including but not limited to detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. It does not include other paint products, furniture coatings, or architectural coatings (ARB 2015e). The default emission factor developed for CalEEMod was used.

4.4.4 - Landscape Equipment

CalEEMod estimated the landscaping equipment using the default assumptions in the model.

4.4.5 - Electricity

Electricity used by the project (for lighting, etc.) would result in emissions from the power plants that would generate electricity distributed on the electrical power grid. Electricity emissions estimates are only used in the GHG analysis. CalEEMod was used to estimate these emissions from the project.

Electricity Emission Factors

The default CalEEMod emission factors for Modesto Irrigation District (MID) are as follows:

- Carbon dioxide: 833.46 pounds per megawatt hour (lbs/MWh)
- Methane: 0.029 lb/MWh
- Nitrous oxide: 0.006 lb/MWh

It is assumed that the Renewable Electricity Standards was implemented by 2020. The Renewable Electricity Standard requires that electricity providers include a minimum of 33 percent renewable energy in their portfolios by the year 2020. The MID emissions factors for 2020 assuming RPS compliance is provided below.

- Carbon dioxide: 607.37 pounds per megawatt hour (lbs/MWh)
- Methane: 0.022 lb/MWh
- Nitrous oxide: 0.005 lb/MWh

SB 100 requires utilities to achieve 60 percent renewable by 2030. The rates for MID assuming RPS compliance in 2030 is provided below.

- Carbon dioxide: 364.4 lbs/MWh
- Methane: 0.012 lb/MWh
- Nitrous oxide: 0.002 lb/MWh

4.4.6 - Stationary Equipment

The project will require SJVAPCD permits for stationary emission sources. The project includes a paint booth that will require SJVAPCD. The operator has permits for a paint booth at their current site that will be moved to the new building. The equipment will meet SJVAPCD emission limits for regulated pollutants pursuant to Rule 2201.

4.4.7 - Off-road Equipment

The project includes forklifts to move materials on the project site. The project will include electric and propane forklifts as described below:

- Electric forklifts: Forklifts used inside the building will be zero emission electric models.
- Propane forklifts: The project is expected to use 5 forklifts fueled by propane.

4.4.8 - Water and Wastewater

The project will obtain water from a water system on a neighboring parcel; however, the project may eventually be connected to the City of Modesto water system. Domestic liquid waste will go to an on-site septic system, but the system will be designed for future connection to the City of Modesto sewer lines in the future. GHG emissions are emitted from the use of electricity to pump water used by the project and to treat wastewater. The project will use septic systems for domestic wastewater that do not use electricity. The analysis is based on CalEEMod default assumptions, since the project may ultimately be connected to City of Modesto services, which would result in higher energy use and related GHG emissions compared with on-site water and wastewater systems.

4.4.9 - Solid Waste

The project would emit GHGs from the decomposition of solid waste generated by the project. CalEEMod was used to estimate the GHG emissions from this source based on an increase the number of employees and CalRecycle average waste generation per employee. The CalEEMod default for the mix of landfill types is as follows:

- Landfill no gas capture: 6%
- Landfill capture gas flare: 94%
- Landfill capture gas energy recovery: 0%

4.4.10 - Vegetation

The site is currently used for agricultural purposes as an almond orchard. Almond orchards are typically removed after productivity declines, so the loss in sequestration would occur without the project. Landscaping will be as required by Stanislaus County.

4.4.11 - Refrigerants

If the building is equipped with a large air conditioning system it would be subject to the ARB Refrigeration Management Program. Manufacturing and warehouse projects are sometimes not air conditioned, depending on the use.

SECTION 5: AIR QUALITY IMPACT ANALYSIS

This section presents the expected emissions from construction and operation of the project as a necessary requisite for assessing the regulatory significance of project emissions on a regional and localized level.

5.1—CEQA Guidelines

The CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated.

The following air quality significance thresholds are contained in Appendix G of the CEQA Guidelines effective December 28, 2018. A significant impact would occur if the project would:

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 nonattainment under an applicable national or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations; or

d) Result in other emissions (such as those leading to odors adversely affecting a substantial number of people.

While the final determination of whether a project is significant is within the purview of the lead agency pursuant to Section 15064(b) of the CEQA Guidelines, the District recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the lead agency finds that the project has the potential to exceed these air pollution thresholds, the project should be considered to have significant air quality impacts. The applicable District thresholds and methodologies are contained under each impact statement below.

5.2—Impact Analysis

5.2.1 - Consistency with Air Quality Plan

Impact AIR-1: **The project would not conflict with or obstruct implementation of the applicable air quality plan.**

Impact Analysis

The CEQA Guidelines indicate that a significant impact would occur if the project would conflict with or obstruct implementation of the applicable air quality plan. The GAMAQI indicates that projects that do not exceed SJVAPCD regional criteria pollutant emissions quantitative thresholds would not conflict with or obstruct the applicable air quality plan (AQP). An additional criterion regarding the project's implementation of control measures was assessed to provide further evidence of the project's consistency with current AQPs. This document proposes the following criteria for determining project consistency with the current AQPs:

1. Will the project result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQPs? This measure is determined by comparison to the regional and localized thresholds identified by the District for Regional and Local Air Pollutants.
2. Will the project comply with applicable control measures in the AQPs?

The use of the criteria listed above is a standard approach for CEQA analysis of projects in the District's jurisdiction, as well as within other air districts, for the following reasons:

- Significant contribution to existing or new exceedances of the air quality standards would be inconsistent with the goal of attaining the air quality standards.
- AQP emissions inventories and attainment modeling are based on growth assumptions for the area within the air district's jurisdiction.
- AQPs rely on a set of air district-initiated control measures as well as implementation of federal and state measures to reduce emissions within their jurisdictions, with the goal of attaining the air quality standards.

AQPs are plans for reaching attainment of air quality standards. The growth assumptions, emission inventory, and control measures to reduce emissions are analyzed to determine if the Air Basin can reach attainment for the ambient air quality standards by the schedule required by the federal Clean Air Act. In order to show attainment of the standards, the District analyzes the growth projections in the valley, contributing factors in air pollutant emissions and formations, and existing and adopted emissions controls. The District then formulates a control strategy to reach attainment that includes both State and District regulations and other local programs and measures. For projects that include permitted stationary sources of emissions, the District relies on project compliance with Rule 2201—New and Modified Stationary Source Review to ensure that growth in stationary source emissions would not interfere with the applicable AQP. Projects exceeding the offset thresholds included in the rule are required to purchase offsets in the form of Emission Reduction Credits (ERCs).

Contribution to Air Quality Violations

A measure for determining if the project is consistent with the air quality plans is if the project would not result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the air quality plans. Regional air quality impacts and attainment of standards are the result of the cumulative impacts of all emission sources within the air basin. Individual projects are generally not large enough to contribute measurably to an existing violation of air quality standards. Therefore, the cumulative impact of the project is based on its cumulative contribution. Because of the region's nonattainment status for ozone, $PM_{2.5}$, and PM_{10}—if project-generated emissions of either of the ozone precursor pollutants (ROG and NO_X), PM_{10}, or $PM_{2.5}$

would exceed the District's significance thresholds—then the project would be considered to contribute to violations of the applicable standards and conflict with the attainment plans.

As discussed in Impact AIR-2 below, emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$ associated with the construction and operation of the project would not exceed the District's significance thresholds. As shown in Impact AIR-2, the project would not result in CO hotspots that would violate CO standards. Therefore, the project would not contribute to air quality violations.

Air Quality Plan Control Measures

The AQP contains a number of control measures that are enforceable requirements through the adoption of rules and regulations. The following rules and regulations may apply to the project:

Rule 2201—New and Modified Stationary Source Review Rule. The review of new and modified Stationary Sources of air pollution and to provide mechanisms including emission trade-offs by which Authorities to Construct such sources may be granted, without interfering with the attainment or maintenance of Ambient Air Quality Standards. The paint booth at the tenant's current facility will be used at the new facility, which will require changes to the SJVAPCD permits.

Rule 4601—**Architectural Coatings.** The purpose of this rule is to limit Volatile Organic Compounds (VOC) emissions from architectural coatings. Emissions are reduced by limits on VOC content and providing requirements on coatings storage, cleanup, and labeling. Only compliant components are available for purchase in the San Joaquin Valley.

Rule 4603—**Surface Coating of Metal Parts and Products, Plastic Parts and Products, and Pleasure Craft.** The purpose of this rule is to limit the emissions of volatile organic compounds (VOC) from the coating of metal parts and products, large appliances parts or products, metal furniture, plastic parts and products, automotive/transportation and business machine plastic parts and products, and pleasure crafts, and from the organic solvent cleaning and storage and disposal of solvents and waste solvent materials associated with such coating. The coating processes used at the facility will comply with this rule.

Rule 4641—**Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations.** The purpose of this rule is to limit VOC emissions from asphalt paving and maintenance operations. If asphalt paving will be used, then the paving operations will be subject to Rule 4641. This regulation is enforced on the asphalt provider.

Rule 9410—Employer Based Trip Reduction. The purpose of this rule is to reduce vehicle miles traveled (VMT) from private vehicles used by employees to commute to and from their worksites to reduce emissions of oxides of nitrogen (NO_X), volatile organic compounds (VOC) and particulate matter (PM). If the project exceeds 100 employees during peak commute hours, it will be required to comply with Rule 9510.

SJVAPCD Rule 9510—Indirect Source Review (ISR) is a control measure in the 2006 PM_{10} Plan that requires NO_X and PM_{10} emission reductions from development projects in the San Joaquin Valley. The NO_X emission reductions help reduce the secondary formation of PM_{10} in the atmosphere (primarily ammonium nitrate and ammonium sulfate) and also reduce the formation of ozone.

Reductions in directly emitted PM_{10} reduce particles such as dust, soot, and aerosols. Rule 9510 is also a control measure in the 2016 Plan for the 2008 8-Hour Ozone Standard. Developers of projects subject to Rule 9510 must reduce emissions occurring during construction and operational phases through on-site measures, or pay off-site mitigation fees. Project's for which the primary use of the facility is subject stationary source permits are exempt from ISR. A determination from the SJVAPCD may be required in order to determine rule applicability.

Regulation VIII—Fugitive PM_{10} Prohibitions. This regulation is a control measure that is one of the main strategies from the 2006 PM_{10} for reducing the PM_{10} emissions that are part of fugitive dust. Projects over 10 acres are required to file a Dust Control Plan (DCP) containing dust control practices sufficient to comply with Regulation VIII. Rule 8021 regulates construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and trackout, etc. All development projects that involve soil disturbance are subject to at least one provision of the Regulation VIII series of rules.

The project would comply with all applicable ARB and SJVAPCD rules and regulations. Therefore, the project complies with this criterion and would not conflict with or obstruct implementation of the applicable air quality attainment plan.

Conclusion

The project's emissions would be less than significant for all criteria pollutants and would not result in inconsistency with the AQP for this criterion. The project complies with all applicable rules and regulations from the applicable air quality plans; therefore, the project is not considered inconsistent with the AQP, and the impact would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

5.2.2 - Cumulative Criteria Pollutant Impacts

Impact AIR-2: **The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).**

Impact Analysis

To result in a less than significant impact, the following criteria must be true:

1. Regional analysis: emissions of nonattainment pollutants must be below the District's regional significance thresholds. This is an approach recommended by the District in its GAMAQI.

2. Summary of projections: the project must be consistent with current air quality attainment plans including control measures and regulations. This is an approach consistent with Section 15130(b) of the CEQA Guidelines.
3. Cumulative health impacts: the project must result in less than significant cumulative health effects from the nonattainment pollutants. This approach correlates the significance of the regional analysis with health effects, consistent with the court decision, *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1219-20.

Regional Emissions

Air pollutant emissions have both regional and localized effects. This analysis assesses the regional effects of the project's criteria pollutant emissions in comparison to SJVAPCD thresholds of significance for short-term construction activities and long-term operation of the project. Localized emissions from project construction and operation are addressed under Impact AIR-3 using concentration-based SJVAPCD pound-per-day thresholds that determine if the project would result in a localized exceedance of any ambient air quality standards or would make a cumulatively considerable contribution to an existing exceedance at the nearest sensitive receptor location. The SJVAPCD AQP includes a summary of projections of all growth anticipated in the San Joaquin Valley Air Basin and controls required to meet air quality standards. This criterion is met through the AQP consistency analysis included under Impact AIR-1.

The primary pollutants of concern during project construction and operation are ROG, NO_X, PM_{10}, and $PM_{2.5}$. The SJVAPCD GAMAQI adopted in 2015 contains thresholds for CO, NO_X, ROG, SO_X, PM_{10}, and $PM_{2.5}$.

Ozone is a secondary pollutant that can be formed miles from the source of emissions, through reactions of ROG and NO_X emissions in the presence of sunlight. Therefore, ROG and NO_X are termed ozone precursors. The Air Basin often exceeds the state and national ozone standards. Therefore, if the project emits a substantial quantity of ozone precursors, the project may contribute to an exceedance of the ozone standard. The Air Basin also exceeds air quality standards for PM_{10}, and $PM_{2.5}$; therefore, substantial project emissions may contribute to an exceedance for these pollutants. The District's annual emission significance thresholds used for the project define the substantial contribution for both operational and construction emissions as follows:

- 100 tons per year CO
- 10 tons per year NO_X
- 10 tons per year ROG
- 27 tons per year SO_X
- 15 tons per year PM_{10}
- 15 tons per year $PM_{2.5}$

The project does not contain sources that would produce substantial quantities of SO_2 emissions during construction and operation. Modeling conducted for the project show that SO_2 emissions are well below the SJVAPCD GAMAQI thresholds, as shown in the modeling results contained in Appendix A. No further analysis of SO_2 is required.

Construction Emissions

Construction emissions associated with the project are shown in Table 7. The emissions from construction activities were compared with the significance threshold. For assumptions in estimating the emissions, please refer to Section 4, Modeling Parameters and Assumptions. As shown in Table 7, the emissions are below the significance thresholds. Therefore, the emissions would be less than significant on a project basis.

Table 7: Construction Air Pollutant Emissions (Annual)

Year	Emissions (tons per year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2021	0.16	1.50	1.18	0.23	0.12
2022	1.43	3.41	3.59	0.49	0.22
Highest Emissions in any Year	**1.43**	**3.41**	**3.59**	**0.49**	**0.22**
Significance threshold (tons/year)	10	10	100	15	15
Exceed threshold—significant impact?	No	No	No	No	No

Notes:
PM_{10} and $PM_{2.5}$ emissions are from the mitigated output to reflect compliance with Regulation VIII—Fugitive PM_{10} Prohibitions.
ROG = reactive organic gases NO_X = nitrogen oxides PM_{10} and $PM_{2.5}$ = particulate matter
Calculations use unrounded numbers.
Source: CalEEMod output (Appendix A).

Operational Emissions (Non-Permitted)

Operational emissions occur over the lifetime of the project and are primarily from on-road and off-road mobile sources. The project is expected to commence operations in October 2022. The largest source is motor vehicle emissions for all pollutants except for ROG. The largest source of ROG is the use of consumer products that is included in the area source category. The SJVAPCD considers permitted and non-permitted emission sources separately when making significance determinations. In addition, the annual operational emissions are also considered separately from construction emissions.

For assumptions in estimating the emissions, please refer to Section 4, Modeling Parameters and Assumptions and Appendix A. The emissions modeling results for project operation are summarized in Table 8. Modeling results are provided in Appendix A. As shown in Table 8, the operational emissions do not exceed the SJVAPCD significance thresholds for any criteria pollutant and, therefore, would result in a less than significant impact.

Table 8: Operational Air Pollutant Emissions (2022)

Source	Emissions (tons per year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area	1.42	0.00	0.00	0.00	0.00
Energy	0.03	0.30	0.26	0.02	0.02
Mobile (employee and customer)	0.11	0.27	1.68	0.56	0.15

Table 8 (cont.): Operational Air Pollutant Emissions (2022)

Source	Emissions (tons per year)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Mobile (Truck)	0.05	1.02	0.31	0.15	0.04
Off-road Equipment (Forklifts)	0.07	0.63	0.69	0.04	0.04
Total	**1.68**	**2.22**	**2.93**	**0.77**	**0.25**
Significance threshold	10	10	100	15	15
Exceed threshold—significant impact?	No	No	No	No	No

Notes:
ROG = reactive organic gases NO_X = nitrogen oxides PM_{10} and $PM_{2.5}$ = particulate matter
Area source emissions include emissions from natural gas, and landscape.
Source: CalEEMod output (Appendix A).

Operational Permitted Emissions

The SJVAPCD GAMAQI recommends assessing the emissions from permitted sources of emissions separate from non-permitted sources. The District's permitting process ensures that emissions of criteria pollutants from permitted equipment and activities at stationary sources are reduced or mitigated to below the District's thresholds of significance. District implementation of New Source Review (NSR) ensures that there is no net increase in emissions above specified thresholds from new and modified Stationary Sources for all nonattainment pollutants and their precursors. Permitted sources emitting more than the NSR Offset Thresholds for any criteria pollutant must, in general, offset all emission increases in excess of the thresholds.

The SJVAPCD will prepare an engineering evaluation of all permitted equipment to determine the controls required to achieve best available control technology (BACT) requirements. The permitted emissions are dependent on the control technology selected and any process limits included in the permit conditions. Sufficient detail regarding the process were not available to estimate the amount of emissions from the facility's painting and coatings operation, but the project is required to comply with SJVAPCD BACT requirements.

Project Health Impacts

In the 5th District Court of Appeal case *Sierra Club v. County of Fresno (Friant Ranch, L.P.)*, the Court found the project EIR deficient because it did not identify specific health related effects resulting from the estimated amount of pollutants generated by the project. The ruling stated that the EIR should give a "sense of the nature and magnitude of the 'health and safety problems' caused by a project's air pollution. The EIR should translate the emission numbers into adverse impacts or to understand why such translation is not possible at this time (and what limited translation is, in fact, possible)."

The standard measure of the severity of impact is the concentration of pollutant in the atmosphere compared to the ambient air quality standard for the pollutant for a specified period of time. The severity of the impact increases with the concentration and the amount of time that people are exposed to the pollutant. The change in health impacts with concentration is described in Table 3 and Table 4. The pollutants of concern in the Friant Ranch ruling were regional criteria pollutants ozone, and PM_{10}. It is important to note that the potential for localized impacts can be addressed through dispersion modeling. The SJVAPCD includes screening criteria that if exceeded would require dispersion modeling to determine if project emissions would result in a significant health impact. For this project, no significant localized health impacts would occur. Regional pollutants require more complex modeling as described below.

Ozone concentrations are estimated using regional photochemical models because ozone formation is subject to temperature, inversion strength, sunlight, emissions transport over long distances, dispersion, and the regional nature of the precursor emissions. The emissions from individual projects are too small to produce a measurable change in ozone concentrations—it is the cumulative contribution of emissions from existing and new development that is accounted for in the photochemical model. Ozone concentrations vary widely throughout the day and year even with the same amount of daily emissions. The SJVAPCD indicated in an Amicus Brief on Friant Ranch that running the photochemical model with just Friant Ranch emissions (109.5 tons/year NO_X) is not likely to yield valid information given the relative scale involved. A copy of the SJVAPCD brief is included in Appendix B. The NO_X inventory for the San Joaquin Valley is 224 tons per day in 2019 or 81,760 tons per year. Friant Ranch would result in 0.13 percent increase in NO_X emissions. A project emitting at the SJVAPCD CEQA threshold of 10 tons per year would result in a 0.01 percent increase in NO_X emissions. Most project emissions are generated by motor vehicle travel distributed on regional roadways miles from the project site, and these emissions are not conducive to project-level modeling.

Emissions throughout the San Joaquin Valley are projected to markedly decline in the coming decade. The SJVAPCD 2016 Ozone Plan predicts NO_X emissions will decline to 103 tons per day by 2029 or 54 percent from 2019 levels through implementation of control measures included in the plan. This means that ozone health impacts to residents of the San Joaquin Valley will be lower than currently experienced and most areas of the San Joaquin Valley will have attained ozone air quality standards. The plan accounts for growth in population at rates projected by the State of California for the San Joaquin Valley, so only cumulative projects that would exceed regional growth projections would potentially delay attainment and prolong the time and the number of people would experience health impacts. It is unlikely that anyone would experience greater impacts from regional emissions than currently occur. The federal transportation conformity regulation provides a means of ensuring growth in emissions does not exceed emission budgets for each County. Regional Transportation Plans and Regional Transportation Improvement Plans must provide a conformity analysis based on the latest planning assumptions that demonstrates that budgets will be not be exceeded. If budgets are exceeded, the San Joaquin Valley may be subject to Clean Air Act sanctions until the deficiency is addressed.

Particulate emission impacts can be localized and regional. Particulates can be directly emitted and can be formed in the atmosphere with chemical reactions. Small directly emitted particles such as diesel emissions and other combustion emissions can remain in the atmosphere for a long time and can be transported over long distances. Large particles such as fugitive dust tend to be deposited a short distance from where emitted but can also travel long distances during periods of high winds. Particulates can be washed out of the atmosphere by rain and deposited on surfaces. Secondary particulates formed in the atmosphere such as ammonium nitrate require NO_X and ammonia, and they require low inversion levels and certain ranges of temperature and humidity to result in substantial concentrations. These complications make modeling project particulate emissions to determine concentration feasible only for directly emitted particles at receptor locations close to the project site. Regional particulate concentrations are modeled using a gridded inventory (emissions in tons/day are placed a 4-kilometer, three-dimensional grid to spatially allocate the emissions geographically and vertically in the atmosphere) and an atmospheric chemistry component to simulate the chemical reactions. The model uses relative reduction factors to determine the reductions of each PM component needed to attain the air quality standards on the days with the conditions most favorable to high particulate concentrations. Projects with emissions below the SJVAPCD thresholds of significance would not produce sufficient emissions to determine a project's individual contribution to the particulate concentration.

Cumulative Health Impacts

The Air Basin is in nonattainment for ozone, PM_{10} (State only), and $PM_{2.5}$, which means that the background levels of those pollutants are at times higher than the ambient air quality standards. The air quality standards were set to protect public health, including the health of sensitive individuals (such as children, the elderly, and the infirm). Therefore, when the concentration of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population would experience health effects that were described in Table 1. However, the health effects are a factor of the dose-response curve. Concentration of the pollutant in the air (dose), the length of time exposed, and the response of the individual are factors involved in the severity and nature of health impacts. If a significant health impact results from project emissions, it does not mean that 100 percent of the population would experience health effects.

Since the Basin is nonattainment for ozone, PM_{10}, and $PM_{2.5}$, it is considered to have an existing significant cumulative health impact without the project. When this occurs, the analysis considers whether the project's contribution to the existing violation of air quality standards is cumulatively considerable. The SJVAPCD regional thresholds for NO_X, VOC, PM_{10}, or $PM_{2.5}$ are applied as cumulative contribution thresholds. Projects that exceed the regional thresholds would have a cumulatively considerable health impact. As shown in Table 7 and Table 8, the regional analysis of construction and operational emissions indicates that the project would not exceed the District's significance thresholds and the project is consistent with the applicable Air Quality Attainment Plan. Therefore, the project would not result in significant cumulative health impacts.

The SJVAPCD Air Quality Attainment Plans predict that nonattainment pollutant emissions will continue to decline each year as regulations adopted to reduce these emissions are implemented, accounting for growth projected for the region. Therefore, the cumulative health impact will also decline even with the project's emission contribution.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

5.2.3 - Sensitive Receptors

Impact AIR-3: The project could expose sensitive receptors to substantial pollutant concentrations.

Impact Analysis

Sensitive Receptors

Those who are sensitive to air pollution include children, the elderly, and persons with preexisting respiratory or cardiovascular illness. The District considers a sensitive receptor to be a location that houses or attracts children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants. Examples of sensitive receptors include hospitals, residences, convalescent facilities, and schools. The closest sensitive receptor is a residence located approximately 341 feet southeast the project site across Tully Road.

Localized Pollutant Analysis

Emissions occurring at or near the project have the potential to create a localized impact, also referred to as an air pollutant hotspot. Localized emissions are considered significant if when combined with background emissions, they would result in exceedance of any health-based air quality standard. In locations that already exceed standards for these pollutants, significance is based on a significant impact level (SIL) that represents the amount that is considered a cumulatively considerable contribution to an existing violation of an air quality standard.

The SJVAPCD’s GAMAQI includes screening thresholds for identifying projects that need detailed analysis for localized impacts. Projects with on-site emission increases from construction activities or operational activities that exceed the 100 pounds per day screening level of any criteria pollutant after implementation of all enforceable mitigation measures would require additional analysis to determine if the preparation of an ambient air quality analysis is needed. The criteria pollutants of concern for localized impact in the SJVAB are PM_{10}, $PM_{2.5}$, NO_X, and CO. There is no localized emission standard for ROG and most types of ROG are not toxic and have no health-based standard; however, ROG was included for informational purposes only.

An analysis of maximum daily emissions during construction and operation was conducted using CalEEMod to determine if emissions would exceed 100 pounds per day for any pollutant of concern. The maximum daily operational emissions would occur at project buildout, which was assumed to occur in 2022. Operational emissions include those generated on-site by area sources such as consumer products, and landscape maintenance, energy use from natural gas combustion, and motor vehicles operation at the project site. Motor vehicle emissions are estimated for on-site operations within 0.5 mile of the site.

The results of the construction screening analysis are presented in Table 9. The highest daily NO_X, CO, PM_{10}, $PM_{2.5}$, emissions occur during site preparation, and grading activities. The highest ROG emissions occur during application of architectural coatings.

Table 9: Maximum Daily Air Pollutant Emissions during Construction

Maximum Daily Emissions	Emissions (pounds per day)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
2021	5.85	46.51	47.74	10.41	6.41
2022	99.94	42.40	45.85	6.29	2.72
Highest Emissions any Year	**99.94**	**46.51**	**47.74**	**10.41**	**6.41**
Screening threshold	100	100	100	100	100
Exceed screening threshold?	NA	No	No	No	No

Notes:
NO_X = nitrogen oxides CO = carbon monoxide PM_{10} and $PM_{2.5}$ = particulate matter N/A = Not applicable
Summer emissions were used except for NO_X, which are higher in winter. PM is from the mitigated run, which accounts for compliance with Regulation VIII dust control measures. ROG emissions are for on-site activities only. There is no ambient air quality standard for ROG.
Source: CalEEMod output (Appendix A).

The project would not exceed the emission screening thresholds during project construction. Therefore, no dispersion modeling is required to ensure that localized construction impacts would be less than significant.

The maximum daily operational emissions are shown in Table 10. The largest sources of daily emissions are natural gas usage for heating and motor vehicles accessing the site.

Table 10: Maximum Daily Air Pollutant Emissions during Operations (2021)

Maximum Daily Emissions	Emissions (pounds per day)				
	ROG	NO_X	CO	PM_{10}	$PM_{2.5}$
Area	7.13	0.00	0.03	0.00	0.00
Energy	0.18	1.67	1.40	0.13	0.13
Mobile (Emp. and Visitor)	0.75	1.57	10.69	3.15	0.85
Mobile (Truck)	0.27	5.70	1.68	0.84	0.27
Off-road Equipment (Forklifts)	0.37	3.44	3.76	0.23	0.21
Maximum Daily Operational Emissions	**8.71**	**12.38**	**17.56**	**4.35**	**1.46**
Screening threshold	—	100	100	100	100
Exceed screening threshold?	N/A	No	No	No	No

Notes:
NOX = nitrogen oxides CO = carbon monoxide PM_{10} and $PM_{2.5}$ = particulate matter N/A = Not applicable
Summer emissions were higher for ROG and CO. Winter emissions were higher for NO_X. There is no ambient air quality standard for ROG.
Source: CalEEMod output (Appendix A).

The project would not exceed SJVAPCD screening thresholds for localized criteria pollutant impacts; therefore, the project's localized criteria pollutant impacts would be less than significant.

Carbon Monoxide Hot Spot Analysis

Localized high levels of CO are associated with traffic congestion and idling or slow-moving vehicles. The SJVAPCD provides screening criteria to determine when to quantify local CO concentrations based on impacts to the level of service (LOS) of intersections in the project vicinity.

Construction of the project would result in minor increases in traffic for the surrounding road network during the duration of construction. Motor vehicles accessing the site when it becomes operational would result in a relatively minor increase in daily trips that would not substantially reduce the LOS. The project is located in a rural location with very little traffic congestion. No congested conditions that would result in a CO hotspot are possible. In addition, the highest background 8-hour average of carbon monoxide during the latest year CO was monitored is 2.06 ppm, which is 78 percent lower than the state ambient air quality standard of 9.0 ppm. Therefore, the project would not significantly contribute to an exceedance of state or federal CO standards.

Construction: Toxic Air Contaminants

Project construction would involve the use of diesel-fueled vehicles and equipment that emit DPM, which is considered a TAC. The SJVAPCD's current threshold of significance for TAC emissions is an increase in cancer risk for the maximally exposed individual of 20 in a million (formerly 10 in a million). The SJVAPCD's 2015 GAMAQI does not currently recommend analysis of TAC emissions from project construction activities, but instead focuses on projects with operational emissions that would expose sensitive receptors over a typical lifetime of 70 years. In addition, most of the project's construction emissions would occur during site preparation and grading phases over a 40-day period. Building construction requires limited amounts of diesel equipment. In addition, the project site is relatively large (17.16 acres); therefore, construction equipment operation at any given location on the site is limited and will have limited impacts on individual sensitive receptor locations. For example, the closest sensitive receptor location is approximately 341 feet to the southeast of the closest part of the building. Equipment used to construct the rest of the building will be operated at a greater distance. Based on these factors, no significant impact from the construction activities is expected.

Operation: Toxic Air Contaminants

The SJVAPCD recommends preparation of a screening analysis using its health risk prioritization tool to estimate the impacts of TAC emissions on sensitive receptors. The project will generate TAC emissions from truck travel and idling on the project site for incoming materials for fabrication and outgoing delivery trucks for finished products. The nearest off-site sensitive receptor is a residence located approximately 104 meters (341 feet) southwest of the closest truck loading dock on the project site. At this distance, the TAC emissions have dispersed to the point that concentrations and health risk are below SJVAPCD health risk thresholds.

The results of the screening analysis presented in Table 11 show that the total risk score is below the SJVAPCD threshold for requiring a health risk assessment using dispersion modeling. The screening tool provides results at incremental distances from the source of emissions to the receptor. The analysis conservatively assumes that all TAC sources are located within 100 meters of the sensitive receptor location even though most a substantial amount of activity would occur more distant from the receptors. The screening tool spreadsheet and the modeling assumptions used in the analysis are provided in Appendix A.

Table 11: Prioritization Tool Health Risk Screening Results

Impact Source	Risk Screening Score	Chronic Risk Score	Acute Risk Score
Diesel Truck	2.370	0.004	0.000
Screening Risk Score Threshold	10	1	1
Significance Threshold (Cancer Risk)	20	1	1
Source: Appendix A: Modeling Results.			

The project would not exceed the cancer risk, chronic risk, and acute risk screening threshold levels. Since the project does not exceed SJVAPCD screening thresholds for cancer risk, acute risk, or chronic risk, this impact would be less than significant.

Valley Fever

Valley fever, or coccidioidomycosis, is an infection caused by inhalation of the spores of the fungus, *Coccidioides immitis* (*C. immitis*). The spores live in soil and can live for an extended time in harsh environmental conditions. Activities or conditions that increase the amount of fugitive dust contribute to greater exposure, and they include dust storms, grading, and recreational off-road activities.

The San Joaquin Valley is considered an endemic area for Valley fever. By geographic region, hospitalizations for Valley fever in the San Joaquin Valley increased from 230 (6.9 per 100,000 population) in 2000 to 701 (17.7 per 100,000 population) in 2007. Within the region, Kern County reported the highest hospitalization rates, increasing from 121 (18.2 per 100,000 population) in 2000 to 285 (34.9 per 100,000 population) in 2007, and peaking in 2005 at 353 hospitalizations (45.8 per 100,000 population). The Centers for Disease Control and Prevention indicates that 752 of the 8,657 persons (8.7 percent) hospitalized in California between 2000 and 2007 for Valley fever died (CDC 2009). California experienced 7,466 new cases of Valley fever in 2017. There was a total of 129 Valley fever cases reported in Stanislaus County in 2017, up from 105 cases in 2016 and 63 cases in 2016 (for a rate of 82.4 per 100,000 people (Stanislaus County 2018).

The distribution of *C. immitis* within endemic areas is not uniform and growth sites are commonly small (a few tens of meters) and widely scattered. Known sites appear to have some ecological factors in common suggesting that certain physical, chemical, and biological conditions are more favorable for *C. immitis* growth. Avoidance, when possible, of sites favorable for the occurrence of *C. immitis* is a prudent risk management strategy. Listed below are ecologic factors and sites favorable for the occurrence of *C. immitis*:

1) Rodent burrows (often a favorable site for *C. immitis*, perhaps because temperatures are more moderate and humidity higher than on the ground surface)
2) Old (prehistoric) Indian campsites near fire pits
3) Areas with sparse vegetation and alkaline soils

4) Areas with high salinity soils
5) Areas adjacent to arroyos (where residual moisture may be available)
6) Packrat middens
7) Upper 30 centimeters of the soil horizon, especially in virgin undisturbed soils
8) Sandy, well-aerated soil with relatively high water-holding capacities

Sites within endemic areas less favorable for the occurrence of *C. immitis* include:

1) Cultivated fields
2) Heavily vegetated areas (e.g., grassy lawns)
3) Higher elevations (above 7,000 feet)
4) Areas where commercial fertilizers (e.g., ammonium sulfate) have been applied
5) Areas that are continually wet
6) Paved (asphalt or concrete) or oiled areas
7) Soils containing abundant microorganisms
8) Heavily urbanized areas where there is little undisturbed virgin soil (USGS 2000).

The project is situated on a site previously used as an almond orchard that does not provide suitable habitat for the spores. Therefore, implementation of the project would have a low probability of the site having *C. immitis* growth sites and exposure to the spores from disturbed soil.

Although conditions are not favorable, construction activities could generate fugitive dust that contain *C. immitis* spores. The project will minimize the generation of fugitive dust during construction activities by complying with the District's Regulation VIII. Therefore, this regulation, combined with the relatively low probability of the presence of *C. immitis* spores would reduce Valley fever impacts to less than significant.

During operations, dust emissions are anticipated to be relatively small, because most of the project area would be occupied by buildings, landscaping, and pavement. This condition would lessen the possibility of the project from providing habitat suitable for *C. immitis* spores and for generating fugitive dust that may contribute to Valley fever exposure. Impacts would be less than significant.

Naturally Occurring Asbestos

Review of the map of areas where naturally occurring asbestos in California are likely to occur (U.S. Geological Survey 2011) found no such areas in the project area. Therefore, development of the project is not anticipated to expose receptors to naturally occurring asbestos. Impacts would be less than significant.

In summary, the project would not exceed SJVAPCD localized emission daily screening levels for any criteria pollutant. The project is not a significant source of TAC emissions during construction or operation. The project is not in an area with suitable habitat for Valley fever spores and is not in area known to have naturally occurring asbestos. Therefore, the project would not result in significant impacts to sensitive receptors.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

5.2.4 - Objectionable Odors

Impact AIR-4: The project would not create objectionable odors affecting a substantial number of people.

Impact Analysis

Thresholds of Significance

Odor impacts on residential areas and other sensitive receptors, such as hospitals, day-care centers, schools, etc. warrant the closest scrutiny, but consideration should also be given to other land uses where people may congregate, such as recreational facilities, worksites, and commercial areas. The project is near to rural residences but is situated in an agricultural area where similar odors are common.

Two situations create a potential for odor impact. The first occurs when a new odor source is located near an existing sensitive receptor. The second occurs when a new sensitive receptor locates near an existing source of odor. The project is of the first type, since it involves a new odor source.

Although the project is a manufacturing facility, most processes occur indoors where odors from painting and coating processes are conducted in a controlled environment. Although the project is located near rural residences where sensitive receptor are present, the project will comply with SJVAPCD painting and coating regulations that would keep the impact to less than significant levels. The screening levels for these land use types are shown in Table 12.

Table 12: Screening Levels for Potential Odor Sources

Odor Generator	Screening Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Composting Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile

Table 12 (cont.): Screening Levels for Potential Odor Sources

Odor Generator	Screening Distance
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g., auto body shop)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile
Source: SJVAPCD 2015a.	

Project Analysis

The project is expected to have a painting/coating operation and is located within one mile of sensitive receptors. The project could generate odors from operation of diesel trucks and equipment on the project site. The nearest off-site sensitive receptor is located approximately 341 feet southwest of the project site.

The project site is currently used as an almond orchard where the use of diesel equipment and organic chemicals are common and accepted as part of the existing environment. The area surrounding the project site is sparsely populated. The project tenant currently operates a facility that will be relocated to the project site. The existing facility does not have a history of odor complaints; therefore, it is unlikely to generate odor complaints at its new location. In addition, the project site is in a growing industrial area where this type of use is expected. Therefore, the project would not expose substantial numbers of people to objectionable odors.

During construction, various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable for extended periods of time beyond the project's site boundaries. The potential for diesel odor impacts would therefore be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

SECTION 6: GREENHOUSE GAS IMPACT ANALYSIS

6.1—CEQA Guidelines

CEQA Guidelines define a significant effect on the environment as "a substantial, or potentially substantial, adverse change in the environment." To determine if a project would have a significant impact on GHGs, the type, level, and impact of emissions generated by the project must be evaluated.

The following GHG significance thresholds are contained in Appendix G of the CEQA Guidelines, which were amendments adopted into the Guidelines on March 18, 2010, pursuant to SB 9797 and further clarified in amendments approved on December 28, 2018. A significant impact would occur if the project would:

(a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or

(b) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

6.2—Impact Analysis

6.2.1 - Greenhouse Gas Inventory

Impact GHG-1: The project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.

Impact Analysis

Threshold of Significance

Section 15064.4(b) of the CEQA Guidelines' amendments for GHG emissions states that a lead agency may take into account the following three considerations in assessing the significance of impacts from GHG emissions.

- **Consideration #1**: The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.
- **Consideration #2**: Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
- **Consideration #3**: 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 greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

Stanislaus County has not adopted its own GHG thresholds or prepared a Climate Action Plan that can be used as a basis for determining project significance; however, the SJVAPCD has adopted its Policy—Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as a Lead Agency. The SJVAPCD may approve discretionary permits for the project and would be considered a Responsible Agency under CEQA in that case. Under the SJVAPCD policy, the District would require stationary source projects with increased GHG emissions to implement performance-based standards, or otherwise demonstrate that project specific GHG emissions have been reduced or mitigated by at least 29 percent, as compared to Business-as-Usual. The SJVAPCD has identified best performance standards for a number of sources that have been pre-determined to meet the standard. In addition, the SJVAPCD's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* includes thresholds based on whether the project will reduce or mitigate GHG levels by 29 percent from BAU levels compared with 2005 levels (SJVAPCD 2009b). This level of GHG reduction is based on the target established by ARB's AB 32 Scoping Plan, approved in 2008. The only permitted equipment is used in the painting and coating operation, which is not a significant source of GHG emissions.

The First Update to the Climate Change Scoping Plan adopted in May 2014 provided revised inventory projections to reflect slower growth in emissions during the recession and lower future year projections. The State's 2020 BAU inventory was reduced from 596 $MMTCO_2e$ to 545 $MMTCO_2e$ (ARB 2014). The new GHG reduction level for the State to reach 1990 emission levels by 2020 is 21.7 percent from BAU in 2020. The First Update to the Climate Change Scoping Plan also confirmed that the State is on track to achieve the 2020 target and to maintain and continue reductions beyond 2020 as required by AB 32 (ARB 2014). Therefore, the analysis uses a threshold based achieving a 21.7 percent reduction from BAU to demonstrate consistency with AB 32 and the approach recommended by the SJVAPCD. The analysis prepared for the project also includes a qualitative assessment of compliance with Scoping Plan measures to support GHG significance findings under Impact GHG-2. The SJVAPCD defines BAU as the total baseline emissions for all emissions sources within the development type, projected for the year 2020, assuming no change in GHG emissions per unit of activity as established for the baseline period.

The State adopted the 2017 Scoping Plan Update on December 14, 2017 that provides the State's strategy to achieve the SB 32 2030 target of a 40 percent reduction in emissions compared to 1990 levels. The plan includes existing and new measures that when implemented are expected to achieve the SB 32 2030 target. The 2017 Scoping Plan includes substantial reductions beyond 2020 through continued implementation of existing regulations. Other regulations will be adopted to implement recently enacted legislation including SB 350, which requires an increase in renewable energy from 33 percent to 50 percent and doubling the efficiency of existing buildings by 2030. The Legislature extended the Cap-and-Trade Program through 2030. Cap-and-Trade provides a mechanism to make up shortfalls in other strategies if they occur (ARB 2017c). In addition, the strategy relies on reductions achieved in implementing the ARB Short-Lived Climate Pollutant (SLCP) Reduction Strategy to reduce pollutants not previously controlled for climate change such as black carbon, methane, and hydrofluorocarbons (HFCs) (ARB 2017b).

The project will commence operations after the 2020 AB 32 target year; however, no new quantitative target based on a reduction from BAU has been developed for the 2030 SB 32 target year. The 2017 Scoping Plan provides ranges of reductions for each plan strategy but does not provide readily accessible reduction estimates and assumptions for each measure that are needed to determine reductions attributable to each region and project. To address this issue, the analysis shows the amount of continued progress after 2020 by comparing 2022 and 2030 emissions with BAU emissions. A qualitative assessment of compliance with the 2008 and the 2017 Scoping Plan measures is provided under Impact GHG-2.

Newhall Ranch

On November 30, 2015, the California Supreme Court issued its decision in *Newhall Ranch,* invalidating the GHG analysis for a large master planned residential development in Los Angeles County consisting of over 20,000 residential dwelling units and other uses. In particular, the Court upheld: (1) use of the statewide emissions reduction goal in AB 32 as a significance criterion (pp. 15–19), (2) use of the Scoping Plan's BAU model "as a comparative tool for evaluating efficiency and conservation efforts" of the Project (pp. 18–19), and (3) a comparison of the project's expected emissions to a BAU model rather than a baseline of pre-project conditions (pp. 15–19). The Court invalidated the GHG analysis on the grounds that the "administrative record discloses no substantial evidence that the Newhall Ranch's project-level reduction of 31 percent in comparison to [BAU] is consistent with achieving AB 32's statewide goal of a 29 percent reduction from [BAU]." The Court indicated that a lead agency may use a BAU comparison based on the Scoping Plan's methodology if it also substantiates the reduction a particular project must achieve to comply with statewide goals. The Court suggested a lead agency could examine the "data behind the Scoping Plan's business-as-usual model" to determine the necessary project-level reductions from new land use development at the proposed location (p. 25.) A lead agency "might assess consistency with A.B. 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities."

The substantial evidence needed to support a project BAU threshold can be derived from data used to develop the Scoping Plan inventory and control strategy, and from analysis conducted by the ARB to track progress in achieving the AB 32 2020 target. The critical factor in determining the appropriate project threshold is whether the State requires additional reductions beyond those achieved by existing regulations in order to achieve its target. If no additional reductions are required from individual projects, no nexus exists to require a project to mitigate its emissions. In that case, the percentage reductions achieved by projects through compliance with regulations is the amount needed to reach the AB 32 target.

The State's regulatory program implementing the 2008 Scoping Plan is now fully mature. All regulations envisioned in the Scoping Plan have been adopted by the responsible agencies and the effectiveness of those regulations have been estimated by the agencies during the adoption process and then are tracked to verify their effectiveness after implementation. The combined effect of this successful effort is that the State now projects that it will meet the 2020 target and achieve continued progress toward meeting post-2020 targets. In fact, the State achieved the target four years early as shown in the 2016, 2017, and 2018 emission inventories.

The Supreme Court was concerned that new development may need to do more than existing development to reduce greenhouse gases to demonstrate that it is doing its fair share of reductions. As will be shown below, new development does do more than existing development and, due to the nature of the sources of GHG emissions related to development, existing development is equally responsible for reducing emissions from the most important sources of emissions. It is important to note that most of the State's regulatory program applies to new and existing development.

The Scoping Plan reduction from BAU accounts for growth projected in the State and assumes that existing development would continue to emit GHGs at the same rate that occurred in the base year. The DOF forecasts California's population will grow by 8.1 percent between 2020 and 2030, so existing development will be responsible for 92 percent of the emissions that occur in 2030 and new development for 8 percent of the emissions that occur in 2030. If measures to reduce emissions from existing development were not available, new development could not provide sufficient reductions to reach the 2030 target even if their emissions were reduced to net zero.

The State's regulatory program is able to target both new and existing development because the two most important strategies—motor vehicle fuel efficiency and emissions from electricity generation—obtain reductions equally from existing and new sources. This is because all vehicle operators use cleaner low carbon fuels and buy vehicles subject to the fuel efficiency regulations, and all building owners or operators purchase cleaner energy from the grid that is produced by increasing percentages of renewable fuels. This includes regulations on mobile sources, such as the Pavley standards, that apply to all vehicles purchased in California; the LCFS that applies to all fuel used in California; and the Renewable Portfolio Standard and Renewable Energy Standard that apply to utilities providing electricity to all California homes and businesses. The project building would be constructed after 2020 and would be required to comply with 2019 Title 24 standards.

As described above, the State requires an average reduction from all sources of the emission inventory of about 22 percent. The Scoping Plan strategy will achieve more than average reductions from energy and mobile source sectors that are the primary sources related to development projects, and lower than average reductions from other sources such as agriculture. The amount of reduction estimated by the ARB for each sector was based on technical feasibility and cost effectiveness. The Scoping Plan did not include any control strategies targeting the agricultural sector except for the voluntary use of anaerobic digesters on dairies.

As suggested by the Court, a project BAU analysis was prepared for this project that assesses "consistency with AB 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities." The analysis shows the extent to which the project complies with adopted regulations and the additional amount that will be achieved through project design features. At this point in time, no additional reductions are required from new development beyond regulations for the State to achieve its target. Therefore, this analysis meets the consistency test described by the Supreme Court. The 2030 target will require a reduction from 431 $MTCO_2e$ to 260 $MTCO_2e$ or 40 percent from 1990 levels. After accounting for projected growth of approximately 0.8 percent per year an average decrease of 5.2 percent per year from the State GHG inventory will be required to achieve the target. The 2017 Scoping Plan Update includes a strategy for achieving the needed reductions, but does not identify an amount required specifically from new development. However, all GHG emission sources within development projects are subject to GHG regulations.

Therefore, this analysis shows progress toward achieving the 2030 target. The quantitative analysis prepared for the project provides the reduction from BAU in the 2030 target year to show the progress anticipated prior to applying reductions from new strategies contained in the 2017 Scoping Plan Update. The new reduction strategies from the plan are designed to close the gap between existing commitments and those needed to achieve the 2030 target, but many of the strategies must go through a regulatory process to be implemented. Therefore, the reductions needed from new development beyond regulations, if any, is uncertain.

The analysis prepared for the project also includes qualitative assessments of compliance with 2008 Scoping Plan, and the 2017 Scoping Plan Update to support GHG significance findings under Impact GHG-2.

Impact Analysis

Stationary Source Best Performance Standards Analysis

The project will require SJVAPCD permits for its painting and coating operations. Painting and coating operations are not significant sources of GHG emissions. Therefore, GHG emissions from this source were not estimated.

Construction

Total GHG emissions generated during construction are presented in Table 13. The SJVAPCD does not recommend assessing the significance of construction-related emissions. However, other jurisdictions, such as the SCAQMD and the SMAQMD, have concluded that construction emissions should be included since they may remain in the atmosphere for years after construction is complete. In order to account for the construction emissions, amortization of the total emissions generated during construction were based on the life of the development (non-residential—30 years) and added to the operational emissions.

Table 13: Construction Greenhouse Gas Emissions

Year	$MTCO_2e$ per year
2021	243.3
2022	852.7
Total	**243.3**
Amortized over 30 years	***8.11***

Notes:
Calculation totals use unrounded numbers from CalEEMod output.
$MTCO_2e$ = metric tons of carbon dioxide equivalents
Source: CalEEMod output (Appendix A).

Operation

Operational or long-term emissions occur over the life of the project. Sources of emissions may include motor vehicles and trucks, energy usage, water usage, and waste generation, and area sources such as consumer products and landscaping activities.

Business-As-Usual Operational Emissions

Operational emissions under the BAU scenario were modeled using CalEEMod 2016.3.2 and EMFAC 2017. Modeling assumptions for the year 2005 were used to represent 2022 and 2030 BAU conditions (without the benefit of regulations adopted to reduce GHG emissions). The SJVAPCD guidance recommends using emissions in 2002–2004 in the baseline scenario to represent conditions—as if regulations had not been adopted—to allow the effect of projected growth on achieving reduction targets to be clearly defined. The vehicle fleet mix was revised to reflect the project's trip generation and vehicle types. The year 2022 was chosen because it is the first year of project operations. The year 2030 was also modeled because it is the SB 32 target year. Full assumptions and CalEEMod model outputs are provided in Appendix A.

2022 and 2030 Operational Emissions

Operational emissions for the year 2022 and 2030 were modeled using. CalEEMod assumes compliance with some, but not all, applicable rules and regulations regarding energy efficiency, vehicle fuel efficiency, renewable energy usage, and other GHG reduction policies, as described in the CalEEMod User's Guide (SCAQMD 2017). The analysis assumes MID compliance with RPS requirements.

The reductions obtained from each regulation and the source of the reduction amount used in the analysis are described below.

The following regulations are incorporated into the CalEEMod emission factors:

- Pavley I motor vehicle emission standards
- Pavley II (LEV III) Advanced Clean Cars Program
- 2005, 2008, 2013, and 2016 Title 24 Energy Efficiency Standards

The following regulations have not been incorporated into the CalEEMod emission factors and require alternative methods to account for emission reductions provided by the regulations:

- Low Carbon Fuel Standard (LCFS)
- Renewable Portfolio Standard (RPS)

Pavley II/LEV III standards have been incorporated in the latest version of CalEEMod. ARB estimates a 3 percent reduction in 2020 and a 19 percent reduction from the vehicle categories subject to the regulation by 2030 (ARB 2010b and ARB 2013d).

The ARB GHG Regulation for Medium and Heavy-Duty Engines and Vehicles applies to trucks that will be accessing the project site. The benefits of the regulation were incorporated into CalEEMod 2016.3.2. The ARB estimates that this regulation will reduce GHG emissions from the affected vehicles by 7.2 percent (ARB 2013f).

The Low Carbon Fuel Standard (LCFS) is estimated to achieve a 10 percent reduction in emissions by 2020 and a 20 percent reduction by 2030 (ARB 2018b). CalEEMod does not include credit for the LCFS, so the reduction is calculated off-model.

RPS is not included in CalEEMod, so the benefits of compliance with the RPS is accounted for using the individual energy intensity of the electric utility.

Reductions in emissions from solid waste are based on the County achieving the CalRecycle 75 Percent Initiative by 2020 compared with a 50 percent baseline for 2005. Reductions are taken using the CalEEMod mitigation component.

Regulations applicable to project sources and the percent reduction anticipated from each source are shown in Table 14. The percentage reductions are only applied to the specific sources subject to the regulations. For example, the Pavley Low Emission Vehicle Standards apply only to light-duty cars and trucks.

Table 14: Reductions from Greenhouse Gas Regulations

Regulation	Project Applicability	Reduction Source	Percent Reduction in 2020 and 2030
Pavley Low Emission Vehicle Standards	Light-duty cars and trucks accessing the site are subject to the regulation	CalEEMod defaults (Pavley I)	25.1[1]
		CalEEMod defaults	3% 2020 19.5% 2030[2]
ARB Truck and Bus Regulation	Heavy Duty Trucks serving the project are subject to the regulation	Adjusted GHG Emission Factors for HD Trucks in CalEEMod	7.16%[3]
Low Carbon Fuel Standard (LCFS)	Vehicles accessing the site will use fuel subject to the LCFS	Off model adjustment of results	10% 2020 20% 2030[1]
Title 24 Energy Efficiency Standards	Project buildings will be constructed to meet the latest version of Title 24 (currently 2019).	Adjusted CalEEMod energy intensity factors	10.6% Electricity 1.0% Natural Gas[4]
Green Building Code Standards	The project will include water conservation features required by the standard.	CalEEMod mitigation component	20%[5]
Water Efficient Land Use Ordinance	The project landscaping will comply with the regulation.	CalEEMod mitigation component	20%[6]
Renewable Portfolio Standard (RPS)	Electricity purchased for use at the project site is subject to the 33 percent RPS mandate.	CalEEMod adjusted energy intensity factors with PG&E emission factors that show the company will exceed the 33 percent mandate.	33.0% 2020 60.0% 2030[7]
Solid waste	The solid waste service provider will need to provide programs to increase diversion and recycling to meet the 75 percent mandate.	CalEEMod mitigation component	25%[8]

Notes:

Regulations are described in Section 2.3 Regulatory Environment. The source of the percentage reductions from each measure are from the following sources:

[1] Pavley 1 + Low Carbon Fuel Standard Postprocessor Version 1.0 User's Guide (ARB 2010 and ARB 2018b)
[2] ARB Staff Report for LEV III Amendments (ARB 2013e)
[3] ARB Truck and Bus Regulation (ARB 2013f)
[4] 2019 Building Energy Efficiency Standards Frequently Asked Questions (CEC 2018)
[5] 2013 California Green Building Standards Code Section 5.303.2
[6] California Water Plan Update 2013 (CDWR 2013)
[7] Based on CalEEMod default for MID and achieving 2020 and 2030 RPS standards
[8] CalRecycle 75 Percent Initiative: Defining the Future (2016).

Full assumptions and model outputs are provided in Appendix A and results of this analysis for the 2022 modeling year are presented in Table 15.

Table 15: Project Operational Greenhouse Gases (2022)

Source	Emissions ($MTCO_2e$ per year)		
	Business as Usual	2022 (with Regulation)	Percent Reduction
Area	0.01	0.01	4.5%
Energy	1,372.35	1,090.76	20.5%
Mobile Employee	615.83	463.69	24.7%
Mobile Truck	403.01	336.08	16.6%
Off-road Equipment (Forklifts)	97.35	72.45	25.6%
Waste	187.08	140.31	25.0%
Water	236.77	158.56	33.0%
Amortized Construction Emissions	8.11	8.11	0.0%
Total	**2,920.51**	**2,269.96**	**22.3%**
Reduction from BAU		**650.56**	—
Percent Reduction		**22.3%**	—
Significance Threshold		21.7%	—
Are emissions significant?		No	

Notes:
$MTCO_2e$ = metric tons of carbon dioxide equivalents
The project achieves the 21.7 percent required to show consistency with AB 32 targets.
Source: CalEEMod output using 2005 modeling year to represent emissions in 2021 without regulations (Appendix A).
Source of 2022 emissions: CalEEMod output for the year 2022 (Appendix A).

As shown in Table 15, the project would achieve a reduction of 22.3 percent from BAU by the year 2022 with regulations incorporated. This is 0.6 percent above the 21.7 percent average reduction from all sources of GHG emissions now required to achieve AB 32 targets. The ARB originally identified a reduction of 29 percent from BAU as needed to achieve AB 32 targets and used to develop the SJVAPCD BAU threshold. The 2008 recession and slower growth in the years since 2008 have reduced the growth forecasted for 2020, and the amount needed to be reduced to achieve 1990 levels as required by AB 32.

Table 16 shows progress toward achieving 2030 targets with implementation of adopted regulations and on-site reductions from efficiency measures. The results show that the project would achieve a 40.6 percent reduction from BAU by 2030. This is 18.9 percent beyond the average reduction required by the State from all sources to achieve the AB 32 target.

Table 16: Project Operational Greenhouse Gases (2030)

Source	Emissions (MTCO$_2$e per year)		
	Business as Usual	2030 (with Regulation)	Percent Reduction
Area	0.01	0.01	4.7%
Energy	1,372.35	787.37	42.6%
Mobile Employee	615.83	314.08	49.0%
Mobile Truck	403.01	283.46	29.7%
Off-road Equipment (Forklifts)	97.35	77.08	20.8%
Waste	187.08	140.31	25.0%
Water	236.77	125.30	47.1%
Amortized Construction Emissions	8.11	8.11	0.0%
Total	**2,920.51**	**1,735.72**	**40.6%**
Reduction from BAU		**1,184.79**	—
Percent Reduction		**40.6%**	—
Significance Threshold		21.7%	—
Are emissions significant?		No	

Notes:
MTCO$_2$e = metric tons of carbon dioxide equivalents
The project achieves the 21.7 percent required to show consistency with AB 32 targets.
Source: CalEEMod output using 2005 modeling year to represent emissions in 2030 without regulations (Appendix A).
Source of 2030 emissions: CalEEMod output for the year 2030 (Appendix A).

The analysis presented above does not include new strategies included in the 2017 Scoping Plan Update. The update was adopted in December 2017. The update provides alternatives in terms of their likelihood of implementation and ranges of reduction from the strategies. Measures already authorized by legislation are highly likely to be implemented, while measures requiring new legislation are less likely to go forward. The State is highly likely to incorporate zero net energy buildings in future updates to Title 24. A new round of motor vehicle fuel efficiency standards beyond 2025 when LEV III standards are at their maximum reduction level is highly likely. Changing heavy-duty trucks and off-road equipment to alternative fuels face greater technological hurdles and are less likely to provide dramatic reductions by 2030; however, ARB adopted the Advanced Truck Regulation on June 25, 2020. The new regulation applies to vehicles sold between 2024 and 2035 and is expected to provide substantial reductions toward California's GHG reduction goals (ARB 2020b).

The 2030 emission limit is 260 MMTCO$_2$e. The ARB estimates that the 2030 BAU (reference) Inventory will be 392 MMTCO$_2$e—a reduction of 132 MMCO$_2$e, including existing policies and programs but not including known commitments that are already underway. The 2017 Scoping Plan Update includes the estimated GHG emissions by sector compared with 1990 levels that is presented in Table 17. The proposed plan would achieve the bulk of the reductions from Electric Power, Industrial fuel combustion, and Transportation. Cap-and-Trade would provide between 10 and 20 percent of the required reductions depending on the amounts achieved by the other reduction measures.

Table 17: 2017 Scoping Plan Update Estimated Change in GHG Emissions by Sector

Scoping Plan Sector	Emissions (MMTCO$_2$e per year)		
	1990	2030 Proposed Plan Ranges	Percent Change form 1990
Agriculture	26	24–25	-4 to -8
Residential and Commercial	44	38–40	-9 to -14
Electric Power	108	42–62	-43 to -61
High GWP	3	8–11	167 to 267
Industrial	98	77–87	-11 to -21
Recycling and Waste	7	8–9	14 to 29
Transportation (including TCU)	152	103–111	-27 to -32
Net Sink	-7	TBD	TBD
Subtotal	431	300–345	-20 to -30
Cap-and-Trade Program	N/A	40–85	N/A
Total	431	260	-40

Source: ARB 2017 Scoping Plan Update (ARB 2017c).

Although 2017 Scoping Plan Update focuses on state agency actions necessary to achieve the 2030 GHG limit, the ARB considers local governments essential partners in achieving California's goals to reduce GHG emissions. The 2030 target will require an increase in the rate of emission reductions compared with what was needed to achieve the 2020 limit, and this will require action and collaboration at all levels, including local government action to complement and support State-level actions. For individual projects, the 2017 Scoping Plan Update suggests that all new land use development implement all feasible measures to reduce GHG emissions. The Scoping Plan does not define all feasible measures or attribute an amount of reductions required from new development beyond compliance with regulations. When requiring mitigation of a project's fair share of a cumulative impact, the Lead Agency must show the nexus between the project contribution and its fair share of mitigation to reduce the impact to less than cumulatively considerable. A threshold based on local support and collaboration with state actions as described in the 2017 Scoping Plan Update does not lend itself to a quantitative determination of fair share. Requiring developers and future business operators to fully mitigate emissions without accounting for compliance with regulations would result in double mitigation, first by the developer and then by the business operator purchasing electricity, fuel, and vehicles compliant with regulations in effect at the time of purchase and beyond that would violate constitutional nexus requirements.

In conclusion, the project would achieve reductions of 22.3 percent, which is 0.6 percent beyond the ARB 2020 21.7 percent target reduction from BAU requirements from adopted regulations. No new threshold has been adopted by the County or the SJVAPCD for the SB 32 2030 target. However, the project would achieve a reduction of 40.6 percent from BAU by 2030 through compliance with existing regulations, which is 18.9 percent beyond the 2020 target. Based on this progress and the strong likelihood that the measures included in the 2017 Scoping Plan Update will be implemented, it is reasonable to conclude that the project is consistent with the 2017 Scoping Plan and will contribute a reasonable fair-share contribution to achieving the 2030 target. Fair share may very well be achieved through compliance with increasingly stringent state regulations that apply to new development, such as Title 24 and CALGreen; regulations on energy production, fuels, and motor vehicles that apply to both new and existing development; and voluntary actions to improve energy efficiency in existing development. In addition, compliance with the VMT targets adopted to comply with SB 375 and implemented through the RTP/SCS may be considered to adequately address GHG emissions from passenger cars and light-duty trucks. As shown in Table 17, the state strategy relies on the Cap-and-Trade Program to make up any shortfalls that may occur from the other regulatory strategies. The costs of Cap-and-Trade emission reductions will ultimately be passed on to consumers of fuels, electricity, and products produced by regulated industries, such as future businesses and residents and other purchasers of products and services. Therefore, the impact in terms of Considerations #1 and #2 would be less than significant.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

6.2.2 - Greenhouse Gas Reduction Plans

Impact GHG-2: **The project would not conflict with any applicable plan, policy, or regulation of an agency adopted to reduce the emissions of greenhouse gases.**

Impact Analysis

The following analysis assesses the project’s compliance with Consideration #3 regarding consistency with adopted plans to reduce GHG emissions. Stanislaus County has not adopted a GHG reduction plan. In addition, the County has not completed the GHG inventory, benchmarking, or goal-setting process required to identify a reduction target and take advantage of the streamlining provisions contained in the CEQA Guidelines amendments adopted for SB 97 and clarifications provided in the CEQA Guidelines amendments adopted on December 28, 2018. The SJVAPCD has adopted a Climate Action Plan, but it does not contain measures that are applicable to the project. Therefore, the SJVAPCD Climate Action Plan cannot be applied to the project. Since no other local or regional Climate Action Plan is in place, the project is assessed for its consistency with ARB’s adopted 2008 and 2017 Scoping Plans. This would be achieved with an assessment of the project’s compliance with Scoping Plan measures.

AB 32 Scoping Plan

The California State Legislature adopted AB 32 in 2006. AB 32 focuses on reducing GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) to 1990 levels by the year 2020. Pursuant to the requirements in AB 32, the ARB adopted the Climate Change Scoping Plan (Scoping Plan) in 2008, which outlines actions recommended to obtain that goal. The 2008 Scoping Plan calls for an “ambitious but achievable” reduction in California’s GHG emissions, cutting approximately 30 percent from BAU emission levels projected for 2020, or about 10 percent from 2008 levels. On a per-capita basis, that means reducing annual emissions of 14 tons of carbon dioxide for every man, woman, and child in California down to about 10 tons per person by 2020. As stated earlier, the State emission inventory was below the target in 2016, 2017, and 2018, and is expected to remain below the target in 2020 (ARB 2018a).

The Scoping Plan contains a variety of strategies to reduce the State’s emissions. As shown in Table 18, the project is consistent with most of the strategies, while others are not applicable to the project. As discussed earlier, the 2017 Scoping Plan Update strategies primarily rely on increasing the stringency of existing regulations with which the project would continue to comply.

Table 18: Project Consistency with Scoping Plan

Scoping Plan Sector	Scoping Plan Measure	Implementing Regulations	Project Consistency
Transportation	California Cap-and-Trade Program Linked to Western Climate Initiative	Regulation for the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanism October 20, 2015 (CCR 95800)	**Consistent.** The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers. However, the regulation indirectly affects people who use the products and services produced by these industrial sources when increased cost of products or services (such as electricity and fuel) are transferred to the consumers. The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period.
	California Light-Duty Vehicle Greenhouse Gas Standards	Pavley I 2005 Regulations to Control GHG Emissions from Motor Vehicles	**Consistent.** This measure applies to all new vehicles starting with model year 2012. The project would not conflict with its implementation as it would apply to all new passenger vehicles purchased in California. Passenger vehicles, model year 2012 and later, associated with construction and operation of the project would be required to comply with the Pavley emissions standards.
		2012 LEV III Amendments to the California Greenhouse Gas and Criteria Pollutant Exhaust and Evaporative Emission Standards	
	Low Carbon Fuel Standard	2009 readopted in 2015. Regulations to Achieve Greenhouse Gas Emission Reductions Subarticle 7. Low Carbon Fuel Standard CCR 95480	**Consistent.** This measure applies to transportation fuels utilized by vehicles in California. The project would not conflict with implementation of this measure. Motor vehicles associated with construction and operation of the project would utilize low carbon transportation fuels as required under this measure.

Table 18 (cont.): Project Consistency with Scoping Plan

Scoping Plan Sector	Scoping Plan Measure	Implementing Regulations	Project Consistency
	Regional Transportation-Related Greenhouse Gas Targets	SB 375. Cal. Public Resources Code §§ 21155, 21155.1, 21155.2, 21159.28	**Consistent.** The project will provide a small increase in employment in the region that is consistent with the growth projections in the 2018 Regional Transportation Plan/Sustainable Communities Strategy (SCS). The project is not within an SCS priority area and so is not subject to requirements applicable to those areas.
	Goods Movement	Goods Movement Action Plan January 2007.	**Not applicable**. The project does not propose any changes to maritime, rail, or intermodal facilities or forms of transportation.
	Medium/Heavy-Duty Vehicles	2010 Amendments to the Truck and Bus Regulation, the Drayage Truck Regulation and the Tractor-Trailer Greenhouse Gas Regulation	**Consistent.** This measure applies to medium and heavy-duty vehicles that operate in the State. The project would not conflict with implementation of this measure. Medium- and heavy-duty vehicles associated with construction and operation of the project would be required to comply with the requirements of this regulation.
	High Speed Rail	Funded under SB 862	**Not applicable**. This is a statewide measure that cannot be implemented by a project applicant or lead agency.
Electricity and Natural Gas	Energy Efficiency	Title 20 Appliance Efficiency Regulation	**Consistent.** The project would not conflict with implementation of this measure. The project will comply with the latest energy efficiency standards and incorporate applicable energy efficiency features designed to reduce project energy consumption.
		Title 24 Part 6 Energy Efficiency Standards for Residential and Non-Residential Building	
		Title 24 Part 11 California Green Building Code Standards	
	Renewable Portfolio Standard/ Renewable Electricity Standard	2010 Regulation to Implement the Renewable Electricity Standard (33% 2020)	**Consistent.** Modesto Irrigation District (MID) is expected to comply with the 2020 33 percent RPS requirement and the 60% SB 100 RPS requirement for 2030.
		SB 350 Clean Energy and Pollution Reduction Act of 2015 (50% 2030)	
		SB 100 60% renewable requirement	

Table 18 (cont.): Project Consistency with Scoping Plan

Scoping Plan Sector	Scoping Plan Measure	Implementing Regulations	Project Consistency
	Million Solar Roofs Program	Tax incentive program	**Consistent.** This measure is to increase solar throughout California, which is being done by various electricity providers and existing solar programs. The program does not target industrial facilities; however, the project could install solar panels voluntarily in the future.
Water	Water	Title 24 Part 11 California Green Building Code Standards SBX 7-7—The Water Conservation Act of 2009 Model Water Efficient Landscape Ordinance [MWELO]	**Consistent.** The project will comply with the California Green Building Standards Code, which requires a 20 percent reduction in indoor water use. The project may install limited landscaping that will be consistent with provisions of the subject to a Model Water Efficient Landscape Ordinance (MWELO) if required by Stanislaus County.
Green Buildings	Green Building Strategy	Title 24 Part 11 California Green Building Code Standards	**Consistent.** The project will comply with the California Green Building Standards Code, which requires a 20 percent reduction in indoor water use and solar ready roofs.
Industry	Industrial Emissions	2010 ARB Mandatory Reporting Regulation	**Consistent.** The project emissions are less than the thresholds for participation in the Mandatory Reporting Program.
Recycling and Waste Management	Recycling and Waste	Title 24 Part 11 California Green Building Code Standards AB 341 Statewide 75 Percent Diversion Goal	**Consistent.** The project would not conflict with implementation of these measures. The project is would participate in any recycling program operated by its solid waste hauler and would use agricultural waste and by-products for beneficial uses.
Forests	Sustainable Forests	Cap-and-Trade Offset Projects	**Not applicable.** The project site will be designated for industrial. No forested lands exist on-site.
High Global Warming Potential	High Global Warming Potential Gases	ARB Refrigerant Management Program CCR 95380	**Consistent**. The regulations are applicable to refrigerants used by large air conditioning systems and large commercial and industrial refrigerators and cold storage system. No large systems are proposed for the project.

Table 18 (cont.): Project Consistency with Scoping Plan

Scoping Plan Sector	Scoping Plan Measure	Implementing Regulations	Project Consistency
Agriculture	Agriculture	Cap-and-Trade Offset Projects for Livestock and Rice Cultivation	**Not applicable.** The project is an agricultural equipment manufacturing facility that is not subject to Cap-and-Trade. The only Agricultural Scoping Plan measure is one that encourages dairies to install anaerobic digesters.
Source of ARB Scoping Plan Reduction Measures: California Air Resources Board 2008			

In summary, the project incorporates a number of features that would minimize GHG emissions. These features are consistent with project-level strategies identified by the ARB's 2008 Scoping Plan. The project promotes the goals of the Scoping Plan through implementation of design measures that reduce energy consumption, water consumption, and VMT.

Consistency with California's Post-2020 Targets

The State's executive branch adopted several Executive Orders related to GHG emissions. Executive Orders S-3-05 and B-30-15 are two examples. Executive Order S-3-05 sets goals to reduce emissions to 1990 levels by 2020 and 80 percent below 1990 levels by 2050. The goal of Executive Order S-3-05 to reduce GHG emissions to 1990 levels by 2020 was codified by AB 32. The project, as analyzed above, is consistent with AB 32. Therefore, the project does not conflict with this component of Executive Order S-3-05. Executive Order B-30-15 establishes an interim goal to reduce GHG emissions to 40 percent below 1990 levels by 2030.

The 2030 goal of Executive Order B-30-15 was codified under SB 32 and is now addressed by the 2017 Scoping Plan Update. The 2017 Scoping Plan update provides a strategy that is capable of reaching the SB 32 target if the measures included in the plan are implemented and achieve reductions within the ranges expected. Under the Scoping Plan Update, local government plays a supporting role through its land use authority and control over local transportation infrastructure. The Plan Update includes reductions from implementation of SB 375 that applies to VMT from passenger vehicles. Stanislaus County targets for SB 375 are a 5 percent reduction by 2020 and a 10 percent reduction by 2035. SB 375 is implemented with the StanCOG RTP/SCS. The RTP/SCS envisions an increase in development density that would encourage fewer and shorter trips and more trips by transit, walking, and bicycling.

Now that the 2017 Scoping Plan has been adopted, new methodologies and threshold approaches are required to determine the fair-share contributions County development projects would need to make to achieve the 2030 target. In the meantime, however, the discussion under "Consistency with SB 32" below addresses the consistency of the proposed project with SB 32, which provides the statutory underpinning of the 2017 Scoping Plan. The SB 32 target requires GHG emissions to be reduced by 40 percent from 1990 levels. No consensus has been reached around the State on a new quantitative target for new development based on consistency with the SB 32 target.

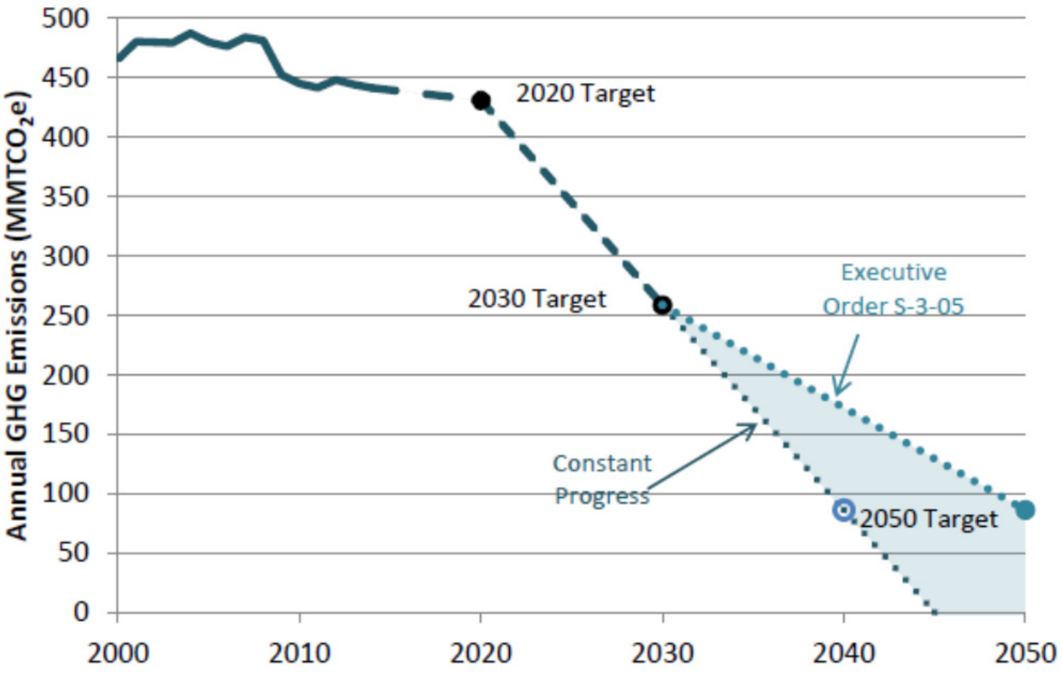
The Executive Order S-3-05 2050 target has not been codified by legislation. Studies have shown that, in order to meet the 2050 target, aggressive pursuit of technologies in the transportation and energy sectors, including electrification and the decarbonization of fuel, will be required. Because of the technological shifts required and the unknown parameters of the regulatory framework in 2050, quantitatively analyzing the project's impacts further relative to the 2050 goal is speculative for purposes of CEQA (ARB 2014).

The 2008 Scoping Plan recognized that AB 32 established an emissions reduction trajectory that will allow California to achieve the more stringent 2050 target: "These [greenhouse gas emission reduction] measures also put the State on a path to meet the long-term 2050 goal of reducing California's GHG emissions to 80 percent below 1990 levels. This trajectory is consistent with the reductions that are needed globally to stabilize the climate." In addition, ARB's First Update "lays the foundation for establishing a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050," and many of the emission reduction strategies recommended by ARB would serve to reduce the proposed project's post-2020 emissions level to the extent applicable by law:

- **Energy Sector:** Continued improvements in California's appliance and building energy efficiency programs and initiatives, such as the State's zero net energy building goals, would serve to reduce the proposed project's emissions level. Additionally, further additions to California's renewable resource portfolio would favorably influence the proposed project's emissions level.
- **Transportation Sector:** Anticipated deployment of improved vehicle efficiency, zero emission technologies, lower carbon fuels, and improvement of existing transportation systems all will serve to reduce the proposed project's emissions level.
- **Water Sector:** The proposed project's emissions level will be reduced as a result of further desired enhancements to water conservation technologies.
- **Waste Management Sector:** Plans to further improve recycling, reuse and reduction of solid waste will beneficially reduce the proposed project's emissions level.

For the reasons described above, the project's post-2020 emissions trajectory is expected to follow a declining trend, consistent with the 2030 and 2050 targets. The trajectory required to achieve the post-2020 targets is shown in Figure 8.

Figure 8: California's Path to Achieving the 2050 Target



Source: ARB 2017 Scoping Plan Update (ARB 2017c).

In his January 2015 inaugural address, Governor Brown expressed a commitment to achieve "three ambitious goals" that he would like to see accomplished by 2030 to reduce the State's GHG emissions:

- Increasing the State's Renewable Portfolio Standard from 33 percent in 2020 to 50 percent in 2030;
- Cutting the petroleum use in cars and trucks in half; and
- Doubling the efficiency of existing buildings and making heating fuels cleaner.

Consistency with SB 32

The 2017 Scoping Plan includes the strategy that the State intends to pursue to achieve the 2030 targets of Executive Order S-3-05 and SB 32. The 2017 Scoping Plan includes the following summary of its overall strategy for reaching the 2030 target:

- SB 350
    - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030 (Now 60 percent per SB 100).
    - Doubling of energy efficiency savings by 2030.
- Low Carbon Fuel Standard (LCFS)
    - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020) (Now 20 percent in 2030).
- Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
    - Maintaining existing GHG standards for light- and heavy-duty vehicles.
    - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
    - Increase ZEV buses, delivery and other trucks.
- Sustainable Freight Action Plan
    - Improve freight system efficiency.
    - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
    - Deploy over 100,000 zero-emission trucks and equipment by 2030.
- Short-Lived Climate Pollutant (SLCP) Reduction Strategy
    - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
    - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
- SB 375 Sustainable Communities Strategies
    - Increased stringency of 2035 targets.
- Post-2020 Cap-and-Trade Program
    - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
    - ARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.

- By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

Table 19 provides an analysis of the project's consistency with the 2017 Scoping Plan Update measures.

Table 19: Consistency with SB 32 2017 Scoping Plan Update

Scoping Plan Measure	Project Consistency
SB 350 50% Renewable Mandate. Utilities subject to the legislation will be required to increase their renewable energy mix from 33% in 2020 to 50% in 2030 (now 60% under SB 100).	**Consistent.** The project will purchase electricity from a utility subject to the SB 350 Renewable Mandate.
SB 350 Double Building Energy Efficiency by 2030. This is equivalent to a 20 percent reduction from 2014 building energy usage compared to current projected 2030 levels	**Not Applicable.** This measure applies to existing buildings.
Low Carbon Fuel Standard. This measure requires fuel providers to meet an 18 percent reduction in carbon content by 2030.	**Consistent.** Vehicles accessing the project site will use fuel containing lower carbon content as the fuel standard is implemented.
Mobile Source Strategy (Cleaner Technology and Fuels Scenario). Vehicle manufacturers will be required to meet existing regulations mandated by the LEV III and Heavy-Duty Vehicle programs. The strategy includes a goal of having 4.2 million ZEVs on the road by 2030 and increasing numbers of ZEV trucks and buses.	**Consistent.** Future employees can be expected to purchase increasing numbers of more fuel-efficient and zero emission cars and trucks each year.
Sustainable Freight Action Plan The plan's target is to improve freight system efficiency 25 percent by increasing the value of goods and services produced from the freight sector, relative to the amount of carbon that it produces by 2030. This would be achieved by deploying over 100,000 freight vehicles and equipment capable of zero emission operation and maximize near-zero emission freight vehicles and equipment powered by renewable energy by 2030.	**Not Applicable.** The measure applies to owners and operators of trucks and freight operations.
Short-Lived Climate Pollutant (SLCP) Reduction Strategy. The strategy requires the reduction of SLCPs by 40 percent from 2013 levels by 2030 and the reduction of black carbon by 50 percent from 2013 levels by 2030.	**Not Applicable.** The project does not include sources that produce significant quantities of methane or black carbon. Diesel trucks accessing the site will achieve significant reductions in $PM_{2.5}$ with adopted regulations that will reduce this source of black carbon.
SB 375 Sustainable Communities Strategies. Requires Regional Transportation Plans to include a sustainable communities strategy for reduction of per capita vehicle miles traveled.	**Not Applicable.** The project is a manufacturing facility in a rural area and is not within a transit priority area and so is not subject to requirements applicable to those areas.
Post-2020 Cap-and-Trade Program. The Post 2020 Cap-and-Trade Program continues the existing program for another 10 years. The Cap-and-Trade Program applies to large industrial sources such as power plants, refineries, and cement manufacturers.	**Consistent.** The post-2020 Cap-and-Trade Program indirectly affects people who use the products and services produced by the regulated industrial sources when increased costs of products or services (such as electricity and fuel) are transferred to the consumers.

Table 19 (cont.): Consistency with SB 32 2017 Scoping Plan Update

Scoping Plan Measure	Project Consistency
	The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program. The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the program's first compliance period.
Natural and Working Lands Action Plan. The ARB is working in coordination with several other agencies at the federal, state, and local levels, stakeholders, and with the public, to develop measures as outlined in the Scoping Plan Update and the governor's Executive Order B-30-15 to reduce GHG emissions and to cultivate net carbon sequestration potential for California's natural and working land.	**Not Applicable.** The project site is currently used as an almond orchard that is not considered natural or working lands suitable for sequestration.
Source: ARB 2017c—2017 Scoping Plan Update.	

Regarding goals for 2050 under Executive Order S-3-05, it is not possible at this time to quantify the emissions savings from future regulatory measures, as they have not yet been developed; nevertheless, it can be anticipated that operation of the project would comply with applicable measures enacted by state lawmakers to achieve an 80 percent reduction below 1990 levels by 2050. In its 2008 Scoping Plan, ARB acknowledged that the "measures needed to meet the 2050 are too far in the future to define in detail." In the First Scoping Plan Update; however, ARB generally described the type of activities required to achieve the 2050 target: "energy demand reduction through efficiency and activity changes; large scale electrification of on-road vehicles, buildings, and industrial machinery; decarbonizing electricity and fuel supplies; and rapid market penetration of efficiency and clean energy technologies that requires significant efforts to deploy and scale markets for the cleanest technologies immediately." The 2017 Scoping Plan provides an intermediate target that is intended to achieve reasonable progress toward the 2050 target.

Accordingly, taking into account the proposed project's emissions, consistency with Scoping Plan measures, and the progress being made by the State towards reducing emissions in key sectors such as transportation, industry, and electricity, the project would further the State's goals of reducing GHG emissions to 1990 levels by 2020, a 40 percent reduction from 1990 levels by 2030, and an 80 percent reduction below 1990 levels by 2050, and would not obstruct their attainment.

Level of Significance Before Mitigation

Less than significant impact.

Mitigation Measures

No mitigation measures are required.

Level of Significance After Mitigation

Less than significant impact.

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Appendix A:
Modeling Assumptions and Results

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Appendix A: Modeling Assumptions and Results

Appendix A: Modeling Assumptions

LPC Industrial Development Project

Kiernan and Tully, Stanislaus Coutny

Zoning	Planned Development	
Parcel Size	17.16	Acres
Building	300,000	SF
Construction Start Date	10/1/2021	
Construction End Date	9/30/2022	
Earliest Operation Date	10/1/2022	
Employees	200	6:00 AM to 5:00 PM
Total Peak Daily Employees	200	

Truck Trips	**Range**	**Truck Type**	**Maximum/Day**	**ADT**
Steel Delivery	1 to 2/day	HHDT	2	4
Large Part Delivery	0-2 per day	HHDT	2	4
Refuse Hauling	2/week	HHDT	0.29	0.57
Total HHD			4.29	8.57
Parts Delivery	1-2 per day	MHD	2	4
Van Deliveries Fedex UPS	2-4 per day	LHDT1	4	8
Finished Equipment Deliveries	2-3 per day	LHDT2	3	6

Equipment is picked up by dealers with their trucks. Assuming use a flat bed truck or pickup with a trailer to haul the equip.
Farmers picking up equipment oftern use a pickup with a trailer.

Customer Trips			**Months**	**Annual Trips**	**ADT**
Harvest Season	25 per day	July-Sept	3	4600	
Off Season	0-2 per day	Oct-June	9	1092	
Total Trips				**5692**	**15.59**

Trip Lengths	**Incoming**	**Product**
	50	50.00

Parking		108	Standard		
		6	Accessible		
		31	Trailer		
APN		046-001-001	17.16		
Water Use (gal/day)			Well		
		Acres			
New Construction Area		**17.16**			
Building Area		**6.89**			
Paved and Landscaped Area		10.27			
Other Equipment During Operations		No. Equipment	Hours/Day		Hours/Year
Propane Forklifts 58 HP		5	8	365	14600
Energy Intensity Modesto Irrigation District					
		CO2	**CH4**	**N2O**	
Default		833.46	0.029	0.006	
	2020	607.3637	0.022	0.005	
All Natural Gas		911	EIA rate for natural gas power plants		
	2006	833.46	0.029	0.006	
2006 Renewable %		0.0851			
2020 Renewable %		**0.3333**	**0.3333**	**0.3333**	
2030 Renewable %		0.6	0.6	0.6	
	2030	364.4	0.0116	0.0024	

Appendix A: Offroad Equipment

LPC Industrial Development Construction Equipment and Schedule

Default Construction Schedule

PhaseNumber	PhaseName	PhaseType	PhaseStartDate	PhaseEndDate	NumDaysW	NumDays
1	Site Preparation	Site Preparation	2021/10/01	2021/10/14	5	10
2	Grading	Grading	2021/10/15	2021/11/25	5	30
3	Building Construction	Building Constructi	2021/11/26	2023/01/19	5	300
4	Paving	Paving	2023/01/20	2023/02/16	5	20
5	Architectural Coating	Architectural Coati	2023/02/17	2023/03/16	5	20

Ajdusted Construction Schedule

PhaseNumber	PhaseName	PhaseType	PhaseStartDate	PhaseEndDate	NumDaysW	NumDays
1	Site Preparation	Site Preparation	2021/10/01	2021/10/14	5	10
2	Grading	Grading	2021/10/15	2021/11/25	5	30
3	Building Construction	Building Constructi	2021/11/26	2022/08/05	5	181
4	Paving	Paving	2022/08/06	2022/09/02	5	20
5	Architectural Coating	Architectural Coati	2022/09/03	2022/09/30	5	20

Ajdusted Equipment Usage

PhaseName	OffRoad Equipment Type	OffRoad Equipment Unit Amount	UsageHours	Days/Phase	Hours Per Phase	Adjusted Days	Adjusted Equip No.	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8	10	240	10	3	247	0.4
Site Preparation	Tractors/Loaders/Backho	4	8	10	320	10	4	97	0.37
Grading	Excavators	2	8	20	320	20	2	158	0.38
Grading	Graders	1	8	20	160	20	1	187	0.41
Grading	Rubber Tired Dozers	1	8	20	160	20	1	247	0.4
Grading	Scrapers	2	8	20	320	20	2	367	0.48
Grading	Tractors/Loaders/Backho	2	8	30	480	20	3	97	0.37
Building Construction	Cranes	1	7	300	2100	181	2	231	0.29
Building Construction	Forklifts	3	8	300	7200	181	5	89	0.2
Building Construction	Generator Sets	1	8	300	2400	181	2	84	0.74
Building Construction	Tractors/Loaders/Backho	3	7	300	6300	181	5	97	0.37
Building Construction	Welders	1	8	300	2400	181	2	46	0.45
Paving	Pavers	2	8	20	320	20	2	130	0.42
Paving	Paving Equipment	2	8	20	320	20	2	132	0.36
Paving	Rollers	2	8	20	320	20	2	80	0.38
Architectural Coating	Air Compressors	1	6	20	120	20	1	78	0.48
					23480				

Appendix A: Vehicle Fleet Mix

LPC Industrial Development Fleet Mix Allocation

Fleet Mix Allocation

Land Use Assumptions

LandUseType	**LandUseSubType**	**LandUseUnitAmou**	**LandUseSizeMetric**
Industrial	Light Industrial	300	KSF

ITE 9th Edition/CalEEMod

Project Trip Generation

VehicleTripsLandUseSul	**VehicleTripsLandUs**	**WD_TR**	**ST_TR**	**SU_TR**	**Daily Avg Tr**	**LU SF**	**Trip Gen**
Industrial	Project Specific	1.35	1.35	1.35	1.35	300.00	405.00

	LHD1	**LHD2**	**MHD**	**HHD**	**OBUS**	**UBUS**	**MCY**	**SBUS**	**MH**	
Default	0.02282	0.00535	0.02756	0.08830	0.00184	0.00112	0.00463	0.00085	0.00091	
Revised	0.020629	0.00	0.00	0.001474	0.00	0.00	0.00	0.00	0.00	
Diffence to Allocate	0.00219	0.00535	0.02756	0.08683	0.00184	0.00112	0.00463	0.00085	0.00091	0.13127

Adjusted Fleet Mix for No HDT Trucks	**LDA**	**LDT1**	**LDT2**	**MDV**	**Total**		
Default Fleet Mix	0.516452	0.033212	0.173817	0.12315	0.846631		0.131266
Adjusted Fleet Mix	0.596526	0.038361	0.200767	0.142244	0.977897	Allocation Fraction	**0.131266**
					0.131266		

2022 CalEEMod Default Fleet Mix for Stanislaus County

	EmissionType	**LDA**	**LDT1**	**LDT2**	**MDV**	**LHD1**	**LHD2**	**MHD**	**HHD**	**OBUS**	**UBUS**	**MCY**	**SBUS**	**MH**	
Default Fleet Mix	FleetMix	0.516452	0.033212	0.173817	0.12315	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911	1
Revised Fleet Mix		**0.59653**	**0.03836**	**0.20077**	**0.14224**	0.020629	0	0	**0.001474**	0	0	0	0	0	1.000000

Employee Trips/KSF	0.938
Employee Trips/Day	79.83

Truck Trips	**Range**	**Truck Type**	**Maximum/Day**	**ADT**	**Trip Length**
Steel Delivery	1 to 2/day	HHDT	2	4	50
Large Part Delivery	0-2 per day	HHDT	2	4	50
Refuse Hauling	2/week	HHDT	0.29	0.57	Default
Total HHD			4.29	8.57	
Parts Delivery	1-2 per day	MHD	2	4	50
Van Deliveries Fedex UF	2-4 per day	LHDT1	4	8	Default
Finished Equipment Del	2-3 per day	LHDT2	3	6	50
				26.57	

Truck Model Run Trips

	Truck Type	**ADT**	**Trips/KSF**	**leet Fraction**
Steel	HHDT	4.00		0.222222
Large Part	HHDT	4.00		0.222222
Small Part	MHD	4.00		0.222222
Equipment	LHDT2	6.00		0.333333
		18.00	0.060	1

Equipment is picked up by dealers with their trucks. Assuming transport with a flat bed truck or pickup with a trailer.
Farmers picking up equipment often use a pickup with a trailer. Used LHDT2 as a conservative assumption

Customer Trips			**Months**	**Annual Trips**	**ADT**
Harvest Season	25 per day	July-Sept	3	4600	
Off Season	0-2 per day	Oct-June	9	1092	
Total Trips				**5692**	**15.59**

Trip Lengths	**Incoming**	**Product**
	50	50.00

	Employees	**AVR**	**Employee Vehicles**	**Employee Trips/Day**
Employee Trips	200	1.1	182	363.6

Total Trips all Purposes	405.80
Trips per KSF	1.353

Employee and Customer Trips

	ADT	Trips/KSF	Fleet Fraction	Vehicles
Employees	363.6			LDA and LDT MDT
Customers	15.59			LDA and LDT MDT
	379.23		0.9779	LDA and LDT MDT
Package Delivery	8		0.0206	LHDT1
Refuse	0.57		0.0015	HHDT
	387.8	1.293	1	

Appendix A: Health Risk Screening Analysis

LPC Industrial Dev.

Prioritization Calculator

Applicability	Use to provide a Prioritization score based on the emission potency method. Entries required in yellow areas, output in grey areas.			
Author or updater	Matthew Cegielski	*Last Update*	October 13, 2016	
Facility:	LDC Industrial Development			
ID#:				
Project #:				
Unit and Process#	Mobile Source Diesel			
Operating Hours hr/yr	8,760.00			

Receptor Proximity and Proximity Factors		Cancer Score	Chronic Score	Acute Score	Max Score
0< R<100	**1.000**	2.37E+00	3.52E-03	0.00E+00	2.37E+00
100≤R<250	**0.250**	5.93E-01	8.79E-04	0.00E+00	5.93E-01
250≤R<500	**0.040**	9.49E-02	1.41E-04	0.00E+00	9.49E-02
500≤R<1000	**0.011**	2.61E-02	3.87E-05	0.00E+00	2.61E-02
1000≤R<1500	**0.003**	7.12E-03	1.06E-05	0.00E+00	7.12E-03
1500≤R<2000	**0.002**	4.74E-03	7.03E-06	0.00E+00	4.74E-03
2000<R	**0.001**	2.37E-03	3.52E-06	0.00E+00	2.37E-03

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

Mobile Source Diesel	Enter the unit's CAS# of the substances emitted and their amounts.				Prioritzation score for each substance generated below. Totals on last row.		
Substance	**CAS#**	**Annual Emissions (lbs/yr)**	**Maximum Hourly (lbs/hr)**	**Average Hourly (lbs/hr)**	**Cancer**	**Chronic**	**Acute**
Diesel engine exhaust, particulate matter (Diesel PM)	**9901**	1.03E+00	2.34E-04	1.17E-04	2.37E+00	3.52E-03	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				0.00E+00	0.00E+00	0.00E+00	0.00E+00
				Totals	**2.37E+00**	**3.52E-03**	**0.00E+00**

Use the substance dropdown list in the CAS# Finder to locate CAS# of substances.

Substance	CAS# Finder
Wood preservatives (containing arsenic and chromate)	1206

Health Risk Priortization Screening

Diesel Truck Trips

	LHDT1	LHDT2	MHD	HHD	Total
Trucks Onsite Per Day (annual avg.)	4	3	2	4.29	13.29
Average Daily Truck Trips	8.00	6.00	4.00	8.58	26.58

Max Daily Trucks Onsite	13.3	Max Daily Factor	1.5
Idling Time per Event (min.)	15		
Average Distance Onsite RT (mi)	0.36		
Miles per Day Onsite	4.78		
Idling Minutes/Day	199		

	Miles/ Round Trip		Trips/Year	Miles/Year	Speed (mph)
Offsite Miles Estimate	0.5		4,851	2,425	5-25

	Distance Onsite (mi)	Idling Min/Year	Idling Emission (g/year)	Idling Emissions (lbs/year)
Loading Docks	0.36	72,763	23.98	0.05
	0.36	**72,763**		

Total Travel Distance per day (Miles)	4.78
Total Travel Distance per year (miles)	1,746
Idling Emission Rate for Diesel (g/hr)	0.019775
g/lb conversion factor	0.00220

Closest Receptor Location	**Meters**
House SW of Project	104
House NNW of Project	158
House N of Project	165

Estimated with Google Earth Measurement Tool

Risk from all Sources

	Cancer Score	Chronic Score	Acute Score
Diesel Trucks	2.370	0.004	0.000
Total	**2.370**	**0.004**	**0.000**

Onsite Travel Distances	Feet	Miles	Weighted Avg Trip Length
W. Entrance N. Loading Docks	1,469	0.28	0.07
W. Entrance S. Loading Docks	729	0.14	0.035
N. Entrance N. Loading Docks	3,064	0.44	0.11
N. Entrance S. Loading Docks	2,329	0.58	0.145
Weighted Avg Trip Length			0.360

Estimated using Google Earth Measurement Tool

Onsite Emissions (5-15 mph)	Truck Type	ADT	Trips/Year	PM10 Emission Rate g/mi	Average Distance Onsite	PM10 (grams/year)	Emissions (pounds/year)	Emissions (pounds/hour)
Steel	HHDT	4.00	1460.00					
Large Part	HHDT	4.00	1460.00					
Refuse	HHDT	0.29	105.85					
		8.29	3025.85	0.04991	0.36	54.3694	0.1199	
Small Part	MHD	4.00	1460.00	0.06316	0.36	33.1955	0.0732	
Equipment	LHDT2	6.00	2190.00	0.05895	0.36	46.4798	0.1025	
Parcel Delivery	LHDT1	8.00	2920.00	0.07178	0.36	75.4574	0.1664	
Total							**0.4619**	0.0001

Offsite Emissions (5-25 mph)	Truck Type	ADT	Trips/Year	PM10 Emission Rate g/mi	Average Distance Onsite	PM10 (grams/year)	Emissions (pounds/year)	Emission (pound/hour)
Steel	HHDT	4.00	1460.00					
Large Part	HHDT	4.00	1460.00					
Refuse	HHDT	0.29	105.85					
		8.29	3025.85	0.03965	0.50	59.9885	0.1323	
Small Part	MHD	4.00	1460.00	0.04821	0.50	35.1941	0.0776	
Equipment	LHDT2	6.00	2190.00	0.04804	0.50	52.6087	0.1160	
Parcel Delivery	LHDT1	8.00	2920.00	0.05781	0.50	84.3967	0.1861	
Total							**0.5119**	0.0001

	PM10 (lbs/day)	PM10 (lbs/hr)
Onsite Running (0.36 mi RT)	0.462	0.00011
Offsite Running (0.50 RT)	0.512	0.00012
Idling	0.053	0.00001
Total	1.027	0.00023

Emission Rates from EMFAC 2017 for Stanislaus County 2022

Idling Emission Rate from EMFAC 2017

EMFAC2017 (v1.0.2) Emission Rates
Region Type: County
Region: STANISLAUS
Calendar Year: 2022
Season: Annual
Vehicle Classification: EMFAC2011 Categories
Units: miles/day for VMT, g/mile for RUNEX, PMBW and PMTW. Note 'day' in the unit is operation day.

Region	**Calendar Year**	**Vehicle Category**	**Model Year**	**Speed**	**Fuel**	**VMT**	**PM2.5_RUNEX**	**PM10_RUNEX**
STANISLAU	2022	LHD1	Aggregated	5	DSL	5129.905	0.09027	0.09435
STANISLAU	2022	LHD1	Aggregated	10	DSL	17059.27	0.06597	0.06895
STANISLAU	2022	LHD1	Aggregated	15	DSL	36945.5	0.04979	0.05204
STANISLAU	2022	LHD1	Aggregated	20	DSL	40504.2	0.03892	0.04068
STANISLAU	2022	LHD1	Aggregated	25	DSL	43350.3	0.03158	0.03301
Total							0.27653	0.28903
Average Emissions 5-25 MPH							**0.05531**	**0.05781**
STANISLAU	2022	LHD2	Aggregated	5	DSL	1627.8	0.07254	0.07581
STANISLAU	2022	LHD2	Aggregated	10	DSL	5413.178	0.05461	0.05708
STANISLAU	2022	LHD2	Aggregated	15	DSL	11723.39	0.04207	0.04397
STANISLAU	2022	LHD2	Aggregated	20	DSL	12852.62	0.03333	0.03483
STANISLAU	2022	LHD2	Aggregated	25	DSL	13755.74	0.02729	0.02852
Total							0.22983	0.24022
Average Emissions 5-25 MPH							**0.04597**	**0.04804**
STANISLAU	2022	T6 instate heavy	Aggregated	5	DSL	2121.392	0.07637	0.07983
STANISLAU	2022	T6 instate heavy	Aggregated	10	DSL	4812.46	0.06306	0.06591
STANISLAU	2022	T6 instate heavy	Aggregated	15	DSL	6146.96	0.04184	0.04374
STANISLAU	2022	T6 instate heavy	Aggregated	20	DSL	8108.238	0.02750	0.02875
STANISLAU	2022	T6 instate heavy	Aggregated	25	DSL	11329.92	0.02185	0.02284
Total							0.23063	0.24106
Average Emissions 5-25 MPH							**0.04613**	**0.04821**

STANISLAU	2022	T7 tractor	Aggregated	5	DSL	1097.616	0.05891	0.06157
STANISLAU	2022	T7 tractor	Aggregated	10	DSL	2344.123	0.04949	0.05173
STANISLAU	2022	T7 tractor	Aggregated	15	DSL	2988.837	0.03486	0.03643
STANISLAU	2022	T7 tractor	Aggregated	20	DSL	3415.085	0.02515	0.02629
STANISLAU	2022	T7 tractor	Aggregated	25	DSL	4154.099	0.02127	0.02223
Total							0.18968	0.19825
Average Emissions 5-25 MPH							**0.03794**	**0.03965**

Region	Calendar Y	Vehicle Category	Model Year	Speed	Fuel	VMT	PM2.5_RUNEX	PM10_RUNEX
STANISLAU	2022	LHD1	Aggregated	5	DSL	5129.905	0.09027	0.09435
STANISLAU	2022	LHD1	Aggregated	10	DSL	17059.27	0.06597	0.06895
STANISLAU	2022	LHD1	Aggregated	15	DSL	36945.5	0.04979	0.05204
Total							0.20603	0.21535
Average Emissions 5-15 MPH							**0.06868**	**0.07178**
STANISLAU	2022	LHD2	Aggregated	5	DSL	1627.8	0.07254	0.07581
STANISLAU	2022	LHD2	Aggregated	10	DSL	5413.178	0.05461	0.05708
STANISLAU	2022	LHD2	Aggregated	15	DSL	11723.39	0.04207	0.04397
Total							0.16921	0.17686
Average Emissions 5-15 MPH							**0.05640**	**0.05895**
STANISLAU	2022	T6 instate heavy	Aggregated	5	DSL	2121.392	0.07637	0.07983
STANISLAU	2022	T6 instate heavy	Aggregated	10	DSL	4812.46	0.06306	0.06591
STANISLAU	2022	T6 instate heavy	Aggregated	15	DSL	6146.96	0.04184	0.04374
Total							0.18128	0.18947
Average Emissions 5-15 MPH							**0.06043**	**0.06316**
STANISLAU	2022	T7 tractor	Aggregated	5	DSL	1097.616	0.05891	0.06157
STANISLAU	2022	T7 tractor	Aggregated	10	DSL	2344.123	0.04949	0.05173
STANISLAU	2022	T7 tractor	Aggregated	15	DSL	2988.837	0.03486	0.03643
Total							0.14326	0.14974
Average Emissions 5-15 MPH							**0.04775**	**0.04991**

Appendix A: Emission Summary

Emission Summary LPC Industrial Development

				Tons/Year		
Construction Emissions (Annual)		**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
	2021	0.16	1.50	1.18	0.23	0.12
	2022	**1.43**	**3.41**	**3.59**	**0.49**	**0.22**
Highest Year of Construction		**0.16**	**1.50**	**1.18**	**0.23**	**0.12**

Operational Emissions

				Tons/Year		
	2022	**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
Area		1.42	0.00	0.00	0.00	0.00
Energy		0.03	0.30	0.26	0.02	0.02
Mobile (employee and visitor)		0.11	0.27	1.68	0.56	0.15
Mobile (Truck)		0.05	1.02	0.31	0.15	0.04
Forklifts (Propane)		0.07	0.63	0.69	0.04	0.04
Total		**1.68**	**2.22**	**2.93**	**0.77**	**0.25**

Construction				**Pounds/Day**		
Maximum Daily Emission Summer		**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
	2021	4.84	46.47	47.74	10.41	6.41
	2022	99.95	42.13	45.85	6.29	2.72

Construction				**Pounds/Day**		
Maximum Daily Emission Winter		**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
	2021	5.85	46.51	45.37	10.41	6.41
	2022	99.94	42.40	43.66	6.29	2.72

Construction				**Pounds/Day**		
Maximum Daily Emission Any Season		**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
		99.95	46.51	47.74	10.41	6.41

Offsite ROG	.
Site Prep	0.11
Grading	0.13
Building Const	2.33
Paving	0.09
Architectural Coatings	**0.37**

PM10 includes compliance with Reg VIII dust control.

Operations			**Pounds/Day**		
Max Daily Emissions Summer	**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
Area	7.13	0.00	0.03	0.00	0.00
Energy	0.18	1.67	1.40	0.13	0.13
Mobile (employee and visitor)	0.75	1.38	10.69	3.15	0.85
Mobile (Trucks)	0.27	5.39	1.68	0.84	0.27
Forklifts (Propane)	0.37	3.44	3.76	0.23	0.21
Total	**8.71**	**11.88**	**17.56**	**4.35**	**1.46**

Operations			**Pounds/Day**		
Max Daily Emissions Winter	**ROG**	**NOX**	**CO**	**PM10**	**PM2.5**
Area	7.13	0.00	0.03	0.00	0.00
Energy	0.18	1.67	1.40	0.13	0.13
Mobile (employee and visitor)	0.55	1.57	9.08	3.15	0.85
Mobile (Trucks)	0.27	5.70	1.69	0.84	0.27
Forklifts (Propane)	0.37	3.44	3.76	0.23	0.21
Total	**8.51**	**12.38**	**15.96**	**4.35**	**1.46**

Operational GHG Emissions

	BAU	2022	Percent Reduction
Area	0.01	0.01	**4.5%**
Energy	1,372.35	1,090.76	**20.5%**
Mobile Emp and Visitor	615.83	463.69	**24.7%**
Mobile Truck	403.01	336.08	**16.6%**
Forklifts (Propane)	97.35	72.45	**25.6%**
Waste	187.08	140.31	**25.0%**
Water	236.77	158.56	**33.0%**
Amortized Construction Emissions	8.11	8.11	**0.0%**
Total	**2,920.51**	**2,269.96**	**22.3%**
			21.7%
Reduction from BAU		**650.56**	**0.58%**

Mobile sources inlcude 10 percent in 2020 for LCFS

Mobile Source Emp and Visitor	515.21	CalEEMod Result
Mobile Source Truck	373.42	CalEEMod Result

	BAU	2030	Percent Reduction
Area	0.01	0.01	**4.7%**
Energy	1,372.35	787.37	**42.6%**
Mobile Emp and Visitor	615.83	314.08	**49.0%**
Mobile Truck	403.01	283.46	**29.7%**
Forklifts (Propane	97.35	77.08	**20.8%**
Waste	187.08	140.31	**25.0%**
Water	236.77	125.30	**47.1%**
Amortized Construction Emissions	8.11	8.11	**0.0%**
Total	**2,920.51**	**1,735.72**	**40.6%**
			21.7%
Reduction from BAU		**1,184.79**	**18.87%**

Mobile Sources include 20 percent reduction for compliance with LCFS in 2030

Mobile Source Emp and Visitor	392.60	CalEEMod Result
Mobile Source Truck	354.32	CalEEMod Result

Construction GHG Emissions

		MTCO2e
	2021	243.3
	2022	852.7
Total Construction		**243.3**
Amortized Construction 30 years		**8.11**

Appendix A: CalEEMod Output

CalEEMod Output

Construction and Operation Employee 2022 (Annual)

LPC Industrial Development Const and Ops

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33/% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Operational Off-Road Equipment - Propane Forklift

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	1.4740e-003
tblFleetMix	LDA	0.52	0.60
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.17	0.20
tblFleetMix	LHD1	0.02	0.02

tblFleetMix	LHD2	5.3520e-003	0.00
tblFleetMix	MCY	4.6330e-003	0.00
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.00
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHorsePower	89.00	58.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	5.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

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					
2021	0.1583	1.5037	1.1773	2.7200e-003	0.2856	0.0634	0.3490	0.1211	0.0589	0.1800	0.0000	242.0802	242.0802	0.0497	0.0000	243.3216
2022	1.4283	3.4101	3.5886	9.4800e-003	0.3691	0.1248	0.4939	0.0994	0.1176	0.2170	0.0000	849.9122	849.9122	0.1102	0.0000	852.6682
Maximum	**1.4283**	**3.4101**	**3.5886**	**9.4800e-003**	**0.3691**	**0.1248**	**0.4939**	**0.1211**	**0.1176**	**0.2170**	**0.0000**	**849.9122**	**849.9122**	**0.1102**	**0.0000**	**852.6682**

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					
2021	0.1583	1.5037	1.1773	2.7200e-003	0.1643	0.0634	0.2277	0.0642	0.0589	0.1230	0.0000	242.0800	242.0800	0.0497	0.0000	243.3214
2022	1.4283	3.4101	3.5886	9.4800e-003	0.3691	0.1248	0.4939	0.0994	0.1176	0.2170	0.0000	849.9118	849.9118	0.1102	0.0000	852.6678
Maximum	**1.4283**	**3.4101**	**3.5886**	**9.4800e-003**	**0.3691**	**0.1248**	**0.4939**	**0.0994**	**0.1176**	**0.2170**	**0.0000**	**849.9118**	**849.9118**	**0.1102**	**0.0000**	**852.6678**

	ROG	**NOx**	**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**	**18.52**	**0.00**	**14.39**	**25.84**	**0.00**	**14.35**	**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	**10-1-2021**	**12-31-2021**	1.6581	1.6581
2	**1-1-2022**	**3-31-2022**	1.5342	1.5342
3	**4-1-2022**	**6-30-2022**	1.5422	1.5422
4	**7-1-2022**	**9-30-2022**	1.7665	1.7665
		Highest	1.7665	1.7665

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	1.4189	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Energy	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	1,086.2517	1,086.2517	0.0337	0.0123	1,090.7565
Mobile	0.1082	0.2688	1.6770	5.6700e-003	0.5539	4.4400e-003	0.5584	0.1474	4.1200e-003	0.1515	0.0000	513.7041	513.7041	0.0126	0.0000	514.0181
Offroad	0.0676	0.6273	0.6861	9.1000e-004		0.0416	0.0416		0.0382	0.0382	0.0000	79.8581	79.8581	0.0258	0.0000	80.5038
Waste						0.0000	0.0000		0.0000	0.0000	75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water						0.0000	0.0000		0.0000	0.0000	22.0095	103.4171	125.4266	2.2643	0.0542	198.1950
Total	**1.6280**	**1.2005**	**2.6217**	**8.4100e-003**	**0.5539**	**0.0691**	**0.6231**	**0.1474**	**0.0655**	**0.2129**	**97.5221**	**1,783.2365**	**1,880.7587**	**6.7991**	**0.0665**	**2,070.5586**

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	1.3007	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Energy	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	1,086.2517	1,086.2517	0.0337	0.0123	1,090.7565
Mobile	0.1082	0.2688	1.6770	5.6700e-003	0.5539	4.4400e-003	0.5584	0.1474	4.1200e-003	0.1515	0.0000	513.7041	513.7041	0.0126	0.0000	514.0181
Offroad	0.0676	0.6273	0.6861	9.1000e-004		0.0416	0.0416		0.0382	0.0382	0.0000	79.8581	79.8581	0.0258	0.0000	80.5038
Waste						0.0000	0.0000		0.0000	0.0000	56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water						0.0000	0.0000		0.0000	0.0000	17.6076	82.7337	100.3413	1.8115	0.0434	158.5560
Total	**1.5099**	**1.2005**	**2.6217**	**8.4100e-003**	**0.5539**	**0.0691**	**0.6231**	**0.1474**	**0.0655**	**0.2129**	**74.2421**	**1,762.5531**	**1,836.7952**	**5.2306**	**0.0557**	**1,984.1498**

	ROG	**NOx**	**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	**7.26**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**23.87**	**1.16**	**2.34**	**23.07**	**16.31**	**4.17**

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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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					
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	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.6000e-004	3.8300e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total	**5.2000e-004**	**3.6000e-004**	**3.8300e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1300e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

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					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0407**	**0.0102**	**0.0509**	**0.0223**	**9.4000e-003**	**0.0317**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.2000e-004	3.6000e-004	3.8300e-003	1.0000e-005	1.1200e-003	1.0000e-005	1.1300e-003	3.0000e-004	1.0000e-005	3.0000e-004	0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total	**5.2000e-004**	**3.6000e-004**	**3.8300e-003**	**1.0000e-005**	**1.1200e-003**	**1.0000e-005**	**1.1300e-003**	**3.0000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

3.3 Grading - 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					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.1301**	**0.0298**	**0.1599**	**0.0540**	**0.0274**	**0.0814**	**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

3.3 Grading - 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	0.0000	0.0000	0.0000	0.0000	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	1.7300e-003	1.2000e-003	0.0128	4.0000e-005	3.7300e-003	3.0000e-005	3.7500e-003	9.9000e-004	2.0000e-005	1.0200e-003	0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total	**1.7300e-003**	**1.2000e-003**	**0.0128**	**4.0000e-005**	**3.7300e-003**	**3.0000e-005**	**3.7500e-003**	**9.9000e-004**	**2.0000e-005**	**1.0200e-003**	**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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					0.0586	0.0000	0.0586	0.0243	0.0000	0.0243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.0586**	**0.0298**	**0.0883**	**0.0243**	**0.0274**	**0.0517**	**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

3.3 Grading - 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	0.0000	0.0000	0.0000	0.0000	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	1.7300e-003	1.2000e-003	0.0128	4.0000e-005	3.7300e-003	3.0000e-005	3.7500e-003	9.9000e-004	2.0000e-005	1.0200e-003	0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total	**1.7300e-003**	**1.2000e-003**	**0.0128**	**4.0000e-005**	**3.7300e-003**	**3.0000e-005**	**3.7500e-003**	**9.9000e-004**	**2.0000e-005**	**1.0200e-003**	**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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	0.0456	0.4163	0.3901	6.4000e-004		0.0226	0.0226		0.0213	0.0213	0.0000	55.3749	55.3749	0.0130	0.0000	55.6989
Total	**0.0456**	**0.4163**	**0.3901**	**6.4000e-004**		**0.0226**	**0.0226**		**0.0213**	**0.0213**	**0.0000**	**55.3749**	**55.3749**	**0.0130**	**0.0000**	**55.6989**

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	4.6100e-003	0.1709	0.0279	4.1000e-004	9.5700e-003	4.4000e-004	0.0100	2.7600e-003	4.2000e-004	3.1800e-003	0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker	0.0235	0.0164	0.1738	5.0000e-004	0.0507	3.6000e-004	0.0511	0.0135	3.3000e-004	0.0138	0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total	**0.0281**	**0.1873**	**0.2016**	**9.1000e-004**	**0.0603**	**8.0000e-004**	**0.0611**	**0.0162**	**7.5000e-004**	**0.0170**	**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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	0.0456	0.4163	0.3901	6.4000e-004		0.0226	0.0226		0.0213	0.0213	0.0000	55.3748	55.3748	0.0130	0.0000	55.6988
Total	**0.0456**	**0.4163**	**0.3901**	**6.4000e-004**		**0.0226**	**0.0226**		**0.0213**	**0.0213**	**0.0000**	**55.3748**	**55.3748**	**0.0130**	**0.0000**	**55.6988**

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	4.6100e-003	0.1709	0.0279	4.1000e-004	9.5700e-003	4.4000e-004	0.0100	2.7600e-003	4.2000e-004	3.1800e-003	0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker	0.0235	0.0164	0.1738	5.0000e-004	0.0507	3.6000e-004	0.0511	0.0135	3.3000e-004	0.0138	0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total	**0.0281**	**0.1873**	**0.2016**	**9.1000e-004**	**0.0603**	**8.0000e-004**	**0.0611**	**0.0162**	**7.5000e-004**	**0.0170**	**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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	0.2445	2.2250	2.2952	3.8500e-003		0.1139	0.1139		0.1074	0.1074	0.0000	330.2348	330.2348	0.0767	0.0000	332.1520
Total	**0.2445**	**2.2250**	**2.2952**	**3.8500e-003**		**0.1139**	**0.1139**		**0.1074**	**0.1074**	**0.0000**	**330.2348**	**330.2348**	**0.0767**	**0.0000**	**332.1520**

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	0.0256	0.9695	0.1536	2.4400e-003	0.0570	2.2700e-003	0.0593	0.0165	2.1700e-003	0.0187	0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker	0.1301	0.0874	0.9457	2.8500e-003	0.3023	2.1000e-003	0.3044	0.0803	1.9300e-003	0.0823	0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total	**0.1556**	**1.0569**	**1.0992**	**5.2900e-003**	**0.3594**	**4.3700e-003**	**0.3637**	**0.0968**	**4.1000e-003**	**0.1009**	**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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	0.2445	2.2250	2.2952	3.8500e-003		0.1139	0.1139		0.1074	0.1074	0.0000	330.2344	330.2344	0.0767	0.0000	332.1516
Total	**0.2445**	**2.2250**	**2.2952**	**3.8500e-003**		**0.1139**	**0.1139**		**0.1074**	**0.1074**	**0.0000**	**330.2344**	**330.2344**	**0.0767**	**0.0000**	**332.1516**

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	0.0256	0.9695	0.1536	2.4400e-003	0.0570	2.2700e-003	0.0593	0.0165	2.1700e-003	0.0187	0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker	0.1301	0.0874	0.9457	2.8500e-003	0.3023	2.1000e-003	0.3044	0.0803	1.9300e-003	0.0823	0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total	**0.1556**	**1.0569**	**1.0992**	**5.2900e-003**	**0.3594**	**4.3700e-003**	**0.3637**	**0.0968**	**4.1000e-003**	**0.1009**	**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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	0.0135					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0245**	**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	8.0000e-004	5.4000e-004	5.8300e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8800e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total	**8.0000e-004**	**5.4000e-004**	**5.8300e-003**	**2.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8800e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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	0.0135					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0245**	**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**

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	8.0000e-004	5.4000e-004	5.8300e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8800e-003	5.0000e-004	1.0000e-005	5.1000e-004	0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total	**8.0000e-004**	**5.4000e-004**	**5.8300e-003**	**2.0000e-005**	**1.8600e-003**	**1.0000e-005**	**1.8800e-003**	**5.0000e-004**	**1.0000e-005**	**5.1000e-004**	**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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	0.9974					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	**0.9995**	**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	3.3700e-003	2.2600e-003	0.0245	7.0000e-005	7.8300e-003	5.0000e-005	7.8800e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total	**3.3700e-003**	**2.2600e-003**	**0.0245**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8800e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.9974					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	**0.9995**	**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

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	3.3700e-003	2.2600e-003	0.0245	7.0000e-005	7.8300e-003	5.0000e-005	7.8800e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total	**3.3700e-003**	**2.2600e-003**	**0.0245**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8800e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1082	0.2688	1.6770	5.6700e-003	0.5539	4.4400e-003	0.5584	0.1474	4.1200e-003	0.1515	0.0000	513.7041	513.7041	0.0126	0.0000	514.0181
Unmitigated	0.1082	0.2688	1.6770	5.6700e-003	0.5539	4.4400e-003	0.5584	0.1474	4.1200e-003	0.1515	0.0000	513.7041	513.7041	0.0126	0.0000	514.0181

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	754.8625	754.8625	0.0273	6.2100e-003	757.3979
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	754.8625	754.8625	0.0273	6.2100e-003	757.3979
NaturalGas Mitigated	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
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
Total		**0.0335**	**0.3044**	**0.2557**	**1.8300e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
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
Total		**0.0335**	**0.3044**	**0.2557**	**1.8300e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	711.6007	0.0258	5.8600e-003	713.9908
Parking Lot	157034	43.2619	1.5700e-003	3.6000e-004	43.4072
Total		**754.8625**	**0.0274**	**6.2200e-003**	**757.3979**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	711.6007	0.0258	5.8600e-003	713.9908
Parking Lot	157034	43.2619	1.5700e-003	3.6000e-004	43.4072
Total		**754.8625**	**0.0274**	**6.2200e-003**	**757.3979**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	1.3007	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Unmitigated	1.4189	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003

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	0.2179					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Total	**1.4189**	**3.0000e-005**	**2.8600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9100e-003**

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	0.0997					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Total	**1.3007**	**3.0000e-005**	**2.8600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	100.3413	1.8115	0.0434	158.5560
Unmitigated	125.4266	2.2643	0.0542	198.1950

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	125.4266	2.2643	0.0542	198.1950
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**125.4266**	**2.2643**	**0.0542**	**198.1950**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	100.3413	1.8115	0.0434	158.5560
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**100.3413**	**1.8115**	**0.0434**	**158.5560**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	5	8.00	365	58	0.20	CNG

UnMitigated/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
Equipment Type	tons/yr										MT/yr					
Forklifts	0.0676	0.6273	0.6861	9.1000e-004		0.0416	0.0416		0.0382	0.0382	0.0000	79.8581	79.8581	0.0258	0.0000	80.5038
Total	**0.0676**	**0.6273**	**0.6861**	**9.1000e-004**		**0.0416**	**0.0416**		**0.0382**	**0.0382**	**0.0000**	**79.8581**	**79.8581**	**0.0258**	**0.0000**	**80.5038**

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

CalEEMod Output

Operations – Trucks 2022 (Annual)

LPC Industrial Development Ops 2022 Truck Only

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Truck trips 0.06 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	0.33
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.03	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LHD1	0.02	0.22
tblFleetMix	LHD2	5.3520e-003	0.22
tblFleetMix	MCY	4.6330e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.22
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	CC_TL	6.60	50.00
tblVehicleTrips	CNW_TL	6.60	50.00
tblVehicleTrips	CW_TL	14.70	50.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.06
tblVehicleTrips	SU_TR	0.68	0.06
tblVehicleTrips	WD_TR	6.97	0.06

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	1.0028	0.0164	0.0426	1.0000e-004	7.8300e-003	8.7000e-004	8.7000e-003	2.0800e-003	8.7000e-004	2.9500e-003	0.0000	9.2128	9.2128	3.4000e-004	0.0000	9.2213
Maximum	**1.0028**	**0.0164**	**0.0426**	**1.0000e-004**	**7.8300e-003**	**8.7000e-004**	**8.7000e-003**	**2.0800e-003**	**8.7000e-004**	**2.9500e-003**	**0.0000**	**9.2128**	**9.2128**	**3.4000e-004**	**0.0000**	**9.2213**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	1.0028	0.0164	0.0426	1.0000e-004	7.8300e-003	8.7000e-004	8.7000e-003	2.0800e-003	8.7000e-004	2.9500e-003	0.0000	9.2128	9.2128	3.4000e-004	0.0000	9.2213
Maximum	**1.0028**	**0.0164**	**0.0426**	**1.0000e-004**	**7.8300e-003**	**8.7000e-004**	**8.7000e-003**	**2.0800e-003**	**8.7000e-004**	**2.9500e-003**	**0.0000**	**9.2128**	**9.2128**	**3.4000e-004**	**0.0000**	**9.2213**

	ROG	**NOx**	**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)
4	**7-1-2022**	**9-30-2022**	1.0193	1.0193
		Highest	1.0193	1.0193

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	1.4189	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Energy	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	1,086.2517	1,086.2517	0.0337	0.0123	1,090.7565
Mobile	0.0495	1.0219	0.3055	3.9500e-003	0.1428	6.9900e-003	0.1498	0.0408	6.6900e-003	0.0475	0.0000	373.2062	373.2062	8.4600e-003	0.0000	373.4176
Waste						0.0000	0.0000		0.0000	0.0000	75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water						0.0000	0.0000		0.0000	0.0000	22.0095	103.4171	125.4266	2.2643	0.0542	198.1950
Total	**1.5019**	**1.3263**	**0.5641**	**5.7800e-003**	**0.1428**	**0.0301**	**0.1730**	**0.0408**	**0.0298**	**0.0706**	**97.5221**	**1,562.8806**	**1,660.4027**	**6.7692**	**0.0665**	**1,849.4544**

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	1.3007	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Energy	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	1,086.2517	1,086.2517	0.0337	0.0123	1,090.7565
Mobile	0.0495	1.0219	0.3055	3.9500e-003	0.1428	6.9900e-003	0.1498	0.0408	6.6900e-003	0.0475	0.0000	373.2062	373.2062	8.4600e-003	0.0000	373.4176
Waste						0.0000	0.0000		0.0000	0.0000	56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water						0.0000	0.0000		0.0000	0.0000	17.6076	82.7337	100.3413	1.8115	0.0434	158.5560
Total	**1.3837**	**1.3263**	**0.5641**	**5.7800e-003**	**0.1428**	**0.0301**	**0.1730**	**0.0408**	**0.0298**	**0.0706**	**74.2421**	**1,542.1972**	**1,616.4392**	**5.2006**	**0.0557**	**1,763.0456**

	ROG	**NOx**	**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	**7.87**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**23.87**	**1.32**	**2.65**	**23.17**	**16.31**	**4.67**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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	0.9974					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	**0.9995**	**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	3.3700e-003	2.2600e-003	0.0245	7.0000e-005	7.8300e-003	5.0000e-005	7.8800e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total	**3.3700e-003**	**2.2600e-003**	**0.0245**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8800e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

3.2 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	0.9974					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	**0.9995**	**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	3.3700e-003	2.2600e-003	0.0245	7.0000e-005	7.8300e-003	5.0000e-005	7.8800e-003	2.0800e-003	5.0000e-005	2.1300e-003	0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total	**3.3700e-003**	**2.2600e-003**	**0.0245**	**7.0000e-005**	**7.8300e-003**	**5.0000e-005**	**7.8800e-003**	**2.0800e-003**	**5.0000e-005**	**2.1300e-003**	**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0495	1.0219	0.3055	3.9500e-003	0.1428	6.9900e-003	0.1498	0.0408	6.6900e-003	0.0475	0.0000	373.2062	373.2062	8.4600e-003	0.0000	373.4176
Unmitigated	0.0495	1.0219	0.3055	3.9500e-003	0.1428	6.9900e-003	0.1498	0.0408	6.6900e-003	0.0475	0.0000	373.2062	373.2062	8.4600e-003	0.0000	373.4176

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	18.00	18.00	18.00	327,600	327,600
Parking Lot	0.00	0.00	0.00		
Total	18.00	18.00	18.00	327,600	327,600

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
General Light Industry	50.00	50.00	50.00	59.00	28.00	13.00	100	0	0
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.222222	0.222222	0.222222	0.333333	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	754.8625	754.8625	0.0273	6.2100e-003	757.3979
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	754.8625	754.8625	0.0273	6.2100e-003	757.3979
NaturalGas Mitigated	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
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
Total		**0.0335**	**0.3044**	**0.2557**	**1.8300e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006	0.0335	0.3044	0.2557	1.8300e-003		0.0231	0.0231		0.0231	0.0231	0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
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
Total		**0.0335**	**0.3044**	**0.2557**	**1.8300e-003**		**0.0231**	**0.0231**		**0.0231**	**0.0231**	**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	711.6007	0.0258	5.8600e-003	713.9908
Parking Lot	157034	43.2619	1.5700e-003	3.6000e-004	43.4072
Total		**754.8625**	**0.0274**	**6.2200e-003**	**757.3979**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	711.6007	0.0258	5.8600e-003	713.9908
Parking Lot	157034	43.2619	1.5700e-003	3.6000e-004	43.4072
Total		**754.8625**	**0.0274**	**6.2200e-003**	**757.3979**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 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	1.3007	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Unmitigated	1.4189	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003

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	0.2179					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Total	**1.4189**	**3.0000e-005**	**2.8600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9100e-003**

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	0.0997					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.2007					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.7000e-004	3.0000e-005	2.8600e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9100e-003
Total	**1.3007**	**3.0000e-005**	**2.8600e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9100e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	100.3413	1.8115	0.0434	158.5560
Unmitigated	125.4266	2.2643	0.0542	198.1950

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	125.4266	2.2643	0.0542	198.1950
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**125.4266**	**2.2643**	**0.0542**	**198.1950**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	100.3413	1.8115	0.0434	158.5560
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**100.3413**	**1.8115**	**0.0434**	**158.5560**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

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

CalEEMod Output

Construction and Ops (Employee)

(Summer Daily)

LPC Industrial Development Const and Ops

Stanislaus County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33/% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Operational Off-Road Equipment - Propane Forklift

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	1.4740e-003
tblFleetMix	LDA	0.52	0.60
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.17	0.20
tblFleetMix	LHD1	0.02	0.02

tblFleetMix	LHD2	5.3520e-003	0.00
tblFleetMix	MCY	4.6330e-003	0.00
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.00
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHorsePower	89.00	58.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	5.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2021	5.8395	46.4736	47.7416	0.1235	18.2962	2.0461	20.3422	9.9917	1.8824	11.8740	0.0000	12,225.8825	12,225.8825	1.9504	0.0000	12,263.3220
2022	100.3140	42.1345	45.8508	0.1217	4.7637	1.5251	6.2887	1.2804	1.4378	2.7182	0.0000	12,047.2389	12,047.2389	1.4667	0.0000	12,083.9057
Maximum	**100.3140**	**46.4736**	**47.7416**	**0.1235**	**18.2962**	**2.0461**	**20.3422**	**9.9917**	**1.8824**	**11.8740**	**0.0000**	**12,225.8825**	**12,225.8825**	**1.9504**	**0.0000**	**12,263.3220**

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	lb/day										lb/day					
2021	5.8395	46.4736	47.7416	0.1235	8.3597	2.0461	10.4058	4.5298	1.8824	6.4122	0.0000	12,225.8825	12,225.8825	1.9504	0.0000	12,263.3220
2022	100.3140	42.1345	45.8508	0.1217	4.7637	1.5251	6.2887	1.2804	1.4378	2.7182	0.0000	12,047.2389	12,047.2389	1.4667	0.0000	12,083.9057
Maximum	**100.3140**	**46.4736**	**47.7416**	**0.1235**	**8.3597**	**2.0461**	**10.4058**	**4.5298**	**1.8824**	**6.4122**	**0.0000**	**12,225.8825**	**12,225.8825**	**1.9504**	**0.0000**	**12,263.3220**

	ROG	**NOx**	**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**	**43.09**	**0.00**	**37.31**	**48.46**	**0.00**	**37.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Area	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.7539	1.3840	10.6911	0.0340	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,397.5781	3,397.5781	0.0838		3,399.6722
Offroad	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**9.0835**	**6.4896**	**15.8834**	**0.0490**	**3.1291**	**0.3790**	**3.5081**	**0.8308**	**0.3590**	**1.1898**		**5,881.6053**	**5,881.6053**	**0.2783**	**0.0367**	**5,899.4985**

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	lb/day										lb/day					
Area	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.7539	1.3840	10.6911	0.0340	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,397.5781	3,397.5781	0.0838		3,399.6722
Offroad	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**8.4359**	**6.4896**	**15.8834**	**0.0490**	**3.1291**	**0.3790**	**3.5081**	**0.8308**	**0.3590**	**1.1898**		**5,881.6053**	**5,881.6053**	**0.2783**	**0.0367**	**5,899.4985**

	ROG	NOx	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	**7.13**	**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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 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	lb/day										lb/day					
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
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
Worker	0.1137	0.0664	0.9037	2.3900e-003	0.2299	1.6000e-003	0.2315	0.0610	1.4800e-003	0.0625		238.3925	238.3925	6.8400e-003		238.5634
Total	**0.1137**	**0.0664**	**0.9037**	**2.3900e-003**	**0.2299**	**1.6000e-003**	**0.2315**	**0.0610**	**1.4800e-003**	**0.0625**		**238.3925**	**238.3925**	**6.8400e-003**		**238.5634**

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	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 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	lb/day										lb/day					
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
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
Worker	0.1137	0.0664	0.9037	2.3900e-003	0.2299	1.6000e-003	0.2315	0.0610	1.4800e-003	0.0625		238.3925	238.3925	6.8400e-003		238.5634
Total	**0.1137**	**0.0664**	**0.9037**	**2.3900e-003**	**0.2299**	**1.6000e-003**	**0.2315**	**0.0610**	**1.4800e-003**	**0.0625**		**238.3925**	**238.3925**	**6.8400e-003**		**238.5634**

3.3 Grading - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 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	lb/day										lb/day					
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
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
Worker	0.1263	0.0738	1.0042	2.6600e-003	0.2555	1.7800e-003	0.2572	0.0678	1.6400e-003	0.0694		264.8805	264.8805	7.6000e-003		265.0704
Total	**0.1263**	**0.0738**	**1.0042**	**2.6600e-003**	**0.2555**	**1.7800e-003**	**0.2572**	**0.0678**	**1.6400e-003**	**0.0694**		**264.8805**	**264.8805**	**7.6000e-003**		**265.0704**

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	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 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	lb/day										lb/day					
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
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
Worker	0.1263	0.0738	1.0042	2.6600e-003	0.2555	1.7800e-003	0.2572	0.0678	1.6400e-003	0.0694		264.8805	264.8805	7.6000e-003		265.0704
Total	**0.1263**	**0.0738**	**1.0042**	**2.6600e-003**	**0.2555**	**1.7800e-003**	**0.2572**	**0.0678**	**1.6400e-003**	**0.0694**		**264.8805**	**264.8805**	**7.6000e-003**		**265.0704**

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	lb/day										lb/day					
Off-Road	3.5087	32.0262	30.0048	0.0496		1.7357	1.7357		1.6356	1.6356		4,695.4094	4,695.4094	1.0990		4,722.8844
Total	**3.5087**	**32.0262**	**30.0048**	**0.0496**		**1.7357**	**1.7357**		**1.6356**	**1.6356**		**4,695.4094**	**4,695.4094**	**1.0990**		**4,722.8844**

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	lb/day										lb/day					
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
Vendor	0.3476	13.0096	1.9714	0.0322	0.7530	0.0331	0.7861	0.2168	0.0317	0.2485		3,371.8493	3,371.8493	0.2793		3,378.8325
Worker	1.9832	1.1589	15.7653	0.0418	4.0107	0.0280	4.0387	1.0636	0.0257	1.0894		4,158.6238	4,158.6238	0.1193		4,161.6051
Total	**2.3308**	**14.1684**	**17.7367**	**0.0739**	**4.7637**	**0.0611**	**4.8248**	**1.2804**	**0.0574**	**1.3378**		**7,530.4731**	**7,530.4731**	**0.3986**		**7,540.4376**

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	lb/day										lb/day					
Off-Road	3.5087	32.0262	30.0048	0.0496		1.7357	1.7357		1.6356	1.6356	0.0000	4,695.4094	4,695.4094	1.0990		4,722.8844
Total	**3.5087**	**32.0262**	**30.0048**	**0.0496**		**1.7357**	**1.7357**		**1.6356**	**1.6356**	**0.0000**	**4,695.4094**	**4,695.4094**	**1.0990**		**4,722.8844**

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	lb/day										lb/day					
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
Vendor	0.3476	13.0096	1.9714	0.0322	0.7530	0.0331	0.7861	0.2168	0.0317	0.2485		3,371.8493	3,371.8493	0.2793		3,378.8325
Worker	1.9832	1.1589	15.7653	0.0418	4.0107	0.0280	4.0387	1.0636	0.0257	1.0894		4,158.6238	4,158.6238	0.1193		4,161.6051
Total	**2.3308**	**14.1684**	**17.7367**	**0.0739**	**4.7637**	**0.0611**	**4.8248**	**1.2804**	**0.0574**	**1.3378**		**7,530.4731**	**7,530.4731**	**0.3986**		**7,540.4376**

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	lb/day										lb/day					
Off-Road	3.1548	28.7102	29.6149	0.0496		1.4693	1.4693		1.3855	1.3855		4,697.0523	4,697.0523	1.0908		4,724.3214
Total	**3.1548**	**28.7102**	**29.6149**	**0.0496**		**1.4693**	**1.4693**		**1.3855**	**1.3855**		**4,697.0523**	**4,697.0523**	**1.0908**		**4,724.3214**

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	lb/day										lb/day					
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
Vendor	0.3232	12.3876	1.8208	0.0319	0.7529	0.0287	0.7816	0.2168	0.0274	0.2442		3,340.0418	3,340.0418	0.2692		3,346.7718
Worker	1.8384	1.0367	14.4151	0.0403	4.0107	0.0271	4.0378	1.0636	0.0249	1.0885		4,010.1449	4,010.1449	0.1067		4,012.8126
Total	**2.1616**	**13.4243**	**16.2359**	**0.0721**	**4.7637**	**0.0558**	**4.8194**	**1.2804**	**0.0524**	**1.3327**		**7,350.1867**	**7,350.1867**	**0.3759**		**7,359.5843**

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	lb/day										lb/day					
Off-Road	3.1548	28.7102	29.6149	0.0496		1.4693	1.4693		1.3855	1.3855	0.0000	4,697.0523	4,697.0523	1.0908		4,724.3214
Total	**3.1548**	**28.7102**	**29.6149**	**0.0496**		**1.4693**	**1.4693**		**1.3855**	**1.3855**	**0.0000**	**4,697.0523**	**4,697.0523**	**1.0908**		**4,724.3214**

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	lb/day										lb/day					
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
Vendor	0.3232	12.3876	1.8208	0.0319	0.7529	0.0287	0.7816	0.2168	0.0274	0.2442		3,340.0418	3,340.0418	0.2692		3,346.7718
Worker	1.8384	1.0367	14.4151	0.0403	4.0107	0.0271	4.0378	1.0636	0.0249	1.0885		4,010.1449	4,010.1449	0.1067		4,012.8126
Total	**2.1616**	**13.4243**	**16.2359**	**0.0721**	**4.7637**	**0.0558**	**4.8194**	**1.2804**	**0.0524**	**1.3327**		**7,350.1867**	**7,350.1867**	**0.3759**		**7,359.5843**

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	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.3493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4521**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	lb/day										lb/day					
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
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
Worker	0.0878	0.0495	0.6886	1.9200e-003	0.1916	1.2900e-003	0.1929	0.0508	1.1900e-003	0.0520		191.5674	191.5674	5.1000e-003		191.6949
Total	**0.0878**	**0.0495**	**0.6886**	**1.9200e-003**	**0.1916**	**1.2900e-003**	**0.1929**	**0.0508**	**1.1900e-003**	**0.0520**		**191.5674**	**191.5674**	**5.1000e-003**		**191.6949**

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	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.3493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4521**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	lb/day										lb/day					
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
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
Worker	0.0878	0.0495	0.6886	1.9200e-003	0.1916	1.2900e-003	0.1929	0.0508	1.1900e-003	0.0520		191.5674	191.5674	5.1000e-003		191.6949
Total	**0.0878**	**0.0495**	**0.6886**	**1.9200e-003**	**0.1916**	**1.2900e-003**	**0.1929**	**0.0508**	**1.1900e-003**	**0.0520**		**191.5674**	**191.5674**	**5.1000e-003**		**191.6949**

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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3688	0.2080	2.8922	8.0800e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		804.5832	804.5832	0.0214		805.1184
Total	**0.3688**	**0.2080**	**2.8922**	**8.0800e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**804.5832**	**804.5832**	**0.0214**		**805.1184**

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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3688	0.2080	2.8922	8.0800e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		804.5832	804.5832	0.0214		805.1184
Total	**0.3688**	**0.2080**	**2.8922**	**8.0800e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**804.5832**	**804.5832**	**0.0214**		**805.1184**

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	lb/day										lb/day					
Mitigated	0.7539	1.3840	10.6911	0.0340	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,397.5781	3,397.5781	0.0838		3,399.6722
Unmitigated	0.7539	1.3840	10.6911	0.0340	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,397.5781	3,397.5781	0.0838		3,399.6722

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
NaturalGas Unmitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062

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	lb/day										lb/day					
General Light Industry	17013.7	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

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	lb/day										lb/day					
General Light Industry	17.0137	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Unmitigated	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724

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	lb/day										lb/day					
Architectural Coating	1.1942					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.7760**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

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	lb/day										lb/day					
Architectural Coating	0.5465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.1284**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	5	8.00	365	58	0.20	CNG

UnMitigated/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
Equipment Type	lb/day										lb/day					
Forklifts	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**0.3702**	**3.4373**	**3.7594**	**4.9800e-003**		**0.2277**	**0.2277**		**0.2095**	**0.2095**		**482.3477**	**482.3477**	**0.1560**		**486.2477**

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

CalEEMod Output

Construction and Ops (Employee)
(Winter Daily)

LPC Industrial Development Const and Ops

Stanislaus County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33/% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Operational Off-Road Equipment - Propane Forklift

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	1.4740e-003
tblFleetMix	LDA	0.52	0.60
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT2	0.17	0.20
tblFleetMix	LHD1	0.02	0.02

tblFleetMix	LHD2	5.3520e-003	0.00
tblFleetMix	MCY	4.6330e-003	0.00
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.00
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHorsePower	89.00	58.00
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	5.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2021	5.8480	46.5064	45.3715	0.1175	18.2962	2.0461	20.3422	9.9917	1.8824	11.8740	0.0000	11,625.4502	11,625.4502	1.9494	0.0000	11,663.4028
2022	100.3124	42.4037	43.6526	0.1159	4.7637	1.5264	6.2901	1.2804	1.4391	2.7195	0.0000	11,464.9944	11,464.9944	1.4880	0.0000	11,502.1935
Maximum	**100.3124**	**46.5064**	**45.3715**	**0.1175**	**18.2962**	**2.0461**	**20.3422**	**9.9917**	**1.8824**	**11.8740**	**0.0000**	**11,625.4502**	**11,625.4502**	**1.9494**	**0.0000**	**11,663.4028**

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	lb/day										lb/day					
2021	5.8480	46.5064	45.3715	0.1175	8.3597	2.0461	10.4058	4.5298	1.8824	6.4122	0.0000	11,625.4502	11,625.4502	1.9494	0.0000	11,663.4028
2022	100.3124	42.4037	43.6526	0.1159	4.7637	1.5264	6.2901	1.2804	1.4391	2.7195	0.0000	11,464.9944	11,464.9944	1.4880	0.0000	11,502.1935
Maximum	**100.3124**	**46.5064**	**45.3715**	**0.1175**	**8.3597**	**2.0461**	**10.4058**	**4.5298**	**1.8824**	**6.4122**	**0.0000**	**11,625.4502**	**11,625.4502**	**1.9494**	**0.0000**	**11,663.4028**

	ROG	**NOx**	**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**	**43.09**	**0.00**	**37.31**	**48.46**	**0.00**	**37.43**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Area	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.5508	1.5714	9.0805	0.0302	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,016.4746	3,016.4746	0.0744		3,018.3338
Offroad	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**8.8804**	**6.6770**	**14.2727**	**0.0452**	**3.1291**	**0.3790**	**3.5081**	**0.8308**	**0.3590**	**1.1898**		**5,500.5018**	**5,500.5018**	**0.2689**	**0.0367**	**5,518.1601**

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	lb/day										lb/day					
Area	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.5508	1.5714	9.0805	0.0302	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,016.4746	3,016.4746	0.0744		3,018.3338
Offroad	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**8.2328**	**6.6770**	**14.2727**	**0.0452**	**3.1291**	**0.3790**	**3.5081**	**0.8308**	**0.3590**	**1.1898**		**5,500.5018**	**5,500.5018**	**0.2689**	**0.0367**	**5,518.1601**

	ROG	**NOx**	**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	**7.29**	**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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 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	lb/day										lb/day					
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
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
Worker	0.1131	0.0792	0.7450	2.1100e-003	0.2299	1.6000e-003	0.2315	0.0610	1.4800e-003	0.0625		210.2447	210.2447	5.9000e-003		210.3922
Total	**0.1131**	**0.0792**	**0.7450**	**2.1100e-003**	**0.2299**	**1.6000e-003**	**0.2315**	**0.0610**	**1.4800e-003**	**0.0625**		**210.2447**	**210.2447**	**5.9000e-003**		**210.3922**

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	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 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	lb/day										lb/day					
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
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
Worker	0.1131	0.0792	0.7450	2.1100e-003	0.2299	1.6000e-003	0.2315	0.0610	1.4800e-003	0.0625		210.2447	210.2447	5.9000e-003		210.3922
Total	**0.1131**	**0.0792**	**0.7450**	**2.1100e-003**	**0.2299**	**1.6000e-003**	**0.2315**	**0.0610**	**1.4800e-003**	**0.0625**		**210.2447**	**210.2447**	**5.9000e-003**		**210.3922**

3.3 Grading - 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	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 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	lb/day										lb/day					
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
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
Worker	0.1256	0.0880	0.8278	2.3500e-003	0.2555	1.7800e-003	0.2572	0.0678	1.6400e-003	0.0694		233.6052	233.6052	6.5500e-003		233.7691
Total	**0.1256**	**0.0880**	**0.8278**	**2.3500e-003**	**0.2555**	**1.7800e-003**	**0.2572**	**0.0678**	**1.6400e-003**	**0.0694**		**233.6052**	**233.6052**	**6.5500e-003**		**233.7691**

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	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 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	lb/day										lb/day					
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
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
Worker	0.1256	0.0880	0.8278	2.3500e-003	0.2555	1.7800e-003	0.2572	0.0678	1.6400e-003	0.0694		233.6052	233.6052	6.5500e-003		233.7691
Total	**0.1256**	**0.0880**	**0.8278**	**2.3500e-003**	**0.2555**	**1.7800e-003**	**0.2572**	**0.0678**	**1.6400e-003**	**0.0694**		**233.6052**	**233.6052**	**6.5500e-003**		**233.7691**

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	lb/day										lb/day					
Off-Road	3.5087	32.0262	30.0048	0.0496		1.7357	1.7357		1.6356	1.6356		4,695.4094	4,695.4094	1.0990		4,722.8844
Total	**3.5087**	**32.0262**	**30.0048**	**0.0496**		**1.7357**	**1.7357**		**1.6356**	**1.6356**		**4,695.4094**	**4,695.4094**	**1.0990**		**4,722.8844**

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	lb/day										lb/day					
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
Vendor	0.3669	13.0982	2.3705	0.0311	0.7530	0.0346	0.7876	0.2168	0.0331	0.2499		3,262.4389	3,262.4389	0.3162		3,270.3439
Worker	1.9724	1.3819	12.9962	0.0368	4.0107	0.0280	4.0387	1.0636	0.0257	1.0894		3,667.6019	3,667.6019	0.1029		3,670.1745
Total	**2.3393**	**14.4801**	**15.3666**	**0.0680**	**4.7637**	**0.0625**	**4.8263**	**1.2804**	**0.0588**	**1.3392**		**6,930.0408**	**6,930.0408**	**0.4191**		**6,940.5184**

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	lb/day										lb/day					
Off-Road	3.5087	32.0262	30.0048	0.0496		1.7357	1.7357		1.6356	1.6356	0.0000	4,695.4094	4,695.4094	1.0990		4,722.8844
Total	**3.5087**	**32.0262**	**30.0048**	**0.0496**		**1.7357**	**1.7357**		**1.6356**	**1.6356**	**0.0000**	**4,695.4094**	**4,695.4094**	**1.0990**		**4,722.8844**

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	lb/day										lb/day					
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
Vendor	0.3669	13.0982	2.3705	0.0311	0.7530	0.0346	0.7876	0.2168	0.0331	0.2499		3,262.4389	3,262.4389	0.3162		3,270.3439
Worker	1.9724	1.3819	12.9962	0.0368	4.0107	0.0280	4.0387	1.0636	0.0257	1.0894		3,667.6019	3,667.6019	0.1029		3,670.1745
Total	**2.3393**	**14.4801**	**15.3666**	**0.0680**	**4.7637**	**0.0625**	**4.8263**	**1.2804**	**0.0588**	**1.3392**		**6,930.0408**	**6,930.0408**	**0.4191**		**6,940.5184**

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	lb/day										lb/day					
Off-Road	3.1548	28.7102	29.6149	0.0496		1.4693	1.4693		1.3855	1.3855		4,697.0523	4,697.0523	1.0908		4,724.3214
Total	**3.1548**	**28.7102**	**29.6149**	**0.0496**		**1.4693**	**1.4693**		**1.3855**	**1.3855**		**4,697.0523**	**4,697.0523**	**1.0908**		**4,724.3214**

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	lb/day										lb/day					
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
Vendor	0.3413	12.4579	2.1918	0.0308	0.7529	0.0301	0.7830	0.2168	0.0287	0.2455		3,231.153 1	3,231.153 1	0.3052		3,238.784 1
Worker	1.8305	1.2356	11.8459	0.0355	4.0107	0.0271	4.0378	1.0636	0.0249	1.0885		3,536.789 1	3,536.789 1	0.0920		3,539.088 0
Total	**2.1718**	**13.6935**	**14.0377**	**0.0663**	**4.7637**	**0.0571**	**4.8208**	**1.2804**	**0.0537**	**1.3340**		**6,767.942 2**	**6,767.942 2**	**0.3972**		**6,777.872 1**

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	lb/day										lb/day					
Off-Road	3.1548	28.7102	29.6149	0.0496		1.4693	1.4693		1.3855	1.3855	0.0000	4,697.052 3	4,697.052 3	1.0908		4,724.321 4
Total	**3.1548**	**28.7102**	**29.6149**	**0.0496**		**1.4693**	**1.4693**		**1.3855**	**1.3855**	**0.0000**	**4,697.052 3**	**4,697.052 3**	**1.0908**		**4,724.321 4**

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	lb/day										lb/day					
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
Vendor	0.3413	12.4579	2.1918	0.0308	0.7529	0.0301	0.7830	0.2168	0.0287	0.2455		3,231.1531	3,231.1531	0.3052		3,238.7841
Worker	1.8305	1.2356	11.8459	0.0355	4.0107	0.0271	4.0378	1.0636	0.0249	1.0885		3,536.7891	3,536.7891	0.0920		3,539.0880
Total	**2.1718**	**13.6935**	**14.0377**	**0.0663**	**4.7637**	**0.0571**	**4.8208**	**1.2804**	**0.0537**	**1.3340**		**6,767.9422**	**6,767.9422**	**0.3972**		**6,777.8721**

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	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225		2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.3493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4521**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**		**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	lb/day										lb/day					
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
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
Worker	0.0875	0.0590	0.5659	1.7000e-003	0.1916	1.2900e-003	0.1929	0.0508	1.1900e-003	0.0520		168.9549	168.9549	4.3900e-003		169.0647
Total	**0.0875**	**0.0590**	**0.5659**	**1.7000e-003**	**0.1916**	**1.2900e-003**	**0.1929**	**0.0508**	**1.1900e-003**	**0.0520**		**168.9549**	**168.9549**	**4.3900e-003**		**169.0647**

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	lb/day										lb/day					
Off-Road	1.1028	11.1249	14.5805	0.0228		0.5679	0.5679		0.5225	0.5225	0.0000	2,207.6603	2,207.6603	0.7140		2,225.5104
Paving	1.3493					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.4521**	**11.1249**	**14.5805**	**0.0228**		**0.5679**	**0.5679**		**0.5225**	**0.5225**	**0.0000**	**2,207.6603**	**2,207.6603**	**0.7140**		**2,225.5104**

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	lb/day										lb/day					
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
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
Worker	0.0875	0.0590	0.5659	1.7000e-003	0.1916	1.2900e-003	0.1929	0.0508	1.1900e-003	0.0520		168.9549	168.9549	4.3900e-003		169.0647
Total	**0.0875**	**0.0590**	**0.5659**	**1.7000e-003**	**0.1916**	**1.2900e-003**	**0.1929**	**0.0508**	**1.1900e-003**	**0.0520**		**168.9549**	**168.9549**	**4.3900e-003**		**169.0647**

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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3673	0.2479	2.3767	7.1200e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		709.6106	709.6106	0.0185		710.0718
Total	**0.3673**	**0.2479**	**2.3767**	**7.1200e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**709.6106**	**709.6106**	**0.0185**		**710.0718**

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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3673	0.2479	2.3767	7.1200e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		709.6106	709.6106	0.0185		710.0718
Total	**0.3673**	**0.2479**	**2.3767**	**7.1200e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**709.6106**	**709.6106**	**0.0185**		**710.0718**

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	lb/day										lb/day					
Mitigated	0.5508	1.5714	9.0805	0.0302	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,016.4746	3,016.4746	0.0744		3,018.3338
Unmitigated	0.5508	1.5714	9.0805	0.0302	3.1291	0.0244	3.1535	0.8308	0.0227	0.8534		3,016.4746	3,016.4746	0.0744		3,018.3338

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
NaturalGas Unmitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062

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	lb/day										lb/day					
General Light Industry	17013.7	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

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	lb/day										lb/day					
General Light Industry	17.0137	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Unmitigated	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724

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	lb/day										lb/day					
Architectural Coating	1.1942					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.7760**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

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	lb/day										lb/day					
Architectural Coating	0.5465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.1284**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	5	8.00	365	58	0.20	CNG

UnMitigated/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
Equipment Type	lb/day										lb/day					
Forklifts	0.3702	3.4373	3.7594	4.9800e-003		0.2277	0.2277		0.2095	0.2095		482.3477	482.3477	0.1560		486.2477
Total	**0.3702**	**3.4373**	**3.7594**	**4.9800e-003**		**0.2277**	**0.2277**		**0.2095**	**0.2095**		**482.3477**	**482.3477**	**0.1560**		**486.2477**

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

CalEEMod Output

Operations – Trucks (Summer Daily)

LPC Industrial Development Ops 2022 Truck Only

Stanislaus County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Truck trips 0.06 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	0.33
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.03	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LHD1	0.02	0.22
tblFleetMix	LHD2	5.3520e-003	0.22
tblFleetMix	MCY	4.6330e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.22
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	CC_TL	6.60	50.00
tblVehicleTrips	CNW_TL	6.60	50.00
tblVehicleTrips	CW_TL	14.70	50.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.06
tblVehicleTrips	SU_TR	0.68	0.06
tblVehicleTrips	WD_TR	6.97	0.06

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	100.3140	1.6165	4.7058	0.0111	0.8047	0.0872	0.8919	0.2134	0.0867	0.3001	0.0000	1,086.0313	1,086.0313	0.0397	0.0000	1,087.0246
Maximum	**100.3140**	**1.6165**	**4.7058**	**0.0111**	**0.8047**	**0.0872**	**0.8919**	**0.2134**	**0.0867**	**0.3001**	**0.0000**	**1,086.0313**	**1,086.0313**	**0.0397**	**0.0000**	**1,087.0246**

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	lb/day										lb/day					
2022	100.3140	1.6165	4.7058	0.0111	0.8047	0.0872	0.8919	0.2134	0.0867	0.3001	0.0000	1,086.0313	1,086.0313	0.0397	0.0000	1,087.0246
Maximum	**100.3140**	**1.6165**	**4.7058**	**0.0111**	**0.8047**	**0.0872**	**0.8919**	**0.2134**	**0.0867**	**0.3001**	**0.0000**	**1,086.0313**	**1,086.0313**	**0.0397**	**0.0000**	**1,087.0246**

	ROG	**NOx**	**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**

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	lb/day										lb/day					
Area	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.2722	5.3888	1.6804	0.0218	0.8035	0.0384	0.8419	0.2286	0.0367	0.2653		2,267.4818	2,267.4818	0.0502		2,268.7361
Total	**8.2317**	**7.0571**	**3.1132**	**0.0318**	**0.8035**	**0.1653**	**0.9688**	**0.2286**	**0.1636**	**0.3922**		**4,269.1613**	**4,269.1613**	**0.0887**	**0.0367**	**4,282.3146**

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	lb/day										lb/day					
Area	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.2722	5.3888	1.6804	0.0218	0.8035	0.0384	0.8419	0.2286	0.0367	0.2653		2,267.4818	2,267.4818	0.0502		2,268.7361
Total	**7.5841**	**7.0571**	**3.1132**	**0.0318**	**0.8035**	**0.1653**	**0.9688**	**0.2286**	**0.1636**	**0.3922**		**4,269.1613**	**4,269.1613**	**0.0887**	**0.0367**	**4,282.3146**

	ROG	NOx	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	7.87	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	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3688	0.2080	2.8922	8.0800e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		804.5832	804.5832	0.0214		805.1184
Total	**0.3688**	**0.2080**	**2.8922**	**8.0800e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**804.5832**	**804.5832**	**0.0214**		**805.1184**

3.2 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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3688	0.2080	2.8922	8.0800e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		804.5832	804.5832	0.0214		805.1184
Total	**0.3688**	**0.2080**	**2.8922**	**8.0800e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**804.5832**	**804.5832**	**0.0214**		**805.1184**

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	lb/day										lb/day					
Mitigated	0.2722	5.3888	1.6804	0.0218	0.8035	0.0384	0.8419	0.2286	0.0367	0.2653		2,267.481 8	2,267.481 8	0.0502		2,268.736 1
Unmitigated	0.2722	5.3888	1.6804	0.0218	0.8035	0.0384	0.8419	0.2286	0.0367	0.2653		2,267.481 8	2,267.481 8	0.0502		2,268.736 1

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	18.00	18.00	18.00	327,600	327,600
Parking Lot	0.00	0.00	0.00		
Total	18.00	18.00	18.00	327,600	327,600

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
General Light Industry	50.00	50.00	50.00	59.00	28.00	13.00	100	0	0
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.222222	0.222222	0.222222	0.333333	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
NaturalGas Unmitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062

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	lb/day										lb/day					
General Light Industry	17013.7	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

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	lb/day										lb/day					
General Light Industry	17.0137	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Unmitigated	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724

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	lb/day										lb/day					
Architectural Coating	1.1942					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.7760**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

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	lb/day										lb/day					
Architectural Coating	0.5465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.1284**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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

Operations - Trucks (Winter Daily)

LPC Industrial Development Ops 2022 Truck Only

Stanislaus County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2022
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	607.36	**CH4 Intensity (lb/MWhr)**	0.022	**N2O Intensity (lb/MWhr)**	0.005

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 33% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Truck trips 0.06 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	0.33
tblFleetMix	LDA	0.52	0.00
tblFleetMix	LDT1	0.03	0.00
tblFleetMix	LDT2	0.17	0.00
tblFleetMix	LHD1	0.02	0.22
tblFleetMix	LHD2	5.3520e-003	0.22
tblFleetMix	MCY	4.6330e-003	0.00

tblFleetMix	MDV	0.12	0.00
tblFleetMix	MH	9.1100e-004	0.00
tblFleetMix	MHD	0.03	0.22
tblFleetMix	OBUS	1.8370e-003	0.00
tblFleetMix	SBUS	8.4500e-004	0.00
tblFleetMix	UBUS	1.1190e-003	0.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.022
tblProjectCharacteristics	CO2IntensityFactor	833.46	607.36
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.005
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	CC_TL	6.60	50.00
tblVehicleTrips	CNW_TL	6.60	50.00
tblVehicleTrips	CW_TL	14.70	50.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.06
tblVehicleTrips	SU_TR	0.68	0.06
tblVehicleTrips	WD_TR	6.97	0.06

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

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	lb/day										lb/day					
2022	100.3124	1.6564	4.1903	0.0101	0.8047	0.0872	0.8919	0.2134	0.0867	0.3001	0.0000	991.0586	991.0586	0.0368	0.0000	991.9779
Maximum	**100.3124**	**1.6564**	**4.1903**	**0.0101**	**0.8047**	**0.0872**	**0.8919**	**0.2134**	**0.0867**	**0.3001**	**0.0000**	**991.0586**	**991.0586**	**0.0368**	**0.0000**	**991.9779**

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	lb/day										lb/day					
2022	100.3124	1.6564	4.1903	0.0101	0.8047	0.0872	0.8919	0.2134	0.0867	0.3001	0.0000	991.0586	991.0586	0.0368	0.0000	991.9779
Maximum	**100.3124**	**1.6564**	**4.1903**	**0.0101**	**0.8047**	**0.0872**	**0.8919**	**0.2134**	**0.0867**	**0.3001**	**0.0000**	**991.0586**	**991.0586**	**0.0368**	**0.0000**	**991.9779**

	ROG	**NOx**	**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**

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	lb/day										lb/day					
Area	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.2724	5.7011	1.6861	0.0217	0.8035	0.0386	0.8420	0.2286	0.0369	0.2655		2,256.9874	2,256.9874	0.0530		2,258.3112
Total	**8.2319**	**7.3694**	**3.1190**	**0.0317**	**0.8035**	**0.1654**	**0.9689**	**0.2286**	**0.1637**	**0.3923**		**4,258.6670**	**4,258.6670**	**0.0915**	**0.0367**	**4,271.8898**

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	lb/day										lb/day					
Area	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Energy	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
Mobile	0.2724	5.7011	1.6861	0.0217	0.8035	0.0386	0.8420	0.2286	0.0369	0.2655		2,256.9874	2,256.9874	0.0530		2,258.3112
Total	**7.5843**	**7.3694**	**3.1190**	**0.0317**	**0.8035**	**0.1654**	**0.9689**	**0.2286**	**0.1637**	**0.3923**		**4,258.6670**	**4,258.6670**	**0.0915**	**0.0367**	**4,271.8898**

	ROG	NOx	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	**7.87**	**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	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817		281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**		**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3673	0.2479	2.3767	7.1200e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		709.6106	709.6106	0.0185		710.0718
Total	**0.3673**	**0.2479**	**2.3767**	**7.1200e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**709.6106**	**709.6106**	**0.0185**		**710.0718**

3.2 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	lb/day										lb/day					
Archit. Coating	99.7406					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2045	1.4085	1.8136	2.9700e-003		0.0817	0.0817		0.0817	0.0817	0.0000	281.4481	281.4481	0.0183		281.9062
Total	**99.9451**	**1.4085**	**1.8136**	**2.9700e-003**		**0.0817**	**0.0817**		**0.0817**	**0.0817**	**0.0000**	**281.4481**	**281.4481**	**0.0183**		**281.9062**

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	lb/day										lb/day					
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
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
Worker	0.3673	0.2479	2.3767	7.1200e-003	0.8047	5.4300e-003	0.8101	0.2134	5.0000e-003	0.2184		709.6106	709.6106	0.0185		710.0718
Total	**0.3673**	**0.2479**	**2.3767**	**7.1200e-003**	**0.8047**	**5.4300e-003**	**0.8101**	**0.2134**	**5.0000e-003**	**0.2184**		**709.6106**	**709.6106**	**0.0185**		**710.0718**

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	lb/day										lb/day					
Mitigated	0.2724	5.7011	1.6861	0.0217	0.8035	0.0386	0.8420	0.2286	0.0369	0.2655		2,256.9874	2,256.9874	0.0530		2,258.3112
Unmitigated	0.2724	5.7011	1.6861	0.0217	0.8035	0.0386	0.8420	0.2286	0.0369	0.2655		2,256.9874	2,256.9874	0.0530		2,258.3112

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	18.00	18.00	18.00	327,600	327,600
Parking Lot	0.00	0.00	0.00		
Total	18.00	18.00	18.00	327,600	327,600

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
General Light Industry	50.00	50.00	50.00	59.00	28.00	13.00	100	0	0
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.222222	0.222222	0.222222	0.333333	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
NaturalGas Unmitigated	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062

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	lb/day										lb/day					
General Light Industry	17013.7	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

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	lb/day										lb/day					
General Light Industry	17.0137	0.1835	1.6680	1.4011	0.0100		0.1268	0.1268		0.1268	0.1268		2,001.6116	2,001.6116	0.0384	0.0367	2,013.5062
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
Total		**0.1835**	**1.6680**	**1.4011**	**0.0100**		**0.1268**	**0.1268**		**0.1268**	**0.1268**		**2,001.6116**	**2,001.6116**	**0.0384**	**0.0367**	**2,013.5062**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	7.1284	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Unmitigated	7.7760	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724

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	lb/day										lb/day					
Architectural Coating	1.1942					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.7760**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

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	lb/day										lb/day					
Architectural Coating	0.5465					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	6.5789					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.9500e-003	2.9000e-004	0.0317	0.0000		1.1000e-004	1.1000e-004		1.1000e-004	1.1000e-004		0.0679	0.0679	1.8000e-004		0.0724
Total	**7.1284**	**2.9000e-004**	**0.0317**	**0.0000**		**1.1000e-004**	**1.1000e-004**		**1.1000e-004**	**1.1000e-004**		**0.0679**	**0.0679**	**1.8000e-004**		**0.0724**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

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

CalEEMod Output

Project Operations - Employee (GHG BAU)

LPC Industrial Development Ops GHG BAU

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2005
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	833.46	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 60% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Operational Off-Road Equipment - Propane forklifts

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaCoating	Area_EF_Residential_Exterior	250	150
tblAreaCoating	Area_EF_Residential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.07	1.4740e-003

tblFleetMix	HHD	0.07	0.09
tblFleetMix	LDA	0.42	0.60
tblFleetMix	LDA	0.42	0.52
tblFleetMix	LDT1	0.07	0.04
tblFleetMix	LDT1	0.07	0.03
tblFleetMix	LDT2	0.16	0.20
tblFleetMix	LDT2	0.16	0.17
tblFleetMix	LHD1	0.05	0.02
tblFleetMix	LHD1	0.05	0.02
tblFleetMix	LHD2	8.2280e-003	0.00
tblFleetMix	LHD2	8.2280e-003	5.3520e-003
tblFleetMix	MCY	5.0770e-003	0.00
tblFleetMix	MCY	5.0770e-003	4.6330e-003
tblFleetMix	MDV	0.19	0.14
tblFleetMix	MDV	0.19	0.12
tblFleetMix	MH	2.4220e-003	0.00
tblFleetMix	MH	2.4220e-003	9.1100e-004
tblFleetMix	MHD	0.03	0.00
tblFleetMix	MHD	0.03	0.03
tblFleetMix	OBUS	1.5290e-003	0.00
tblFleetMix	OBUS	1.5290e-003	1.8370e-003
tblFleetMix	SBUS	8.3500e-004	0.00
tblFleetMix	SBUS	8.3500e-004	8.4500e-004
tblFleetMix	UBUS	9.9900e-004	0.00
tblFleetMix	UBUS	9.9900e-004	1.1190e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00
tblOperationalOffRoadEquipment	OperHorsePower	89.00	58.00
tblOperationalOffRoadEquipment	OperLoadFactor	0.20	0.20
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	5.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

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					
2021											0.0000	242.0802	242.0802	0.0497	0.0000	243.3216
2022											0.0000	849.9122	849.9122	0.1102	0.0000	852.6682
Maximum											**0.0000**	**849.9122**	**849.9122**	**0.1102**	**0.0000**	**852.6682**

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					
2021											0.0000	242.0800	242.0800	0.0497	0.0000	243.3214
2022											0.0000	849.9118	849.9118	0.1102	0.0000	852.6678
Maximum											**0.0000**	**849.9118**	**849.9118**	**0.1102**	**0.0000**	**852.6678**

	ROG	**NOx**	**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)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Energy											0.0000	1,367.2620	1,367.2620	0.0424	0.0135	1,372.3546
Mobile											0.0000	614.2129	614.2129	0.0648	0.0000	615.8319
Offroad											0.0000	96.7284	96.7284	0.0247	0.0000	97.3454
Waste											75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water											22.0095	141.9159	163.9254	2.2655	0.0544	236.7744
Total											**97.5221**	**2,220.1247**	**2,317.6469**	**6.8601**	**0.0679**	**2,509.3918**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Energy											0.0000	1,367.2620	1,367.2620	0.0424	0.0135	1,372.3546
Mobile											0.0000	614.2129	614.2129	0.0648	0.0000	615.8319
Offroad											0.0000	96.7284	96.7284	0.0247	0.0000	97.3454
Waste											56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water											17.6076	113.5327	131.1403	1.8124	0.0435	189.4195
Total											**74.2421**	**2,191.7416**	**2,265.9836**	**5.2913**	**0.0571**	**2,415.2671**

	ROG	**NOx**	**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**	**23.87**	**1.28**	**2.23**	**22.87**	**16.02**	**3.75**

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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

3.3 Grading - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total											**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total											**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	55.3749	55.3749	0.0130	0.0000	55.6989
Total											**0.0000**	**55.3749**	**55.3749**	**0.0130**	**0.0000**	**55.6989**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	55.3748	55.3748	0.0130	0.0000	55.6988
Total											**0.0000**	**55.3748**	**55.3748**	**0.0130**	**0.0000**	**55.6988**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	330.2348	330.2348	0.0767	0.0000	332.1520
Total											**0.0000**	**330.2348**	**330.2348**	**0.0767**	**0.0000**	**332.1520**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	330.2344	330.2344	0.0767	0.0000	332.1516
Total											**0.0000**	**330.2344**	**330.2344**	**0.0767**	**0.0000**	**332.1516**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	614.2129	614.2129	0.0648	0.0000	615.8319
Unmitigated											0.0000	614.2129	614.2129	0.0648	0.0000	615.8319

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	1,035.8728	1,035.8728	0.0360	7.4600e-003	1,038.9961
Electricity Unmitigated											0.0000	1,035.8728	1,035.8728	0.0360	7.4600e-003	1,038.9961
NaturalGas Mitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	976.5060	0.0340	7.0300e-003	979.4503
Parking Lot	157034	59.3668	2.0700e-003	4.3000e-004	59.5458
Total		**1,035.872 8**	**0.0361**	**7.4600e-003**	**1,038.996 1**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	976.5060	0.0340	7.0300e-003	979.4503
Parking Lot	157034	59.3668	2.0700e-003	4.3000e-004	59.5458
Total		**1,035.872 8**	**0.0361**	**7.4600e-003**	**1,038.996 1**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Unmitigated											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**3.0000e-005**	**0.0000**	**6.1900e-003**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**3.0000e-005**	**0.0000**	**6.1900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	131.1403	1.8124	0.0435	189.4195
Unmitigated	163.9254	2.2655	0.0544	236.7744

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	163.9254	2.2655	0.0544	236.7744
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**163.9254**	**2.2655**	**0.0544**	**236.7744**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	131.1403	1.8124	0.0435	189.4195
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**131.1403**	**1.8124**	**0.0435**	**189.4195**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	5	8.00	365	58	0.20	Diesel

UnMitigated/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
Equipment Type	tons/yr										MT/yr					
Forklifts											0.0000	96.7284	96.7284	0.0247	0.0000	97.3454
Total											**0.0000**	**96.7284**	**96.7284**	**0.0247**	**0.0000**	**97.3454**

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

CalEEMod Output

Project Operations – Truck (GHG BAU)

LPC Industrial Development Ops GHG BAU Truck Only

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2005
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	833.46	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 60% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Truck trips 0.06 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	150
tblAreaCoating	Area_EF_Nonresidential_Interior	250	150
tblAreaCoating	Area_EF_Residential_Exterior	250	150
tblAreaCoating	Area_EF_Residential_Interior	250	150
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.07	0.33
tblFleetMix	HHD	0.07	0.09
tblFleetMix	LDA	0.42	0.00

tblFleetMix	LDA	0.42	0.52
tblFleetMix	LDT1	0.07	0.00
tblFleetMix	LDT1	0.07	0.03
tblFleetMix	LDT2	0.16	0.00
tblFleetMix	LDT2	0.16	0.17
tblFleetMix	LHD1	0.05	0.22
tblFleetMix	LHD1	0.05	0.02
tblFleetMix	LHD2	8.2280e-003	0.22
tblFleetMix	LHD2	8.2280e-003	5.3520e-003
tblFleetMix	MCY	5.0770e-003	0.00
tblFleetMix	MCY	5.0770e-003	4.6330e-003
tblFleetMix	MDV	0.19	0.00
tblFleetMix	MDV	0.19	0.12
tblFleetMix	MH	2.4220e-003	0.00
tblFleetMix	MH	2.4220e-003	9.1100e-004
tblFleetMix	MHD	0.03	0.22
tblFleetMix	MHD	0.03	0.03
tblFleetMix	OBUS	1.5290e-003	0.00
tblFleetMix	OBUS	1.5290e-003	1.8370e-003
tblFleetMix	SBUS	8.3500e-004	0.00
tblFleetMix	SBUS	8.3500e-004	8.4500e-004
tblFleetMix	UBUS	9.9900e-004	0.00
tblFleetMix	UBUS	9.9900e-004	1.1190e-003
tblVehicleTrips	CC_TL	7.30	50.00
tblVehicleTrips	CNW_TL	7.30	50.00
tblVehicleTrips	CW_TL	9.50	50.00
tblVehicleTrips	DV_TP	5.00	0.00

tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.06
tblVehicleTrips	SU_TR	0.68	0.06
tblVehicleTrips	WD_TR	6.97	0.06

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022											0.0000	6.8788	6.8788	2.8000e-004	0.0000	6.8858
Maximum											**0.0000**	**6.8788**	**6.8788**	**2.8000e-004**	**0.0000**	**6.8858**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022											0.0000	6.8788	6.8788	2.8000e-004	0.0000	6.8858
Maximum											**0.0000**	**6.8788**	**6.8788**	**2.8000e-004**	**0.0000**	**6.8858**

	ROG	**NOx**	**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)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Energy											0.0000	1,367.2620	1,367.2620	0.0424	0.0135	1,372.3546
Mobile											0.0000	402.2114	402.2114	0.0319	0.0000	403.0092
Waste											75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water											22.0095	141.9159	163.9254	2.2655	0.0544	236.7744
Total											**97.5221**	**1,911.3949**	**2,008.9170**	**6.8025**	**0.0679**	**2,199.2238**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Energy											0.0000	1,367.2620	1,367.2620	0.0424	0.0135	1,372.3546
Mobile											0.0000	402.2114	402.2114	0.0319	0.0000	403.0092
Waste											56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water											17.6076	113.5327	131.1403	1.8124	0.0435	189.4195
Total											**74.2421**	**1,883.0117**	**1,957.2538**	**5.2338**	**0.0571**	**2,105.0991**

	ROG	**NOx**	**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**	**23.87**	**1.48**	**2.57**	**23.06**	**16.02**	**4.28**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
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
Architectural Coating	1	63.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	4.3255	4.3255	1.2000e-004	0.0000	4.3284
Total											**0.0000**	**4.3255**	**4.3255**	**1.2000e-004**	**0.0000**	**4.3284**

3.2 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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	4.3255	4.3255	1.2000e-004	0.0000	4.3284
Total											**0.0000**	**4.3255**	**4.3255**	**1.2000e-004**	**0.0000**	**4.3284**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	402.2114	402.2114	0.0319	0.0000	403.0092
Unmitigated											0.0000	402.2114	402.2114	0.0319	0.0000	403.0092

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	18.00	18.00	18.00	327,600	327,600
Parking Lot	0.00	0.00	0.00		
Total	18.00	18.00	18.00	327,600	327,600

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
General Light Industry	50.00	50.00	50.00	59.00	28.00	13.00	100	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.000000	0.000000	0.000000	0.000000	0.222222	0.222222	0.222222	0.333333	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	1,035.8728	1,035.8728	0.0360	7.4600e-003	1,038.9961
Electricity Unmitigated											0.0000	1,035.8728	1,035.8728	0.0360	7.4600e-003	1,038.9961
NaturalGas Mitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	976.5060	0.0340	7.0300e-003	979.4503
Parking Lot	157034	59.3668	2.0700e-003	4.3000e-004	59.5458
Total		**1,035.8728**	**0.0361**	**7.4600e-003**	**1,038.9961**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	976.5060	0.0340	7.0300e-003	979.4503
Parking Lot	157034	59.3668	2.0700e-003	4.3000e-004	59.5458
Total		**1,035.8728**	**0.0361**	**7.4600e-003**	**1,038.9961**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Unmitigated											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**3.0000e-005**	**0.0000**	**6.1900e-003**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	3.0000e-005	0.0000	6.1900e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**3.0000e-005**	**0.0000**	**6.1900e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	131.1403	1.8124	0.0435	189.4195
Unmitigated	163.9254	2.2655	0.0544	236.7744

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	163.9254	2.2655	0.0544	236.7744
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**163.9254**	**2.2655**	**0.0544**	**236.7744**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	131.1403	1.8124	0.0435	189.4195
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**131.1403**	**1.8124**	**0.0435**	**189.4195**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

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

CalEEMod Output

Operations – Employee (GHG 2030)

LPC Industrial Development Ops GHG 2030

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2030
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	364.4	**CH4 Intensity (lb/MWhr)**	0.012	**N2O Intensity (lb/MWhr)**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 60% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	1.4740e-003
tblFleetMix	HHD	0.09	0.09
tblFleetMix	LDA	0.55	0.60
tblFleetMix	LDA	0.55	0.52
tblFleetMix	LDT1	0.03	0.04
tblFleetMix	LDT1	0.03	0.03

tblFleetMix	LDT2	0.18	0.20
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	3.7060e-003	0.00
tblFleetMix	LHD2	3.7060e-003	5.3520e-003
tblFleetMix	MCY	3.9940e-003	0.00
tblFleetMix	MCY	3.9940e-003	4.6330e-003
tblFleetMix	MDV	0.10	0.14
tblFleetMix	MDV	0.10	0.12
tblFleetMix	MH	5.4400e-004	0.00
tblFleetMix	MH	5.4400e-004	9.1100e-004
tblFleetMix	MHD	0.03	0.00
tblFleetMix	MHD	0.03	0.03
tblFleetMix	OBUS	1.8160e-003	0.00
tblFleetMix	OBUS	1.8160e-003	1.8370e-003
tblFleetMix	SBUS	7.5000e-004	0.00
tblFleetMix	SBUS	7.5000e-004	8.4500e-004
tblFleetMix	UBUS	9.1700e-004	0.00
tblFleetMix	UBUS	9.1700e-004	1.1190e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.012
tblProjectCharacteristics	CO2IntensityFactor	833.46	364.4

tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

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					
2021											0.0000	242.0802	242.0802	0.0497	0.0000	243.3216
2022											0.0000	849.9122	849.9122	0.1102	0.0000	852.6682
Maximum											**0.0000**	**849.9122**	**849.9122**	**0.1102**	**0.0000**	**852.6682**

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					
2021											0.0000	242.0800	242.0800	0.0497	0.0000	243.3214
2022											0.0000	849.9118	849.9118	0.1102	0.0000	852.6678
Maximum											**0.0000**	**849.9118**	**849.9118**	**0.1102**	**0.0000**	**852.6678**

	ROG	**NOx**	**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)**
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Energy											0.0000	784.2869	784.2869	0.0213	8.5600e-003	787.3697
Mobile											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Waste											75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water											22.0095	62.0476	84.0570	2.2626	0.0537	156.6307
Total											**97.5221**	**1,238.7959**	**1,336.3181**	**6.7527**	**0.0623**	**1,523.6955**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Energy											0.0000	784.2869	784.2869	0.0213	8.5600e-003	787.3697
Mobile											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Waste											56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water											17.6076	49.6380	67.2456	1.8101	0.0430	125.3045
Total											**74.2421**	**1,226.3864**	**1,300.6285**	**5.1845**	**0.0515**	**1,445.5996**

	ROG	**NOx**	**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**	**23.87**	**1.00**	**2.67**	**23.22**	**17.26**	**5.13**

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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

3.3 Grading - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total											**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total											**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	55.3749	55.3749	0.0130	0.0000	55.6989
Total											**0.0000**	**55.3749**	**55.3749**	**0.0130**	**0.0000**	**55.6989**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	55.3748	55.3748	0.0130	0.0000	55.6988
Total											**0.0000**	**55.3748**	**55.3748**	**0.0130**	**0.0000**	**55.6988**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	330.2348	330.2348	0.0767	0.0000	332.1520
Total											**0.0000**	**330.2348**	**330.2348**	**0.0767**	**0.0000**	**332.1520**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	330.2344	330.2344	0.0767	0.0000	332.1516
Total											**0.0000**	**330.2344**	**330.2344**	**0.0767**	**0.0000**	**332.1516**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Unmitigated											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	452.8976	452.8976	0.0149	2.4900e-003	454.0112
Electricity Unmitigated											0.0000	452.8976	452.8976	0.0149	2.4900e-003	454.0112
NaturalGas Mitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	426.9416	0.0141	2.3400e-003	427.9914
Parking Lot	157034	25.9560	8.5000e-004	1.4000e-004	26.0198
Total		**452.8976**	**0.0149**	**2.4800e-003**	**454.0112**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	426.9416	0.0141	2.3400e-003	427.9914
Parking Lot	157034	25.9560	8.5000e-004	1.4000e-004	26.0198
Total		**452.8976**	**0.0149**	**2.4800e-003**	**454.0112**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Unmitigated											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9000e-003**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	67.2456	1.8101	0.0430	125.3045
Unmitigated	84.0570	2.2626	0.0537	156.6307

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	84.0570	2.2626	0.0537	156.6307
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**84.0570**	**2.2626**	**0.0537**	**156.6307**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	67.2456	1.8101	0.0430	125.3045
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**67.2456**	**1.8101**	**0.0430**	**125.3045**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

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

CalEEMod Output

Operations – Truck (GHG 2030)

LPC Industrial Development Ops GHG 2030

Stanislaus County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	300.00	1000sqft	6.89	300,000.00	0
Parking Lot	10.30	Acre	10.30	448,668.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	46
Climate Zone	3			**Operational Year**	2030
Utility Company	Modesto Irrigation District				
CO2 Intensity (lb/MWhr)	364.4	**CH4 Intensity (lb/MWhr)**	0.012	**N2O Intensity (lb/MWhr)**	0.002

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Intensity factor with 60% RPS

Land Use - Site plan acreage

Construction Phase - Project Schedule

Off-road Equipment - Adjusted equipment list to reflect shorter project schedule while retaining default hours of use.

Architectural Coating - Rule 4601 Architectural Coatings compliance

Vehicle Trips - Employee and Customer trips 1.293 trips/ksf

Energy Use - 2019 Title 24 Energy Efficiency 10.7% electricity 1.0% natural gas

Construction Off-road Equipment Mitigation -

Area Mitigation - Rule 4601 Architectural Coatings Compliance

Water Mitigation - CalGreen Code and MWELO compliance

Waste Mitigation - CalRecycle 75% diversion mandate

Fleet Mix - Fleet Mix for employees, customers, package delivery and refuse hauling

Operational Off-Road Equipment - Propane Forklifts

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	65.00
tblArchitecturalCoating	EF_Nonresidential_Interior	150.00	65.00
tblAreaMitigation	UseLowVOCPaintNonresidentialExteriorValue	150	65
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	150	65
tblConstructionPhase	NumDays	300.00	181.00
tblEnergyUse	T24E	1.96	1.75
tblEnergyUse	T24NG	17.03	16.86
tblFleetMix	HHD	0.09	1.4740e-003
tblFleetMix	HHD	0.09	0.09
tblFleetMix	LDA	0.55	0.60
tblFleetMix	LDA	0.55	0.52
tblFleetMix	LDT1	0.03	0.04

tblFleetMix	LDT1	0.03	0.03
tblFleetMix	LDT2	0.18	0.20
tblFleetMix	LDT2	0.18	0.17
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD1	0.01	0.02
tblFleetMix	LHD2	3.7060e-003	0.00
tblFleetMix	LHD2	3.7060e-003	5.3520e-003
tblFleetMix	MCY	3.9940e-003	0.00
tblFleetMix	MCY	3.9940e-003	4.6330e-003
tblFleetMix	MDV	0.10	0.14
tblFleetMix	MDV	0.10	0.12
tblFleetMix	MH	5.4400e-004	0.00
tblFleetMix	MH	5.4400e-004	9.1100e-004
tblFleetMix	MHD	0.03	0.00
tblFleetMix	MHD	0.03	0.03
tblFleetMix	OBUS	1.8160e-003	0.00
tblFleetMix	OBUS	1.8160e-003	1.8370e-003
tblFleetMix	SBUS	7.5000e-004	0.00
tblFleetMix	SBUS	7.5000e-004	8.4500e-004
tblFleetMix	UBUS	9.1700e-004	0.00
tblFleetMix	UBUS	9.1700e-004	1.1190e-003
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOperationalOffRoadEquipment	OperDaysPerYear	260.00	365.00

tblOperationalOffRoadEquipment	OperFuelType	Diesel	CNG
tblOperationalOffRoadEquipment	OperHorsePower	89.00	58.00
tblOperationalOffRoadEquipment	OperLoadFactor	0.20	0.20
tblOperationalOffRoadEquipment	OperOffRoadEquipmentNumber	0.00	5.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.012
tblProjectCharacteristics	CO2IntensityFactor	833.46	364.4
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.002
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblVehicleTrips	ST_TR	1.32	1.29
tblVehicleTrips	SU_TR	0.68	1.29
tblVehicleTrips	WD_TR	6.97	1.29

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					
2021											0.0000	242.0802	242.0802	0.0497	0.0000	243.3216
2022											0.0000	849.9122	849.9122	0.1102	0.0000	852.6682
Maximum											**0.0000**	**849.9122**	**849.9122**	**0.1102**	**0.0000**	**852.6682**

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					
2021											0.0000	242.0800	242.0800	0.0497	0.0000	243.3214
2022											0.0000	849.9118	849.9118	0.1102	0.0000	852.6678
Maximum											**0.0000**	**849.9118**	**849.9118**	**0.1102**	**0.0000**	**852.6678**

	ROG	**NOx**	**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)
		Highest		

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Energy											0.0000	784.2869	784.2869	0.0213	8.5600e-003	787.3697
Mobile											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Offroad											0.0000	96.7284	96.7284	4.2600e-003	0.0000	96.8347
Waste											75.5126	0.0000	75.5126	4.4627	0.0000	187.0794
Water											22.0095	62.0476	84.0570	2.2626	0.0537	156.6307
Total											**97.5221**	**1,335.5243**	**1,433.0464**	**6.7570**	**0.0623**	**1,620.5303**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Energy											0.0000	784.2869	784.2869	0.0213	8.5600e-003	787.3697
Mobile											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Offroad											0.0000	96.7284	96.7284	4.2600e-003	0.0000	96.8347
Waste											56.6345	0.0000	56.6345	3.3470	0.0000	140.3095
Water											17.6076	49.6380	67.2456	1.8101	0.0430	125.3045
Total											**74.2421**	**1,323.1148**	**1,397.3569**	**5.1888**	**0.0515**	**1,542.4343**

	ROG	**NOx**	**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**	**23.87**	**0.93**	**2.49**	**23.21**	**17.26**	**4.82**

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	10/1/2021	10/14/2021	5	10	
2	Grading	Grading	10/15/2021	11/25/2021	5	30	
3	Building Construction	Building Construction	11/26/2021	8/5/2022	5	181	
4	Paving	Paving	8/6/2022	9/2/2022	5	20	
5	Architectural Coating	Architectural Coating	9/3/2022	9/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 10.3

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 450,000; Non-Residential Outdoor: 150,000; Striped Parking Area: 26,920 (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	2	7.00	231	0.29
Building Construction	Forklifts	5	8.00	89	0.20
Building Construction	Generator Sets	2	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	5	7.00	97	0.37
Building Construction	Welders	2	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	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	16	314.00	123.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	63.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total											**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	0.9866	0.9866	3.0000e-005	0.0000	0.9873
Total											**0.0000**	**0.9866**	**0.9866**	**3.0000e-005**	**0.0000**	**0.9873**

3.3 Grading - 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					
Fugitive Dust											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total											**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total											**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

3.3 Grading - 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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	3.2886	3.2886	9.0000e-005	0.0000	3.2909
Total											**0.0000**	**3.2886**	**3.2886**	**9.0000e-005**	**0.0000**	**3.2909**

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											0.0000	55.3749	55.3749	0.0130	0.0000	55.6989
Total											**0.0000**	**55.3749**	**55.3749**	**0.0130**	**0.0000**	**55.6989**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	55.3748	55.3748	0.0130	0.0000	55.6988
Total											**0.0000**	**55.3748**	**55.3748**	**0.0130**	**0.0000**	**55.6988**

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
Vendor											0.0000	39.2235	39.2235	3.4800e-003	0.0000	39.3105
Worker											0.0000	44.7463	44.7463	1.2500e-003	0.0000	44.7777
Total											**0.0000**	**83.9699**	**83.9699**	**4.7300e-003**	**0.0000**	**84.0882**

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											0.0000	330.2348	330.2348	0.0767	0.0000	332.1520
Total											**0.0000**	**330.2348**	**330.2348**	**0.0767**	**0.0000**	**332.1520**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	330.2344	330.2344	0.0767	0.0000	332.1516
Total											**0.0000**	**330.2344**	**330.2344**	**0.0767**	**0.0000**	**332.1516**

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
Vendor											0.0000	231.6116	231.6116	0.0200	0.0000	232.1117
Worker											0.0000	257.2398	257.2398	6.6900e-003	0.0000	257.4071
Total											**0.0000**	**488.8514**	**488.8514**	**0.0267**	**0.0000**	**489.5188**

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											0.0000	20.0276	20.0276	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	20.0275	20.0275	6.4800e-003	0.0000	20.1895
Paving											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	1.5856	1.5856	4.0000e-005	0.0000	1.5867
Total											**0.0000**	**1.5856**	**1.5856**	**4.0000e-005**	**0.0000**	**1.5867**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road											0.0000	2.5533	2.5533	1.7000e-004	0.0000	2.5574
Total											**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
Vendor											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker											0.0000	6.6596	6.6596	1.7000e-004	0.0000	6.6639
Total											**0.0000**	**6.6596**	**6.6596**	**1.7000e-004**	**0.0000**	**6.6639**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099
Unmitigated											0.0000	392.4560	392.4560	6.1500e-003	0.0000	392.6099

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	387.00	387.00	387.00	1,495,161	1,495,161
Parking Lot	0.00	0.00	0.00		
Total	387.00	387.00	387.00	1,495,161	1,495,161

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
General Light Industry	14.70	6.60	6.60	59.00	28.00	13.00	92	5	3
Parking Lot	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.596530	0.038360	0.200770	0.142240	0.020629	0.000000	0.000000	0.001474	0.000000	0.000000	0.000000	0.000000	0.000000
Parking Lot	0.516452	0.033212	0.173817	0.123150	0.022816	0.005352	0.027555	0.088301	0.001837	0.001119	0.004633	0.000845	0.000911

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated											0.0000	452.8976	452.8976	0.0149	2.4900e-003	454.0112
Electricity Unmitigated											0.0000	452.8976	452.8976	0.0149	2.4900e-003	454.0112
NaturalGas Mitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
NaturalGas Unmitigated											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

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					
General Light Industry	6.21e +006											0.0000	331.3893	331.3893	6.3500e-003	6.0800e-003	333.3585
Parking Lot	0											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total												**0.0000**	**331.3893**	**331.3893**	**6.3500e-003**	**6.0800e-003**	**333.3585**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	426.9416	0.0141	2.3400e-003	427.9914
Parking Lot	157034	25.9560	8.5000e-004	1.4000e-004	26.0198
Total		**452.8976**	**0.0149**	**2.4800e-003**	**454.0112**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	2.583e +006	426.9416	0.0141	2.3400e-003	427.9914
Parking Lot	157034	25.9560	8.5000e-004	1.4000e-004	26.0198
Total		**452.8976**	**0.0149**	**2.4800e-003**	**454.0112**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Unmitigated											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9000e-003**

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											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products											0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping											0.0000	5.5400e-003	5.5400e-003	1.0000e-005	0.0000	5.9000e-003
Total											**0.0000**	**5.5400e-003**	**5.5400e-003**	**1.0000e-005**	**0.0000**	**5.9000e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	67.2456	1.8101	0.0430	125.3045
Unmitigated	84.0570	2.2626	0.0537	156.6307

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	69.375 / 0	84.0570	2.2626	0.0537	156.6307
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**84.0570**	**2.2626**	**0.0537**	**156.6307**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	55.5 / 0	67.2456	1.8101	0.0430	125.3045
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**67.2456**	**1.8101**	**0.0430**	**125.3045**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	56.6345	3.3470	0.0000	140.3095
Unmitigated	75.5126	4.4627	0.0000	187.0794

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	372	75.5126	4.4627	0.0000	187.0794
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**75.5126**	**4.4627**	**0.0000**	**187.0794**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	279	56.6345	3.3470	0.0000	140.3095
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**56.6345**	**3.3470**	**0.0000**	**140.3095**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
Forklifts	5	8.00	365	58	0.20	CNG

UnMitigated/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
Equipment Type	tons/yr										MT/yr					
Forklifts											0.0000	96.7284	96.7284	4.2600e-003	0.0000	96.8347
Total											**0.0000**	**96.7284**	**96.7284**	**4.2600e-003**	**0.0000**	**96.8347**

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Appendix B:
San Joaquin Valley Air Pollution Control District Amicus Brief on Friant Ranch Supreme Court Decision

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SUPREME COURT COPY

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

SUPREME COURT
FILED

APR 13 2015

Frank A. McGuire Clerk

Deputy

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org

Counsel for San Joaquin Valley Unified Air Pollution Control District

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org

Counsel for San Joaquin Valley Unified Air Pollution Control District

APPLICATION

Pursuant to California Rules of Court 8.520(f)(1), proposed Amicus Curiae San Joaquin Valley Unified Air Pollution Control District hereby requests permission from the Chief Justice to file an amicus brief in support of Defendant and Respondent, County of Fresno, and Defendant and Real Parties in Interest Friant Ranch, L.P. Pursuant to Rule 8.520(f)(5) of the California Rules of Court, the proposed amicus curiae brief is combined with this Application. The brief addresses the following issue certified by this Court for review:

> Is an EIR adequate when it identifies the health impacts of air pollution and quantifies a project's expected emissions, or does CEQA further require the EIR to *correlate* a project's air quality emissions to specific health impacts?

As of the date of this filing, the deadline for the final reply brief on the merits was March 5, 2015. Accordingly, under Rule 8.520(f)(2), this application and brief are timely.

1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District

The San Joaquin Valley Unified Air Pollution Control District ("Air District") regulates air quality in the eight counties comprising the San Joaquin Valley ("Central Valley"): Kern, Tulare, Madera, Fresno, Merced, San Joaquin, Stanislaus, and Kings, and is primarily responsible for attaining air quality standards within its jurisdiction. After billions of dollars of investment by Central Valley businesses, pioneering air quality regulations, and consistent efforts by residents, the Central Valley air basin has made historic improvements in air quality.

The Central Valley's geographical, topographical and meteorological features create exceptionally challenging air quality conditions. For example, it receives air pollution transported from the San Francisco Bay Area and northern Central Valley communities, and the southern portion of the Central Valley includes three mountain ranges (Sierra, Tehachapi, and Coastal) that, under some meteorological conditions, effectively trap air pollution. Central Valley air pollution is only a fraction of what the Bay Area and Los Angeles produce, but these natural conditions result in air quality conditions that are only marginally better than Los Angeles, even though about ten times more pollution is emitted in the Los Angeles region. Bay Area air quality is much better than the Central Valley's, even though the Bay Area produces about six times more pollution. The Central Valley also receives air pollution transported from the Bay Area and northern counties in the Central Valley, including Sacramento, and transboundary anthropogenic ozone from as far away as China.

Notwithstanding these challenges, the Central Valley has reduced emissions at the same or better rate than other areas in California and has achieved unparalleled milestones in protecting public health and the environment:

- In the last decade, the Central Valley became the first air basin classified by the federal government under the Clean Air Act as a "serious nonattainment" area to come into attainment of health-based National Ambient Air Quality Standard ("NAAQS") for coarse particulate matter (PM10), an achievement made even more notable given the Valley's extensive agricultural sector. Unhealthy levels of particulate matter can cause and exacerbate a range of chronic and acute illnesses.
- In 2013, the Central Valley became the first air basin in the country to improve from a federal designation of "extreme" nonattainment to

actually attain (and quality for an attainment designation) of the 1-hour ozone NAAQS; ozone creates "smog" and, like PM10, causes adverse health impacts.

- The Central Valley also is in full attainment of federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide.
- The Central Valley continues to make progress toward compliance with its last two attainment standards, with the number of exceedences for the 8-hour ozone NAAQS reduced by 74% (for the 1997 standard) and 38% (for the 2008 standard) since 1991, and for the small particulate matter (PM2.5) NAAQS reduced by 85% (for the 1997 standard) and 61% (for the 2006 standard).

Sustained improvement in Central Valley air quality requires a rigorous and comprehensive regulatory framework that includes prohibitions (e.g., on wood-burning fireplaces in new residences), mandates (e.g., requiring the installation of best available pollution reduction technologies on new and modified equipment and industrial operations), innovations (e.g., fees assessed against residential development to fund pollution reduction actions to "offset" vehicular emissions associated with new residences), incentive programs (e.g., funding replacements of older, more polluting heavy duty trucks and school buses)[1], ongoing planning for continued air quality improvements, and enforcement of Air District permits and regulations.

The Air District is also an expert air quality agency for the eight counties and cities in the San Joaquin Valley. In that capacity, the Air District has developed air quality emission guidelines for use by the Central

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[1] San Joaquin's incentive program has been so successful that through 2012, it has awarded over $ 432 million in incentive funds and has achieved 93,349 tons of lifetime emissions reductions. *See* SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 2012 PM2.5 PLAN, 6-6 (2012) *available at* http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/06%20Chapter%206%20Incentives.pdf.

Valley counties and cities that implement the California Environment Quality Act (CEQA).[2] In its guidance, the Air District has distinguished between toxic air contaminants and criteria air pollutants.[3] Recognizing this distinction, the Air District's CEQA Guidance has adopted distinct thresholds of significance for *criteria* pollutants (i.e., ozone, PM2.5 and their respective precursor pollutants) based upon scientific and factual data which demonstrates the level that can be accommodated on a cumulative basis in the San Joaquin Valley without affecting the attainment of the applicable NAAQS.[4] For *toxic air* pollutants, the District has adopted different thresholds of significance which scientific and factual data demonstrates has the potential to expose sensitive receptors (i.e., children, the elderly) to levels which may result in localized health impacts.[5]

The Air District's CEQA Guidance was followed by the County of Fresno in its environment review of the Friant Ranch project, for which the Air District also served as a commenting agency. The Court of Appeal's holding, however, requiring correlation between the project's criteria

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[2] *See, e.g.*, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, PLANNING DIVISION, GUIDE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2015), *available at* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf ("CEQA Guidance").

[3] Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from toxic air contaminants and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of toxic air contaminants occurs solely under section 112 of the Act. Compare 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 with 42 U.S.C. § 7411.

[4] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 64-66, 80.

[5] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 66, 99-101.

pollutants and local health impacts, departs from the Air District's Guidance and approved methodology for assessing criteria pollutants. A close reading of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants (for which a local health risk assessment is feasible and routinely performed) and criteria air pollutants (for which a local health risk assessment is not feasible and would result in speculative results).[6] The Air District has a direct interest in ensuring the lawfulness and consistent application of its CEQA Guidance, and will explain how the Court of Appeal departed from the Air District's long-standing CEQA Guidance in addressing criteria pollutants and toxic air contaminants in this amicus brief.

2. How the Proposed Amicus Curiae Brief Will Assist the Court

As counsel for the proposed amicus curiae, we have reviewed the briefs filed in this action. In addition to serving as a "commentary agency" for CEQA purposes over the Friant Ranch project, the Air District has a strong interest in assuring that CEQA is used for its intended purpose, and believes that this Court would benefit from additional briefing explaining the distinction between criteria pollutants and toxic air contaminants and the different methodologies employed by local air pollution control agencies such as the Air District to analyze these two categories of air pollutants under CEQA. The Air District will also explain how the Court of Appeal's opinion is based upon a fundamental misunderstanding of these two different approaches by requiring the County of Fresno to correlate the project's *criteria* pollution emissions with *local* health impacts. In doing

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[6] CEQA does not require speculation. *See, e.g., Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.*, 6 Cal. 4th 1112, 1137 (1993) (upholding EIR that failed to evaluate cumulative toxic air emission increases given absence of any acceptable means for doing so).

so, the Air District will provide helpful analysis to support its position that at least insofar as criteria pollutants are concerned, CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible.

Rule 8.520 Disclosure

Pursuant to Cal. R. 8.520(f)(4), neither the Plaintiffs nor the Defendant or Real Party In Interest or their respective counsel authored this brief in whole or in part. Neither the Plaintiffs nor the Defendant or Real Party in Interest or their respective counsel made any monetary contribution towards or in support of the preparation of this brief.

CONCLUSION

On behalf of the San Joaquin Valley Unified Air Pollution Control District, we respectfully request that this Court accept the filing of the attached brief.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel
Attorney for Proposed Amicus Curiae

SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CASE NO. S219783

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SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
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COUNTY OF FRESNO,
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After a Decision by the Court of Appeal, filed May 27, 2014
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Case No. 11CECG00726

AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette A. Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org
Counsel for San Joaquin Valley Unified Air Pollution Control District

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I. INTRODUCTION.

The San Joaquin Valley Unified Air Pollution Control District ("Air District") respectfully submits that the Court of Appeal erred when it held that the air quality analysis contained in the Environmental Impact Report ("EIR") for the Friant Ranch development project was inadequate under the California Environmental Quality Act ("CEQA") because it did not include an analysis of the correlation between the project's criteria air pollutants and the potential adverse human health impacts. A close reading of the portion of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants and criteria air pollutants.

Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants (hereinafter referred to as "TACs") regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from TACs and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of TACs occurs solely under section 112 of the Act. *Compare* 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 *with* 42 U.S.C. § 7411.

The most relevant difference between criteria pollutants and TACs for purposes of this case is the manner in which human health impacts are accounted for. While it is common practice to analyze the correlation between an individual facility's TAC emissions and the expected localized human health impacts, such is not the case for criteria pollutants. Instead, the human health impacts associated with criteria air pollutants are analyzed and taken into consideration when EPA sets the national ambient air quality standard ("NAAQS") for each criteria pollutant. 42 U.S.C. § 7409(b)(1). The health impact of a particular criteria pollutant is analyzed on a regional and not a facility level based on how close the area is to complying with (attaining) the NAAQS. Accordingly, while the type of individual facility / health impact analysis that the Court of Appeal has required is a customary practice for TACs, it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.

It is clear from a reading of both the administrative record and the Court of Appeal's decision that the Court did not have the expertise to fully appreciate the difference between TACs and criteria air pollutants. As a result, the Court has ordered the County of Fresno to conduct an analysis that is not practicable and not likely yield valid information. The Air District respectfully requests that this portion of the Court of Appeal's decision be reversed.

II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.

Although the Air District does not take lightly the amount of air emissions at issue in this case, it submits that the Court of Appeal got it wrong when it required Fresno County to revise the Friant Ranch EIR to include an analysis correlating the criteria air pollutant emissions associated with the project with specific, localized health-impacts. The type of analysis the Court of Appeal has required will not yield reliable information because currently available modeling tools are not well suited for this task. Further, in reviewing this issue de novo, the Court of Appeal failed to appreciate that it lacked the scientific expertise to appreciate the significant differences between a health risk assessment commonly performed for toxic air contaminants and a similar type of analysis it felt should have been conducted for criteria air pollutants.

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A. Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project's Air Emissions and Specific Human Health Impacts.

In order to appreciate the problematic nature of the Court of Appeals' decision requiring a health risk type analysis for criteria air pollutants, it is important to understand how the relevant criteria pollutants (ozone and particulate matter) are formed, dispersed and regulated.

Ground level ozone (smog) is not directly emitted into the air, but is formed when precursor pollutants such as oxides of nitrogen (NOx) and volatile organic compounds (VOCs) are emitted into the atmosphere and undergo complex chemical reactions in the process of sunlight.[1] Once formed, ozone can be transported long distances by wind.[2] Because of the complexity of ozone formation, a specific tonnage amount of NOx or VOCs emitted in a particular area does not equate to a particular concentration of ozone in that area. In fact, even rural areas that have relatively low tonnages of emissions of NOx or VOCs can have high levels of ozone concentration simply due to wind transport.[3] Conversely, the San Francisco Bay Area has six times more NOx and VOC emissions per square mile than the San Joaquin Valley, but experiences lower

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[1] *See* United States Environmental Protection Agency, *Ground-level Ozone: Basic Information*, available at: http://www.epa.gov/airquality/ozonepollution/basic.html (visited March 10, 2015).

[2] *Id.*

[3] *Id.*

concentrations of ozone (and better air quality) simply because sea breezes disperse the emissions.[4]

Particulate matter ("PM") can be divided into two categories: directly emitted PM and secondary PM.[5] While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to the local PM concentration because it can be transported long distances by wind.[6] Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur dioxides (SOx) and NOx.[7] Because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area.

The disconnect between the *tonnage* of precursor pollutants (NOx, SOx and VOCs) and the *concentration* of ozone or PM formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects, but the concentration of resulting ozone or PM. Indeed, the national ambient air quality standards ("NAAQS"), which are statutorily required to be set by the United States Environmental Protection

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[4] *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, Executive Summary p. ES-6, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).

[5] United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at: http://www.epa.gov/airquality/particlepollution/basic.html (visited March 10, 2015).

[6] *Id.*

[7] *Id.*

Agency ("EPA") at levels that are "requisite to protect the public health," 42 U.S.C. § 7409(b)(1), are established as concentrations of ozone or particulate matter and not as tonnages of their precursor pollutants.[8]

Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period.[9] Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District's tools and plans for attaining the NAAQS are regional in nature.

For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NOx, SOx and VOCs) and the atmospheric chemistry and meteorology of the Valley.[10] At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor

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[8] See, e.g., United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at: http://www.epa.gov/air/criteria.html#3 (visited March 10, 2015).

[9] *San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard*, Ch. 2 p. 2-16, available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).

[10] *Id.* at Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM2.5 Plan*, Appendix F, pp. F-2 – F-5, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_Adopted_PM2.5/20%20Appendix%20F.pdf
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emissions Valley wide.[11] Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which *all* of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.[12]

Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the Valley can accommodate without affecting the attainment date for the NAAQS.[13] The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources permitted by the Air District must "offset" their emissions.[14] This "offset"

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[11] *Id.*

[12] Although the Air District does have a dispersion modeling tool used during its air permitting process that is used to predict whether a particular project's directly emitted PM will either cause an exceedance of the PM NAAQS or contribute to an existing exceedance, this model bases the prediction on a worst case scenario of emissions and meteorology and has no provision for predicting any associated human health impacts. Further, this analysis is only performed for stationary sources (factories, oil refineries, etc.) that are required to obtain a New Source Review permit from the Air District and not for development projects such as Friant Ranch over which the Air District has no preconstruction permitting authority. *See* San Joaquin Valley Unified Air Pollution Control District Rule 2201 §§ 2.0; 3.3.9; 4.14.1, available at: http://www.valleyair.org/rules/currntrules/Rule22010411.pdf (visited March 19, 2015).

[13] *San Joaquin Valley Unified Air Pollution Control District Guide to Assessing and Mitigating Air Quality Impacts*, (March 19, 2015) p. 22, available at: http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf (visited March 30, 2015).

[14] *Id.* at pp. 22, 25.

level allows for growth while keeping the cumulative effects of all new sources at a level that will not impede attainment of the NAAQS.[15] In the Valley, these thresholds are 15 tons per year of PM, and 10 tons of NOx or VOC per year. *Sierra Club*, *supra*, 172 Cal.Rptr.3d at 303; AR 4554. Thus, the CEQA air quality analysis for criteria pollutants is not really a localized, project-level impact analysis but one of regional, "cumulative impacts."

Accordingly, the significance thresholds applied in the Friant Ranch EIR (15 tons per year of PM and 10 tons of NOx or VOCs) are not intended to be indicative of any localized human health impact that the project may have. While the health effects of air pollution are of primary concern to the Air District (indeed, the NAAQS are established to protect human health), the Air District is simply not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual CEQA project directly impact human health in a particular area. This is true even for projects with relatively high levels of emissions of criteria pollutant precursor emissions.

For instance, according to the EIR, the Friant Ranch project is estimated to emit 109.52 tons per year of ROG (VOC), 102.19 tons per year of NOx, and 117.38 tons per year of PM. Although these levels well

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[15] [15] *San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines* (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).

exceed the Air District's CEQA significance thresholds, this does not mean that one can easily determine the concentration of ozone or PM that will be created at or near the Friant Ranch site on a particular day or month of the year, or what specific health impacts will occur. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. This is especially true for a project like Friant Ranch where most of the criteria pollutant emissions derive not from a single "point source," but from area wide sources (consumer products, paint, etc.) or mobile sources (cars and trucks) driving to, from and around the site.

In addition, it would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have. As discussed above, the currently available modeling tools are equipped to model the impact of *all* emission sources in the Valley on attainment. According to the most recent EPA-approved emission inventory, the NOx inventory for the Valley is for the year 2014 is 458.2 tons per day, or 167,243 tons per year and the VOC (or ROG) inventory is 361.7 tons per day, or 132,020.5 tons per year.[16] Running the photochemical grid model used for predicting ozone attainment with the

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[16] *San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan*, Appendix B pp. B-6, B-9,
available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).

emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information given the relative scale involved.

Finally, even once a model is developed to accurately ascertain local increases in concentrations of photochemical pollutants like ozone and some particulates, it remains impossible, using today's models, to correlate that increase in concentration to a specific health impact. The reason is the same: such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level.

For these reasons, it is not the norm for CEQA practitioners, including the Air District, to conduct an analysis of the localized health impacts associated with a project's criteria air pollutant emissions as part of the EIR process. When the accepted scientific method precludes a certain type of analysis, "the court cannot impose a legal standard to the contrary." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 717 n. 8. However, that is exactly what the Court of Appeal has done in this case. Its decision upends the way CEQA air quality analysis of criteria pollutants occurs and should be reversed.

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B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants.

The Court of Appeal's error in requiring the new health impact analysis for criteria air pollutants clearly stems from a misunderstanding of terms of art commonly used in the air pollution field. More specifically, the Court of Appeal (and Appellants Sierra Club et al.) appear to have confused the health risk analysis ("HRA") performed to determine the health impacts associated with a project's toxic air contaminants ("TACs"), with an analysis correlating a project's criteria air pollutants (ozone, PM and the like) with specific localized health impacts.

The first type of analysis, the HRA, is commonly performed during the Air District's stationary source permitting process for projects that emit TACs and is, thus, incorporated into the CEQA review process. An HRA is a comprehensive analysis to evaluate and predict the dispersion of TACs emitted by a project and the potential for exposure of human populations. It also assesses and quantifies both the individual and population-wide health risks associated with those levels of exposure. There is no similar analysis conducted for criteria air pollutants. Thus, the second type of analysis (required by the Court of Appeal), is not currently part of the Air District's process because, as outlined above, the health risks associated with exposure to criteria pollutants are evaluated on a regional level based on the region's attainment of the NAAQS.

The root of this confusion between the types of analyses conducted for TACs versus criteria air pollutants appears to stem from a comment that was presented to Fresno County by the City of Fresno during the administrative process.

In its comments on the draft EIR, the City of Fresno (the only party to raise this issue) stated:

> [t]he EIR must disclose the human health related effects of the Project's air pollution impacts. (CEQA Guidelines section 15126.2(a).) The EIR fails completely in this area. The EIR should be revised to disclose and determine the significance of TAC impacts, and of human health risks due to exposure to Project-related air emissions.

(AR 4602.)

In determining that the issue regarding the correlation between the Friant Ranch project's criteria air pollutants and adverse health impacts was adequately exhausted at the administrative level, the Court of Appeal improperly read the first two sentences of the City of Fresno's comment in isolation rather than in the context of the entire comment. *See Sierra Club v. County of Fresno* (2014) 172 Cal.Rptr.3d 271, 306. Although the comment first speaks generally in terms of "human health related effects" and "air pollution," it requests only that the EIR be revised to disclose "the significance of TACs" and the "human health risks due to exposure."

The language of this request in the third sentence of the comment is significant because, to an air pollution practitioner, the language would only have indicated only that a HRA for TACs was requested, and not a separate analysis of the health impacts associated with the project's criteria air pollutants. Fresno County clearly read the comment as a request to perform an HRA for TACs and limited its response accordingly. (AR 4602.)[17] The Air District submits that it would have read the City's comment in the same manner as the County because the City's use of the terms "human health risks" and "TACs" signal that an HRA for TACs is being requested. Indeed, the Air District was also concerned that an HRA be conducted, but understood that it was not possible to conduct such an analysis until the project entered the phase where detailed site specific information, such as the types of emission sources and the proximity of the sources to sensitive receptors became available. (AR 4553.)[18] The City of Fresno was apparently satisfied with the County's discussion of human health risks, as it did not raise the issue again when it commented on the final EIR. (AR 8944 – 8960.)

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[17] Appellants do not challenge the manner in which the County addressed TACs in the EIR. (Appellants' Answer Brief p. 28 fn. 7.)

[18] Appellants rely on the testimony of Air District employee, Dan Barber, as support for their position that the County should have conducted an analysis correlating the project's criteria air pollutant emissions with localized health impacts. (Appellants Answer Brief pp. 10-11; 28.) However, Mr. Barber's testimony simply reinforces the Air District's concern that a risk assessment (HRA) be conducted once the actual details of the project become available. (AR 8863.) As to criteria air pollutants, Mr. Barber's comments are aimed at the Air District's concern about the amount of emissions and the fact that the emissions will make it "more difficult for Fresno County and the Valley to reach attainment which means that the health of Valley residents maybe [sic] adversely impacted." Mr. Barber says nothing about conducting a separate analysis of the localized health impacts the project's emissions may have.

The Court of Appeal's holding, which incorrectly extrapolates a request for an HRA for TACs into a new analysis of the localized health impacts of the project's criteria air pollutants, highlights two additional errors in the Court's decision.

First, the Court of Appeal's holding illustrates why the Court should have applied the deferential substantial evidence standard of review to the issue of whether the EIR's air quality analysis was sufficient. The regulation of air pollution is a technical and complex field and the Court of Appeal lacked the expertise to fully appreciate the difference between TACs and criteria air pollutants and tools available for analyzing each type of pollutant.

Second, it illustrates that the Court likely got it wrong when it held that the issue regarding the criteria pollutant / localized health impact analysis was properly exhausted during the administrative process. In order to preserve an issue for the court, '[t]he "exact issue" must have been presented to the administrative agency....' [Citation.] *Citizens for Responsible Equitable Environmental Development v. City of San Diego*, (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 535, 78 Cal.Rptr.3d 1, 13. "'[T]he objections must be sufficiently specific so that the agency has the opportunity to evaluate and respond to them.' [Citation.]" *Sierra Club v. City of Orange*,163 Cal.App.4th at 536.[19]

As discussed above, the City's comment, while specific enough to request a commonly performed HRA for TACs, provided the County with no notice that it should perform a new type of analysis correlating criteria pollutant tonnages to specific human health effects. Although the parties have not directly addressed the issue of failure to exhaust administrative remedies in their briefs, the Air District submits that the Court should consider how it affects the issues briefed by the parties since "[e]xhaustion of administrative remedies is a jurisdictional prerequisite to maintenance of a CEQA action." *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203.

III. CONCLUSION

For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal's decision requiring an analysis correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

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[19] *Sierra Club v. City of Orange*, is illustrative here. In that case, the plaintiffs challenged an EIR approved for a large planned community on the basis that the EIR improperly broke up the various environmental impacts by separate project components or "piecemealed" the analysis in violation of CEQA. In evaluating the defense that the plaintiffs had failed to adequately raise the issue at the administrative level, the Court held that comments such as *"the use of a single document for both a project-level and a program-level EIR [is] 'confusing',"* and *"[t]he lead agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project,"* were too vague to fairly raise the argument of piecemealing before the agency. *Sierra Club v. City of Orange*, 163 Cal.App.4th at 537.

correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

Respectfully submitted,

Dated: April 2, 2015

Catherine T. Redmond
Attorney for Proposed Amicus
Curiae

SAN JOAQUIN VALLEY
UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.204 of the California Rules of Court, I hereby certify that this document, based on the Word County feature of the Microsoft Word software program used to compose and print this document, contains, exclusive of caption, tables, certificate of word count, signature block and certificate of service, 3806 words.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel (SBN 192176)

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

PROOF OF SERVICE

I am over the age of 18 years and not a p[arty to the above-captioned action; that my business address is San Joaquin Valley Unified Air Pollution Control District located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

On April 2, 2015, I served the document described below:

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO

On all parties to this action at the following addresses and in the following manner:

PLEASE SEE ATTACHED SERVICE LIST

(XX) **(BY MAIL)** I caused a true copy of each document(s) to be laced in a sealed envelope with first-class postage affixed and placed the envelope for collection. Mail is collected daily at my office and placed in a United State Postal Service collection box for pick-up and delivery that same day.

( ) **(BY ELECTRONIC MAIL)** I caused a true and correct scanned image (.PDF file) copy to be transmitted via electronic mail transfer system in place at the San Joaquin Valley Unified Air Pollution Control District ("District"), originating from the undersigned at 1990 E. Gettysburg Avenue, Fresno, CA, to the address(es) indicated below.

( ) **(BY OVERNIGHT MAIL)** I caused a true and correct copy to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I executed this document on April 2, 2015, at Fresno, California.

Esthela Soto

Esthela Soto

SERVICE LIST

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

Sara Hedgpeth-Harris, Esq. LAW OFFICE OF SARA HEDGPETH-HARRIS 2125 Kern Street, Suite 301 Fresno, California 93721 Telephone: (559) 233-0907 Facsimile: (559) 272-6046 Email: sara.hedgpethharris@shh-law.com	Attorney for Plaintiffs and Appellants, Sierra Club, et al
Daniel C. Cederborg, Esq. Bruce B. Johnson, Jr., Esq. OFFICE OF THE FRESNO COUNTY COUNSEL 2220 Tulare Street, Suite 500 Fresno, California 93721 Telephone: (559) 600-3479 Facsimile: (559) 600-3480 Email: bjohnson@co.fresno.ca.us	Attorneys for Defendant and Respondent, County of Fresno
Bryan N. Wagner, Esq. WAGNER & WAGNER 7110 N. Fresno Street, Suite 340 Fresno, California 93720 Telephone: (559) 224-0871 Facsimile: (559) 224-0885 Email: bryan@wagnerandwagner.com	Attorneys for Real Party in Interest/Respondent Friant Ranch, L.P.
Clerk of the Court Superior Court of California County of Fresno 1130 'O' Street Fresno, California 93721 Telephone: (559) 457-1900	
Clerk of the Court Fifth District Court of Appeal 2424 Ventura Street Fresno, California 93721 Telephone: (559) 445-5491	

R. Tyson Sohagim, Esq. THE SOHAGI LAW GROUP 11999 San Vicente Blvd., Suite 150 Los Angeles, California 90049 Telephone: (310) 475-5700 Facsimile: (310) 475-5707 Email: tsohagi@sohagi.com	Attorney for Amici Curiae; League of California Cities, and the California State Association of Counties
Marcia L. Scully, Esq. General Counsel METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA Post Office Box 54153 Los Angeles, California 90054 Telephone: (213) 217-6115	Attorney for Amicus Curiae, The Metropolitan Water District of Southern CA
Amy Minteer, Esq. CHATEN-BROWN & CARSTENS LLP 2200 Pacific Coast Highway, Suite 318 Hermosa Beach, California 90254 Telephone: (310) 798-2400 Facsimile: (310) 798-2402 Email: ACM@CBCEarthlaw.com	Attorney for Amici Curiae, Association of Irritated Residents, Medical Advocates for Healthy Air, and Coalition for Clean Air
Shanda M. Beltran, Esq. General Counsel BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION 17744 Sky Park Cr., Suite 170 Irvine, California 92614 Telephone: (949) 553-9500 Facsimile: (949) 769-8943 Email: sbeltran@biasc.org	Attorney for Amicus Curiae, Building Industry Legal Defense Foundation
Gene Talmadge, President CALIFORNIA ASSOCIATION OF ENVIRONMENTAL PROFESSIONALS 40747 Baranda Court Palm Desert, California 92260 Telephone: (760) 340-4499 Facsimile: (760) 674-2479	Attorney for Amicus Curiae, California Association of Environmental Professionals
Jennifer L. Hernandez, Esq. HOLLAND & KNIGHT LLP 50 California Street, Suite 2800 San Francisco, California 94111	On behalf of Amicus Curiae, CEQA Research Council

Telephone: (415) 743-6927 Facsimile: (415) 743-6910 Email: Jennifer.hernandez@hklaw.com	

TRANSPORTATION IMPACT ANALYSIS

For

LIBITZKY INDUSTRIAL DEVELOPMENT GPA AND REZONE TO PD

Stanislaus County, CA

Prepared For:

LPC Commercial Real Estate
1475 Powell Street, Suite 201
Emeryville, CA 94608

Prepared By:

KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, CA 95650
(916) 660-1555

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4530-01

Libitzky Industrial GPA.rpt

TRANSPORTATION IMPACT ANALYSIS FOR LIBITZKY INDUSTRIAL DEVELOPMENT GPA AND REZONE TO PD

Stanislaus County, CA

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TRANSPORTATION IMPACT ANALYSIS FOR LIBITZKY INDUSTRIAL DEVELOPMENT GPA AND REZONE TO PD

Stanislaus County, CA

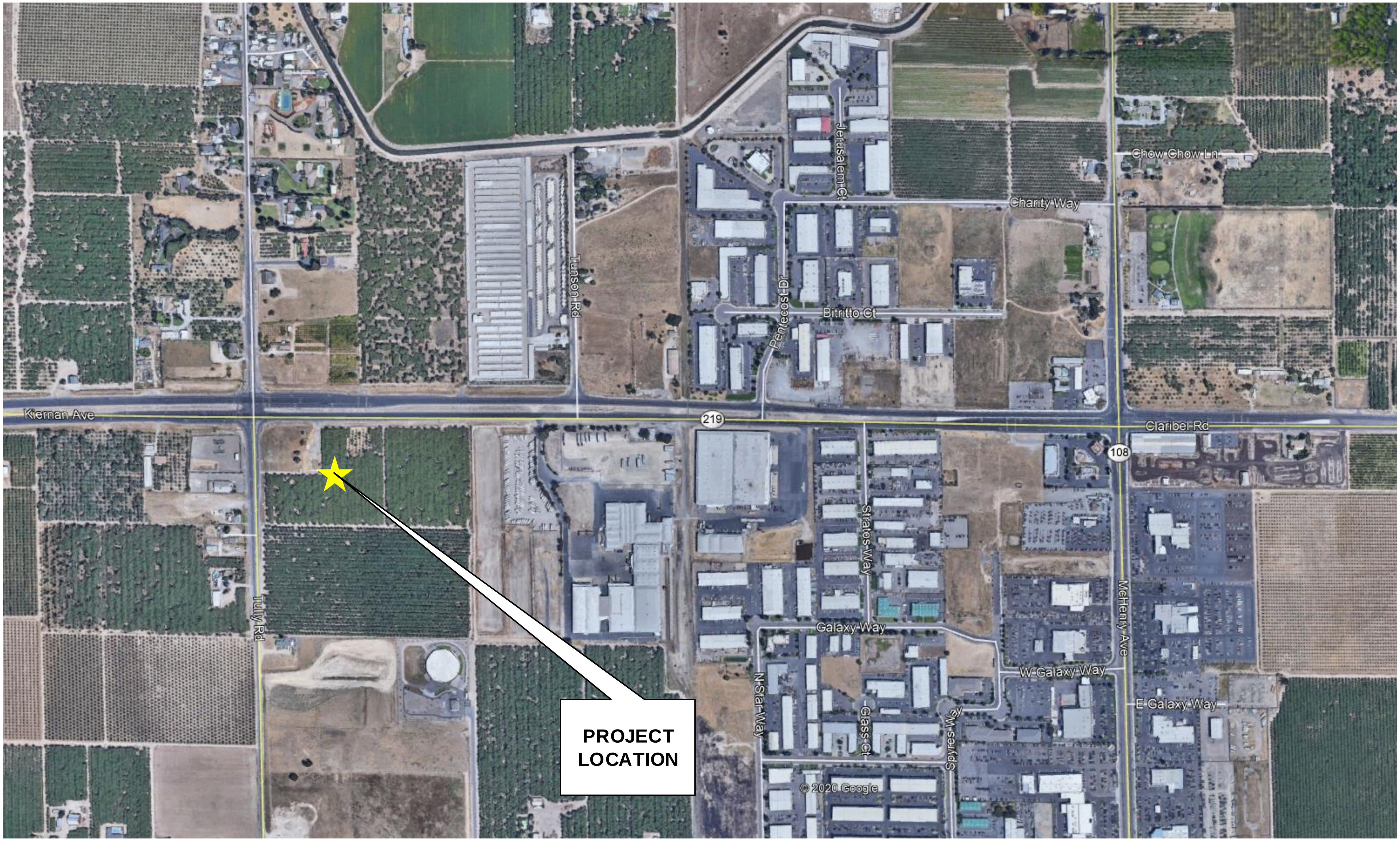
INTRODUCTION

This report summarizes **KD Anderson & Associates'** analysis of the potential traffic impacts associated with the **Libitzky Industrial Development (LID)** in Stanislaus County, California. The project is located on a 17 acre site at the southeast corner of the intersection of Kiernan Avenue (SR 219) and Tully Road within the City of Modesto sphere of influence, as noted in Figure 1. The site has a County General Plan designation of Urban Transition and a City of Modesto General Plan designation of Business Park. The County General Plan Land Use designation will be changed from Urban Transition to Planned Development, to match the County General Plan designation on PD (131) to the east.

The project would construct a 300,000 sf Industrial/Light Industrial/Warehouse building. The tenants of the building are expected included Jackrabbit Manufacturing in about 150,000 square feet. Uses for the remaining 150,000 have not been identified, although Jackrabbit Manufacturing is a highly likely potential user for the remaining area in the future.

The project proposes two points of access, as noted in Figure 2. A new driveway will be constructed on Tully Road at the southern end of the project's frontage. This property and the approved 36 acre PD (131) property to the east will allow cross access to an existing driveway on Kiernan Avenue, and easements will be granted as necessary.

Study Scope. This report identifies project impacts with regards to current traffic conditions as well as cumulative conditions that assume occupancy of other approved projects or long-term traffic growth. Current traffic conditions that are representative of Year 2020 without the effects of COVID-19 have been identified. Project automobile and truck trip generation has been estimated, and the effects of the project on that background condition have been determined. The project's effects have also been assessed within the context of a short term cumulative condition that reflects occupancy of approved projects in the City of Modesto and Stanislaus County has been identified, as well as 2040 conditions that are consistent with the North County Corridor (NCC) EIR traffic model. The extent of local circulation system improvements needed to accommodate project access and to result in conditions that are consistent with City and County General Plan policy requirements have been identified.



VICINITY MAP

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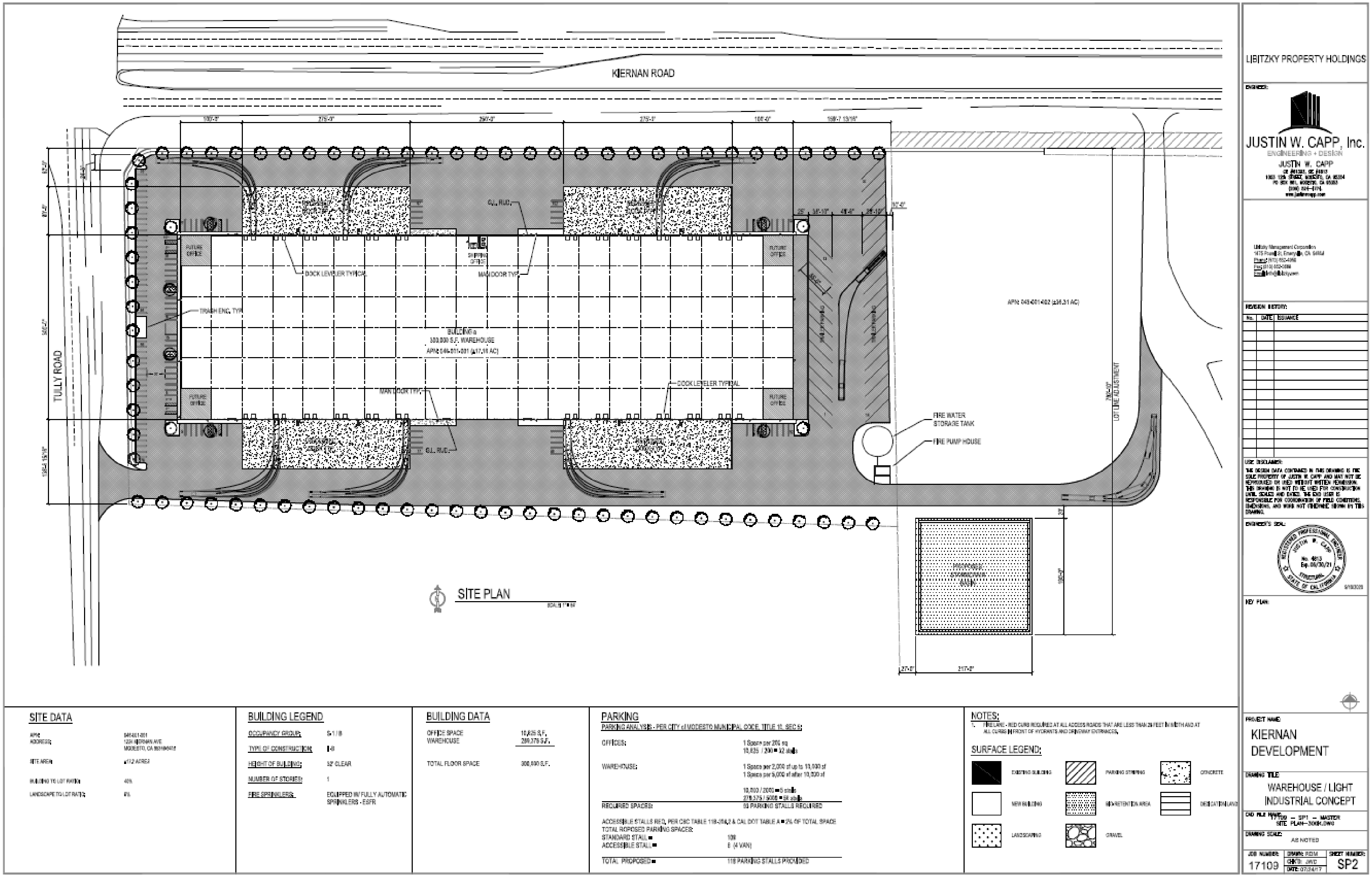
figure 1



SITE DATA

APN:	046-001-001
ADDRESS:	1234 KIERNAN AVE MODESTO, CA [illegible]
SITE AREA:	±17.2 ACRES
BUILDING TO LOT RATIO:	40%
LANDSCAPE TO LOT RATIO:	8%

BUILDING LEGEND

OCCUPANCY GROUP:	S-1 / B
TYPE OF CONSTRUCTION:	II-B
HEIGHT OF BUILDING:	32' CLEAR
NUMBER OF STORIES:	1
FIRE SPRINKLERS:	EQUIPPED W/ FULLY AUTOMATIC SPRINKLERS - ESFR

BUILDING DATA

OFFICE SPACE	10,625 S.F.
WAREHOUSE	289,375 S.F.
TOTAL FLOOR SPACE	300,000 S.F.

PARKING

PARKING ANALYSIS - PER CITY of MODESTO MUNICIPAL CODE, TITLE 10, SEC 5:

OFFICES:	1 Space per 200 sq 10,625 / 200 = 32 stalls
WAREHOUSE:	1 Space per 2,000 sf up to 10,000 sf 1 Space per 5,000 sf after 10,000 sf 10,000 / 2000 = 5 stalls 279,375 / 5000 = 56 stalls
REQUIRED SPACES:	93 PARKING STALLS REQUIRED

ACCESSIBLE STALLS REQ. PER CBC TABLE 11B-208.2 & CAL DOT TABLE A = 2% OF TOTAL SPACE
TOTAL PROPOSED PARKING SPACES:

STANDARD STALL =	108
ACCESSIBLE STALL =	8 (4 VAN)
TOTAL PROPOSED =	116 PARKING STALLS PROVIDED

NOTES:

1. FIRE LANE - RED CURB REQUIRED AT ALL ACCESS ROADS THAT ARE LESS THAN 26 FEET IN WIDTH AND AT ALL CURBS IN FRONT OF HYDRANTS AND DRIVEWAY ENTRANCES.

SITE PLAN

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figure 2

EXECUTIVE SUMMARY

The following conclusions have been reached and recommendations made in this analysis.

Existing Traffic Operating Conditions. Assessment of Year 2020 traffic volumes adjusted to account for the effects of COVID -19 indicates that all intersections in the study area operate LOS C or better during peak hours and satisfy the minimum requirements for locations in Stanislaus County within the City of Modesto Sphere of Influence (i.e., LOS D). Projected peak hour queues can be accommodated within available storage at intersections.

Project Characteristics. While the amount of automobile and truck traffic associated with the project will depend on the eventual users, the proposed project is projected to generate a 'worst case" total of 1,488 daily trips, with 210 trips in the a.m. peak hour and 189 trips in the p.m. peak hour. Similarly, while truck traffic will vary with the individual user, trucks are expected to comprise 5% of the peak hour trip generation. This estimate assumed 100% occupancy by Light industrial users, and the forecast would be lower if the specific characteristics of the Jackrabbit Manufacturing operation were assumed.

Project Access. The project would have two points of access. An existing driveway on Kiernan Avenue roughly 1,750 feet east of Tully Road is available, and a new driveway at the southern end of the project's Tully Road frontage roughly 600 feet from Kiernan Avenue is proposed. The Kiernan Avenue access will be limited to right turns only. Full access is proposed on Tully Road, recognizing that the City of Modesto will provide direction on access controls and that long term plans for ultimate Tully Road / Kiernan Avenue improvements under City design standards would limit this access to right turns only.

Existing Plus Project Traffic Operations. The addition of project traffic to the study area street system does not result in any location operating with a Levels of Service that exceed the minimum LOS D standard. Projected 95th percentile queues can be contained within available storage.

Existing Plus Approved Project Conditions. Approved projects that remain to be developed within the study area were identified by City of Modesto and County staff. These projects include an approved 96,000 sf industrial building adjoining the proposed project that would share access with the proposed project as well as a church on Tully Road and the Woodglen Residential area between Carver Road and Tully Road. Development of these projects would not result in conditions in excess of adopted standards for LOS or queuing. While the addition of trips from the proposed project increase the length of delays, applicable LOS and queuing standards will continue to be satisfied.

Year 2040 Traffic Operations. Long term traffic conditions will reflect the effects of regional growth and implementation of planned circulation system improvements. Future traffic volume forecasts were derived from the regional travel demand forecasting model created for the North County Corridor (NCC) EIR and reflect the addition of the City of Riverbanks Crossroads West SP which was approved following the NCC EIR. Locally long term improvements have already been made along Kiernan Avenue (SR 219), but a single point interchange is anticipated at the Kiernan Avenue (SR 219) / McHenry Avenue (SR 108) intersection, while Tully Road and its intersection on Kiernan Avenue would be expected to be improved to City standards (i.e., Detail 360).

Under these conditions all signalized study area intersections are expected to deliver Levels of Service that satisfy the minimum LOS D standard with and without the project. However, the length of peak period queues in the northbound Tully Road left turn lanes may exceed the storage provided by the City's standard design. This issue would need to be considered when the intersection is widened. In addition, with and without the proposed project, long delays would exist for vehicles making right turns at driveways and unsignalized intersections on Kiernan Avenue such as Pentecost Drive. This issue may be addressed with the latter phases of the NCC project if access to the expressway is eliminated corridor wide.

SR 219 (Kiernan Avenue) Access. The project proposes to make use on an existing 30 foot encroachment on SR 219 (Kiernan Avenue) located roughly 1,750 feet east of Tully Road. This driveway is currently used by an existing industrial use and RV Storage. The RV Storage will be replaced by an approved 96,000 sf industrial building, as noted in the discussion of Approved projects. That project was conditioned by Stanislaus County to install a raised "pork chop" island in the driveway in order to enforce the existing right turn only limitation.

The layout of the existing driveway itself is not conducive to truck access on a high speed expressway, but there are mitigating factors. While separate deceleration and acceleration lanes are not provided, the paved shoulder along SR 219 in this area is 12 feet. This area can be used by trucks assuming that the pavement section is adequate for truck traffic, thus mitigating for the absence of dedicated turn lanes.

Installing the right turn only driveway median will change the situation slightly. As is evident at the Tunsen Road encroachment on the north side of SR 219 directly opposite this location, additional widening is needed to accommodate the turning requirements of trucks outside of the median area. Incorporation of a similar design that is sized to handle the applicable design vehicle is recommended. However, it is likely that this feature could require widening the encroachment beyond the existing 30 feet, and if so, and a modification to the existing encroachment permit or a new permit may be required.

Tully Road Access. The project also proposes access to Tully Road in a location at the southern property limit roughly 600 feet beyond Kiernan Avenue. A TWLT lane exists in this area. The driveway is 40 feet wide and proposes 50 foot return radii.

Because this portion of Tully Road is within the City's Sphere of influence Stanislaus County generally defers to the City of Modesto for guidance on access design. In this case, the ultimate plan for Tully Road / Kiernan Avenue improvements is guided by standard plan detail No. 361 which indicates the length of turn lanes and transitions. That detail indicates that the combination of northbound left turn lanes and their transition areas will extend for roughly 600 feet.

While right turn only access will ultimately be required, the feasibility of full access on an interim basis has been assessed. Overall, full access will be feasible in the near term because there is room for concurrent northbound and southbound left turns in the TWLT lane.

EXISTING SETTING

This report section describes current weekday a.m. and p.m. peak hour traffic volume levels and accompanying traffic operations on the roadways and intersections within a study area under the jurisdiction of Stanislaus County (lead agency), Caltrans District 10 (commenting agency) and City of Modesto (commenting agency).

Existing Street and Highway System

Stanislaus County roads and Modesto city streets will be used to access the site. The project is currently served by major regional routes such as Kiernan Avenue (SR 219), Tully Road and McHenry Avenue.

Based on consideration of the project's location and existing traffic controls, this study addresses the operations at these existing intersections, as well as the project's access on Tully Road

1. SR 219 (Kiernan Avenue) / Tully Road
2. SR 219 (Kiernan Avenue) / Existing Industrial Access
3. SR 219 (Kiernan Avenue) / Pentecost Drive
4. SR 219 (Kiernan Avenue) / McHenry Avenue

The text that follows describes these facilities.

Kiernan Avenue (SR 219). Kiernan Avenue **(**SR 219) is a key east-west facility across eastern Modesto and Stanislaus County. SR 219 begins at its western terminus at an interchange on SR 99 in Salida and continues for roughly 5 miles to its junction with SR 108 (McHenry Avenue). At that point Claribel Road continues easterly along the south side of Riverbank into rural Stanislaus County beyond the Oakdale-Waterford Highway. Today Kiernan Avenue is a divided four-lane / six-lane facility. Kiernan Avenue is designated an Expressway in The City of Modesto General Plan. The speed limit is 55 mph.

Caltrans traffic counts indicate that in 2019 Kiernan Avenue carried 27,500 AADT east of SR 99 and 14,200 AADT west of McHenry Avenue. Trucks comprise 9% of the daily volume.

Tully Road. Tully Road is a north-south roadway that extends from downtown Modesto into Stanislaus County north of Kiernan Road (SR 219). Tully Road is a four-lane facility south of Pelandale Avenue and is a two-lane rural road from that point north to a location 500± feet south of Kiernan Avenue where two southbound lanes are available. Tully Road is designated a six lane Principal Arterial between Kiernan Avenue and Standiford Avenue in the Modesto General Plan.

McHenry Avenue. McHenry Avenue (SR 108) is a major north-south arterial that extends from the City of Modesto across the Stanislaus River to Escalon. The portion of McHenry Avenue south of Patterson Road is also SR 108. McHenry Avenue varies in width, as the roadway has six-lanes south of Coralwood Road, four-lanes from Coralwood Road north across Kiernan Avenue and two-lanes north to San Joaquin County where the roadway has been widened adjoining River Road. McHenry Avenue is designated a six-lane Principal Arterial in the City of Modesto General Plan.

Caltrans traffic counts indicate that in 2019 McHenry Avenue carried 19,200 AADT south of Kiernan Avenue and 12,700 AADT south of Patterson Road. Trucks comprise 7% of the daily volume north of Kiernan Avenue.

Pentecost Drive. Pentecost Drive is a two-lane local road that extends north from Kiernan Avenue into the existing industrial area north of the expressway.

The quality of traffic flow is generally governed by the operation of major intersections, and the physical characteristics of study intersections are as follows.

The **Kiernan Avenue / Tully Road intersection** is controlled by a traffic signal. Kiernan Avenue has three travel lanes in each direction as well as separate right turn lanes. A single eastbound left turn lane and dual westbound left turn lanes are provided. The northbound Tully Road approach has separate left turn, through and right turn lanes, and the left turn lane continues south as continuous Two-Way Left-Turn (TWLT) lane for nearly 900 feet. Crosswalks are not striped at this rural intersection.

The **existing access on Kiernan Avenue** that will be available to the project is a 30 foot encroachment located 1,750 feet east of Tully Road (centerline to centerline). This “Tee” access intersection is limited to right turns only by the unimproved median in Kiernan Avenue (i.e., not a raised median). The access has 25 foot curb return radii and no auxiliary lanes. An approved project that will share this access with the proposed project is conditioned to install a raised median in the driveway to enforce the right turn only restriction.

The **Kiernan Avenue / Pentecost Drive intersection** is located roughly ¼ mile east of the project’s existing Kiernan Avenue driveway. A median break allows eastbound left turns onto Pentecost Drive at this “Tee” intersection, but outbound left turns are prohibited.

The **McHenry Avenue (SR 108) / Kiernan Avenue (SR 219) intersection** is controlled by an actuated traffic signal. The four-lane McHenry Avenue approaches have two through lanes and separate left turn and right turn lanes. The six lane eastbound Kiernan Avenue approach has dual left turn lanes, three through lanes and a separate right turn lane. The westbound Claribel Road approach has dual left turn lanes, a through lane and a combined through+right turn lane. Crosswalks are striped across each leg of the intersection.

Level of Service Calculation - Methodology

Levels of Service were determined at the study intersections to quantitatively evaluate traffic operating conditions and to provide a basis for comparison of conditions with and without project generated traffic.

"Level of Service" (LOS) is a quantitative measure of traffic operating conditions whereby a letter grade "A" through "F" is assigned to an intersection. LOS "A" through "F" represents progressively worsening traffic conditions. The characteristics associated with the various LOS for intersections are presented in Table 1. LOS "E" and "F" are associated with severe congestion and delay and are unacceptable to most motorists.

The methods and procedures used for calculating Levels of Service at intersections is as presented in the Highway Capacity Manual, 6th Edition (HCM). Table 1 presents a summary of Level of Service characteristics specific to signalized and unsignalized intersections. Levels of Service were calculated using SYNCHRO software, as typically requested by Caltrans District 10, Stanislaus County and the City of Modesto.

TABLE 1
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10.0 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Sources: Highway Capacity Manual, 6th Edition Transportation Research Board (TRB) Special Report 209.

Information describing Levels of Service at unsignalized intersections is also presented in the HCM. While the unsignalized Level of Service may indicate very long delays (i.e., LOS "E") traffic conditions are generally not assumed to be significant unless a significant number of motorists are delayed. For this analysis, the satisfaction of rural peak hour traffic signal warrants has been used to suggest the significance of unsignalized Level of Service. Although satisfying signal warrants signifies that an intersection has unacceptable operating conditions, it does not mean that installation of a signal is the only way to mitigate those conditions. It is often possible to improve an intersection with additional lanes or improved geometrics so that signalization is not necessary.

Level of Service – Minimum Standards

Minimum acceptable LOS standard are selected by local agencies and typically disclosed in General Plan documents. For this analysis the standards employed by the agency with jurisdiction over a particular facility have been used.

Stanislaus County Policy. According to Policy 2.1 from the Circulation Element of the Stanislaus County General Plan, originally adopted in 1987 and most recently revised in 2000, the minimum acceptable operating standards has been determined as follows:

- The County shall maintain LOS C or better for all County roadways and intersections, except, within the sphere of influence of a city that has adopted a lower Level of Service standard, the City standard shall apply.

In this case, the City of Modesto's General Plan boundary / sphere of influence extends north to Kiernan Avenue.

City of Modesto General Plan Policy V.C.1 notes that LOS D is the significance threshold for Planned Urbanizing areas, and this is the minimum standard for all other study intersection and the site access.

Evaluation Criteria. With the implementation of SB 743 and the use of Vehicle Miles Traveled (VMT) as the applicable metric, CEQA analysis no longer considers change to operating Level of Service as a "significance" criteria. However, the following polices can be used for determining consistency with the General Plan on Stanislaus County facilities:

Intersections. A significant project inconsistency is defined to occur at a signalized or un-signalized intersection if the addition of project traffic causes either of the following:

1. An intersection operating at an acceptable level (LOS D or better) to degrade to an unacceptable level (LOS E or worse).
2. An increase in control delay of more than five (5.0) seconds at an approach/movement at a signalized or un-signalized intersection that currently operates at an unacceptable level.

Existing Traffic Volumes

Approach. For much of 2020 travel limitations and school closures caused by COVD-19 have resulted in traffic volumes on County Roads, City streets and state highways that fall below previous levels. In response Caltrans has provided traffic study guidance indicating that "non-COVID conditions be used for analysis. Ideally, recent traffic counts collected prior to COVID-19 will be used where available, but techniques making use of cell-phone based "Big Data" have been created to estimate traffic volumes for locations where physical traffic count data is not available.

In this case, a.m. p.m. peak hour traffic volume data is limited. Traffic counts were available at the Kiernan Avenue (SR 219) / McHenry Avenue (SR 108) intersection for March 4, 2020 and from November 16, 2016. In general, the 2020 count was conducted before the effects of COVID-19 has been felt in Stanislaus County, and as noted in Table 2. the total intersection volumes in 2020 were greater than those observed in 2016. The 2020 volumes were employed for this analysis.

TABLE 2
MCHENRY AVENUE (SR 108) / KIERNAN AVENUE (SR 219) INTERSECTION
PEAK HOUR TRAFFIC VOLUMES COMPARISON

Date	Total Approach Volume (vph)			
	AM Peak Hour		PM Peak Hour	
	Volume (vph)	Ratio	Volume (vph)	Ratio
March 4, 2020	3,195	1.00	4,086	1.00
November 16, 2016	2,776	0.87	3,507	0.86
November 17, 2020	3,005	0.94	3,952	0.97

Sources of data for other study location were reviewed. No recent intersection traffic counts were available for other locations and Caltrans PeMS data for SR 219 is outdated. An alternative approach was taken to estimate peak hour traffic volumes for these locations combining new traffic counts and cell phone based Big Data from StreetLight Data Inc.

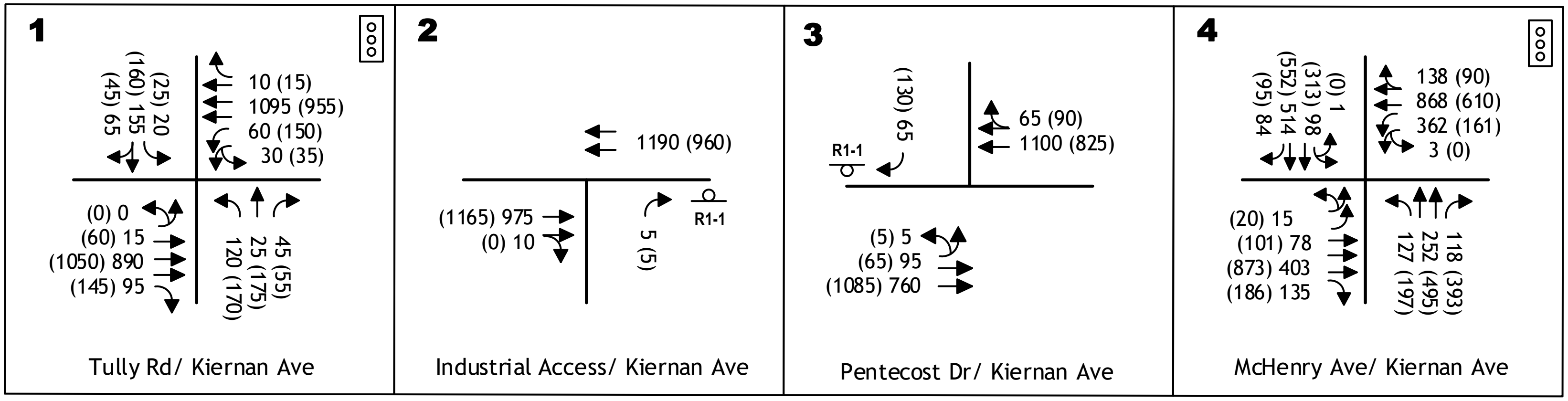
Method. A multi-step process was followed to create representative traffic volumes for the other study locations.

- Data Set #1. New year 2020 am/pm weekday counts were made on November 17, 2020 at all locations. The counts would reflect the effects of COVID-19 on current travel patterns.

- Data Set #2. Cellphone-based GIS data from StreetLight Data Inc. was assembled that was representative of peak hours during COVID-19 travel restrictions (i.e., October 2020) and of peak hours of "average" months (i.e., March, April, September, October) in 2019. The 2019 volume forecasts would represent current "Non-Covid" conditions and are data Set #2.

- The two StreetLight estimates were compared, a growth increment was identified for each turning movement, and that increment was added to the observed 2020 counts (data set # 1) to create adjusted 2020 volumes.

Results. Figure 3 presents the adjusted year 2020 peak hour volumes employed for this analysis.



EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 3

Current Traffic Operations

Levels of Service. Peak hour levels of service were calculated at the existing study intersections (Refer to Appendix for calculation worksheets) under "Existing - No Project" conditions. The results of these calculations are presented in Table 3. As shown, the Level of Service at both signalized study intersections satisfy the City of Modesto's minimum LOS D standard and are acceptable to Stanislaus County. Because access is limited to right turns only, the delays at unsignalized intersections in the area of the project are also low. Resulting Levels of Service are LOS B and LOS C, and all meet Stanislaus County or City of Modesto minimum standards.

TABLE 3
EXISTING INTERSECTION LEVELS OF SERVICE

		AM Peak Hour		PM Peak Hour	
		Existing		Existing	
Intersection	**Control**	**Average Delay (sec)**	**LOS**	**Average Delay (sec/veh)**	**LOS**
Kiernan Avenue (SR 219) / Tully Road	Signal	24.5	C	33.6	C
Kiernan Avenue (SR 219) / Industrial access Northbound approach	NB/SB Stop	12.2	B	13.7	B
Kiernan Avenue (SR 219) / Pentecost Dr Southbound approach	SB Stop	15.5	C	14.0	B
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	Signal	33.0	C	45.9	D

95th Percentile Queue Lengths. The 95th percentile queue lengths estimated for key locations at study area intersections have been developed as a byproduct of HCM LOS analysis, and the resulted are noted in Table 4. Current traffic volumes and available lane storage are also precented. As indicated the left turn lanes on Kiernan Avenue are very long and accommodate both storage for waiting vehicles and deceleration outside of through travel lanes by turning vehicles. All turn lanes can accommodate estimated 95th percentile queues.

TABLE 4
EXISTING 95th PERCENTILE QUEUES AT INTERSECTIONS

			AM Peak Hour		PM Peak Hour	
			Existing		Existing	
Intersection	**Lane**	**Storage (feet)**	**Volume (vph)**	**95th % Queue (feet)**	**Volume (vph)**	**95th % Queue (feet)**
Kiernan Avenue (SR 219) / Tully Road	NB left	275	120	150	170	200
	NB Thru		25	25	175	105
	WB left	670	90	40	185	85
Kiernan Avenue (SR 219) / Industrial access	NB approach		5	<25	5	<25
Kiernan Avenue (SR 219) / Pentecost Drive	EB left turn	830	100	<25	70	<25
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	NB left	140[2]	127	65	197	315
	EB left	765	93	<25	121	115

[1] lane continues as TWLT lane for another 600 feet

[2] lane continues as continuous TWLT along McHenry Ave

Traffic Signal Warrants. The peak hour traffic volumes at unsignalized intersections were reviewed to determine whether peak hour traffic signal warrants may be satisfied according to the Manual of Uniform Traffic Control Devices (MUTCD 2014, Section 4C.04 Warrant 3, Peak Hour). The choice between rural (>40 mph) and urban (≤40 mph) criteria we based on the posted speed limit. Technically, the volume of traffic occurring at the Kiernan Avenue (SR 219) / Pentecost Drive intersection reaches the level that would satisfy the peak hour volume warrant. However, because all side street traffic turns right, delays are short, the LOS is acceptable and a traffic signal is not justified.

Sight Distance. The minimum sight distance needed to safely access public roads from private access points is defined in Table 201.1 of the Caltrans Highway Design Manual (HDM). These minimum requirements range from 250 feet at 35 mph to 500 feet at 55 mph, which are the posted speed limits on Tully Road and Kiernan Avenue, respectively. At each intersection the alignment of the major street is straight and level, and the view in each direction satisfies minimum requirements.

PROJECT TRAFFIC IMPACTS

Project Characteristics

The LPC Light Industrial Development covers roughly 17 acres, and the project proposes 300,000 sf of building floor area. One tenant for half of the site has been identified (Jackrabbit Manufacturing), and that user expects to employ 100 to 200 persons.

Trip Generation Rates. The Institute of Transportation Engineer's publications provide trip generation rates for typical industrial building uses that may be applicable to this project, as noted in Table 5 as described below.

General Light Industrial. A light industrial facility is a free-standing facility devoted to a single use. The facility has an emphasis on activities other than manufacturing and typically has minimal office space. Typical light industrial activities include printing, material testing, and assembly of data processing equipment.

Manufacturing. A manufacturing facility is an area where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research, and associated functions.

Warehousing. Warehouses are primarily devoted to the storage of materials, but they may also include small office and maintenance areas.

High Cube Warehouse. High Cube Warehouses are used for the storage of materials, goods and merchandise prior to their distribution to retail outlets, distribution centers or other warehouses. While trip generation rates exist for several varieties of High Cube Warehouse, Transload and Short-Term Storage is the most common type.

Trip Generation Forecasts. Table 5 also presents trip generation projections for a 300 ksf building under each land use category. As indicated, the forecasts are highest for the Light Industrial use, with the Manufacturing use being close behind. Warehousing generates many less trips.

Estimate for Jackrabbit Manufacturing. Jackrabbit Manufacturing anticipates employing 100 to 200 persons in 150,000 sf of building floor area. Typical hours of operation are 6:00 a.m. to 5:00 p.m., although welders may start as early as 5:00 a.m. in the heat of the summer. Assuming each employee drove alone to and from the site, 200 to 400 daily trips would result. The share of this traffic that may fall within the specific a.m. or p.m. peak hour on Kiernan Avenue is unknown but would depend on the number of employees that start or end their day between 7:00 a.m. to 9:00 a.m. and between 4:00 p.m. to 6:00 p.m..

Truck trips are currently expected to be about 1 to 2 semi-trucks per day for steel delivery, about 0 to 2 semi-trucks per day for large parts delivery, about 1 to 2 box trucks per day for parts delivery, and about 2 to 4 van deliveries per day from FedEx or UPS. During the harvest season, customer trips could be up to 25 per day. During the off-season, this would be reduced to about 0 to 2 per day. With each truck generating two trips (one inbound and one outbound), truck activity could total 20 daily trips in the off-season and 70 daily trips in the harvest season.

Altogether, if 200 employees are at the site then Jackrabbit Manufacturing likely generates about 420 daily trips in the off-season and 470 daily trips during harvest.

Trip generation rates are also available on a “per employee” basis, and these rates for manufacturing uses can be applied to Jackrabbit Manufacturing. As shown in Table 5, using ITE rates a manufacturer employing 200 persons could generate 494 daily trips, which is very close to the estimate based on expected Jackrabbit Manufacturing operations, but is greater than a “per ksf” forecast applied to 150,000 sf of building (i.e., 786/2 = 393 daily trips).

Results. The highest trip generation forecast can be derived from the ITE rates for General Industry Building (Code 110). The daily forecast of 1,488 daily trips would exceed that for other uses and would exceed the hypothetical case of Jackrabbit Manufacturing doubling is occupancy to 400 persons in 300,000 sf (i.e., 988 daily trips.)

Similarly, the peak hour trip generation forecasts associated with the Light Industrial rate are greater than those for other uses, including the doubling of Jackrabbit Manufacturing’s use.

The Manufacturing Truck trip generation rates do yield greater estimates for daily truck trips (i.e., 141 daily truck trips) than do the rates for General Industrial use (i.e., 75 daily truck trips). To present a “worst case” evaluation of project traffic impacts it has been assumed that trucks comprise a higher share of overall daily trip estimate than is suggested by the General Industrial data. Trucks are assumed to comprise 5% of the project’s trips during peak hours.

TABLE 5
AVERAGE TRIP GENERATION RATES AND FORECASTS

ITE Code	Land Use Description	Unit	Quantity	Trips per Unit						
				Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
110	General Light Industrial	ksf	1	4.96	0.62	0.08	0.70	0.08	0.55	0.63
	Proposed Project		300	1,488	186	24	210	24	165	189
	Trucks only		1	0.25			0.01			0.01
			300	75			3			3
	Automobiles			1,413			207			186
140	Manufacturing	ksf	1	2.62	0.48	0.14	0.62	0.21	0.46	0.67
	Proposed Project		300	786	144	42	186	63	138	201
	Trucks only		1	0.47			0.03			0.03
			300	141			9			9
	Automobiles			645			177			192
	Manufacturing	employee	1	2.47	0.27	0.10	0.37	0.13	0.20	0.33
	Jackrabbit Manufacturing in 150,000 sf		200	494	54	20	74	26	40	66
	Trucks only		1	0.35			0.03			0.02
			200	70			6			4
	Automobiles			424			70			62
150	Warehousing	ksf	1	1.74	0.13	0.04	0.17	0.05	0.14	0.19
	Proposed Project		300	522	39	12	51	15	42	57
	Trucks only		1	0.60			0.02			0.03
			300	180			6			9
	Automobiles			342			45			48
154	High Cube Transload and Short-term Storage	ksf	1	1.40	0.06	0.02	0.08	0.03	0.07	0.10
	Proposed Project		300	420	18	6	24	9	21	30
	Trucks only		1	0.22			0.02			0.01
			300	66			6			3
	Automobiles			354			18			27

Source: ITE Trip Generation Manual, 10th Edition

Used for analysis

Trip Distribution. The distribution of peak hour trips generated by the proposed project will generally reflect the commute patterns of Modesto / Stanislaus County area residents. The travel demand forecasting model created for the North County Corridor (NNC) EIR has the ability to track trips with origin or destination within specific traffic analysis zones (TAZ), and this tool was employed to identify the regional trip distribution for this project. The results are noted in Table 6.

TABLE 6
TRIP DISTRIBUTION ASSUMPTIONS

Direction	Route	Percentage
North	Tully Road	3%
	McHenry Avenue (SR 108) beyond Kiernan Avenue	3%
East	Claribel Road east of McHenry Avenue	11%
South	Tully Road	45%
	McHenry Avenue	28%
West	Kiernan Avenue (SR 219) beyond Tully Road	10%
	Total	100%

Trip Assignment. The project's trips were assigned to the local street system using the two access locations. Full access was assumed at the the Tully Road access under short term conditions, while the Kiernan Avenue access was assumed to remain right-turns only. The choice of access was assumed to reflect the location of parking within the project and the shortest time path between those locations and trip destinations. Figure 4 presents the project's resulting peak hour trips

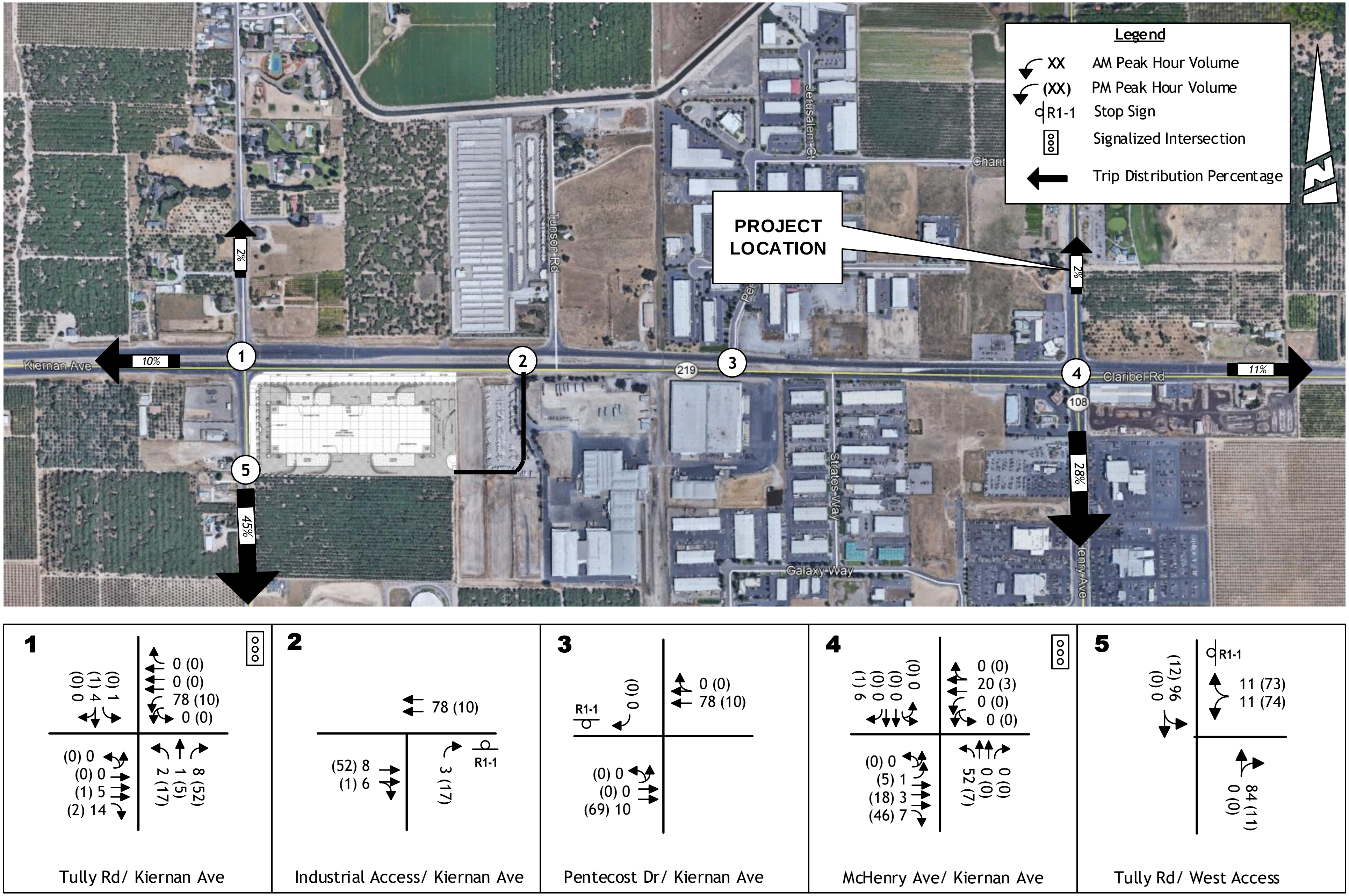
Project Traffic Impacts

Using the trip generation, distribution and assignment assumptions noted above, the trips generated by the expansion were superimposed onto current background volumes to create "Existing Plus Project" conditions. The peak hour traffic volumes associated with 300 person and 1,100 person attendance levels are presented in Figure 5.

Levels of Service. Resulting Levels of Service were then calculated for study intersections and street segments under these conditions. As noted in Table 7, the addition of project trips does not result in any location operating with Level of Service that exceeds the LOS D minimum.

95th % Queues. The introduction of project traffic will increase the length of 95th percentile queues occurring during peak periods in key turn lanes. However, as noted in Table 8, at no location do the projected queue lengths exceed available storage.

Traffic Signal Warrants. The addition of project trips does not result in any new location when an unsignalized intersection carried volumes that reached the level which would satisfy peak hour warrants.



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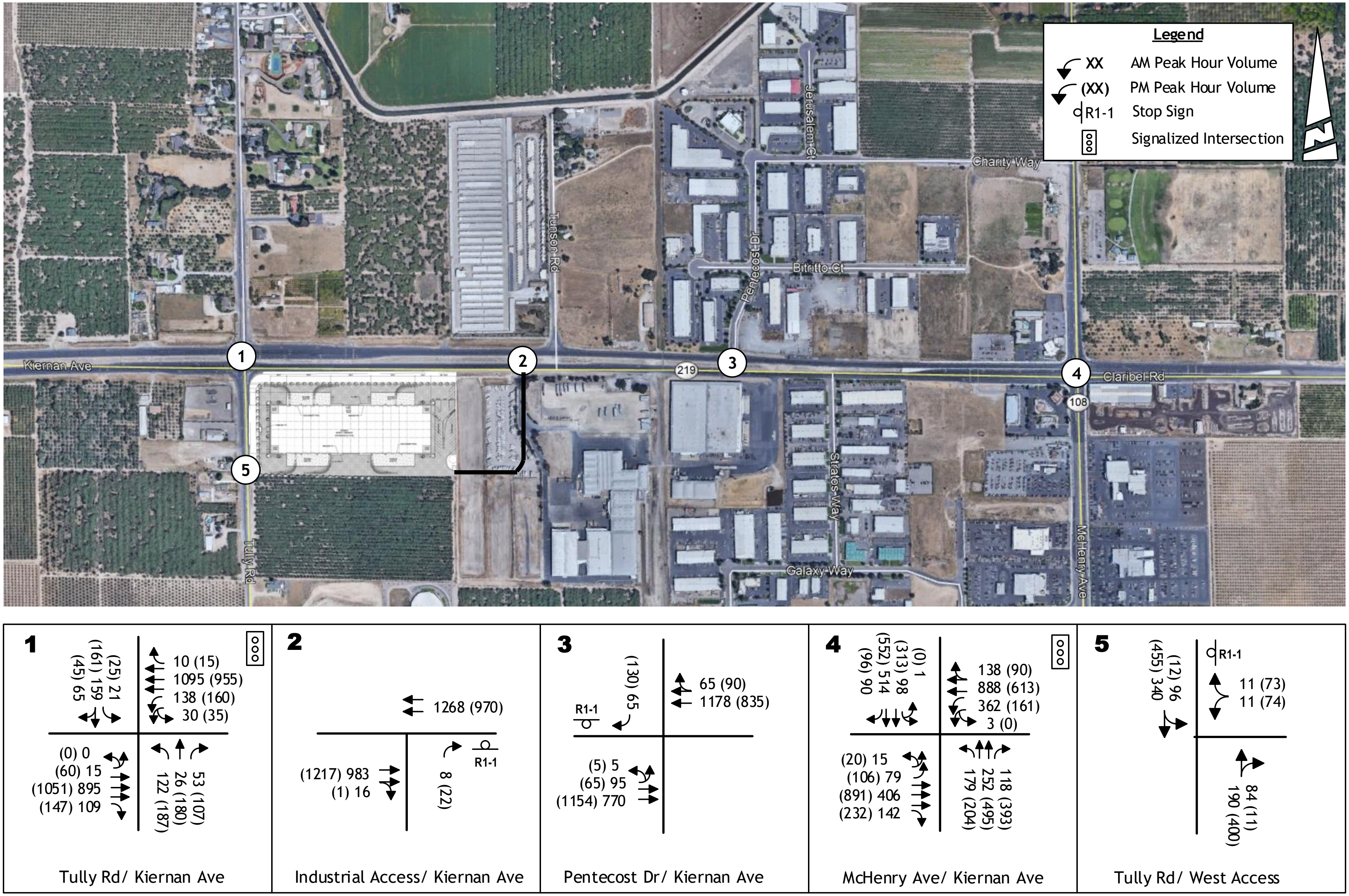
PROJECT ONLY TRAFFIC VOLUMES AND LANE CONFIGURATIONS

figure 4



EXISTING PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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figure 5

TABLE 7
EXISTING INTERSECTION LEVELS OF SERVICE

		AM Peak Hour				PM Peak Hour			
		Existing		Existing Plus Project		Existing		Existing Plus Project	
Intersection	**Control**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**
Kiernan Avenue (SR 219) / Tully Road	Signal	24.5	C	25.4	C	33.6	C	37.4	D
Kiernan Avenue (SR 219) / Industrial access	NB/SB Stop								
Northbound approach		12.2	B	12.3	B	13.7	B	14.3	B
Kiernan Avenue (SR 219) / Pentecost Dr	SB Stop								
Southbound approach		15.4	C	16.2	C	14.0	B	14.1	B
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	Signal	33.0	C	37.7	D	45.9	D	46.6	D
Tully Road / Project Access	WB Stop								
Westbound approach				22.4	C			16.5	C

TABLE 8
EXISTING 95th PERCENTILE QUEUES AT INTERSECTIONS

			AM Peak Hour				PM Peak Hour			
			Existing		Existing Plus Project		Existing		Existing Plus Project	
Intersection	Lane	Storage (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)
Kiernan Avenue (SR 219) / Tully Road	NB left	275	120	150	122	155	170	200	187	220
	NB Thru		25	25	26	25	175	105	180	110
	WB left	670	90	40	168	80	185	85	195	90
Kiernan Avenue (SR 219) / Industrial access	NB approach		5	<25	8	<25	5	<25	22	<25
Kiernan Avenue (SR 219) / Pentecost Drive	EB left turn	830	100	<25	100	<25	70	<25	70	<25
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	NB left	140[2]	127	230	179	365	197	315	204	345
	EB left	765	93	80	94	80	121	115	126	125
Tully Road / Project access	SB left				96	<25			12	<25
	WB approach				22	<25			147	35

[1] lane continues as TWLT lane for another 600 feet

[2] lane continues as continuous TWLT along McHenry Ave

EXISTING PLUS APPROVED PROJECTS (EPAP) CONDITIONS

Approach

The effects of the proposed project have also been considered within the contexts of a short term future condition which assumes that other approved projects are occupied.

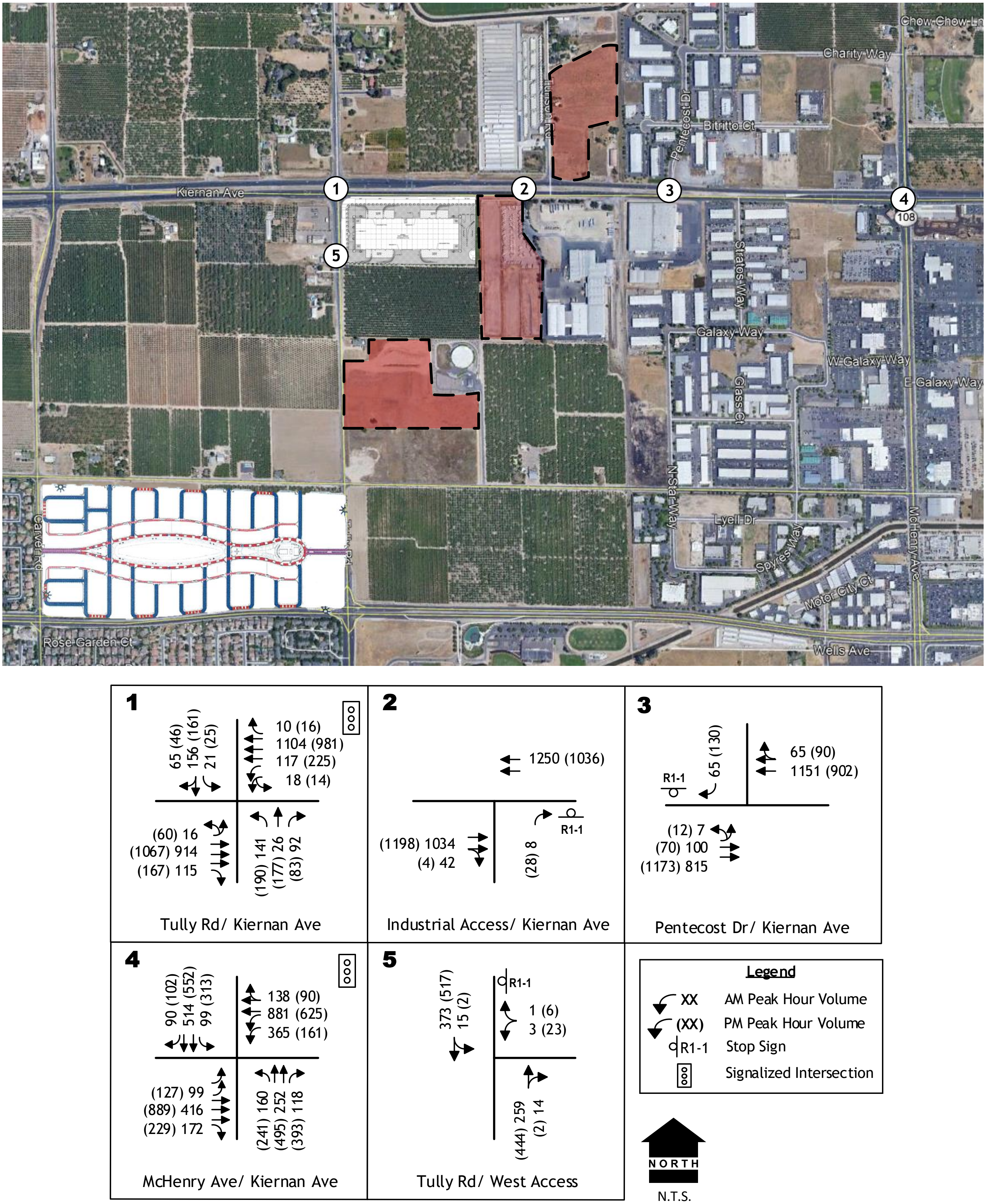
Land Use. Stanislaus County and City of Modesto staff were contacted to identify approved projects in the study area. Figure 6 identifies the locations of these projects that are summarized in Table 9.

TABLE 9
APPROVED PROJECTS

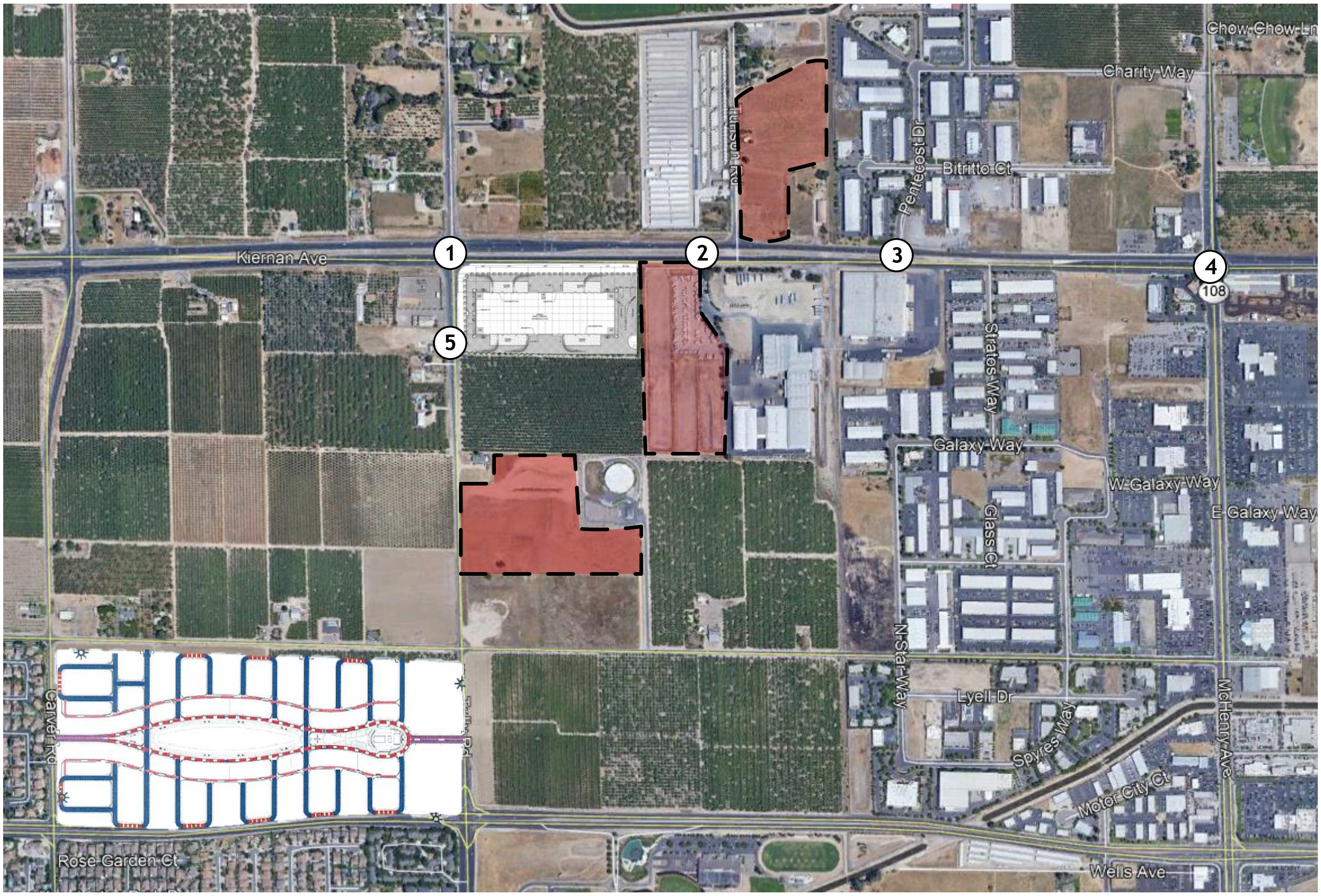
Name	Description	Trip Generation		
		Daily	AM Peak Hour	PM Peak Hour
Stanislaus County Projects				
Libitzky (PLN2018-0082)	96 ksf Industrial east of proposed project	476	67	60
Derrell's Mini-Storage (PLN2019-0077)	256 ksf ministorage expansion north of Kiernan Avenue	400	26	44
Holy Family Church[1]	Church with 634 seats at 4524 Tully Road	387	6	59
City of Modesto Projects				
Woodglen[2]	543 unit subdivision located between Tully Road and Carver Avenue	4,638	370	472

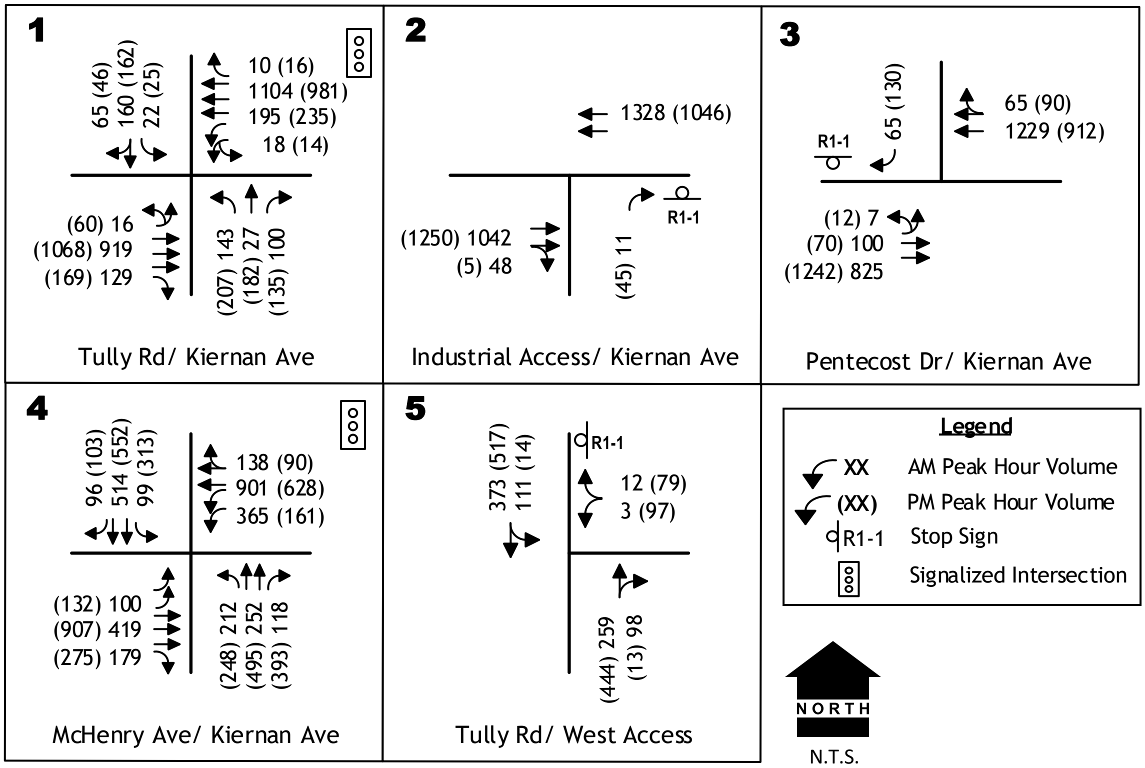
[1] Traffic Impact Analysis for Holy Family Church, KDA, June 2014
[2] Traffic Impact Analysis for Woodglen Residential Plan, KDA September 2007

Traffic Volumes. The trips associated with each approved project were assigned to the study area street system based on the assumptions made in each respective traffic study. Resulting Existing Plus Approved Projects (EPAP) volumes are noted in Figure 6, while Figure 7 presents the sum of EPAP and project volumes.



EXISTING PLUS APPROVED PROJECTS
TRAFFIC VOLUMES AND LANE CONFIGURATIONS





EPAP PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

EPAP PLUS Project Traffic Conditions

Levels of Service. Resulting Levels of Service were then calculated for study intersections and street segments under these conditions. As noted in Table 10, the addition of project trips does not result in any location operating with Level of Service that exceeds the LOS D minimum.

95th % Queues. The introduction of project traffic will increase the length of 95th percentile queues occurring during peak periods in key turn lanes, as noted in Table 11. However, at no location do the projected queue lengths exceed available storage.

Traffic Signal Warrants. The addition of project trips does not result in any new location where an unsignalized intersection carried volumes that reached the level which would satisfy peak hour warrants.

TABLE 10
EXISTING PLUS APPROVED PROJECT (EPAP) INTERSECTION LEVELS OF SERVICE

		AM Peak Hour				PM Peak Hour			
		Existing Plus Approved Projects		EPAP Plus Project		Existing Plus Approved Projects		EPAP Plus Project	
Intersection	**Control**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**
Kiernan Avenue (SR 219) / Tully Road	Signal	28.1	C	30.0	C	43.7	D	49.2	D
Kiernan Avenue (SR 219) / Industrial access Northbound approach	NB/SB Stop	13.0	B	13.1	B	14.3	B	15.2	C
Kiernan Avenue (SR 219) / Pentecost Drive Southbound approach	SB Stop	15.9	C	16.8	C	15.6	C	15.7	C
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	Signal	37.3	D	42.6	D	51.1	D	51.9	D
Tully Road / Project access Westbound approach	WB Stop	11.9	B	12.0	B	14.9	B	20.3	C

TABLE 11
EXISTING PLUS APPROVED PROJECTS (EPAP) 95th PERCENTLE QUEUES AT INTERSECTIONS

Intersection	Lane	Storage (feet)	AM Peak Hour				PM Peak Hour			
			Existing Plus Approved Projects		EPAP Plus Project		Existing Plus Approved Projects		EPAP Plus Project	
			Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)	Volume (vph)	95th % Queue (feet)
Kiernan Avenue (SR 219) / Tully Road	NB left	275	141	175	143	180	190	235	207	255
	NB Thru		26	25	27	25	177	115	182	115
	WB left	670	135	55	213	110	239	125	249	130
Kiernan Avenue (SR 219) / Industrial access	NB approach		8	<25	11	<25	28	<25	45	<25
Kiernan Avenue (SR 219) / Pentecost Dr	EB left turn	830	107	<25	107	25	82	<25	82	<25
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	NB left	140[2]	160	315	212	445	241	450	248	465
	EB left	765	99	85	100	85	127	135	132	140
Tully Road / Project access	SB left		15	<25	111	<25	2	<25	14	<25
	WB approach		4	<25	15	<25	29	<25	176	60

[1] lane continues as TWLT lane for another 600 feet

[2] lane continues as continuous TWLT along McHenry Ave

CUMULATIVE YEAR 2040 CONDITIONS

Background Assumptions

The analysis of conditions twenty years in the future (i.e., 2040) was prepared to assess the adequacy of traffic operations at study intersections and site access under long-term conditions. The long-term scenario addresses the effects of both regional circulation improvements and county-wide development.

Approach. The analysis makes use of the regional travel demand forecasting model created for NCC EIR and subsequently modified for the City of Riverbank's Crossroads West Specific Plan EIR. It is reasonable to include Crossroads West in this analysis as this large project lies immediately north of Claribel Road east of the study area.

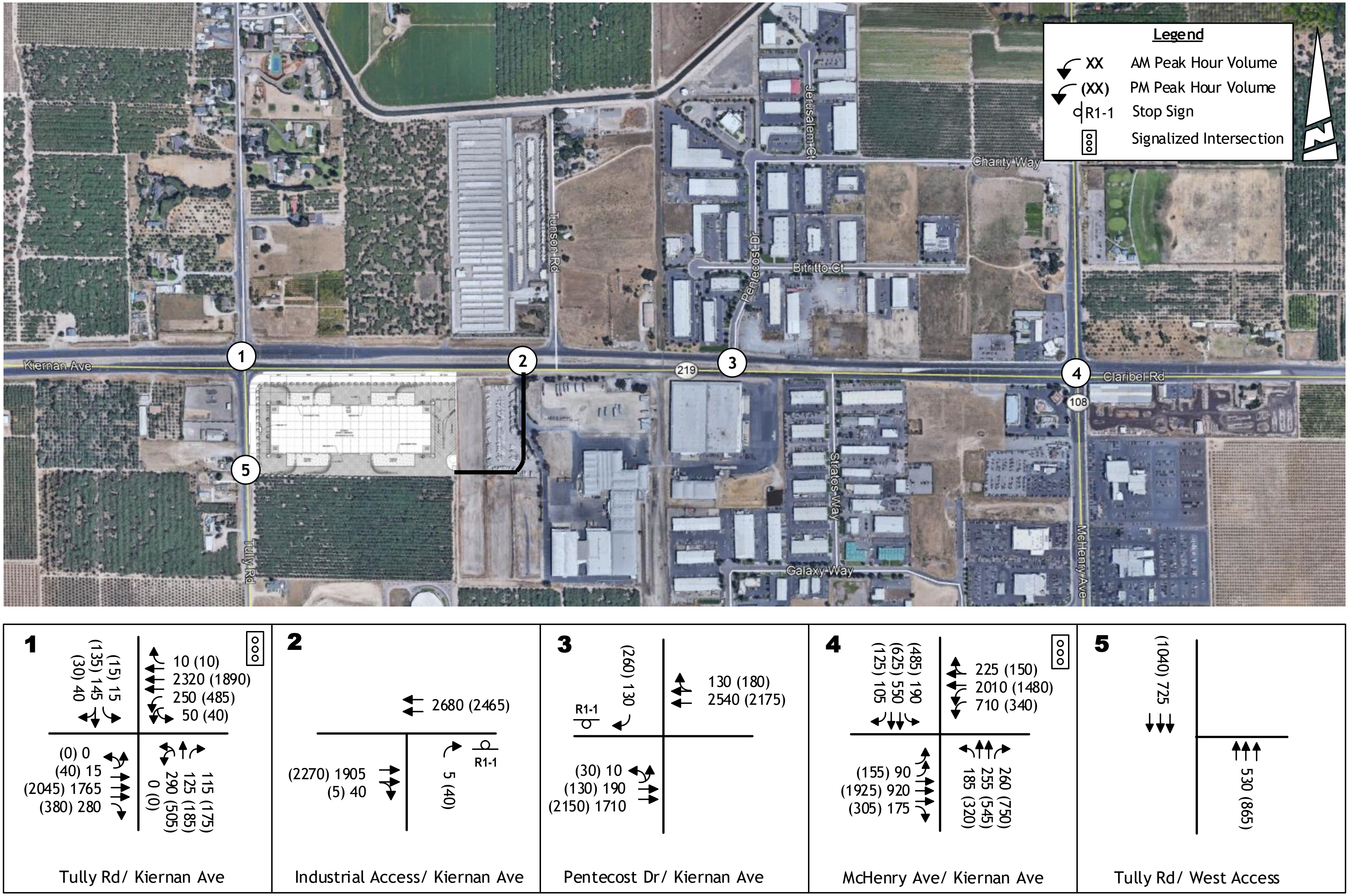
Circulation System Improvements. The cumulative analysis reflects the major improvements planned anticipated the north Modesto area develops. Primarily, the Kiernan Avenue / Tully Road intersection is expected to be improved to the City of Modesto's adopted layout for the intersection of a 6 lane primary arterial on a six lane expressway (i.e., Standard Detail 361). While Kiernan Avenue has already been improved to this standard, Tully Road will be widened to provide dual left turn lanes, three through lanes and a separate right turn lane.

The NCC plan suggests additional long-term improvements that may be made if funds eventually become available for the final project phases. These improvements include elimination of unsignalized access to SR 219 and the development of various local street extensions to link affected properties with other Arterial. Because the latter phases of NCC are unlikely to be implemented in the foreseeable future, this analysis assumes access to SR 219 remains under cumulative conditions.

Implementing the City of Modesto standards would affect the feasibility of project access onto Tully Road. The standard detail includes a raised median that extends south from Kiernan Avenue for more than 500 feet. The median would preclude development of a southbound left turn lane to serve the project access, and outbound left turns across three travel lanes would be problematic. Under long term conditions it has been assumed that site access on Tully Toad would be limited to right turns in and out only.

Traffic Volume Forecasts. Background traffic volume forecasts were created using the traffic model created for the NCC EIR and subsequently modified to the City of Riverbank's Crossroads West Specific Plan EIR. For this analysis an incremental approach was taken for creating study area traffic volumes. The baseline model version and Year 2042 model with Crossroads West land uses and streets included were rerun. Daily intersection approach volumes were identified on each intersection approach, and 20 year growth factors were calculated. These growth factors were then applied to current peak hour traffic volumes, and the results were balanced using the "Furness" techniques from the Transportation Research Board's (TRB) NCHRP Report 255, *Highway Traffic Data for Urbanized Area Project Planning and Design.* Figure 8 presents resulting cumulative conditions without the project.

Project trips were superimposed onto the base Cumulative volumes (Figure 8) to create the Cumulative plus Project volumes presented in Figure 9. As indicated, project trips as well as trips associated with the approved adjoining use were reassigned to reflect the turn limitation that will occur at the Tully Road access (i.e., right turns only).



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CUMULATIVE TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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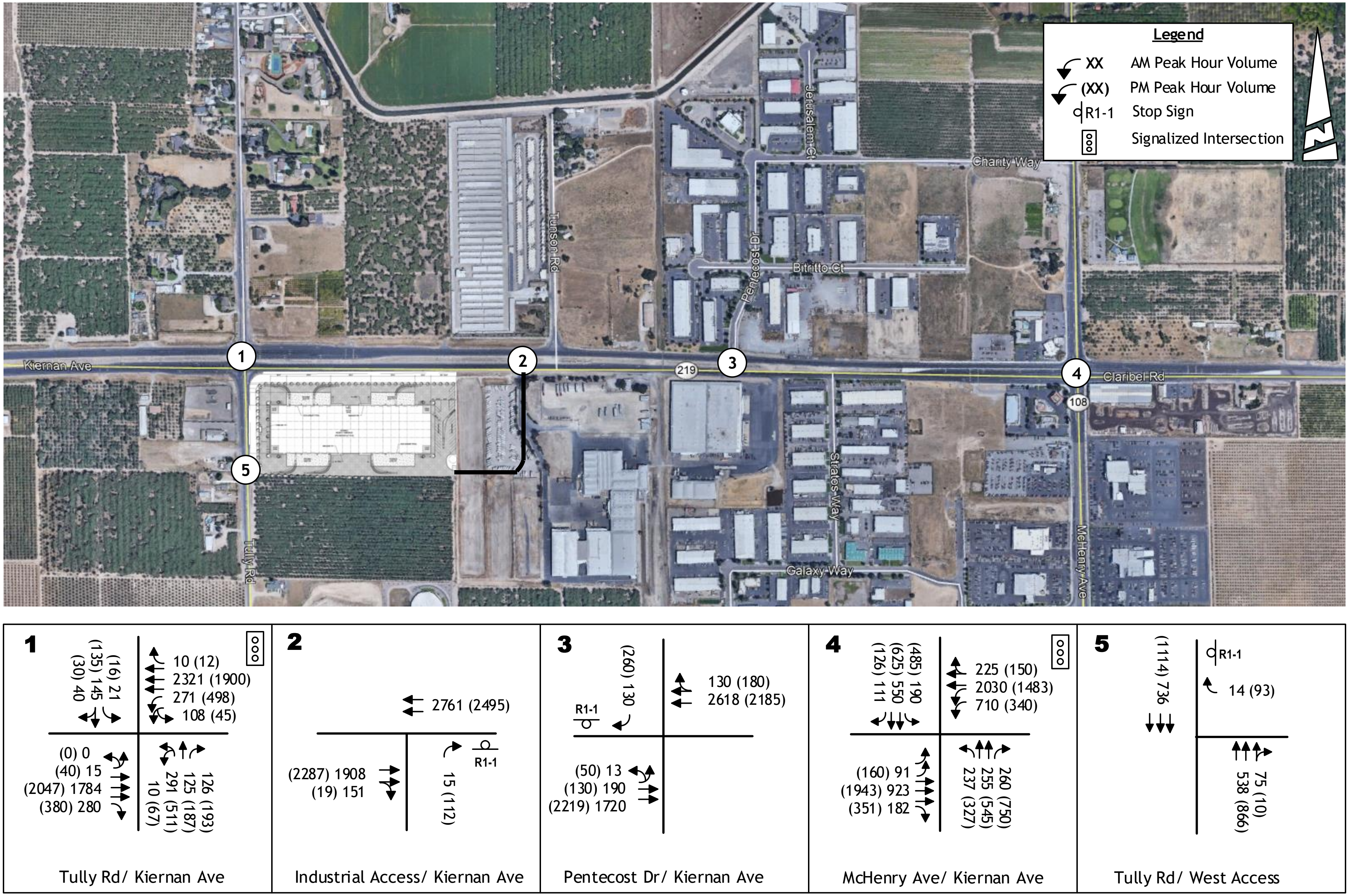
figure 8



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CUMULATIVE PLUS PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

4530-001 RA 2/4/2021

figure 9

Cumulative Year 2040 Traffic Operations

Intersection Level of Service. Table 12 compares Year 2040 peak hour traffic conditions with and without the proposed project. As shown, no signalized intersections are projected to operate with Level of Service that exceed the General Plan LOS D standard. However, long delays may occur on the side street approach at the Pentecost Drive access where vehicles will wait to turn onto SR 219, and LOS F is projected whether the proposed project proceeds or not. Ultimately the latter phases of the NCC project address this issue by construing alternative routes to other Arterial streets for affected properties. At the project's Kiernan Avenue access the projected Level of Service with proposed project traffic is also LOS F on the northbound project exit. This issue may be addressed in the design of the access intersection treatment to further facilitate turns or eventually, implementing the latter phases of NCC.

95th Percentile Queues. Table 13 summarizes projected queue lengths at study area turn lanes. As indicated, with one exception all 95th percentile queues can be contained within the anticipated turn lane storage. On northbound Tully Road the left turn lane queue is projected to exceed the standard 300 foot turn lane length. This issue will need to be considered when the intersection is constructed to its ultimate layout.

TABLE 12
YEAR 2040 CUMULATIVE PLUS PROJECT INTERSECTION LEVELS OF SERVICE

		AM Peak Hour				PM Peak Hour			
		No Project		Plus Project		No Project		Plus Project	
Intersection	**Control**	**Average Delay (sec)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**	**Average Delay (sec/veh)**	**LOS**
Kiernan Avenue (SR 219) / Tully Road	Signal	47.8	D	50.3	D	48.7	D	54.5	D
Kiernan Avenue (SR 219) / Industrial access Northbound approach	NB/SB Stop	21.3	C	23.9	C	31.4	D	**65.5**	**F**
Kiernan Avenue (SR 219) / Pentecost Drive Southbound approach	SB Stop	162.8	F	190.7	F	**<300**	**F**	**<300**	**F**
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	Signal	17.1	B	17.7	B	32.4	C	38.6	D
Tully Road / Project access Westbound approach	WB Stop	-		11.5	B	-		15.0	C

TABLE 13
YEAR 2040 CUMULATIVE PLUS PROJECT 95th PERCENTLE QUEUES AT INTERSECTIONS

Intersection	**Lane**	**Storage (feet)**	**AM Peak Hour**				**PM Peak Hour**			
			No Project		**Plus Project**		**No Project**		**Plus Project**	
			Volume (vph)	**95th % Queue (feet)**	**Volume (vph)**	**95th % Queue (feet)**	**Volume (vph)**	**95th % Queue (feet)**	**Volume (vph)**	**95th % Queue (feet)**
Kiernan Avenue (SR 219) / Tully Road	NB left	300	290	245	301	250	505	**400**	578	**465**
	WB left	670	300	240	379	290	525	420	543	440
Kiernan Avenue (SR 219) / Industrial access	NB approach		5	<25	15	<25	40	25	22	105
Kiernan Avenue (SR 219) / Pentecost Dr	EB left turn	830	200	370	203	405	160	180	180	225
Kiernan Avenue (SR 219) / McHenry Avenue (SR 108)	NB left	140[1]	185	-	237	-	320	-	327	-
	EB left	765	90	95	91	95	155	140	160	155
Tully Road / Project access	WB approach				14	<25			93	<25

[1] lane continues as continuous TWLT along McHenry Ave / queue length calculation not supported by Synchro for single point interchange

Bold values exceed storage

PROJECT ACCESS AND CIRCULATION

SR 219 (Kiernan Avenue) Access

Background. The project proposes to make use on an existing 30 foot encroachment on SR 219 (Kiernan Avenue) located roughly 1,750 feet east of Tully Road. This driveway is currently used by the existing industrial use and RV Storage. The RV Storage will be replaced by an approved 96,000 sf industrial building, as noted in the discussion of Approved projects. That project was conditioned by Stanislaus County to install a raised "pork chop" island in the driveway in order to enforce the existing right turn only limitation. That island has not been designed, and the extent to which the 30 foot opening will need to be widened has not been determined.

Project Effects. The proposed project will increase the volume of traffic using the driveway, and it is very likely that this access will be the point of entry for large trucks arriving from SR 99. Trucks returning to SR 99 are more likely to turn directly onto Tully Road than to use this driveway. Because a center median is eventually expected on Tully Road, the feasibility of other truck access from SR 99 is limited. However, as noted in the cumulative analysis, in the long term the increase traffic volume on Kieran Avenue will make it difficult for employees to turn right onto eastbound SR 219 (i.e., LOS F for exiting traffic). In turn, those delays will result in northbound queuing on site at the driveway. With implementation of the approved project the driveway throat is estimated to be roughly 280 feet long. As noted in the cumulative analysis, the anticipated peak period queue is 105 feet.

Assessment / Recommendation. The layout of the existing driveway itself is not conducive to truck access on a high-speed expressway, but there are mitigating factors. While separate deceleration and acceleration lanes are not provided, the paved shoulder along SR 219 in this area is 12 feet. This area can be used by trucks assuming that the pavement section is adequate for truck traffic.

Installing the right turn only driveway median will change the situation slightly. As is evident at the Tunsen Road encroachment on the north side of SR 219 directly opposite this location, additional widening is needed to accommodate the turning requirements of trucks outside of the median area. Incorporation of a similar design that is sized to handle the applicable design vehicle is recommended. However, it is likely that this feature will require widening the encroachment beyond the existing 30 feet, and if so, and a modification to the existing encroachment permit or a new permit may be required.

Tully Road Access

Description / Background. The project proposes access to Tully Road in a location at the southern property limit roughly 600 feet beyond Kiernan Avenue. A TWLT lane exists in this area and continues to the south for another 250 feet. A private driveway is generally opposite the project access. The driveway is 40 feet wide and proposes 50foot return radii. Measured from the existing edge of pavement on Tully Road, the driveway throat extends for roughly 90 feet before it reaches a point where inbound traffic might pause before turning left into the on-site parking supply.

Because this portion of Tully Road is within the City's Sphere of Influence Stanislaus County generally defers to the City of Modesto for guidance on access design. In this case, the ultimate plan for Tully Road / Kiernan Avenue improvements is guided by standard plan detail No. 361 which indicates the length of turn lanes and transitions. That detail indicates that the combination of northbound left turn lanes and their transition areas will extend for roughly 600 feet.

Assessment / Conclusions. While right turn only access will ultimately be required, the feasibility of full access on an interim basis has been assessed. Full access would be desirable as it would minimize the number of northbound to southbound u-turns added at the Kiernan Avenue / Tully Road intersection. The evaluation considered the availability of adequate sight distance, the LOS provided at the driveway, the extent of conflicts with traffic using other existing driveways and throat depth.

As noted earlier, the ***minimum stopping sight distance*** at Tully Road's 35 mph speed limit is 300 feet. As the view is clear to Kiernan Avenue from the proposed driveway, that requirement is satisfied looking north and south.

As noted in the assessment of EPAP plus Project traffic operations the peak hour **Level of Service** for motorists at the driveway intersection is LOS C or better, which satisfies the minimum LOS D standard. Thus, this criteria is satisfied.

There are five existing driveways on the west side of Tully Road in the area within 300 feet of north or south of the proposed access. With the exception of Landmark Missionary Baptist Church, all are rural industrial / residential uses generating limited traffic. The Church could have peak traffic before and after Sunday services, but that would likely be a time period of limited activity at the proposed project. ***Conflicts*** with the opposite side driveways should not be an issue.

The left turn area between Kiernan Avenue and the project access provides room for ***concurrent left turns*** at the traffic signal and at the project access. Under EPAP plus Project conditions the northbound left turn lane queue at Kiernan Avenue reaches 180 feet in the a.m. peak hour and 255 feet in the p.m. peak hour. While the HCM analysis suggests a very short southbound queue at the project access (i.e., <25 feet), the probable storage needed has been suggested based on Caltrans guidelines for rural left turn lanes. Assuming storage for a two-minute accumulation of peak hour vehicles, the 111 left turns expected in the a.m. peak hour could justify storage for six vehicles or 150 feet. The sum of worst case northbound and southbound queues (i.e., 150 + 255 feet) can be accommodated in the area between the driveway and Kiernan Avenue.

The ***driveway throat*** is the area available for exiting vehicles to wait approaching Tully Road without interfering with the route of entering traffic. The queue of exiting vehicles could extend for about 90 feet before reaching a point that entering traffic might need to stop before turning left towards the employee parking area. The adequacy of the depth is dependent on the estimated queue length.

As noted in the discussion of EPAP Plus Project conditions, the 95th percentile queue in the driveway during the p.m. peak hour is 60 feet. This would represent 2 to 3 vehicles waiting, and a queue of this length would not exceed the 90 foot throat depth block entering traffic. However, a truck takes up 75 feet so, occasionally adding a truck as part of a three vehicle queue could result in a total of 125 feet. However, review of the site plan reveals that pavement exists to maneuver around a 125 foot queue and still reach the employee parking area. Because inbound traffic is relatively limited during the p.m. peak hour (i.e., 24 vehicles per hour) the throat depth would be adequate.

Overall, full access will be feasible in the near term. As with an “interim” condition, background traffic on Tully Road would eventually reach the level that the driveway LOS reached an unacceptable level and the exiting queue became a problem.

APPENDIX

Prepared by National Data & Surveying Services

Tully Rd & SR 219/Kiernan Ave

Peak Hour Turning Movement Count

ID: 20-090176-001
City: Modesto

Day: Tuesday
Date: 11/17/2020

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM

Tully Rd SOUTHBOUND

	↲	↓	↳	U	⇧
AM	41	17	18	0	21
NOON	0	0	0	0	0
PM	21	28	13	0	54
	0	0	0	0	

SR 219/Kiernan Ave EASTBOUND

	AM	NOON	PM	
⇦	1019	0	1013	
U	0	0	1	0
↱	15	0	37	0
→	711	0	966	0
↴	63	0	22	0

SR 219/Kiernan Ave WESTBOUND

		PM	NOON	AM
0	↰	12	0	5
0	←	822	0	937
0	↙	38	0	28
0	U	32	0	30
	⇨	1022	0	769

CONTROL

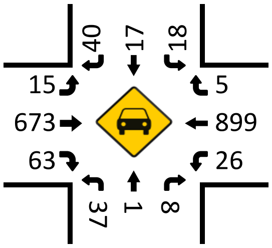
Signalized

	AM	NOON	PM
TEV	1917	0	2177
PHF	0.90		0.95

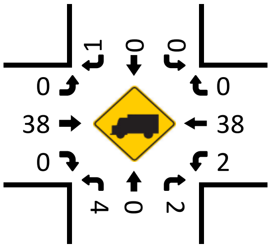
Tully Rd NORTHBOUND

	⇩	U	↰	↑	↱
		0	0	0	0
PM	88	0	169	5	11
NOON	0	0	0	0	0
AM	108	0	41	1	10

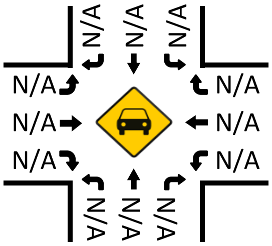
Cars (AM)



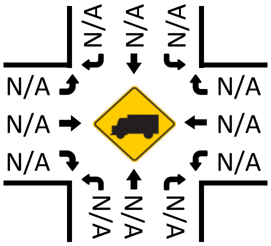
HT (AM)



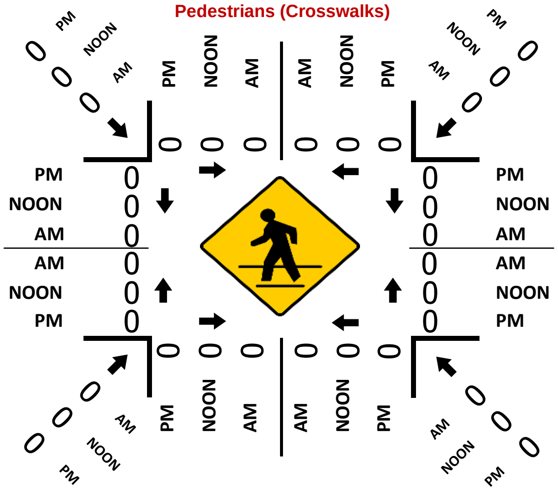
Cars (NOON)



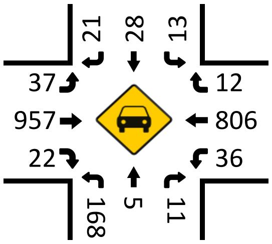
HT (NOON)



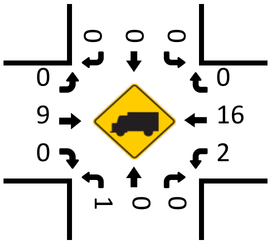
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Tully Rd & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-001
Date: 11/17/2020

Total

NS/EW Streets:	Tully Rd				Tully Rd				SR 219/Kiernan Ave				SR 219/Kiernan 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	10	1	3	0	2	1	6	0	7	125	4	0	1	187	0	5	352
7:15 AM	5	1	1	0	7	5	6	0	0	151	7	0	4	212	1	4	404
7:30 AM	8	1	2	0	3	3	11	0	5	182	13	0	7	262	1	7	505
7:45 AM	7	0	1	0	7	7	10	0	4	190	21	0	8	276	1	3	535
8:00 AM	13	0	5	0	4	2	10	0	4	167	17	0	7	211	3	10	453
8:15 AM	13	0	2	0	4	5	10	0	2	172	12	0	6	188	0	10	424
8:30 AM	13	1	2	0	2	3	7	1	3	148	8	0	14	196	3	1	402
8:45 AM	7	0	5	0	5	3	5	0	3	166	14	0	5	191	2	2	408
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	76	4	21	0	34	29	65	1	28	1301	96	0	52	1723	11	42	3483
APPROACH %'s :	75.25%	3.96%	20.79%	0.00%	26.36%	22.48%	50.39%	0.78%	1.96%	91.30%	6.74%	0.00%	2.84%	94.26%	0.60%	2.30%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	41	1	10	0	18	17	41	0	15	711	63	0	28	937	5	30	1917
PEAK HR FACTOR :	0.788	0.250	0.500	0.000	0.643	0.607	0.932	0.000	0.750	0.936	0.750	0.000	0.875	0.849	0.417	0.750	0.896
	0.722				0.792				0.917				0.868				

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	29	1	2	0	5	5	10	0	5	244	12	0	10	194	1	7	525
4:15 PM	19	0	4	0	2	5	10	0	8	244	7	0	11	198	4	5	517
4:30 PM	37	1	3	0	1	4	5	0	7	226	4	1	14	200	2	11	516
4:45 PM	28	0	4	0	5	4	5	0	8	237	8	0	5	217	1	8	530
5:00 PM	56	1	3	0	3	9	4	0	13	251	6	0	11	188	3	8	556
5:15 PM	48	3	1	0	4	11	7	0	9	252	4	0	8	217	6	5	575
5:30 PM	24	1	2	0	2	7	4	0	9	210	10	0	8	189	4	9	479
5:45 PM	18	1	0	0	0	4	5	0	5	170	2	1	4	170	2	2	384
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	259	8	19	0	22	49	50	0	64	1834	53	2	71	1573	23	55	4082
APPROACH %'s :	90.56%	2.80%	6.64%	0.00%	18.18%	40.50%	41.32%	0.00%	3.28%	93.91%	2.71%	0.10%	4.12%	91.35%	1.34%	3.19%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	169	5	11	0	13	28	21	0	37	966	22	1	38	822	12	32	2177
PEAK HR FACTOR :	0.754	0.417	0.688	0.000	0.650	0.636	0.750	0.000	0.712	0.958	0.688	0.250	0.679	0.947	0.500	0.727	0.947
	0.771				0.705				0.950				0.958				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Tully Rd & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-001
Date: 11/17/2020

Cars

NS/EW Streets:	Tully Rd				Tully Rd				SR 219/Kiernan Ave				SR 219/Kiernan 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	10	1	3	0	2	1	6	0	7	116	4	0	1	180	0	4	335
7:15 AM	5	1	1	0	7	5	6	0	0	137	7	0	4	202	1	4	380
7:30 AM	5	1	1	0	3	3	11	0	5	169	13	0	6	252	1	7	477
7:45 AM	6	0	1	0	7	7	10	0	4	180	21	0	7	267	1	3	514
8:00 AM	13	0	5	0	4	2	10	0	4	160	17	0	7	202	3	9	436
8:15 AM	13	0	1	0	4	5	9	0	2	164	12	0	6	178	0	9	403
8:30 AM	12	1	2	0	2	3	7	1	3	136	8	0	14	186	3	0	378
8:45 AM	7	0	5	0	5	3	5	0	3	158	14	0	5	182	2	2	391
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	71	4	19	0	34	29	64	1	28	1220	96	0	50	1649	11	38	3314
APPROACH %'s :	75.53%	4.26%	20.21%	0.00%	26.56%	22.66%	50.00%	0.78%	2.08%	90.77%	7.14%	0.00%	2.86%	94.34%	0.63%	2.17%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	37	1	8	0	18	17	40	0	15	673	63	0	26	899	5	28	1830
PEAK HR FACTOR :	0.71	0.250	0.400	0.000	0.643	0.607	0.909	0.000	0.750	0.935	0.750	0.000	0.929	0.842	0.417	0.778	0.890
		0.639				0.781				0.916				0.862			

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	29	1	2	0	5	5	9	0	5	236	11	0	10	187	1	7	508
4:15 PM	18	0	3	0	2	5	9	0	8	241	7	0	11	194	4	5	507
4:30 PM	36	1	3	0	1	4	5	0	7	223	4	1	12	194	2	11	504
4:45 PM	28	0	4	0	5	4	5	0	8	233	8	0	5	215	1	8	524
5:00 PM	56	1	3	0	3	9	4	0	13	251	6	0	11	183	3	8	551
5:15 PM	48	3	1	0	4	11	7	0	9	250	4	0	8	214	6	5	570
5:30 PM	24	1	2	0	2	7	4	0	9	205	10	0	8	182	4	9	467
5:45 PM	18	1	0	0	0	4	4	0	5	167	2	1	4	168	2	2	378
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	257	8	18	0	22	49	47	0	64	1806	52	2	69	1537	23	55	4009
APPROACH %'s :	90.81%	2.83%	6.36%	0.00%	18.64%	41.53%	39.83%	0.00%	3.33%	93.87%	2.70%	0.10%	4.10%	91.27%	1.37%	3.27%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	168	5	11	0	13	28	21	0	37	957	22	1	36	806	12	32	2149
PEAK HR FACTOR :	0.75	0.417	0.688	0.000	0.650	0.636	0.750	0.000	0.712	0.953	0.688	0.250	0.750	0.937	0.500	0.727	0.943
		0.767				0.705				0.942				0.951			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Tully Rd & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-001
Date: 11/17/2020

HT

NS/EW Streets:	Tully Rd				Tully Rd				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	0	0	0	9	0	0	0	7	0	1	17
7:15 AM	0	0	0	0	0	0	0	0	0	14	0	0	0	10	0	0	24
7:30 AM	3	0	1	0	0	0	0	0	0	13	0	0	1	10	0	0	28
7:45 AM	1	0	0	0	0	0	0	0	0	10	0	0	1	9	0	0	21
8:00 AM	0	0	0	0	0	0	0	0	0	7	0	0	0	9	0	1	17
8:15 AM	0	0	1	0	0	0	1	0	0	8	0	0	0	10	0	1	21
8:30 AM	1	0	0	0	0	0	0	0	0	12	0	0	0	10	0	1	24
8:45 AM	0	0	0	0	0	0	0	0	0	8	0	0	0	9	0	0	17
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	5	0	2	0	0	0	1	0	0	81	0	0	2	74	0	4	169
APPROACH %'s :	71.43%	0.00%	28.57%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	2.50%	92.50%	0.00%	5.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	4	0	2	0	0	0	1	0	0	38	0	0	2	38	0	2	87
PEAK HR FACTOR :	0.333	0.000	0.500	0.000	0.000	0.000	0.250	0.000	0.000	0.731	0.000	0.000	0.500	0.950	0.000	0.500	0.777
	0.375				0.250				0.731				0.955				

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	0	0	1	0	0	8	1	0	0	7	0	0	17
4:15 PM	1	0	1	0	0	0	1	0	0	3	0	0	0	4	0	0	10
4:30 PM	1	0	0	0	0	0	0	0	0	3	0	0	2	6	0	0	12
4:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	2	0	0	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	3	0	0	5
5:30 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	7	0	0	12
5:45 PM	0	0	0	0	0	0	1	0	0	3	0	0	0	2	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	2	0	1	0	0	0	3	0	0	28	1	0	2	36	0	0	73
APPROACH %'s :	66.67%	0.00%	33.33%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	96.55%	3.45%	0.00%	5.26%	94.74%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	1	0	0	0	0	0	0	0	0	9	0	0	2	16	0	0	28
PEAK HR FACTOR :	0.25	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563	0.000	0.000	0.250	0.667	0.000	0.000	0.583
	0.250								0.563				0.563				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Tully Rd & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-001
Date: 11/17/2020

Bikes

NS/EW Streets:	Tully Rd				Tully Rd				SR 219/Kiernan Ave				SR 219/Kiernan Ave				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
AM	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	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	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
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
										0.250							

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	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	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Tully Rd & SR 219/Kiernan Ave
City: Modesto

Project ID: 20-090176-001
Date: 11/17/2020

Pedestrians (Crosswalks)

NS/EW Streets:	Tully Rd		Tully Rd		SR 219/Kiernan Ave		SR 219/Kiernan 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	0	0	0	0	0
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	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

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	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

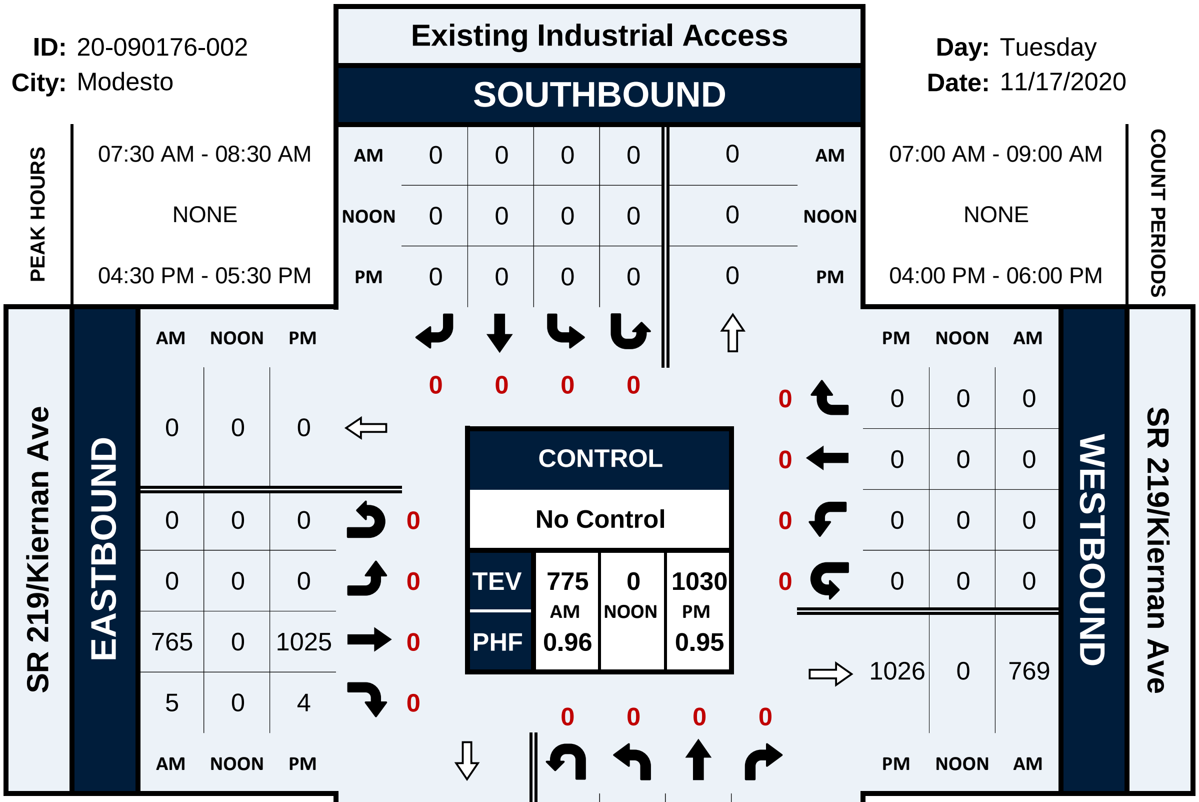
Existing Industrial Access & SR 219/Kiernan Ave

Peak Hour Turning Movement Count

ID: 20-090176-002
City: Modesto

Day: Tuesday
Date: 11/17/2020

PEAK HOURS		COUNT PERIODS
07:30 AM - 08:30 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:30 PM - 05:30 PM	PM	04:00 PM - 06:00 PM



Existing Industrial Access
SOUTHBOUND

	↲	↓	↳	U	⇧
AM	0	0	0	0	0
NOON	0	0	0	0	0
PM	0	0	0	0	0
	0	0	0	0	

SR 219/Kiernan Ave
EASTBOUND

	AM	NOON	PM	
⇦	0	0	0	
U	0	0	0	0
↱	0	0	0	0
→	765	0	1025	0
↴	5	0	4	0

SR 219/Kiernan Ave
WESTBOUND

		PM	NOON	AM
↰	0	0	0	0
←	0	0	0	0
↙	0	0	0	0
U	0	0	0	0
⇨		1026	0	769

CONTROL

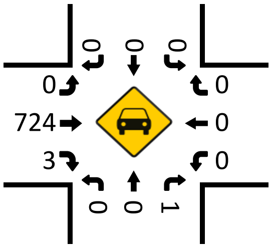
No Control

	AM	NOON	PM
TEV	775	0	1030
PHF	0.96		0.95

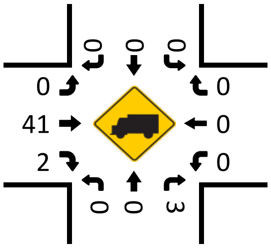
	⇩	U	↰	↑	↱
		0	0	0	0
PM	4	0	0	0	1
NOON	0	0	0	0	0
AM	6	1	0	0	4

NORTHBOUND
Existing Industrial Access

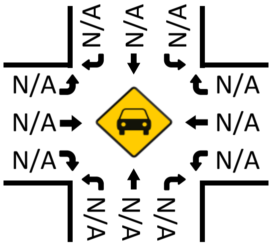
Cars (AM)



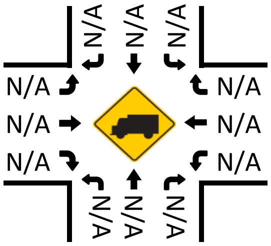
HT (AM)



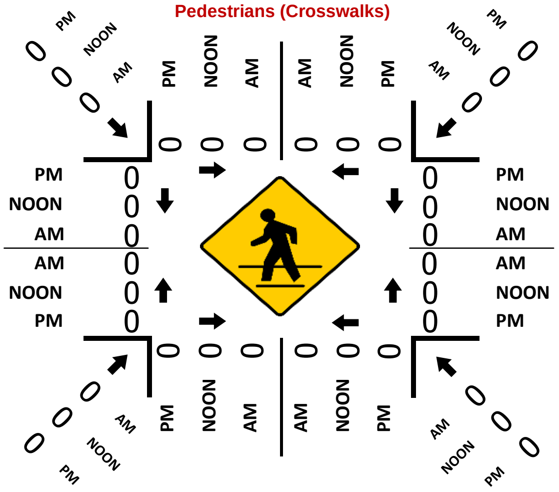
Cars (NOON)



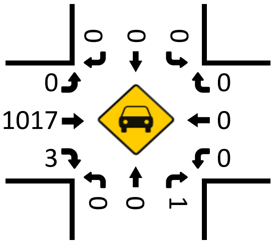
HT (NOON)



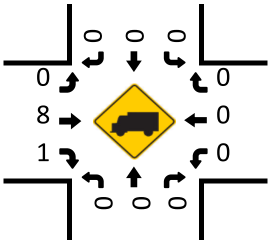
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Existing Industrial Access & SR 219/Kiernan Ave
City: Modesto
Control: No Control

Project ID: 20-090176-002
Date: 11/17/2020

Total

NS/EW Streets:	Existing Industrial Access				Existing Industrial Access				SR 219/Kiernan Ave				SR 219/Kiernan 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	3	0	0	0	0	0	0	133	6	0	0	0	0	0	142
7:15 AM	0	0	1	0	0	0	0	0	0	157	2	0	0	0	0	0	160
7:30 AM	0	0	1	0	0	0	0	0	0	198	1	0	0	0	0	0	200
7:45 AM	0	0	0	0	0	0	0	0	0	201	0	0	0	0	0	0	201
8:00 AM	0	0	1	0	0	0	0	0	0	176	2	0	0	0	0	0	179
8:15 AM	0	0	2	1	0	0	0	0	0	190	2	0	0	0	0	0	195
8:30 AM	0	0	2	0	0	0	0	0	0	155	1	0	0	0	0	0	158
8:45 AM	0	0	3	0	0	0	0	0	0	175	2	0	0	0	0	0	180
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	13	1	0	0	0	0	0	1385	16	0	0	0	0	0	1415
APPROACH %'s :	0.00%	0.00%	92.86%	7.14%					0.00%	98.86%	1.14%	0.00%					
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	0	0	4	1	0	0	0	0	0	765	5	0	0	0	0	0	775
PEAK HR FACTOR :	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.000	0.951	0.625	0.000	0.000	0.000	0.000	0.000	0.964
	0.417								0.958								

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	2	0	0	0	0	0	0	261	1	0	0	0	0	0	264
4:15 PM	0	0	4	0	0	0	0	0	0	251	1	0	0	0	0	0	256
4:30 PM	0	0	0	0	0	0	0	0	0	242	0	0	0	0	0	0	242
4:45 PM	0	0	0	0	0	0	0	0	0	249	2	0	0	0	0	0	251
5:00 PM	0	0	0	0	0	0	0	0	0	271	1	0	0	0	0	0	272
5:15 PM	0	0	1	0	0	0	0	0	0	263	1	0	0	0	0	0	265
5:30 PM	0	0	1	0	0	0	0	0	0	216	0	0	0	0	0	0	217
5:45 PM	0	0	2	0	0	0	0	0	0	168	1	0	0	0	0	0	171
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	10	0	0	0	0	0	0	1921	7	0	0	0	0	0	1938
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.64%	0.36%	0.00%					
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	0	1	0	0	0	0	0	0	1025	4	0	0	0	0	0	1030
PEAK HR FACTOR :	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.946	0.500	0.000	0.000	0.000	0.000	0.000	0.947
	0.250								0.946								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Existing Industrial Access & SR 219/Kiernan Ave
City: Modesto
Control: No Control

Project ID: 20-090176-002
Date: 11/17/2020

Cars

NS/EW Streets:	Existing Industrial Access				Existing Industrial Access				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	0	0	0	124	4	0	0	0	0	0	128
7:15 AM	0	0	0	0	0	0	0	0	0	144	2	0	0	0	0	0	146
7:30 AM	0	0	1	0	0	0	0	0	0	185	0	0	0	0	0	0	186
7:45 AM	0	0	0	0	0	0	0	0	0	191	0	0	0	0	0	0	191
8:00 AM	0	0	0	0	0	0	0	0	0	169	1	0	0	0	0	0	170
8:15 AM	0	0	0	1	0	0	0	0	0	179	2	0	0	0	0	0	182
8:30 AM	0	0	2	0	0	0	0	0	0	145	0	0	0	0	0	0	147
8:45 AM	0	0	0	0	0	0	0	0	0	167	1	0	0	0	0	0	168
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	3	1	0	0	0	0	0	1304	10	0	0	0	0	0	1318
APPROACH %'s :	0.00%	0.00%	75.00%	25.00%					0.00%	99.24%	0.76%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	1	1	0	0	0	0	0	724	3	0	0	0	0	0	729
PEAK HR FACTOR :	0.00	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.948	0.375	0.000	0.000	0.000	0.000	0.000	0.954
		0.500								0.952							

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	2	0	0	0	0	0	0	252	1	0	0	0	0	0	255
4:15 PM	0	0	4	0	0	0	0	0	0	248	0	0	0	0	0	0	252
4:30 PM	0	0	0	0	0	0	0	0	0	240	0	0	0	0	0	0	240
4:45 PM	0	0	0	0	0	0	0	0	0	245	2	0	0	0	0	0	247
5:00 PM	0	0	0	0	0	0	0	0	0	270	1	0	0	0	0	0	271
5:15 PM	0	0	1	0	0	0	0	0	0	262	0	0	0	0	0	0	263
5:30 PM	0	0	1	0	0	0	0	0	0	212	0	0	0	0	0	0	213
5:45 PM	0	0	1	0	0	0	0	0	0	164	1	0	0	0	0	0	166
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	9	0	0	0	0	0	0	1893	5	0	0	0	0	0	1907
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	99.74%	0.26%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	1	0	0	0	0	0	0	1017	3	0	0	0	0	0	1021
PEAK HR FACTOR :	0.00	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.942	0.375	0.000	0.000	0.000	0.000	0.000	0.942
		0.250								0.941							

National Data & Surveying Services

Intersection Turning Movement Count

Location: Existing Industrial Access & SR 219/Kiernan Ave
City: Modesto
Control: No Control

Project ID: 20-090176-002
Date: 11/17/2020

HT

NS/EW Streets:	Existing Industrial Access				Existing Industrial Access				SR 219/Kiernan Ave				SR 219/Kiernan 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	3	0	0	0	0	0	0	9	2	0	0	0	0	0	14
7:15 AM	0	0	1	0	0	0	0	0	0	13	0	0	0	0	0	0	14
7:30 AM	0	0	0	0	0	0	0	0	0	13	1	0	0	0	0	0	14
7:45 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	10
8:00 AM	0	0	1	0	0	0	0	0	0	7	1	0	0	0	0	0	9
8:15 AM	0	0	2	0	0	0	0	0	0	11	0	0	0	0	0	0	13
8:30 AM	0	0	0	0	0	0	0	0	0	10	1	0	0	0	0	0	11
8:45 AM	0	0	3	0	0	0	0	0	0	8	1	0	0	0	0	0	12
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	10	0	0	0	0	0	0	81	6	0	0	0	0	0	97
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	93.10%	6.90%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	3	0	0	0	0	0	0	41	2	0	0	0	0	0	46
PEAK HR FACTOR :	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.788	0.500	0.000	0.000	0.000	0.000	0.000	0.821
	0.375								0.768								

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	0	0	0	0	0	9	0	0	0	0	0	0	9
4:15 PM	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	4
4:30 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	4
5:45 PM	0	0	1	0	0	0	0	0	0	4	0	0	0	0	0	0	5
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	0	28	2	0	0	0	0	0	31
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	93.33%	6.67%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	8	1	0	0	0	0	0	9
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.000	0.563
									0.563								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Existing Industrial Access & SR 219/Kiernan Ave
City: Modesto
Control: No Control

Project ID: 20-090176-002
Date: 11/17/2020

Bikes

NS/EW Streets:	Existing Industrial Access				Existing Industrial Access				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	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
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

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	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Existing Industrial Access & SR 219/Kiernan Ave
City: Modesto
Project ID: 20-090176-002
Date: 11/17/2020

Pedestrians (Crosswalks)

NS/EW Streets:	Existing Industrial Access		Existing Industrial Access		SR 219/Kiernan Ave		SR 219/Kiernan 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	0	0	0	0	0
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	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

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	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

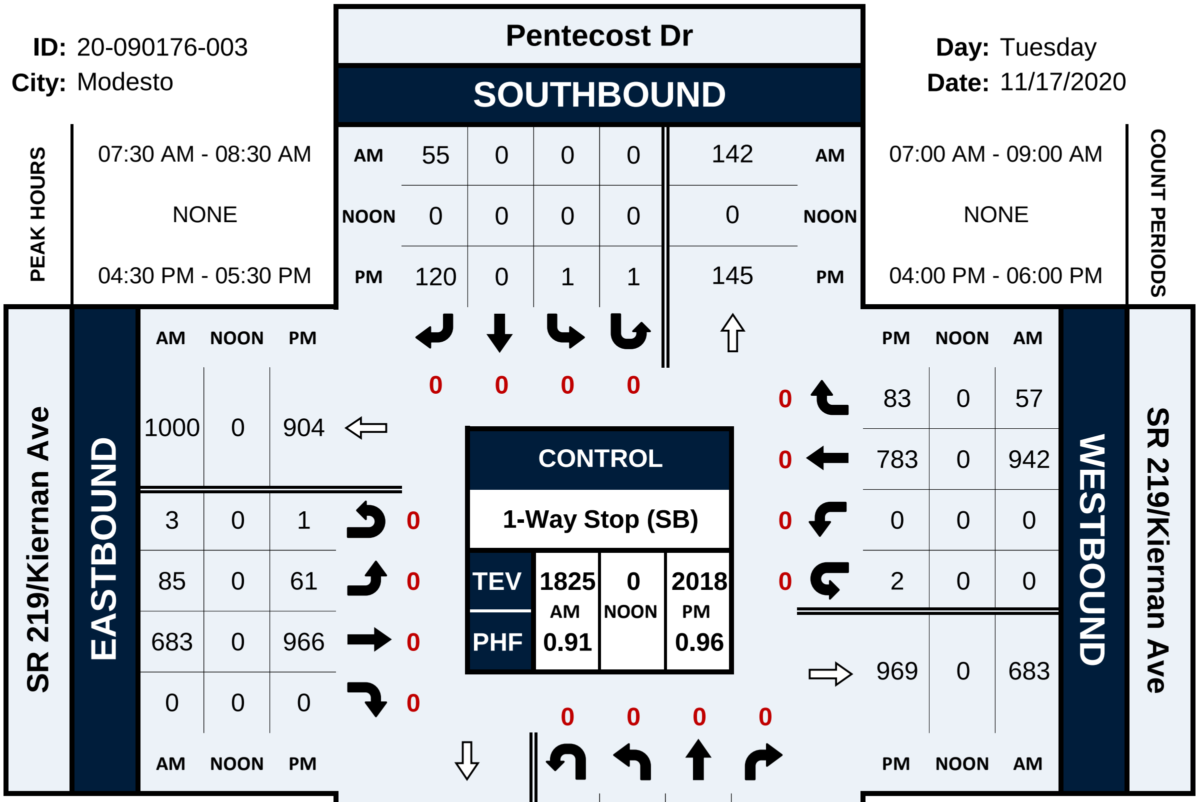
Pentecost Dr & SR 219/Kiernan Ave

Peak Hour Turning Movement Count

ID: 20-090176-003
City: Modesto

Day: Tuesday
Date: 11/17/2020

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
04:30 PM - 05:30 PM	04:00 PM - 06:00 PM

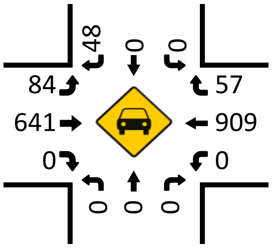


PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

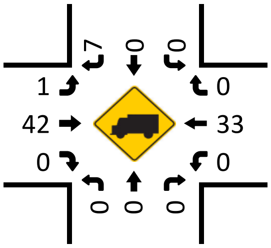
NORTHBOUND

Pentecost Dr

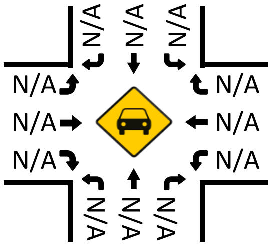
Cars (AM)



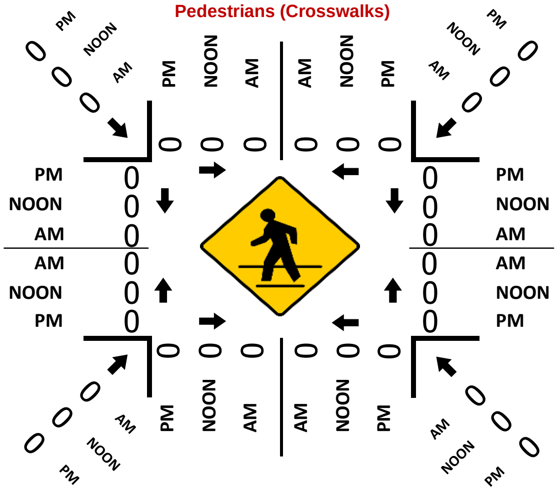
HT (AM)



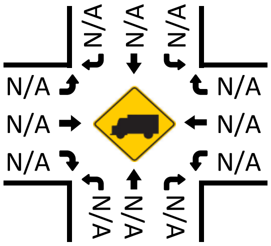
Cars (NOON)



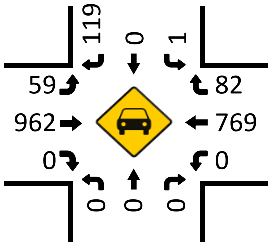
Pedestrians (Crosswalks)



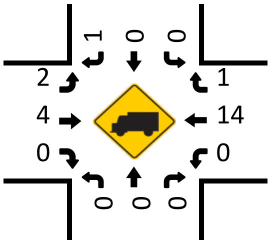
HT (NOON)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Pentecost Dr & SR 219/Kiernan Ave
City: Modesto
Control: 1-Way Stop (SB)

Project ID: 20-090176-003
Date: 11/17/2020

Total

NS/EW Streets:	Pentecost Dr				Pentecost Dr				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	6	0	17	116	0	2	0	179	14	0	334
7:15 AM	0	0	0	0	0	0	8	0	12	146	0	2	0	234	15	0	417
7:30 AM	0	0	0	0	0	0	17	0	30	168	0	1	0	269	15	0	500
7:45 AM	0	0	0	0	0	0	8	0	26	168	0	0	0	263	15	0	480
8:00 AM	0	0	0	0	0	0	17	0	10	170	0	1	0	213	16	0	427
8:15 AM	0	0	0	0	0	0	13	0	19	177	0	1	0	197	11	0	418
8:30 AM	0	0	0	0	0	0	12	0	10	143	0	2	0	208	19	0	394
8:45 AM	0	0	0	0	0	0	12	0	20	158	0	2	0	183	12	0	387
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	93	0	144	1246	0	11	0	1746	117	0	3357
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	10.28%	88.94%	0.00%	0.79%	0.00%	93.72%	6.28%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	55	0	85	683	0	3	0	942	57	0	1825
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.809	0.000	0.708	0.965	0.000	0.750	0.000	0.875	0.891	0.000	0.913
						0.809				0.969				0.879			

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	0	0	29	0	13	244	0	3	0	167	12	0	468
4:15 PM	0	0	0	0	1	0	33	0	20	237	0	2	0	193	17	0	503
4:30 PM	0	0	0	0	0	0	36	1	11	227	0	0	0	187	20	0	482
4:45 PM	0	0	0	0	0	0	24	0	14	244	0	0	0	209	17	0	508
5:00 PM	0	0	0	0	0	0	35	0	22	234	0	1	0	189	20	1	502
5:15 PM	0	0	0	0	1	0	25	0	14	261	0	0	0	198	26	1	526
5:30 PM	0	0	0	0	1	0	18	0	12	191	0	1	0	180	10	1	414
5:45 PM	0	0	0	0	0	0	14	0	8	171	0	3	0	167	12	0	375
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	3	0	214	1	114	1809	0	10	0	1490	134	3	3778
APPROACH %'s :					1.38%	0.00%	98.17%	0.46%	5.90%	93.59%	0.00%	0.52%	0.00%	91.58%	8.24%	0.18%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	1	0	120	1	61	966	0	1	0	783	83	2	2018
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.250	0.000	0.833	0.250	0.693	0.925	0.000	0.250	0.000	0.937	0.798	0.500	0.959
						0.824				0.935				0.960			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Pentecost Dr & SR 219/Kiernan Ave
City: Modesto
Control: 1-Way Stop (SB)

Project ID: 20-090176-003
Date: 11/17/2020

Cars

NS/EW Streets:	Pentecost Dr				Pentecost Dr				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	5	0	14	108	0	1	0	174	13	0	315
7:15 AM	0	0	0	0	0	0	4	0	12	133	0	1	0	228	15	0	393
7:30 AM	0	0	0	0	0	0	13	0	29	155	0	1	0	264	15	0	477
7:45 AM	0	0	0	0	0	0	7	0	26	159	0	0	0	254	15	0	461
8:00 AM	0	0	0	0	0	0	16	0	10	161	0	1	0	204	16	0	408
8:15 AM	0	0	0	0	0	0	12	0	19	166	0	0	0	187	11	0	395
8:30 AM	0	0	0	0	0	0	11	0	10	132	0	2	0	198	19	0	372
8:45 AM	0	0	0	0	0	0	10	0	18	151	0	2	0	176	11	0	368
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	78	0	138	1165	0	8	0	1685	115	0	3189
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	10.53%	88.86%	0.00%	0.61%	0.00%	93.61%	6.39%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	48	0	84	641	0	2	0	909	57	0	1741
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.724	0.965	0.000	0.500	0.000	0.861	0.891	0.000	0.912
						0.750				0.982				0.866			

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	0	0	29	0	11	237	0	2	0	160	12	0	451
4:15 PM	0	0	0	0	1	0	33	0	20	234	0	2	0	188	17	0	495
4:30 PM	0	0	0	0	0	0	36	1	10	225	0	0	0	181	19	0	472
4:45 PM	0	0	0	0	0	0	24	0	14	242	0	0	0	207	17	0	504
5:00 PM	0	0	0	0	0	0	34	0	21	234	0	1	0	186	20	1	497
5:15 PM	0	0	0	0	1	0	25	0	14	261	0	0	0	195	26	1	523
5:30 PM	0	0	0	0	1	0	18	0	11	187	0	1	0	173	10	1	402
5:45 PM	0	0	0	0	0	0	14	0	8	168	0	2	0	166	12	0	370
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	3	0	213	1	109	1788	0	8	0	1456	133	3	3714
APPROACH %'s :					1.38%	0.00%	98.16%	0.46%	5.72%	93.86%	0.00%	0.42%	0.00%	91.46%	8.35%	0.19%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	1	0	119	1	59	962	0	1	0	769	82	2	1996
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.250	0.000	0.826	0.250	0.702	0.921	0.000	0.250	0.000	0.929	0.788	0.500	0.954
						0.818				0.929				0.952			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Pentecost Dr & SR 219/Kiernan Ave
City: Modesto
Control: 1-Way Stop (SB)

Project ID: 20-090176-003
Date: 11/17/2020

HT

NS/EW Streets:	Pentecost Dr				Pentecost Dr				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	1	0	3	8	0	1	0	5	1	0	19
7:15 AM	0	0	0	0	0	0	4	0	0	13	0	1	0	6	0	0	24
7:30 AM	0	0	0	0	0	0	4	0	1	13	0	0	0	5	0	0	23
7:45 AM	0	0	0	0	0	0	1	0	0	9	0	0	0	9	0	0	19
8:00 AM	0	0	0	0	0	0	1	0	0	9	0	0	0	9	0	0	19
8:15 AM	0	0	0	0	0	0	1	0	0	11	0	1	0	10	0	0	23
8:30 AM	0	0	0	0	0	0	1	0	0	11	0	0	0	10	0	0	22
8:45 AM	0	0	0	0	0	0	2	0	2	7	0	0	0	7	1	0	19
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	15	0	6	81	0	3	0	61	2	0	168
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	6.67%	90.00%	0.00%	3.33%	0.00%	96.83%	3.17%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	7	0	1	42	0	1	0	33	0	0	84
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.438	0.000	0.250	0.808	0.000	0.250	0.000	0.825	0.000	0.000	0.913
					0.438				0.786				0.825				

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	0	0	0	0	2	7	0	1	0	7	0	0	17
4:15 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	5	0	0	8
4:30 PM	0	0	0	0	0	0	0	0	1	2	0	0	0	6	1	0	10
4:45 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
5:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	3	0	0	5
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3
5:30 PM	0	0	0	0	0	0	0	0	1	4	0	0	0	7	0	0	12
5:45 PM	0	0	0	0	0	0	0	0	0	3	0	1	0	1	0	0	5
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	1	0	5	21	0	2	0	34	1	0	64
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	17.86%	75.00%	0.00%	7.14%	0.00%	97.14%	2.86%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	0	2	4	0	0	0	14	1	0	22
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.500	0.500	0.000	0.000	0.000	0.583	0.250	0.000	0.550
					0.250				0.500				0.536				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Pentecost Dr & SR 219/Kiernan Ave
City: Modesto
Control: 1-Way Stop (SB)

Project ID: 20-090176-003
Date: 11/17/2020

Bikes

NS/EW Streets:	Pentecost Dr				Pentecost Dr				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	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
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

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	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: Pentecost Dr & SR 219/Kiernan Ave
City: Modesto

Project ID: 20-090176-003
Date: 11/17/2020

Pedestrians (Crosswalks)

NS/EW Streets:	Pentecost Dr		Pentecost Dr		SR 219/Kiernan Ave		SR 219/Kiernan 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	0	0	0	0	0
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	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**07:30 AM - 08:30 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

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	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	**04:30 PM - 05:30 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

Prepared by National Data & Surveying Services

McHenry Ave/SR 108 & SR 219/Kiernan Ave

Peak Hour Turning Movement Count

ID: 20-090176-004
City: Modesto

Day: Tuesday
Date: 11/17/2020

	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

McHenry Ave/SR 108

SOUTHBOUND

	↲	↓	↳	↶	⇧
AM	138	529	76	0	487
NOON	0	0	0	0	0
PM	105	524	268	1	798
	0	0	0	0	

SR 219/Kiernan Ave

EASTBOUND

	AM	NOON	PM	
⇦	986	0	874	
↶	25	0	41	0
↱	101	0	149	0
→	351	0	714	0
↴	165	0	154	0

SR 219/Kiernan Ave

WESTBOUND

		PM	NOON	AM
0	↰	92	0	98
0	←	509	0	701
0	↲	178	0	284
0	↶	1	0	3
	⇨	1424	0	554

CONTROL

Signalized

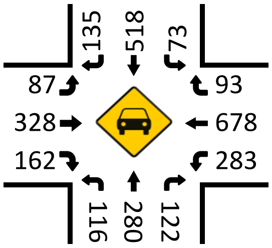
	AM	NOON	PM
TEV	3005	0	3952
PHF	0.91		0.98

NORTHBOUND

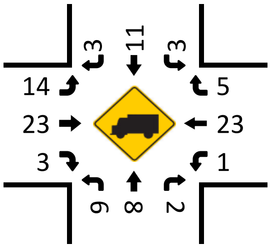
McHenry Ave/SR 108

	⇩	↶	↰	↑	↱
		0	0	0	0
PM	856	0	219	556	441
NOON	0	0	0	0	0
AM	978	0	122	288	124

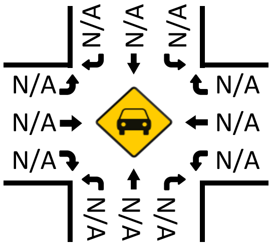
Cars (AM)



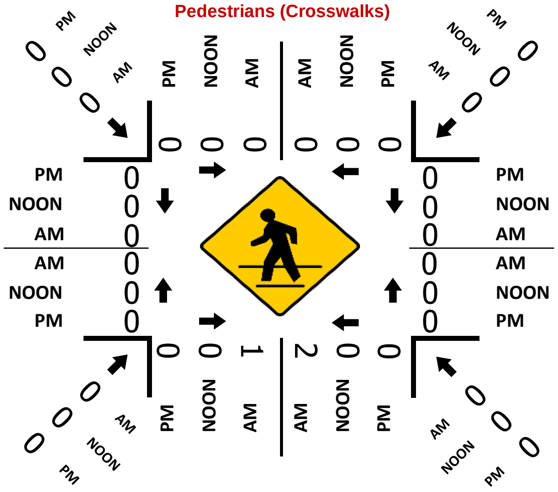
HT (AM)



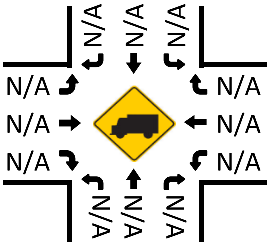
Cars (NOON)



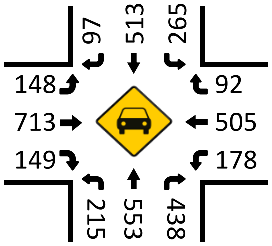
Pedestrians (Crosswalks)



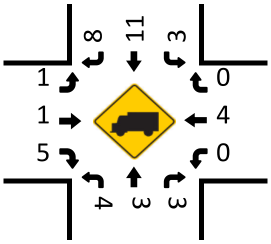
HT (NOON)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: McHenry Ave/SR 108 & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-004
Date: 11/17/2020

Total

NS/EW Streets:	McHenry Ave/SR 108				McHenry Ave/SR 108				SR 219/Kiernan Ave				SR 219/Kiernan 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	16	0	10	90	28	0	17	62	26	3	32	135	18	0	513
7:15 AM	32	60	37	0	18	121	24	1	26	76	23	2	36	180	23	0	659
7:30 AM	32	82	28	0	23	139	41	0	27	71	44	3	69	186	22	1	768
7:45 AM	35	67	37	0	17	132	42	0	29	88	40	3	83	221	29	0	823
8:00 AM	28	74	22	0	17	125	27	0	25	95	38	13	71	153	25	1	714
8:15 AM	27	65	37	0	19	133	28	0	20	97	43	6	61	141	22	1	700
8:30 AM	42	63	32	0	29	106	28	0	25	83	37	5	62	157	20	0	689
8:45 AM	38	68	49	0	14	107	25	0	21	64	44	5	48	129	12	0	624
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	260	529	258	0	147	953	243	1	190	636	295	40	462	1302	171	3	5490
APPROACH %'s :	24.83%	50.53%	24.64%	0.00%	10.94%	70.91%	18.08%	0.07%	16.37%	54.78%	25.41%	3.45%	23.84%	67.18%	8.82%	0.15%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	122	288	124	0	76	529	138	0	101	351	165	25	284	701	98	3	3005
PEAK HR FACTOR :	0.871	0.878	0.838	0.000	0.826	0.951	0.821	0.000	0.871	0.905	0.938	0.481	0.855	0.793	0.845	0.750	0.913
	0.940				0.915				0.939				0.815				

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	42	124	73	0	80	124	24	0	29	184	45	8	36	106	18	0	893
4:15 PM	42	126	79	0	63	130	27	0	34	171	46	6	55	140	29	1	949
4:30 PM	53	137	111	0	70	141	27	0	27	152	41	14	52	121	22	0	968
4:45 PM	51	136	109	0	69	134	24	0	40	181	47	7	35	138	26	0	997
5:00 PM	52	140	109	0	66	131	30	0	46	178	30	12	48	114	20	1	977
5:15 PM	63	143	112	0	63	118	24	1	36	203	36	8	43	136	24	0	1010
5:30 PM	36	95	107	1	55	121	32	0	28	128	34	7	41	116	13	0	814
5:45 PM	27	100	72	0	57	98	16	0	25	139	30	1	42	128	13	0	748
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	366	1001	772	1	523	997	204	1	265	1336	309	63	352	999	165	2	7356
APPROACH %'s :	17.10%	46.78%	36.07%	0.05%	30.32%	57.80%	11.83%	0.06%	13.43%	67.71%	15.66%	3.19%	23.19%	65.81%	10.87%	0.13%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	219	556	441	0	268	524	105	1	149	714	154	41	178	509	92	1	3952
PEAK HR FACTOR :	0.869	0.972	0.984	0.000	0.957	0.929	0.875	0.250	0.810	0.879	0.819	0.732	0.856	0.922	0.885	0.250	0.978
	0.956				0.943				0.935				0.961				

National Data & Surveying Services

Intersection Turning Movement Count

Location: McHenry Ave/SR 108 & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-004
Date: 11/17/2020

Cars

NS/EW Streets:	McHenry Ave/SR 108				McHenry Ave/SR 108				SR 219/Kiernan Ave				SR 219/Kiernan 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	25	50	16	0	10	90	26	0	13	60	23	3	31	132	18	0	497
7:15 AM	32	58	36	0	17	117	22	1	23	65	21	2	36	176	22	0	628
7:30 AM	31	81	28	0	23	137	41	0	21	68	43	3	68	182	21	1	748
7:45 AM	33	66	35	0	17	130	41	0	26	81	40	3	83	215	27	0	797
8:00 AM	26	71	22	0	17	120	26	0	21	87	37	12	71	148	24	1	683
8:15 AM	26	62	37	0	16	131	27	0	19	92	42	6	61	133	21	1	674
8:30 AM	39	61	32	0	29	102	24	0	24	76	35	5	60	153	20	0	660
8:45 AM	36	67	45	0	14	105	24	0	21	61	41	5	47	125	12	0	603
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	248	516	251	0	143	932	231	1	168	590	282	39	457	1264	165	3	5290
APPROACH %'s :	24.43%	50.84%	24.73%	0.00%	10.94%	71.31%	17.67%	0.08%	15.57%	54.68%	26.14%	3.61%	24.19%	66.91%	8.73%	0.16%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	116	280	122	0	73	518	135	0	87	328	162	24	283	678	93	3	2902
PEAK HR FACTOR :	0.88	0.864	0.824	0.000	0.793	0.945	0.823	0.000	0.837	0.891	0.942	0.500	0.852	0.788	0.861	0.750	0.910
	0.925				0.903				0.945				0.813				

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	40	120	73	0	79	121	22	0	28	180	42	8	36	103	16	0	868
4:15 PM	42	126	78	0	62	127	27	0	33	170	44	6	54	135	29	1	934
4:30 PM	52	137	111	0	68	134	23	0	27	152	40	14	52	119	22	0	951
4:45 PM	51	136	109	0	69	132	23	0	39	180	45	7	35	137	26	0	989
5:00 PM	51	138	107	0	66	130	29	0	46	178	29	12	48	113	20	1	968
5:15 PM	61	142	111	0	62	117	22	1	36	203	35	8	43	136	24	0	1001
5:30 PM	35	94	107	1	55	121	30	0	28	127	32	7	41	113	13	0	804
5:45 PM	27	99	72	0	56	95	16	0	24	137	29	1	41	127	13	0	737
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	359	992	768	1	517	977	192	1	261	1327	296	63	350	983	163	2	7252
APPROACH %'s :	16.93%	46.79%	36.23%	0.05%	30.65%	57.91%	11.38%	0.06%	13.41%	68.16%	15.20%	3.24%	23.36%	65.62%	10.88%	0.13%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	215	553	438	0	265	513	97	1	148	713	149	41	178	505	92	1	3909
PEAK HR FACTOR :	0.88	0.974	0.986	0.000	0.960	0.957	0.836	0.250	0.804	0.878	0.828	0.732	0.856	0.922	0.885	0.250	0.976
	0.960				0.973				0.932				0.956				

National Data & Surveying Services

Intersection Turning Movement Count

Location: McHenry Ave/SR 108 & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-004
Date: 11/17/2020

HT

NS/EW Streets:	McHenry Ave/SR 108				McHenry Ave/SR 108				SR 219/Kiernan Ave				SR 219/Kiernan 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	1	0	0	0	0	0	2	0	4	2	3	0	1	3	0	0	16
7:15 AM	0	2	1	0	1	4	2	0	3	11	2	0	0	4	1	0	31
7:30 AM	1	1	0	0	0	2	0	0	6	3	1	0	1	4	1	0	20
7:45 AM	2	1	2	0	0	2	1	0	3	7	0	0	0	6	2	0	26
8:00 AM	2	3	0	0	0	5	1	0	4	8	1	1	0	5	1	0	31
8:15 AM	1	3	0	0	3	2	1	0	1	5	1	0	0	8	1	0	26
8:30 AM	3	2	0	0	0	4	4	0	1	7	2	0	2	4	0	0	29
8:45 AM	2	1	4	0	0	2	1	0	0	3	3	0	1	4	0	0	21
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	12	13	7	0	4	21	12	0	22	46	13	1	5	38	6	0	200
APPROACH %'s :	37.50%	40.63%	21.88%	0.00%	10.81%	56.76%	32.43%	0.00%	26.83%	56.10%	15.85%	1.22%	10.20%	77.55%	12.24%	0.00%	
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	6	8	2	0	3	11	3	0	14	23	3	1	1	23	5	0	103
PEAK HR FACTOR :	0.750	0.667	0.250	0.000	0.250	0.550	0.750	0.000	0.583	0.719	0.750	0.250	0.250	0.719	0.625	0.000	0.831
	0.800				0.708				0.732				0.806				

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	2	4	0	0	1	3	2	0	1	4	3	0	0	3	2	0	25
4:15 PM	0	0	1	0	1	3	0	0	1	1	2	0	1	5	0	0	15
4:30 PM	1	0	0	0	2	7	4	0	0	0	1	0	0	2	0	0	17
4:45 PM	0	0	0	0	0	2	1	0	1	1	2	0	0	1	0	0	8
5:00 PM	1	2	2	0	0	1	1	0	0	0	1	0	0	1	0	0	9
5:15 PM	2	1	1	0	1	1	2	0	0	0	1	0	0	0	0	0	9
5:30 PM	1	1	0	0	0	0	2	0	0	1	2	0	0	3	0	0	10
5:45 PM	0	1	0	0	1	3	0	0	1	2	1	0	1	1	0	0	11
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	7	9	4	0	6	20	12	0	4	9	13	0	2	16	2	0	104
APPROACH %'s :	35.00%	45.00%	20.00%	0.00%	15.79%	52.63%	31.58%	0.00%	15.38%	34.62%	50.00%	0.00%	10.00%	80.00%	10.00%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	4	3	3	0	3	11	8	0	1	1	5	0	0	4	0	0	43
PEAK HR FACTOR :	0.50	0.375	0.375	0.000	0.375	0.393	0.500	0.000	0.250	0.250	0.625	0.000	0.000	0.500	0.000	0.000	0.632
	0.500				0.423				0.438				0.500				

National Data & Surveying Services

Intersection Turning Movement Count

Location: McHenry Ave/SR 108 & SR 219/Kiernan Ave
City: Modesto
Control: Signalized

Project ID: 20-090176-004
Date: 11/17/2020

Bikes

NS/EW Streets:	McHenry Ave/SR 108				McHenry Ave/SR 108				SR 219/Kiernan Ave				SR 219/Kiernan 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	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	0	2	0	0	0	0	0	0	3
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
									0.250								

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	0	0	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	

National Data & Surveying Services

Intersection Turning Movement Count

Location: McHenry Ave/SR 108 & SR 219/Kiernan Ave
City: Modesto

Project ID: 20-090176-004
Date: 11/17/2020

Pedestrians (Crosswalks)

NS/EW Streets:	McHenry Ave/SR 108		McHenry Ave/SR 108		SR 219/Kiernan Ave		SR 219/Kiernan 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	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	2	0	0	0	0	2
8:00 AM	0	0	1	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	1	0	0	0	0	1
8:45 AM	0	0	1	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	3	0	0	0	0	5
APPROACH %'s :			40.00%	60.00%					
PEAK HR :	07:30 AM - 08:30 AM								TOTAL
PEAK HR VOL :	0	0	1	2	0	0	0	0	3
PEAK HR FACTOR :			0.250	0.250					0.375
			0.375						

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	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0
APPROACH %'s :									
PEAK HR :	04:30 PM - 05:30 PM								TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0
PEAK HR FACTOR :									

KDA

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	989	106	100	1217	11	133	28	50	22	244
v/c Ratio	0.12	0.67	0.18	0.36	0.63	0.02	0.93	0.04	0.07	0.15	0.45
Control Delay	29.5	22.6	1.5	31.9	18.6	0.0	93.9	13.9	0.2	30.2	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.5	22.6	1.5	31.9	18.6	0.0	93.9	13.9	0.2	30.2	19.3
Queue Length 50th (ft)	6	125	0	19	124	0	53	6	0	8	67
Queue Length 95th (ft)	23	167	9	40	#234	0	#149	24	0	28	127
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	143	1485	588	278	1938	714	143	776	764	143	543
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.67	0.18	0.36	0.63	0.02	0.93	0.04	0.07	0.15	0.45

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↑↱	
Traffic Volume (veh/h)	15	890	95	90	1095	10	120	25	45	20	155	65
Future Volume (veh/h)	15	890	95	90	1095	10	120	25	45	20	155	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	989	106	100	1217	11	133	28	50	22	172	72
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	37	1329	413	231	1566	486	146	658	558	45	370	155
Arrive On Green	0.02	0.26	0.26	0.07	0.31	0.31	0.08	0.35	0.35	0.03	0.30	0.30
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	1870	1585	1781	1252	524
Grp Volume(v), veh/h	17	989	106	100	1217	11	133	28	50	22	0	244
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1870	1585	1781	0	1776
Q Serve(g_s), s	0.6	10.8	3.2	1.7	13.2	0.3	4.5	0.6	1.3	0.7	0.0	6.8
Cycle Q Clear(g_c), s	0.6	10.8	3.2	1.7	13.2	0.3	4.5	0.6	1.3	0.7	0.0	6.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	37	1329	413	231	1566	486	146	658	558	45	0	525
V/C Ratio(X)	0.47	0.74	0.26	0.43	0.78	0.02	0.91	0.04	0.09	0.48	0.00	0.47
Avail Cap(c_a), veh/h	146	1508	468	284	1566	486	146	658	558	146	0	525
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	20.7	17.9	27.3	19.2	14.7	27.7	13.0	13.2	29.3	0.0	17.5
Incr Delay (d2), s/veh	8.9	1.8	0.3	1.3	2.5	0.0	48.6	0.1	0.3	7.8	0.0	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.2	1.1	0.7	5.1	0.1	3.8	0.3	0.5	0.4	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.4	22.5	18.2	28.6	21.8	14.8	76.4	13.1	13.5	37.1	0.0	20.5
LnGrp LOS	D	C	B	C	C	B	E	B	B	D	A	C
Approach Vol, veh/h		1112			1328			211			266	
Approach Delay, s/veh		22.3			22.2			53.1			21.9	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	25.9	8.6	20.4	9.5	22.5	5.8	23.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.7	3.3	3.7	12.8	6.5	8.8	2.6	15.2
Green Ext Time (p_c), s	0.0	0.2	0.0	3.0	0.0	0.9	0.0	2.0

Intersection Summary			
HCM 6th Ctrl Delay			24.5
HCM 6th LOS			C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	975	10	0	1190	0	5
Future Vol, veh/h	975	10	0	1190	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1016	10	0	1240	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	513
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	506
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	506
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	506	-	-	-
HCM Lane V/C Ratio	0.01	-	-	-
HCM Control Delay (s)	12.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	100	760	1100	65	0	65
Future Vol, veh/h	100	760	1100	65	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	835	1209	71	0	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1280	0	-	0	-	640
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	538	-	-	-	0	418
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	538	-	-	-	-	418
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	538	-	-	-	418
HCM Lane V/C Ratio	0.204	-	-	-	0.171
HCM Control Delay (s)	13.4	-	-	-	15.4
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.8	-	-	-	0.6

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	102	443	148	401	1106	140	277	130	109	565	92
v/c Ratio	0.39	0.29	0.26	0.87	0.89	0.67	0.31	0.26	0.58	0.68	0.19
Control Delay	58.4	31.3	6.7	68.7	43.8	66.8	34.9	6.8	64.3	42.8	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	31.3	6.7	68.7	43.8	66.8	34.9	6.8	64.3	42.8	2.5
Queue Length 50th (ft)	36	85	0	149	372	97	87	0	76	201	0
Queue Length 95th (ft)	80	152	53	#338	#687	#231	132	45	166	271	14
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	299	2096	739	461	1602	256	976	531	250	938	516
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.34	0.21	0.20	0.87	0.69	0.55	0.28	0.24	0.44	0.60	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

AM EXISTING
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	93	403	135	365	868	138	127	252	118	99	514	84
Future Volume (veh/h)	93	403	135	365	868	138	127	252	118	99	514	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	102	443	148	401	954	152	140	277	130	109	565	92
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	1514	470	484	1146	183	175	775	346	140	721	321
Arrive On Green	0.06	0.30	0.30	0.14	0.37	0.37	0.10	0.22	0.22	0.08	0.20	0.20
Sat Flow, veh/h	3456	5106	1585	3456	3070	489	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	102	443	148	401	552	554	140	277	130	109	565	92
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1782	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.5	5.8	6.3	9.8	24.5	24.6	6.7	5.7	6.1	5.2	13.1	4.3
Cycle Q Clear(g_c), s	2.5	5.8	6.3	9.8	24.5	24.6	6.7	5.7	6.1	5.2	13.1	4.3
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	218	1514	470	484	663	665	175	775	346	140	721	321
V/C Ratio(X)	0.47	0.29	0.31	0.83	0.83	0.83	0.80	0.36	0.38	0.78	0.78	0.29
Avail Cap(c_a), veh/h	366	2556	793	565	889	892	314	1018	454	305	989	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	23.6	23.7	36.4	24.8	24.8	38.3	28.8	28.9	39.3	32.8	29.3
Incr Delay (d2), s/veh	1.6	0.1	0.4	8.8	5.1	5.1	8.1	0.3	0.7	9.0	2.9	0.5
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	1.0	2.1	2.2	4.4	9.8	9.9	3.2	2.4	2.2	2.5	5.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.9	23.7	24.1	45.2	29.9	29.9	46.4	29.1	29.6	48.3	35.7	29.8
LnGrp LOS	D	C	C	D	C	C	D	C	C	D	D	C
Approach Vol, veh/h		693			1507			547			766	
Approach Delay, s/veh		26.3			33.9			33.6			36.8	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.9	24.8	18.0	32.3	13.3	23.4	11.3	38.9
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	14.9	* 25	14.2	43.5	* 15	24.2	9.2	43.5
Max Q Clear Time (g_c+I1), s	7.2	8.1	11.8	8.3	8.7	15.1	4.5	26.6
Green Ext Time (p_c), s	0.1	1.9	0.4	3.2	0.2	2.5	0.1	5.9

Intersection Summary	
HCM 6th Ctrl Delay	33.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

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

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	980	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	980	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	980	-	-	-	-	-
Mov Cap-2 Maneuver	980	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	980	-	-	-	-	-

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

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

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	1105	153	195	1005	16	179	184	58	26	215
v/c Ratio	0.46	0.83	0.27	0.73	0.62	0.02	1.30	0.27	0.08	0.19	0.41
Control Delay	39.4	28.2	3.8	46.8	20.7	0.1	207.4	17.1	0.2	31.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	28.2	3.8	46.8	20.7	0.1	207.4	17.1	0.2	31.1	19.6
Queue Length 50th (ft)	24	146	0	39	129	0	~92	43	0	10	60
Queue Length 95th (ft)	#63	#200	28	#84	173	0	#201	106	0	31	114
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	138	1338	573	268	1620	657	138	689	698	138	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.83	0.27	0.73	0.62	0.02	1.30	0.27	0.08	0.19	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
8: TULLY RD & KIERNAN AVE

PM EXISTING
02/19/2021

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	60	1050	145	185	955	15	170	175	55	25	160	45
Future Volume (veh/h)	60	1050	145	185	955	15	170	175	55	25	160	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1767	1870	1870	1767	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	1105	153	195	1005	16	179	184	58	26	168	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	94	1319	434	273	1445	475	141	625	530	52	400	112
Arrive On Green	0.05	0.27	0.27	0.08	0.30	0.30	0.08	0.33	0.33	0.03	0.28	0.28
Sat Flow, veh/h	1781	4823	1585	3456	4823	1585	1781	1870	1585	1781	1406	393
Grp Volume(v), veh/h	63	1105	153	195	1005	16	179	184	58	26	0	215
Grp Sat Flow(s),veh/h/ln	1781	1608	1585	1728	1608	1585	1781	1870	1585	1781	0	1800
Q Serve(g_s), s	2.2	13.7	4.9	3.5	11.7	0.5	5.0	4.6	1.6	0.9	0.0	6.1
Cycle Q Clear(g_c), s	2.2	13.7	4.9	3.5	11.7	0.5	5.0	4.6	1.6	0.9	0.0	6.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	94	1319	434	273	1445	475	141	625	530	52	0	512
V/C Ratio(X)	0.67	0.84	0.35	0.71	0.70	0.03	1.27	0.29	0.11	0.50	0.00	0.42
Avail Cap(c_a), veh/h	141	1371	451	273	1445	475	141	625	530	141	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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	21.7	18.5	28.5	19.6	15.7	29.2	15.6	14.6	30.3	0.0	18.4
Incr Delay (d2), s/veh	7.9	4.6	0.5	8.6	1.5	0.0	166.7	1.2	0.4	7.4	0.0	2.5
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	1.1	5.3	1.7	1.7	4.2	0.2	8.5	2.0	0.6	0.5	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	26.3	19.0	37.0	21.1	15.7	195.8	16.8	15.0	37.7	0.0	20.9
LnGrp LOS	D	C	B	D	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1321			1216			421			241	
Approach Delay, s/veh		26.0			23.6			92.6			22.8	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	25.7	9.5	21.8	9.5	22.5	7.8	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.9	6.6	5.5	15.7	7.0	8.1	4.2	13.7
Green Ext Time (p_c), s	0.0	0.9	0.0	1.6	0.0	0.8	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	33.6
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1165	0	0	960	0	5
Future Vol, veh/h	1165	0	0	960	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	9	2	9	2	9
Mvmt Flow	1226	0	0	1011	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	613
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.08
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.39
Pot Cap-1 Maneuver	-	-	0	-	0	419
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	419
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	419	-	-	-
HCM Lane V/C Ratio	0.013	-	-	-
HCM Control Delay (s)	13.7	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	70	1085	825	90	0	130
Future Vol, veh/h	70	1085	825	90	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	9	9	2	2	2
Mvmt Flow	73	1130	859	94	0	135

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	953	0	-	0	-	477
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	717	-	-	-	0	534
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	717	-	-	-	-	534
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	14
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	717	-	-	-	534
HCM Lane V/C Ratio	0.102	-	-	-	0.254
HCM Control Delay (s)	10.6	-	-	-	14
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	123	891	190	164	714	201	505	401	319	563	97
v/c Ratio	0.57	0.74	0.37	0.64	0.82	0.76	0.63	0.78	0.87	0.56	0.18
Control Delay	66.5	43.9	7.6	65.9	48.1	66.3	42.1	30.2	67.6	36.1	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	66.5	43.9	7.6	65.9	48.1	66.3	42.1	30.2	67.6	36.1	2.9
Queue Length 50th (ft)	45	216	0	60	249	139	176	138	217	181	0
Queue Length 95th (ft)	#116	339	61	#152	410	#314	261	283	#520	277	20
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	222	1425	576	264	1024	361	1024	602	449	1195	616
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.63	0.33	0.62	0.70	0.56	0.49	0.67	0.71	0.47	0.16

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	121	873	186	161	610	90	197	495	393	313	552	95
Future Volume (veh/h)	121	873	186	161	610	90	197	495	393	313	552	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	123	891	190	164	622	92	201	505	401	319	563	97
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	9	9	9	9	9	9	7	7	7	7	7	7
Cap, veh/h	178	1115	346	240	734	108	233	938	418	352	1187	530
Arrive On Green	0.05	0.23	0.23	0.07	0.25	0.25	0.14	0.27	0.27	0.21	0.35	0.35
Sat Flow, veh/h	3264	4823	1497	3264	2934	433	1711	3413	1522	1711	3413	1522
Grp Volume(v), veh/h	123	891	190	164	355	359	201	505	401	319	563	97
Grp Sat Flow(s),veh/h/ln	1632	1608	1497	1632	1678	1689	1711	1706	1522	1711	1706	1522
Q Serve(g_s), s	4.0	18.8	12.1	5.3	21.8	21.8	12.4	13.6	28.0	19.7	13.9	4.8
Cycle Q Clear(g_c), s	4.0	18.8	12.1	5.3	21.8	21.8	12.4	13.6	28.0	19.7	13.9	4.8
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	178	1115	346	240	420	423	233	938	418	352	1187	530
V/C Ratio(X)	0.69	0.80	0.55	0.68	0.85	0.85	0.86	0.54	0.96	0.91	0.47	0.18
Avail Cap(c_a), veh/h	224	1362	423	266	496	499	363	938	418	451	1187	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.2	39.2	36.6	48.8	38.5	38.6	45.7	33.3	38.6	41.9	27.5	24.5
Incr Delay (d2), s/veh	6.4	2.8	1.4	6.2	11.3	11.5	12.1	0.6	33.3	18.7	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	7.2	4.3	2.3	9.6	9.8	6.0	5.6	13.5	9.8	5.4	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	42.0	37.9	55.0	49.8	50.0	57.8	33.9	71.8	60.6	27.8	24.7
LnGrp LOS	E	D	D	E	D	D	E	C	E	E	C	C
Approach Vol, veh/h		1204			878			1107			979	
Approach Delay, s/veh		42.8			50.9			52.0			38.2	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.3	35.5	13.7	31.5	19.4	43.4	11.7	33.5
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	28.5	* 30	8.8	30.5	* 23	35.0	7.4	31.9
Max Q Clear Time (g_c+I1), s	21.7	30.0	7.3	20.8	14.4	15.9	6.0	23.8
Green Ext Time (p_c), s	0.5	0.0	0.1	4.2	0.3	3.6	0.0	2.4

Intersection Summary			
HCM 6th Ctrl Delay			45.9
HCM 6th LOS			D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th TWSC
12: TULLY RD & PROJECT ACCESS

PM EXISTING
02/19/2021

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	2	6	6	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1	0	0	0	0	0
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.37	7.22	-	-	5.42	-
Critical Hdwy Stg 1	6.72	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.71	3.96	-	-	3.16	-
Pot Cap-1 Maneuver	969	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	969	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	969	-	-	-	-	-
Mov Cap-2 Maneuver	969	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	969	-	-	-	-	-

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

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

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	17	994	121	187	1217	11	136	29	59	23	249
v/c Ratio	0.12	0.71	0.21	0.69	0.61	0.02	0.98	0.04	0.08	0.17	0.47
Control Delay	29.7	24.0	2.2	44.1	18.1	0.0	106.6	15.8	0.2	30.5	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	24.0	2.2	44.1	18.1	0.0	106.6	15.8	0.2	30.5	20.0
Queue Length 50th (ft)	6	125	0	37	124	0	54	6	0	9	69
Queue Length 95th (ft)	23	168	15	#79	#234	0	#153	25	0	28	130
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	139	1444	577	270	2006	733	139	697	704	139	529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.12	0.69	0.21	0.69	0.61	0.02	0.98	0.04	0.08	0.17	0.47

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: TULLY RD & KIERNAN AVE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	15	895	109	168	1095	10	122	26	53	21	159	65
Future Volume (veh/h)	15	895	109	168	1095	10	122	26	53	21	159	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	17	994	121	187	1217	11	136	29	59	23	177	72
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	36	1320	410	278	1627	505	144	644	546	47	367	149
Arrive On Green	0.02	0.26	0.26	0.08	0.32	0.32	0.08	0.34	0.34	0.03	0.29	0.29
Sat Flow, veh/h	1781	5106	1585	3456	5106	1585	1781	1870	1585	1781	1264	514
Grp Volume(v), veh/h	17	994	121	187	1217	11	136	29	59	23	0	249
Grp Sat Flow(s),veh/h/ln	1781	1702	1585	1728	1702	1585	1781	1870	1585	1781	0	1778
Q Serve(g_s), s	0.6	11.1	3.8	3.3	13.2	0.3	4.7	0.6	1.6	0.8	0.0	7.2
Cycle Q Clear(g_c), s	0.6	11.1	3.8	3.3	13.2	0.3	4.7	0.6	1.6	0.8	0.0	7.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.29
Lane Grp Cap(c), veh/h	36	1320	410	278	1627	505	144	644	546	47	0	516
V/C Ratio(X)	0.47	0.75	0.30	0.67	0.75	0.02	0.95	0.05	0.11	0.49	0.00	0.48
Avail Cap(c_a), veh/h	144	1481	460	278	1627	505	144	644	546	144	0	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	21.2	18.5	27.7	18.9	14.5	28.4	13.5	13.9	29.8	0.0	18.2
Incr Delay (d2), s/veh	9.0	2.0	0.4	6.1	2.0	0.0	59.2	0.1	0.4	7.7	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.3	1.3	1.5	5.0	0.1	4.3	0.3	0.6	0.4	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	23.2	18.9	33.9	20.9	14.5	87.6	13.7	14.3	37.5	0.0	21.4
LnGrp LOS	D	C	B	C	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1132			1415			224			272	
Approach Delay, s/veh		22.9			22.5			58.7			22.8	
Approach LOS		C			C			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	25.9	9.5	20.5	9.5	22.5	5.8	24.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.8	3.6	5.3	13.1	6.7	9.2	2.6	15.2
Green Ext Time (p_c), s	0.0	0.2	0.0	2.9	0.0	0.9	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	983	16	0	1268	0	8
Future Vol, veh/h	983	16	0	1268	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1024	17	0	1321	0	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	521
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	500
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	500
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	500	-	-	-
HCM Lane V/C Ratio	0.017	-	-	-
HCM Control Delay (s)	12.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	100	770	1178	65	0	65
Future Vol, veh/h	100	770	1178	65	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	110	846	1295	71	0	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1366	0	-	0	-	683
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	499	-	-	-	0	392
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	499	-	-	-	-	392
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	16.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	499	-	-	-	392
HCM Lane V/C Ratio	0.22	-	-	-	0.182
HCM Control Delay (s)	14.2	-	-	-	16.2
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.8	-	-	-	0.7

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	103	446	46	401	1128	197	277	130	109	565	99
v/c Ratio	0.41	0.29	0.08	0.91	0.91	0.84	0.30	0.25	0.60	0.69	0.21
Control Delay	59.4	31.8	0.3	75.2	46.3	79.8	34.8	6.6	66.2	44.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	31.8	0.3	75.2	46.3	79.8	34.8	6.6	66.2	44.4	3.1
Queue Length 50th (ft)	38	87	0	153	391	144	88	0	78	207	0
Queue Length 95th (ft)	80	153	0	#338	#711	#363	132	45	166	271	20
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	287	2012	701	443	1539	246	961	525	240	906	502
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.22	0.07	0.91	0.73	0.80	0.29	0.25	0.45	0.62	0.20

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	94	406	42	365	888	138	179	252	118	99	514	90
Future Volume (veh/h)	94	406	42	365	888	138	179	252	118	99	514	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	103	446	46	401	976	152	197	277	130	109	565	99
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1498	465	474	1144	178	232	873	389	139	702	313
Arrive On Green	0.06	0.29	0.29	0.14	0.37	0.37	0.13	0.25	0.25	0.08	0.20	0.20
Sat Flow, veh/h	3456	5106	1585	3456	3081	480	1781	3554	1585	1781	3554	1585
Grp Volume(v), veh/h	103	446	46	401	563	565	197	277	130	109	565	99
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1777	1784	1781	1777	1585	1781	1777	1585
Q Serve(g_s), s	2.7	6.4	2.0	10.7	27.5	27.5	10.2	6.0	6.4	5.7	14.3	5.0
Cycle Q Clear(g_c), s	2.7	6.4	2.0	10.7	27.5	27.5	10.2	6.0	6.4	5.7	14.3	5.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	1498	465	474	659	662	232	873	389	139	702	313
V/C Ratio(X)	0.50	0.30	0.10	0.85	0.85	0.85	0.85	0.32	0.33	0.79	0.80	0.32
Avail Cap(c_a), veh/h	337	2355	731	520	819	823	289	938	418	281	912	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	25.8	24.2	39.7	27.3	27.3	40.1	29.1	29.2	42.7	36.1	32.4
Incr Delay (d2), s/veh	1.9	0.1	0.1	11.5	7.3	7.3	17.4	0.2	0.5	9.4	4.1	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	2.4	0.7	5.0	11.6	11.7	5.5	2.5	2.3	2.8	6.3	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	25.9	24.3	51.3	34.5	34.6	57.5	29.3	29.7	52.1	40.2	33.0
LnGrp LOS	D	C	C	D	C	C	E	C	C	D	D	C
Approach Vol, veh/h		595			1529			604			773	
Approach Delay, s/veh		29.1			39.0			38.6			40.9	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	29.0	18.7	34.2	17.0	24.4	11.4	41.5
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	14.9	* 25	14.2	43.5	* 15	24.2	9.2	43.5
Max Q Clear Time (g_c+I1), s	7.7	8.4	12.7	8.4	12.2	16.3	4.7	29.5
Green Ext Time (p_c), s	0.1	1.9	0.2	2.9	0.2	2.3	0.1	5.5

Intersection Summary	
HCM 6th Ctrl Delay	37.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	11	11	190	84	96	340
Future Vol, veh/h	11	11	190	84	96	340
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	12	207	91	104	370

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	646	149	0	0	298	0
Stage 1	253	-	-	-	-	-
Stage 2	393	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	433	740	-	-	841	-
Stage 1	698	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	365	740	-	-	841	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	698	-	-	-	-	-
Stage 2	531	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.7	0	2.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	489	841	-
HCM Lane V/C Ratio	-	-	0.049	0.124	-
HCM Control Delay (s)	-	-	12.7	9.9	0.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.4	-

Queues
8: TULLY RD & KIERNAN AVE

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	63	1106	155	205	1005	16	197	189	113	26	216
v/c Ratio	0.46	0.83	0.27	0.76	0.62	0.02	1.43	0.27	0.16	0.19	0.41
Control Delay	39.4	28.2	3.9	49.9	20.7	0.1	257.6	17.2	1.6	31.1	19.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	28.2	3.9	49.9	20.7	0.1	257.6	17.2	1.6	31.1	19.6
Queue Length 50th (ft)	24	146	0	41	129	0	~107	45	0	10	60
Queue Length 95th (ft)	#63	#200	29	#90	173	0	#220	109	12	31	115
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	138	1338	573	268	1620	657	138	689	698	138	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.83	0.27	0.76	0.62	0.02	1.43	0.27	0.16	0.19	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	60	1051	147	195	955	15	187	180	107	25	161	45
Future Volume (veh/h)	60	1051	147	195	955	15	187	180	107	25	161	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1767	1870	1870	1767	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	63	1106	155	205	1005	16	197	189	113	26	169	47
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	9	2	2	9	2	2	2	2	2	2	2
Cap, veh/h	94	1320	434	273	1445	475	141	625	530	52	400	111
Arrive On Green	0.05	0.27	0.27	0.08	0.30	0.30	0.08	0.33	0.33	0.03	0.28	0.28
Sat Flow, veh/h	1781	4823	1585	3456	4823	1585	1781	1870	1585	1781	1408	392
Grp Volume(v), veh/h	63	1106	155	205	1005	16	197	189	113	26	0	216
Grp Sat Flow(s),veh/h/ln	1781	1608	1585	1728	1608	1585	1781	1870	1585	1781	0	1800
Q Serve(g_s), s	2.2	13.7	5.0	3.7	11.7	0.5	5.0	4.7	3.2	0.9	0.0	6.2
Cycle Q Clear(g_c), s	2.2	13.7	5.0	3.7	11.7	0.5	5.0	4.7	3.2	0.9	0.0	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	94	1320	434	273	1445	475	141	625	530	52	0	512
V/C Ratio(X)	0.67	0.84	0.36	0.75	0.70	0.03	1.40	0.30	0.21	0.50	0.00	0.42
Avail Cap(c_a), veh/h	141	1371	451	273	1445	475	141	625	530	141	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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.4	21.7	18.5	28.6	19.6	15.7	29.2	15.6	15.1	30.3	0.0	18.4
Incr Delay (d2), s/veh	7.9	4.6	0.5	11.1	1.5	0.0	217.4	1.2	0.9	7.4	0.0	2.5
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	1.1	5.3	1.8	1.9	4.2	0.2	10.5	2.1	1.2	0.5	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	26.3	19.0	39.6	21.1	15.7	246.6	16.9	16.0	37.7	0.0	21.0
LnGrp LOS	D	C	B	D	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1324			1226			499			242	
Approach Delay, s/veh		26.0			24.1			107.4			22.8	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	25.7	9.5	21.8	9.5	22.5	7.8	23.5
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.9	6.7	5.7	15.7	7.0	8.2	4.2	13.7
Green Ext Time (p_c), s	0.0	1.1	0.0	1.6	0.0	0.8	0.0	2.6

Intersection Summary	
HCM 6th Ctrl Delay	37.4
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1217	1	0	970	0	22
Future Vol, veh/h	1217	1	0	970	0	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	9	5	5	9	5	5
Mvmt Flow	1281	1	0	1021	0	23

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	641
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.35
Pot Cap-1 Maneuver	-	-	0	-	0	410
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	410
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	410	-	-	-
HCM Lane V/C Ratio	0.056	-	-	-
HCM Control Delay (s)	14.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	70	1154	835	90	0	130
Future Vol, veh/h	70	1154	835	90	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	9	9	2	2	2
Mvmt Flow	73	1202	870	94	0	135

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	964	0	-	0	-	482
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	710	-	-	-	0	530
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	710	-	-	-	-	530
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	710	-	-	-	530
HCM Lane V/C Ratio	0.103	-	-	-	0.256
HCM Control Delay (s)	10.7	-	-	-	14.1
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1

Queues

PM EX PL PROJ

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

02/19/2021

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	129	909	237	164	718	208	505	401	319	563	98
v/c Ratio	0.60	0.75	0.43	0.64	0.81	0.77	0.63	0.78	0.87	0.57	0.18
Control Delay	67.6	44.0	7.3	66.4	47.7	67.1	42.4	30.4	68.1	36.6	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.6	44.0	7.3	66.4	47.7	67.1	42.4	30.4	68.1	36.6	3.0
Queue Length 50th (ft)	47	221	0	60	251	144	177	139	217	183	0
Queue Length 95th (ft)	#124	346	68	#152	413	#330	261	283	#520	277	21
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	220	1413	606	262	1016	358	1016	599	445	1183	611
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.59	0.64	0.39	0.63	0.71	0.58	0.50	0.67	0.72	0.48	0.16

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

PM EX PL PROJ
02/19/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	126	891	232	161	613	90	204	495	393	313	552	96
Future Volume (veh/h)	126	891	232	161	613	90	204	495	393	313	552	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1767	1767	1767	1767	1767	1767	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	129	909	237	164	626	92	208	505	401	319	563	98
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	9	9	9	9	9	9	7	7	7	7	7	7
Cap, veh/h	184	1132	352	239	739	108	240	933	416	351	1167	521
Arrive On Green	0.06	0.23	0.23	0.07	0.25	0.25	0.14	0.27	0.27	0.21	0.34	0.34
Sat Flow, veh/h	3264	4823	1497	3264	2937	431	1711	3413	1522	1711	3413	1522
Grp Volume(v), veh/h	129	909	237	164	357	361	208	505	401	319	563	98
Grp Sat Flow(s),veh/h/ln	1632	1608	1497	1632	1678	1689	1711	1706	1522	1711	1706	1522
Q Serve(g_s), s	4.2	19.3	15.6	5.3	22.0	22.1	12.9	13.7	28.2	19.8	14.1	4.9
Cycle Q Clear(g_c), s	4.2	19.3	15.6	5.3	22.0	22.1	12.9	13.7	28.2	19.8	14.1	4.9
Prop In Lane	1.00		1.00	1.00		0.26	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	184	1132	352	239	422	425	240	933	416	351	1167	521
V/C Ratio(X)	0.70	0.80	0.67	0.69	0.85	0.85	0.87	0.54	0.96	0.91	0.48	0.19
Avail Cap(c_a), veh/h	222	1353	420	264	493	496	360	933	416	449	1167	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	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	50.4	39.2	37.8	49.2	38.7	38.7	45.7	33.7	39.0	42.2	28.2	25.1
Incr Delay (d2), s/veh	7.4	3.0	3.3	6.4	11.5	11.7	13.4	0.6	34.8	18.9	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.4	5.7	2.3	9.8	9.9	6.3	5.7	13.8	9.9	5.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	42.2	41.1	55.6	50.2	50.4	59.1	34.3	73.7	61.1	28.5	25.3
LnGrp LOS	E	D	D	E	D	D	E	C	E	E	C	C
Approach Vol, veh/h		1275			882			1114			980	
Approach Delay, s/veh		43.6			51.3			53.1			38.8	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.4	35.5	13.7	32.0	20.0	43.0	11.9	33.8				
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5				
Max Green Setting (Gmax), s	28.5	* 30	8.8	30.5	* 23	35.0	7.4	31.9				
Max Q Clear Time (g_c+I1), s	21.8	30.2	7.3	21.3	14.9	16.1	6.2	24.1				
Green Ext Time (p_c), s	0.5	0.0	0.1	4.2	0.3	3.6	0.0	2.4				
Intersection Summary												
HCM 6th Ctrl Delay			46.6									
HCM 6th LOS			D									

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

12: TULLY RD & PROJECT ACCESS

Intersection	
Int Delay, s/veh	2.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	74	73	401	11	12	491
Future Vol, veh/h	74	73	401	11	12	491
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	5	5	2	5	5	2
Mvmt Flow	80	79	436	12	13	534

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	735	224	0	0	448	0
Stage 1	442	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Critical Hdwy	6.35	7.2	-	-	5.4	-
Critical Hdwy Stg 1	6.7	-	-	-	-	-
Critical Hdwy Stg 2	5.9	-	-	-	-	-
Follow-up Hdwy	3.7	3.95	-	-	3.15	-
Pot Cap-1 Maneuver	379	657	-	-	705	-
Stage 1	532	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	369	657	-	-	705	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	679	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	16.5		0		0.3	
HCM LOS	C					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	472	705	-
HCM Lane V/C Ratio	-	-	0.339	0.019	-
HCM Control Delay (s)	-	-	16.5	10.2	0.1
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	1.5	0.1	-

Queues
8: TULLY RD & KIERNAN AVE

AM EX PL APPR PROJ
02/03/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	1016	128	150	1227	11	157	29	102	23	245
v/c Ratio	0.13	0.71	0.22	0.54	0.66	0.02	1.10	0.04	0.14	0.16	0.45
Control Delay	29.7	23.5	2.4	36.1	19.4	0.0	139.1	15.8	1.1	30.4	19.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	23.5	2.4	36.1	19.4	0.0	139.1	15.8	1.1	30.4	19.4
Queue Length 50th (ft)	7	130	0	29	127	0	~73	6	0	9	67
Queue Length 95th (ft)	24	173	18	#56	#245	0	#177	25	7	28	127
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	143	1424	587	277	1860	712	143	717	719	143	541
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.71	0.22	0.54	0.66	0.02	1.10	0.04	0.14	0.16	0.45

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: TULLY RD & KIERNAN AVE

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	16	914	115	135	1104	10	141	26	92	21	156	65
Future Volume (veh/h)	16	914	115	135	1104	10	141	26	92	21	156	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	1016	128	150	1227	11	157	29	102	23	173	72
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, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	38	1309	420	257	1571	504	144	644	546	47	364	151
Arrive On Green	0.02	0.26	0.26	0.07	0.32	0.32	0.08	0.34	0.34	0.03	0.29	0.29
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	1781	1870	1585	1781	1254	522
Grp Volume(v), veh/h	18	1016	128	150	1227	11	157	29	102	23	0	245
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1781	1870	1585	1781	0	1776
Q Serve(g_s), s	0.6	11.8	4.0	2.6	14.0	0.3	5.0	0.6	2.8	0.8	0.0	7.0
Cycle Q Clear(g_c), s	0.6	11.8	4.0	2.6	14.0	0.3	5.0	0.6	2.8	0.8	0.0	7.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.29
Lane Grp Cap(c), veh/h	38	1309	420	257	1571	504	144	644	546	47	0	515
V/C Ratio(X)	0.47	0.78	0.31	0.58	0.78	0.02	1.09	0.05	0.19	0.49	0.00	0.48
Avail Cap(c_a), veh/h	144	1434	460	278	1571	504	144	644	546	144	0	515
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	21.1	18.2	27.8	19.2	14.5	28.5	13.5	14.3	29.8	0.0	18.1
Incr Delay (d2), s/veh	8.7	2.5	0.4	2.7	2.6	0.0	102.5	0.1	0.8	7.7	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.5	1.4	1.1	5.2	0.1	6.1	0.3	1.0	0.4	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	23.6	18.7	30.4	21.8	14.6	131.0	13.7	15.0	37.5	0.0	21.3
LnGrp LOS	D	C	B	C	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1162			1388			288			268	
Approach Delay, s/veh		23.3			22.7			78.1			22.7	
Approach LOS		C			C			E			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.1	25.9	9.1	20.9	9.5	22.5	5.8	24.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.8	4.8	4.6	13.8	7.0	9.0	2.6	16.0
Green Ext Time (p_c), s	0.0	0.3	0.0	2.6	0.0	0.9	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	28.1
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1034	42	0	1240	0	8
Future Vol, veh/h	1034	42	0	1240	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	1077	44	0	1292	0	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	561
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	461
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	461
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	461	-	-	-
HCM Lane V/C Ratio	0.018	-	-	-
HCM Control Delay (s)	13	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	107	815	1151	65	0	65
Future Vol, veh/h	107	815	1151	65	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	118	896	1265	71	0	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1336	0	-	0	-	668
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	512	-	-	-	0	401
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	512	-	-	-	-	401
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	512	-	-	-	401
HCM Lane V/C Ratio	0.23	-	-	-	0.178
HCM Control Delay (s)	14.1	-	-	-	15.9
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.9	-	-	-	0.6

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	109	457	189	401	1120	176	277	130	109	565	99
v/c Ratio	0.43	0.31	0.31	0.91	0.92	0.79	0.32	0.26	0.60	0.71	0.21
Control Delay	59.9	31.9	6.2	75.9	48.4	75.1	35.3	6.6	66.5	45.4	3.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	31.9	6.2	75.9	48.4	75.1	35.3	6.6	66.5	45.4	3.1
Queue Length 50th (ft)	40	90	0	153	394	127	90	0	78	210	0
Queue Length 95th (ft)	85	157	59	#338	#720	#315	132	45	166	274	20
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	286	1929	738	441	1485	245	918	526	239	861	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.24	0.26	0.91	0.75	0.72	0.30	0.25	0.46	0.66	0.20

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

AM EX PL APPR PROJ
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	99	416	172	365	881	138	160	252	118	99	514	90
Future Volume (veh/h)	99	416	172	365	881	138	160	252	118	99	514	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	109	457	189	401	968	152	176	277	130	109	565	99
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	6	2	2	6	2	2	7	2	2	7	2
Cap, veh/h	207	1484	476	473	1124	176	211	816	379	139	692	321
Arrive On Green	0.06	0.30	0.30	0.14	0.38	0.38	0.12	0.24	0.24	0.08	0.20	0.20
Sat Flow, veh/h	3456	4944	1585	3456	2980	468	1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	109	457	189	401	559	561	176	277	130	109	565	99
Grp Sat Flow(s),veh/h/ln	1728	1648	1585	1728	1721	1727	1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	2.9	6.7	8.9	10.7	28.3	28.3	9.1	6.3	6.4	5.7	14.9	5.0
Cycle Q Clear(g_c), s	2.9	6.7	8.9	10.7	28.3	28.3	9.1	6.3	6.4	5.7	14.9	5.0
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	207	1484	476	473	649	651	211	816	379	139	692	321
V/C Ratio(X)	0.53	0.31	0.40	0.85	0.86	0.86	0.83	0.34	0.34	0.79	0.82	0.31
Avail Cap(c_a), veh/h	337	2279	731	520	793	796	289	901	418	281	875	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	25.5	26.2	39.8	27.1	27.1	40.7	29.7	29.8	42.7	35.9	32.0
Incr Delay (d2), s/veh	2.1	0.1	0.5	11.6	8.1	8.2	14.0	0.2	0.5	9.4	4.9	0.5
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	1.2	2.4	3.1	5.0	11.6	11.7	4.7	2.6	2.3	2.8	6.3	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	25.6	26.8	51.3	35.2	35.3	54.7	30.0	30.3	52.1	40.8	32.5
LnGrp LOS	D	C	C	D	D	D	D	C	C	D	D	C
Approach Vol, veh/h		755			1521			583			773	
Approach Delay, s/veh		28.7			39.5			37.5			41.3	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.4	28.4	18.7	34.8	15.9	24.9	11.5	42.1
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	14.9	* 25	14.2	43.5	* 15	24.2	9.2	43.5
Max Q Clear Time (g_c+I1), s	7.7	8.4	12.7	10.9	11.1	16.9	4.9	30.3
Green Ext Time (p_c), s	0.1	1.9	0.2	3.4	0.2	2.2	0.1	5.3

Intersection Summary	
HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	3	1	259	14	15	373
Future Vol, veh/h	3	1	259	14	15	373
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	2	6	6	2
Mvmt Flow	3	1	282	15	16	405

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	525	149	0	0	297	0
Stage 1	290	-	-	-	-	-
Stage 2	235	-	-	-	-	-
Critical Hdwy	6.37	7.22	-	-	5.42	-
Critical Hdwy Stg 1	6.72	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.71	3.96	-	-	3.16	-
Pot Cap-1 Maneuver	496	731	-	-	828	-
Stage 1	653	-	-	-	-	-
Stage 2	742	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	484	731	-	-	828	-
Mov Cap-2 Maneuver	484	-	-	-	-	-
Stage 1	653	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	11.9		0		0.5	
HCM LOS	B					

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	529	828	-
HCM Lane V/C Ratio	-	-	0.008	0.02	-
HCM Control Delay (s)	-	-	11.9	9.4	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0	0.1	-

8: TULLY RD & KIERNAN AVE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	67	1186	186	266	1090	18	211	197	92	28	230
v/c Ratio	0.49	0.86	0.32	0.99	0.65	0.03	1.53	0.29	0.13	0.20	0.44
Control Delay	41.3	30.1	5.0	87.4	21.4	0.1	298.5	17.3	0.6	31.4	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	30.1	5.0	87.4	21.4	0.1	298.5	17.3	0.6	31.4	20.2
Queue Length 50th (ft)	26	159	0	54	142	0	~118	47	0	11	65
Queue Length 95th (ft)	#68	#232	40	#123	189	0	#235	113	3	32	123
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	138	1376	578	268	1666	657	138	689	698	138	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.86	0.32	0.99	0.65	0.03	1.53	0.29	0.13	0.20	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: TULLY RD & KIERNAN AVE

02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↑↱	
Traffic Volume (veh/h)	60	1067	167	239	981	16	190	177	83	25	161	46
Future Volume (veh/h)	60	1067	167	239	981	16	190	177	83	25	161	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	1186	186	266	1090	18	211	197	92	28	179	51
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, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	97	1371	439	271	1490	478	140	619	524	55	396	113
Arrive On Green	0.05	0.28	0.28	0.08	0.30	0.30	0.08	0.33	0.33	0.03	0.28	0.28
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	1781	1870	1585	1781	1400	399
Grp Volume(v), veh/h	67	1186	186	266	1090	18	211	197	92	28	0	230
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1781	1870	1585	1781	0	1799
Q Serve(g_s), s	2.4	14.5	6.1	4.9	12.6	0.5	5.0	5.0	2.6	1.0	0.0	6.7
Cycle Q Clear(g_c), s	2.4	14.5	6.1	4.9	12.6	0.5	5.0	5.0	2.6	1.0	0.0	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	97	1371	439	271	1490	478	140	619	524	55	0	509
V/C Ratio(X)	0.69	0.87	0.42	0.98	0.73	0.04	1.51	0.32	0.18	0.51	0.00	0.45
Avail Cap(c_a), veh/h	140	1398	448	271	1490	478	140	619	524	140	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	21.9	18.8	29.3	19.9	15.7	29.3	15.9	15.1	30.4	0.0	18.8
Incr Delay (d2), s/veh	8.4	5.9	0.6	48.9	1.9	0.0	261.9	1.4	0.7	7.2	0.0	2.9
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	1.2	5.9	2.2	3.8	4.7	0.2	12.2	2.2	1.0	0.5	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	27.7	19.5	78.1	21.8	15.7	291.2	17.3	15.9	37.6	0.0	21.7
LnGrp LOS	D	C	B	E	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1439			1374			500			258	
Approach Delay, s/veh		27.1			32.6			132.6			23.4	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	25.5	9.5	22.1	9.5	22.5	8.0	23.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.0	7.0	6.9	16.5	7.0	8.7	4.4	14.6
Green Ext Time (p_c), s	0.0	1.0	0.0	1.1	0.0	0.8	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	43.7
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1198	4	0	1013	0	28
Future Vol, veh/h	1198	4	0	1013	0	28
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	1248	4	0	1055	0	29

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	626
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	417
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	417
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	417	-	-	-
HCM Lane V/C Ratio	0.07	-	-	-
HCM Control Delay (s)	14.3	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	82	1173	902	90	0	130
Future Vol, veh/h	82	1173	902	90	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	90	1289	991	99	0	143

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1090	0	-	0	-	545
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	636	-	-	-	0	482
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	636	-	-	-	-	482
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		WB		SB
HCM Control Delay, s	0.8		0		15.6
HCM LOS					C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	636	-	-	-	482
HCM Lane V/C Ratio	0.142	-	-	-	0.296
HCM Control Delay (s)	11.6	-	-	-	15.6
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	-	1.2

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	140	977	252	177	786	265	544	432	344	607	112
v/c Ratio	0.62	0.78	0.42	0.67	0.86	0.85	0.65	0.80	0.89	0.63	0.21
Control Delay	69.7	46.0	7.0	68.7	52.0	73.0	43.4	34.5	71.1	39.2	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	69.7	46.0	7.0	68.7	52.0	73.0	43.4	34.5	71.1	39.2	4.8
Queue Length 50th (ft)	55	258	0	70	302	197	200	179	253	213	0
Queue Length 95th (ft)	#132	373	69	#161	456	#447	283	331	#560	302	32
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	227	1404	634	270	1014	362	984	600	451	1144	620
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.70	0.40	0.66	0.78	0.73	0.55	0.72	0.76	0.53	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	127	889	229	161	625	90	241	495	393	313	552	102
Future Volume (veh/h)	127	889	229	161	625	90	241	495	393	313	552	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	140	977	252	177	687	99	265	544	432	344	607	112
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	6	2	2	6	2	2	7	2	2	7	2
Cap, veh/h	198	1194	383	247	772	111	297	911	423	376	1076	500
Arrive On Green	0.06	0.24	0.24	0.07	0.26	0.26	0.17	0.27	0.27	0.21	0.32	0.32
Sat Flow, veh/h	3456	4944	1585	3456	3019	435	1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	140	977	252	177	391	395	265	544	432	344	607	112
Grp Sat Flow(s),veh/h/ln	1728	1648	1585	1728	1721	1733	1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	4.4	20.8	16.0	5.6	24.4	24.4	16.2	15.5	29.7	21.0	16.5	5.8
Cycle Q Clear(g_c), s	4.4	20.8	16.0	5.6	24.4	24.4	16.2	15.5	29.7	21.0	16.5	5.8
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	198	1194	383	247	440	443	297	911	423	376	1076	500
V/C Ratio(X)	0.71	0.82	0.66	0.72	0.89	0.89	0.89	0.60	1.02	0.91	0.56	0.22
Avail Cap(c_a), veh/h	230	1356	435	273	493	497	367	911	423	456	1076	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.5	39.9	38.0	50.5	39.9	39.9	45.4	35.6	40.8	42.9	31.7	28.1
Incr Delay (d2), s/veh	8.0	3.7	3.0	7.7	16.6	16.7	20.2	1.1	49.1	20.4	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	8.3	6.1	2.6	11.6	11.8	8.7	6.5	16.5	11.0	6.6	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	43.5	41.1	58.2	56.5	56.6	65.6	36.6	89.9	63.3	32.4	28.3
LnGrp LOS	E	D	D	E	E	E	E	D	F	E	C	C
Approach Vol, veh/h		1369			963			1241			1063	
Approach Delay, s/veh		44.7			56.9			61.3			42.0	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.6	35.5	13.8	33.4	23.2	40.9	12.2	35.0
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	28.5	* 30	8.8	30.5	* 23	35.0	7.4	31.9
Max Q Clear Time (g_c+I1), s	23.0	31.7	7.6	22.8	18.2	18.5	6.4	26.4
Green Ext Time (p_c), s	0.5	0.0	0.1	4.0	0.3	3.7	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	51.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰↱		↑↑↱			↰↑
Traffic Vol, veh/h	23	6	444	2	2	517
Future Vol, veh/h	23	6	444	2	2	517
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	2	6	6	2
Mvmt Flow	25	7	483	2	2	562

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	769	243	0	0	485	0
Stage 1	484	-	-	-	-	-
Stage 2	285	-	-	-	-	-
Critical Hdwy	6.37	7.22	-	-	5.42	-
Critical Hdwy Stg 1	6.72	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.71	3.96	-	-	3.16	-
Pot Cap-1 Maneuver	360	636	-	-	674	-
Stage 1	499	-	-	-	-	-
Stage 2	701	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	359	636	-	-	674	-
Mov Cap-2 Maneuver	359	-	-	-	-	-
Stage 1	499	-	-	-	-	-
Stage 2	698	-	-	-	-	-

Approach	WB		NB		SB	
HCM Control Delay, s	14.9		0		0	
HCM LOS	B					

Minor Lane/Major Mvmt		NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)		-	-	395	674	-
HCM Lane V/C Ratio		-	-	0.08	0.003	-
HCM Control Delay (s)		-	-	14.9	10.4	0
HCM Lane LOS		-	-	B	B	A
HCM 95th %tile Q(veh)		-	-	0.3	0	-

8: TULLY RD & KIERNAN AVE

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	18	1021	143	237	1227	11	159	30	111	24	250
v/c Ratio	0.13	0.76	0.25	0.88	0.63	0.01	1.14	0.04	0.16	0.17	0.47
Control Delay	29.8	25.3	3.3	63.6	18.9	0.0	153.7	15.9	1.5	30.7	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	25.3	3.3	63.6	18.9	0.0	153.7	15.9	1.5	30.7	20.0
Queue Length 50th (ft)	7	131	0	48	127	0	~75	6	0	9	69
Queue Length 95th (ft)	24	175	24	#107	#245	0	#179	26	11	29	131
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	139	1386	576	270	1936	734	139	695	703	139	528
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.74	0.25	0.88	0.63	0.01	1.14	0.04	0.16	0.17	0.47

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: TULLY RD & KIERNAN AVE

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	16	919	129	213	1104	10	143	27	100	22	160	65
Future Volume (veh/h)	16	919	129	213	1104	10	143	27	100	22	160	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	18	1021	143	237	1227	11	159	30	111	24	178	72
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, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	38	1307	419	276	1596	512	142	637	540	49	364	147
Arrive On Green	0.02	0.26	0.26	0.08	0.32	0.32	0.08	0.34	0.34	0.03	0.29	0.29
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	1781	1870	1585	1781	1266	512
Grp Volume(v), veh/h	18	1021	143	237	1227	11	159	30	111	24	0	250
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1781	1870	1585	1781	0	1778
Q Serve(g_s), s	0.6	12.0	4.6	4.2	14.0	0.3	5.0	0.7	3.1	0.8	0.0	7.3
Cycle Q Clear(g_c), s	0.6	12.0	4.6	4.2	14.0	0.3	5.0	0.7	3.1	0.8	0.0	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.29
Lane Grp Cap(c), veh/h	38	1307	419	276	1596	512	142	637	540	49	0	512
V/C Ratio(X)	0.47	0.78	0.34	0.86	0.77	0.02	1.12	0.05	0.21	0.49	0.00	0.49
Avail Cap(c_a), veh/h	142	1423	456	276	1596	512	142	637	540	142	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	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.2	21.3	18.6	28.4	19.1	14.4	28.8	13.8	14.6	30.0	0.0	18.4
Incr Delay (d2), s/veh	8.7	2.7	0.5	22.6	2.3	0.0	110.0	0.1	0.9	7.6	0.0	3.3
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	0.3	4.6	1.6	2.5	5.2	0.1	6.4	0.3	1.1	0.4	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.0	24.0	19.1	51.0	21.4	14.5	138.8	14.0	15.5	37.6	0.0	21.8
LnGrp LOS	D	C	B	D	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1182			1475			300			274	
Approach Delay, s/veh		23.6			26.1			80.7			23.1	
Approach LOS		C			C			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	25.8	9.5	21.0	9.5	22.5	5.8	24.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	2.8	5.1	6.2	14.0	7.0	9.3	2.6	16.0
Green Ext Time (p_c), s	0.0	0.4	0.0	2.6	0.0	0.9	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	30.0
HCM 6th LOS	C

9: INDUSTRIAL ACCESS & KIERNAN AVE

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1042	48	0	1318	0	11
Future Vol, veh/h	1042	48	0	1318	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	1085	50	0	1373	0	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	568
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	456
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	456
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		WB		NB	
HCM Control Delay, s	0		0		13.1	
HCM LOS					B	

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	456	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-
HCM Control Delay (s)	13.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	107	825	1229	65	0	65
Future Vol, veh/h	107	825	1229	65	0	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	118	907	1351	71	0	71

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1422	0	-	0	-	711
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	475	-	-	-	0	375
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	475	-	-	-	-	375
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	1.7	0	16.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	475	-	-	-	375
HCM Lane V/C Ratio	0.248	-	-	-	0.19
HCM Control Delay (s)	15.1	-	-	-	16.8
HCM Lane LOS	C	-	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	0.7

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

02/03/2021

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	110	460	197	401	1142	233	277	130	109	565	105
v/c Ratio	0.44	0.31	0.32	0.93	0.94	0.97	0.31	0.25	0.61	0.72	0.22
Control Delay	60.4	32.2	6.1	80.7	51.5	104.1	35.2	6.5	67.2	46.2	3.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.4	32.2	6.1	80.7	51.5	104.1	35.2	6.5	67.2	46.2	3.9
Queue Length 50th (ft)	40	91	0	153	406	174	90	0	78	210	0
Queue Length 95th (ft)	85	158	60	#338	#745	#442	132	45	166	274	24
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	279	1880	729	430	1446	239	906	520	233	843	493
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.24	0.27	0.93	0.79	0.97	0.31	0.25	0.47	0.67	0.21

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

AM EPAP PL PROJ
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	100	419	179	365	901	138	212	252	118	99	514	96
Future Volume (veh/h)	100	419	179	365	901	138	212	252	118	99	514	96
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	110	460	197	401	990	152	233	277	130	109	565	105
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	6	2	2	6	2	2	7	2	2	7	2
Cap, veh/h	194	1465	470	464	1119	172	263	903	419	138	675	314
Arrive On Green	0.06	0.30	0.30	0.13	0.37	0.37	0.15	0.26	0.26	0.08	0.20	0.20
Sat Flow, veh/h	3456	4944	1585	3456	2990	459	1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	110	460	197	401	569	573	233	277	130	109	565	105
Grp Sat Flow(s),veh/h/ln	1728	1648	1585	1728	1721	1729	1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	3.2	7.4	10.2	11.6	31.5	31.6	13.1	6.6	6.7	6.1	16.2	5.8
Cycle Q Clear(g_c), s	3.2	7.4	10.2	11.6	31.5	31.6	13.1	6.6	6.7	6.1	16.2	5.8
Prop In Lane	1.00		1.00	1.00		0.27	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	194	1465	470	464	644	647	263	903	419	138	675	314
V/C Ratio(X)	0.57	0.31	0.42	0.86	0.88	0.89	0.88	0.31	0.31	0.79	0.84	0.33
Avail Cap(c_a), veh/h	312	2110	677	482	734	738	267	903	419	260	810	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.9	27.8	28.8	43.2	29.8	29.8	42.6	30.0	30.0	46.2	39.3	35.1
Incr Delay (d2), s/veh	2.6	0.1	0.6	14.7	11.3	11.4	27.4	0.2	0.4	9.8	6.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	2.7	3.7	5.6	13.7	13.8	7.6	2.7	2.4	3.0	7.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	27.9	29.4	57.9	41.1	41.2	70.0	30.2	30.4	56.0	45.9	35.7
LnGrp LOS	D	C	C	E	D	D	E	C	C	E	D	D
Approach Vol, veh/h		767			1543			640			779	
Approach Delay, s/veh		31.4			45.5			44.7			45.9	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	32.8	19.5	36.7	19.8	26.0	11.5	44.7
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	14.9	* 25	14.2	43.5	* 15	24.2	9.2	43.5
Max Q Clear Time (g_c+I1), s	8.1	8.7	13.6	12.2	15.1	18.2	5.2	33.6
Green Ext Time (p_c), s	0.1	1.9	0.1	3.5	0.0	1.9	0.1	4.6

Intersection Summary	
HCM 6th Ctrl Delay	42.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	3	12	259	98	111	373
Future Vol, veh/h	3	12	259	98	111	373
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	2	6	6	2
Mvmt Flow	3	13	282	107	121	405

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	781	195	0	0	389	0
Stage 1	336	-	-	-	-	-
Stage 2	445	-	-	-	-	-
Critical Hdwy	6.37	7.22	-	-	5.42	-
Critical Hdwy Stg 1	6.72	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.71	3.96	-	-	3.16	-
Pot Cap-1 Maneuver	355	683	-	-	749	-
Stage 1	613	-	-	-	-	-
Stage 2	582	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	281	683	-	-	749	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	460	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	531	749	-
HCM Lane V/C Ratio	-	-	0.031	0.161	-
HCM Control Delay (s)	-	-	12	10.7	0.7
HCM Lane LOS	-	-	B	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0.6	-

Queues
8: TULLY RD & KIERNAN AVE

PM EPAP PL PROJ
02/04/2021

	⤴	→	⤵	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	67	1187	188	277	1090	18	230	202	150	28	231
v/c Ratio	0.49	0.86	0.32	1.03	0.65	0.03	1.67	0.29	0.21	0.20	0.44
Control Delay	41.3	30.1	5.0	97.7	21.4	0.1	355.5	17.4	3.2	31.4	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.3	30.1	5.0	97.7	21.4	0.1	355.5	17.4	3.2	31.4	20.2
Queue Length 50th (ft)	26	159	0	~59	142	0	~134	48	0	11	66
Queue Length 95th (ft)	#68	#232	40	#128	189	0	#255	115	27	32	124
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	138	1376	580	268	1666	657	138	689	698	138	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.86	0.32	1.03	0.65	0.03	1.67	0.29	0.21	0.20	0.44

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
8: TULLY RD & KIERNAN AVE

PM EPAP PL PROJ
02/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑	↱	↰	↱	
Traffic Volume (veh/h)	60	1068	169	249	981	16	207	182	135	25	162	46
Future Volume (veh/h)	60	1068	169	249	981	16	207	182	135	25	162	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	67	1187	188	277	1090	18	230	202	150	28	180	51
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, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	97	1371	440	271	1490	478	140	618	524	55	396	112
Arrive On Green	0.05	0.28	0.28	0.08	0.30	0.30	0.08	0.33	0.33	0.03	0.28	0.28
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	1781	1870	1585	1781	1402	397
Grp Volume(v), veh/h	67	1187	188	277	1090	18	230	202	150	28	0	231
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1781	1870	1585	1781	0	1799
Q Serve(g_s), s	2.4	14.5	6.2	5.0	12.6	0.5	5.0	5.2	4.5	1.0	0.0	6.7
Cycle Q Clear(g_c), s	2.4	14.5	6.2	5.0	12.6	0.5	5.0	5.2	4.5	1.0	0.0	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	97	1371	440	271	1490	478	140	618	524	55	0	509
V/C Ratio(X)	0.69	0.87	0.43	1.02	0.73	0.04	1.64	0.33	0.29	0.51	0.00	0.45
Avail Cap(c_a), veh/h	140	1398	448	271	1490	478	140	618	524	140	0	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.6	21.9	18.9	29.3	19.9	15.7	29.3	16.0	15.7	30.4	0.0	18.8
Incr Delay (d2), s/veh	8.4	5.9	0.7	60.0	1.9	0.0	319.5	1.4	1.4	7.2	0.0	2.9
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	1.2	5.9	2.2	4.2	4.7	0.2	14.5	2.3	1.7	0.5	0.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	27.8	19.5	89.3	21.8	15.7	348.8	17.4	17.1	37.6	0.0	21.7
LnGrp LOS	D	C	B	F	C	B	F	B	B	D	A	C
Approach Vol, veh/h		1442			1385			582			259	
Approach Delay, s/veh		27.2			35.2			148.3			23.4	
Approach LOS		C			D			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	25.5	9.5	22.2	9.5	22.5	8.0	23.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	18.0	5.0	18.0	5.0	18.0	5.0	18.0
Max Q Clear Time (g_c+I1), s	3.0	7.2	7.0	16.5	7.0	8.7	4.4	14.6
Green Ext Time (p_c), s	0.0	1.2	0.0	1.1	0.0	0.8	0.0	2.2

Intersection Summary	
HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1250	5	0	1046	0	45
Future Vol, veh/h	1250	5	0	1046	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	1302	5	0	1090	0	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	654
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	400
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	400
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		WB		NB
HCM Control Delay, s	0		0		15.2
HCM LOS					C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	400	-	-	-
HCM Lane V/C Ratio	0.117	-	-	-
HCM Control Delay (s)	15.2	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.4	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	82	1242	912	90	0	130
Future Vol, veh/h	82	1242	912	90	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	90	1365	1002	99	0	143

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1101	0	-	0	-	551
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	630	-	-	-	0	478
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	630	-	-	-	-	478
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	630	-	-	-	478
HCM Lane V/C Ratio	0.143	-	-	-	0.299
HCM Control Delay (s)	11.7	-	-	-	15.7
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	-	1.2

Queues
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

	↗	→	↘	↙	←	↖	↑	↗	↘	↓	↙
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	145	997	302	177	789	273	544	432	344	607	113
v/c Ratio	0.65	0.79	0.48	0.68	0.86	0.87	0.66	0.80	0.89	0.63	0.21
Control Delay	70.7	46.3	6.9	69.1	51.7	75.3	43.6	34.7	71.5	39.5	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.7	46.3	6.9	69.1	51.7	75.3	43.6	34.7	71.5	39.5	4.9
Queue Length 50th (ft)	57	265	0	70	303	204	200	179	253	213	0
Queue Length 95th (ft)	#139	382	75	#161	458	#465	283	331	#560	302	33
Internal Link Dist (ft)		2106			4572		3154			3057	
Turn Bay Length (ft)	765		650	965		140		215	420		540
Base Capacity (vph)	226	1396	667	268	1009	360	978	598	449	1137	617
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.71	0.45	0.66	0.78	0.76	0.56	0.72	0.77	0.53	0.18

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
PM EPAP PL PROJ
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD
02/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑↱		↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	132	907	275	161	628	90	248	495	393	313	552	103
Future Volume (veh/h)	132	907	275	161	628	90	248	495	393	313	552	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	145	997	302	177	690	99	273	544	432	344	607	113
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	6	2	2	6	2	2	7	2	2	7	2
Cap, veh/h	203	1206	387	246	775	111	304	907	421	376	1058	491
Arrive On Green	0.06	0.24	0.24	0.07	0.26	0.26	0.17	0.27	0.27	0.21	0.31	0.31
Sat Flow, veh/h	3456	4944	1585	3456	3021	433	1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	145	997	302	177	393	396	273	544	432	344	607	113
Grp Sat Flow(s),veh/h/ln	1728	1648	1585	1728	1721	1733	1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	4.6	21.3	19.9	5.6	24.6	24.6	16.8	15.6	29.7	21.1	16.7	5.9
Cycle Q Clear(g_c), s	4.6	21.3	19.9	5.6	24.6	24.6	16.8	15.6	29.7	21.1	16.7	5.9
Prop In Lane	1.00		1.00	1.00		0.25	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	1206	387	246	441	445	304	907	421	376	1058	491
V/C Ratio(X)	0.71	0.83	0.78	0.72	0.89	0.89	0.90	0.60	1.03	0.91	0.57	0.23
Avail Cap(c_a), veh/h	229	1350	433	272	491	495	365	907	421	454	1069	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.7	40.0	39.4	50.8	40.0	40.0	45.4	35.8	41.0	43.1	32.4	28.6
Incr Delay (d2), s/veh	8.8	4.0	8.1	7.9	16.9	17.0	21.4	1.1	50.4	20.6	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.5	8.1	2.6	11.8	11.9	9.1	6.5	16.7	11.1	6.7	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	44.0	47.5	58.7	56.9	57.0	66.8	36.9	91.4	63.7	33.1	28.9
LnGrp LOS	E	D	D	E	E	E	E	D	F	E	C	C
Approach Vol, veh/h		1444			966			1249			1064	
Approach Delay, s/veh		46.4			57.3			62.3			42.5	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.7	35.5	13.8	33.7	23.8	40.4	12.4	35.2
Change Period (Y+Rc), s	5.1	* 5.8	5.8	6.5	* 4.7	5.8	5.8	6.5
Max Green Setting (Gmax), s	28.5	* 30	8.8	30.5	* 23	35.0	7.4	31.9
Max Q Clear Time (g_c+I1), s	23.1	31.7	7.6	23.3	18.8	18.7	6.6	26.6
Green Ext Time (p_c), s	0.5	0.0	0.1	3.9	0.3	3.7	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	51.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑↱			↰↑
Traffic Vol, veh/h	97	79	444	13	14	517
Future Vol, veh/h	97	79	444	13	14	517
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	6	6	2	6	6	2
Mvmt Flow	105	86	483	14	15	562

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	801	249	0	0	497	0
Stage 1	490	-	-	-	-	-
Stage 2	311	-	-	-	-	-
Critical Hdwy	6.37	7.22	-	-	5.42	-
Critical Hdwy Stg 1	6.72	-	-	-	-	-
Critical Hdwy Stg 2	5.92	-	-	-	-	-
Follow-up Hdwy	3.71	3.96	-	-	3.16	-
Pot Cap-1 Maneuver	345	631	-	-	665	-
Stage 1	495	-	-	-	-	-
Stage 2	680	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	334	631	-	-	665	-
Mov Cap-2 Maneuver	334	-	-	-	-	-
Stage 1	495	-	-	-	-	-
Stage 2	658	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.3	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	423	665	-
HCM Lane V/C Ratio	-	-	0.452	0.023	-
HCM Control Delay (s)	-	-	20.3	10.5	0.2
HCM Lane LOS	-	-	C	B	A
HCM 95th %tile Q(veh)	-	-	2.3	0.1	-

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	1858	295	316	2442	11	305	132	121	16	195
v/c Ratio	0.25	0.88	0.35	0.93	0.93	0.01	0.97	0.08	0.19	0.23	0.43
Control Delay	75.7	42.2	3.7	95.9	37.8	0.0	107.5	32.4	6.7	73.4	45.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.7	42.2	3.7	95.9	37.8	0.0	107.5	32.4	6.7	73.4	45.7
Queue Length 50th (ft)	15	559	0	149	682	0	145	28	0	14	143
Queue Length 95th (ft)	40	630	54	#241	#937	0	#242	50	48	40	221
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	63	2117	852	340	2628	904	313	1743	622	69	453
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.88	0.35	0.93	0.93	0.01	0.97	0.08	0.19	0.23	0.43

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
8: TULLY RD & KIERNAN AVE

AM CUMULATIVE
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↱	
Traffic Volume (veh/h)	15	1765	280	300	2320	10	290	125	115	15	145	40
Future Volume (veh/h)	15	1765	280	300	2320	10	290	125	115	15	145	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	1858	295	316	2442	11	305	132	121	16	153	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	30	2101	674	348	2517	807	320	1672	519	30	355	97
Arrive On Green	0.02	0.42	0.42	0.10	0.51	0.51	0.09	0.33	0.33	0.02	0.25	0.25
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	3456	5106	1585	1781	1413	388
Grp Volume(v), veh/h	16	1858	295	316	2442	11	305	132	121	16	0	195
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1728	1702	1585	1781	0	1801
Q Serve(g_s), s	1.2	47.8	18.2	12.5	66.2	0.5	12.1	2.5	7.7	1.2	0.0	12.6
Cycle Q Clear(g_c), s	1.2	47.8	18.2	12.5	66.2	0.5	12.1	2.5	7.7	1.2	0.0	12.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	30	2101	674	348	2517	807	320	1672	519	30	0	452
V/C Ratio(X)	0.54	0.88	0.44	0.91	0.97	0.01	0.95	0.08	0.23	0.54	0.00	0.43
Avail Cap(c_a), veh/h	65	2170	696	348	2517	807	320	1672	519	71	0	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	67.4	36.6	28.0	61.5	32.9	16.8	62.3	32.1	33.8	67.4	0.0	43.4
Incr Delay (d2), s/veh	14.5	4.7	0.4	26.7	11.8	0.0	37.6	0.1	1.1	14.5	0.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	19.9	7.0	6.8	28.4	0.2	7.0	1.0	3.2	0.7	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.8	41.2	28.5	88.1	44.7	16.8	100.0	32.2	34.9	81.8	0.0	46.4
LnGrp LOS	F	D	C	F	D	B	F	C	C	F	A	D
Approach Vol, veh/h		2169			2769			558			211	
Approach Delay, s/veh		39.8			49.5			69.8			49.1	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	49.7	18.4	63.2	17.3	39.2	6.8	74.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.5	42.0	13.9	60.6	12.8	34.7	5.0	69.5
Max Q Clear Time (g_c+I1), s	3.2	9.7	14.5	49.8	14.1	14.6	3.2	68.2
Green Ext Time (p_c), s	0.0	1.3	0.0	8.9	0.0	1.0	0.0	1.3

Intersection Summary	
HCM 6th Ctrl Delay	47.8
HCM 6th LOS	D

9: INDUSTRIAL ACCESS & KIERNAN AVE

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1905	40	0	2680	0	5
Future Vol, veh/h	1905	40	0	2680	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	2005	42	0	2821	0	5

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1024
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	226
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	226
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	21.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	226	-	-	-
HCM Lane V/C Ratio	0.023	-	-	-
HCM Control Delay (s)	21.3	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	19.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	200	1710	2540	130	0	130
Future Vol, veh/h	200	1710	2540	130	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	211	1800	2674	137	0	137

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2811	0	-	0	-	1406
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	~ 135	-	-	-	0	~ 129
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	~ 135	-	-	-	-	~ 129
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	36	0	162.8
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	~ 135	-	-	-	129
HCM Lane V/C Ratio	1.559	-	-	-	1.061
HCM Control Delay (s)	$ 343.4	-	-	-	162.8
HCM Lane LOS	F	-	-	-	F
HCM 95th %tile Q(veh)	14.8	-	-	-	7.7

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	95	184	747	237	195	268	274	200	579	111
v/c Ratio	0.42	0.40	0.97	0.33	0.85	0.35	0.48	0.87	0.78	0.21
Control Delay	55.9	4.3	64.0	4.8	74.7	33.3	7.1	78.3	43.2	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	4.3	64.0	4.8	74.7	33.3	7.1	78.3	43.2	0.9
Queue Length 50th (ft)	26	0	205	0	106	69	0	109	167	0
Queue Length 95th (ft)	#92	24	#639	56	#394	139	64	#406	304	0
Internal Link Dist (ft)						3154			3057	
Turn Bay Length (ft)	765	650	965		140		215	420		540
Base Capacity (vph)	228	463	882	737	280	817	591	280	806	560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.42	0.40	0.85	0.32	0.70	0.33	0.46	0.71	0.72	0.20

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰		↱	↰↰		↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	90	0	175	710	0	225	185	255	260	190	550	105
Future Volume (veh/h)	90	0	175	710	0	225	185	255	260	190	550	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	95	0	184	747	0	237	195	268	221	200	579	111
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	2	0	2	2	7	2	2	7	2
Cap, veh/h	318	0	0	891	0	0	286	801	372	252	765	355
Arrive On Green	0.09	0.00	0.00	0.26	0.00	0.00	0.16	0.23	0.23	0.14	0.22	0.22
Sat Flow, veh/h	3456	95		3456	747		1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	95	19.5		747	16.9		195	268	221	200	579	111
Grp Sat Flow(s),veh/h/ln	1728	B		1728	B		1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	1.2			9.3			4.7	3.0	5.7	5.0	7.2	2.7
Cycle Q Clear(g_c), s	1.2			9.3			4.7	3.0	5.7	5.0	7.2	2.7
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	318			891			286	801	372	252	765	355
V/C Ratio(X)	0.30			0.84			0.68	0.33	0.59	0.79	0.76	0.31
Avail Cap(c_a), veh/h	455			1757			558	1347	625	558	1324	615
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.3			16.0			18.0	14.5	15.5	18.9	16.5	14.8
Incr Delay (d2), s/veh	0.2			0.8			1.1	0.1	0.6	2.2	0.6	0.2
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4			2.7			1.7	1.0	1.5	1.8	2.2	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.5			16.9			19.1	14.6	16.1	21.1	17.1	14.9
LnGrp LOS	B			B			B	B	B	C	B	B
Approach Vol, veh/h								684			890	
Approach Delay, s/veh								16.4			17.7	
Approach LOS								B			B	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	11.5	16.5	17.6		12.0	16.0	10.0
Change Period (Y+Rc), s	5.1	* 5.8	5.8		* 4.7	5.8	5.8
Max Green Setting (Gmax), s	14.3	* 18	23.2		* 14	17.7	6.0
Max Q Clear Time (g_c+I1), s	7.0	7.7	11.3		6.7	9.2	3.2
Green Ext Time (p_c), s	0.0	0.6	0.4		0.1	1.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	17.1
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑↱			↑↑↑
Traffic Vol, veh/h	0	0	530	0	0	725
Future Vol, veh/h	0	0	530	0	0	725
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	2	6	2	2
Mvmt Flow	0	0	558	0	0	763

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	279	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.96	-	-	-	-
Pot Cap-1 Maneuver	0	603	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	603	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

Queues
8: TULLY RD & KIERNAN AVE

PM CUMULATIVE
02/03/2021

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	2153	400	553	1989	11	532	195	184	16	174
v/c Ratio	0.51	1.01	0.36	1.09	0.74	0.01	1.05	0.13	0.32	0.22	0.71
Control Delay	84.2	59.1	2.9	118.6	25.5	0.0	107.2	36.2	6.8	70.0	68.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	84.2	59.1	2.9	118.6	25.5	0.0	107.2	36.2	6.8	70.0	68.7
Queue Length 50th (ft)	36	~680	14	~274	471	0	~255	43	0	14	139
Queue Length 95th (ft)	#86	#874	62	#419	594	0	#397	71	58	41	219
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	84	2132	1113	507	2706	924	507	1904	707	75	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	1.01	0.36	1.09	0.74	0.01	1.05	0.10	0.26	0.21	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
8: TULLY RD & KIERNAN AVE

PM CUMULATIVE
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↱	
Traffic Volume (veh/h)	40	2045	380	525	1890	10	505	185	175	15	135	30
Future Volume (veh/h)	40	2045	380	525	1890	10	505	185	175	15	135	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	2153	400	553	1989	11	532	195	184	16	142	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	54	2194	942	520	2788	894	520	1276	396	30	172	39
Arrive On Green	0.03	0.44	0.44	0.15	0.56	0.56	0.15	0.25	0.25	0.02	0.12	0.12
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	3456	5106	1585	1781	1477	333
Grp Volume(v), veh/h	42	2153	400	553	1989	11	532	195	184	16	0	174
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1728	1702	1585	1781	0	1810
Q Serve(g_s), s	3.0	55.6	17.7	19.5	38.0	0.4	19.5	3.9	12.8	1.2	0.0	12.2
Cycle Q Clear(g_c), s	3.0	55.6	17.7	19.5	38.0	0.4	19.5	3.9	12.8	1.2	0.0	12.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	54	2194	942	520	2788	894	520	1276	396	30	0	211
V/C Ratio(X)	0.78	0.98	0.42	1.06	0.71	0.01	1.02	0.15	0.46	0.53	0.00	0.83
Avail Cap(c_a), veh/h	87	2194	942	520	2788	894	520	1947	604	77	0	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	62.4	35.5	14.3	55.0	20.6	12.4	55.0	37.9	41.2	63.2	0.0	56.0
Incr Delay (d2), s/veh	20.8	15.0	0.3	57.4	0.9	0.0	45.4	0.1	0.8	13.8	0.0	7.9
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	1.7	24.8	6.3	12.6	14.4	0.1	11.8	1.6	5.1	0.6	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.2	50.5	14.6	112.4	21.5	12.4	100.5	37.9	42.1	77.0	0.0	63.9
LnGrp LOS	F	D	B	F	C	B	F	D	D	E	A	E
Approach Vol, veh/h		2595			2553			911			190	
Approach Delay, s/veh		45.5			41.2			75.3			65.0	
Approach LOS		D			D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	36.9	24.0	62.0	24.0	19.6	8.4	77.6				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.6	49.4	19.5	57.5	19.5	35.5	6.3	70.7				
Max Q Clear Time (g_c+I1), s	3.2	14.8	21.5	57.6	21.5	14.2	5.0	40.0				
Green Ext Time (p_c), s	0.0	2.0	0.0	0.0	0.0	0.9	0.0	20.2				
Intersection Summary												
HCM 6th Ctrl Delay			48.7									
HCM 6th LOS			D									

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	2270	5	0	2465	0	40
Future Vol, veh/h	2270	5	0	2465	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	2	2	6	2	2
Mvmt Flow	2389	5	0	2595	0	42

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1197
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	178
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	178
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	31.4
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	178	-	-	-
HCM Lane V/C Ratio	0.237	-	-	-
HCM Control Delay (s)	31.4	-	-	-
HCM Lane LOS	D	-	-	-
HCM 95th %tile Q(veh)	0.9	-	-	-

Intersection	
Int Delay, s/veh	22.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	160	2150	2175	180	0	260
Future Vol, veh/h	160	2150	2175	180	0	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	168	2263	2289	189	0	274

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2478	0	-	0	-	1239
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	183	-	-	-	0	~ 167
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	183	-	-	-	-	~ 167
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	6.8	0	$ 361.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	183	-	-	-	167
HCM Lane V/C Ratio	0.92	-	-	-	1.639
HCM Control Delay (s)	98.8	-	-	-	$ 361.5
HCM Lane LOS	F	-	-	-	F
HCM 95th %tile Q(veh)	7.1	-	-	-	18.8

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Queues

PM CUMULATIVE

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

02/03/2021

Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	163	321	358	158	337	574	789	511	658	132
v/c Ratio	0.62	0.62	0.96	0.34	0.96	0.78	0.91	1.00	0.64	0.22
Control Delay	60.6	10.0	84.2	3.8	81.1	45.9	29.5	78.2	35.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	10.0	84.2	3.8	81.1	45.9	29.5	78.2	35.1	4.2
Queue Length 50th (ft)	48	0	109	0	191	172	223	293	183	0
Queue Length 95th (ft)	#141	78	#356	24	#615	307	599	#938	341	32
Internal Link Dist (ft)						3154			3057	
Turn Bay Length (ft)	765	650	965		140		215	420		540
Base Capacity (vph)	323	520	374	464	419	971	867	511	1136	634
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.62	0.96	0.34	0.80	0.59	0.91	1.00	0.58	0.21

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰		↱	↰↰		↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	155	0	305	340	0	150	320	545	750	485	625	125
Future Volume (veh/h)	155	0	305	340	0	150	320	545	750	485	625	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	163	0	321	358	0	158	337	574	736	511	658	132
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	2	0	2	2	7	2	2	7	2
Cap, veh/h	267	0	0	442	0	0	377	1168	745	547	1512	702
Arrive On Green	0.08	0.00	0.00	0.13	0.00	0.00	0.21	0.34	0.34	0.31	0.44	0.44
Sat Flow, veh/h	3456	163		3456	358		1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	163	34.4		358	39.4		337	574	736	511	658	132
Grp Sat Flow(s),veh/h/ln	1728	C		1728	D		1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	3.4			7.6			13.8	10.0	25.7	20.9	10.0	3.8
Cycle Q Clear(g_c), s	3.4			7.6			13.8	10.0	25.7	20.9	10.0	3.8
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	267			442			377	1168	745	547	1512	702
V/C Ratio(X)	0.61			0.81			0.89	0.49	0.99	0.93	0.44	0.19
Avail Cap(c_a), veh/h	433			502			562	1168	745	686	1512	702
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5			31.8			28.8	19.5	19.7	25.3	14.4	12.7
Incr Delay (d2), s/veh	0.8			7.5			8.9	0.1	29.6	16.0	0.1	0.0
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3			3.3			6.5	3.7	15.8	10.3	3.3	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4			39.4			37.6	19.6	49.3	41.3	14.5	12.7
LnGrp LOS	C			D			D	B	D	D	B	B
Approach Vol, veh/h								1647			1301	
Approach Delay, s/veh								36.6			24.8	
Approach LOS								D			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	28.2	31.5	15.4		20.6	39.1	11.6
Change Period (Y+Rc), s	5.1	* 5.8	5.8		* 4.7	5.8	5.8
Max Green Setting (Gmax), s	28.9	* 26	10.9		* 24	30.6	9.4
Max Q Clear Time (g_c+I1), s	22.9	27.7	9.6		15.8	12.0	5.4
Green Ext Time (p_c), s	0.1	0.0	0.0		0.1	1.4	0.0

Intersection Summary	
HCM 6th Ctrl Delay	32.4
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑↱			↑↑↑
Traffic Vol, veh/h	0	0	865	0	0	1040
Future Vol, veh/h	0	0	865	0	0	1040
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	911	0	0	1095

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	456	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	472	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	472	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

Queues

8: TULLY RD & KIERNAN AVE

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	16	1878	295	399	2443	11	317	132	133	22	195
v/c Ratio	0.25	0.94	0.36	0.95	0.93	0.01	0.97	0.08	0.22	0.30	0.44
Control Delay	75.7	49.8	4.0	93.1	37.9	0.0	105.8	34.1	6.6	75.6	46.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.7	49.8	4.0	93.1	37.9	0.0	105.8	34.1	6.6	75.6	46.2
Queue Length 50th (ft)	15	594	0	188	683	0	151	31	0	20	144
Queue Length 95th (ft)	40	#675	56	#290	#938	0	#249	50	49	50	222
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	63	2002	822	421	2628	904	326	1659	606	75	447
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.94	0.36	0.95	0.93	0.01	0.97	0.08	0.22	0.29	0.44

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

8: TULLY RD & KIERNAN AVE

02/04/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↑↱	
Traffic Volume (veh/h)	15	1784	280	379	2321	10	301	125	126	21	145	40
Future Volume (veh/h)	15	1784	280	379	2321	10	301	125	126	21	145	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	1878	295	399	2443	11	317	132	133	22	153	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	30	2013	645	426	2541	814	329	1634	507	37	346	95
Arrive On Green	0.02	0.41	0.41	0.12	0.51	0.51	0.10	0.32	0.32	0.02	0.25	0.25
Sat Flow, veh/h	1781	4944	1585	3456	4944	1585	3456	5106	1585	1781	1413	388
Grp Volume(v), veh/h	16	1878	295	399	2443	11	317	132	133	22	0	195
Grp Sat Flow(s),veh/h/ln	1781	1648	1585	1728	1648	1585	1728	1702	1585	1781	0	1801
Q Serve(g_s), s	1.2	50.7	18.9	16.0	66.2	0.5	12.7	2.5	8.7	1.7	0.0	12.8
Cycle Q Clear(g_c), s	1.2	50.7	18.9	16.0	66.2	0.5	12.7	2.5	8.7	1.7	0.0	12.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	30	2013	645	426	2541	814	329	1634	507	37	0	441
V/C Ratio(X)	0.54	0.93	0.46	0.94	0.96	0.01	0.96	0.08	0.26	0.60	0.00	0.44
Avail Cap(c_a), veh/h	64	2031	651	426	2541	814	329	1634	507	77	0	441
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	68.1	39.5	30.1	60.6	32.6	16.6	62.8	33.1	35.2	67.7	0.0	44.6
Incr Delay (d2), s/veh	14.6	8.6	0.5	28.2	10.4	0.0	39.4	0.1	1.3	14.8	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	21.9	7.4	8.7	28.1	0.2	7.4	1.1	3.6	0.9	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.7	48.1	30.6	88.8	43.0	16.6	102.2	33.2	36.5	82.5	0.0	47.7
LnGrp LOS	F	D	C	F	D	B	F	C	D	F	A	D
Approach Vol, veh/h		2189			2853			582			217	
Approach Delay, s/veh		46.0			49.3			71.5			51.3	
Approach LOS		D			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	7.4	49.1	21.7	61.3	17.8	38.7	6.8	76.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.0	41.5	17.2	57.3	13.3	34.2	5.0	69.5
Max Q Clear Time (g_c+I1), s	3.7	10.7	18.0	52.7	14.7	14.8	3.2	68.2
Green Ext Time (p_c), s	0.0	1.3	0.0	4.1	0.0	1.0	0.0	1.2

Intersection Summary		
HCM 6th Ctrl Delay		50.3
HCM 6th LOS		D

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	1908	151	0	2761	0	15
Future Vol, veh/h	1908	151	0	2761	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	2008	159	0	2906	0	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1084
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	206
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	206
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	23.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	206	-	-	-
HCM Lane V/C Ratio	0.077	-	-	-
HCM Control Delay (s)	23.9	-	-	-
HCM Lane LOS	C	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

Intersection	
Int Delay, s/veh	22.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	203	1720	2618	130	0	130
Future Vol, veh/h	203	1720	2618	130	0	130
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	214	1811	2756	137	0	137

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2893	0	-	0	-	1447
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	~ 125	-	-	-	0	~ 121
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	~ 125	-	-	-	-	~ 121
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		WB		SB
HCM Control Delay, s	43.5		0		190.7
HCM LOS					F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	~ 125	-	-	-	121
HCM Lane V/C Ratio	1.709	-	-	-	1.131
HCM Control Delay (s)	$ 411.7	-	-	-	190.7
HCM Lane LOS	F	-	-	-	F
HCM 95th %tile Q(veh)	16.1	-	-	-	8.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	96	192	747	237	249	268	274	200	579	117
v/c Ratio	0.43	0.42	0.98	0.33	0.98	0.33	0.47	0.88	0.78	0.22
Control Delay	56.7	5.1	66.2	4.8	94.6	32.9	6.8	80.4	44.3	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	5.1	66.2	4.8	94.6	32.9	6.8	80.4	44.3	0.9
Queue Length 50th (ft)	27	0	207	0	140	70	0	110	169	0
Queue Length 95th (ft)	#94	30	#639	56	#521	139	64	#406	304	0
Internal Link Dist (ft)						3154			3057	
Turn Bay Length (ft)	765	650	965		140		215	420		540
Base Capacity (vph)	221	458	858	727	272	819	592	272	787	553
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.42	0.87	0.33	0.92	0.33	0.46	0.74	0.74	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

AM CUM PL PROJ
02/04/2021

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰		↱	↰↰		↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	91	0	182	710	0	225	237	255	260	190	550	111
Future Volume (veh/h)	91	0	182	710	0	225	237	255	260	190	550	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	96	0	192	747	0	237	249	268	221	200	579	117
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	2	0	2	2	7	2	2	7	2
Cap, veh/h	316	0	0	888	0	0	306	836	388	251	760	353
Arrive On Green	0.09	0.00	0.00	0.26	0.00	0.00	0.17	0.24	0.24	0.14	0.22	0.22
Sat Flow, veh/h	3456	96		3456	747		1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	96	20.0		747	17.3		249	268	221	200	579	117
Grp Sat Flow(s),veh/h/ln	1728	C		1728	B		1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	1.2			9.6			6.3	3.0	5.7	5.1	7.4	2.9
Cycle Q Clear(g_c), s	1.2			9.6			6.3	3.0	5.7	5.1	7.4	2.9
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	316			888			306	836	388	251	760	353
V/C Ratio(X)	0.30			0.84			0.81	0.32	0.57	0.80	0.76	0.33
Avail Cap(c_a), veh/h	443			1715			545	1314	610	545	1292	600
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.8			16.5			18.6	14.5	15.5	19.4	17.0	15.2
Incr Delay (d2), s/veh	0.2			0.9			2.0	0.1	0.5	2.2	0.6	0.2
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4			2.8			2.4	1.0	1.5	1.9	2.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.0			17.3			20.7	14.5	16.0	21.6	17.6	15.4
LnGrp LOS	C			B			C	B	B	C	B	B
Approach Vol, veh/h								738			896	
Approach Delay, s/veh								17.0			18.2	
Approach LOS								B			B	

Timer - Assigned Phs	1	2	3		5	6	7					
Phs Duration (G+Y+Rc), s	11.7	17.2	17.8		12.7	16.2	10.1					
Change Period (Y+Rc), s	5.1	* 5.8	5.8		* 4.7	5.8	5.8					
Max Green Setting (Gmax), s	14.3	* 18	23.2		* 14	17.7	6.0					
Max Q Clear Time (g_c+I1), s	7.1	7.7	11.6		8.3	9.4	3.2					
Green Ext Time (p_c), s	0.0	0.6	0.4		0.1	1.0	0.0					

Intersection Summary			
HCM 6th Ctrl Delay			17.7
HCM 6th LOS			B

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑↱			↑↑↑
Traffic Vol, veh/h	0	14	538	75	0	736
Future Vol, veh/h	0	14	538	75	0	736
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	2	6	2	2
Mvmt Flow	0	15	566	79	0	775

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	323	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.96	-	-	-	-
Pot Cap-1 Maneuver	0	565	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	565	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	565	-
HCM Lane V/C Ratio	-	-	0.026	-
HCM Control Delay (s)	-	-	11.5	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.1	-

	⤴	→	⤵	↙	←	↖	↰	↑	↱	↘	↓
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	42	2155	400	572	2000	13	608	197	203	17	174
v/c Ratio	0.32	1.03	0.36	1.13	0.74	0.01	1.14	0.13	0.26	0.23	0.71
Control Delay	70.3	64.7	2.9	130.3	25.5	0.0	133.2	35.5	16.4	70.2	68.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.3	64.7	2.9	130.3	25.5	0.0	133.2	35.5	16.4	70.2	68.7
Queue Length 50th (ft)	18	~720	14	~291	472	0	~312	43	67	14	139
Queue Length 95th (ft)	40	#887	62	#438	597	0	#463	71	135	43	219
Internal Link Dist (ft)		2649			1677			265			2536
Turn Bay Length (ft)	700		370	665		415	275		400	295	
Base Capacity (vph)	130	2095	1113	507	2707	924	533	1939	779	76	492
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.32	1.03	0.36	1.13	0.74	0.01	1.14	0.10	0.26	0.22	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Signalized Intersection Summary
8: TULLY RD & KIERNAN AVE

PM CUM PL PROJ
02/03/2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑↑	↱	↰	↱	
Traffic Volume (veh/h)	40	2047	380	543	1900	12	578	187	193	16	135	30
Future Volume (veh/h)	40	2047	380	543	1900	12	578	187	193	16	135	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1811	1870	1870	1811	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	2155	400	572	2000	13	608	197	203	17	142	32
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	6	2	2	6	2	2	2	2	2	2	2
Cap, veh/h	104	2156	942	520	2751	882	547	1312	646	31	172	39
Arrive On Green	0.03	0.44	0.44	0.15	0.56	0.56	0.16	0.26	0.26	0.02	0.12	0.12
Sat Flow, veh/h	3456	4944	1585	3456	4944	1585	3456	5106	1585	1781	1477	333
Grp Volume(v), veh/h	42	2155	400	572	2000	13	608	197	203	17	0	174
Grp Sat Flow(s),veh/h/ln	1728	1648	1585	1728	1648	1585	1728	1702	1585	1781	0	1810
Q Serve(g_s), s	1.5	56.5	17.7	19.5	39.0	0.5	20.5	3.9	11.3	1.2	0.0	12.2
Cycle Q Clear(g_c), s	1.5	56.5	17.7	19.5	39.0	0.5	20.5	3.9	11.3	1.2	0.0	12.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	104	2156	942	520	2751	882	547	1312	646	31	0	211
V/C Ratio(X)	0.40	1.00	0.42	1.10	0.73	0.01	1.11	0.15	0.31	0.54	0.00	0.83
Avail Cap(c_a), veh/h	133	2156	942	520	2751	882	547	1982	854	78	0	496
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.7	36.5	14.3	55.0	21.4	12.9	54.5	37.2	26.1	63.1	0.0	56.0
Incr Delay (d2), s/veh	2.5	19.3	0.3	69.6	1.0	0.0	73.0	0.1	0.3	13.6	0.0	7.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	24.6	5.7	13.2	13.6	0.2	14.4	1.6	4.1	0.7	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	55.8	14.6	124.6	22.4	12.9	127.6	37.3	26.4	76.8	0.0	63.9
LnGrp LOS	E	E	B	F	C	B	F	D	C	E	A	E
Approach Vol, veh/h		2597			2585			1008			191	
Approach Delay, s/veh		49.6			45.0			89.5			65.1	
Approach LOS		D			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.8	37.8	24.0	61.0	25.0	19.6	8.4	76.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.7	50.3	19.5	56.5	20.5	35.5	5.0	71.0
Max Q Clear Time (g_c+I1), s	3.2	13.3	21.5	58.5	22.5	14.2	3.5	41.0
Green Ext Time (p_c), s	0.0	2.1	0.0	0.0	0.0	0.9	0.0	17.3

Intersection Summary	
HCM 6th Ctrl Delay	54.5
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↱			↑↑		↱
Traffic Vol, veh/h	2287	19	0	2495	0	112
Future Vol, veh/h	2287	19	0	2495	0	112
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	6	6	2	6	2	6
Mvmt Flow	2407	20	0	2626	0	118

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	1214
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.02
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.36
Pot Cap-1 Maneuver	-	-	0	-	0	168
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	168
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	65.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	168	-	-	-
HCM Lane V/C Ratio	0.702	-	-	-
HCM Control Delay (s)	65.5	-	-	-
HCM Lane LOS	F	-	-	-
HCM 95th %tile Q(veh)	4.2	-	-	-

Intersection	
Int Delay, s/veh	24

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑	↑↱			↱
Traffic Vol, veh/h	180	2219	2185	180	0	260
Future Vol, veh/h	180	2219	2185	180	0	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	820	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	6	2	2	2
Mvmt Flow	189	2336	2300	189	0	274

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	2489	0	-	0	-	1245
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	3.32
Pot Cap-1 Maneuver	~ 181	-	-	-	0	~ 165
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	~ 181	-	-	-	-	~ 165
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	10	0	$ 370.6
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	~ 181	-	-	-	165
HCM Lane V/C Ratio	1.047	-	-	-	1.659
HCM Control Delay (s)	132.8	-	-	-	$ 370.6
HCM Lane LOS	F	-	-	-	F
HCM 95th %tile Q(veh)	9	-	-	-	19

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

Lane Group	EBL	EBR	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	168	369	358	158	344	574	789	511	658	133
v/c Ratio	0.63	0.65	0.84	0.31	1.03	0.81	0.88	1.09	0.69	0.23
Control Delay	58.7	9.9	61.8	2.3	99.4	47.2	23.9	104.5	36.2	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	9.9	61.8	2.3	99.4	47.2	23.9	104.5	36.2	2.7
Queue Length 50th (ft)	48	0	100	0	195	171	182	~313	182	0
Queue Length 95th (ft)	#153	84	#320	7	#690	305	529	#975	332	21
Internal Link Dist (ft)						3154			3057	
Turn Bay Length (ft)	765	650	965		140		215	420		540
Base Capacity (vph)	316	567	496	520	340	724	920	469	958	571
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.65	0.72	0.30	1.01	0.79	0.86	1.09	0.69	0.23

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

11: MCHENRY AVE & KIERNAN AVE/CLARIBEL RD

02/03/2021

	↗	→	↘	↙	←	↖	↖	↑	↗	↘	↓	↙
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰		↱	↰↰		↱	↰	↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	160	0	351	340	0	150	327	545	750	485	625	126
Future Volume (veh/h)	160	0	351	340	0	150	327	545	750	485	625	126
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	0	1870	1870	0	1870	1870	1796	1870	1870	1796	1870
Adj Flow Rate, veh/h	168	0	369	358	0	158	344	574	736	511	658	133
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	0	2	2	0	2	2	7	2	2	7	2
Cap, veh/h	325	0	0	468	0	0	393	934	648	557	1270	590
Arrive On Green	0.09	0.00	0.00	0.14	0.00	0.00	0.22	0.27	0.27	0.31	0.37	0.37
Sat Flow, veh/h	3456	168		3456	358		1781	3413	1585	1781	3413	1585
Grp Volume(v), veh/h	168	26.3		358	26.0		344	574	736	511	658	133
Grp Sat Flow(s),veh/h/ln	1728	C		1728	C		1781	1706	1585	1781	1706	1585
Q Serve(g_s), s	2.8			6.0			11.2	8.8	16.4	16.6	9.0	3.4
Cycle Q Clear(g_c), s	2.8			6.0			11.2	8.8	16.4	16.6	9.0	3.4
Prop In Lane	1.00			1.00			1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325			468			393	934	648	557	1270	590
V/C Ratio(X)	0.52			0.77			0.88	0.61	1.14	0.92	0.52	0.23
Avail Cap(c_a), veh/h	507			796			547	934	648	752	1310	608
HCM Platoon Ratio	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00			1.00			1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9			25.0			22.6	19.0	17.7	19.9	14.6	12.9
Incr Delay (d2), s/veh	0.5			1.0			8.8	0.9	78.9	11.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0			0.0			0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0			2.1			5.2	3.2	20.6	7.4	2.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3			26.0			31.4	19.9	96.7	31.2	14.8	13.0
LnGrp LOS	C			C			C	B	F	C	B	B
Approach Vol, veh/h								1654			1302	
Approach Delay, s/veh								56.4			21.1	
Approach LOS								E			C	

Timer - Assigned Phs	1	2	3		5	6	7
Phs Duration (G+Y+Rc), s	23.8	22.2	13.9		17.9	28.1	11.4
Change Period (Y+Rc), s	5.1	* 5.8	5.8		* 4.7	5.8	5.8
Max Green Setting (Gmax), s	25.3	* 16	13.8		* 18	23.0	8.8
Max Q Clear Time (g_c+I1), s	18.6	18.4	8.0		13.2	11.0	4.8
Green Ext Time (p_c), s	0.2	0.0	0.1		0.1	1.3	0.0

Intersection Summary	
HCM 6th Ctrl Delay	38.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations		↱	↑↑↱			↑↑↑
Traffic Vol, veh/h	0	93	866	10	0	1114
Future Vol, veh/h	0	93	866	10	0	1114
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	6	2	6	2	2
Mvmt Flow	0	98	912	11	0	1173

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	462	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.96	-	-	-	-
Pot Cap-1 Maneuver	0	459	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	-	459	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	459	-
HCM Lane V/C Ratio	-	-	0.213	-
HCM Control Delay (s)	-	-	15	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.8	-