March 2024 | Initial Study / Mitigated Negative Declaration

OXFORD PREPARATORY ACADEMY EXPANSION PROJECT

Saddleback Valley Unified School District

Prepared for:

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Abbreviations and Acronyms

AAQS	ambient air quality standards
AB	Assembly Bill
AQMD	Air Quality Management District
AQMP	air quality management plan
CALGreen	California Green Building Standards Code
CBC	California Building Code
CDE	California Department of Education
CH_4	methane
CNEL	community noise equivalent level
CO	carbon monoxide
CO_2e	carbon dioxide equivalent
dB	decibel
dBA	A-weighted decibel
DPM	diesel particulate matter
DSA	Division of the State Architect
EPA	United States Environmental Protection Agency
FHSZ	fire hazard severity zone
FTA	Federal Transit Administration
GHG	greenhouse gases
LOS	level of service
LST	localized significance thresholds
MBTA	Migratory Bird Treaty Act
MRZ	Mineral Resources Zones
MWDOC	Municipal Water District of Orange County
NO_X	nitrogen oxides
O_3	ozone
OPA	Oxford Preparatory Academy–Saddleback Valley
PM	particulate matter
ppm	parts per million
PPV	peak particle velocity
RCNM	Roadway Construction Noise Model
RPS	renewable portfolio standard
RTP/SCS	Regional Transportation Plan/Sustainable Communities Strategy

Abbreviations and Acronyms

SB	Senate Bill
SCAG	Southern California Association of Governments
SoCAB	South Coast Air Basin
SO_X	sulfur oxides
SRA	source receptor area (air quality)
SRA	state responsibility area (wildfire)
USFWS	United States Fish and Wildlife Service
UWMP	urban water management plan
VdB	velocity decibels (vibration)
VMT	vehicle miles traveled
VOC	volatile organic compound

Abbreviations and Acronyms

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1. Introduction

1.1 PROJECT OVERVIEW

The Saddleback Valley Unified School District (District) plans to add 18 relocatable classrooms and a restroom building at the Oxford Preparatory Academy–Saddleback Valley (OPA) site, to support 7th and 8th graders at the school. The school currently serves grades TK-6 with an overall capacity of 448 students. With the addition of the new grades 7 and 8 classrooms, the school would have an overall capacity of 1,200 students. The proposed project is required to undergo an environmental review pursuant to the California Environmental Quality Act (CEQA). This Initial Study provides an evaluation of the potential environmental consequences associated with this proposed project.

1.2 PURPOSE OF CEQA AND THE INITIAL STUDY

CEQA (California Environmental Quality Act; Public Resources Code Section 21000 et seq.) requires that before a lead agency[1] makes a decision to approve a project that could have one or more adverse effects on the physical environment, the agency must inform itself about and consider the project's potential environmental impacts, inform members of the public about the project's potential environmental impacts and provide them an opportunity to comment on the environmental issues, and take feasible measures to avoid or reduce potential harm to the physical environment.

Saddleback Valley Unified School District—in its capacity as lead agency pursuant to CEQA Guidelines Section 15050—is responsible for preparing environmental documentation in accordance with CEQA to determine if approval of the discretionary actions and subsequent development associated with the proposed project would have a significant impact on the environment. As part of the project's environmental review, the District authorized preparation of this Initial Study in accordance with the provisions of CEQA Guidelines Section 15063. Pursuant to Section 15063, purposes of an Initial Study are to:

- Provide the lead agency information to use as the basis for deciding whether to prepare an environmental impact report (EIR) or negative declaration.
- Enable an applicant or lead agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a negative declaration.
- Assist in the preparation of an EIR if one is required.
- Facilitate environmental assessment early in the design of a project.

[1] Pursuant to Public Resources Code Section 21067, lead agency refers to the public agency that has the principal responsibility for carrying out or approving a project that may have a significant effect on the environment.

- Provide documentation of the factual basis for the finding in a negative declaration that a project will not have a significant effect on the environment.
- Eliminate unnecessary EIRs.
- Determine whether a previously-prepared EIR could be used with the project.

As further defined by Section 15063, an Initial Study is prepared to provide the District with information to use as the basis for determining whether an environmental impact report (EIR), Negative Declaration, or Mitigated Negative Declaration (MND) would be appropriate for providing the necessary environmental documentation and clearance for the proposed project.

In its preparation of this Initial Study, the District determined that the Initial Study supports the adoption of an MND. An MND is a written statement by the lead agency that briefly describes the reasons why a project that is not exempt from the requirements of CEQA will not have a significant effect on the environment and therefore does not require preparation of an EIR (CEQA Guidelines Section 15371). The CEQA Guidelines require preparation of an MND if the Initial Study prepared for a project identifies potentially significant effects, but: 1) revisions in the project plans or proposals made by, or agreed to by the applicant before a proposed MND and Initial Study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and 2) there is no substantial evidence, in light of the whole record before the Lead Agency, that the project may have a significant effect on the environment (CEQA Guidelines Section 15070[b]).

The District has considered the information in this Initial Study in its decision-making processes. Although the Initial Study was prepared with consultant support, the analysis, conclusions, and findings made as part of its preparation fully represent the independent judgment and analysis of the District.

1.3 ENVIRONEMNTAL SETTING

1.3.1 Project Location

The approximately 9.7-acre project site encompasses the OPA property at 22882 Loumont Dr., Lake Forest, CA, 92630. The project site consists of Assessor's Parcel Number (APN) 617-151-09. The City of Lake Forest is an incorporated city in southern Orange County and is surrounded by Mission Viejo on the east, Irvine on the west, and Laguna Woods and Laguna Hills on the south. The Cleveland National Forest in unincorporated Orange County lies immediately north of Lake Forest. Figure 1, *Regional and Local Vicinity Map*, shows the project site in its regional and local contexts. Access to the project site is from Loumont Drive to the north and Blackfoot Drive to the west, both of which can be reached by Interstate 5, approximately 1.5 miles west of the project site.

Figure 1 Regional and Local Vicinity Map

1. Introduction

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Figure 2 Project Site

1. Introduction

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Circulation

The parking lot and student drop off area can be entered from Blackfoot Drive and exit onto Loumont Drive. The parking lot has a capacity of 40 parked vehicles.

1.3.1.2 PROGRAMS

OPA is one of three schools in the Oxford Preparatory Academy system. They are charter schools in the Saddleback Valley Unified School District. The district has 35 other schools. OPA offers grades TK-6, currently with 448 students. The school serves students from Orange County, with priority given to those residing in the District.

1.3.2 Surrounding Land Use

The project is surrounded by residential uses, with single-family residential directly east and across the streets, Dune Mear Road to the south, and Coleford Street to the east. Lake Forest Planned Community with multifamily homes is north across Loumont Drive and west across Blackfoot Drive (see Figure 2, *Project Site*). Further from the project site, the area is primarily residential uses with some commercial uses along Muirlands Boulevard. El Toro High School is approximately 1.3 miles away from the project site.

1.3.3 Existing Zoning and General Plan Land Use Designations

The City of Lake Forest General Plan designation for the project site is Public Facility (Lake Forest 2020). The project site is zoned as a Single-Family Residential Zone (R1) (Lake Forest 2023b). The surrounding areas are designated Low-Density Residential and zoned R1 and Medium Density Residential (MDR). The MDR zones to the north and west of the project are in the Lake Forest Planned Community.

1.4 PROJECT DESCRIPTION

1.4.1 Proposed Project

The District plans to add 18 new relocatable classrooms at the OPA site—nine classrooms for 7th-grade students and nine for 8th-grade students. A restroom will be added adjacent to the 7th-grade classrooms to serve the 18 new classrooms. Two paved courtyards will be between each building section—the east courtyard used as the 7th-grade court and the west courtyard used as the 8th grade court. The 18 new relocatable classrooms will be added to the southern part of the project site and south of the current buildings on a 0.60-acre disturbed area (see Figure 3, *Site Plan*).

1.4.1.1 ACCESS AND CIRCULATION

The project would not affect the parking lot or existing student drop-off area. The existing student drop-off will remain in the northeast section of the project adjacent to Blackfoot Drive and Loumont Drive.

1.4.1.2 STUDENT ENROLLMENT

The current student enrollment in TK-6 is 448. The proposed project would increase overall capacity of the school to 1,200 students and would include grades TK-8.

1.4.1.3 PROJECT PHASING

The project construction began in June 2023 upon necessary approvals and is to be completed by December 2024.

1.5 DISCRETIONARY ACTION REQUESTED

It is anticipated that approval required for the proposed project would include, but may not be limited to:

- **City of Lake Forest Department of Transportation.** Approval of construction-related haul route.
- **California Department of General Services, Division of State Architect.** Plan review and construction oversight, including structural safety, fire and life safety, and access compliance.
- **California Department of Education, School Facilities Planning Division (CDE).** If the District is requesting matching funds from the State Allocation Board, CDE must review and approve the plans (Education Code Section 17070.50) prior to submission of a funding request.

Figure 3 Site Plan

1. Introduction

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2. Environmental Checklist

2.1 PROJECT INFORMATION

1. **Project Title:** Oxford Preparatory Academy Expansion Project

2. **Lead Agency**:
   Saddleback Valley Unified School District
   25631 Peter A. Hartman Way
   Mission Viejo, CA 92691

3. **Contact Person and Phone Number:**
   Robert Craven (949) 580-3361

4. **Project Location:**
   Oxford Preparatory Academy
   22882 Loumont Dr.
   Lake Forest, CA 92630

5. **Project Sponsor's Name and Address:**
   Saddleback Valley Unified School District
   25631 Peter A. Hartman Way
   Mission Viejo, CA 92691

6. **General Plan Designation:** Public Facility

7. **Zoning:** Single Family Residential

8. **Description of Project:**
   The District plans to add 18 new relocatable classrooms at the Oxford Preparatory Academy site.

9. **Surrounding Land Uses and Setting:**
   The project is in a residential community designated Low Density Residential and zoned for Single-Family Residential to the east and south and Medium Density Residential to the north and west.

2. Environmental Checklist

10. Other Public Agencies Whose Approval Is Required (e.g., permits, financing approval, or participating agreement):

- City of Lake Forest
- California Department of Education, School Facilities Planning Division
- California Department of General Services, Division of State Architect

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

> Note: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process. (See Public Resources Code section 21080.3.2.) Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.94 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality.

Saddleback Unified School District invited 25 California Native American tribes that are traditionally and culturally affiliated with the project area to consult on the proposed project via email and certified mail, consistent with Assembly Bill 52. The letters were sent to on July 14, 2023. The District received one response from the Gabrieleno Band of Mission Indians – Kizh Nation requesting consultation. The District conducted consultation with the tribe. The District received no requests to consult from any of the other tribes contacted.

2.2 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 and 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

2.3 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 — *Date*: March 13, 2024

Robert Craven — Asst. Superintendent

2.4 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 would not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

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

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

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

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 Analyses Used.** Identify and state where they are available for review.

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

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

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

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

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

9. The explanation of each issue should identify:

   a) the significance criteria or threshold, if any, used to evaluate each question; and
   b) the mitigation measure identified, if any, to reduce the impact to less than significance.

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Except as provided in Public Resources Code Section 21099, would the project:				
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 nonurbanized 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	
II. AGRICULTURE AND FORESTRY 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 Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to 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

2. Environmental Checklist

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?				X
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:				
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 leading to odors) adversely affecting a substantial number of people?			X	
IV. BIOLOGICAL RESOURCES. Would the project:				
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 Wildlife 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 Wildlife 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
V. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 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 dedicated cemeteries?			X	

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. ENERGY. Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?			X	
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?			X	
VII. GEOLOGY AND SOILS. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.			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		
VIII. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X
IX. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
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	

2. Environmental Checklist

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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 § 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
X. HYDROLOGY AND WATER QUALITY. Would the project:				
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:				
i) result in a substantial erosion or siltation on- or off-site;			X	
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;			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
XI. LAND USE AND PLANNING. Would the project:				
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

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be a 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
XIII. NOISE. Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			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
XIV. POPULATION AND HOUSING. Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?				X
XV. PUBLIC SERVICES. Would the project:				
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?			X	
Police protection?			X	
Schools?				X
Parks?			X	
Other public facilities?				X
XVI. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	

2. Environmental Checklist

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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
XVII. TRANSPORTATION. Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?			X	
b) Conflict or be inconsistent with CEQA Guidelines § 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	
XVIII. TRIBAL CULTURAL RESOURCES.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code § 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or		X		
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code § 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code § 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.		X		
XIX. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?			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 waste water treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?			X	

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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	
XX. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?				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 or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?				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
XXI. MANDATORY FINDINGS OF SIGNIFICANCE.				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		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	

2. Environmental Checklist

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3. Environmental Analysis

Section 2.4 provided a checklist of environmental impacts. This section provides an evaluation of the impact categories and questions in the checklist and identifies mitigation measures, if applicable.

3.1 AESTHETICS

Except as provided in Public Resources Code Section 21099, would the project:

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

Less Than Significant Impact. Vistas provide visual access or panoramic views to a large geographic area. The field of view from a vista location can be wide and extend into the distance. Panoramic views are usually associated with vantage points looking out over a section of urban or natural areas that provide a geographic orientation not commonly available. Examples of panoramic views include an urban skyline, valley, mountain range, the ocean, or other water bodies. The Lake Forest General Plan does not specify any scenic vistas in the city. Lake Forest is in an urban landscape of primarily residential and commercial buildings. The existing project site is a built-out school campus. The proposed project would include 18 classrooms on the southern portion of the site. The proposed project would be a single-story development, similar to the existing structures on the project site. This project would not create any new obstructions to the current views of the Santa Ana Mountains and foothills east of the project site or Pacific Ocean west of the project site. Therefore, impacts would be less than significant.

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

No Impact. The closest designated state scenic highway is a portion of State Route 91 (SR-91) approximately 20 miles north of the project site (Caltrans 2023). The closest eligible state scenic highway is SR-1 10 miles west of the project site and SR-74 12 miles south of the project site. Due to the distance and intervening structures, the proposed project would not result in impacts to scenic resources within a designated state scenic highway. No impacts would occur.

c) In nonurbanized 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?

Less Than Significant Impact. The project site is in an urbanized area on the existing OPA campus. Residential uses surround the project site. The proposed project would include the addition of portable classroom buildings (See Figure 3). The proposed project would be consistent with the existing zoning and General Plan land use designations on-site, and compatible with the surrounding residential character. The

project would add buildings to the site on what is currently grass, but the locations and style of the buildings would result in a similar scenic quality to the existing school and would not significantly change the aesthetic of the site. Therefore, although project implementation would alter the visual appearance of the site, the completed project would not substantially alter the visual character and quality of the project site and surrounding area. Therefore, the impacts would be less than significant.

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

Less Than Significant Impact. The two major causes of light pollution are glare and spill light. Spill light is caused by misdirected light that illuminates areas outside the intended area to be lit. Glare occurs when a bright object is against a dark background, such as oncoming vehicle headlights or an unshielded light bulb. Existing sources of light on the project site include parking lot lights, vehicle headlights, internal and exterior building lights, and security lights.

The proposed project would add portable classroom buildings, and the lighting generated from the proposed project would be like the existing conditions. The proposed project would not substantially increase development intensity or change uses to create a significant increase in light and glare impacts. Additionally, the proposed project does not include significant nighttime lighting. The proposed project would provide lighting sources similar to the existing uses and would not adversely affect day or nighttime views in the area. Impacts would be less than significant.

3.2 AGRICULTURE AND FORESTRY 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 Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

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

No Impact. The proposed project would add classrooms on the existing campus. The project site and surrounding area are designated Urban and Built-Up Land (DOC 2023). There are no agricultural uses on the project site, and the proposed project would not convert any specially designated farmland identified on the state's Farmland Mapping and Monitoring Program to a nonagricultural use. No impact would occur.

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

No Impact. The proposed project would add classrooms on the existing OPA campus. The proposed project would continue to serve the existing use as a school and public facility. The project site is zoned as a Single-Family Residential Zone (R1) and designated a Public Facility in the General Plan. There are no agricultural uses on-site or in the vicinity of the project site (Lake Forest 2020, 2023b). Implementation of the proposed project would not conflict with existing zoning for agricultural use or a Williamson Act contract. No impact would occur.

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))?

No Impact. The proposed project would occur within the boundaries of the existing OPA campus. The campus is zoned Single Family Residential (R1) and does not contain any forest land or timberland zoning designation on-site or in the vicinity (Lake Forest 2023b). Implementation of the proposed project would not conflict with existing zoning for forest land or timberland. No impact would occur.

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

No Impact. The proposed project would occur within the boundaries of the existing OPA campus. The campus is zoned Single Family Residential (R1) and does not contain any forest land on-site or in the vicinity. Construction of the proposed project would not result in the loss or conversion of forest land. The project would remain within the boundaries of the campus. No vegetation on-site is cultivated for forest resources. No forest land would be affected by the project. No impact would occur.

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?

No Impact. Since this project is on the existing OPA campus and there is no existing farmland or forestland within the project site, no farmland or forest land would be converted to nonagricultural use or nonforest use as a result of the proposed project. There is no farmland in the vicinity that would be affected. No impact would occur.

3.3 AIR QUALITY

The Air Quality section addresses the impacts of the proposed project on ambient air quality and the exposure of people, especially sensitive individuals, to unhealthy pollutant concentrations. A background discussion on the air quality regulatory setting, meteorological conditions, existing ambient air quality in the vicinity of the project site, and air quality modeling can be found in Appendix A.

The primary air pollutants of concern for which ambient air quality standards (AAQS) have been established are ozone (O_3), carbon monoxide (CO), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb). Areas are classified under the federal

and California Clean Air Act as either in attainment or nonattainment for each criteria pollutant based on whether the AAQS have been achieved. The South Coast Air Basin (SoCAB), which is managed by the South Coast Air Quality Management District (AQMD), is designated nonattainment for O_3, and $PM_{2.5}$ under the California and National AAQS, nonattainment for PM_{10} under the California AAQS, and nonattainment for lead (Los Angeles County only) under the National AAQS (CARB 2023).

Furthermore, the South Coast AQMD has identified regional thresholds of significance for criteria pollutant emissions and criteria air pollutant precursors, including volatile organic compounds (VOC), CO, nitrous oxides (NO_X), sulfur oxides (SO_X), PM_{10}, and $PM_{2.5}$. Development projects below the regional significance thresholds are not expected to generate sufficient criteria pollutant emissions to violate any air quality standard or contribute substantially to an existing or projected air quality violation. Where available, the significance criteria established by the South Coast AQMD may be relied upon to make the following determinations.

Would the project:

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

Less Than Significant Impact. The South Coast AQMD adopted the 2022 Air Quality Management Plan (AQMP) on December 2, 2022. Regional growth projections are used by South Coast AQMD to forecast future emission levels in the SoCAB. For southern California, these regional growth projections are provided by the Southern California Association of Governments (SCAG) and are partially based on land use designations in city/county general plans. Typically, only large, regionally significant projects have the potential to affect regional growth projections. In addition, consistency analysis is generally only required in connection with the adoption of general plans, specific plans, and significant projects. Changes in population, housing, or employment growth projections have the potential to affect SCAG's demographic projections and therefore the assumptions in South Coast AQMD's AQMP. These demographic trends are incorporated into SCAG's 2020–2045 Regional Transportation Plan/Sustainable Communities Strategy to determine priority transportation projects and vehicle miles traveled in the SCAG region.

Changes in population, housing, or employment growth projections have the potential to affect SCAG's demographic projections and the assumptions in South Coast AQMD's AQMP. The proposed project would add 18 new relocatable classrooms at the OPA site, which would increase student capacity from 448 to 1,200 students. However, based on its scope and nature, buildout of the proposed project would not substantially affect housing, employment, or population projections in the region. Additionally, as demonstrated in Section 3.3(b), the regional emissions that would be generated by the operational phase of the proposed project would be less than the South Coast AQMD emissions thresholds and would therefore not be considered by South Coast AQMD to be a substantial source of air pollutant emissions that would have the potential to affect the attainment designations in the SoCAB. Therefore, the proposed project would not affect the regional emissions inventory or conflict with strategies in the 2022 AQMP. Impacts would be less than significant.

b) 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?

Less Than Significant Impact. The following describes project-related impacts from regional short-term construction activities and regional long-term operation of the proposed project.

Regional Short-Term Construction Impacts

Construction activities would result in the generation of air pollutants. These emissions would primarily be 1) exhaust from off-road diesel-powered construction equipment; 2) dust generated by construction activities; 3) exhaust from on-road vehicles; and 4) off-gassing of VOCs from paints and asphalt.

Construction activities associated with the 18 new relocatable classrooms would disturb 0.60-acre on the project site. The project would involve site preparation, rough and fine grading, utilities trenching, building construction, and paving. Construction started in June 2023 and is anticipated to finish in December 2024. Construction emissions were estimated using the California Emissions Estimator Model (CalEEMod) (ver. 2022.1.) and are based on the preliminary construction duration[2] and equipment mix provided by the District.

Construction emissions modeling is shown in Table 1 and shows that maximum daily emissions for VOC, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ from construction-related activities would be less than their respective South Coast AQMD regional significance threshold values. Projects that do not exceed the South Coast AQMD regional significance thresholds would not result in an incremental increase in health impacts in the SoCAB from project-related increases in criteria air pollutants. Therefore, air quality impacts from project-related construction activities would be less than significant.

Table 1 Maximum Daily Regional Construction Emissions

Construction Phase	Pollutants (lb/day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Year 2023						
Site Preparation and Utility Trenching	1	6	7	<1	1	<1
Site Preparation, Utility Trenching, and Rough Grading	2	19	19	<1	8	4
Rough Grading	1	13	12	<1	6	3
Fine Grading and Paving	5	18	18	<1	7	3
Building Construction	1	8	9	<1	1	<1
Maximum Daily Construction Emissions						
Maximum Daily Emissions	**5**	**19**	**19**	**<1**	**8**	**4**
South Coast AQMD Regional Construction Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Significant?	No	No	No	No	No	No

Source: CalEEMod Version 2022.1.

[1] Based on the preliminary information provided by the District. Where specific information regarding project-related construction activities was not available, construction assumptions were based on CalEEMod defaults, which are based on construction surveys conducted by South Coast AQMD of construction equipment.

[2] Preliminary construction duration of June 2023 through August 2023 received from the District.

Table 1 Maximum Daily Regional Construction Emissions

Construction Phase	Pollutants (lb/day)[1, 2]					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$

[2] Includes implementation of fugitive dust control measures required by South Coast AQMD under Rule 403, including watering disturbed areas a minimum of two times per day, reducing speed limit to 25 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.

[3] Emissions based on preliminary construction duration of June 2023 through August 2023 received from the District. As the model assumes construction equipment would become more efficient over time as older equipment is phased out, maximum daily emissions estimates are conservative.

Long-Term Operation-Related Air Quality Impact

Typical long-term air pollutant emissions are generated by area sources (e.g., landscape fuel use, aerosols, architectural coatings, and asphalt pavement), energy use (natural gas), and mobile sources (i.e., on-road vehicles). Implementation of the proposed project would result in 18 new relocatable classrooms at the OPA school campus. As described in Section 1.4, *Project Description*, the proposed project would increase overall student capacity from 448 students to 1,200 students. Because student capacity would increase after full buildout, the proposed project would result in an increase in the long-term air pollutant emissions, and the primary source would be mobile emissions from project-generated vehicle trips.

Table 2 Maximum Daily Regional Operational Phase Emissions

Source	Maximum Daily Emissions (lbs/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Mobile[1]	5	3	41	<1	8	2
Area	<1	<1	1	<1	<1	<1
Energy	<1	<1	<1	<1	<1	<1
Total Emissions	**6**	**3**	**42**	**<1**	**8**	**2**
South Coast AQMD Regional Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Regional Threshold?	No	No	No	No	No	No

Source: CalEEMod Version 2022.1. Highest winter or summer emissions are reported.
Notes: Totals may not add up to 100 percent due to rounding. lbs = pounds
[1] Based on trip generation data provided by Garland and Associates (see Appendix C).

As shown in Table 2, air pollutant emissions generated from operation-related activities would be less than their respective South Coast AQMD regional significance threshold values. Projects that do not exceed the South Coast AQMD regional significance thresholds would not result in an incremental increase in health impacts in the SoCAB from project-related increases in criteria air pollutants. In addition, emissions from the proposed building energy use would be minimized due to compliance with current California Building and Energy Efficiency Standards. Therefore, impacts to the regional air quality associated with operation of the project would be less than significant.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The proposed project could expose sensitive receptors to elevated pollutant concentrations if it causes or significantly contributes to elevated pollutant concentration levels. Unlike regional emissions, localized emissions are typically evaluated in terms of air concentration rather than mass so they can be more readily correlated to potential health effects.

Construction LSTs

Localized significance thresholds (LST) are based on the California AAQS, which are the most stringent AAQS to provide a margin of safety in the protection of public health and welfare. They are designated to protect sensitive receptors most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and people engaged in strenuous work or exercise. The screening-level construction LSTs are based on the size of the project site, distance to the nearest sensitive receptor, and source receptor area (SRA). The nearest off-site sensitive receptors are the single-family residences along Blackfoot Drive approximately 130 feet to the west and OPA school buildings approximately 82 feet to the north of the construction area withing the project site.

Air pollutant emissions generated by construction activities would cause temporary increases in air pollutant concentrations. Table 3 shows the maximum daily construction emissions (pounds per day) generated during on-site construction activities compared with the South Coast AQMD's screening-level LSTs for sensitive receptors within 82 feet (25 meters) for NO_X and CO, and within 130 feet (40 meters) for PM_{10} and $PM_{2.5}$. As shown in Table 3, construction of the proposed project would not generate construction-related on-site emissions that would exceed the screening-level LSTs. Thus, project-related construction activities would not have the potential to expose sensitive receptors to substantial pollutant concentrations. Localized air quality impacts from construction activities would be less than significant.

Table 3 Localized Construction Emissions

	Pollutants(lbs/day)[1]			
Construction Activity	**NO_X**	**CO**	**PM_{10}[2]**	**$PM_{2.5}$[2]**
South Coast AQMD ≤1.00 Acre LST	**91**	**696**	**8.09**	**3.58**
Site Preparation and Utility Trenching	6	7	1.14	0.37
Site Preparation, Utility Trenching, and Rough Grading	19	18	7.41	3.53
Rough Grading	13	11	6.27	3.16
Fine Grading and Paving	17	17	6.49	3.36
Building Construction	6	7	0.28	0.26
Exceeds LST?	No	No	No	No

Source: CalEEMod Version 2022.1. South Coast AQMD 2008 and 2023.
Notes: In accordance with South Coast AQMD methodology, only on-site stationary sources and mobile equipment are included in the analysis. Screening level LSTs are based on 82 feet (25 meters) for NO_X and CO and within 130 feet (40 meters) for PM_{10} and $PM_{2.5}$ in SRA 19.
[1] Where specific information for project-related construction activities or processes was not available, modeling was based on CalEEMod defaults. These defaults are based on construction surveys conducted by the South Coast AQMD.
[2] Includes fugitive dust control measures required by South Coast AQMD under Rule 403, such as watering disturbed areas a minimum of two times per day, reducing speed limit to 25 miles per hour on unpaved surfaces, replacing ground cover quickly, and street sweeping with Rule 1186–compliant sweepers.

3. Environmental Analysis

Construction Health Risk

Emissions from construction equipment primarily consist of diesel particulate matter (DPM). In 2015, the Office of Environmental Health Hazards Assessment (OEHHA) adopted guidance for preparation of health risk assessments, which included the development of a cancer risk factor and noncancer chronic reference exposure level for DPM over a 30-year time frame (OEHHA 2015). Currently, South Coast AQMD does not require the evaluation of long-term excess cancer risk or chronic health impacts for a short-term project. The proposed project is anticipated to be completed in approximately eighteen months, which would limit the exposure to on-site and off-site receptors. Furthermore, construction activities would not generate on-site exhaust emissions that would exceed the screening-level construction LSTs. Thus, construction emissions would not pose a health risk to on-site and off-site receptors, and project-related construction health impacts would be less than significant.

Operation LSTs

Operation of the proposed project would not generate substantial emissions from on-site stationary sources. Land uses that have the potential to generate substantial stationary sources of emissions include industrial land uses, such as chemical processing and warehousing operations where truck idling would occur on-site and would require a permit from South Coast AQMD. The proposed project does not fall within these categories of uses. While operation of the new relocatable classroom buildings would use standard on-site mechanical equipment such as heating, ventilation, and air conditioning, air pollutant emissions would be nominal. Localized air quality impacts related to operation-related emissions would be less than significant.

Carbon Monoxide Hotspots

Vehicle congestion has the potential to create pockets of CO called hotspots. Hotspots are typically produced at intersections, where traffic congestion is highest because vehicles are backed-up and idle for longer periods and are subject to reduced speeds. These pockets could exceed the state one-hour standard of 20 parts per million (ppm) or the eight-hour standard of 9.0 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations.

The SoCAB has been designated attainment under both the national and California AAQS for CO. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection to more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited—in order to generate a significant CO impact (BAAQMD 2023). Based on the traffic study, the proposed project would generate an additional 556 AM and 271 PM peak-hour vehicle trips (Appendix C). Therefore, implementation of the proposed project would not have the potential to substantially increase CO hotspots at intersections in the vicinity of the proposed site. Operational impacts would be less than significant.

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

Less Than Significant Impact.

The proposed project would not result in objectionable odors. The threshold for odor is if a project creates an odor nuisance pursuant to South Coast AQMD Rule 402, Nuisance, which states:

> A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

The type of facilities that are considered to have objectionable odors include wastewater treatments plants, compost facilities, landfills, solid waste transfer stations, fiberglass manufacturing facilities, paint/coating operations (e.g., auto body shops), dairy farms, petroleum refineries, asphalt batch plants, chemical manufacturing, and food manufacturing facilities. The proposed project involves 18 new relocatable classrooms at the OPA school campus and would not fall within the objectionable odors land uses or generate odors different than what is already generated on-site. Emissions from construction equipment, such as diesel exhaust, and VOCs from paving activities may generate odors. However, these odors would be low in concentration, temporary, and would not affect a substantial number of people. Odor impacts would be less than significant.

3.4 BIOLOGICAL RESOURCES

Would the project:

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 Wildlife or U.S. Fish and Wildlife Service?

No Impact. The project site is developed and includes school classrooms and buildings and paved surfaces (parking lots and playgrounds). Vegetation at the project site consists of ornamental trees and plants and grass fields. The disturbance area is currently a grass field. There is no native habitat and no suitable habitat for threatened, endangered, or rare species on or near the site due to the frequent disturbances on-site. The likelihood of species dispersal, whether plants or wildlife, from surrounding areas to the campus is very low. No impact would occur.

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 Wildlife or U.S. Fish and Wildlife Service?

No Impact. The project site is developed and includes school classrooms and buildings and paved surfaces (parking lots and playgrounds). The U.S. Fish and Wildlife Service (USFWS) manages the National Wetlands Inventory, a digital wetlands mapper with current information on wetlands and riparian. A freshwater pond 0.3 mile north of the project site is the closest wetland area (USFWS 2023a). The National Wetlands Inventory indicates no riparian habitats exist on or in the vicinity of the project site (USFWS 2023a). Additionally, neither the project site nor the city of Lake Forest is within a critical habitat area (USFWS 2023b). Thus, the proposed project would not affect any riparian habitats or other sensitive natural communities. No impact would occur.

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?

No Impact. Wetlands are defined under the federal Clean Water Act as land that is flooded or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that normally does support, a prevalence of vegetation adapted to life in saturated soils. According to the USFWS's National Wetlands Inventory, there are no federally protected wetlands, including but not limited to marsh, vernal pool, and coastal areas, within the OPA campus or in the vicinity of Lake Forest (USFWS 2023a). The project site is developed, and there are no waterways or underdeveloped land capable of supporting federally protected wetlands. Implementation of the proposed project would not have a substantial adverse effect on any protected wetlands. No impact would occur.

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?

Less Than Significant Impact. The project site is already developed and operating as a school and is surrounded by residential uses. The ornamental vegetation on-site or nearby could be used for nesting by birds protected under the Migratory Bird Treaty Act (MBTA) (US Code Title 16, Sections 703-712), and California Fish and Game Code Sections 3503 et seq. Compliance with the MBTA requires:

- Avoid grading activities during the nesting season, February 15 to August 15.
- Or, if grading activities are to be undertaken during the nesting season, a site survey for nesting birds by a qualified biologist is required before commencement of grading activities. If nesting birds are found, the applicant would consult with the USFWS regarding means to avoid or minimize impacts to nesting birds.

Impacts would be less than significant with compliance with the MBTA. Additionally, the project site does not contain any surface water and therefore is not suitable for the movement or migration of fish. No impact would occur to native residents or migratory fish.

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

Less Than Significant Impact. The City of Lake Forest Tree Perseveration and Landscaping Ordinance states that the removal of trees may be subject to permit conditions should the Directors of Public Works and Community Development "deem it necessary or appropriate to minimize damage to other tree or vegetation on a site". Though no trees are proposed to be removed, should a tree need to be removed during construction, the appropriate consultations and permits would be followed, and the impacts would be less than significant.

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?

No Impact. The project site is currently a developed school campus in an urban residential area. The project site is not in a natural community conservation plan or habitat conservation plan area. The project site does not contain any sensitive biological resources. The proposed project would not affect a habitat conservation plan; natural community conservation plan; or other approved local, regional, or state conservation plans. No impact would occur.

3.5 CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

No Impact. Section 15064.5 defines historic resources as resources listed or determined to be eligible for listing by the State Historical Resources Commission, a local register of historical resources, or the lead agency. Generally, a resource is considered "historically significant" if it meets one of the following criteria:

i) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

ii) Is associated with the lives of persons important in our past;

iii) Embodies the distinctive characteristics of a type, period, region or method of construction, or represents the work of an important creative individual, or possesses high artistic values;

iv) Has yielded, or may be likely to yield, information important in prehistory or history.

The proposed project would add classrooms to the existing OPA site. This campus was completed and first opened on September 6, 2016 (CDE 2023a). The campus is not listed as a historical resource in the National Register of Historic Places (NPS 2023). Additionally, OPA is not listed in the California Historical Landmarks and Points of Historical Interest, or State Historic Structures, and the proposed project would not demolish any structures that can potentially meet any of the criteria listed above (California State Parks 2023). Therefore,

there are no resources on the campuses that would be considered historically significant pursuant to Section 15064.5. No impact would occur.

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

Less Than Significant Impact with Mitigation Incorporated. Implementation of the proposed project would result in limited ground disturbance to develop the classrooms and other buildings. Earthwork associated with the proposed project would include grading, drilling holes for installation, and utility trenching. The proposed project would not disturb subterranean levels of soil and would not require extensive excavation. The proposed project would occur within the boundaries of an existing campus that has already been developed with associated structures and facilities such as classroom buildings, administration buildings, and paved courtyards; therefore, the potential for discovery of archaeological resources would be minimal. However, ground-disturbing activities from the proposed project still has potential to uncover unknown archaeological resources and could result in a potentially significant impact. Implementation of Mitigation Measure CUL-1 would ensure, in the event archaeological resources are discovered during ground-disturbing activities, that they would be recovered in accordance with state and federal requirements. If archaeological resources are discovered, all ground-disturbing activities shall halt and a qualified archeologist shall be retained to assess such findings. Implementation of Mitigation Measure CUL-1 would reduce impacts to archaeological resources to less than significant.

Mitigation Measures

CUL-1 Prior to issuance of grading permits, a qualified archaeological monitor shall be identified to be on call during ground-disturbing activities. If archeological resources are discovered during excavation and/or construction activities, construction shall stop within 25 feet of the find, and the qualified archaeologist shall be consulted to determine whether the resource requires further study. The archaeologist shall make recommendations to the District to protect the discovered resources. Archaeological resources recovered shall be offered to a repository with a retrievable collection system and an educational and research interest in the materials, or a responsible public or private institution with a suitable repository willing to and capable of accepting and housing the resource.

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

Less Than Significant Impact. There are no cemeteries or known human remains at the campus, which was previously disturbed during construction of the existing school; however, limited ground-disturbing activities (i.e., grading, utility trenching, and drill holes) would have the potential to result in discovery of human remains. In the unlikely event that human remains are discovered, the District would be responsible for compliance with Health and Safety Code Section 7050.5 and CEQA Guidelines Section 15064.5. California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made the necessary findings as to the origin. Further, pursuant to California Public Resources Code section 5097.98(b), remains shall be left in place and free from disturbance until a final decision as to their treatment and disposition has been made. If the Orange County coroner determines the remains to be Native American, the Native

American Heritage Commission (NAHC) shall be contacted within 24 hours. Subsequently, the NAHC shall identify the most likely descendant. The most likely descendant shall then make recommendations and engage in consultations concerning the treatment of the remains, as provided in Public Resources Code Section 5097.98. Adherence to these existing legal requirements would reduce impacts associated with the disturbance of human remains. Impacts would be less than significant.

3.6 ENERGY

Would the project:

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

Less Than Significant Impact. The following discusses the potential energy demands from construction activities associated with the construction and operation of the 18 new relocatable classrooms at the OPA school campus.

Short-Term Construction Impacts

Electrical Energy

The majority of construction equipment would be gas or diesel powered, and electricity would not be used to power most of the construction equipment. Electricity use during construction would vary during different phases of construction. Later construction phases could result in the use of electric-powered equipment for interior construction and architectural coatings (if applicable). It is anticipated that the majority of electric-powered construction equipment would be hand tools (e.g., power drills, table saws) and lighting, which would result in minimal electricity usage during construction activities. Therefore, project-related construction activities would not result in wasteful or unnecessary electricity demands, and impacts would be less than significant.

Natural Gas Energy

It is not anticipated that construction equipment used for the proposed project would be powered by natural gas, and no natural gas demand is anticipated during construction. Therefore, impacts would be less than significant with respect to natural gas usage.

Transportation Energy

Transportation energy use during construction of the proposed project would come from delivery vehicles, haul trucks, and construction employee vehicles. In addition, transportation energy demand would come from use of off-road construction equipment. It is anticipated that the majority of off-road construction equipment, such as those used during grading, would be gas or diesel powered.

The use of energy resources by vehicles and equipment would fluctuate according to the phase of construction and would be temporary. In addition, all construction equipment would cease operating upon completion of project construction. Thus, impacts related to transportation energy use during construction would be

temporary and would not require expanded energy supplies or the construction of new infrastructure. Furthermore, to limit wasteful and unnecessary energy consumption, the construction contractors are anticipated to minimize nonessential idling of construction equipment during construction, in accordance with the California Code of Regulations, Title 13, Article 4.8, Chapter 9, Section 2449.

Construction trips would also not result in unnecessary use of energy because the project site is centrally located and is served by numerous regional freeway systems (e.g., I-5 and I-405) that provide the most direct routes from various areas of the region. Electrical energy would be available for use during construction from existing connections, precluding the use of less-efficient generators. Thus, energy use during construction of the project would not be considered inefficient, wasteful, or unnecessary. Impacts would be less than significant.

Long-Term Impacts During Operation

Operation of the proposed project would generate new demand for electricity, natural gas, and transportation energy on the project site. Operational use of energy would include heating, cooling, and ventilation of buildings; water heating; operation of electrical systems, use of on-site equipment and appliances; and indoor, outdoor, and perimeter lighting.

Electrical Energy

The proposed increase in electricity consumption from the proposed project is shown in Table 4.

Table 4 Operation-Related Electricity Consumption

Land Use[1]	Electricity (kWh/year)[1]
Proposed Elementary School	96,069

Source: Appendix A.
Note: kWh=kilowatt-hour
[1] The annual electricity demand is based on the square footage of the proposed classroom buildings and restroom building.

While the proposed project would generate additional energy demand at the site, it would be required to comply with the applicable Building Energy Efficiency Standards and California Green Building Standards Code (CALGreen) requirements. In addition to the proposed building energy efficiency, Southern California Edison is required to comply with the state's renewable portfolios standard (RPS), which mandates utilities to procure a certain proportion of electricity from eligible renewable and carbon-free sources and increasing the proportion through the coming years with an ultimate procurement requirement of 100 percent by 2045. The RPS requirements would support use of electricity by the proposed project that is generated from renewable or carbon-free sources. Overall, the proposed project would generally be consistent with the goals outlined in Appendix F of the CEQA Guidelines regarding increasing energy efficiency, decreasing reliance on fossil fuels, and increasing renewable energy sources. Because the proposed project would comply with these regulations, it would not result in wasteful, inefficient, or unnecessary electricity demands. Therefore, operation of the proposed project would result in a less than significant impact related to electricity.

Natural Gas Energy

The net new natural gas consumption associated with the proposed project is shown in Table 5. As seen in the table, the new natural gas demand by the new buildings would total 322,321 kilo-British thermal units per year following buildout of the proposed project.

While the proposed project would result in a higher natural gas demand, the new classroom buildings would be consistent with the requirements of the Building Energy Efficiency Standards and would generally result in a decrease in per capita natural gas consumption. Compliance with the Building Energy Efficiency Standards would include installation of a high efficiency heating, ventilation, and air conditioning system and thermal envelope (e.g., insulation materials), which would contribute to reducing natural gas demands and decreasing overall reliance on fossil fuels. Therefore, operation of the proposed project would result in less than significant impacts with respect to natural gas usage.

Table 5 Operation-Related Natural Gas Consumption

Land Use	Natural Gas (kBTU/year)[1]
Proposed Elementary School	332,321

Source: Appendix A.
Note: kBTU=kilo-British thermal units.
[1] The annual natural gas demand is based on the square footage of the proposed buildings.

Transportation Energy

The proposed project would result in the consumption of transportation energy during operation from the use of motor vehicles associated with students, staff, and visitors to the OPA school campus. The efficiency of the motor vehicles in use (average miles per gallon) is unknown and highly variable. Thus, estimates of transportation energy use are based on the overall vehicle miles traveled (VMT) and related transportation energy use. The project-related VMT would primarily come from students and staff. Since student capacity would increase after installation of the new classroom buildings, implementation of the proposed project would result in an additional 1,580 daily vehicle trips (Appendix C). However, since the proposed project would fall into the category of a local-serving public facility, the proposed project would be screened from requiring a detailed VMT analysis. Based on the traffic study, the student-related trips would not result in an incremental increase in VMT because these trips would occur regardless of the proposed project. Also, providing a closer option for students would avoid the need to travel farther distances to other schools. Therefore, the proposed project would not result in an increase in VMT after buildout.

Moreover, fuel efficiency of vehicles after buildout would on average improve compared to vehicle fuel efficiencies experienced under existing conditions, resulting in a lower per capita fuel consumption assuming travel distances, travel modes, and trip rates remain the same. The improvement in fuel efficiency would be attributable to the statewide fuel reduction strategies and regulatory compliances (e.g., CAFE standards), resulting in new cars that are more fuel efficient and the attrition of older, less fuel-efficient vehicles. The CAFE standards are not directly applicable to land use development projects, but to car manufacturers. Thus, the school employees do not have direct control in determining the fuel efficiency of vehicles that are manufactured

and available. However, compliance with the CAFE standards by car manufacturers would ensure that vehicles produced in future years have greater fuel efficiency and would generally result in an overall benefit of reducing fuel usage by providing the population of the project site's region more fuel-efficient vehicle options.

As electricity consumed in California is required to meet the increasing renewable energy mix requirements under the State's RPS, accelerated by SB 100, greater and greater proportions of electricity consumed for transportation energy demand envisioned under the proposed project would continue to be sourced from renewable energy sources rather than fossil fuels. Since vehicle fuel efficiencies would improve year over year through the buildout and result in a decrease in overall per capita transportation energy consumption, impacts would be less than significant with respect to operation-related fuel usage.

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

Less Than Significant Impact. The state's electricity grid is transitioning to renewable energy under California's Renewable Energy Program. Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. Electricity production from renewable sources is generally considered carbon neutral. Executive Order S-14-08, signed in November 2008, expanded the state's RPS to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). Senate Bill 350 (de Leon) was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. Senate Bill 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

On September 10, 2018, Governor Brown signed SB 100, which supersedes the SB 350 requirements. Under SB 100, the RPS for public-owned facilities and retail sellers consist of 44 percent renewable energy by 2024, 50 percent by 2026, 52 percent by 2027, and 60 percent by 2030. The bill also established a state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all State agencies by December 31, 2045. Additionally, SB 1020 adds interim targets to SB 100 framework to require renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035 and 95 percent of all retail electricity sales by 2040. Under SB 100 and SB 1020, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

The statewide RPS requirements do not directly apply to individual development projects, but to utilities and energy providers such as Southern California Edison, whose compliance with RPS requirements would contribute to the state objective of transitioning to renewable energy. In addition, the proposed project would be required to comply with the applicable Building Energy Efficiency Standards and CALGreen requirements. Therefore, implementation of the proposed project would not conflict with or obstruct implementation of California's RPS Program, and impacts would be less than significant.

3.7 GEOLOGY AND SOILS

Would the project:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning map, issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

Less Than Significant Impact. The Alquist-Priolo Earthquake Fault Zoning Act requires the delineation of zones along active faults in California. The purpose of the Alquist-Priolo Act is to regulate development and prohibit construction on or near active fault traces to reduce hazards associated with fault rupture. The Alquist-Priolo Earthquake Fault Zones are the regulatory zones that include surface traces of active faults. Wherever an active fault exists, if it has the potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally 50 feet). An active fault, for the purposes of the Alquist-Priolo Act, is one that has ruptured in the last 11,000 years (DOC 2023b).

Lake Forest is surrounded by earthquake faults; the Newport-Inglewood Fault and the Glen Ivy North Fault are two major fault lines in the region (DOC 2023c). The nearest fault is the Pelican Hill Fault, approximately 10 miles west of the project site. However, the project site is not in an earthquake fault zone, and the immediate surrounding area is not in an Alquist-Priolo Earthquake special study zone (DOC 2023c). Provided the classroom buildings are constructed in accordance with the applicable California Building Code (CBC) and Division of the State Architect (DSA) criteria for seismic safety, less than significant impacts from these major faults are anticipated.

ii) Strong seismic ground shaking?

Less Than Significant Impact. Southern California is a generally seismically active region. Ground shaking from earthquakes along active faults, many miles away, could cause injury to people and damage to property at the project site. The closest significant regional active faults that could produce earthquakes felt at the project site include the Pelican Hill Fault approximately 10 miles west, the Newport-Inglewood-Rose Canyon fault zone approximately 12 miles west, and the Glen Ivy North Fault approximately 15 miles northeast of the project site. As stated in 3.7(a)(i), above, the project site is not within an earthquake fault zone nor is the immediate surrounding area in an Alquist-Priolo Earthquake special study zone (DOC 2023c).

Development of the proposed project would be required to comply with the CBC) including seismic design parameters. In addition, since the proposed project is a school site, California Geological Survey and DSA would ensure that the buildings are sufficiently designed to withstand ground shaking. Impacts would be less than significant.

iii) Seismic-related ground failure, including liquefaction?

No Impact. Liquefaction refers to loose, saturated sand, or gravel deposits that lose their load-supporting capability when subjected to intense shaking. Liquefaction potential varies based on three main contributing factors: 1) cohesionless, granular soils having relatively low densities (usually of Holocene age); 2) shallow groundwater (generally less than 50 feet); and 3) moderate to high seismic ground shaking.

According to the California Geological Survey, some of the city is in a liquefaction zone but the project site is not (CGS 2023). The nearest liquefaction zone is one mile north of the project site. Therefore, there is no potential for liquefaction at the project site. Additionally, the proposed project would be designed in compliance with the CBC and the DSA criteria for seismic safety, including from liquefaction impacts. Compliance with established standards would reduce the risk of liquefaction hazards, and no impacts are anticipated.

iv) Landslides?

Less Than Significant Impact. Landslides are a type of erosion in which masses of earth and rock move downslope as a single unit. Susceptibility of slopes to landslides and lurching (earth movement at right angles to a cliff or steep slope during ground shaking) depends on several factors that are usually present in combination—steep slopes, condition of rock and soil materials, presence of water, formational contacts, geologic shear zones, and seismic activity. The OPA campus and adjacent properties are flat and exhibit no unusual geographic features or slopes. Additionally, the California Department of Conservation does not map the campus within a landslide zone nor show any landslide activity in the vicinity of Lake Forest. The proposed project would be designed in compliance with the CBC and the DSA criteria for seismic safety, and the proposed project would not result in significant safety impacts due to landslides. Impacts would be less than significant.

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

Less Than Significant Impact. Erosion is a normal and inevitable geologic process whereby earthen materials are loosened, worn away, decomposed, or dissolved and removed from one place and transported to another. The project site is an existing school site with paved and impervious surfaces (parking lot, buildings, pavement) as well as pervious surfaces (landscaping). The project site is flat, and the proposed project does not contain subterranean levels. Therefore, the proposed project would not require extensive excavation, so soils would not be exposed to substantial erosion impacts.

The construction contractor would be required to take all measures deemed necessary during grading to provide erosion control devices to protect exposed soil and adjacent properties from storm damage and flood hazard originating on the proposed project. During operation, all project surfaces would be covered in vegetation, building surfaces, walkways, parking lots, and driveways, and there would be no soils susceptible to soil erosion or the loss of topsoil. Impacts would be less than significant.

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?

Less Than Significant Impact. As discussed in Sections 3.7.a.iii and 3.7.a.iv, impacts from liquefaction and landslides would be less than significant since the proposed project would comply with applicable seismic requirements of the CBC and DSA.

Lateral spreading is a phenomenon where large blocks of intact, nonliquefied soil move downslope on a large, liquefied substratum. The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff and has been known to move on slope gradients as little as one degree. The topography of the project site is flat, and therefore impacts from lateral spreading would be less than significant. Subsidence and collapse are generally due to substantial overdraft of groundwater or underground petroleum reserves. Collapsible soils may appear strong and stable in their natural (dry) state, but they rapidly consolidate under wetting, generating large and often unexpected settlements. Seismically induced settlement consists of dynamic settlement of unsaturated soil (above groundwater) and liquefaction-induced settlement (below groundwater). These settlements occur primarily in low-density sandy soil due to the reduction in volume during and shortly after an earthquake. The City of Lake Forest and the OPA campus are not in areas of recorded subsidence due to groundwater pumping (USGS 2023). Additionally, compliance with applicable CBC and DSA requirements would ensure adequate design and construction of building foundations. Impacts would be less than significant.

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?

Less Than Significant Impact. Highly expansive soils swell when they absorb water and shrink as they dry and can cause structural damage to building foundations. Therefore, they are less suitable for development than nonexpansive soils. The soils on campus consist of Myford sandy loam. These are drained sandy soils with low to very low runoff class rates and low shrink-swell or expansion characteristics (USDA 2023). Additionally, the proposed project would be consistent with CBC and DSA requirements, thus reducing any potential impacts due to expansive and collapsible soils. Impacts would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The proposed project is in an urbanized area. No septic tanks or alternative wastewater disposal system is proposed. The proposed project would connect to existing sewer lines in the vicinity of the project site. No impacts would occur.

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

Less Than Significant Impact With Mitigation Incorporated. The proposed project is in the urbanized and built-out city of Lake Forest. The project site is already on a developed campus, which had previous earthwork on-site. The project site is underlain by very old alluvial fan deposits (Qvof) from middle to early Pleistocene (DOC 2023d). These old alluvial deposits have high paleontological sensitivity. The proposed

project would require light ground-disturbing activities, which are unlikely to unearth paleontological resources. Though discovery of fossils is not expected during project construction, it is possible that paleontological resources could be discovered during ground-disturbing activities.

Implementation of Mitigation Measure GEO-1 would ensure that if paleontological resources are discovered during ground-disturbing activities, they would be recovered in accordance with State and federal requirements. Implementation of Mitigation Measure GEO-1 would reduce impacts to paleontological resources to a less than significant level.

Mitigation Measures

GEO-1 Prior to construction, a field survey for paleontological resources shall be conducted by a qualified paleontologist. If unique paleontologist resources are not discovered during the field survey, then excavation and/or construction activities can commence. If unique paleontological resources are discovered during excavation and/or construction activities, construction shall stop within 25 feet of the find, and the qualified paleontologist shall be consulted to determine whether the resource requires further study. The paleontologist shall make recommendations to the District to protect the discovered resources. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction is allowed to resume at the location of the find. If the project proponent determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of the project based on the qualities that make the resource important, and any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution.

3.8 GREENHOUSE GAS EMISSIONS

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as greenhouse gases (GHGs), into the atmosphere. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change has identified four major GHGs—water vapor, carbon dioxide (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. The Intergovernmental Panel on Climate Change identified other GHG that contribute to global warming to a lesser extent, including nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons.[3]

Information on manufacture of cement, steel, and other "life cycle" emissions that would occur as a result of the project are not applicable and are not included in the analysis.[4] Black carbon emissions are not included in

[3] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant, but part of the feedback loop rather than a primary cause of change.

[4] Life cycle emissions include indirect emissions associated with materials manufacture. However, these indirect emissions involve numerous parties, each of which is responsible for GHG emissions of their particular activity. The California Resources Agency, in adopting the CEQA Guidelines Amendments on GHG emissions found that lifecycle analyses was not warranted for project-

the GHG analysis because the California Air Resources Board (CARB) does not include this short-lived climate pollutant in the state's Senate Bill 32 (SB 32) and Assembly Bill 1279 (AB 1279) inventory but treats it separately.[5] A background discussion on the GHG regulatory setting and GHG modeling can be found in Appendix A to this Initial Study.

Would the project:

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

Less Than Significant Impact. Global climate change is not confined to a particular project area and is generally accepted as the consequence of global industrialization over the last 200 years. A typical project, even a very large one, does not generate enough greenhouse gas emissions on its own to influence global climate change significantly; hence, the issue of global climate change is, by definition, a cumulative environmental impact.

Project-related construction and operation-phase GHG emissions are shown in Table 6. Implementation of the proposed project would result in 18 new relocatable classroom buildings and a restroom building on the OPA school campus. Construction of the proposed project would also generate GHG one-time emissions.[6] The annual average construction emissions were amortized over 30 years and included in the emissions inventory to account for one-time GHG emissions from the construction phase of the project. In addition, because student capacity would increase after buildout of the proposed project, operation of the proposed project would result in an increase in trips, refrigerant use, water demand, wastewater generation, and solid waste generation.

As shown in Table 6, construction and operation of the proposed project would not generate annual emissions that exceed the South Coast AQMD Working Group bright-line threshold of 3,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) per year (South Coast AQMD 2010). Additionally, GHG emissions from building energy use would be minimized because the new classroom building would be required to comply with the current California Building and Energy Efficiency Standards and CALGreen. Therefore, the proposed project's cumulative contribution to GHG emissions would be less than significant.

specific CEQA analysis in most situations, for a variety of reasons, including lack of control over some sources, and the possibility of double-counting emissions (CNRA 2018). Because the amount of materials consumed during the operation or construction of the proposed project is not known, the origin of the raw materials purchased is not known, and manufacturing information for those raw materials are also not known, calculation of life cycle emissions would be speculative. A life-cycle analysis is not warranted (OPR 2008).

[5] Particulate matter emissions, which include black carbon, are analyzed in Section 3.3, Air Quality. Black carbon emissions have sharply declined due to efforts to reduce on-road and off-road vehicle emissions, especially diesel particulate matter. The state's existing air quality policies will virtually eliminate black carbon emissions from on-road diesel engines within 10 years (CARB 2017.).

[6] Construction GHG emissions were based on preliminary schedule of 2 months from District. Construction GHG emissions were proportionally increased to account for the new 18-month construction schedule.

Table 6 Project-Related GHG Emissions

Source	GHG ($MTCO_2e$/Year)
Mobile	931
Area	<1
Energy	33
Water	1
Solid Waste	6
Refrigerants	<1
Amortized Construction Emissions[1]	18
Total GHG Emissions	**990**
South Coast AQMD Bright-Line Threshold	3,000 $MTCO_2e$/Yr
Exceeds Bright-Line Threshold?	**No**

Source: CalEEMod, Version 2022.1.
Notes: MTons = metric tons; $MTCO_2e$ = metric ton of carbon dioxide equivalent
[1] Total construction GHG emissions (proportionally increased to account for the 18-month schedule) are amortized over 30 years per South Coast AQMD Working Group methodology (South Coast AQMD 2008).

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

No Impact. Applicable plans adopted for the purpose of reducing GHG emissions include CARB's Scoping Plan and SCAG's Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS). A consistency analysis with these plans is presented below.

CARB 2022 Scoping Plan

CARB's latest Climate Change Scoping Plan (2022) outlines the State's strategies to reduce GHG emissions in accordance with the targets established under AB 32, SB 32 and AB 1279. The Scoping Plan is applicable to State agencies and is not directly applicable to cities/counties and individual projects. Nonetheless, the Scoping Plan has been the primary tool that is used to develop performance-based and efficiency-based CEQA criteria and GHG reduction targets for climate action planning efforts.

Statewide strategies to reduce GHG emissions in the 2022 Climate Change Scoping Plan include: implementing SB 100, which expands the RPS to 60 percent by 2030; expanding the Low Carbon Fuel Standards to 18 percent by 2030; implementing the Mobile Source Strategy to deploy zero-electric vehicle buses and trucks; implementing the Sustainable Freight Action Plan; implementing the Short-Lived Climate Pollutant Reduction Strategy, which reduces methane and hydrofluorocarbons to 40 percent below 2013 levels by 2030 and black carbon emissions to 50 percent below 2013 levels by 2030; continuing to implement SB 375; creating a post-2020 Cap-and-Trade Program; and developing an Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

Statewide strategies to reduce GHG emissions include the low carbon fuel standards, California Appliance Energy Efficiency regulations, California Renewable Energy Portfolio standard, changes in the CAFE standards, and other early action measures as necessary to ensure the State is on target to achieve the GHG emissions reduction goals of AB 32, SB 32, and AB 1279. In addition, new developments are required to comply with the current Building Energy Efficiency Standards and CALGreen. Overall, the proposed project's GHG emissions would be reduced from compliance with statewide measures that have been adopted since AB 32, SB 32, and AB 1279 were adopted. Therefore, the proposed project would not obstruct implementation of the 2022 Scoping Plan, and impacts would be less than significant.

SCAG's Regional Transportation Plan / Sustainable Communities Strategy

SCAG adopted the 2020-2045 RTP/SCS (Connect SoCal) in September 2020 (SCAG 2020). Connect SoCal finds that land use strategies that focus on new housing and job growth in areas rich with destinations and mobility options would be consistent with a land use development pattern that supports and complements the proposed transportation network. The overarching strategy in Connect SoCal is to plan for the southern California region to grow in more compact communities in transit priority areas and priority growth areas; provide neighborhoods with efficient and plentiful public transit; establish abundant and safe opportunities to walk, bike, and pursue other forms of active transportation; and preserve more of the region's remaining natural lands and farmlands (SCAG 2020). Connect SoCal's transportation projects help more efficiently distribute population, housing, and employment growth, and forecast development is generally consistent with regional-level general plan data to promote active transportation and reduce GHG emissions. The projected regional development, when integrated with the proposed regional transportation network in Connect SoCal, would reduce per capita GHG emissions related to vehicular travel and achieve the GHG reduction per capita targets for the SCAG region.

The Connect SoCal Plan does not require that local general plans, specific plans, or zoning be consistent with the SCS, but provides incentives for consistency to governments and developers. The proposed project would expand classroom facilities to include grades TK-8 for the existing and future students of OPA school within an existing operational school campus. The proposed project would continue to serve the local student population in the surrounding communities. Therefore, the proposed project would not interfere with SCAG's ability to implement the regional strategies in Connect SoCal, and impacts would be less than significant.

3.9 HAZARDS AND HAZARDOUS MATERIALS

Would the project:

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

Less Than Significant Impact. Construction of the proposed project would require small amounts of hazardous materials associated with construction equipment which include vehicle fuels, lubricants, grease and transmission fluids; as well as paints and coatings. The handling, use, transport, and disposal of hazardous materials by the construction phase of the project would comply with existing regulations of several agencies—

the Environmental Protection Agency (EPA), California Division of Occupational Safety and Health, US Occupational Safety and Health Administration, and US Department of Transportation.

The operation of the proposed project would transport, use, store and dispose of small amounts of hazardous materials typical of school facilities, such as cleaning and maintenance supplies (cleaners, gasoline, paint, and pesticides). These materials would be used in relatively small quantities, clearly labeled, and stored in compliance with State and federal requirements. The project site is already developed and operating as a school campus, and the proposed project would not change the existing use of the site as a school campus. No manufacturing, industrial, or other uses utilizing large amounts of hazardous materials would occur within the campus. Compliance with applicable federal and state laws and regulations governing the use, storage, transport, and disposal of hazardous materials would ensure that all potentially hazardous materials are used and handled in an appropriate manner and would minimize the potential for safety impacts. Therefore, the proposed project would not create substantial hazards to the public or the environment. Impacts would be less than significant.

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?

Less Than Significant Impact. Five environmental lists were searched for hazardous materials site on the project site and surrounding 1,500 feet:

- GeoTracker: State Water Resources Control Board (SWRCB 2023)
- EnviroStor: Department of Toxic Substances Control (DTSC 2023)
- EJScreen: US Environmental Protection Agency (EPA 2012a)
- EnviroMapper: US Environmental Protection Agency (EPA 2023b)
- Solid Waste Information System (SWIS): California Department of Resources, Recycling and Recovery (CalRecycle 2021)

The only evidence that a hazardous materials release or threatened release have occurred on the project site or within a 1,500- foot radius was on GeoTracker. Three leaking underground storage tank sites were identified—one on Muirlands Boulevard and two on Ridge Route. All three are completed gasoline cleanup sites, and cases are closed. The project site is surrounded by residential uses. No significant hazards from hazardous materials are expected at the project site. As discussed in 3.9(a), construction activities would require small amounts of hazardous materials; which include vehicle fuels, lubricants, grease, transmission fluids, paints, and coatings. The use, transportation, and disposal of hazardous materials would be in accordance with regulatory standards and manufacturers' specifications. Hazardous materials would be used in small quantities and properly stored so they do not pose significant safety hazards. The operation of the proposed project would transport, use, store, and dispose of small amounts of hazardous materials typical of school facilities, such as cleaning and maintenance supplies (cleaners, gasoline, paint, and pesticides). The operation of the proposed project would use cleaners and other chemicals—not typically considered hazardous materials that would lead to significant hazard to the public or the environment—in relatively small quantities, Compliance with applicable federal and

state laws and regulations governing the use, storage, transport, and disposal of hazardous materials would ensure impacts would be less than significant.

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

Less Than Significant Impact. The project site currently operates as a school and would continue to operate as such with expanded capacity. It would not emit hazardous emissions or handle hazardous materials or substances other than discussed in 3.9(a). There are no other schools located within 0.25 mile of the project site. Impacts would be less than significant.

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?

No Impact. A significant impact would occur if the project site were included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and would create a significant hazard to the public or the environment. Five environmental databases were searched for hazardous material sites on or within 0.25 mile of the project site:

- GeoTracker. State Water Resources Control Board (SWRCB 2023)
- EnviroStor. Department of Toxic Substances and Controls (DTSC 2023)
- EJScreen. US Environmental Protection Agency (EPA 2023a)
- EnviroMapper. US Environmental Protection Agency (EPA 2023b)
- Solid Waste Information System (SWIS). CalRecycle (CalRecycle 2023)

There were no hazardous waste sites located on or within 0.25 mile of the project site (SWRCB 2023; DTSC 2023; EPA 2023a; EPA 2023b; CalRecycle 2023). The proposed project would not create a hazard to the public or the environment because of a hazardous materials site pursuant to Government Code Section 65962.5. No impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles or 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?

No Impact. The closest airport is John Wayne Airport in Santa Ana, which is approximately 11 miles northwest of the project site. The project site is not within an airport land use plan nor within any airport influence area (AELUP 2008). Therefore, no impacts would occur.

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

Less Than Significant Impact. The proposed project would not conflict with adopted emergency response or evacuation plans. The surrounding roadways would continue to provide emergency access to the project site

and surrounding properties during construction and post-construction. Both the City Fire Marshal and DSA would be required to approve fire access at the site. As part of the DSA process, a Fire and Life Safety Review would be conducted, and the DSA would review building construction and how occupants can safely exit the buildings in case of a fire. The proposed project would not result in inadequate emergency access. Impacts would be less than significant.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

No Impact. The project site is not located in a very high fire hazard severity zone (CAL FIRE 2023). The proposed project and site conditions would not contribute to an increase in exposure to wildfire risk. The proposed project would also comply with the California Building and Fire Codes, which would ensure impacts are less than significant.

3.10 HYDROLOGY AND WATER QUALITY

Would the project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less Than Significant Impact. Lake Forest falls within the jurisdiction of two Regional Water Quality Control Boards: Santa Ana and San Diego. The project site falls within the Santa Ana Region, which covers the northwestern portion of the city north of El Toro Road (Lake Forest 2020). Drainage and surface water discharges during construction and operation of the proposed project would not violate any water quality standards or waste discharge requirements. Site preparation and other soil-disturbing activities during construction of the project could temporarily increase the amount of soil erosion and siltation entering the local stormwater drainage system; however, impacts would be less than significant.

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

Less Than Significant Impact. Lake Forest is within the Coastal Plain of Orange County Groundwater Basin managed by the Municipal Water District of Orange County (MWDOC) (Lake Forest 2023). The proposed project does propose wells that would extract from this basin, nor would project operation substantially interfere with groundwater recharge. The site is already an operating school, and the proposed project would add classrooms but would not substantially decrease groundwater supplies. Impacts would be less than significant.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

i) Result in a substantial erosion or siltation on- or off-site?

Less Than Significant Impact. As discussed in Section 3.10(a), the proposed project would include temporary site disturbance and would be within the previously developed school site. The proposed project does not result in substantial erosion or siltation on- or off-site. Once the construction phase is completed, no untreated or exposed soils that are susceptible to erosion or siltation would remain. Impacts would be less than significant.

ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite?

Less Than Significant Impact. The proposed project would replace turf with impervious surfaces like buildings and paved courtyards. Compliance with the State Water Resources Control Board regulations and best management practices would ensure the rate and amount of surface runoff remains the same as current operations, making this impact less than significant.

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?

Less Than Significant Impact. Project implementation would increase impervious surfaces on-site, but the required best management practices would reduce impacts associated with impervious surfaces. The proposed project would be required to comply with local, State, and federal regulations pertaining to stormwater. Therefore, the proposed project would not exceed the capacity of existing or planned stormwater drainage systems. Impacts would be less than significant.

iv) Impede or redirect flood flows?

No Impact. The project site is designated by the Federal Emergency Management Agency in Flood Zone X: Area of Minimal Hazard (FEMA 2009). Additionally, the project site is not within a dam inundation area (DWR 2023). No impact would occur.

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

No Impact. As noted in Section 3.10(c)(iv), above, the project site is in Flood Zone X, an area of minimal flooding hazard. Therefore, there is no risk of pollutant release due to flooding.

A tsunami is a series of ocean waves caused by a sudden displacement of the ocean floor, most often due to earthquakes. The campus is approximately nine miles inland of the Pacific Ocean, at an elevation of approximately 489 feet above sea mean sea level, outside of the tsunami hazard zone identified by the California Department of Conservation's Orange County Tsunami Hazard Area map (DOC 2023e). Therefore, the proposed project would not risk release of pollutants due to tsunamis.

A seiche is a surface wave created when a body of water is shaken, usually by earthquake activity. Seiches are of concern relative to water storage facilities because inundation from a seiche can occur if the wave overflows a containment wall, such as the wall of a reservoir, water storage tank, dam or other artificial body of water. According to the California Department of Water Resources' Dam Breach Inundation Map, the campus is not within any dam's inundation area (DWR 2023). Therefore, there is no risk of pollutant release due to inundation from a seiche. No impact would occur.

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

No Impact. The proposed project would not conflict or obstruct the implementation of water quality management plans or suitable groundwater management plans. Lake Forest's water is controlled by the MWDOC, specifically the El Toro Water District (MWDOC 2023). Implementation of the proposed project would not involve any activities that would affect or could potentially affect the city's or MWDOC's water supply sources or systems, nor would it conflict with or obstruct implementation of a water quality control plan. Additionally, the proposed project would adhere to and not conflict with the El Toro Urban Water Management Plan. Therefore, the proposed project would not involve any activities that could adversely affect any water quality control plans or sustainable groundwater management plans. No impact would occur.

3.11 LAND USE AND PLANNING

Would the project:

a) Physically divide an established community?

No Impact. The proposed project would add classrooms on the existing developed campus. The proposed project would occur entirely within the campus boundaries and would not create any new land uses or divide or disrupt the physical arrangement of any surrounding community. No impact would occur.

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?

No Impact. The proposed project would add buildings to an existing, fully operating school. It has a land use designation of Public Facility and a zoning designation of Single Family Residential (R1) (Lake Forest 2023). The proposed project would not alter or modify the site's current land use and zoning designations. Development of the proposed project would not conflict with any applicable land use plans, policies, or regulations. No impact would occur.

3.12 MINERAL RESOURCES

Would the project:

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

No Impact. In 1975, the State legislature adopted the Surface Mining and Reclamation Act. This designated Mineral Resources Zones (MRZ) that were of statewide or regional importance. The classifications used to define MRZs are:

- **MRZ-1:** Adequate information indicates that no significant mineral deposits are present or likely to be present.
- **MRZ-2:** Adequate information indicates that significant mineral deposits are present, or the likelihood of their presence, and development should be controlled.
- **MRZ-3:** The significance of mineral deposits cannot be determined from the available data.
- **MRZ-4:** Insufficient data to assign any other MRZ designation.

The California Department of Conservation, Division of Geological Survey produces Mineral L:and Classification studies that identify areas with potentially important mineral resources. The Generalized Mineral Land Classification of Orange County shows the project site is mapped in MRZ-1 (DOC 1994). The project site and surroundings are in an area where adequate information indicates that no significant mineral deposits are present or likely to be present. Additionally, the project site is an existing school campus that has had previous earthwork, and no mineral resources are being extracted. The proposed project would not result in the loss of availability of a known mineral resource valuable to the region and the state. No impact would occur.

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

No Impact. As previously mentioned in Section 3.12 (a), the project site is in MRZ-1, an area where adequate information indicates that no significant mineral deposits are present or likely to be present. The Lake Forest General Plan does not mention or indicate any mines in the city (Lake Forest 2020). The project site is surrounded by urban development and is not a locally important mineral resource site. Implementation of the proposed project would not result in the loss of availability of a known mineral resource. No impact would occur.

3.13 NOISE

Noise Fundamentals

Noise is defined as unwanted sound and, when overexposed, is known to have several adverse effects on people, including hearing loss, speech and sleep interference, physiological responses, and annoyance. Based on these known adverse effects of noise, federal, state, and city governments have established criteria to protect public health and safety and to prevent the disruption of certain human activities, such as classroom instruction, communication, or sleep. Additional information on noise and vibration fundamentals and applicable regulations are contained in Appendix B.

Environmental Setting

The project site is proposed to be developed within an existing school (OPA) and is in a predominantly residential area with residences to the north, east, south, and west of the project site. The nearest major source of transportation noise to the project site is Ridge Route Drive and Muirlands Boulevard, to the north and to the west, respectively. Intermittent noise from nearby residential uses (e.g., property maintenance and parking lot noise) also contribute to the overall noise environment in the project vicinity.

The existing noise environment consists primarily of noise from the school activity when it is in operation with secondary noise associated with residential activity as the project site is located within a residential neighborhood. Therefore, ambient noise levels would be typical of those of a residential neighborhood, which ranges from 45 to 60 dBA. Additionally, intermittent rail operations may influence the ambient environment from the railroad tracks that are approximately 650 feet to the east of the OPA school boundary.

Sensitive Receptors

Certain land uses are particularly sensitive to noise and vibration. These uses include residences, schools, hospital facilities, houses of worship, and open space/recreation areas where quiet environments are necessary for the enjoyment, public health, and safety of the community. As stated previously, there are sensitive receptors (residences) on all sides of the school site. The nearest sensitive receptors selected to show impacts from implementation of the project include the residence northwest of the school at 22891 Loumont Drive, residence to the east of the school at 24662 Coleford Street, residence to the south of the school at 23022 Dune Mear Road, and the residence to the southwest of the school at 24552 Blackfoot Drive.

Applicable Standards

California Building Code

The State of California's noise insulation standards for non-residential uses are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 11, California Green Building Standards Code (CALGreen). CALGreen noise standards are applied to new or renovation construction projects in California to control interior noise levels resulting from exterior noise sources. Proposed projects may use either the prescriptive method (Section 5.507.4.1) or the performance method (Section 5.507.4.2) to show compliance. Under the prescriptive method, a project must demonstrate transmission loss ratings for the wall and roof-

ceiling assemblies and exterior windows when located within a noise environment of 65 dBA CNEL or higher. Under the performance method, a project must demonstrate that interior noise levels do not exceed 50 dBA $Leq_{(1hr)}$.

Title 5, Section 14040(q).

Under Title 5, the California Department of Education (CDE) regulations require the school district to consider noise in the site selection process. As recommended by CDE guidance, if a school district is considering a potential school site near a freeway or other source of noise, it should hire an acoustical engineer to determine the level of sound that the site is exposed to and to assist in designing the school should that site be chosen.

City of Lake Forest General Plan

Construction

The City of Lake Forest General Plan provides hours in which temporary construction may occur which provides the following statement: Restrict construction activities to the hours of 7:00 AM to 7:00 PM on Monday through Friday, and 8:00 AM to 6:00 PM on Saturdays. No construction shall be permitted outside of these hours or on Sundays or legal City of Lake Forest holiday, without a specific exemption issued by the City.

Stationary Sources of Noise

Stationary sources of noise are governed under the City of Lake Forest General Plan (Table PS-2). The General Plan states that no person shall, within the City, create any sound, radiated for extended periods from any premises which produces a sound pressure level at any point on the property in excess of 55 dBA L_{eq} from 7:00 AM to 10:00 PM and 50 dBA L_{eq} from 10:00 PM to 7:00 AM.

Vibration Noise

The City of Lake Forest General Plan requires vibration from construction to not exceed the following standards for vibration damage and annoyance, which are adopted standards from the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual (FTA 2018):

A vibration noise impact would occur if:

- Vibration levels would exceed 0.30 inches/second (in/sec) peak particle velocity (PPV) which typically applies to a structure of normal conventional construction for the nearby sensitive receptors.

- The City shall require new residential projects located adjacent to major freeways, hard rail lines, or light rail lines to follow the FTA vibration screening distance criteria to ensure that residential uses are not exposed to vibrations exceeding 72 VdB for frequent events (more than 70 events per day), 75 VdB for occasional events (30-70 events per day), or 80 VdB for infrequent events (less than 30 events per day).

Federal Transit Administration

The City of Lake Forest does not have a quantified threshold for temporary construction noise. Therefore, to determine impact significance, the following Federal Transit Administration (FTA) criteria are adopted.

A construction noise impact would occur if:

- Project construction activities would generate noise levels greater than 80 dBA Leq at the sensitive receptor property line.

Would the project result in:

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

Less Than Significant Impact. Following is a discussion of the temporary and permanent noise impacts as a result of the Proposed Project's construction and operational phases.

Construction Noise

Two types of short-term noise impacts could occur during construction: (1) mobile-source noise from transport of workers, material deliveries, and debris and soil haul and (2) stationary-source noise from use of construction equipment on the project site.

Construction Vehicles

The transport of workers and materials to and from the construction site would incrementally increase noise levels along site access roadways. Individual construction vehicle pass-bys may create momentary noise levels of up to approximately 85 dBA L_{max} at 50 feet from the worker and vendor vehicles. However, these occurrences would generally be infrequent and lasting a short-period of time.

Worker and vendor trips would total a maximum of approximately 32 daily vendor and worker trips during overlapping construction activity phases. Site access would be through either Dune Mear Road, Blackfoot Drive, or Loumont Drive, which as shown in Table 8, *Traffic Noise Increase from Project, dBA CNEL*, the lowest existing ADT was found to be 850. The addition of 32 daily construction trips would result in a temporary noise increase of 0.2 dBA CNEL or less, which would not be perceptible nor permanent. Therefore, construction-vehicle noise impacts would be considered less than significant, and no mitigation measures are necessary.

Construction Equipment

Noise generated by onsite construction equipment is based on the type of equipment used, its location relative to sensitive receptors in the project vicinity, and the timing and duration of noise-generating activities. Each stage of construction involves different kinds of equipment and has distinct noise characteristics. Noise levels from construction activities are typically dominated by the loudest equipment. The dominant equipment noise source is typically the engine, although work-piece noise (such as dropping of materials) can also be noticeable.

The noise produced at each construction stage is determined by combining the L_{eq} contributions from each piece of equipment used at a given time, while accounting for the ongoing time-variations of noise emissions. Heavy equipment, such as a dozer or a loader, can have maximum, short-duration noise levels of up to 85 dBA at 50 feet. However, overall noise emissions vary considerably, depending on the specific activity performed at any given moment. Noise attenuation due to distance, the number and type of equipment, and the load and power requirements to accomplish tasks at each construction phase would result in different noise levels from construction activities at a given receptor. Since noise from construction equipment is intermittent and diminishes at a rate of at least 6 dBA per doubling of distance (conservatively ignoring other attenuation effects from air absorption, ground effects, and shielding effects), the average noise levels at noise-sensitive receptors in the project vicinity could vary considerably, because mobile construction equipment would move around the site with different loads and power requirements.

On-site Construction Noise

Average noise levels from project-related construction activities are calculated by modeling the three loudest pieces of equipment per activity phase. Equipment for grading and site preparation is modeled at spatially averaged distances (i.e., from the acoustical center of the general construction site to the property line of the nearest receptors) because the area around the center of construction activities best represents the potential average construction-related noise levels at the various sensitive receptors for mobile equipment. For the nearby residences analyzed this was measured from the center of the portable classrooms/bathroom installation. Similarly, construction noise from paving activities, building construction, and utility trenching is modeled from the edge of the proposed portables/bathroom to the nearest sensitive receptors.

The project's expected construction equipment mix was categorized by construction activity using the FHWA Roadway Construction Noise Model (RCNM). The associated, aggregate sound levels—grouped by construction activity—are summarized in Table 7, *Project Related Construction Noise, dBA Leq*. RCNM modeling input and output worksheets are included in Appendix B.

As shown in Table 7 on-site construction-related noise levels would not exceed the 80 dBA Leq threshold at the nearest sensitive receptors at any point. Therefore, construction-equipment noise impacts would be considered less-than-significant.

Table 7 Project-Related Construction Noise, dBA Leq

Construction Activity Phase	RCNM Reference Noise Level	Residence to the Northwest at 22891 Loumont Drive	Residence to the East at 24662 Coleford Street	Residence to the South at 23022 Dune Mear Road	Residence to the Southwest at 24552 Blackfoot Drive
Distance in feet	50	600	440	245	245
Site Preparation	84	62	65	70	70
Rough Grading	85	63	66	71	71
Fine Grading	85	63	66	71	71
Distance in feet	50	540	195	310	115
Building Construction	82	61	70	66	75
Paving	83	62	71	67	76
Utilities Trenching	77	56	65	61	70

Table 7 Project-Related Construction Noise, dBA Leq

Construction Activity Phase	RCNM Reference Noise Level	Residence to the Northwest at 22891 Loumont Drive	Residence to the East at 24662 Coleford Street	Residence to the South at 23022 Dune Mear Road	Residence to the Southwest at 24552 Blackfoot Drive
Maximum dBA Leq		63	71	71	76
Exceed 80 Leq dBA Threshold?		No	No	No	No

Notes: Calculations performed with the FHWA RCNM software are included in Appendix B.

Operational Noise

Traffic Noise

A project will normally have a significant effect on the environment related to noise if it substantially increases the ambient noise levels for adjoining areas. Most people can detect changes in sound levels of approximately 3 dBA under normal, quiet conditions, and changes of 1 to 3 dBA under quiet, controlled conditions. Changes of less than 1 dBA are usually indiscernible. A change of 5 dBA is readily discernible to most people in an outdoor environment. Noise levels above 65 dBA CNEL are normally unacceptable at sensitive receptor locations such as residences, and noise environments in these areas would be considered degraded. Based on this, a significant impact would occur if the following traffic noise increases occur relative to the existing noise environment:

- For Project-related traffic noise, the Project causes the ambient noise levels measured at the property line of affected uses to increase by 3 dBA CNEL to or within the "normally unacceptable" or "clearly unacceptable" categories; or

- The Project causes the ambient noise levels measured at the property line of affected uses to increase by 5 dBA CNEL or more within the "normally acceptable" or "conditionally acceptable" categories.

With the additional classroom capacity, student enrollment would also increase. Therefore, resulting in even more trips overall from the Oxford Preparatory Academy. Traffic volume data for the new trips associated with the planned classrooms are provided by Garland Associates (2023). The data provided by the traffic engineer presents the traffic volumes of 15 local roadway segments and shows the existing, existing with project, future without project, and future with project values which is modeled in Table 8, *Traffic Noise Increase from Project, dBA CNEL*. Overall, implementation of the project would produce at most 760 trips along the local roadway segments to as low as 160 trips. As shown in Table 8 the project would not result in a 3 dBA increase over existing, future, and cumulative conditions. Since the project would not result in a 3 dBA increase, which as stated before is the threshold for the human ear to perceive or ambient conditions, impacts would be less than significant.

Table 8 Traffic Noise Increase from Project, dBA CNEL

Roadway Segment	ADT Traffic Volumes				Project Increase (dBA CNEL)		
	Existing	Existing plus Project	Future No Project	Future Plus Project	Existing No Project	Cumulative Increase	Project Cumulative Contribution
Blackfoot Drive North of Loumont Drive	1,200	1,910	1,240	1,950	2.02	2.11	1.97
Blackfoot Drive South of Loumont Drive	1,300	1,900	1,340	1,940	1.65	1.74	1.61
Costa Bella Drive West of Blackfoot Drive	850	1,170	880	1,200	1.39	1.50	1.35
Costa Bella Drive East of Blackfoot Drive	850	1,250	880	1,280	1.67	1.78	1.63
Loumont Drive East of Blackfoot Drive	1,000	1,760	1,030	1,790	2.46	2.53	2.40
Loumont Drive East of Muirlands Boulevard	850	1,170	880	1,200	1.39	1.50	1.35
Dune Mear Road West of Blackfoot Drive	2,000	2,870	2,060	2,930	1.57	1.66	1.53
Dune Mear Road East of Blackfoot Drive	1,000	1,270	1,030	1,300	1.04	1.14	1.01
Entradas Drive East of Muirlands Boulevard	1,900	2,770	1,960	2,830	1.64	1.73	1.60
Coleford Street South of Ridgeroute Drive	700	1100	720	1120	1.96	2.04	1.92
Muirlands Boulevard North of Loumont Drive	17,600	18,410	18,130	18,940	0.20	0.32	0.19
Muirlands Boulevard Between Loumont Drive and Entradas Drive	17,600	18,070	18,130	18,600	0.11	0.24	0.11
Muirlands Boulevard South of Entradas Drive	17,600	18,000	18,130	18,530	0.10	0.22	0.09
Ridgeroute Drive West of Coleford Street	7,200	7,360	7,420	7,580	0.10	0.22	0.09
Ridgeroute Drive East of Coleford Street	7,200	7,440	7,420	7,660	0.14	0.27	0.14

Sources: Garland Associates 2023.

Mechanical Equipment Noise

Heating, ventilation, and air conditioning (HVAC) systems are anticipated to be installed on the roofs of the proposed buildings/portables. The nearest sensitive receptor property line to the nearest proposed school building is approximately 150 feet to the west of the proposed portable buildings. Typical HVAC equipment generates noise levels ranging up to 72 dBA at a distance of 3 feet. At a distance of 150 feet from the nearest proposed portable, noise levels would attenuate to 38 dBA and would, therefore, not exceed the City of Lake Forest stationary noise standards at any time of the day. Therefore, impacts would be less than significant impact and no mitigation measures are necessary.

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

Less Than Significant Impact.

Operational Vibration

Project operation would not include any substantial long-term vibration sources. Therefore, no significant vibration impacts would occur and no mitigation measures are necessary.

Vibration Annoyance

Groundborne vibration is rarely annoying to people who are outdoors, so it is usually evaluated in terms of indoor receivers. For annoyance, vibration is typically noticed nearby when objects in a building generate noise from rattling windows or picture frames. Since construction activities are distributed throughout the project site, vibration annoyance impacts are typically based on average vibration levels (levels that would be experienced by sensitive receptors most of the time). Therefore, to represent the worst-case scenario for vibration annoyance, distances to the nearest sensitive receptor buildings are measured from the closest distances the equipment shown below in Table 9 might occur to the sensitive receptor. As a result, the calculations were measured from the edge of the closest portable installation. For vibration annoyance, the FTA vibration level limit of 72 VdB will apply to the surrounding residential receptors.

Table 9, *Worst Case Annoyance Vibration Levels from Construction Equipment,* shows the vibration levels from typical earthmoving construction equipment at the nearest sensitive receptors in the project vicinity. As shown in the table, construction-generated vibration levels would not exceed 72 VdB for the residences surrounding the project site. Therefore, impacts related to construction vibration annoyance less than significant.

Table 9 Worst-Case Annoyance Vibration Levels from Construction Equipment

	Vibration Levels (VdB)				
Equipment	Reference Levels at 25 feet	Residence to the Northwest at 22891 Loumont Drive at 565 feet	Residence to the East at 24662 Coleford Street at 330 feet	Residence to the South at 23022 Dune Mear Road at 175 feet	Residence to the west at 24552 Blackfoot Drive at 150 feet
Vibratory Roller	94.0	53.4	60.4	68.6	70.7
Static Roller	82.0	41.4	48.4	56.6	58.7
Large Bulldozer	87.0	46.4	53.4	61.6	63.7
Caisson Drilling	87.0	46.4	53.4	61.6	63.7
Loaded Trucks	86.0	45.4	52.4	60.6	62.7
Jackhammer	79.0	38.4	45.4	53.6	55.7
Small Bulldozer	58.0	17.4	24.4	32.6	34.7
FTA Threshold	-	72	72	72	72
Exceeds Threshold?	-	**No**	**No**	**No**	**No**

Source: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. New Zealand Transport Agency 2012.
Bold numbers indicate values that exceed the FTA annoyance criteria.
NA= Not Applicable
Distances are from the nearest distance from where these equipment pieces may be used to the nearest receptor building within each land use type.

Vibration Damage

Construction operations can generate varying degrees of ground vibration, depending on the construction procedures and equipment. Operation of construction equipment generates vibrations that spread through the ground and diminish with distance from the source. The effect on buildings in the vicinity of the construction site varies depending on soil type, ground strata, and receptor-building construction. The effects from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to slight architectural damage at the highest levels. Vibration from construction activities rarely reaches the levels that can damage structures.

For reference, a vibration level of 0.3 in/sec PPV is used as the limit for structures with normal conventional construction methods (which would apply to the surrounding residential structures). Vibration damage is measured from the edge of the project site (nearest proposed building/portable) to the nearest structure (home) façade because vibration damage, unlike human vibration perception or annoyance, is determined by measuring instantaneous peak particle velocity generated by equipment. Table 10, *Vibration Damage Levels for Typical Construction Equipment,* summarizes vibration levels for typical construction equipment at a reference distance of 25 feet and at the nearest sensitive receptors. The nearest structure to proposed construction activities is the residences approximately 150 feet or less to the west of the Project site. If paving, demolition, grading, and earthwork equipment operates within approximately 20 feet or less of the residences, the 0.3 in/sec PPV threshold would be exceeded in which case alternative construction methods (which produce less vibration) or vibration monitoring and post construction survey would be necessary.

Table 10 Vibration Damage Levels for Typical Construction Equipment

	PPV (in/sec)				
Equipment	FTA Reference at 25 feet	Residence to the Northwest at 22891 Loumont Drive at 565 feet	Residence to the East at 24662 Coleford Street at 330 feet	Residence to the South at 23022 Dune Mear Road at 175 feet	Residence to the West at 24552 Blackfoot Drive at 150 feet
Vibratory Roller	0.21	0.002	0.004	0.011	0.014
Static Roller	0.05	0.000	0.001	0.003	0.003
Hoe Ram	0.089	0.001	0.002	0.005	0.006
Large Bulldozer	0.089	0.001	0.002	0.005	0.006
Caisson Drilling	0.089	0.001	0.002	0.004	0.005
Loaded Trucks	0.076	0.000	0.001	0.002	0.002
Jackhammer	0.035	0.000	0.000	0.000	0.000
Small Bulldozer	0.003	0.002	0.004	0.011	0.014

Sources: Federal Transit Administration, *Transit Noise and Vibration Impact Assessment Manual,* September 2018. New Zealand Transport Agency 2012.
NA= Not Applicable
Bold = Threshold exceedance

As shown in Table 10 vibration levels would not result in an exceedance of 0.3 in/sec PPV at nearby sensitive receptors from the proposed remodeling, resulting in a less than significant impact.

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?

No Impact. The nearest airport to the Project site is John Wayne Airport, approximately 9.7 miles northwest (AirNav 2023). The proposed project would not expose people residing or working in the project area to excessive aircraft noise levels. Therefore, no impact would occur.

3.14 POPULATION AND HOUSING

Would the project:

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

No Impact. The campus is in a built-out, urbanized community, and no new roads or extensions of existing roads are proposed. The proposed project does not include the construction of any new homes or businesses or changes to the existing land uses on-site. The proposed project would add classroom buildings within the boundaries of the existing campus. The proposed project would increase the current capacity of OPA, but students are expected to come from other schools in the district. This project would not increase the overall capacity of the District. Additionally, the project would continue to utilize the existing roads and infrastructure; no new roads, expanded utilities, or housing would be developed. Therefore, project development would not induce unplanned population growth in the area, either directly or indirectly. No impact would occur.

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

No Impact. The proposed project is in the existing OPA campus, and improvements would occur within the boundaries of the project site. The proposed project would not involve the removal or relocation of any housing and would therefore not displace any people or necessitate the construction of any replacement housing. No existing residences would be displaced or removed as a result of the proposed project. No impact would occur.

3.15 PUBLIC SERVICES

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

a) Fire protection?

Less Than Significant Impact. Fire services in Lake Forest are provided by the Orange County Fire Authority, Division 5. The project site is served by Station 19 at 23022 El Toro Road, Lake Forest, CA, a mile

southeast of the campus. Station 19 is staffed daily by one fire captain, one fire apparatus engineer, and two firefighters (OCFA 2023).

The proposed project would be subject to DSA review to ensure that plans, specifications, and construction comply with access, fire, and life safety design standards established by DSA and California's building codes (Title 24 of the California Code of Regulations). DSA would review fire and emergency vehicle access roadways and school drop-off and pick-up areas to ensure adequate emergency access is maintained. The proposed project would not require the provision of new or physically altered fire protection facilities to maintain acceptable service ratios, response times, or other performance objectives. Impacts would be less than significant.

b) Police protection?

Less Than Significant Impact. Lake Forest currently contracts with Orange County's Sheriff's Department for law enforcement services. There are 5 sergeants, 3 investigators, 37 deputies, an investigative assistant, 5 community services officers, and a crime prevention specialist on staff. The Lake Forest policing center is at 25550 Commercentre Dr., Lake Forest, CA, four miles northeast of the project site. The county sheriff's Southeast Operations are headquartered at 20202 Windrow Dr., Lake Forest, CA (OCSD 2023). The proposed project would add students to the existing campus but would not require the provision of new or physically altered police protection facilities to maintain acceptable service ratios, response times, or other performance objectives. Impacts would be less than significant.

c) Schools?

No Impact. School service needs are related to the size of a residential population, geographic area served, and community characteristics. The proposed project would add buildings to the existing OPA campus and increase enrollment capacity. The new school facilities would continue to serve the existing OPA students and allow more students from the District to attend. The proposed project would not generate additional school demands within the District boundaries, and no impact would occur.

d) Parks?

Less Than Significant Impact. The proposed project would not generate a demand for park space, which is typically caused by population and or employment growth. The proposed project would add buildings to the existing campus as well as additional courtyards due to the increase in student capacity. The proposed plan also shows the removal of a portion of an unused baseball diamond to be replaced with asphalt. The additional students served by the proposed project are already served by the District and the Community Service Parks and Recreation division already, and therefore would not increase the overall demand for parks. Impacts would be less than significant.

e) Other public facilities?

No Impact. The proposed project does not include development of residential or commercial uses and would not contribute to population growth in the City of Lake Forest. Therefore, the proposed project would not

increase the demand for public facilities, such as library services or other administrative services in the City of Lake Forest. The proposed project would not induce population growth. No impact would occur.

3.16 RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated?

Less Than Significant Impact. Typically, the demand for parks is created by the development of new housing and/ or actions that generate additional population. The proposed project is not a population-increasing or growth including project. There are 31 parks in the city, and 2 are within a mile of the project site: Mountain View Park and Veteran's Park (Lake Forest 2020b). The proposed project would serve the existing student population and staff that are already served by the District, local, and regional recreational facilities. Existing play areas will remain on campus, and as mentioned in 3.15.d, the unused OPA baseball field would be removed and replaced with asphalt. The addition of new classroom buildings would not increase the demand for off-site recreational resources, parks, and other facilities within the city. Therefore, the proposed project would not result in the need for construction of new recreational facilities. Impacts would be less than significant.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

No Impact. As discussed in Section 3.16.a, the proposed project would not require construction of off-site recreational facilities. The proposed project would add new classroom buildings to the existing OPA campus and would not induce any significant population generation. No construction of new recreational facilities would be required; therefore, no impact would occur.

3.17 TRANSPORTATION

Would the project:

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

Less Than Significant Impact. The proposed project includes the renovation of the existing OPA in the City of Lake Forest. Since all improvements would be made within the existing site and along private streets with no planned changes to the existing circulation system, the proposed project would not cause conflicts with proposed programs or plans to improve the circulation system for all users, including transit passengers, vehicles, bicyclists, and pedestrians. The proposed project would be required to comply with applicable provisions of the Lake Forest Municipal Code. Additionally, as further discussed under Threshold 3.17(c), the proposed project would be required to comply with CDE and DSA guidelines for site design and circulation and the Orange County Fire Authority's design standards, which are imposed on project developments by the State and City during the building plan check and development review process. Since the proposed project would not make off-site improvements that would conflict with planned programs and plans and would also

not conflict with policies governing the local circulation system, the proposed project would not conflict with programs, plans, and ordinances addressing the circulation system. As described in the Traffic Impact Analysis (Appendix C), the intersection levels of service would not be exceeded as a result of the proposed project; the proposed project would not adversely affect the performance or safety of any transit or non-motorized transportation facilities (pedestrians and bicycles); and the proposed project would not conflict with any adopted plans, policies, or programs relative to these alternative transportation modes. Therefore, impacts would be less than significant.

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

Less Than Significant Impact.

Significance Criteria

Vehicle Miles Traveled

The "VMT Impact Analysis" section of the City of Lake Forest "Transportation Analysis Guidelines" states that public facilities that are publicly owned or controlled, such as K-12 schools in established communities and serving local needs, are assumed to cause a less-than-significant transportation impact. Because the proposed project—expansion of an existing K-6 school to include grades 7 and 8—falls into this category of a local-serving public facility, it can be screened from requiring a detailed VMT analysis.

Level of Service

The "City of Lake Forest Transportation Analysis Guidelines" indicates that the level of service performance standard for streets and intersections is level of service (LOS) D or better. Based on the LOS D threshold of significance, an intersection would be significantly impacted and mitigation would be required if a project would result in a change from LOS A through D to LOS E or F or if the project would result in an increase of 0.02 or greater in the ICU value at an intersection that is projected to operate at LOS E or F. The impacts would not be significant at intersections that are projected to operate at LOS A through D.

With regard to the CEQA thresholds of significance, Appendix G of the CEQA Guidelines states that a project would normally have a significant effect on the environment if the project could:

T-1 Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities,

T-2 Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), which addresses vehicle miles traveled (VMT),

T-3 Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), or

T-4 Result in inadequate emergency access.

3. Environmental Analysis

Analysis

As shown in Appendix C, the analysis indicates all six of the study area intersections are projected to operate at an acceptable level of service A (LOS A) during the morning peak period based on the intersection capacity utilization (ICU) calculations. The City of Lake Forest guidelines indicate that LOS A through D represent acceptable conditions. The afternoon peak hour was not addressed because the school-generated traffic does not coincide with the afternoon commuter peak period. Additionally, an analysis of average vehicle delays at the study area intersections indicates that the most critically impacted turning movements at the intersections would operate at LOS B, C, and D for the "2024 with project" scenario. These represent acceptable levels of service. Therefore, the levels of traffic generated by the project would not result in a significant impact at any of the study area intersections based on the projected levels of service and the significance criteria used by the City of Lake Forest for evaluating significant traffic impacts. The impact would be less than significant because the proposed project is a local-serving public use and would not result in an overall increase in student-related vehicle trips.

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

Less Than Significant Impact. The proposed project includes the addition of 7th and 8th grade classrooms to the existing OPA campus. The project site currently operates as the OPA, and operation of the proposed project would continue this use. Therefore, the operation of the proposed project does not represent an incompatible use. The proposed project is not proposing to make off-site improvements to the local transportation network that would result in sharp curves, dangerous intersections, or other hazards. As shown in Appendix C, the analysis indicates that the streets, intersections, and driveways are designed to accommodate the anticipated levels of vehicular and pedestrian activity and that the streets have been readily accommodating the traffic generated by the existing OPA. The addition of the proposed relocatable classrooms would be compatible with the neighborhood, and the proposed project would not result in any major hazards for vehicular traffic, pedestrians, or bicyclists. The proposed project would not, therefore, substantially increase hazards due to a geometric design feature or incompatible uses, and impacts would be less than significant.

d) Result in inadequate emergency access?

Less Than Significant Impact. As discussed in Appendix C, the existing access and circulation features at the school, including the driveways, on-site roadways, parking lots, and fire lanes, would accommodate emergency ingress and egress by fire trucks, police units, and ambulance/paramedic vehicles. Emergency vehicles would be able to access the school grounds, the buildings, and all other areas of the school, including the play fields, via on-site travel corridors. The proposed project would not result in inadequate emergency access, and impacts would be less than significant.

3.18 TRIBAL CULTURAL RESOURCES

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

Less Than Significant Impact with Mitigation Incorporated. Assembly Bill 52 (AB 52) requires meaningful consultation with California Native American tribes on potential impacts to tribal cultural resources, as defined in PRC Section 21074. Tribal cultural resources are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either eligible or listed in the California Register of Historical Resources or local register of historical resources. As part of the AB 52 process, Native American tribes must submit a written request to the District (lead agency) to be notified of projects within their traditionally and culturally affiliated area. The District must then provide written, formal notification to those tribes, and the tribe must respond to the lead agency within 30 days of receiving this notification if they want to engage in consultation on the project. When these steps are completed, the District must begin the consultation process within 30 days of receiving the tribe's request. Consultation concludes when 1): the parties agree to mitigation measures to avoid a significant effect on a tribal cultural resource, or 2) a party, acting in good faith and after reasonable effort, concludes mutual agreement cannot be reached.

The project site is not currently listed in the California Register of Historical Resource or in a local register of historical resources (NPS 2020). Public Resources Code Section 5020.1(k) defines a local register of historical resources as a list of properties officially designated or recognized as historically significant by a local government pursuant to a local ordinance or resolution. There is no local ordinance or resolution that identifies the project site as a historical resource. The proposed project would not result in potential impacts to sensitive tribal resources.

However, development of the proposed project could unearth previously unknown archeological resources and human remains. Although no known tribal cultural resources have been identified on the project site, the proposed project has the potential to disturb subsurface deposits possessing traditional or cultural significance to Native American or other descendant communities. With implementation of mitigation measure CUL-1 in Section 3.5, *Cultural Resources*, potential impacts to tribal cultural resources would be less than significant.

ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource

3. Environmental Analysis

Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Less Than Significant Impact with Mitigation Incorporated. AB 52 took effect July 1, 2015, and requires inclusion of a new section in CEQA documents titled "Tribal Cultural Resources," which include heritage sites. Under AB 52, a tribal cultural resource is defined as sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either included or eligible for inclusion in the California Register of Historic Resources or included in a local register of historical resources, or the lead agency, supported by substantial evidence, chooses at its discretion to treat the resource as a tribal cultural resource.

AB 52 requires consultation with tribes at an early stage to determine whether the project would have an adverse impact on the tribal cultural resource and define mitigation to protect them. Per AB 52, within 14 days of deciding to undertake a project or determining that a project application is complete, the lead agency must provide formal written notification to all tribes who have requested it. The tribe then has 30 days of receiving the notification to respond if it wishes to engage in consultation. The lead agency must initiate consultation within 30 days of receiving the request from the tribe. Consultation concludes when both parties have agreed on measures to mitigate or avoid a significant effect to a tribal cultural resource, or a party, after a reasonable effort in good faith, decides that mutual agreement cannot be reached. Regardless of the outcome of consultation, the CEQA document must disclose significant impacts on tribal cultural resources and discuss feasible alternatives or mitigation that avoid or lessen the impact.

AB 52 requires that tribes interested in consulting submit or have submitted a general request letter to the lead agency to consult under AB 52 on projects requiring the preparation of a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report. The District has not been contacted by tribes regarding the AB 52 consultation process.

The district contacted 25 Native American individuals and groups provided by the NAHC to inform them of their involvement with the proposed project. This contact does not constitute consultation with tribes. These 25 Native American individuals and groups include: Campo Band of Diegueno Mission Indians, Ewiiaapaayp Band of Kumeyaay Indians, Manzanita Band of Kumeyaay Nation, Mesa Grande Band of Diegueno Mission Indians, La Posta Band of Diegueno Mission Indians, La Jolla Band of Luiseno Indians, Pala Band of Mission Indians, Pauma Band of Luiseno Indians, Santa Rosa Band of Cahuilla Indians, Soboba Band of Luiseno Indians, Gabrieleno Band of Mission Indians - Kizh Nation, Gabrieleno/Tongva San Gabriel Band of Mission Indians, Gabrielino /Tongva Nation, Gabrielino Tongva Indians of California Tribal Council, Gabrielino-Tongva Tribe, Juaneno Band of Mission Indians, and Juaneno Band of Mission Indians Acjachemen Nation.

The District invited all tribes on NAHC's list (listed above) to consult pursuant to AB 52 on July 14, 2023. The District received a response from the Gabrieleno Band of Mission Indians – Kizh Nation requesting consultation. The District conducted consultation with the tribe via phone call and the tribe did not have any concerns or requested mitigation measures for the proposed project. The District did not receive a response to the invitation letter from any other tribes.

The project site is currently developed, and project construction work would occur within the boundaries of the project site. No extensive subterranean earthwork is proposed, therefore, the probability of encountering tribal cultural resources is low. Nevertheless, in the event that unearthed tribal cultural resources are uncovered during ground-disturbing activities, the District will comply with CEQA Guidelines Section 15064.5, which provides that work in the area of a discovery shall be suspended until a qualified archaeologist can assess the significance of the find, and, if necessary, develop appropriate avoidance and/or recovery. In the event that tribal cultural resources are inadvertently discovered, the proposed project would implement Mitigation Measure TCR-1. With the implementation of Mitigation Measure TCR-1, the proposed project would not adversely affect the significance of a tribal cultural resource. Impacts would be less than significant with mitigation incorporated.

Mitigation Measure

TCR-1 If tribal cultural resources are inadvertently discovered during ground disturbing activities for this project, the following procedures will be carried out for treatment and disposition of the discoveries:

- Upon discovery of any tribal cultural resources, construction activities shall cease in the immediate vicinity of the find (not less than the surrounding 50 feet) until the find can be assessed.
- All tribal cultural resources unearthed by project activities shall be evaluated by the qualified archaeologist. If the resources are Native American in origin, the proper tribe(s) will retain it/them in the form and/or manner the tribe(s) deems appropriate, for educational, cultural and/or historic purposes.
- If human remains and/or grave goods are discovered or recognized at the project site, all ground disturbance shall immediately cease, and the county coroner shall be notified per Public Resources Code Section 5097.98, and Health & Safety Code Section 7050.5. Human remains and grave/burial goods shall be treated alike per California Public Resources Code Section 5097.98(d)(1) and (2).
- Work may continue on other parts of the project site while evaluation and, if necessary, mitigation takes place (CEQA Guidelines Section 15064.5[f]). If a non-Native American resource is determined by the qualified archaeologist to constitute a "historical resource" or "unique archaeological resource," time allotment and funding sufficient to allow for implementation of avoidance measures, or appropriate mitigation, must be available. The treatment plan established for the resources shall be in accordance with CEQA Guidelines Section 15064.5(f) for historical resources and PRC Section 21083.2(b) for unique archaeological resources.
- Preservation in place (i.e., avoidance) is the preferred manner of treatment. If preservation in place is not feasible, treatment may include implementation of archaeological data recovery excavations to remove the resource along with subsequent laboratory processing and analysis. Any historic archaeological material that is not Native

American in origin shall be curated at a public, nonprofit institution with a research interest in the materials if such an institution agrees to accept the material. If no institution accepts the archaeological material, it shall be offered to a local school or historical society in the area for educational purposes.

3.19 UTILITIES AND SERVICE SYSTEMS

Would the project:

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

Less Than Significant Impact.

Water Expansion

The project site is currently operating as the OPA campus and served by adequate water facilities. El Toro Water District provides water to the project site as a member of the MWDOC (MWDOC 2023). The proposed project would connect to the existing water system to serve the additional classroom buildings and would comply with CALGreen standards, including mandatory water-conserving measures for plumbing fixtures to reduce water usage, and City code requirements. The proposed project would not increase the student population within the district. However, the proposed project would increase student capacity at OPA to approximately 1,200 students, a 752-student increase. The proposed project includes the addition of a new restroom building that would increase water usage but would continue to comply with CALGreen standards. The proposed project would not require the construction of new or expanded water facilities that could cause significant effects. Impacts would be less than significant.

Wastewater Treatment

El Toro District also provides wastewater collection and conveyance services to the project site. Wastewater generated by the campus is conveyed to El Toro District Water Recycling Plant (ETSD 2023). The proposed project is not expected to substantially increase wastewater as District enrollment would not increase; however, an increase of approximately 752 student capacity would increase wastewater on site. Wastewater generated at the new buildings will be conveyed to the existing sanitary sewer main. The negligible increase of wastewater from the proposed project's development would not require the construction of new or expanded wastewater facilities that could cause significant environmental effects. Impacts would be less than significant.

Stormwater Drainage

Development of the new classrooms and courtyards would increase impervious surfaces which would be serviced by the existing runoff pattern and would be discharged to the existing City storm drains. Any increased runoff would be negligible as the disturbance area is already surrounded by paved surfaces. The proposed project would not result in the relocation of stormwater drainage. Impacts would be less than significant.

Electric Power

Electricity to the project site is provided by Southern California Edison. The project site is already a developed school. Trenching for power lines would be necessary to connect to existing electrical facilities within the campus. Although the proposed project would result in a higher electricity demand than existing conditions, the increase would be negligible to a regional provider like Southern California Edison. Development of the new classroom buildings would be required to comply with energy efficiency standards set forth by California Administrative Code (Title 24, Part 6) and CALGreen standards (Title 24, Part 11). Implementation of the proposed project would not result in major construction related to electrical power facilities that could cause significant environmental impacts. Impacts would be less than significant.

Natural Gas

Natural gas service is provided by the Southern California Gas Company. The proposed project would not require the use of natural gas during operation. The proposed project would not require the construction of new or expanded facilities. No impact would occur.

Telecommunications

Various private services, which include AT&T, HughesNet, Lake Forest DIRECTV, Planet DISH, Cox, and Frontier communications, provide telecommunication services to the city, including OPA campus (Lake Forest 2023). The proposed project, if necessary, may connect to the existing telecommunications on-site. Facilities and infrastructure from the various telecommunication providers are adequate to serve the needs of the proposed project. The proposed project would not require construction of new or expanded telecommunication facilities. Impacts would be less than significant.

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

Less Than Significant Impact. El Toro Water District prepared an Urban Water Management Plan (UWMP) in 2020 that outlines the water district's water usage, including the project site. Water usage within the district has been relatively stable over the past 10 years with an average of 8,972 acre-feet used annually. Water usage of the water district is projected to increase 8.5 percent between 2020 and 2045, with recycled water use increasing and potable water demand remaining the same (ETWD 2021).

The proposed project operation would require water use and installation of utility improvements necessary to serve the new buildings. The increases in demand for water would be negligible and captured by the projected demand of El Toro Water District UWMP. Development of the proposed project would be required to comply with the provisions of CALGreen, specifically Division 5.3, Water Efficiency and Conservation, including Sections 5.303, Indoor Water Use, and 5.304, Outdoor Water Use. Based on the UWMP, the City has adequate water supplies to meet the water demands of the proposed project during normal, dry, and multiple dry years. Impacts would be less than significant.

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

Less Than Significant Impact. As discussed in 3.19a, El Toro District Water Recycling Plant serves the project site and has a capacity of six million gallons per day (ETWD 2023). The proposed project's increase of capacity at the school would cause a negligible increase in wastewater; therefore, it is anticipated that the wastewater facilities would continue to have adequate capacity to serve the proposed project. Impacts would be less than significant.

d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less Than Significant Impact. The proposed project would add classroom buildings at the OPA site. During construction the proposed project may generate some waste debris, though no buildings are proposed to be demolished, so construction solid waste generation would be minimal. In accordance with Section 16.12.015 of the Lake Forest municipal code, prior to starting a project, the applicant shall submit a properly completed waste reduction and recycling plan to the City (Lake Forest 2022). Solid waste from all District schools is transported to the Prima Deshecha Landfill, a member of County or Orange Waste and Recycling that permits 4,000 tons daily. The proposed project would not increase District capacity but would increase waste at this location. The increase in waste generation would be negligible and would continue to be serviced by Prima Deshecha Landfill. The proposed project would not adversely impact landfill capacity or impair attainment of solid waste reduction goals. Impacts would be less than significant.

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

Less Than Significant Impact. The City of Lake Forest and the District shall comply with state requirements to reduce the volume of solid waste through recycling and organic waste diversion. The District currently complies with federal, state, and local statutes and regulations related to solid waste, such as the California Integrated Waste Management Act and local recycling and waste programs. The District and its construction contractor would comply with all applicable laws and regulations and make every effort to reuse and/or recycle the construction debris that would otherwise be taken to a landfill. CALGreen Section 5.408, Construction Waste Reduction, Disposal, and Recycling, requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse. Hazardous waste, such as paint used during construction, would be disposed of only at facilities permitted to receive them in accordance with local, state, and federal regulations. The proposed project would comply with all applicable federal, state, and local statutes and regulations related to solid waste disposal. Impacts would be less than significant.

3.20 WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones (FHSZ), would the project:

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

No Impact. The OPA campus is in a local responsibility area and is not designated a very high FHSZ (CAL FIRE 2023). The campus is not in or near a state responsibility area (SRA), federal responsibility area (FRA), or lands classified as very high FHSZ. The nearest FHSZ to the project site is approximately three miles east in Laguna Woods. The proposed project would not impair an adopted emergency evacuation or response plan in the area. No impact would occur.

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?

No Impact. The OPA campus is not in or near an SRA or lands classified as very high FHSZ (CAL FIRE 2023). The project site is generally flat with no significant topography, and there are no steep slopes where high winds can exacerbate wildfire risk. The project is in an existing school in an urban and residential area. Construction of the proposed project would not result in increased exposure to pollution concentration from a wildfire or uncontrolled spread of wildfire or the uncontrolled spread of a wildfire. No impact would occur.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No Impact. The OPA campus is not in or near an SRA or lands classified as very high FHSZ (CAL FIRE 2023). The proposed project would add classrooms to a current school, and the new buildings would use the existing infrastructure. No new roads, fuel breaks, emergency water sources, power lines, or other utilities would be required. Therefore, construction of the proposed project would not exacerbate wildfire risk or result in temporary or ongoing impacts to the environment, and no impacts would occur.

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?

No Impact. The OPA campus is not in or near an SRA or lands classified as very high FHSZ (CAL FIRE 2023). The project site is flat with no significant topography; therefore, the proposed project would not lead to a significant risk of post-fire slope instability leading to flooding or landslides, drainage changes, or runoff. No impact would occur.

3.21 MANDATORY FINDINGS OF SIGNIFICANCE

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

Less Than Significant Impact With Mitigation Incorporated. The proposed project area is already developed and would add buildings to the existing school. As discussed in Section 3.4, there is no native or suitable habitat for listed species due to the frequent disturbances on-site making it rare that any species would occur within the project area. The project must comply with MBTA and respect nesting bird season. Due to the minimal habitat in this already-disturbed project area, impacts to plant and animal communities would be less than significant.

As discussed in Sections 3.5 and 3.7, to protect California history, mitigation measures CUL-1 and GEO-1 will be implemented if any culturally or paleontologically sensitive material is discovered during project construction. With these mitigation measures incorporated, impacts would be less than significant.

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.)

Less Than Significant Impact. The potential for cumulative impacts occurs when the independent impacts of a given project are combined with the impacts of related projects that would create impacts that are greater than those of the project alone. Related projects include past, current, and/or probable future projects in the vicinity of the proposed project site whose development could contribute to potentially significant cumulative impacts. As analyzed throughout this IS/MND, any construction or operational-related impacts would either be less than significant or mitigated to a less than significant level. Additionally, this proposed project's disturbance area is small and localized on an already developed campus, and since no other cumulative projects are identified in the area, the proposed project would not result in impacts that are individually limited but cumulatively considerable.

c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?

Less Than Significant Impact. The proposed project would add new classrooms and increase the capacity of the currently operating OPA. As shown in this analysis, no significant impacts would cause substantial adverse effects on human beings. Impacts would be less than significant.

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Appendix A Air Quality and Greenhouse Gas Background and Modeling Data

Appendix

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Air Quality and Greenhouse Gas Appendix

Air Quality and Greenhouse Gas Background and Modeling Data

AIR QUALITY

Air Quality Regulatory Setting

The proposed project has the potential to release gaseous emissions of criteria pollutants and dust into the ambient air; therefore, it falls under the ambient air quality standards promulgated at the local, state, and federal levels. The project site is in the SoCAB and is subject to the rules and regulations imposed by the South Coast Air Quality Management District (South Coast AQMD). However, South Coast AQMD reports to California Air Resources board (CARB), and all criteria emissions are also governed by the California and national Ambient Air Quality Standards (AAQS). Federal, state, regional, and local laws, regulations, plans, or guidelines that are potentially applicable to the proposed project are summarized below.

AMBIENT AIR QUALITY STANDARDS

The Clean Air Act (CAA) was passed in 1963 by the US Congress and has been amended several times. The 1970 Clean Air Act amendments strengthened previous legislation and laid the foundation for the regulatory scheme of the 1970s and 1980s. In 1977, Congress again added several provisions, including nonattainment requirements for areas not meeting National AAQS and the Prevention of Significant Deterioration program. The 1990 amendments represent the latest in a series of federal efforts to regulate the protection of air quality in the United States. The CAA allows states to adopt more stringent standards or to include other pollution species. The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the state to achieve and maintain the California AAQS by the earliest practical date. The California AAQS tend to be more restrictive than the National AAQS, based on even greater health and welfare concerns.

These National AAQS and California AAQS are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect "sensitive receptors" most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both California and the federal government have established health-based AAQS for seven air pollutants. As shown in Table 1, *Ambient Air Quality Standards for Criteria Pollutants*, these pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), coarse inhalable particulate matter (PM_{10}), fine inhalable particulate matter ($PM_{2.5}$), and lead (Pb). In addition, the state has set standards for

sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Ozone (O_3)[3]	1 hour	0.09 ppm	*	Motor vehicles, paints, coatings, and solvents.
	8 hours	0.070 ppm	0.070 ppm	
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9 ppm	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm	Motor vehicles, petroleum-refining operations, industrial sources, aircraft, ships, and railroads.
	1 hour	0.18 ppm	0.100 ppm	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	*	0.030 ppm	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	0.075 ppm	
	24 hours	0.04 ppm	0.14 ppm	
Respirable Coarse Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	*	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	50 µg/m^3	150 µg/m^3	
Respirable Fine Particulate Matter ($PM_{2.5}$)[4]	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3	Dust and fume-producing construction, industrial, and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 hours	*	35 µg/m^3	
Lead (Pb)	30-Day Average	1.5 µg/m^3	*	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	Calendar Quarter	*	1.5 µg/m^3	
	Rolling 3-Month Average	*	0.15 µg/m^3	
Sulfates (SO_4)[5]	24 hours	25 µg/m^3	*	Industrial processes.
Visibility Reducing Particles	8 hours	ExCo =0.23/km visibility of 10≥ miles	No Federal Standard	Visibility-reducing particles consist of suspended particulate matter, which is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, dust, and salt.

Table 1 Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time	California Standard[1]	Federal Primary Standard[2]	Major Pollutant Sources
Hydrogen Sulfide	1 hour	0.03 ppm	No Federal Standard	Hydrogen sulfide (H_2S) is a colorless gas with the odor of rotten eggs. It is formed during bacterial decomposition of sulfur-containing organic substances. Also, it can be present in sewer gas and some natural gas and can be emitted as the result of geothermal energy exploitation.
Vinyl Chloride	24 hours	0.01 ppm	No Federal Standard	Vinyl chloride (chloroethene), a chlorinated hydrocarbon, is a colorless gas with a mild, sweet odor. Most vinyl chloride is used to make polyvinyl chloride (PVC) plastic and vinyl products. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites, due to microbial breakdown of chlorinated solvents.

Source: CARB 2016.
Notes: ppm: parts per million; µg/m^3: micrograms per cubic meter
* Standard has not been established for this pollutant/duration by this entity.
1 California standards for O_3, CO (except 8-hour Lake Tahoe), SO_2 (1 and 24 hour), NO_2, and particulate matter (PM_{10}, $PM_{2.5}$, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2 National standards (other than O_3, PM, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
3 On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
4 On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 µg/m^3 to 12.0 µg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 µg/m^3, as was the annual secondary standard of 15 µg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 µg/m^3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
5 On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. The 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

California has also adopted a host of other regulations that reduce criteria pollutant emissions, including:

- CARB Advanced Clean Fleets (ACF)
- CARB Advanced Clean Trucks (ACT)
- AB 1493: Pavley Fuel Efficiency Standards
- Title 20 California Code of Regulations (CCR): Appliance Energy Efficiency Standards
- Title 24, Part 6, CCR: Building and Energy Efficiency Standards
- Title 24, Part 11, CCR: Green Building Standards Code

AIR POLLUTANTS OF CONCERN

Criteria Air Pollutants

The air pollutants emitted into the ambient air by stationary and mobile sources are regulated by federal and state law. Air pollutants are categorized as primary or secondary pollutants. Primary air pollutants are those that are emitted directly from sources and include CO, VOC, NO_2, SO_X, PM_{10}, $PM_{2.5}$, and Pb. Of these, CO, SO_2, NO_2, PM_{10}, and $PM_{2.5}$ are "criteria air pollutants," which means that ambient air quality standards (AAQS) have been established for them. VOC and oxides of nitrogen (NO_x) are air pollutant precursors that form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone

(O_3) and NO_2 are the principal secondary pollutants. A description of each of the primary and secondary criteria air pollutants and their known health effects is presented below.

Carbon Monoxide (CO) is a colorless, odorless, toxic gas produced by incomplete combustion of carbon substances, such as gasoline or diesel fuel. CO is a primary criteria air pollutant. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion, engines and motor vehicles operating at slow speeds are the primary source of CO in the SoCAB. The highest ambient CO concentrations are generally found near traffic-congested corridors and intersections. The primary adverse health effect associated with CO is interference with normal oxygen transfer to the blood, which may result in tissue oxygen deprivation (South Coast AQMD 2005; US EPA 2023a). The SoCAB is designated as being in attainment under the California AAQS and attainment (serious maintenance) under the National AAQS (CARB 2023a).

Volatile Organic Compounds (VOC) are composed primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of VOCs. Other sources include evaporative emissions from paints and solvents, asphalt paving, and household consumer products such as aerosols (South Coast AQMD 2005). There are no AAQS for VOCs. However, because they contribute to the formation of O_3, South Coast AQMD has established a significance threshold (South Coast AQMD 2023a). The health effects for ozone are described later in this section.

Nitrogen Oxides (NO_X) are a by-product of fuel combustion and contribute to the formation of ground-level O_3, PM_{10}, and $PM_{2.5}$. The two major forms of NO_X are nitric oxide (NO) and nitrogen dioxide (NO_2). NO is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. The principal form of NO_X produced by combustion is NO, but NO reacts quickly with oxygen to form NO_2, creating the mixture of NO and NO_2 commonly called NO_X. NO_2 is an acute irritant and more injurious than NO in equal concentrations. At atmospheric concentrations, however, NO_2 is only potentially irritating. NO_2 absorbs blue light; the result is a brownish-red cast to the atmosphere and reduced visibility. NO_2 exposure concentrations near roadways are of particular concern for susceptible individuals, including asthmatics, children, and the elderly. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects, including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Also, studies show a connection between elevated short-term NO_2 concentrations and increased visits to emergency departments and hospital admissions for respiratory issues, especially asthma (South Coast AQMD 2005; USEPA 2023a). The SoCAB is designated as unclassified/attainment (maintenance) under the National AAQS and attainment under the California AAQS (CARB 2023a).

Sulfur Dioxide (SO_2) is a colorless, pungent, irritating gas formed by the combustion of sulfurous fossil fuels. It enters the atmosphere as a result of burning high-sulfur-content fuel oils and coal and chemical processes at plants and refineries. Gasoline and natural gas have very low sulfur content and do not release significant quantities of SO_2. When sulfur dioxide forms sulfates (SO_4) in the atmosphere, together these pollutants are referred to as sulfur oxides (SO_X). Thus, SO_2 is both a primary and secondary criteria air pollutant. At sufficiently high concentrations, SO_2 may irritate the upper respiratory tract. Current scientific

evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects, including bronchoconstriction and increased asthma symptoms. These effects are particularly adverse for asthmatics at elevated ventilation rates (e.g., while exercising or playing) at lower concentrations and when combined with particulates, SO_2 may do greater harm by injuring lung tissue. Studies also show a connection between short-term exposure and increased visits to emergency facilities and hospital admissions for respiratory illnesses, particularly in at-risk populations such as children, the elderly, and asthmatics (South Coast AQMD 2005; US EPA 2023a). The SoCAB is designated as attainment under the California and National AAQS (CARB 2023a).

Suspended Particulate Matter (PM_{10} and $PM_{2.5}$) consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulates are now recognized and regulated. Inhalable coarse particles, or PM_{10}, include particulate matter with an aerodynamic diameter of 10 microns or less (i.e., ≤0.01 millimeter). Inhalable fine particles, or $PM_{2.5}$, have an aerodynamic diameter of 2.5 microns or less (i.e., ≤0.002.5 millimeter). Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in people who are naturally sensitive or susceptible to breathing problems. The EPA's scientific review concluded that $PM_{2.5}$, which penetrates deeply into the lungs, is more likely than PM_{10} to contribute to health effects and at far lower concentrations. These health effects include premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, and increased respiratory symptoms (e.g., irritation of the airways, coughing, or difficulty breathing) (South Coast AQMD 2005). There has been emerging evidence that ultrafine particulates, which are even smaller particulates with an aerodynamic diameter of <0.1 microns or less (i.e., ≤0.0001 millimeter) have human health implications because their toxic components may initiate or facilitate biological processes that may lead to adverse effects to the heart, lungs, and other organs (South Coast AQMD 2022). However, the EPA and the California Air Resources Board (CARB) have not adopted AAQS to regulate these particulates. Diesel particulate matter is classified by CARB as a carcinogen (CARB 2023e). Particulate matter can also cause environmental effects such as visibility impairment,[1] environmental damage,[2] and aesthetic damage[3] (South Coast AQMD 2005; US EPA 2023a). The SoCAB is a nonattainment area for $PM_{2.5}$ under California and National AAQS and a nonattainment area for PM_{10} under the California AAQS (CARB 2023a).[4]

Ozone (O_3) is a key ingredient of "smog" and is a gas that is formed when VOCs and NO_X, both by-products of internal combustion engine exhaust, undergo photochemical reactions in sunlight. O_3 is a secondary criteria air pollutant. O_3 concentrations are generally highest during the summer months when

1 $PM_{2.5}$ is the main cause of reduced visibility (haze) in parts of the United States.

2 Particulate matter can be carried over long distances by wind and then settle on ground or water, making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems.

3 Particulate matter can stain and damage stone and other materials, including culturally important objects such as statues and monuments.

4 CARB approved the South Coast AQMD's request to redesignate the SoCAB from serious nonattainment for PM_{10} to attainment for PM_{10} under the National AAQS on March 25, 2010, because the SoCAB did not violate federal 24-hour PM_{10} standards from 2004 to 2007. The EPA approved the State of California's request to redesignate the South Coast PM_{10} nonattainment area to attainment of the PM_{10} National AAQS, effective on July 26, 2013.

direct sunlight, light winds, and warm temperatures create favorable conditions for its formation. O_3 poses a health threat to those who already suffer from respiratory diseases as well as to healthy people. Breathing O_3 can trigger a variety of health problems, including chest pain, coughing, throat irritation, and congestion. It can worsen bronchitis, emphysema, and asthma. Ground-level O_3 also can reduce lung function and inflame the linings of the lungs. Repeated exposure may permanently scar lung tissue. O_3 also affects sensitive vegetation and ecosystems, including forests, parks, wildlife refuges, and wilderness areas. In particular, O_3 harms sensitive vegetation during the growing season (South Coast AQMD 2005; US EPA 2023a). The SoCAB is designated extreme nonattainment under the California AAQS (1-hour and 8-hour) and National AAQS (8-hour) (CARB 2023a).

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. Once taken into the body, lead distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the oxygen-carrying capacity of the blood. The effects of lead most commonly encountered in current populations are neurological effects in children and cardiovascular effects in adults (e.g., high blood pressure and heart disease). Infants and young children are especially sensitive to even low levels of lead, which may contribute to behavioral problems, learning deficits, and lowered IQ (South Coast AQMD 2005; USEPA 2018). The major sources of lead emissions have historically been mobile and industrial sources. As a result of the EPA's regulatory efforts to remove lead from gasoline, emissions of lead from the transportation sector dramatically declined by 95 percent between 1980 and 1999, and levels of lead in the air decreased by 94 percent between 1980 and 1999. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. However, in 2008 the EPA and CARB adopted more strict lead standards, and special monitoring sites immediately downwind of lead sources recorded very localized violations of the new state and federal standards.[5] As a result of these violations, the Los Angeles County portion of the SoCAB is designated as nonattainment under the National AAQS for lead (South Coast AQMD 2012; CARB 2023a). However, lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011 (South Coast AQMD 2012). CARB's State Implementation Plan (SIP) revision was submitted to the EPA for approval. Because emissions of lead are found only in projects that are permitted by South Coast AQMD, lead is not a pollutant of concern for the proposed project.

Table 2, *Criteria Air Pollutant Health Effects Summary*, summarizes the potential health effects associated with the criteria air pollutants.

Table 2 Criteria Air Pollutant Health Effects Summary

Pollutant	Health Effects	Examples of Sources

[5] Source-oriented monitors record concentrations of lead at lead-related industrial facilities in the SoCAB, which include Exide Technologies in the City of Commerce; Quemetco, Inc., in the City of Industry; Trojan Battery Company in Santa Fe Springs; and Exide Technologies in Vernon. Monitoring conducted between 2004 through 2007 showed that the Trojan Battery Company and Exide Technologies exceed the federal standards (South Coast AQMD 2012).

Table 2 Criteria Air Pollutant Health Effects Summary

Pollutant	Health Effects	Examples of Sources
Carbon Monoxide (CO)	• Chest pain in heart patients • Headaches, nausea • Reduced mental alertness • Death at very high levels	Any source that burns fuel such as cars, trucks, construction and farming equipment, and residential heaters and stoves
Ozone (O_3)	• Cough, chest tightness • Difficulty taking a deep breath • Worsened asthma symptoms • Lung inflammation	Atmospheric reaction of organic gases with nitrogen oxides in sunlight
Nitrogen Dioxide (NO_2)	• Increased response to allergens • Aggravation of respiratory illness	Same as carbon monoxide sources
Particulate Matter (PM_{10} and $PM_{2.5}$)	• Hospitalizations for worsened heart diseases • Emergency room visits for asthma • Premature death	Cars and trucks (particularly diesels) Fireplaces and woodstoves Windblown dust from overlays, agriculture, and construction
Sulfur Dioxide (SO_2)	• Aggravation of respiratory disease (e.g., asthma and emphysema) • Reduced lung function	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, and industrial processes
Lead (Pb)	• Behavioral and learning disabilities in children • Nervous system impairment	Contaminated soil

Source: CARB 2023b.

Toxic Air Contaminants

CARB has identified other air pollutants as toxic air contaminants (TACs), which are pollutants that may cause serious, long-term effects. People exposed to TACs at sufficient concentrations and durations may have an increased chance of getting cancer or experiencing other serious health effects. These health effects can include damage to the immune system as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory, and other health problems (US EPA 2023b). By the last update to the TAC list in December 1999, CARB had designated 244 compounds as TACs (CARB 1999). Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. There are no air quality standards for TACs. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most relevant to the proposed project being particulate matter from diesel-fueled engines.

Diesel Particulate Matter

In 1998, CARB identified particulate emissions from diesel-fueled engines (diesel PM) as a TAC (US EPA 1998). Previously, the individual chemical compounds in diesel exhaust were considered TACs. Almost all diesel exhaust particles are 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lungs. Long-term

(chronic) inhalation of DPM is likely a lung cancer risk. Short-term (i.e., acute) exposure can cause irritation and inflammatory systems and may exacerbate existing allergies and asthma systems (US EPA 2002).

CARB has promulgated the following specific rules to limit TAC emissions:

- 13 CCR Chapter 10, Section 2485, Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling
- 13 CCR Chapter 10, Section 2480, Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools
- 13 CCR Section 2477 and Article 8, Airborne Toxic Control Measure for In-Use Diesel-Fueled Transport Refrigeration Units (TRU) and TRU Generator Sets and Facilities Where TRUs Operate

Community Risk

In addition, to reduce exposure to TACs, CARB developed and approved the *Air Quality and Land Use Handbook: A Community Health Perspective* (2005) to provide guidance regarding the siting of sensitive land uses in the vicinity of freeways, distribution centers, rail yards, ports, refineries, chrome-plating facilities, dry cleaners, and gasoline-dispensing facilities. This guidance document was developed to assess compatibility and associated health risks when placing sensitive receptors near existing pollution sources. CARB's recommendations on the siting of new sensitive land uses were based on a compilation of recent studies that evaluated data on the adverse health effects from proximity to air pollution sources. The key observation in these studies is that proximity to air pollution sources substantially increases exposure and the potential for adverse health effects. There are three carcinogenic toxic air contaminants that constitute the majority of the known health risks from motor vehicle traffic, DPM from trucks, and benzene and 1,3-butadiene from passenger vehicles. CARB recommendations are based on data that show that localized air pollution exposures can be reduced by as much as 80 percent by following CARB minimum distance separations.

AIR QUALITY MANAGEMENT PLANNING

The South Coast AQMD is the agency responsible for improving air quality in the SoCAB and ensuring that the National and California AAQS are attained and maintained. South Coast AQMD is responsible for preparing the air quality management plan (AQMP) for the SoCAB in coordination with the Southern California Association of Governments (SCAG). Since 1979, a number of AQMPs have been prepared.

2022 AQMP

South Coast AQMD adopted the 2022 AQMP on December 2, 2022, which serves as an update to the 2017 AQMP. On October 1, 2015, the EPA strengthened the National AAQS for ground-level ozone, lowering the primary and secondary ozone standard levels to 70 parts per billion (ppb) (2015 Ozone National AAQS.). The SoCAB is currently classified as an "extreme" nonattainment for the 2015 Ozone National AAQS. Meeting the 2015 federal ozone standard requires reducing NO_x emissions, the key pollutant that creates ozone, by 67 percent more than is required by adopted rules and regulations in 2037. The only way to achieve the required NO_x reductions is through extensive use of zero emission (ZE) technologies across all stationary

and mobile sources. South Coast AQMD's primary authority is over stationary sources which account for approximately 20 percent of NO_x emissions. The overwhelming majority of NO_x emissions are from heavy-duty trucks, ships and other State and federally regulated mobile sources that are mostly beyond the South Coast AQMD's control. The region will not meet the standard absent significant federal action. In addition to federal action, the 2022 AQMP requires substantial reliance on future deployment of advanced technologies to meet the standard. The control strategy for the 2022 AQMP includes aggressive new regulations and the development of incentive programs to support early deployment of advanced technologies. The two key areas for incentive programs are (1) promoting widespread deployment of available ZE and low-NO_x technologies and (2) developing new ZE and ultra-low NO_x technologies for use in cases where the technology is not currently available. South Coast AQMD is prioritizing distribution of incentive funding in Environmental Justice areas and seeking opportunities to focus benefits on the most disadvantaged communities (South Coast AQMD 2022).

Lead State Implementation Plan

In 2008, EPA designated the Los Angeles County portion of the SoCAB nonattainment under the federal lead (Pb) classification due to the addition of source-specific monitoring under the new federal regulation. This designation was based on two source-specific monitors in Vernon and the City of Industry exceeding the new standard. The rest of the SoCAB, outside the Los Angeles County nonattainment area remains in attainment of the new standard. On May 24, 2012, CARB approved the SIP revision for the federal lead standard, which the EPA revised in 2008. Lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011. The SIP revision was submitted to EPA for approval.

South Coast AQMD $PM_{2.5}$ Redesignation Request and Maintenance Plan

In 1997, the EPA adopted the 24-hour fine $PM_{2.5}$ standard of 65 micrograms per cubic meter ($\mu g/m^3$). In 2006, this standard was lowered to a more health-protective level of 35 $\mu g/m^3$. The SoCAB is designated nonattainment for both the 65 and 35 $\mu g/m^3$ 24-hour $PM_{2.5}$ standards (24-hour $PM_{2.5}$ standards). In 2020, monitored data demonstrated that the SoCAB attained both 24-hour $PM_{2.5}$ standards. The South Coast AQMD has developed the 2021 Redesignation Request and Maintenance Plan for the 1997 and 2006 24-hour $PM_{2.5}$ Standards demonstrating that the SoCAB has met the requirements to be redesignated to attainment for the 24-hour $PM_{2.5}$ standards (South Coast AQMD 2021b).

AB 617, Community Air Protection Program

Assembly Bill (AB) 617 (C. Garcia, Chapter 136, Statutes of 2017) requires local air districts to monitor and implement air pollution control strategies that reduce localized air pollution in communities that bear the greatest burdens. In response to AB 617, CARB has established the Community Air Protection Program.

Air districts are required to host workshops to help identify disadvantaged communities disproportionately affected by poor air quality. Once the criteria for identifying the highest priority locations have been identified and the communities have been selected, new community monitoring systems would be installed to track and monitor community-specific air pollution goals. In 2018 CARB prepared an air monitoring plan (Community Air Protection Blueprint), that evaluates the availability and effectiveness of air monitoring technologies and

existing community air monitoring networks. Under AB 617, the Blueprint is required to be updated every five years.

Under AB 617, CARB is also required to prepare a statewide strategy to reduce TACs and criteria pollutants in impacted communities; provide a statewide clearinghouse for best available retrofit control technology; adopt new rules requiring the latest best available retrofit control technology for all criteria pollutants for which an area has not achieved attainment of California AAQS; and provide uniform, statewide reporting of emissions inventories. Air districts are required to adopt a community emissions reduction program to achieve reductions for the communities impacted by air pollution that CARB identifies.

Existing Conditions

CLIMATE/METEOROLOGY

South Coast Air Basin

The project site lies in the South Coast Air Basin (SoCAB), which includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The SoCAB is in a coastal plain with connecting broad valleys and low hills and is bounded by the Pacific Ocean in the southwest quadrant, with high mountains forming the remainder of the perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. This usually mild weather pattern is interrupted infrequently by periods of extremely hot weather, winter storms, and Santa Ana winds (South Coast AQMD 2005).

Temperature and Precipitation

The annual average temperature varies little throughout the SoCAB, ranging from the low to middle 60s, measured in degrees Fahrenheit (°F). With a more pronounced oceanic influence, coastal areas show less variability in annual minimum and maximum temperatures than inland areas. The lowest average temperature is reported at 44.1°F in December, and the highest average temperature is 86.5°F in August (USA.Com 2023).

In contrast to a very steady pattern of temperature, rainfall is seasonally and annually highly variable. Almost all rain falls from October through April. Summer rainfall is normally restricted to widely scattered thundershowers near the coast, with slightly heavier shower activity in the east and over the mountains. Rainfall averages 13.84 inches per year in the vicinity of the area (USA.Com 2023).

Humidity

Although the SoCAB has a semiarid climate, the air near the earth's surface is typically moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the SoCAB by offshore winds, the "ocean effect" is dominant. Periods of heavy fog, especially along the coast, are frequent. Low clouds, often referred to as high fog, are a characteristic climatic feature. Annual average humidity is 70 percent at the coast and 57 percent in the eastern portions of the (South Coast AQMD 2005).

Wind

Wind patterns across the south coastal region are characterized by westerly or southwesterly onshore winds during the day and by easterly or northeasterly breezes at night. Wind speed is somewhat greater during the dry summer months than during the rainy winter season.

Between periods of wind, periods of air stagnation may occur, both in the morning and evening hours. Air stagnation is one of the critical determinants of air quality conditions on any given day. During the winter and fall months, surface high-pressure systems over the SoCAB, combined with other meteorological conditions, can result in very strong, downslope Santa Ana winds. These winds normally continue a few days before predominant meteorological conditions are reestablished.

The mountain ranges to the east affect the transport and diffusion of pollutants by inhibiting their eastward transport. Air quality in the SoCAB generally ranges from fair to poor and is similar to air quality in most of coastal southern California. The entire region experiences heavy concentrations of air pollutants during prolonged periods of stable atmospheric conditions (South Coast AQMD 2005).

Inversions

In conjunction with the two characteristic wind patterns that affect the rate and orientation of horizontal pollutant transport, there are two similarly distinct types of temperature inversions that control the vertical depth through which pollutants are mixed. These are the marine/subsidence inversion and the radiation inversion. The combination of winds and inversions are critical determinants in leading to the highly degraded air quality in summer and the generally good air quality in the winter in the project area (South Coast AQMD 2005).

AREA DESIGNATIONS

The AQMP provides the framework for air quality basins to achieve attainment of the state and federal ambient air quality standards through the State Implementation Plan (SIP). Areas are classified as attainment or nonattainment areas for particular pollutants, depending on whether they meet ambient air quality standards. Severity classifications for ozone nonattainment range in magnitude from marginal, moderate, and serious to severe and extreme.

- **Unclassified:** a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.

- **Attainment:** a pollutant is in attainment if the CAAQS for that pollutant was not violated at any site in the area during a three-year period.

- **Nonattainment:** a pollutant is in nonattainment if there was at least one violation of a state AAQS for that pollutant in the area.

- **Nonattainment/Transitional:** a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the AAQS for that pollutant.

The attainment status for the SoCAB is shown in Table 3, *Attainment Status of Criteria Pollutants in the South Coast Air Basin.*

Table 3 Attainment Status of Criteria Pollutants in the South Coast Air Basin

Pollutant	State	Federal
Ozone – 1-hour	Extreme Nonattainment	No Federal Standard
Ozone – 8-hour	Extreme Nonattainment	Extreme Nonattainment
PM_{10}	Serious Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment[1]
CO	Attainment	Attainment
NO_2	Attainment	Attainment/Maintenance
SO_2	Attainment	Attainment
Lead	Attainment	Nonattainment (Los Angeles County only)[2]
All others	Attainment/Unclassified	Attainment/Unclassified

Source: CARB 2023a.

1 The SoCAB is pending a resignation request from nonattainment to attainment for the 24-hour federal $PM_{2.5}$ standards. The 2021 $PM_{2.5}$ Redesignation Request and Maintenance Plan demonstrates that the South Coast meets the requirements of the CAA to allow US EPA to redesignate the SoCAB to attainment for the 65 µg/m^3 and 35 µg/m^3 24-hour $PM_{2.5}$ standards. CARB will submit the 2021 $PM_{2.5}$ Redesignation Request to the US EPA as a revision to the California SIP (CARB 2021).

2 In 2010, the Los Angeles portion of the SoCAB was designated nonattainment for lead under the new 2008 federal AAQS as a result of large industrial emitters. Remaining areas for lead in the SoCAB are unclassified. However, lead concentrations in this nonattainment area have been below the level of the federal standard since December 2011 (South Coast AQMD 2012). CARB's SIP revision was submitted to the EPA for approval.

EXISTING AMBIENT AIR QUALITY

Existing levels of ambient air quality and historical trends and projections in the vicinity of the project site are best documented by measurements taken by the South Coast AQMD. The project site is located within Source Receptor Area (SRA) 19: Saddleback Valley. The air quality monitoring station closest to the proposed project is the Mission Viejo – 26081 Via Pera Monitoring Station, which is one of 31 monitoring stations South Coast AQMD operates and maintains within the SoCAB.[6] Data from this station includes O_3, PM_{10}, and $PM_{2.5}$; data for NO_2 is supplemented based on Anaheim – Pampas Lane Monitoring Station. As summarized in Table 4, *Ambient Air Quality Monitoring Summary*, the data show regular violations of the state and federal O_3, state PM_{10}, and federal $PM_{2.5}$ standards in the last five years.

[6] Locations of the SRAs and monitoring stations are shown here: http://www.aqmd.gov/docs/default-source/default-document-library/map-of-monitoring-areas.pdf.

Table 4 Ambient Air Quality Monitoring Summary

Pollutant/Standard	Number of Days Threshold Were Exceeded and Maximum Levels during Such Violations[1,2]				
	2017	2018	2019	2020	2021
Ozone (O_3)					
State 1-Hour ≥ 0.09 ppm (days exceed threshold)	3	2	3	20	2
State & Federal 8-hour ≥ 0.070 ppm (days exceed threshold)	25	9	11	32	8
Max. 1-Hour Conc. (ppm)	0.103	0.121	0.106	0.171	0.105
Max. 8-Hour Conc. (ppm)	0.083	0.088	0.087	0.122	0.081
Nitrogen Dioxide (NO_2)					
State 1-Hour ≥ 0.18 ppm (days exceed threshold)	0	0	0	0	0
Max. 1-Hour Conc. (ppb)	0.0812	0.0660	0.0594	0.0709	0.0671
Coarse Particulates (PM_{10})					
State 24-Hour > 50 µg/m^3 (days exceed threshold)	1	1	0	2	0
Federal 24-Hour > 150 µg/m^3 (days exceed threshold)	0	0	0	0	0
Max. 24-Hour Conc. (µg/m^3)	58.2	55.6	45.1	56.2	35.2
Fine Particulates ($PM_{2.5}$)					
Federal 24-Hour > 35 µg/m^3 (days exceed threshold)	0	1	0	6	0
Max. 24-Hour Conc. (µg/m^3)	19.5	38.9	20.8	46.6	32.6

Source: CARB 2023c.
Notes: ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter; * = Data not available
[1] Data obtained from the Mission Viejo – 26081 Via Pera Monitoring Station O_3, PM_{10}, and $PM_{2.5}$; data for NO_2 is supplemented based on Anaheim – Pampas Lane Monitoring Station.
[2] Most recent data available as of July 2023.

MULTIPLE AIR TOXICS EXPOSURE STUDY V

The Multiple Air Toxics Exposure Study (MATES) is a monitoring and evaluation study on existing ambient concentrations of TACs and the potential health risks from air toxics in the SoCAB. In April 2021, South Coast AQMD released the latest update to the MATES study, MATES V. The first MATES analysis, MATES I, began in 1986 but was limited because of the technology available at the time. Conducted in 1998, MATES II was the first MATES iteration to include a comprehensive monitoring program, an air toxics emissions inventory, and a modeling component. MATES III was conducted in 2004 to 2006, with MATES IV following in 2012 to 2013.

MATES V uses measurements taken during 2018 and 2019, with a comprehensive modeling analysis and emissions inventory based on 2018 data. The previous MATES studies quantified the cancer risks based on the inhalation pathway only. MATES V includes information on the chronic noncancer risks from inhalation and non-inhalation pathways for the first time. Cancer risks and chronic noncancer risks from MATES II through IV measurements have been re-examined using current Office of Environmental Health Hazards Assessment (OEHHA) and CalEPA risk assessment methodologies and modern statistical methods to examine the trends over time.

The MATES V study showed that cancer risk in the SoCAB decreased to 454 in a million from 997 in a million in the MATES IV study. Overall, air toxics cancer risk in the SoCAB decreased by 54 percent since 2012 when MATES IV was conducted. MATES V showed the highest risk locations near the Los Angeles

International Airport and the Ports of Long Beach and Los Angeles. Diesel particulate matter continues to be the major contributor to air toxics cancer risk (approximately 72 percent of the total cancer risk). Goods movement and transportation corridors have the highest cancer risk. Transportation sources account for 88 percent of carcinogenic air toxics emissions, and the remainder is from stationary sources, which include large industrial operations such as refineries and power plants as well as smaller businesses such as gas stations and chrome-plating facilities. (South Coast AQMD 2021a).

SENSITIVE RECEPTORS

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

The nearest offsite sensitive receptors are the single-family residences along Blackfoot Drive to the west and the single-family residences along Dune Mear Road to the south of the project site.

Thresholds of Significance

The analysis of the proposed project's air quality impacts follows the guidance and methodologies recommended in South Coast AQMD's *CEQA Air Quality Handbook* and the significance thresholds on South Coast AQMD's website (South Coast AQMD 1993). CEQA allows the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. South Coast AQMD has established thresholds of significance for regional air quality emissions for construction activities and project operation. In addition to the daily thresholds listed above, projects are also subject to the AAQS. These are addressed though an analysis of localized CO impacts and localized significance thresholds (LSTs).

REGIONAL SIGNIFICANCE THRESHOLDS

The South Coast AQMD has adopted regional construction and operational emissions thresholds to determine a project's cumulative impact on air quality in the SoCAB. Table 5, *South Coast AQMD Significance Thresholds*, lists South Coast AQMD's regional significance thresholds that are applicable for all projects uniformly regardless of size or scope. There is growing evidence that although ultrafine particulates contribute a very small portion of the overall atmospheric mass concentration, they represent a greater

proportion of the health risk from PM. However, the EPA or CARB have not yet adopted AAQS to regulate ultrafine particulates; therefore, South Coast AQMD has not developed thresholds for them.

Table 5 South Coast AQMD Significance Thresholds

Air Pollutant	Construction Phase	Operational Phase
Reactive Organic Gases (ROGs)/ Volatile Organic Compounds (VOCs)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NO_X)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_X)	150 lbs/day	150 lbs/day
Particulates (PM_{10})	150 lbs/day	150 lbs/day
Particulates ($PM_{2.5}$)	55 lbs/day	55 lbs/day

Source: South Coast AQMD 2023a.

Projects that exceed the regional significance threshold contribute to the nonattainment designation of the SoCAB. The attainment designations are based on the AAQS, which are set at levels of exposure that are determined to not result in adverse health. Exposure to fine particulate pollution and ozone causes myriad health impacts, particularly to the respiratory and cardiovascular systems:

- Linked to increased cancer risk ($PM_{2.5}$, TACs)
- Aggravates respiratory disease (O_3, $PM_{2.5}$)
- Increases bronchitis (O_3, $PM_{2.5}$)
- Causes chest discomfort, throat irritation, and increased effort to take a deep breath (O_3)
- Reduces resistance to infections and increases fatigue (O_3)
- Reduces lung growth in children ($PM_{2.5}$)
- Contributes to heart disease and heart attacks ($PM_{2.5}$)
- Contributes to premature death (O_3, $PM_{2.5}$)
- Linked to lower birth weight in newborns ($PM_{2.5}$) (South Coast AQMD 2015a)

Exposure to fine particulates and ozone aggravates asthma attacks and can amplify other lung ailments such as emphysema and chronic obstructive pulmonary disease. Exposure to current levels of $PM_{2.5}$ is responsible for an estimated 4,300 cardiopulmonary-related deaths per year in the SoCAB. In addition, University of Southern California scientists responsible for a landmark children's health study found that lung growth improved as air pollution declined for children aged 11 to 15 in five communities in the SoCAB (South Coast AQMD 2015b).

South Coast AQMD is the primary agency responsible for ensuring the health and welfare of sensitive individuals exposed to elevated concentrations of air pollutants in the SoCAB and has established thresholds that would be protective of these individuals. To achieve the health-based standards established by the EPA, South Coast AQMD prepares an AQMP that details regional programs to attain the AAQS. Mass emissions thresholds shown in Table 5 are not correlated with concentrations of air pollutants but contribute to the cumulative air quality impacts in the SoCAB. These thresholds are based on the trigger levels for the federal

New Source Review Program, which was created to ensure projects are consistent with attainment of health-based federal AAQS. Regional emissions from a single project do not trigger a regional health impact, and it is speculative to identify how many more individuals in the air basin would be affected by the health effects listed previously. Projects that do not exceed the South Coast AQMD regional significance thresholds in Table 5 would not violate any air quality standards or contribute substantially to an existing or projected air quality violation.

If projects exceed the emissions levels presented in Table 5, then those emissions would cumulatively contribute to the nonattainment status of the air basin and would contribute to elevating health effects associated with these criteria air pollutants. Known health effects related to ozone include worsening of bronchitis, asthma, and emphysema and a decrease in lung function. Health effects associated with particulate matter include premature death of people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, decreased lung function, and increased respiratory symptoms. Reducing emissions would contribute to reducing possible health effects related to criteria air pollutants. However, for projects that exceed the emissions in Table 5, it is speculative to determine how exceeding the regional thresholds would affect the number of days the region is in nonattainment, because mass emissions are not correlated with concentrations of emissions or how many additional individuals in the air basin would be affected by the health effects cited previously.

South Coast AQMD has not provided methodology to assess the specific correlation between mass emissions generated and the effect on health to address the issue raised in *Sierra Club v. County of Fresno* (Friant Ranch, L.P.) (2018) 6 Cal.5th 502, Case No. S21978. South Coast AQMD currently does not have methodologies that would provide the District with a consistent, reliable, and meaningful analysis to correlate specific health impacts that may result from a Proposed Project's mass emissions.[7] Ozone concentrations are dependent on a variety of complex factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns. Because of the complexities of predicting ground-level ozone concentrations in relation to the National and California AAQS, and the absence of modeling tools that could provide statistically valid data and meaningful additional information regarding health effects from criteria air pollutants generated by individual projects, it is not possible to link specific health risks to the magnitude of emissions exceeding the significance thresholds. However, if a project in the SoCAB exceeds the regional significance thresholds, the project could contribute to an increase in health effects in the basin until the attainment standards are met in the SoCAB.

[7] In April 2019, the Sacramento Metropolitan Air Quality Management District (SMAQMD) published an Interim Recommendation on implementing Sierra Club v. County of Fresno (2018) 6 Cal.5th 502 ("Friant Ranch") in the review and analysis of proposed projects under CEQA in Sacramento County. Consistent with the expert opinions submitted to the court in Friant Ranch by the San Joaquin Valley Air Pollution Control District (SJVAPCD) and South Coast AQMD, the SMAQMD guidance confirms the absence of an acceptable or reliable quantitative methodology that would correlate the expected criteria air pollutant emissions of projects to likely health consequences for people from project-generated criteria air pollutant emissions. The SMAQMD guidance explains that while it is in the process of developing a methodology to assess these impacts, lead agencies should follow the Friant Court's advice to explain in meaningful detail why this analysis is not yet feasible. Since this interim memorandum SMAQMD has provided methodology to address health impacts. However, a similar analysis is not available for projects within the South Coast AQMD region.

CO HOTSPOTS

Areas of vehicle congestion have the potential to create pockets of CO called hot spots. These pockets have the potential to exceed the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm. Because CO is produced in greatest quantities from vehicle combustion and does not readily disperse into the atmosphere, adherence to ambient air quality standards is typically demonstrated through an analysis of localized CO concentrations. Hot spots are typically produced at intersections, where traffic congestion is highest because vehicles queue for longer periods and are subject to reduced speeds. With the turnover of older vehicles, introduction of cleaner fuels, and implementation of control technology on industrial facilities, CO concentrations in the SoCAB and in the state have steadily declined.

In 2007, the SoCAB was designated in attainment for CO under both the California AAQS and National AAQS. The CO hotspot analysis conducted for the attainment by the South Coast AQMD for busiest intersections in Los Angeles during the peak morning and afternoon periods plan did not predict a violation of CO standards.[8] As identified in the South Coast AQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SoCAB in previous years, prior to redesignation, were a result of unusual meteorological and topographical conditions and not a result of congestion at a particular intersection. Under existing and future vehicle emission rates, a project would have to increase traffic volumes at a single intersection to more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (BAAQMD 2023).

LOCALIZED SIGNIFICANCE THRESHOLDS

The South Coast AQMD developed LSTs for emissions of NO_2, CO, PM_{10}, and $PM_{2.5}$ generated at the project site (offsite mobile-source emissions are not included in the LST analysis). LSTs represent the maximum emissions at a project site that are not expected to cause or contribute to an exceedance of the most stringent federal or state AAQS and are shown in Table 6, *South Coast AQMD Localized Significance Thresholds*.

Table 6 South Coast AQMD Localized Significance Thresholds

Air Pollutant (Relevant AAQS)	Concentration
1-Hour CO Standard (CAAQS)	20 ppm
8-Hour CO Standard (CAAQS)	9.0 ppm
1-Hour NO_2 Standard (CAAQS)	0.18 ppm
Annual NO_2 Standard (CAAQS)	0.03 ppm
24-Hour PM_{10} Standard – Construction (South Coast AQMD)[1]	10.4 µg/m^3
24-Hour $PM_{2.5}$ Standard – Construction (South Coast AQMD)[1]	10.4 µg/m^3
24-Hour PM_{10} Standard – Operation (South Coast AQMD)[1]	2.5 µg/m^3

[8] The four intersections were: Long Beach Boulevard and Imperial Highway; Wilshire Boulevard and Veteran Avenue; Sunset Boulevard and Highland Avenue; and La Cienega Boulevard and Century Boulevard. The busiest intersection evaluated (Wilshire and Veteran) had a daily traffic volume of approximately 100,000 vehicles per day with LOS E in the morning peak hour and LOS F in the evening peak hour.

24-Hour $PM_{2.5}$ Standard – Operation (South Coast AQMD)[1]	2.5 µg/m^3

Source: South Coast AQMD 2023a.
ppm – parts per million; µg/m^3 – micrograms per cubic meter
[1] Threshold is based on South Coast AQMD Rule 403. Since the SoCAB is in nonattainment for PM_{10} and $PM_{2.5}$, the threshold is established as an allowable change in concentration. Therefore, background concentration is irrelevant.

To assist lead agencies, South Coast AQMD developed screening-level LSTs to back-calculate the mass amount (lbs. per day) of emissions generated onsite that would trigger the levels shown in Table 6 for projects under 5-acres. These "screening-level" LSTs tables are the localized significance thresholds for all projects of five acres and less; however, it can be used as screening criteria for larger projects to determine whether or not dispersion modeling may be required to compare concentrations of air pollutants generated by the project to the localized concentrations shown in Table 6.

In accordance with South Coast AQMD's LST methodology, the screening-level construction LSTs are based on the acreage disturbed per day based on equipment use. The screening-level construction LSTs for the project site in SRA 19 are shown in Table 7, *South Coast AQMD Screening-Level Localized Significance Thresholds,* for sensitive receptors within 82 feet (25 meters) for NO_X and CO and within 130 feet (40 meters) for PM_{10} and $PM_{2.5}$ of the project site.

Table 7 South Coast AQMD Screening-Level Localized Significance Thresholds

	Threshold (lbs/day)[1]			
Acreage Disturbed	Nitrogen Oxides (NO_X)	Carbon Monoxide (CO)	Coarse Particulates (PM_{10})	Fine Particulates ($PM_{2.5}$)
≤1.00 Acre Disturbed Per Day	91	696	8.09	3.58

Source: South Coast AQMD 2008 and 2023a.
[1] LSTs are based on sensitive receptors within 82 feet (25 meters) for NO_X and CO and within 130 feet (40 meters) for PM_{10} and $PM_{2.5}$ in Source Receptor Area (SRA) 19.

HEALTH RISK

Whenever a project would require use of chemical compounds that have been identified in South Coast AQMD Rule 1401, placed on CARB's air toxics list pursuant to AB 1807, or placed on the EPA's National Emissions Standards for Hazardous Air Pollutants, a health risk assessment is required by the South Coast AQMD. Table 8, *South Coast AQMD Toxic Air Contaminants Incremental Risk Thresholds*, lists the TAC incremental risk thresholds for operation of a project. The type of land uses that typically generate substantial quantities of criteria air pollutants and TACs from operations include industrial (stationary sources) and warehousing (truck idling) land uses (CARB 2005). School uses do not use substantial quantities of TACs, thus these thresholds are typically applied to new industrial projects only. Additionally, the purpose of this environmental evaluation is to identify the significant effects of the proposed project on the environment, not the significant effects of the environment on the proposed project (*California Building Industry Association v. Bay Area Air Quality Management District* (2015) 62 Cal.4th 369 (Case No. S213478)).

Table 8 South Coast AQMD Toxic Air Contaminants Incremental Risk Thresholds

Maximum Incremental Cancer Risk	≥ 10 in 1 million
Hazard Index (project increment)	≥ 1.0
Cancer Burden in areas ≥ 1 in 1 million	> 0.5 excess cancer cases

Source: South Coast AQMD 2023a.

Draft Operational Cumulative Health Risk Thresholds

South Coast AQMD initiated a Working Group to identify cumulative health risk thresholds for development projects in order to address community concerns of health risk impacts of new projects being developed in areas where there is a higher pollution burden. The cumulative health risk threshold methodology first utilizes a screening approach to identify whether projects can qualitatively address cumulative health risk or quantitatively address health risk:

- **Low Cancer Risk Project Types**: Residential, commercial, recreational, educational, and retail.
- **Medium Cancer Risk Project Types**: Truck yards, gas stations, small industrial projects, and linear projects.
- **High Cancer Risk Project Types**. Industrial, major transportation projects (airports, port, railyard, bus/train station), and major planning projects.

For projects with low and medium cancer risks, like the proposed project, no quantitative analysis is required. For projects that result in potentially high cancer risk impacts, a quantitative is recommended. Additionally, the project-level health risk threshold of 10 in a million is adjusted based on the underlying health risk of the zip code the project is within based on South Coast AQMD's MATES V mapping. MATES V is utilized. MATES V identifies a gradient of the effects of air pollution on cancer risk in the South Coast AQMD Region, which is then used to adjust the project-level cancer risk levels as shown in Table 9, *MATES V-Adjusted Cumulative Significant Cancer Risk Thresholds*.

Table 9 MATES V–Adjusted Cumulative Significant Cancer Risk Thresholds

Threshold Increment	MATES V Cancer Risk	Adjusted Cumulative Cancer Risk Threshold
A	Most Stringent	≥ 1 in 1 million
B	>90th Percentile	≥ 3 in 1 million
C	90th Percentile to 50th Percentile	≥ 5 in 1 million
D	50th Percentile to 30th Percentile	≥ 7 in 1 million
E	< 30th Percentile	≥ 10 in 1 million

Source: South Coast AQMD 2023b.

South Coast AQMD has also identified that the thresholds in Table 9 should be adjusted if any of the following criteria apply:

- **Criteria #1 – Post-2018 High Volume Diesel-Fueled Mobile Sources**. If there are post-2018 high volume highways or railroad mainlines, then increase the threshold increment by 1 (e.g., from step "D" to "C").

- **Criteria #2 – Post-2018 Projects with High Volume Diesel Fueled Trucks**. Post-2018 projects are not accounted for in MATES V. Therefore, if new warehousing projects along the truck route have been constructed, then increase the threshold increment by 1 (e.g., from D to C).

- **Criteria #3 – Sensitive Receptor Population**. If the project site is within an AB 617 community or within the 80th percentile of CES 4.0, then increase the threshold increment by 1(e.g., from D to C).

As mentioned previously, this type of project would be considered low to medium cancer risks; thus, an operational cancer risk analysis for the proposed project would not be warranted.

GREENHOUSE GAS EMISSIONS

Scientists have concluded that human activities are contributing to global climate change by adding large amounts of heat-trapping gases, known as GHG, to the atmosphere. Climate change is the variation of Earth's climate over time, whether due to natural variability or as a result of human activities. The primary source of these GHG is fossil fuel use. The Intergovernmental Panel on Climate Change (IPCC) has identified four major GHG—water vapor,[9] carbon (CO_2), methane (CH_4), and ozone (O_3)—that are the likely cause of an increase in global average temperatures observed within the 20th and 21st centuries. Other GHG identified by the IPCC that contribute to global warming to a lesser extent include nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons, perfluorocarbons, and chlorofluorocarbons (IPCC 2001).[10] The major GHG are briefly described below.

- **Carbon dioxide (CO_2)** enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and respiration, and also as a result of other chemical reactions (e.g. manufacture of cement). Carbon dioxide is removed from the atmosphere (sequestered) when it is absorbed by plants as part of the biological carbon cycle.

[9] Water vapor (H_2O) is the strongest GHG and the most variable in its phases (vapor, cloud droplets, ice crystals). However, water vapor is not considered a pollutant, but part of the feedback loop rather than a primary cause of change.

[10] Black carbon contributes to climate change both directly, by absorbing sunlight, and indirectly, by depositing on snow (making it melt faster) and by interacting with clouds and affecting cloud formation. Black carbon is the most strongly light-absorbing component of particulate matter (PM) emitted from burning fuels such as coal, diesel, and biomass. Reducing black carbon emissions globally can have immediate economic, climate, and public health benefits. California has been an international leader in reducing emissions of black carbon, with close to 95 percent control expected by 2020 due to existing programs that target reducing PM from diesel engines and burning activities (CARB 2017a). However, state and national GHG inventories do not yet include black carbon due to ongoing work resolving the precise global warming potential of black carbon. Guidance for CEQA documents does not yet include black carbon.

- **Methane (CH_4)** is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and from the decay of organic waste in municipal landfills and water treatment facilities.

- **Nitrous oxide (N_2O)** is emitted during agricultural and industrial activities as well as during combustion of fossil fuels and solid waste.

- **Fluorinated gases** are synthetic, strong GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as high global-warming-potential (GWP) gases.

    - *Chlorofluorocarbons (CFCs*) are GHGs covered under the 1987 Montreal Protocol and used for refrigeration, air conditioning, packaging, insulation, solvents, or aerosol propellants. Since they are not destroyed in the lower atmosphere (troposphere, stratosphere), CFCs drift into the upper atmosphere where, given suitable conditions, they break down ozone. These gases are also ozone-depleting gases and are therefore being replaced by other compounds that are GHGs covered under the Kyoto Protocol.

    - *Perfluorocarbons (PFCs)* are a group of human-made chemicals composed of carbon and fluorine only. These chemicals (predominantly perfluoromethane [CF_4] and perfluoroethane [C_2F_6]) were introduced as alternatives, along with HFCs, to the ozone-depleting substances. In addition, PFCs are emitted as by-products of industrial processes and are used in manufacturing. PFCs do not harm the stratospheric ozone layer, but they have a high global warming potential.

    - *Sulfur Hexafluoride (SF_6)* is a colorless gas soluble in alcohol and ether, slightly soluble in water. SF_6 is a strong GHG used primarily in electrical transmission and distribution systems as an insulator.

    - *Hydrochlorofluorocarbons (HCFCs)* contain hydrogen, fluorine, chlorine, and carbon atoms. Although ozone-depleting substances, they are less potent at destroying stratospheric ozone than CFCs. They have been introduced as temporary replacements for CFCs and are also GHGs.

    - *Hydrofluorocarbons (HFCs)* contain only hydrogen, fluorine, and carbon atoms. They were introduced as alternatives to ozone-depleting substances to serve many industrial, commercial, and personal needs. HFCs are emitted as by-products of industrial processes and are also used in manufacturing. They do not significantly deplete the stratospheric ozone layer, but they are strong GHGs (IPCC 2001; USEPA 2023b).

GHGs are dependent on the lifetime or persistence of the gas molecule in the atmosphere. Some GHGs have stronger greenhouse effects than others. These are referred to as high GWP gases. The GWP of GHG emissions are shown in Table 10, *GHG Emissions and Their Relative Global Warming Potential Compared to CO_2*. The GWP is used to convert GHGs to CO_2-equivalence (CO_2e) to show the relative potential that different GHGs have to retain infrared radiation in the atmosphere and contribute to the greenhouse effect. For

example, under IPCC's Fourth Assessment Report (AR4) GWP values for CH_4, a project that generates 10 MT of CH_4 would be equivalent to 250 MT of CO_2.[11]

Table 10 GHG Emissions and Their Relative Global Warming Potential Compared to CO_2

GHGs	Second Assessment Report (SAR) Global Warming Potential Relative to CO_2[1]	Fourth Assessment Report (AR4) Global Warming Potential Relative to CO_2[1]	Fifth Assessment Report (AR5) Global Warming Potential Relative to CO_2[1]
Carbon Dioxide (CO_2)	1	1	1
Methane[2] (CH_4)	21	25	28
Nitrous Oxide (N_2O)	310	298	265

Source: IPCC 1995, 2007, 2013.

Notes: The IPCC published updated GWP values in its Fifth Assessment Report (AR5) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO_2. However, GWP values identified in AR4 are used by South Coast AQMD to maintain consistency in statewide GHG emissions modeling. In addition, the 2017 Scoping Plan Update was based on the GWP values in AR4.

1 Based on 100-year time horizon of the GWP of the air pollutant compared to CO_2.

2 The methane GWP includes direct effects and indirect effects due to the production of tropospheric ozone and stratospheric water vapor. The indirect effect due to the production of CO_2 is not included.

GHG Regulatory Setting

REGULATION OF GHG EMISSIONS ON A NATIONAL LEVEL

The US Environmental Protection Agency (EPA) announced on December 7, 2009, that GHG emissions threaten the public health and welfare of the American people and that GHG emissions from on-road vehicles contribute to that threat. The EPA's final findings respond to the 2007 U.S. Supreme Court decision that GHG emissions fit within the Clean Air Act definition of air pollutants. The findings do not in and of themselves impose any emission reduction requirements but allow the EPA to finalize the GHG standards proposed in 2009 for new light-duty vehicles as part of the joint rulemaking with the Department of Transportation (USEPA 2009).

To regulate GHGs from passenger vehicles, EPA was required to issue an endangerment finding. The finding identifies emissions of six key GHGs—CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and SF_6—that have been the subject of scrutiny and intense analysis for decades by scientists in the United States and around the world. The first three are applicable to the project's GHG emissions inventory because they constitute the majority of GHG emissions and, per South Coast AQMD guidance, are the GHG emissions that should be evaluated as part of a project's GHG emissions inventory.

US Mandatory Report Rule for GHGs (2009)

In response to the endangerment finding, the EPA issued the Mandatory Reporting of GHG Rule that requires substantial emitters of GHG emissions (large stationary sources, etc.) to report GHG emissions data. Facilities that emit 25,000 MT or more of CO_2 per year are required to submit an annual report.

11 The global warming potential of a GHG is dependent on the lifetime, or persistence, of the gas molecule in the atmosphere.

Update to Corporate Average Fuel Economy Standards (2021 to 2026)

The federal government issued new Corporate Average Fuel Economy (CAFE) standards in 2012 for model years 2017 to 2025, which required a fleet average of 54.5 miles per gallon in 2025. On March 30, 2020, the EPA finalized an updated CAFE and GHG emissions standards for passenger cars and light trucks and established new standards covering model years 2021 through 2026, known as the Safer Affordable Fuel Efficient (SAFE) Vehicles Final Rule for Model Years 2021 to 2026. Under SAFE, the fuel economy standards will increase 1.5 percent per year compared to the 5 percent per year under the CAFE standards established in 2012. Overall, SAFE requires a fleet average of 40.4 MPG for model year 2026 vehicles (85 Federal Register 24174 (April 30, 2020)).

On December 21, 2021, under direction of Executive Order (EO) 13990 issued by President Biden, the National Highway Traffic Safety Administration repealed Safer Affordable Fuel Efficient Vehicles Rule Part One, which had preempted state and local laws related to fuel economy standards. In addition, on March 31, 2022, the National Highway Traffic Safety Administration finalized new fuel standards in response to EO 13990. Fuel efficiency under the standards proposed will increase 8 percent annually for model years 2024 to 2025 and 10 percent annual for model year 2026. Overall, the new CAFE standards require a fleet average of 49 MPG for passenger vehicles and light trucks for model year 2026, which would be a 10 MPG increase relative to model year 2021 (NHTSA 2022).

EPA Regulation of Stationary Sources under the Clean Air Act (Ongoing)

Pursuant to its authority under the Clean Air Act, the EPA has developed regulations for new, large, stationary sources of emissions, such as power plants and refineries. Under former President Obama's 2013 Climate Action Plan, the EPA was directed to develop regulations for existing stationary sources as well. On June 19, 2019, the EPA issued the final Affordable Clean Energy (ACE) rule, which became effective on August 19, 2019. The ACE rule was crafted under the direction of President Trump's Energy Independence EO. It officially rescinded the Clean Power Plan rule issued during the Obama Administration and set emissions guidelines for states in developing plans to limit CO_2 emissions from coal-fired power plants. The Affordable Clean Energy rule was vacated by the United States Court of Appeals for the District of Columbia Circuit on January 19, 2021. The Biden Administration is assessing options on potential future regulations.

REGULATION OF GHG EMISSIONS ON A STATE LEVEL

Current State of California guidance and goals for reductions in GHG emissions are generally embodied in EO S-03-05 and EO B-30-15, EO B-55-18, Assembly Bill 32 (AB 32), Senate Bill 32 (SB 32), and SB 375.

Executive Order S-3-05

Executive Order S-3-05, signed June 1, 2005. Executive Order S-3-05 set the following GHG reduction targets for the State:

- 2000 levels by 2010
- 1990 levels by 2020

- 80 percent below 1990 levels by 2050

Assembly Bill 32, the Global Warming Solutions Act (2006)

AB 32 was passed by the California state legislature on August 31, 2006, to place the state on a course toward reducing its contribution of GHG emissions. AB 32 follows the 2020 tier of emissions reduction targets established in EO S-03-05. CARB prepared the 2008 Scoping Plan to outline a plan to achieve the GHG emissions reduction targets of AB 32.

Executive Order B-30-15

EO B-30-15, signed April 29, 2015, set a goal of reducing GHG emissions within the state to 40 percent of 1990 levels by year 2030. EO B-30-15 also directed CARB to update the Scoping Plan to quantify the 2030 GHG reduction goal for the state and requires state agencies to implement measures to meet the interim 2030 goal as well as the long-term goal for 2050 in EO S-03-05. It also requires the Natural Resources Agency to conduct triennial updates of the California adaption strategy, "Safeguarding California", in order to ensure climate change is accounted for in state planning and investment decisions.

Senate Bill 32 and Assembly Bill 197

In September 2016, Governor Brown signed SB 32 and AB 197 into law, making the Executive Order goal for year 2030 into a statewide mandated legislative target. AB 197 established a joint legislative committee on climate change policies and requires the CARB to prioritize direction emissions reductions rather than the market-based cap-and-trade program for large stationary, mobile, and other sources.

Executive Order B-55-18

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

Assembly Bill 1279

AB 1279, signed by Governor Newsom in September 2022, codified the carbon neutrality targets of EO B-55-18 for year 2045 and sets a new legislative target for year 2045 of 85 percent below 1990 levels for anthropogenic GHG emissions. SB 1279 also requires CARB to update the Scoping Plan to address these new targets.

2022 Climate Change Scoping Plan

CARB adopted the *2022 Scoping Plan for Achieving Carbon Neutrality* (2022 Scoping Plan) on December 15, 2022, which lays out a path to achieve carbon neutrality by 2045 or earlier and to reduce the State's anthropogenic GHG emissions (CARB 2022). The Scoping Plan provides updates to the previously adopted

2017 Scoping Plan and addresses the carbon neutrality goals of EO B-55-18 (discussed below) and the ambitious GHG reduction target as directed by AB 1279. Previous Scoping Plans focused on specific GHG reduction targets for our industrial, energy, and transportation sectors—to meet 1990 levels by 2020, and then the more aggressive 40 percent below that for the 2030 target. The 2022 Scoping Plan updates the target of reducing anthropogenic emissions to 85 percent below 1990 levels by 2045. Carbon neutrality takes it one step further by expanding actions to capture and store carbon including through natural and working lands and mechanical technologies, while drastically reducing anthropogenic sources of carbon pollution at the same time.

The path forward was informed by the recent Sixth Assessment Report (AR6) of the IPCC and the measures would achieve 85 percent below 1990 levels by 2045 in accordance AB 1279. CARB's 2022 Scoping Plan identifies strategies as shown in Table 11, *Priority Strategies for Local Government Climate Action Plans*, that would be most impactful at the local level for ensuring substantial process towards the State's carbon neutrality goals.

Table 11 Priority Strategies for Local Government Climate Action Plans

Priority Area	Priority Strategies
Transportation Electrification	Convert local government fleets to zero-emission vehicles (ZEV) and provide EV charging at public sites.
	Create a jurisdiction-specific ZEV ecosystem to support deployment of ZEVs statewide (such as building standards that exceed state building codes, permit streamlining, infrastructure siting, consumer education, preferential parking policies, and ZEV readiness plans).
VMT Reduction	Reduce or eliminate minimum parking standards.
	Implement Complete Streets policies and investments, consistent with general plan circulation element requirements.
	Increase access to public transit by increasing density of development near transit, improving transit service by increasing service frequency, creating bus priority lanes, reducing or eliminating fares, microtransit, etc.
	Increase public access to clean mobility options by planning for and investing in electric shuttles, bike share, car share, and walking
	Implement parking pricing or transportation demand management pricing strategies.
	Amend zoning or development codes to enable mixed-use, walkable, transit-oriented, and compact infill development (such as increasing allowable density of the neighborhood).
	Preserve natural and working lands by implementing land use policies that guide development toward infill areas and do not convert "greenfield" land to urban uses (e.g., green belts, strategic conservation easements)

Table 11 Priority Strategies for Local Government Climate Action Plans

Priority Area	Priority Strategies
Building Decarbonization	Adopt all-electric new construction reach codes for residential and commercial uses.
	Adopt policies and incentive programs to implement energy efficiency retrofits for existing buildings, such as weatherization, lighting upgrades, and replacing energy-intensive appliances and equipment with more efficient systems (such as Energy Star-rated equipment and equipment controllers).
	Adopt policies and incentive programs to electrify all appliances and equipment in existing buildings such as appliance rebates, existing building reach codes, or time of sale electrification ordinances.
	Facilitate deployment of renewable energy production and distribution and energy storage on privately owned land uses (e.g., permit streamlining, information sharing).
	Deploy renewable energy production and energy storage directly in new public projects and on existing public facilities (e.g., solar photovoltaic systems on rooftops of municipal buildings and on canopies in public parking lots, battery storage systems in municipal buildings).

Source: CARB 2022

Based on Appendix D of the 2022 CARB Climate Change Scoping Plan, for residential and mixed-use development projects, CARB recommends first demonstrating that these land use development projects are aligned with State climate goals based on the attributes of land use development that reduce operational GHG emissions while simultaneously advancing fair housing. Attributes that accommodate growth in a manner consistent with the GHG and equity goals of SB 32 have all the following attributes:

- Transportation Electrification
  - Provide EV charging infrastructure that, at a minimum, meets the most ambitious voluntary standards in the California Green Building Standards Code at the time of project approval.

- VMT Reduction
  - Is located on infill sites that are surrounded by existing urban uses and reuses or redevelops previously undeveloped or underutilized land that is presently served by existing utilities and essential public services (e.g., transit, streets, water, sewer).
  - Does not result in the loss or conversion of the State's natural and working lands;
  - Consists of transit-supportive densities (minimum of 20 residential dwelling units/acre), or is in proximity to existing transit stops (within a half mile), or satisfies more detailed and stringent criteria specified in the region's Sustainable Communities Strategy (SCS);
  - Reduces parking requirements by:
    - Eliminating parking requirements or including maximum allowable parking ratios (i.e., the ratio of parking spaces to residential units or square feet); or
    - Providing residential parking supply at a ratio of <1 parking space per dwelling unit; or
    - For multifamily residential development, requiring parking costs to be unbundled from costs to rent or own a residential unit.

- At least 20 percent of the units are affordable to lower-income residents;
- Result in no net loss of existing affordable units.

- Building Decarbonization
  - Use all electric appliances without any natural gas connections and does not use propane or other fossil fuels for space heating, water heating, or indoor cooking (CARB 2022).

If the first approach to demonstrating consistency is not applicable (such as in the case of this school modernization project), the second approach to project-level alignment with state climate goals is to achieve net zero GHG emissions. The third approach to demonstrating project-level alignment with state climate goals is to align with GHG thresholds of significance, which many local air quality management (AQMDs) and air pollution control districts (APCDs) have developed or adopted (CARB 2022).

Senate Bill 375

In 2008, SB 375, the Sustainable Communities and Climate Protection Act, was adopted to connect the GHG emissions reductions targets established in the 2008 Scoping Plan for the transportation sector to local land use decisions that affect travel behavior. Its intent is to reduce GHG emissions from light-duty trucks and automobiles (excludes emissions associated with goods movement) by aligning regional long-range transportation plans, investments, and housing allocations to local land use planning to reduce VMT and vehicle trips. Specifically, SB 375 required CARB to establish GHG emissions reduction targets for each of the 18 metropolitan planning organizations (MPO). The Southern California Association of Governments (SCAG) is the MPO for the Southern California region, which includes the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial.

Pursuant to the recommendations of the Regional Transportation Advisory Committee, CARB adopted per capita reduction targets for each of the MPOs rather than a total magnitude reduction target. SCAG's targets are an 8 percent per capita reduction from 2005 GHG emission levels by 2020 and a 13 percent per capita reduction from 2005 GHG emission levels by 2035 (CARB 2010). The 2020 targets are smaller than the 2035 targets because a significant portion of the built environment in 2020 is defined by decisions that have already been made. In general, the 2020 scenarios reflect that more time is needed for large land use and transportation infrastructure changes. Most of the reductions in the interim are anticipated to come from improving the efficiency of the region's transportation network. The targets would result in 3 $MMTCO_2e$ of reductions by 2020 and 15 $MMTCO_2e$ of reductions by 2035. Based on these reductions, the passenger vehicle target in CARB's Scoping Plan (for AB 32) would be met (CARB 2010).

2017 Update to the SB 375 Targets

CARB is required to update the targets for the MPOs every eight years. CARB adopted revised SB 375 targets for the MPOs in March 2018. The updated targets became effective in October2018. All SCSs adopted after October 1, 2018, are subject to these new targets. CARB's updated SB 375 targets for the SCAG region were an 8 percent per capita GHG reduction in 2020 from 2005 levels (unchanged from the 2010 target) and a 19

percent per capita GHG reduction in 2035 from 2005 levels (compared to the 2010 target of 13 percent) (CARB 2018).

The targets consider the need to further reduce VMT, as identified in the 2017 Scoping Plan Update (for SB 32), while balancing the need for additional and more flexible revenue sources to incentivize positive planning and action toward sustainable communities. Like the 2010 targets, the updated SB 375 targets are in units of "percent per capita" reductions in GHG emissions from automobiles and light trucks relative to 2005; this excludes reductions anticipated from implementation of state technology and fuels strategies and any potential future state strategies, such as statewide road user pricing. The proposed targets call for greater per-capita GHG emission reductions from SB 375 than are currently in place, which for 2035 translate into proposed targets that either match or exceed the emission reduction levels in the MPOs' currently adopted SCSs to achieve the SB 375 targets. CARB foresees that the additional GHG emissions reductions in 2035 may be achieved from land use changes, transportation investment, and technology strategies (CARB 2018).

SCAG's Regional Transportation Plan / Sustainable Communities Strategy

SB 375 requires each MPO to prepare a sustainable communities strategy in its regional transportation plan. For the SCAG region, the 2020-2045 RTP/SCS (Connect SoCal) was adopted on September 3, 2020, and is an update to the 2016-2040 RTP/SCS. In general, the SCS outlines a development pattern for the region that, when integrated with the transportation network and other transportation measures and policies, would reduce vehicle miles traveled from automobiles and light duty trucks and thereby reduce GHG emissions from these sources.

Connect SoCal focuses on the continued efforts of the previous RTP/SCSs to integrate transportation and land use strategies in development of the SCAG region through horizon year 2045 (SCAG 2020). Connect SoCal forecasts that the SCAG region will meet its GHG per capita reduction targets of 8 percent by 2020 and 19 percent by 2035. Additionally, Connect SoCal also forecasts that implementation of the plan will reduce VMT per capita in year 2045 by 4.1 percent compared to baseline conditions for that year. Connect SoCal includes a "Core Vision" that centers on maintaining and better managing the transportation network for moving people and goods while expanding mobility choices by locating housing, jobs, and transit closer together and increasing investments in transit and complete streets (SCAG 2020).

Transportation Sector Specific Regulations

Advanced Clean Fleets and Advanced Clean Trucks

CARB adopted the Advanced Clean Fleets (ACF) regulation in 2023 to accelerate the transition to zero-emission medium- and heavy-duty vehicles. In conjunction with the Advanced Clean Trucks (ACT) regulation, the ACF regulations helps to ensure that medium- and heavy-duty zero-emission vehicles (ZEV) are brought to the market, by requiring certain fleets to purchase zero emission vehicles (ZEVs). The ACF ZEV phase-in approach which provides initial focus where the best fleet electrification opportunities exist, sets clear targets for regulated fleets to make a full conversion to ZEVs, and creates a catalyst to accelerate development of a heavy-duty public charging infrastructure network.

Assembly Bill 1493

California vehicle GHG emission standards were enacted under AB 1493 (Pavley I). Pavley I is a clean-car standard that reduces GHG emissions from new passenger vehicles (light-duty auto to medium-duty vehicles) from 2009 through 2016 and is anticipated to reduce GHG emissions from new passenger vehicles by 30 percent in 2016. California implements the Pavley I standards through a waiver granted to California by the EPA. In 2012, the EPA issued a Final Rulemaking that sets even more stringent fuel economy and GHG emissions standards for model years 2017 through 2025 light-duty vehicles. (See also the discussion on the update to the Corporate Average Fuel Economy standards at the beginning of this Section 5.5.2 under "Federal.") In January 2012, CARB approved the Advanced Clean Cars program (formerly known as Pavley II) for model years 2017 through 2025. The program combines the control of smog, soot, and GHGs with requirements for greater numbers of ZE vehicles into a single package of standards. Under California's Advanced Clean Car program, by 2025 new automobiles will emit 34 percent less GHG emissions and 75 percent less smog-forming emissions.

Executive Order S-01-07

On January 18, 2007, the state set a new LCFS for transportation fuels sold in the state. Executive Order S-01-07 sets a declining standard for GHG emissions measured in CO_2e gram per unit of fuel energy sold in California. The LCFS required a reduction of 2.5 percent in the carbon intensity of California's transportation fuels by 2015 and a reduction of at least 10 percent by 2020. The standard applies to refiners, blenders, producers, and importers of transportation fuels, and uses market-based mechanisms to allow these providers to choose how they reduce emissions during the "fuel cycle" using the most economically feasible methods.

Executive Order B-16-2012

On March 23, 2012, the state identified that CARB, the California Energy Commission (CEC), the Public Utilities Commission, and other relevant agencies worked with the Plug-in Electric Vehicle Collaborative and the California Fuel Cell Partnership to establish benchmarks to accommodate ZE vehicles in major metropolitan areas, including infrastructure to support them (e.g., electric vehicle charging stations). The executive order also directed the number of ZE vehicles in California's state vehicle fleet to increase through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles are ZE by 2015 and at least 25 percent by 2020. The executive order also establishes a target for the transportation sector of reducing GHG emissions to 80 percent below 1990 levels.

Executive Order N-79-20

On September 23, 2020, Governor Newsom signed Executive Order N-79-20, whose goal is that 100 percent of in-state sales of new passenger cars and trucks will be ZE by 2035. Additionally, the fleet goals for trucks are that 100 percent of drayage trucks are ZE by 2035, and 100 percent of medium- and heavy-duty vehicles in the state are ZE by 2045, where feasible. The Executive Order's goal for the State is to transition to 100 percent ZE off-road vehicles and equipment by 2035, where feasible.

Renewables Portfolio: Carbon Neutrality Regulations

Senate Bills 1078, 107, and X1-2 and Executive Order S-14-08

A major component of California's Renewable Energy Program is the renewables portfolio standard established under Senate Bills 1078 (Sher) and 107 (Simitian). Under the RPS, certain retail sellers of electricity were required to increase the amount of renewable energy each year by at least 1 percent in order to reach at least 20 percent by December 30, 2010. Executive Order S-14-08, signed in November 2008, expanded the state's renewable energy standard to 33 percent renewable power by 2020. This standard was adopted by the legislature in 2011 (SB X1-2). Renewable sources of electricity include wind, small hydropower, solar, geothermal, biomass, and biogas. The increase in renewable sources for electricity production will decrease indirect GHG emissions from development projects because electricity production from renewable sources is generally considered carbon neutral.

Senate Bill 350

Senate Bill 350 (de Leon) was signed into law September 2015 and establishes tiered increases to the RPS—40 percent by 2024, 45 percent by 2027, and 50 percent by 2030. SB 350 also set a new goal to double the energy-efficiency savings in electricity and natural gas through energy efficiency and conservation measures.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100. Under SB 100, the RPS for public-owned facilities and retail sellers consist of 44 percent renewable energy by 2024, 52 percent by 2027, and 60 percent by 2030. SB 100 also established a new RPS requirement of 50 percent by 2026. Furthermore, the bill establishes an overall state policy that eligible renewable energy resources and zero-carbon resources supply 100 percent of all retail sales of electricity to California end-use customers and 100 percent of electricity procured to serve all state agencies by December 31, 2045. Under the bill, the state cannot increase carbon emissions elsewhere in the western grid or allow resource shuffling to achieve the 100 percent carbon-free electricity target.

Senate Bill 1020

Senate Bill 1020 was signed into law on September 16, 2022. It requires renewable energy and zero-carbon resources to supply 90 percent of all retail electricity sales by 2035 and 95 percent by 2040. Additionally, SB 1020 requires all state agencies to procure 100 percent of electricity from renewable energy and zero-carbon resources by 2035.

Energy Efficiency Regulations

California Building Code: Building Energy Efficiency Standards

Energy conservation standards for new residential and nonresidential buildings were adopted by the California Energy Resources Conservation and Development Commission (now the CEC) in June 1977 (Title 24, Part 6, of the California Code of Regulations [CCR]). Title 24 requires the design of building shells and building components to conserve energy. The standards are updated periodically to allow for consideration and possible incorporation of new energy efficiency technologies and methods.

On August 11, 2021, the CEC adopted the 2022 Building Energy Efficiency Standards, which were subsequently approved by the California Building Standards Commission in December 2021. The 2022 standards went into effect on January 1, 2023, replacing the existing 2019 standards. The 2022 standards would require mixed-fuel single-family homes to be electric-ready to accommodate replacement of gas appliances with electric appliances. In addition, the new standards also include prescriptive photovoltaic system and battery requirements for high-rise, multifamily buildings (i.e., more than three stories) and noncommercial buildings such as hotels, offices, medical offices, restaurants, retail stores, schools, warehouses, theaters, and convention centers (CEC 2021).

California Building Code: CALGreen

On July 17, 2008, the California Building Standards Commission adopted the nation's first green building standards. The California Green Building Standards Code (24 CCR, Part 11, known as "CALGreen") was adopted as part of the California Building Standards Code. CALGreen established planning and design standards for sustainable site development, energy efficiency (in excess of the California Energy Code requirements), water conservation, material conservation, and internal air contaminants.[12] The mandatory provisions of CALGreen became effective January 1, 2011. In 2021, the CEC approved the 2022 CALGreen, which went into effect on January 1, 2023, replacing the existing 2019 standards.

2006 Appliance Efficiency Regulations

The 2006 Appliance Efficiency Regulations (20 CCR §§ 1601–1608) were adopted by the CEC on October 11, 2006, and approved by the California Office of Administrative Law on December 14, 2006. The regulations include standards for both federally regulated appliances and non–federally regulated appliances. Though these regulations are now often viewed as "business as usual," they exceed the standards imposed by all other states, and they reduce GHG emissions by reducing energy demand.

Solid Waste Diversion Regulations

AB 939: Integrated Waste Management Act of 1989

California's Integrated Waste Management Act of 1989 (AB 939, Public Resources Code §§ 40050 et seq.) set a requirement for cities and counties throughout the state to divert 50 percent of all solid waste from landfills by January 1, 2000, through source reduction, recycling, and composting. In 2008, the requirements were modified to reflect a per capita requirement rather than tonnage. To help achieve this, the act requires that each city and county prepare and submit a source reduction and recycling element. AB 939 also established the goal for all California counties to provide at least 15 years of ongoing landfill capacity.

AB 341

AB 341 (Chapter 476, Statutes of 2011) increased the statewide goal for waste diversion to 75 percent by 2020 and requires recycling of waste from commercial and multifamily residential land uses. Section 5.408 of

[12] The green building standards became mandatory in the 2010 edition of the code.

CALGreen also requires that at least 65 percent of the nonhazardous construction and demolition waste from nonresidential construction operations be recycled and/or salvaged for reuse.

AB 1327

The California Solid Waste Reuse and Recycling Access Act (AB 1327, Public Resources Code §§ 42900 et seq.) requires areas to be set aside for collecting and loading recyclable materials in development projects. The act required the California Integrated Waste Management Board to develop a model ordinance for adoption by any local agency requiring adequate areas for collection and loading of recyclable materials as part of development projects. Local agencies are required to adopt the model or an ordinance of their own.

AB 1826

In October of 2014, Governor Brown signed AB 1826 requiring businesses to recycle their organic waste on and after April 1, 2016, depending on the amount of waste they generate per week. This law also requires that on and after January 1, 2016, local jurisdictions across the state implement an organic waste recycling program to divert organic waste generated by businesses and multifamily residential dwellings with five or more units. Organic waste means food waste, green waste, landscape and pruning waste, nonhazardous wood waste, and food-soiled paper waste that is mixed with food waste.

Water Efficiency Regulations

SBX7-7

The 20x2020 Water Conservation Plan was issued by the Department of Water Resources (DWR) in 2010 pursuant to Senate Bill 7, which was adopted during the 7th Extraordinary Session of 2009–2010 and therefore dubbed "SBX7-7." SBX7-7 mandated urban water conservation and authorized the DWR to prepare a plan implementing urban water conservation requirements (20x2020 Water Conservation Plan). In addition, it required agricultural water providers to prepare agricultural water management plans, measure water deliveries to customers, and implement other efficiency measures. SBX7-7 required urban water providers to adopt a water conservation target of 20 percent reduction in urban per capita water use by 2020 compared to 2005 baseline use.

AB 1881: Water Conservation in Landscaping Act

The Water Conservation in Landscaping Act of 2006 (AB 1881) requires local agencies to adopt the updated DWR model ordinance or an equivalent. AB 1881 also requires the CEC to consult with the DWR to adopt, by regulation, performance standards and labeling requirements for landscape irrigation equipment, including irrigation controllers, moisture sensors, emission devices, and valves to reduce the wasteful, uneconomic, inefficient, or unnecessary consumption of energy or water.

Short-Lived Climate Pollutant Reduction Strategy

Senate Bill 1383

On September 19, 2016, the Governor signed SB 1383 to supplement the GHG reduction strategies in the Scoping Plan to consider short-lived climate pollutants, including black carbon and CH_4. Black carbon is the

light-absorbing component of fine particulate matter produced during the incomplete combustion of fuels. SB 1383 required the state board, no later than January 1, 2018, to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants to achieve a reduction in methane by 40 percent, hydrofluorocarbon gases by 40 percent, and anthropogenic black carbon by 50 percent below 2013 levels by 2030. The bill also established targets for reducing organic waste in landfills. On March 14, 2017, CARB adopted the Short-Lived Climate Pollutant Reduction Strategy, which identifies the state's approach to reducing anthropogenic and biogenic sources of short-lived climate pollutants. Anthropogenic sources of black carbon include on- and off-road transportation, residential wood burning, fuel combustion (charbroiling), and industrial processes. According to CARB, ambient levels of black carbon in California are 90 percent lower than in the early 1960s, despite the tripling of diesel fuel use (CARB 2017a). In-use on-road rules were expected to reduce black carbon emissions from on-road sources by 80 percent between 2000 and 2020. South Coast AQMD is one of the air districts that requires air pollution control technologies for chain-driven broilers, which reduces particulate emissions from these charbroilers by over 80 percent (CARB 2017a). Additionally, South Coast AQMD Rule 445 limits installation of new fireplaces in the South Coast Air Basin.

Existing Conditions

CALIFORNIA'S GREENHOUSE GAS SOURCES AND RELATIVE CONTRIBUTION

In 2021, the statewide GHG emissions inventory was updated for 2000 to 2019 emissions using the GWPs in IPCC's AR4 (IPCC 2013). Based on these GWPs, California produced 418.2 $MMTCO_2e$ GHG emissions in 2019. California's transportation sector was the single largest generator of GHG emissions, producing 39.7 percent of the state's total emissions. Industrial sector emissions made up 21.1 percent, and electric power generation made up 14.1 percent of the state's emissions inventory. Other major sectors of GHG emissions include commercial and residential (10.5 percent), agriculture and forestry (7.6 percent), high GWP (4.9 percent), and recycling and waste (2.1 percent) (CARB 2021).

Since the peak level in 2004, California's GHG emission shave generally followed a decreasing trend. In 2016, California statewide GHG emissions dropped below the AB 32 target for year 2020 of 431 $MMTCO_2e$ and have remained below this target since then. In 2019, emissions from routine GHG-emitting activities statewide were almost 13 $MMTCO_2e$ lower than the AB 32 target for year 2020. Per-capita GHG emissions in California have dropped from a 2001 peak of 14.0 $MTCO_2e$ per person to 10.5 $MTCO_2e$ per person in 2019, a 25 percent decrease.

Transportation emissions continued to decline in 2019 statewide as they had done in 2018, with even more substantial reductions due to a significant increase in renewable diesel. Since 2008, California's electricity sector has followed an overall downward trend in emissions. In 2019, solar power generation continued its rapid growth since 2013. Emissions from high-GWP gases comprised 4.9 percent of California's emissions in 2019. This continues the increasing trend as the gases replace ozone-depleting substances being phased out under the 1987 Montreal Protocol. Overall trends in the inventory also demonstrate that the carbon intensity of California's economy (the amount of carbon pollution per million dollars of gross domestic product) has

declined 45 percent since the 2001 peak, though the state's gross domestic product grew 63 percent during this period (CARB 2021).

Thresholds of Significance

The CEQA Guidelines recommend that a lead agency consider the following when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase (or reduce) GHG emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
3. The extent to which the project complies with regulations or requirements adopted to implement an adopted statewide, regional, or local plan for the reduction or mitigation of GHG emissions.[13]

SOUTH COAST AQMD WORKING GROUP

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, South Coast AQMD convened a GHG CEQA Significance Threshold Working Group (Working Group). The South Coast AQMD Working Group (Meeting No. 15) identified a tiered approach for evaluating GHG emissions for development projects where South Coast AQMD is not the lead agency (South Coast AQMD 2010):

- **Tier 1.** If a project is exempt from CEQA, project-level and cumulative GHG emissions are less than significant.
- **Tier 2.** If the project complies with a GHG emissions reduction plan or mitigation program that avoids or substantially reduces GHG emissions in the project's geographic area (i.e., city or county), project-level and cumulative GHG emissions are less than significant.
- **Tier 3.** If GHG emissions are less than the screening-level threshold, project-level and cumulative GHG emissions are less than significant.

  For projects that are not exempt or where no qualifying GHG reduction plans are directly applicable, South Coast AQMD requires an assessment of GHG emissions. The South Coast AQMD Working Group identified a screening-level threshold of 3,000 $MTCO_2e$ annually for all land use types or the following land-use-specific thresholds: 1,400 $MTCO_2e$ for commercial projects, 3,500 $MTCO_2e$ for

[13] The Governor's Office of Planning and Research recommendations include a requirement that such a plan must be adopted through a public review process and include specific requirements that reduce or mitigate the project's incremental contribution of GHG 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.

residential projects, or 3,000 $MTCO_2e$ for mixed-use projects. These bright-line thresholds are based on a review of the Governor's Office of Planning and Research database of CEQA projects. Based on their review of 711 CEQA projects, 90 percent of CEQA projects would exceed the bright-line thresholds identified above. Therefore, projects that do not exceed the bright-line threshold would have a nominal, and therefore, less than cumulatively considerable impact on GHG emissions:

- **Tier 4.** If emissions exceed the screening threshold, a more detailed review of the project's GHG emissions is warranted.

  The South Coast AQMD Working Group has identified an efficiency target for projects that exceed the screening threshold of 4.8 $MTCO_2e$ per year per service population ($MTCO_2e$/year/SP) for project-level analyses and 6.6 $MTCO_2e$/year/SP for plan level projects (e.g., program-level projects such as general plans) for the year 2020.[14] The per capita efficiency targets are based on the AB 32 GHG reduction target and 2020 GHG emissions inventory prepared for CARB's 2008 Scoping Plan.

The bright-line screening-level criterion of 3,000 $MTCO_2e$/yr is used as the significance threshold for this project. Therefore, if the project operation-phase emissions exceed the 3,000 $MTCO_2e$/yr threshold, GHG emissions would be considered potentially significant in the absence of mitigation measures.

[14] It should be noted that the Working Group also considered efficiency targets for 2035 for the first time in this Working Group meeting.

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Assumptions Worksheet

CalEEMod Inputs-Oxford Preparatory Academy Project, Construction

Name: Oxford Preparatory Academy Project, Construction
Project Number: SVU-13.11
Project Location: 22882 Loumont Dr, Lake Forest, CA, 92630
County/Air Basin: Orange County
Climate Zone: 8
Land Use Setting: Urban
Operational Year: 2023
Utility Company: Southern California Edison
Air Basin: South Coast Air Basin
Air District: South Coast AQMD
SRA: 19 - Saddleback Valley

Project Site Acreage	9.70
Disturbed Site Acreage	0.60

Project Components	SQFT	Building Footprint	Acres	Number of Units
Construction				
Relocatable Classroom Buildings	15,360	15,360	0.35	16
Restroom Building	480	480	0.01	NA
Surface Work				
Other Non-parking Asphalt Surfaces		10,500	0.24	NA

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Educational	Elementary School	15.84	1000 sqft	0.36	15,840
Parking	Other Asphalt Surfaces	10.50	1000 sqft	0.24	10,500
				0.60	

Architectural Coating

	Default Percent Painted
Interior Painted:	100%
Exterior Painted:	100%

Rule 1113

Paint VOC content:	100	grams per liter
Paint VOC content:	100	grams per liter

Structures	Land Use Square Feet	CalEEMod Factor[2]	Total Paintable Surface Area	Paintable Interior Area[1]	Paintable Exterior Area[1]
Parking					
Asphalt Surfaces	10,500	6%	630	-	630
					630

Notes

[1] Assumes that all non-parking asphalt will be striped. CalEEMod methodology assumes 6% of surface area is striped.

Construction Mitigation

Water Exposed Area	Frequency:	2	per day
	PM10:	55	% Reduction
	PM25:	55	% Reduction
Unpaved Roads	Vehicle Speed:	25	mph

SCAQMD Rule 1186

Clean Paved Road	9	% PM Reduction

Construction Activities and Schedule Assumptions

* based on preliminary schedule provided by the District

		Construction Schedule		
Construction Activities	**Phase Type**	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Site Preparation	Site Preparation	6/16/2023	6/18/2023	1
Utility Trenching	Trenching	6/16/2023	6/18/2023	1
Rough Grading	Grading	6/18/2023	6/20/2023	2
Fine Grading	Grading	6/22/2023	6/24/2023	2
Paving	Paving	6/22/2023	6/24/2023	2
Building Construction	Building Construction	6/28/2023	8/11/2023	33

Overlapping Construction Schedule (CalEEMod)

Construction Activities	**Start Date**	**End Date**	**CalEEMod Duration (Workday)**
Site Preparation and Utility Trenching	6/16/2023	6/17/2023	1
Site Preparation, Utility Trenching, and Rough Grading	6/18/2023	6/18/2023	0
Rough Grading	6/19/2023	6/20/2023	2
Fine Grading and Paving	6/22/2023	6/24/2023	2
Building Construction	6/28/2023	8/11/2023	33

CalEEMod Construction Off-Road Equipment Inputs

Based on information from District where indicated. CalEEMod default worker and vendor trips have been used for all construction activities. Where information has not been provided by the District, CalEEMod defaults have been used.

Construction Equipment Details					
	Equipment	# of Equipment	hr/day	total trips per day	On-Site Water Truck Travel Distance (miles/day)
Site Preparation					
	Graders	1	8		
	Tractors/Loaders/Backhoes	1	8		
	Worker Trips			5	
	Vendor Trips			0	
	Hauling Trips			0	
	Water Trucks	Acres Disturbed:	1.00	6	0.83
Rough Grading					
	Graders	1	6		
	Rubber Tired Dozers	1	6		
	Tractors/Loaders/Backhoes	1	7		
	Worker Trips			8	
	Vendor Trips			0	
	Hauling Trips			0	
	Water Trucks	Acres Disturbed:	1	6	0.98
Fine Grading					
	Graders	1	6		
	Rubber Tired Dozers	1	6		
	Tractors/Loaders/Backhoes	1	7		
	Worker Trips			8	
	Vendor Trips			0	
	Hauling Trips			0	
	Water Trucks	Acres Disturbed:	1	6	0.98

Building Construction[1]					
	Cranes	1	4		
	Forklifts	2	6		
	Tractors/Loaders/Backhoes	2	8		
	Worker Trips			6	
	Vendor Trips			64	
	Hauling Trips			0	
Paving					
	Cement and Mortar Mixers	4	6		
	Pavers	1	7		
	Rollers	1	7		
	Tractors/Loaders/Backhoes	1	7		
	Worker Trips			18	
	Vendor Trips			0	
	Hauling Trips			0	
Utility Trenching[2]					
	Excavators	1	8		
	Worker Trips			3	
	Vendor Trips			0	
	Hauling Trips			0	

Notes:

[1] Included equipment for construction of restroom and installation of 16 portable classrooms on campus. Included 4 vendor trips per portable.

[2] Construction equipment based on previous portable classroom project.

Water Truck Vendor Trip Calculation

Amount of Water (gal/ acre/ day)[1]	Water Truck Capacity (gallons)[2]
10,000	4,000

Notes:

[1] Based on data provided in Guidance for Application for Dust Control Permit Control Permit. https://www.epa.gov/sites/default/files/2019-04/documents/mr_guidanceforapplicationfordustcontrolpermit.pdf)

[2] Based on standard water truck capacity: McLellan Industries. 2022, January (access). Water Trucks. https://www.mclellanindustries.com/trucks/water-trucks/

[3] Assumes that dozers, tractors/loaders/backhoes, and graders can disturb 0.50 acres per day and scrapers can disturb 1 acre per day.

Phase Name	Worker Trip Ends Per Day	Vendor Trip Ends Per Day	Haul Truck Trip Ends Per Day	Start Date	End Date	Workdays
Site Preparation	5	6	0	6/16/2023	6/18/2023	1
Rough Grading	8	6	0	6/18/2023	6/20/2023	2
Fine Grading	8	6	0	6/22/2023	6/24/2023	2
Building Construction	6	64	0	6/28/2023	8/11/2023	33
Paving	18	0	0	6/22/2023	6/24/2023	2
Utility Trenching	3	0	0	6/16/2023	6/18/2023	1

Construction Activity (Overlapping)	Worker Trip Ends Per Day	Vendor Trip Ends Per Day	Haul Truck Trip Ends Per Day	Start Date	End Date	Workdays
Site Preparation and Utility Trenching	8	6	0	6/16/2023	6/17/2023	1
Site Preparation, Utility Trenching, and Rough Grading	16	12	0	6/18/2023	6/18/2023	0
Rough Grading	8	6	0	6/19/2023	6/20/2023	2
Fine Grading and Paving	26	6	0	6/22/2023	6/24/2023	2
Building Construction	6	64	0	6/28/2023	8/11/2023	33
	26	**64**	**0**			

CalEEMod Inputs-Oxford Preparatory Academy Project, Operation

Name:	Oxford Preparatory Academy Project, Construction
Project Number:	SVU-13.11
Project Location:	22882 Loumont Dr, Lake Forest, CA, 92630
County/Air Basin:	Orange County
Climate Zone:	8
Land Use Setting:	Urban
Operational Year:	2023
Utility Company:	Southern California Edison
Air Basin:	South Coast Air Basin
Air District:	South Coast AQMD
SRA:	19 - Saddleback Valley

Project Site Acreage	9.70
Disturbed Site Acreage	0.60

CalEEMod Land Use Inputs

Land Use Type	Land Use Subtype	Unit Amount	Size Metric	Lot Acreage	Land Use Square Feet
Educational	Elementary School	15.84	1000 sqft	0.36	15,840
Parking	Other Asphalt Surfaces	10.50	1000 sqft	0.24	10,500
				0.60	

Trips [1]

Land Use Type	Average Daily Trips	CalEEMod Trip Rate	Saturday Trips	CalEEMod Trip Rate	Sunday Trips	CalEEMod Trip Rate
Elementary School	1,580	**99.75**	0	**0.00**	0	**0.00**

Source: Garland and Associates. 2024. Oxford Preparatory Academy - Lake Forest Project Generated Traffic.

Notes:

[1] School would not operate on the weekends, therefore no weekend trips were assumed.

Water Use [1]

Land Use	Indoor (gals/year)	Outdoor (gals/year)	Total
Elementary School	459,311	0.00	459,311

Notes:

[1] Water use based on CalEEMod default. Model assumes 100% aerobic treatment

Solid Waste[1]

Land Use	Total Solid Waste (tons/yr)
Solid Waste	20.59

Notes:

[1] Based on CalEEMod default

Electricity (Buildings)

Default CalEEMod Energy Use

Land Use Subtype	Total Annual Electricity Consumption (kWh/year)	Total Annual Natural Gas Consumption (kBTU/year)	Title-24 Electricity Energy Intensity (kWhr/size/year)	Title-24 Natural Gas Energy Intensity (KBTU/size/year)	Nontitle-24 Electricity Energy Intensity (kWhr/size/year)	Nontitle-24 Natural Gas Energy Intensity (KBTU/size/year)
Elementary School	99,068.84	332,321.47	**85,644.05**	**169,036.94**	13,424.79	163,284.53

Architectural Coating

**see Construction assumptions*

Southern California Edison Carbon Intensity Factors[1]

	Forecasted Factors 2023	
CO_2:	348.64	pounds per megawatt hour
CH_4:	0.033	pound per megawatt hour
N_2O:	0.004	pound per megawatt hour

Notes:

[1] CalEEMod default values.

Changes to the CalEEMod Defaults - Fleet Mix 2023 Elementary School

Trips 1,580

Default	HHD	LDA	LDT1	LDT2	LHD1	LHD2	MCY	MDV	MH	MHD	OBUS	SBUS	UBUS	
FleetMix (Model Default)	0.51828618	50.5126357	4.3061275	22.6797849	2.69003678	0.6689636	2.13748161	14.3866226	0.39756862	1.50836129	0.0614482	0.0965709	0.0361086	
FleetMix (Model Default) adjusted	0.00518286	0.50512636	0.04306128	0.22679785	0.02690037	0.00668964	0.02137482	0.14386623	0.00397569	0.01508361	0.00061448	0.00096571	0.00036109	100%
Trips	8	798	68	358	43	11	34	227	6	24	1	2	1	1,580
Percent		80%			6%			14%						100%
without buses/MH	0.005183	0.505126	0.043061	0.226798	0.026900	0.006690	0.021375	0.143866	0.003976	0.015084	0	0.000966	0	100%
Percent		80%			6%			14%						100%
Adjusted without buses/MH	0.005269	0.505126	0.043061	0.226798	0.027347	0.006801	0.021729	0.143866	0.004042	0.015334	0.000000	0.000982	0.000000	
Percent adjusted		80%			6%			14%						100%
Assumed Mix		97.0%			1.00%			2.00%						100%
	0.000881	0.614991	0.052427	0.276126	0.004575	0.001138	0.026456	0.020000	0.000676	0.002565	0.000000	0.000164	0.000000	100%
adjusted with Assumed	**0.088147**	**61.499106**	**5.242708**	**27.612625**	**0.457506**	**0.113773**	**2.645561**	**2.000000**	**0.067616**	**0.256533**	**0.000000**	**0.016424**	**0.000000**	
Trips	1	972	83	436	7	2	42	32	1	4	0	0	0	1,580
		1,533			*14*			*32*						

Fleet mix for the project is modified to reflect a higher proportion of passenger vehicles that the regional VMT. Assumes a mix of approximately 97% passenger vehicles, 2% medium duty trucks, and 1% heavy duty trucks and buses.

CalEEMod Construction Model

SVU-13.11 Custom Report

Table of Contents

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	SVU-13.11
Construction Start Date	6/16/2023
Operational Year	2023
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	6.00
Location	22882 Loumont Dr, Lake Forest, CA 92630, USA
County	Orange
City	Lake Forest
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	6053
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Elementary School	15.8	1000sqft	0.36	15,840	0.00	0.00	—	—
Other Asphalt Surfaces	10.5	1000sqft	0.24	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Water	W-4	Require Low-Flow Water Fixtures

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.39	5.15	19.0	19.2	0.03	0.90	6.81	7.72	0.83	2.77	3.60	—	3,495	3,495	0.17	0.30	6.01	3,594
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.10	0.10	0.94	0.96	< 0.005	0.04	0.12	0.16	0.03	0.05	0.08	—	347	347	0.02	0.03	0.24	356
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.02	0.02	0.17	0.17	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	57.5	57.5	< 0.005	< 0.005	0.04	58.9

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	2.39	5.15	19.0	19.2	0.03	0.90	6.81	7.72	0.83	2.77	3.60	—	3,495	3,495	0.17	0.30	6.01	3,594
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.10	0.10	0.94	0.96	< 0.005	0.04	0.12	0.16	0.03	0.05	0.08	—	347	347	0.02	0.03	0.24	356
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2023	0.02	0.02	0.17	0.17	< 0.005	0.01	0.02	0.03	0.01	0.01	0.01	—	57.5	57.5	< 0.005	< 0.005	0.04	58.9

3. Construction Emissions Details

3.1. Site Preparation (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.54	5.02	5.57	0.01	0.27	—	0.27	0.25	—	0.25	—	858	858	0.03	0.01	—	861
Dust From Material Movement	—	—	—	—	—	—	0.53	0.53	—	0.06	0.06	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.31	0.31	< 0.005	0.03	0.03	—	4.58	4.58	< 0.005	< 0.005	0.01	4.84

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.35	2.35	< 0.005	< 0.005	—	2.36
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.01	0.01	< 0.005	< 0.005	< 0.005	0.01
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Dust From Material Movement	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.33	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	69.1	69.1	< 0.005	< 0.005	0.31	70.3
Vendor	0.02	0.01	0.21	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	197	197	0.01	0.03	0.52	205
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.18	0.18	< 0.005	< 0.005	< 0.005	0.19
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.54	0.54	< 0.005	< 0.005	< 0.005	0.56
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.03	0.03	< 0.005	< 0.005	< 0.005	0.03
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Hauling	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	0.00

3.3. Rough Grading (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.52	1.28	12.6	11.4	0.02	0.60	—	0.60	0.55	—	0.55	—	1,713	1,713	0.07	0.01	—	1,719
Dust From Material Movement	—	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.36	0.36	< 0.005	0.04	0.04	—	5.11	5.11	< 0.005	< 0.005	0.01	5.39
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.39	9.39	< 0.005	< 0.005	—	9.42

Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.03	0.03	< 0.005	< 0.005	< 0.005	0.03
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.55	1.55	< 0.005	< 0.005	—	1.56
Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.49	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.46	105
Vendor	0.02	0.01	0.21	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	197	197	0.01	0.03	0.52	205
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.56
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.08	1.08	< 0.005	< 0.005	< 0.005	1.12
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.18	0.18	< 0.005	< 0.005	< 0.005	0.19

Hauling	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	0.00

3.5. Fine Grading (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.52	1.28	12.6	11.4	0.02	0.60	—	0.60	0.55	—	0.55	—	1,713	1,713	0.07	0.01	—	1,719
Dust From Material Movement	—	—	—	—	—	—	5.31	5.31	—	2.57	2.57	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.36	0.36	< 0.005	0.04	0.04	—	5.11	5.11	< 0.005	< 0.005	0.01	5.39
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.06	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	9.39	9.39	< 0.005	< 0.005	—	9.42
Dust From Material Movement	—	—	—	—	—	—	0.03	0.03	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.03	0.03	< 0.005	< 0.005	< 0.005	0.03
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.55	1.55	< 0.005	< 0.005	—	1.56

Dust From Material Movement	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.49	0.00	0.00	0.10	0.10	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.46	105
Vendor	0.02	0.01	0.21	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.02	—	197	197	0.01	0.03	0.52	205
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.55	0.55	< 0.005	< 0.005	< 0.005	0.56
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.08	1.08	< 0.005	< 0.005	< 0.005	1.12
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.18	0.18	< 0.005	< 0.005	< 0.005	0.19
Hauling	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	0.00

3.7. Building Construction (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.69	0.58	5.93	7.00	0.01	0.28	—	0.28	0.26	—	0.26	—	1,305	1,305	0.05	0.01	—	1,309
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.54	0.63	< 0.005	0.03	—	0.03	0.02	—	0.02	—	118	118	< 0.005	< 0.005	—	118
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.10	0.12	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	19.5	19.5	< 0.005	< 0.005	—	19.6
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.43	0.00	0.00	0.09	0.09	0.00	0.02	0.02	—	92.0	92.0	< 0.005	< 0.005	0.41	93.5
Vendor	0.17	0.06	2.29	1.17	0.01	0.03	0.55	0.58	0.01	0.15	0.17	—	2,098	2,098	0.12	0.28	5.60	2,191
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	8.02	8.02	< 0.005	< 0.005	0.02	8.14
Vendor	0.02	0.01	0.22	0.11	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	190	190	0.01	0.03	0.22	198
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.33	1.33	< 0.005	< 0.005	< 0.005	1.35
Vendor	< 0.005	< 0.005	0.04	0.02	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.4	31.4	< 0.005	< 0.005	0.04	32.8
Hauling	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	0.00

3.9. Paving (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.64	0.53	4.61	5.32	0.01	0.22	—	0.22	0.20	—	0.20	—	823	823	0.03	0.01	—	826
Architectural Coatings	—	2.92	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	0.32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.03	0.03	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.51	4.51	< 0.005	< 0.005	—	4.53

Architectural	—	0.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.75	0.75	< 0.005	< 0.005	—	0.75
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paving	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	1.14	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	242	242	0.01	0.01	1.07	246
Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.28	1.28	< 0.005	< 0.005	< 0.005	1.30
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.21	0.21	< 0.005	< 0.005	< 0.005	0.21
Vendor	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	0.00

Hauling	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	0.00

3.11. Utility Trenching (2023) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.13	0.11	0.87	1.02	< 0.005	0.03	—	0.03	0.03	—	0.03	—	142	142	0.01	< 0.005	—	142
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.39	0.39	< 0.005	< 0.005	—	0.39
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.06	0.06	< 0.005	< 0.005	—	0.06
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.16	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	34.6	34.6	< 0.005	< 0.005	0.15	35.1

Vendor	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	0.00
Hauling	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.09	0.09	< 0.005	< 0.005	< 0.005	0.09
Vendor	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	0.00
Hauling	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	< 0.005	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	0.02	0.02	< 0.005	< 0.005	< 0.005	0.02
Vendor	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	0.00
Hauling	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	0.00

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Site Preparation	Site Preparation	6/16/2023	6/18/2023	5.00	1.00	—
Rough Grading	Grading	6/18/2023	6/20/2023	5.00	2.00	—
Fine Grading	Grading	6/22/2023	6/24/2023	5.00	2.00	—
Building Construction	Building Construction	6/28/2023	8/11/2023	5.00	33.0	—
Paving	Paving	6/22/2023	6/24/2023	5.00	2.00	—
Utility Trenching	Trenching	6/16/2023	6/18/2023	5.00	1.00	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Site Preparation	Graders	Diesel	Average	1.00	8.00	148	0.41
Site Preparation	Tractors/Loaders/Backhoes	Diesel	Average	1.00	8.00	84.0	0.37
Rough Grading	Graders	Diesel	Average	1.00	6.00	148	0.41
Rough Grading	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
Rough Grading	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Fine Grading	Graders	Diesel	Average	1.00	6.00	148	0.41
Fine Grading	Rubber Tired Dozers	Diesel	Average	1.00	6.00	367	0.40
Fine Grading	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Building Construction	Cranes	Diesel	Average	1.00	4.00	367	0.29
Building Construction	Forklifts	Diesel	Average	2.00	6.00	82.0	0.20
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Paving	Cement and Mortar Mixers	Diesel	Average	4.00	6.00	10.0	0.56
Paving	Pavers	Diesel	Average	1.00	7.00	81.0	0.42
Paving	Rollers	Diesel	Average	1.00	7.00	36.0	0.38
Paving	Tractors/Loaders/Backhoes	Diesel	Average	1.00	7.00	84.0	0.37
Utility Trenching	Excavators	Diesel	Average	1.00	8.00	36.0	0.38

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix

Site Preparation	—	—	—	—
Site Preparation	Worker	5.00	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	6.00	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	1.00	0.83	HHDT
Rough Grading	—	—	—	—
Rough Grading	Worker	7.50	18.5	LDA,LDT1,LDT2
Rough Grading	Vendor	6.00	10.2	HHDT,MHDT
Rough Grading	Hauling	0.00	20.0	HHDT
Rough Grading	Onsite truck	1.00	0.98	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	6.65	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	64.0	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	17.5	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Fine Grading	—	—	—	—
Fine Grading	Worker	7.50	18.5	LDA,LDT1,LDT2
Fine Grading	Vendor	6.00	10.2	HHDT,MHDT
Fine Grading	Hauling	0.00	20.0	HHDT
Fine Grading	Onsite truck	1.00	0.98	HHDT
Utility Trenching	—	—	—	—
Utility Trenching	Worker	2.50	18.5	LDA,LDT1,LDT2

Utility Trenching	Vendor	—	10.2	HHDT,MHDT
Utility Trenching	Hauling	0.00	20.0	HHDT
Utility Trenching	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Control Strategies Applied	PM10 Reduction	PM2.5 Reduction
Water unpaved roads twice daily	55%	55%
Limit vehicle speeds on unpaved roads to 25 mph	44%	44%
Sweep paved roads once per month	9%	9%

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Paving	0.00	0.00	0.00	630	630

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Site Preparation	—	—	0.50	0.00	—
Rough Grading	—	—	1.50	0.00	—
Fine Grading	—	—	1.50	0.00	—
Paving	0.00	0.00	0.00	0.00	0.24

5.6.2. Construction Earthmoving Control Strategies

Non-applicable. No control strategies activated by user.

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Elementary School	0.00	0%
Other Asphalt Surfaces	0.24	100%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2023	0.00	349	0.03	< 0.005

8. User Changes to Default Data

Screen	Justification
Land Use	Based on PD, see assumptions file
Construction: Construction Phases	Based on District info., see assumptions file
Construction: Off-Road Equipment	For trenching phase included equipment mix from similar portable classroom project, see assumptions file
Operations: Fleet Mix	adjusted fleet mix, see assumptions file
Operations: Water and Waste Water	assume 100% aerobic treatment, see assumptions file
Operations: Vehicle Data	Based on Traffic Study, see assumptions file
Construction: Trips and VMT	Included 4 vendor trips per portable, see assumptions file
Construction: Architectural Coatings	Assumes that all non-parking asphalt will be striped. CalEEMod methodology assumes 6% of surface area is striped.
Operations: Architectural Coatings	Building portables would not require re-painting, Assumes that all non-parking asphalt will be striped. CalEEMod methodology assumes 6% of surface area is striped.

CalEEMod Operations Model

SVU-13.11 Custom Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	SVU-13.11
Construction Start Date	6/16/2023
Operational Year	2023
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	6.00
Location	22882 Loumont Dr, Lake Forest, CA 92630, USA
County	Orange
City	Lake Forest
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	6053
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.21

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description

Elementary School	15.8	1000sqft	0.36	15,840	0.00	0.00	—	—
Other Asphalt Surfaces	10.5	1000sqft	0.24	0.00	0.00	0.00	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

Sector	#	Measure Title
Water	W-4	Require Low-Flow Water Fixtures

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.73	5.66	2.63	42.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.1	8,235	8,248	1.56	0.27	36.7	8,404
Mit.	5.73	5.66	2.63	42.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.0	8,235	8,247	1.56	0.27	36.7	8,403
% Reduced	—	—	—	—	—	—	—	—	—	—	—	1%	< 0.5%	< 0.5%	—	—	—	< 0.5%
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.59	5.52	2.90	39.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.1	7,860	7,872	1.59	0.29	1.01	7,999
Mit.	5.59	5.52	2.90	39.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.0	7,860	7,872	1.59	0.29	1.01	7,998
% Reduced	—	—	—	—	—	—	—	—	—	—	—	1%	< 0.5%	< 0.5%	—	—	—	< 0.5%
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Unmit.	4.05	4.09	2.12	29.0	0.06	0.04	5.65	5.69	0.04	1.43	1.47	12.1	5,746	5,758	1.46	0.21	11.3	5,868
Mit.	4.05	4.09	2.12	29.0	0.06	0.04	5.65	5.69	0.04	1.43	1.47	12.0	5,746	5,758	1.46	0.21	11.3	5,868
% Reduced	—	—	—	—	—	—	—	—	—	—	—	1%	< 0.5%	< 0.5%	—	—	—	< 0.5%
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.74	0.75	0.39	5.29	0.01	0.01	1.03	1.04	0.01	0.26	0.27	2.00	951	953	0.24	0.03	1.88	972
Mit.	0.74	0.75	0.39	5.29	0.01	0.01	1.03	1.04	0.01	0.26	0.27	1.98	951	953	0.24	0.03	1.88	971
% Reduced	—	—	—	—	—	—	—	—	—	—	—	1%	< 0.5%	< 0.5%	< 0.5%	< 0.5%	—	< 0.5%

2.6. Operations Emissions by Sector, Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.60	5.20	2.53	41.3	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	8,028	8,028	0.43	0.27	36.6	8,155
Area	0.12	0.45	0.01	0.69	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.83	2.83	< 0.005	< 0.005	—	2.84
Energy	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	201	201	0.02	< 0.005	—	202
Water	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Waste	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Total	5.73	5.66	2.63	42.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.0	8,235	8,247	1.56	0.27	36.7	8,403
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	5.58	5.17	2.81	39.0	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	7,656	7,656	0.46	0.29	0.95	7,753
Area	—	0.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Energy	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	201	201	0.02	< 0.005	—	202

Water	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Waste	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Total	5.59	5.52	2.90	39.1	0.08	0.05	7.94	7.99	0.05	2.01	2.06	12.0	7,860	7,872	1.59	0.29	1.01	7,998
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	3.95	3.66	2.03	28.4	0.05	0.03	5.65	5.68	0.03	1.43	1.46	—	5,540	5,540	0.32	0.20	11.3	5,621
Area	0.08	0.42	< 0.005	0.47	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	1.94	1.94	< 0.005	< 0.005	—	1.95
Energy	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	201	201	0.02	< 0.005	—	202
Water	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Waste	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Total	4.05	4.09	2.12	29.0	0.06	0.04	5.65	5.69	0.04	1.43	1.47	12.0	5,746	5,758	1.46	0.21	11.3	5,868
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.72	0.67	0.37	5.19	0.01	0.01	1.03	1.04	0.01	0.26	0.27	—	917	917	0.05	0.03	1.87	931
Area	0.02	0.08	< 0.005	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.32	0.32	< 0.005	< 0.005	—	0.32
Energy	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	33.3	33.3	< 0.005	< 0.005	—	33.4
Water	—	—	—	—	—	—	—	—	—	—	—	0.15	0.44	0.59	< 0.005	< 0.005	—	0.70
Waste	—	—	—	—	—	—	—	—	—	—	—	1.84	0.00	1.84	0.18	0.00	—	6.43
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01
Total	0.74	0.75	0.39	5.29	0.01	0.01	1.03	1.04	0.01	0.26	0.27	1.98	951	953	0.24	0.03	1.88	971

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	5.60	5.20	2.53	41.3	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	8,028	8,028	0.43	0.27	36.6	8,155
Other Asphalt Surfaces	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	0.00
Total	5.60	5.20	2.53	41.3	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	8,028	8,028	0.43	0.27	36.6	8,155
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	5.58	5.17	2.81	39.0	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	7,656	7,656	0.46	0.29	0.95	7,753
Other Asphalt Surfaces	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	0.00
Total	5.58	5.17	2.81	39.0	0.08	0.05	7.94	7.98	0.04	2.01	2.05	—	7,656	7,656	0.46	0.29	0.95	7,753
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.72	0.67	0.37	5.19	0.01	0.01	1.03	1.04	0.01	0.26	0.27	—	917	917	0.05	0.03	1.87	931
Other Asphalt Surfaces	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	0.00
Total	0.72	0.67	0.37	5.19	0.01	0.01	1.03	1.04	0.01	0.26	0.27	—	917	917	0.05	0.03	1.87	931

4.2. Energy

4.2.2. Electricity Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	94.6	94.6	0.01	< 0.005	—	95.2
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	94.6	94.6	0.01	< 0.005	—	95.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	94.6	94.6	0.01	< 0.005	—	95.2
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	94.6	94.6	0.01	< 0.005	—	95.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	15.7	15.7	< 0.005	< 0.005	—	15.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	15.7	15.7	< 0.005	< 0.005	—	15.8

4.2.4. Natural Gas Emissions By Land Use - Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	107	107	0.01	< 0.005	—	107
Other Asphalt Surfaces	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
Total	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	107	107	0.01	< 0.005	—	107
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	107	107	0.01	< 0.005	—	107
Other Asphalt Surfaces	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
Total	0.01	< 0.005	0.09	0.07	< 0.005	0.01	—	0.01	0.01	—	0.01	—	107	107	0.01	< 0.005	—	107
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.6	17.6	< 0.005	< 0.005	—	17.7
Other Asphalt Surfaces	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
Total	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	17.6	17.6	< 0.005	< 0.005	—	17.7

4.3. Area Emissions by Source

4.3.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.12	0.11	0.01	0.69	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.83	2.83	< 0.005	< 0.005	—	2.84
Total	0.12	0.45	0.01	0.69	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.83	2.83	< 0.005	< 0.005	—	2.84
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	0.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Consumer Products	—	0.06	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipme	0.02	0.01	< 0.005	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.32	0.32	< 0.005	< 0.005	—	0.32
Total	0.02	0.08	< 0.005	0.09	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	0.32	0.32	< 0.005	< 0.005	—	0.32

4.4. Water Emissions by Land Use

4.4.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.88	2.68	3.56	< 0.005	< 0.005	—	4.22
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Elementary	—	—	—	—	—	—	—	—	—	—	—	0.15	0.44	0.59	< 0.005	< 0.005	—	0.70
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	0.15	0.44	0.59	< 0.005	< 0.005	—	0.70

4.5. Waste Emissions by Land Use

4.5.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	11.1	0.00	11.1	1.11	0.00	—	38.8

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	1.84	0.00	1.84	0.18	0.00	—	6.43
Other Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	1.84	0.00	1.84	0.18	0.00	—	6.43

4.6. Refrigerant Emissions by Land Use

4.6.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.06	0.06
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Elementary School	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.01	0.01

4.7. Offroad Emissions By Equipment Type

4.7.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.2. Mitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.2. Mitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Elementary School	1,580	0.00	0.00	411,939	11,334	0.00	0.00	2,955,062
Other Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
0	0.00	0.00	0.00	630

5.11. Operational Energy Consumption

5.11.2. Mitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)

Elementary School	99,069	349	0.0330	0.0040	332,321
Other Asphalt Surfaces	0.00	349	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.2. Mitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Elementary School	411,727	0.00
Other Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.2. Mitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Elementary School	20.6	—
Other Asphalt Surfaces	0.00	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.2. Mitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
Elementary School	Household refrigerators and/or freezers	R-134a	1,430	0.02	0.60	0.00	1.00
Elementary School	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
Elementary School	Stand-alone retail refrigerators and freezers	R-134a	1,430	< 0.005	1.00	0.00	1.00

Elementary School	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0

5.15. Operational Off-Road Equipment

5.15.2. Mitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.17. User Defined

Equipment Type	Fuel Type
—	—

8. User Changes to Default Data

Screen	Justification
Land Use	Based on PD, see assumptions file
Construction: Construction Phases	Based on District info., see assumptions file
Construction: Off-Road Equipment	For trenching phase included equipment mix from similar portable classroom project, see assumptions file
Operations: Fleet Mix	adjusted fleet mix, see assumptions file
Operations: Water and Waste Water	assume 100% aerobic treatment, see assumptions file
Operations: Vehicle Data	Based on Traffic Study, see assumptions file
Construction: Trips and VMT	Included 4 vendor trips per portable, see assumptions file
Construction: Architectural Coatings	Assumes that all non-parking asphalt will be striped. CalEEMod methodology assumes 6% of surface area is striped.
Operations: Architectural Coatings	Building portables would not require re-painting, Assumes that all non-parking asphalt will be striped. CalEEMod methodology assumes 6% of surface area is striped.

Emissions Worksheet

Regional Construction Emissions Worksheet:

3.1. Site Preparation (2023)							
		ROG	NOx	CO	SO^2	PM10 Total	PM2.5Total
Onsite		**Summer**					
	Off-Road Equipment	0.54	5.02	5.57	0.01	0.27	0.25
	Dust From Material Movement	0.00	0.00	0.00	0.00	0.53	0.06
	Onsite truck	0.01	0.02	0.01	0.01	0.31	0.03
	Total	**0.55**	**5.04**	**5.58**	**0.02**	**1.11**	**0.34**
Offsite							
	Worker	0.02	0.02	0.33	0.00	0.07	0.02
	Vendor	0.01	0.21	0.11	0.01	0.05	0.02
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.03**	**0.23**	**0.44**	**0.01**	**0.12**	**0.04**
TOTAL		***0.58***	***5.27***	***6.02***	***0.02***	***1.23***	***0.38***

3.3. Rough Grading (2023)							
		ROG	NOx	CO	SO^2	PM10 Total	PM2.5Total
Onsite		**Summer**					
	Off-Road Equipment	1.28	12.60	11.40	0.02	0.60	0.55
	Dust From Material Movement	0.00	0.00	0.00	0.00	5.31	2.57
	Onsite truck	0.01	0.02	0.01	0.01	0.36	0.04
	Total	**1.29**	**12.62**	**11.41**	**0.03**	**6.27**	**3.16**
Offsite							
	Worker	0.03	0.03	0.49	0.00	0.10	0.02
	Vendor	0.01	0.21	0.11	0.01	0.05	0.02
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.04**	**0.24**	**0.60**	**0.01**	**0.15**	**0.04**
TOTAL		***1.33***	***12.86***	***12.01***	***0.03***	***6.42***	***3.20***

3.5. Fine Grading (2023)							
		ROG	NOx	CO	SO^2	PM10 Total	PM2.5Total
Onsite		**Summer**					
	Off-Road Equipment	1.28	12.60	11.40	0.02	0.60	0.55
	Dust From Material Movement	0.00	0.00	0.00	0.00	5.31	2.57
	Onsite truck	0.01	0.02	0.01	0.01	0.36	0.04
	Total	**1.29**	**12.62**	**11.41**	**0.03**	**6.27**	**3.16**
Offsite							
	Worker	0.03	0.03	0.49	0.00	0.10	0.02
	Vendor	0.01	0.21	0.11	0.01	0.05	0.02
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.04**	**0.24**	**0.60**	**0.01**	**0.15**	**0.04**
TOTAL		***1.33***	***12.86***	***12.01***	***0.03***	***6.42***	***3.20***

3.7. Building Construction (2023)							
		ROG	NOx	CO	SO^2	PM10 Total	PM2.5Total
Onsite		**Summer**					
	Off-Road Equipment	0.58	5.93	7.00	0.01	0.28	0.26
	Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.58**	**5.93**	**7.00**	**0.01**	**0.28**	**0.26**
Offsite							
	Worker	0.03	0.03	0.43	0.00	0.09	0.02
	Vendor	0.06	2.29	1.17	0.01	0.58	0.17
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.09**	**2.32**	**1.60**	**0.01**	**0.67**	**0.19**
TOTAL		***0.67***	***8.25***	***8.60***	***0.02***	***0.95***	***0.45***

3.9. Paving (2023)							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite		**Summer**					
	Off-Road Equipment	0.53	4.61	5.32	0.01	0.22	0.20
	Paving	2.92	0.00	0.00	0.00	0.00	0.00
	Onsite truck	0.32	0.00	0.00	0.00	0.00	0.00
	Total	**3.77**	**4.61**	**5.32**	**0.01**	**0.22**	**0.20**
Offsite							
	Worker	0.07	0.07	1.14	0.00	0.23	0.05
	Vendor	0.00	0.00	0.00	0.00	0.00	0.00
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.07**	**0.07**	**1.14**	**0.00**	**0.23**	**0.05**
TOTAL		***3.84***	***4.68***	***6.46***	***0.01***	***0.45***	***0.25***

3.11. Utility Trenching (2023)							
		ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Onsite		**Summer**					
	Off-Road Equipment	0.11	0.87	1.02	0.01	0.03	0.03
	Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.11**	**0.87**	**1.02**	**0.01**	**0.03**	**0.03**
Offsite							
	Worker	0.01	0.01	0.16	0.00	0.03	0.01
	Vendor	0.00	0.00	0.00	0.00	0.00	0.00
	Hauling	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**0.01**	**0.01**	**0.16**	**0.00**	**0.03**	**0.01**
TOTAL		***0.12***	***0.88***	***1.18***	***0.01***	***0.06***	***0.04***

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Site Preparation and Utility Trenching	***1***	***6***	***7***	***0***	***1***	***0***
Site Preparation, Utility Trenching, and Rough Grading	***2***	***19***	***19***	***0***	***8***	***4***
Rough Grading	***1***	***13***	***12***	***0***	***6***	***3***
Fine Grading and Paving	***5***	***18***	***18***	***0***	***7***	***3***
Building Construction	***1***	***8***	***9***	***0***	***1***	***0***
MAX DAILY	**5**	**19**	**19**	**0**	**8**	**4**
Regional Thresholds	**75**	**100**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	No	No	No	No	No	No

Construction LST Worksheet:

3.1. Site Preparation (2023)					
		NOx	CO	PM10 Total	PM2.5Total
Onsite					
	Off-Road Equipment	5.02	5.57	0.27	0.25
	Dust From Material Movement	0.00	0.00	0.53	0.06
	Onsite truck	0.02	0.01	0.31	0.03
	Total	**5.04**	**5.58**	**1.11**	**0.34**
TOTAL		***5.04***	***5.58***	***1.11***	***0.34***

3.3. Rough Grading (2023)					
		NOx	CO	PM10 Total	PM2.5Total
Onsite					
	Off-Road Equipment	12.60	11.40	0.60	0.55
	Dust From Material Movement	0.00	0.00	5.31	2.57
	Onsite truck	0.02	0.01	0.36	0.04
	Total	**12.62**	**11.41**	**6.27**	**3.16**
TOTAL		***12.62***	***11.41***	***6.27***	***3.16***

3.5. Fine Grading (2023)					
		NOx	CO	PM10 Total	PM2.5Total
Onsite					
	Off-Road Equipment	12.60	11.40	0.60	0.55
	Dust From Material Movement	0.00	0.00	5.31	2.57
	Onsite truck	0.02	0.01	0.36	0.04
	Total	**12.62**	**11.41**	**6.27**	**3.16**
TOTAL		***12.62***	***11.41***	***6.27***	***3.16***

3.7. Building Construction (2023)					
		NOx	CO	PM10 Total	PM2.5Total
Onsite					
	Off-Road Equipment	5.93	7.00	0.28	0.26
	Onsite truck	0.00	0.00	0.00	0.00
	Total	**5.93**	**7.00**	**0.28**	**0.26**
TOTAL		***5.93***	***7.00***	***0.28***	***0.26***

3.9. Paving (2023)					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite					
	Off-Road Equipment	4.61	5.32	0.22	0.20
	Paving	0.00	0.00	0.00	0.00
	Onsite truck	0.00	0.00	0.00	0.00
	Total	**4.61**	**5.32**	**0.22**	**0.20**
TOTAL		***4.61***	***5.32***	***0.22***	***0.20***

3.11. Utility Trenching (2023)					
		NOx	CO	PM10 Total	PM2.5 Total
Onsite					
	Off-Road Equipment	0.87	1.02	0.03	0.03
	Onsite truck	0.00	0.00	0.00	0.00
	Total	**0.87**	**1.02**	**0.03**	**0.03**
TOTAL		***0.87***	***1.02***	***0.03***	***0.03***

	NOx	CO	PM10 Total	PM2.5 Total
Site Preparation and Utility Trenching	*6*	*7*	*1.14*	*0.37*
≤1.00 Acre LST	*91*	*696*	*8.09*	*3.58*
Exceeds LST?	*no*	*no*	*no*	*no*
Site Preparation, Utility Trenching, and Rough Grading	*19*	*18*	*7.41*	*3.53*
≤1.00 Acre LST	*91*	*696*	*8.09*	*3.58*
Exceeds LST?	*no*	*no*	*no*	*no*
Rough Grading	*13*	*11*	*6.27*	*3.16*
≤1.00 Acre LST	*91*	*696*	*8.09*	*3.58*
Exceeds LST?	*no*	*no*	*no*	*no*
Fine Grading and Paving	*17*	*17*	*6.49*	*3.36*
≤1.00 Acre LST	*91*	*696*	*8.09*	*3.58*
Exceeds LST?	*no*	*no*	*no*	*no*
Building Construction	*6*	*7*	*0.28*	*0.26*
≤1.00 Acre LST	*91*	*696*	*8.09*	*3.58*
Exceeds LST?	*no*	*no*	*no*	*no*

Regional Operation Emissions Worksheet

[1] CalEEMod, Version 2022.1.

Proposed Project

Summer

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Mobile	5.20	2.53	41.30	0.08	7.98	2.05
Area	0.45	0.01	0.69	0.01	0.01	0.01
Energy	0.01	0.09	0.07	0.01	0.01	0.01
Total	**5.66**	**2.63**	**42.06**	**0.09**	**8.00**	**2.07**

Winter

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Mobile	5.17	2.81	39.00	0.08	7.98	2.05
Area	0.34	0.00	0.00	0.00	0.00	0.00
Energy	0.01	0.09	0.07	0.01	0.01	0.01
Total	**5.52**	**2.90**	**39.07**	**0.09**	**7.99**	**2.06**

Max Daily

	ROG	NOx	CO	SO2	PM10 Total	PM2.5 Total
Mobile	5.20	2.81	41.30	0.08	7.98	2.05
Area	0.45	0.01	0.69	0.01	0.01	0.01
Energy	0.01	0.09	0.07	0.01	0.01	0.01
Total	**5.66**	**2.90**	**42.06**	**0.09**	**8.00**	**2.07**
Regional Thresholds (lb/day)	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Thresholds?	No	No	No	No	No	No

GHG Emissions Inventory

Proposed Project Buildout

Construction[1]

	$MTCO_2e$
June 2023-August 2023	59
Total Construction	**59**
30-Year Amortization[2]	**2**

	$MTCO_2e$
June 2023-December 2024[3]	530
Total Construction	**530**
30-Year Amortization[2]	**18**

[1] CalEEMod, Version 2022.1.

[2] Total construction emissions are amortized over 30 years per SCAQMD methodology; SCAQMD. 2009, November 19. Greenhouse Gases (GHG) CEQA Significance Thresholds Working Group Meeting 14. http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqa-significance-thresholds/year-2008-2009/ghg-meeting-14/ghg-meeting-14-main-presentation.pdf?sfvrsn=2.

[3] Construction GHG emissions based on preliminary schedule of 2 months from District. Construction GHG emissions were proportionally increased to account for 18-month construction schedule.

Operation[1]

	$MTCO_2e$/Year[2] Operations	%
Mobile	931	94%
Area	0	0%
Energy	33	3%
Water	1	0%
Solid Waste	6	1%
Refrigerants	0	0%
30-Year Construction Amortization	18	2%
	990	100%

South Coast AQMD Bright-Line Screening Threshold	**3,000**
Exceed Threshold?	**No**

[1] CalEEMod, Version 2022.1.

[2] MTCO2e=metric tons of carbon dioxide equivalent.

LST Worksheets

Construction Localized Significance Thresholds: Site Prep and Utility Trenching

		NOx & CO		*PM10 & PM2.5*		
SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
19	0.60	25	82	40	130	0.60

Source Receptor	**Saddleback Valley**	**Equipment**	**Acres/8-hr Day**		**Daily hours**	**Equipment Used**	**Acres**
Distance (meters)	25						
NOx	**91**	Tractors	0.5	0.0625	8	1	0.5
CO	**696**	Graders	0.5	0.0625	8	1	0.5
PM10	**8.09**	Dozers	0.5	0.0625			0
PM2.5	**3.58**	Scrapers	1	0.125			0
						Acres	1.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	91	93	108	140	218
	1	91	93	108	140	218
		91	93	108	140	218
CO	1	696	833	1234	2376	7724
	1	696	833	1234	2376	7724
		696	833	1234	2376	7724
PM10	1	4	11	24	48	121
	1	4	11	24	48	121
		4	11	24	48	121
PM2.5	1	3	4	8	19	68
	1	3	4	8	19	68
		3	4	8	19	68

Saddleback Valley

0.60 Acres

	25	**50**	**100**	**200**	**500**
NOx	91	93	108	140	218
CO	696	833	1234	2376	7724
PM10	4	11	24	48	121
PM2.5	3	4	8	19	68

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
19	1	19	1
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Site Preparation, Utility Trenching, and Rough Grading

		NOx & CO		*PM10 & PM2.5*		
SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
19	0.60	25	82	40	130	0.60

Source Receptor	**Saddleback Valley**	**Equipment**	**Acres/8-hr Day**		**Daily hours**	**Equipment Used**	**Acres**
Distance (meters)	25						
NOx	**91**	Tractors	0.5	0.0625	8	1	0.5
CO	**696**	Tractors	0.5	0.0625	7	1	0.4375
PM10	**8.09**	Graders	0.5	0.0625	8	1	0.5
PM2.5	**3.58**	Graders	0.5	0.0625	6	1	0.375
		Dozers	0.5	0.0625	6	1	0.375
		Scrapers	1	0.125			0
						Acres	2.19

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	91	93	108	140	218
	1	91	93	108	140	218
		91	93	108	140	218
CO	1	696	833	1234	2376	7724
	1	696	833	1234	2376	7724
		696	833	1234	2376	7724
PM10	1	4	11	24	48	121
	1	4	11	24	48	121
		4	11	24	48	121
PM2.5	1	3	4	8	19	68
	1	3	4	8	19	68
		3	4	8	19	68

Saddleback Valley

0.60 Acres

	25	**50**	**100**	**200**	**500**
NOx	91	93	108	140	218
CO	696	833	1234	2376	7724
PM10	4	11	24	48	121
PM2.5	3	4	8	19	68

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
19	1	19	1
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Rough Grading

		NOx & CO		*PM10 & PM2.5*		
SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
19	0.60	25	82	40	130	0.60

Source Receptor	**Saddleback Valley**	**Equipment**	**Acres/8-hr Day**		**Daily hours**	**Equipment Used**	**Acres**
Distance (meters)	25						
NOx	**91**	Tractors	0.5	0.0625	7	1	0.4375
CO	**696**	Graders	0.5	0.0625	6	1	0.375
PM10	**8.09**	Dozers	0.5	0.0625	6	1	0.375
PM2.5	**3.58**	Scrapers	1	0.125			0
						Acres	1.19

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	91	93	108	140	218
	1	91	93	108	140	218
		91	93	108	140	218
CO	1	696	833	1234	2376	7724
	1	696	833	1234	2376	7724
		696	833	1234	2376	7724
PM10	1	4	11	24	48	121
	1	4	11	24	48	121
		4	11	24	48	121
PM2.5	1	3	4	8	19	68
	1	3	4	8	19	68
		3	4	8	19	68

Saddleback Valley

0.60 Acres

	25	**50**	**100**	**200**	**500**
NOx	91	93	108	140	218
CO	696	833	1234	2376	7724
PM10	4	11	24	48	121
PM2.5	3	4	8	19	68

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
19	1	19	1
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Rough Grading and Paving

		NOx & CO		*PM10 & PM2.5*		
SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
19	0.60	25	82	40	130	0.60

Source Receptor	**Saddleback Valley**	**Equipment**	**Acres/8-hr Day**		**Daily hours**	**Equipment Used**	**Acres**
Distance (meters)	25						
NOx	**91**	Tractors	0.5	0.0625	7	2	0.875
CO	**696**	Graders	0.5	0.0625	6	1	0.375
PM10	**8.09**	Dozers	0.5	0.0625	6	1	0.375
PM2.5	**3.58**	Scrapers	1	0.125			0
						Acres	1.63

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	91	93	108	140	218
	1	91	93	108	140	218
		91	93	108	140	218
CO	1	696	833	1234	2376	7724
	1	696	833	1234	2376	7724
		696	833	1234	2376	7724
PM10	1	4	11	24	48	121
	1	4	11	24	48	121
		4	11	24	48	121
PM2.5	1	3	4	8	19	68
	1	3	4	8	19	68
		3	4	8	19	68

Saddleback Valley

0.60 Acres

	25	**50**	**100**	**200**	**500**
NOx	91	93	108	140	218
CO	696	833	1234	2376	7724
PM10	4	11	24	48	121
PM2.5	3	4	8	19	68

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
19	1	19	1
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Construction Localized Significance Thresholds: Building Construction

		NOx & CO		*PM10 & PM2.5*		
SRA No.	Acres	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Source Receptor Distance (meters)	Source Receptor Distance (Feet)	Construction / Project Site Size (Acres)
19	0.60	25	82	40	130	0.60

Source Receptor	**Saddleback Valley**	**Equipment**	**Acres/8-hr Day**		**Daily hours**	**Equipment Used**	**Acres**
Distance (meters)	25						
NOx	**91**	Tractors	0.5	0.0625	8	2	1
CO	**696**	Graders	0.5	0.0625			0
PM10	**8.09**	Dozers	0.5	0.0625			0
PM2.5	**3.58**	Scrapers	1	0.125			0
						Acres	1.00

	Acres	**25**	**50**	**100**	**200**	**500**
NOx	1	91	93	108	140	218
	1	91	93	108	140	218
		91	93	108	140	218
CO	1	696	833	1234	2376	7724
	1	696	833	1234	2376	7724
		696	833	1234	2376	7724
PM10	1	4	11	24	48	121
	1	4	11	24	48	121
		4	11	24	48	121
PM2.5	1	3	4	8	19	68
	1	3	4	8	19	68
		3	4	8	19	68

Saddleback Valley

0.60 Acres

	25	**50**	**100**	**200**	**500**
NOx	91	93	108	140	218
CO	696	833	1234	2376	7724
PM10	4	11	24	48	121
PM2.5	3	4	8	19	68

Acre Below		**Acre Above**	
SRA No.	Acres	SRA No.	Acres
19	1	19	1
Distance Increment Below			
25			
Distance Increment Above			
25			

Updated: 10/21/2009 - Table C-1. 2006 – 2008

Appendix B Fundamentals of Noise

Appendix

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Fundamentals of Noise

NOISE

Noise is most often defined as unwanted sound; whether it is loud, unpleasant, unexpected, or otherwise undesirable. Although sound can be easily measured, the perception of noise and the physical response to sound complicate the analysis of its impact on people. People judge the relative magnitude of sound sensation in subjective terms such as "noisiness" or "loudness."

Noise Descriptors

The following are brief definitions of terminology used in this chapter:

- **Sound.** A disturbance created by a vibrating object, which, when transmitted by pressure waves through a medium such as air, is capable of being detected by a receiving mechanism, such as the human ear or a microphone.

- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.

- **Decibel (dB).** A unitless measure of sound, expressed on a logarithmic scale and with respect to a defined reference sound pressure. The standard reference pressure is 20 micropascals (20 μPa).

- **Vibration Decibel (VdB).** A unitless measure of vibration, expressed on a logarithmic scale and with respect to a defined reference vibration velocity. In the U.S., the standard reference velocity is 1 micro-inch per second ($1x10^{-6}$ in/sec).

- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear.

- **Equivalent Continuous Noise Level (L_{eq}); also called the Energy-Equivalent Noise Level.** The value of an equivalent, steady sound level which, in a stated time period (often over an hour) and at a stated location, has the same A-weighted sound energy as the time-varying sound. Thus, the L_{eq} metric is a single numerical value that represents the equivalent amount of variable sound energy received by a receptor over the specified duration.

- **Statistical Sound Level (L_n).** The sound level that is exceeded "n" percent of time during a given sample period. For example, the L_{50} level is the statistical indicator of the time-varying noise signal that is exceeded 50 percent of the time (during each sampling period); that is, half of the sampling time, the changing noise levels are above this value and half of the time they are below it. This is called the "median sound level." The L_{10} level, likewise, is the value that is exceeded 10 percent of the time (i.e., near the maximum) and this is often known as the "intrusive sound level." The L_{90} is the sound level exceeded 90 percent of the time and is often considered the "effective background level" or "residual noise level."

- **Maximum Sound Level (L_{max})**. The highest RMS sound level measured during the measurement period.
- **Root Mean Square Sound Level (RMS).** The square root of the average of the square of the sound pressure over the measurement period.
- **Day-Night Sound Level (L_{dn} or DNL).** The energy-average of the A-weighted sound levels occurring during a 24-hour period, with 10 dB added to the sound levels occurring during the period from 10:00 PM to 7:00 AM.
- **Community Noise Equivalent Level (CNEL).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with 5 dB added from 7:00 PM to 10:00 PM and 10 dB from 10:00 PM to 7:00 AM. NOTE: For general community/environmental noise, CNEL and L_{dn} values rarely differ by more than 1 dB (with the CNEL being only slightly more restrictive – that is, higher than the L_{dn} value). As a matter of practice, L_{dn} and CNEL values are interchangeable and are treated as equivalent in this assessment.
- **Peak Particle Velocity (PPV).** The peak rate of speed at which soil particles move (e.g., inches per second) due to ground vibration.
- **Sensitive Receptor.** Noise- and vibration-sensitive receptors include land uses where quiet environments are necessary for enjoyment and public health and safety. Residences, schools, motels and hotels, libraries, religious institutions, hospitals, and nursing homes are examples.

Characteristics of Sound

When an object vibrates, it radiates part of its energy in the form of a pressure wave. Sound is that pressure wave transmitted through the air. Technically, airborne sound is a rapid fluctuation or oscillation of air pressure above and below atmospheric pressure that creates sound waves.

Sound can be described in terms of amplitude (loudness), frequency (pitch), or duration (time). Loudness or amplitude is measured in dB, frequency or pitch is measured in Hertz [Hz] or cycles per second, and duration or time variations is measured in seconds or minutes.

Amplitude

Unlike linear units such as inches or pounds, decibels are measured on a logarithmic scale. Because of the physical characteristics of noise transmission and perception, the relative loudness of sound does not closely match the actual amounts of sound energy. Table 1 presents the subjective effect of changes in sound pressure levels. Ambient sounds generally range from 30 dBA (very quiet) to 100 dBA (very loud). Changes of 1 to 3 dB are detectable under quiet, controlled conditions, and changes of less than 1 dB are usually not discernible (even under ideal conditions). A 3 dB change in noise levels is considered the minimum change that is detectable with human hearing in outside environments. A change of 5 dB is readily discernible to most people in an exterior environment, and a 10 dB change is perceived as a doubling (or halving) of the sound.

Table 1 Noise Perceptibility

Change in dB	Noise Level
± 3 dB	Barely perceptible increase
± 5 dB	Readily perceptible increase
± 10 dB	Twice or half as loud
± 20 dB	Four times or one-quarter as loud

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Frequency

The human ear is not equally sensitive to all frequencies. Sound waves below 16 Hz are not heard at all, but are "felt" more as a vibration. Similarly, though people with extremely sensitive hearing can hear sounds as high as 20,000 Hz, most people cannot hear above 15,000 Hz. In all cases, hearing acuity falls off rapidly above about 10,000 Hz and below about 200 Hz.

When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to approximate the response of the human ear. The A-weighted noise level has been found to correlate well with people's judgments of the "noisiness" of different sounds and has been used for many years as a measure of community and industrial noise. Although the A-weighted scale and the energy-equivalent metric are commonly used to quantify the range of human response to individual events or general community sound levels, the degree of annoyance or other response also depends on several other perceptibility factors, including:

- Ambient (background) sound level
- General nature of the existing conditions (e.g., quiet rural or busy urban)
- Difference between the magnitude of the sound event level and the ambient condition
- Duration of the sound event
- Number of event occurrences and their repetitiveness
- Time of day that the event occurs

Duration

Time variation in noise exposure is typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called L_{eq}), or alternately, as a statistical description of the sound level that is exceeded over some fraction of a given observation period. For example, the L_{50} noise level represents the noise level that is exceeded 50 percent of the time; half the time the noise level exceeds this level and half the time the noise level is less than this level. This level is also representative of the level that is exceeded 30 minutes in an hour. Similarly, the L_2, L_8 and L_{25} values represent the noise levels that are exceeded 2, 8, and 25 percent of the time or 1, 5, and 15 minutes per hour, respectively. These "n" values are typically used to demonstrate compliance for stationary noise sources with many cities' noise ordinances. Other values typically noted during a noise survey are the L_{min} and L_{max}. These values represent the minimum and maximum root-mean-square noise levels obtained over the measurement period, respectively.

Because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law and many local jurisdictions use an adjusted 24-hour noise descriptor called the Community Noise Equivalent Level (CNEL) or Day-Night Noise Level (L_{dn}). The CNEL descriptor requires that an artificial increment (or "penalty") of 5 dBA be added to the actual noise level for the hours from 7:00 PM to 10:00

PM and 10 dBA for the hours from 10:00 PM to 7:00 AM. The L_{dn} descriptor uses the same methodology except that there is no artificial increment added to the hours between 7:00 PM and 10:00 PM. Both descriptors give roughly the same 24-hour level, with the CNEL being only slightly more restrictive (i.e., higher). The CNEL or L_{dn} metrics are commonly applied to the assessment of roadway and airport-related noise sources.

Sound Propagation

Sound dissipates exponentially with distance from the noise source. This phenomenon is known as "spreading loss." For a single-point source, sound levels decrease by approximately 6 dB for each doubling of distance from the source (conservatively neglecting ground attenuation effects, air absorption factors, and barrier shielding). For example, if a backhoe at 50 feet generates 84 dBA, at 100 feet the noise level would be 79 dBA, and at 200 feet it would be 73 dBA. This drop-off rate is appropriate for noise generated by on-site operations from stationary equipment or activity at a project site. If noise is produced by a line source, such as highway traffic, the sound decreases by 3 dB for each doubling of distance over a reflective ("hard site") surface such as concrete or asphalt. Line source noise in a relatively flat environment with ground-level absorptive vegetation decreases by an additional 1.5 dB for each doubling of distance.

Psychological and Physiological Effects of Noise

Physical damage to human hearing begins at prolonged exposure to noise levels higher than 85 dBA. Exposure to high noise levels affects the entire system, with prolonged noise exposure in excess of 75 dBA increasing body tensions, thereby affecting blood pressure and functions of the heart and the nervous system. Extended periods of noise exposure above 90 dBA results in permanent cell damage, which is the main driver for employee hearing protection regulations in the workplace. For community environments, the ambient or background noise problem is widespread, through generally worse in urban areas than in outlying, less-developed areas. Elevated ambient noise levels can result in noise interference (e.g., speech interruption/masking, sleep disturbance, disturbance of concentration) and cause annoyance. Since most people do not routinely work with decibels or A-weighted sound levels, it is often difficult to appreciate what a given sound pressure level number means. To help relate noise level values to common experience, Table 2 shows typical noise levels from familiar sources.

Table 2 Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Onset of physical discomfort	120+	
	110	Rock Band (near amplification system)
Jet Flyover at 1,000 feet		
	100	
Gas Lawn Mower at three feet		
	90	
Diesel Truck at 50 feet, at 50 mph		Food Blender at 3 feet
	80	Garbage Disposal at 3 feet
Noisy Urban Area, Daytime		
	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal speech at 3 feet
Heavy Traffic at 300 feet	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (background)
Quiet Suburban Nighttime		
	30	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (background)
	20	
		Broadcast/Recording Studio
	10	
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation (Caltrans). 2013, September. Technical Noise Supplement ("TeNS").

Vibration Fundamentals

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Vibration is normally associated with activities stemming from operations of railroads or vibration-intensive stationary sources, but can also be associated with construction equipment such as jackhammers, pile drivers, and hydraulic hammers. As with noise, vibration can be described by both its amplitude and frequency. Vibration displacement is the distance that a point on a surface moves away from its original static position; velocity is the instantaneous speed that a point on a surface moves; and acceleration is the rate of change of the speed. Each of these descriptors can be used to correlate vibration to human response, building damage, and acceptable equipment vibration levels. During construction, the operation of construction equipment can cause groundborne vibration. During the operational phase of a project, receptors may be subject to levels of vibration that can cause annoyance due to noise generated from vibration of a structure or items within a structure.

Vibration amplitudes are usually described in terms of either the peak particle velocity (PPV) or the root mean square (RMS) velocity. PPV is the maximum instantaneous peak of the vibration signal and RMS is the

square root of the average of the squared amplitude of the signal. PPV is more appropriate for evaluating potential building damage and RMS is typically more suitable for evaluating human response.

As with airborne sound, annoyance with vibrational energy is a subjective measure, depending on the level of activity and the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Persons accustomed to elevated ambient vibration levels, such as in an urban environment, may tolerate higher vibration levels. Table 3 displays the human response and the effects on buildings resulting from continuous vibration (in terms of various levels of PPV).

Table 3 Human Reaction to Typical Vibration Levels

Vibration Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.006–0.019	Threshold of perception, possibility of intrusion	Vibrations unlikely to cause damage of any type
0.08	Vibrations readily perceptible	Recommended upper level of vibration to which ruins and ancient monuments should be subjected
0.10	Level at which continuous vibration begins to annoy people	Virtually no risk of "architectural" (i.e. not structural) damage to normal buildings
0.20	Vibrations annoying to people in buildings	Threshold at which there is a risk to "architectural" damage to normal dwelling – houses with plastered walls and ceilings
0.4–0.6	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause "architectural" damage and possibly minor structural damage

Source: California Department of Transportation (Caltrans). 2020, April. *Transportation and Construction Vibration Guidance Manual.* Prepared by ICF International.

LOCAL REGULATIONS AND STANDARDS

GOAL PS-6 NOISE

A comfortable community environment that is free from excessive noise pollution.

PS-6 Policies

PS-6.1 **Land Use Planning**. Require development and infrastructure projects to be consistent with the maximum allowable noise exposure standards identified in Table PS-1 to ensure acceptable noise levels for existing and future development.

PS-6.2 **Sensitive Facilities**. Ensure appropriate mitigation is incorporated into the design of noise-sensitive facilities to minimize noise impacts.

PS-6.3 **Site Design**. Require site planning and project design techniques to minimize noise impacts adjacent to sensitive uses.

PS-6.4 **Noise Control**. Ensure that noise levels do not exceed the limits established in Table PS-2 by incorporating sound-reduction design in new construction or revitalization projects impacted by non-transportation-related noise sources.

PS-6.5 **Roadway Noise**. Encourage nonmotorized transportation alternatives for local trips and the implementation of noise sensitivity measures in the public realm, including traffic-calming road design, lateral separation, natural buffers, and setbacks to decrease excessive motor vehicle noise.

PS-6.6 **Highway Noise**. Continue to coordinate with the California Department of Transportation (Caltrans) and the Transportation Corridor Agency (TCA) to achieve maximum noise abatement in the design of new highway projects or improvements along I-5.

PS-6.7 **Vehicles and Trucks**. Monitor and enforce existing speed limits and motor vehicle codes requiring adequate mufflers on all types of vehicles traveling through the city.

PS-6.8 **Commercial Noise**. Require the use of noise attenuation measures, including screening and buffering techniques, for all new commercial development expected to produce excessive noise; in existing cases where the City's noise standards are exceeded, work with Code Enforcement to require compliance.

PS-6.9 **Interjurisdictional Coordination**. Coordinate with neighboring cities to minimize noise conflicts between land uses along the City's boundaries.

PS-6.10 **Airplane Noise**. Maintain communication with John Wayne Airport and other relevant air transportation agencies to ensure that all future plans have limited impacts to the community of Lake Forest.

PS-6 Actions

PS-6a Update Chapter 11.16 of the Lake Forest Municipal Code to ensure that the noise standards are consistent with this General Plan, including Tables PS-1 and PS-2, and to require new residential, mixed-use with a residential component, and other noise-sensitive development to be designed to minimize noise exposure to noise sensitive uses through incorporation of site planning and architectural techniques. The update shall also include noise standards for residential uses within a mixed-use development, which may differ from other adopted residential noise standards.

PS-6b Review new development projects for compliance with the noise requirements established in this General Plan, including the standards established in Tables PS-1 and PS-2. Where necessary, require new development to mitigate excessive noise through best practices, including building location and orientation, building design features, placement of noise-generating equipment away from sensitive receptors, shielding of noise-generating equipment, placement of noise-tolerant features between noise sources and sensitive receptors, and use of noise-minimizing materials such as rubberized asphalt.

PS-6c Require acoustical studies for all new discretionary projects, including those related to development and transportation, which have the potential to generate noise impacts which exceed the standards identified in this General Plan. The studies shall include representative noise measurements, estimates of existing and projected noise levels, and mitigation measures necessary to ensure compliance with this element.

PS-6d In making a determination of impact under the California Environmental Quality Act (CEQA), a substantial increase will occur if ambient noise levels have a substantial increase. Generally, a 3 dB increase in noise levels is barely perceptible, and a 5 dB increase in noise levels is clearly perceptible. Therefore, increases in noise levels shall be considered to be substantial when the following occurs:

- When existing noise levels are less than 60 dB, a 5 dB increase in noise will be considered substantial;
- When existing noise levels are between 60 dB and 65 dB, a 3 dB increase in noise will be considered substantial;
- When existing noise levels exceed 65 dB, a 1.5 dB increase in noise will be considered substantial.

PS-6e Update the City's Noise Ordinance (Chapter 11.16) to reflect the noise standards established in this General Plan and proactively enforce the City's Noise Ordinance, including requiring the following measures for construction:

- Restrict construction activities to the hours of 7:00 a.m. to 7:00 p.m. on Monday through Friday, and 8:00 a.m. to 6:00 p.m. on Saturdays. No construction shall be permitted outside of these hours or on Sundays or legal City of Lake Forest holiday, without a specific exemption issued by the City.
- A Construction Noise Management Plan shall be submitted by the applicant for construction projects, when determined necessary by the City. The Construction Noise Management Plan shall include proper posting of construction schedules, appointment of a noise disturbance coordinator, and methods for assisting in noise reduction measures.

- Noise reduction measures may include, but are not limited to, the following:
    - Equipment and trucks used for project construction shall utilize the best available noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures and acoustically attenuating shields or shrouds) wherever feasible.
    - Except as provided herein, impact tools (e.g., jack hammers, pavement breakers, and rock drills) used for project construction shall be hydraulically or electrically powered to avoid noise associated with compressed air exhaust from pneumatically powered tools. However, where use of pneumatic tools is unavoidable, an exhaust muffler on the compressed air exhaust shall be used. This muffler can lower noise levels from the exhaust by up to about 10 dBA. External jackets on the tools themselves shall be used, if such jackets are commercially available. this could achieve a reduction of 5 dBA. Quieter procedures shall be used, such as drills rather than impact equipment, whenever such procedures are available and consistent with construction procedures.
    - Temporary power poles shall be used instead of generators where feasible.
    - Stationary noise sources shall be located as far from adjacent properties as possible, and they shall be muffled and enclosed within temporary sheds, incorporate insulation barriers, or use other measures as determined by the City of provide equivalent noise reduction.
    - The noisiest phases of construction shall be limited to less than 10 days at a time. Exceptions may be allowed if the City determines an extension is necessary and all available noise reduction controls are implemented.
    - Delivery of materials shall observe the hours of operation described above. Truck traffic should avoid residential areas to the extent possible.
- Require new development to minimize vibration impacts to adjacent uses during demolition and construction. For sensitive historic structures, a vibration limit of 0.08 in/sec PPV (peak particle velocity) will be used to minimize the potential for cosmetic damage to the building. A vibration limit of 0.30 in/sec PPV will be used to minimize the potential for cosmetic damage at buildings of normal conventional construction.

PS-6f The City shall require new residential projects located adjacent to major freeways, hard rail lines, or light rail lines to follow the FTA vibration screening distance criteria to ensure that residential uses are not exposed to vibrations exceeding 72 VdB for frequent events (more than 70 events per day), 75 VdB for occasional events (30-70 events per day), or 80 VdB for infrequent events (less than 30 events per day).

Table PS-1: Land Use Compatibility for Community Noise Environment

Land Use [1]	Outdoor Activity Areas [2, 3]	Interior Spaces	
		Ldn/ CNEL, dB	Leq, dB [4]
Residential	60	45	-
Motels/Hotels	65	45	-
Mixed-Use	65	45	
Hospitals, Nursing Homes	60	45	-
Theaters, Auditoriums	-	-	35
Churches	60	-	40
Office Buildings	65	-	45
Schools, Libraries, Museums	70	-	45
Playgrounds, Neighborhood Parks	70	-	-
Industrial	75	-	45
Golf Courses, Water Recreation	70	-	-

1. Where a proposed use is not specifically listed, the use shall comply with the standards for the most similar use as determined by the City.

2. Outdoor activity areas for residential development are considered to be the backyard patios or decks of single-family units and the common areas where people generally congregate for multi-family developments. Where common outdoor activity areas for multi-family developments comply with the outdoor noise level standard, the standard will not be applied at patios or decks of individual units provided noise-reducing measures are incorporated (e.g., orientation of patio/deck, screening of patio with masonry or other noise-attenuating material). Outdoor activity areas for non-residential developments are the common areas where people generally congregate, including pedestrian plazas, seating areas, and outside lunch facilities; not all residential developments include outdoor activity areas.

3. In areas where it is not possible to reduce exterior noise levels to achieve the outdoor activity area standard w using a practical application of the best noise-reduction technology, an increase of up to 5 Ldn over the standard will be allowed provided that available exterior noise reduction measures have been implemented and interior noise levels are in compliance with this table

4. Determined for a typical worst-case hour during periods of use.

Table PS-2: Performance Standards for Stationary Noise Sources, Including Affected Projects [1,2,3,4]

Noise Level Descriptor	Daytime	Nighttime
	7 am to 10 pm	10 pm to 7 am
Hourly Leq, dBA	55	50

1. Each of the noise levels specified above should be lowered by 5 dB for simple noise tones, noises consisting primarily of speech or music, or recurring impulsive noises. Such noises are generally considered to be particularly annoying and are a primary source of noise complaints.

2. No standards have been included for interior noise levels. Standard construction practices should, with the exterior noise levels identified, result in acceptable interior noise levels.

3. Stationary noise sources which are typically of concern include, but are not limited to, the following:

HVAC Systems	Cooling Towers/Evaporative Condensers
Pump Stations	Lift Stations
Emergency Generators	Boilers
Steam Valves	Steam Turbines
Generators	Fans
Air Compressors	Heavy Equipment
Conveyor Systems	Transformers
Pile Drivers	Grinders
Drill Rigs	Gas or Diesel Motors
Welders	Cutting Equipment
Outdoor Speakers	Blowers

4. The types of uses which may typically produce the noise sources described above include but are not limited to: industrial facilities, pump stations, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields.

ambient air quality standards are achieved and maintained over an area of approximately 10,743 square miles. This area includes all of Orange County and Los Angeles County except for the Antelope Valley, the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The SCAQMD reviews projects to ensure that they do not (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay the timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan. More information can be found on the agency's website: http://www.aqmd.gov/

CONSTRUCTION NOISE MODELING

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Building Construction	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Front End Loader	No	40		79.1	50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Crane	No	16		80.6	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Front End Loader	79.1	75.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	80.6	72.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	81.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Fine Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Dozer	No	40		81.7	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	84.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Paving	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Paver	No	50	77.2		50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Roller	No	20	80.0		50.0	0.0
Concrete Mixer Truck	No	40	78.8		50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Calculated (dBA) Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq	Day Lmax	Day Leq	Evening Lmax	Evening Leq	Night Lmax	Night Leq
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	80.0	73.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Concrete Mixer Truck	78.8	74.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	84.0	82.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Rough Grading	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Spec Usage (%)	Actual Lmax (dBA)	Receptor Lmax (dBA)	Estimated Distance (feet)	Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Tractor	No	40	84.0		50.0	0.0
Dozer	No	40		81.7	50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	84.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Baselines (dBA)

Description	Land Use	Daytime	Evening	Night
Site Preparation	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85.0		50.0	0.0
Tractor	No	40	84.0		50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA)				Noise Limit Exceedance (dBA)					
			Day		Evening		Night		Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Grader	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tractor	84.0	80.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	83.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 06/16/2023
Case Description: SVU-13.11

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Utilities Trenching	Residential	60.0	55.0	50.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40		80.7	50.0	0.0

Results

Equipment	Calculated (dBA) Lmax	Leq	Noise Limits (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq	Noise Limit Exceedance (dBA) Day Lmax	Leq	Evening Lmax	Leq	Night Lmax	Leq
Excavator	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	80.7	76.7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

SVU-13.11 - Construction Noise Modeling Attenuation Calculations

Levels in dBA Leq

Phase	RCNM Reference Noise Level	Residence to the Northwest at 22891 Loumont Drive	Residence to the East at 24662 Coleford Street	Residence to the South at 23022 Dune Mear Road	Residence to the Southwest at 24552 Blackfoot Drive
Distance in feet	*50*	*600*	*440*	*245*	*245*
Site Preparation	84.0	62.4	65.1	70.2	70.2
Rough Grading	85.0	63.4	66.1	71.2	71.2
Fine Grading	85.0	63.4	66.1	71.2	71.2
Distance in feet	*50*	*540*	*195*	*310*	*115*
Building Construction	82.0	61.3	70.2	66.2	74.8
Paving	83.0	62.3	71.2	67.2	75.8
Utilities Trenching	77.0	56.3	65.2	61.2	69.8

Attenuation calculated through Inverse Square Law: Lp(R2) = Lp(R1) - 20Log(R2/R1)

	RCNM Reference Noise Level	Residence to the West
Distance in feet	*3*	*150*
HVAC	72.0	38.0

SVU-13.11 - Vibration Damage Attenuation Calculations

		Levels, PPV (in/sec)			
	Vibration Reference Level	**Residence to the Northwest at 22891 Loumont**	**Residence to the East at 24662 Coleford Street**	**Residence to the South at 23022 Dune Mear Road**	**Residence to the Southwest at 24552 Blackfoot Drive**
Distance in feet	**at *25 feet***	*565*	*330*	*175*	*150*
Vibratory Roller	0.21	0.002	0.004	0.011	0.014
Static Roller	0.05	0.000	0.001	0.003	0.003
Large Bulldozer	0.089	0.001	0.002	0.005	0.006
Caisson Drilling	0.089	0.001	0.002	0.005	0.006
Loaded Trucks	0.076	0.001	0.002	0.004	0.005
Jackhammer	0.035	0.000	0.001	0.002	0.002
Small Bulldozer	0.003	0.000	0.000	0.000	0.000

SVU-13.11 - Vibration Annoyance Attenuation Calculations

Levels in VdB

Equipment	Vibration @ 25 ft	Residence to the Northwest at 22891 Loumont Drive	Residence to the East at 24662 Coleford Street	Residence to the South at 23022 Dune Mear Road	Residence to the Southwest at 24552 Blackfoot Drive
Distance in feet		*565*	*330*	*175*	*150*
Vibratory Roller	94.0	53.4	60.4	68.6	70.7
Static Roller	82.0	41.4	48.4	56.6	58.7
Large Bulldozer	87.0	46.4	53.4	61.6	63.7
Caisson Drilling	87.0	46.4	53.4	61.6	63.7
Loaded Trucks	86.0	45.4	52.4	60.6	62.7
Jackhammer	79.0	38.4	45.4	53.6	55.7
Small Bulldozer	58.0	17.4	24.4	32.6	34.7

TRAFFIC NOISE MODELING

SVU-13.11

Traffic Noise Calculations

	ADT Volumes				dBA CNEL Increase		
Roadway Segment	Existing No Project	Existing Plus Project	Future No Project	Future Plus Project	Project Noise Increase	Cumulative Increase	Project Cumulative Contribution
Blackfoot Drive North of Loumont Drive	1,200	1,910	1,240	1,950	2.02	2.11	1.97
Blackfoot Drive South of Loumont Drive	1,300	1,900	1,340	1,940	1.65	1.74	1.61
Costa Bella Drive West of Blackfoot Drive	850	1,170	880	1,200	1.39	1.50	1.35
Costa Bella Drive East of Blackfoot Drive	850	1,250	880	1,280	1.67	1.78	1.63
Loumont Drive East of Blackfoot Drive	1,000	1,760	1,030	1,790	2.46	2.53	2.40
Loumont Drive East of Muirlands Boulevard	850	1,170	880	1,200	1.39	1.50	1.35
Dune Mear Road West of Blackfoot Drive	2,000	2,870	2,060	2,930	1.57	1.66	1.53
Dune Mear Road East of Blackfoot Drive	1,000	1,270	1,030	1,300	1.04	1.14	1.01
Entradas Drive East of Muirlands Boulevard	1,900	2,770	1,960	2,830	1.64	1.73	1.60
Coleford Street South of Ridgeroute Drive	700	1,100	720	1,120	1.96	2.04	1.92
Muirlands Boulevard North of Loumont Drive	17,600	18,410	18,130	18,940	0.20	0.32	0.19
Muirlands Boulevard Between Loumont Drive and Entradas Drive	17,600	18,070	18,130	18,600	0.11	0.24	0.11
Muirlands Boulevard South of Entradas Drive	17,600	18,000	18,130	18,530	0.10	0.22	0.09
Ridgeroute Drive West of Coleford Street	7,200	7,360	7,420	7,580	0.10	0.22	0.09
Ridgeroute Drive East of Coleford Street	7,200	7,440	7,420	7,660	0.14	0.27	0.14

Appendix C Traffic Impact Analysis

Appendix

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TRAFFIC IMPACT ANALYSIS

FOR THE PROPOSED EXPANSION OF

OXFORD PREPARATORY ACADEMY

LAKE FOREST

Prepared for

PLACEWORKS
&
SADDLEBACK VALLEY UNIFIED SCHOOL DISTRICT

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I.
INTRODUCTION AND STUDY METHODOLOGY

This traffic analysis was conducted to determine the impacts of the proposed expansion of the existing Oxford Preparatory Academy in Lake Forest. Eighteen relocatable classrooms would be provided to accommodate 7th and 8th grade students. The location of Oxford Preparatory Academy is shown on Figure 1 and the proposed site plan is shown on Figure 2.

The Oxford Preparatory Academy campus is bounded by Loumont Drive on the north, Blackfoot Drive on the west, and Dune Mear Road on the south. The current enrollment capacity is 448 students in grades TK through 6. The proposed project would increase the capacity of the school to 1,200 students in grades TK through 8.

The objective of the traffic analysis is to quantify the impacts of the proposed project on the streets and intersections in the vicinity of the school site. The methodology for the traffic study, in general, was to l) establish the baseline (2023) traffic conditions on the streets that provide access to the school site, 2) project the future baseline traffic conditions for the first year of operation for the proposed project (year 2024), 3) estimate the levels of traffic that would be generated by the proposed school expansion, 4) add the traffic that would be generated by the project to the baseline traffic volumes to establish the traffic conditions with the proposed project, 5) conduct a comparative level of service analysis for the scenarios with and without the proposed project, and 6) evaluate vehicle, pedestrian, and bicycle safety issues, vehicle miles traveled (VMT), and emergency access.

The traffic analysis is based on morning peak hour traffic volumes on the streets and intersections in the project area because traffic that is generated by the school in the morning generally coincides with the morning commuter peak period. The afternoon peak period was not evaluated because the afternoon peak hour of traffic activity for a school does not typically coincide with the commuter peak hour on the roadway network. The afternoon commuter peak period generally occurs from approximately 5:00 to 6:00 p.m., while a K-8 school generally experiences its peak traffic activity between 2:00 and 3:00 p.m. when the background traffic volumes are relatively light (as compared to the peak hours).

The traffic analysis addresses the impacts at six intersections in the vicinity of the school site. The study area intersections and the type of traffic control at each intersection are listed below in Table 1. All of the intersections are in the jurisdiction of the City of Lake Forest.

TABLE 1 STUDY AREA INTERSECTIONS	
Intersection	**Traffic Control**
Blackfoot Drive at Costa Bella Drive	No Stop Signs – T Intersection
Blackfoot Drive at Loumont Drive	No Stop Signs – T Intersection
Blackfoot Drive at Dune Mear Road	No Stop Signs – T Intersection
Muirlands Boulevard at Loumont Drive	Stop Sign on Loumont Drive
Muirlands Boulevard at Entradas Drive	Stop Signs on Entradas Drive
Ridge Route Drive at Coleford Street	Stop Sign on Coleford Street

The traffic impact analysis is based on an evaluation of the levels of service at the affected study area intersections. Level of service (LOS) is an industry standard by which the operating conditions of a roadway segment or an intersection are measured. LOS is defined on a scale of A through F with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS A is characterized as having free flowing traffic conditions with no restrictions on maneuvering or operating speeds and little or no delays, where traffic volumes are low and travel speeds are high. LOS F is characterized as having forced flow with many stoppages, extensive delays, and low operating speeds.

According to the performance criteria cited in the "City of Lake Forest Transportation Analysis Guidelines" (July 21, 2020), LOS A through D represents acceptable conditions, while LOS E and F represent congested, over-capacity conditions. The levels of service at the intersections in the study area were determined by using the Intersection Capacity Utilization (ICU) methodology, as specified in the City of Lake Forest's guidelines. A delay-based level of service analysis was also conducted using the Highway Capacity Manual methodology to address project-related delays for turning movements at the intersections.

The levels of service for the intersections in the vicinity of the school were analyzed for the following scenarios:

- Existing conditions (2023)
- Existing conditions plus the proposed project
- Future baseline conditions without the proposed project for the target year of 2024
- Future conditions with the proposed project.

Although this report was completed in the year 2024, the baseline traffic counts were taken in 2023 when the analysis was initiated. So existing conditions represent the year 2023 when the counts were taken. The year 2024 was used for the future target year as that is anticipated to be the first year of operation for the proposed project.

II.
BASELINE TRAFFIC CONDITIONS

The street network in the project vicinity, the existing and future baseline traffic volumes, and the levels of service at the affected study area intersections are described below.

Street Network

The local streets that provide access to the school site include Loumont Drive, Blackfoot Drive, Dune Mear Road, Coleford Street, Costa Bella Drive, Corta Cresta Drive, and Entradas Drive. The arterial streets that provide access to the project area include Muirlands Boulevard and Ridge Route Drive. The following paragraphs provide a brief description of the characteristics of these streets. A figure showing the study area street network, the types of traffic control at each intersection, and the lane configuration at each intersection is provided as Figure 3.

Loumont Drive is a two lane east-west street that abuts the north side of the school site. The exit driveway from the school's parking lot feeds into Loumont Drive east of Blackfoot Drive. A segment of Loumont Drive also provides a link between Corta Cresta Drive and Muirlands Boulevard and serves as an entrance/exit for the residential neighborhood in which the school is located. The speed limit on Loumont Drive is 25 miles per hour (mph).

Blackfoot Drive is a two lane north-south street that abuts the west side of the school site. The entrance driveway to the school's parking lot is accessed from Blackfoot Drive south of Loumont Drive and the speed limit is 25 mph.

Dune Mear Road is a two lane east-west street that abuts the south side of the school site adjacent to the school's playfields. The speed limit on Dune Mear Road is 25 mph.

Coleford Street is a two lane north-south street located 130 feet east of the school site. There is a row of single-family residences between the school campus and Coleford Street. A segment of Coleford Street also provides a link between Costa Bella Drive and Ridge Route Drive and serves as an entrance/exit for the residential neighborhood in which the school is located. The speed limit on Coleford Street is 25 mph.

Costa Bella Drive is a two lane east-west street located approximately 320 feet (one block) north of the school site. The speed limit on Costa Bella Drive is 25 mph.

Corta Cresta Drive is a two lane north-south street located approximately 320 feet (one block) west of the school site. The speed limit on Corta Cresta Drive is 25 mph.

Entradas Drive is a short two lane east-west street that provides a link between Corta Cresta Drive and Muirlands Boulevard and serves as an entrance/exit for the residential neighborhood in which the school is located. The speed limit on Entradas Drive is 25 mph.

Muirlands Boulevard is a four lane north-south street located approximately 500 feet west of the school site. It has a center left turn lane and bike lanes on both sides of the street. It is classified as a primary arterial roadway in the Mobility Element of the "Lake Forest General Plan 2040" and the speed limit is 45 mph.

Ridge Route Drive is a four lane east-west street located approximately 500 feet north of the school site. It has a raised median with periodic left turn pockets and bike lanes on both sides of the street.

It is classified as a secondary arterial roadway in the Mobility Element and the speed limit is 40 mph.

Existing Traffic Volumes

Manual traffic counts were taken at the study area intersections on Wednesday, June 7, 2023, during the morning peak period. Figure 4 shows the existing peak hour traffic volumes and turning movements at each intersection. The traffic counts were taken from 7:00 to 9:00 a.m. and the highest one-hour period of traffic flow was determined for each intersection. The morning peak hour generally occurs between 7:30 and 8:30 a.m. The afternoon peak period was not addressed in the traffic impact analysis because the peak period of traffic activity for a K-8 school typically occurs from 2:00 to 3:00 p.m., which does not coincide with the late afternoon commuter peak hour, which occurs generally from 5:00 to 6:00 p.m.

Existing Intersection Levels of Service

To quantify the existing baseline traffic conditions, the six study area intersections were analyzed to determine their operating conditions during the morning peak hour. The operating conditions are identified based on the levels of service (LOS) that were calculated for each intersection.

The LOS values were determined by calculating the intersection capacity utilization (ICU) values. ICU is a measure of an intersection's traffic volumes as compared to the theoretical capacity of the intersection. It is essentially the same as a volume/capacity ratio. The relationship between ICU values and levels of service is shown in Table 2.

TABLE 2
RELATIONSHIP BETWEEN ICU VALUES & LEVELS OF SERVICE

Level of Service	ICU Value
A	0.00 to 0.60
B	> 0.60 to 0.70
C	> 0.70 to 0.80
D	> 0.80 to 0.90
E	> 0.90 to 1.00
F	> 1.00

Based on the peak hour traffic volumes, the turning movement volumes, and the number of lanes at each intersection, the levels of service have been determined for the study area intersections, as summarized in Table 3. These values represent the existing 2023 traffic conditions without the project.

TABLE 3 EXISTING (2023) INTERSECTION LEVELS OF SERVICE	
Intersection	**ICU Value & Level of Service AM Peak Hour**
Blackfoot Drive at Costa Bella Drive	0.233 – A
Blackfoot Drive at Loumont Drive	0.221 – A
Blackfoot Drive at Dune Mear Road	0.315 – A
Muirlands Boulevard at Loumont Drive	0.353 – A
Muirlands Boulevard at Entradas Drive	0.365 – A
Ridge Route Drive at Coleford Street	0.191 – A

As shown in Table 3, the study area intersections all currently operate at an acceptable level of service (LOS A through D) during the morning peak hour as all six of the intersections operate at LOS A.

Future Baseline Traffic Conditions

The future (year 2024) baseline traffic conditions without the project were estimated by considering the effects of general ambient regional growth and the cumulative increase in traffic volumes that would be generated by ongoing development in the project area. As the relocatable buildings are proposed to be installed and occupied in the year 2024, that is the target year for the future baseline analysis.

The future baseline traffic volumes were forecast by multiplying the existing traffic volumes by a growth factor of three percent, which accounts for the traffic increases associated with general regional growth and local development in the study area. The projected future baseline traffic volumes without the proposed project for the target year of 2024 are shown on Figure 5.

Based on the projected peak hour traffic volumes and turning movement counts, the future baseline ICU values and levels of service were calculated for each study area intersection, as summarized in Table 4 for the target year of 2024. Table 4 indicates that all six of the study area intersections are projected to operate at acceptable levels of service during the morning peak hour as all of the intersections would operate at LOS A.

TABLE 4 FUTURE BASELINE INTERSECTION LEVELS OF SERVICE WITHOUT PROJECT	
Intersection	**ICU & Level of Service AM Peak Hour**
Blackfoot Drive at Costa Bella Drive	0.237 – A
Blackfoot Drive at Loumont Drive	0.226 – A
Blackfoot Drive at Dune Mear Road	0.323 – A
Muirlands Boulevard at Loumont Drive	0.361 – A
Muirlands Boulevard at Entradas Drive	0.374 – A
Ridge Route Drive at Coleford Street	0.196 – A

III.
TRAFFIC IMPACT ANALYSIS

The following sections summarize the analysis of the project's impacts on study area traffic conditions. First is a discussion of project generated traffic volumes. This is followed by an analysis of the impacts of the proposed project on traffic volumes and intersection levels of service in the vicinity of the project site. Then the impacts associated with vehicle miles traveled (VMT), bicycle and pedestrian safety, traffic hazards, and emergency access are presented.

Project Generated Traffic

The volumes of traffic expected to be generated by the proposed school expansion were determined in order to estimate the impacts of the project on the study area streets and intersections. Table 5 shows the estimated volumes of project generated traffic for an average day and for the morning and afternoon peak hours. The trip generation rates are from the Institute of Transportation Engineers *Trip Generation Manual* (11th Edition, 2021). Although the trip generation rates and traffic volumes shown in Table 5 for the school are based on the number of students, the data represent the total number of vehicle trips generated by the school expansion, including staff/faculty vehicles, drop-off/pick-up activities, visitors, and deliveries.

TABLE 5
PROJECT GENERATED TRAFFIC

Land Use	AM Peak Hour			PM Peak Hour			Daily Traffic
	Total	In	Out	Total	In	Out	
TRIP GENERATION RATES (vehicle trips per student)							
Middle School	0.74	55%	45%	0.36	46%	54%	2.10
GENERATED TRAFFIC VOLUMES							
Middle School (752 additional students)	556	306	250	271	125	146	1,580

Table 5 indicates that the proposed project would generate an estimated 556 vehicle trips during the morning peak hour (306 inbound and 250 outbound), 271 trips during the afternoon peak hour (125 inbound and 146 outbound), and approximately 1,580 vehicle trips per day.

It should be noted that the traffic volumes shown in Tables 5 do not necessarily introduce new traffic to the overall roadway network but instead represent the traffic that would be re-directed to this school site from other existing schools, because the number of students attending school in the district is a function of the school-age population and the demand for educational facilities. Most of the school-related traffic would be traveling on the roadway network regardless of the status of the proposed project. It has been assumed for the traffic analysis, however, that the additional site-generated traffic would be new traffic on the roadway network.

Projected Traffic Volumes

To quantify the increase in traffic volumes at each intersection resulting from the proposed school expansion, the project generated traffic was geographically distributed onto the street network

using the directional percentages shown on Figure 6. The distribution assumptions are based on the layout of the street network, the existing traffic patterns, and the anticipated geographical distribution of the students who would attend the school.

Using the generated traffic volumes shown in Table 5 and the geographical distribution assumptions shown on Figure 6, the volumes of project traffic on each access street and at each study area intersection were determined for the traffic impact analysis. The volumes of project generated traffic at each study area intersection are shown on Figure 7.

The traffic impact analysis considers two scenarios. One is the project's impacts on existing conditions (2023) and the other is the project's impacts on the projected year 2024 conditions. To quantify the impacts on existing conditions, the project generated traffic volumes shown on Figure 7 were added to the existing traffic volumes. The resulting "existing plus project" traffic volumes are shown on Figure 8.

The total volumes of traffic projected for the year 2024 scenario were determined by adding the project generated traffic to the future baseline traffic volumes. These projected traffic volumes are shown on Figure 9.

Significance Criteria

The "City of Lake Forest Transportation Analysis Guidelines" indicates that the level of service performance standard for streets and intersections is LOS D or better. Based on the LOS D threshold of significance, an intersection would be significantly impacted and mitigation would be required if a project would result in a change from LOS A through D to LOS E or F or if the project would result in an increase of 0.02 or greater in the ICU value at an intersection that is projected to operate at LOS E or F. The impacts would not be significant at intersections that are projected to operate at LOS A through D.

With regard to the CEQA thresholds of significance, Appendix G of the CEQA Guidelines states that a project would normally have a significant effect on the environment if the project could:

T-1 Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities,

T-2 Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), which addresses vehicle miles traveled (VMT),

T-3 Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment), or

T-4 Result in inadequate emergency access.

Intersection Impact Analysis

The impact analysis for the six study area intersections was conducted by comparing the ICU values and levels of service (LOS) for the "without project" and "with project" scenarios. For the existing conditions scenario, the analysis compares the existing conditions (2023) to the conditions with the proposed project. Similarly, for the year 2024 scenario, the analysis compares the year 2024 baseline conditions without the proposed project to the year 2024 scenario with the proposed project. The year 2024 was used as the target year for future conditions as that is anticipated to be the first year that the proposed project would be completed and operational.

The comparative levels of service at the study area intersections for the existing conditions baseline scenario are summarized in Table 6. The table shows the before and after ICU values and levels of service that would occur at each study area intersection. Also shown are the increases in the ICU values that would occur as a result of the proposed project. The last column in Table 6 indicates if the intersections would be significantly impacted by the proposed project.

The intersection of Blackfoot Drive and Costa Bella Drive, for example, operates with an ICU value of 0.233 and LOS A for existing conditions and would operate with an ICU value of 0.381 and LOS A for the existing plus project scenario, which represents an increase of 0.148 in the ICU value. This impact would be less than significant according to the criteria outlined above because the intersection would continue to operate at an acceptable LOS A.

TABLE 6
PROJECT IMPACT ON INTERSECTION LEVELS OF SERVICE
EXISTING CONDITIONS AS BASELINE

Intersection	ICU Value & LOS		Increase In ICU Value	Signif-icant Impact
	Existing Conditions	Existing Plus Project		
Blackfoot Drive at Costa Bella Drive	0.233 – A	0.381 – A	0.148	No
Blackfoot Drive at Loumont Drive	0.221 – A	0.399 – A	0.178	No
Blackfoot Drive at Dune Mear Road	0.315 – A	0.493 – A	0.178	No
Muirlands Boulevard at Loumont Drive	0.353 – A	0.454 – A	0.101	No
Muirlands Boulevard at Entradas Drive	0.365 – A	0.508 – A	0.143	No
Ridge Route Drive at Coleford Street	0.191 – A	0.256 – A	0.065	No

Table 6 indicates that none of the study area intersections would be significantly impacted by the additional traffic that would be generated by the proposed project for the existing conditions baseline scenario because all of the intersections would continue to operate at an acceptable LOS A.

The before-and-after ICU values and levels of service at each of the study area intersections are summarized in Table 7 for the year 2024 baseline scenario. The table shows the projected 2024 traffic conditions without the project, the 2024 traffic conditions with the project, and the change in the ICU values associated with the project. The last column in Table 7 indicates if the intersection would be significantly impacted by the project traffic.

Table 7 indicates that none of the study area intersections would be significantly impacted by the additional traffic that would be generated by the proposed project for the year 2024 baseline scenario because all of the intersections would continue to operate at an acceptable LOS A.

TABLE 7 PROJECT IMPACT ON INTERSECTION LEVELS OF SERVICE YEAR 2024 AS BASELINE				
Intersection	ICU Value & LOS		Increase In ICU Value	Signif-icant Impact
	2024 Without Project	2024 With Project		
Blackfoot Drive at Costa Bella Drive	0.237 – A	0.386 – A	0.149	No
Blackfoot Drive at Loumont Drive	0.226 – A	0.404 – A	0.178	No
Blackfoot Drive at Dune Mear Road	0.323 – A	0.501 – A	0.178	No
Muirlands Boulevard at Loumont Drive	0.361 – A	0.464 – A	0.103	No
Muirlands Boulevard at Entradas Drive	0.374 – A	0.516 – A	0.142	No
Ridge Route Drive at Coleford Street	0.196 – A	0.259 – A	0.063	No

Tables 6 and 7 indicate that the proposed project would not have a significant impact at any of the study area intersections based on the significance criteria presented previously because the intersections would all continue to operate at an acceptable LOS A. As there would be no significant impacts, no capacity-related mitigation measures would be required.

As the LOS data provided in Tables 6 and 7 represent an analysis of traffic conditions based on the intersection capacity utilization (ICU) values, as specified in the City of Lake Forest guidelines, an additional analysis of the intersections has been done based on delay values for the critical turning movements at each intersection. This analysis uses the Highway Capacity Manual methodology, which calculates levels of service for each movement based on average vehicle delay values. The relationship between average delay values and levels of service is shown in Table 8.

TABLE 8 RELATIONSHIP BETWEEN DELAY VALUES & LEVELS OF SERVICE	
Level of Service	Average Delay Value (seconds) Unsignalized Intersections
A	0.0 to 10.0
B	> 10.0 to 15.0
C	> 15.0 to 25.0
D	> 25.0 to 35.0
E	> 35.0 to 50.0
F	> 50.0

The average delay values and levels of service for the most-heavily delayed movement at each study area intersection are shown in Table 9. As shown, one of the intersections would operate at LOS B, two intersections would operate at LOS C, and three intersections would operate at LOS D. These delay values are for the movement at the intersections that would experience the highest delays, which is typically a left turn movement. Table 9 indicates that the delay-based LOS values at all six intersections for the most critical movements would remain at an acceptable level (LOS D or better) for the "year 2024 with project" scenario.

TABLE 9 INTERSECTION DELAY VALUES & LEVELS OF SERVICE YEAR 2024 WITH PROJECT	
Intersection	**Delay Value & Level of Service AM Peak Hour**
Blackfoot Drive at Costa Bella Drive	27.8 – D
Blackfoot Drive at Loumont Drive	30.8 – D
Blackfoot Drive at Dune Mear Road	19.9 – C
Muirlands Boulevard at Loumont Drive	19.4 – C
Muirlands Boulevard at Entradas Drive	33.8 – D
Ridge Route Drive at Coleford Street	11.7 – B

Non-Motorized Transportation and Transit

The proposed project would generate an increased demand for non-motorized travel as some students would travel to and from the school as pedestrians or on bicycles. The streets in the vicinity of the school site have sidewalks along both sides of the street, the Loumont Drive/Blackfoot Drive intersection has a painted crosswalk across Loumont Drive, and crossing guards are deployed to assist with pedestrian crossings during the peak arrival and departure times at the school. The crosswalk is yellow to inform motorists that they are in a school zone. Bike lanes are currently in place on both sides of Muirlands Boulevard and Ridge Route Drive and bike racks are available at the existing school campus.

With regard to public transit, the Orange County Transportation Authority (OCTA) operates several bus routes that pass through the school area. Route 177 runs along Muirlands Boulevard and Lake Forest Drive west of and north of the school site, Route 86 runs along Jeronimo Road east of the school site, and Route 89 runs along El Toro Road south of the school site. These bus lines could potentially be used by students and staff at the school.

The proposed project would not adversely affect the performance of any transit or non-motorized transportation facilities and would not conflict with any plans or policies relative to these transportation modes. The proposed project would be consistent with policies supporting alternative transportation because bike lanes and sidewalks are provided on the streets in the vicinity of the school, bike racks are provided at the school campus, and transit routes are available in the vicinity of the school.

Based on the LOS analysis and the discussion of non-motorized transportation and transit, the proposed project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Vehicle Miles Traveled (VMT)

The "VMT Impact Analysis" section of the City of Lake Forest "Transportation Analysis Guidelines" states that public facilities that are publicly owned or controlled, such as K-12 schools located within established communities and serving local needs, are assumed to cause a less-than-significant transportation impact. As the proposed expansion of an existing K-6 school to include

grades 7 and 8 falls into this category of a locally serving public facility, it can be screened from requiring a detailed VMT analysis.

In addition, the County of Orange "Guidelines for Evaluating VMT Under CEQA" state that the development of public facilities, which includes institutional/government and public service uses, can be screened from a CEQA VMT analysis. As the proposed project is included in the public facilities category, it can be screened in accordance with the Orange County guidelines.

Most of the traffic that would be generated by the project consists of trips associated with the transport of students to and from the school site. These student-related trips would not result in an incremental increase in the VMT because these trips would occur regardless of the status of the proposed project. Students would be transported to other schools in the District if the proposed relocatable classrooms were not installed. The proposed project would not, therefore, result in an increase in VMT for student trips.

Traffic Hazards and Incompatible Uses

Vehicular access to the school site would not change as a result of the proposed project. The school site is currently accessed via an ingress driveway on the east side of Blackfoot Drive south of Loumont Drive and an egress driveway on the south side of Loumont Drive east of Blackfoot Drive. The increased levels of traffic, the increased number of pedestrians, and the increased number of vehicular turning movements that would occur at the school driveways and at the nearby intersections would result in an increased number of traffic conflicts and a corresponding increase in the probability of an accident occurring. These impacts would not be significant, however, because the streets, intersections, and driveways are designed to accommodate the anticipated levels of vehicular and pedestrian activity. These streets and intersections have been accommodating school-related traffic on a daily basis for the existing Oxford Preparatory Academy and the conditions would not substantially change as a result of the proposed project.

The addition of relocatable classrooms at the school would be compatible with the neighborhood and would not result in any major hazards for vehicular traffic, pedestrians, or bicyclists. The streets in the vicinity of the school site have sidewalks along both sides of the street and the intersection of Blackfoot Drive and Loumont Drive adjacent to the school site is equipped with a painted crosswalk and has crossing guards to assist with pedestrian crossings. These features enhance pedestrian safety and facilitate pedestrian access to the school.

With regard to bicycle amenities in the vicinity of the school site, Muirlands Boulevard and Ridge Route Drive have bike lanes on both sides of the streets. In addition, bike racks are available for use on the school campus.

As the existing roadway network, including the pedestrian and bicycle circulation features, could readily accommodate the anticipated increase in vehicular, pedestrian, and bicycle activity, the proposed project would not substantially increase hazards due to a geometric design feature or incompatible uses.

Emergency Access

The access and circulation features at the existing school, including the driveways, on-site roadways, parking lots, and fire lanes, would continue to accommodate emergency ingress and egress by fire trucks, police units, and ambulance/paramedic vehicles. All access features were subject to and satisfied the design requirements of the District, the City of Lake Forest, and the

Division of the State Architect (DSA). Emergency vehicles would be able to access the school grounds, the buildings, and all other areas of the school campus, including the play fields, via existing on-site travel corridors. The proposed project would not, therefore, result in inadequate emergency access.

IV.
SUMMARY OF IMPACTS AND CONCLUSIONS

The key findings and conclusions of the traffic impact analysis are outlined below.

- The proposed relocatable classrooms, which would accommodate an additional 752 students at the school, would generate an estimated 556 vehicle trips during the morning peak hour (306 inbound and 250 outbound), 271 trips during the afternoon peak hour (125 inbound and 146 outbound), and 1,580 trips per day.
- The levels of traffic generated by the project would not result in a significant impact at any of the study area intersections based on the projected levels of service and the significance criteria used by the City of Lake Forest for evaluating significant traffic impacts.
- All six of the study area intersections are projected to operate at an acceptable level of service A (LOS A) during the morning peak period based on the intersection capacity utilization (ICU) calculations. The City of Lake Forest guidelines indicate that LOS A through D represents acceptable conditions. The afternoon peak hour was not addressed because the school-generated traffic does not coincide with the afternoon commuter peak period.
- An analysis of average vehicle delays at the study area intersections indicates that the most critically impacted turning movements at the intersections would operate at LOS B, C, and D for the "2024 with project" scenario. This represents acceptable levels of service.
- CEQA threshold of significance T-1 asks if the proposed project would conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities. The analysis indicates that the impact would be less than significant because:
    - The intersection levels of service would not be exceeded as a result of the proposed project, and
    - The proposed project would not adversely affect the performance or safety of any transit or non-motorized transportation facilities (pedestrians and bicycles) and would not conflict with any adopted plans, policies, or programs relative to these alternative transportation modes.
- CEQA threshold of significance T-2 asks if the proposed project would conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b), which addresses vehicle miles traveled (VMT). The analysis indicates that the impact would be less than significant because the proposed project is a local serving public use and it would not result in an overall increase in student-related vehicle trips.
- CEQA threshold of significance T-3 asks if the proposed project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). The analysis indicates that the streets, intersections, and driveways are designed to accommodate the anticipated levels of vehicular and pedestrian activity and that the streets have been readily accommodating the traffic generated by the existing Oxford Preparatory Academy. The addition of the proposed relocatable classrooms would be compatible with the neighborhood and the

proposed project would not result in any major hazards for vehicular traffic, pedestrians, or bicyclists. The proposed project would not, therefore, substantially increase hazards due to a geometric design feature or incompatible uses.

- CEQA threshold of significance T-4 asks if the proposed project would result in inadequate emergency access. The existing access and circulation features at the school, including the driveways, on-site roadways, parking lots, and fire lanes, would accommodate emergency ingress and egress by fire trucks, police units, and ambulance/paramedic vehicles. Emergency vehicles would be able to access the school grounds, the buildings, and all other areas of the school, including the play fields, via on-site travel corridors. The proposed project would not result in inadequate emergency access.

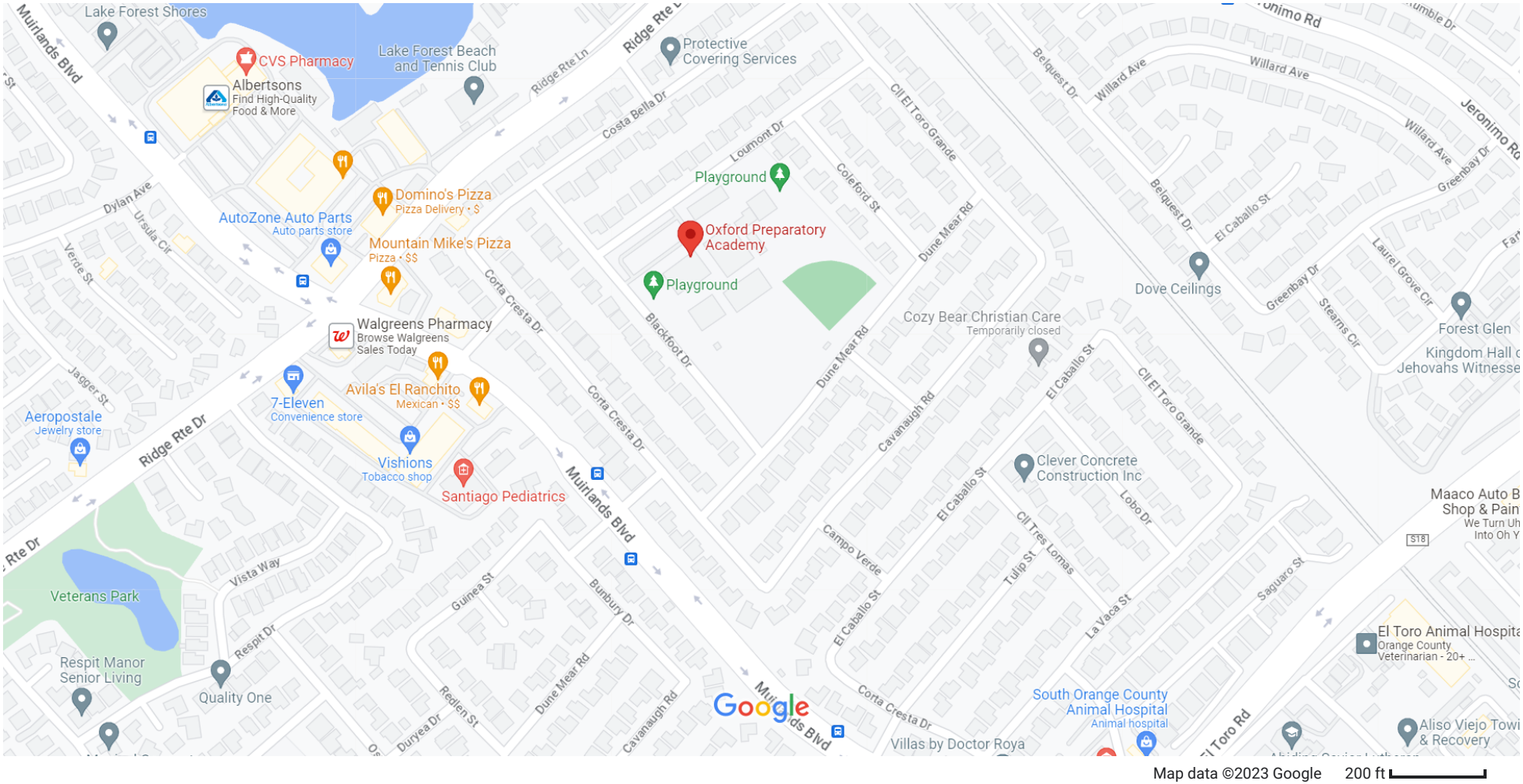

FIGURE 1
LOCATION MAP
OXFORD PREPARATORY ACADEMY - LAKE FOREST

OXFORD PREPARATORY ACADEMY

FIGURE 2
SITE PLAN
OXFORD PREPARATORY ACADEMY - LAKE FOREST

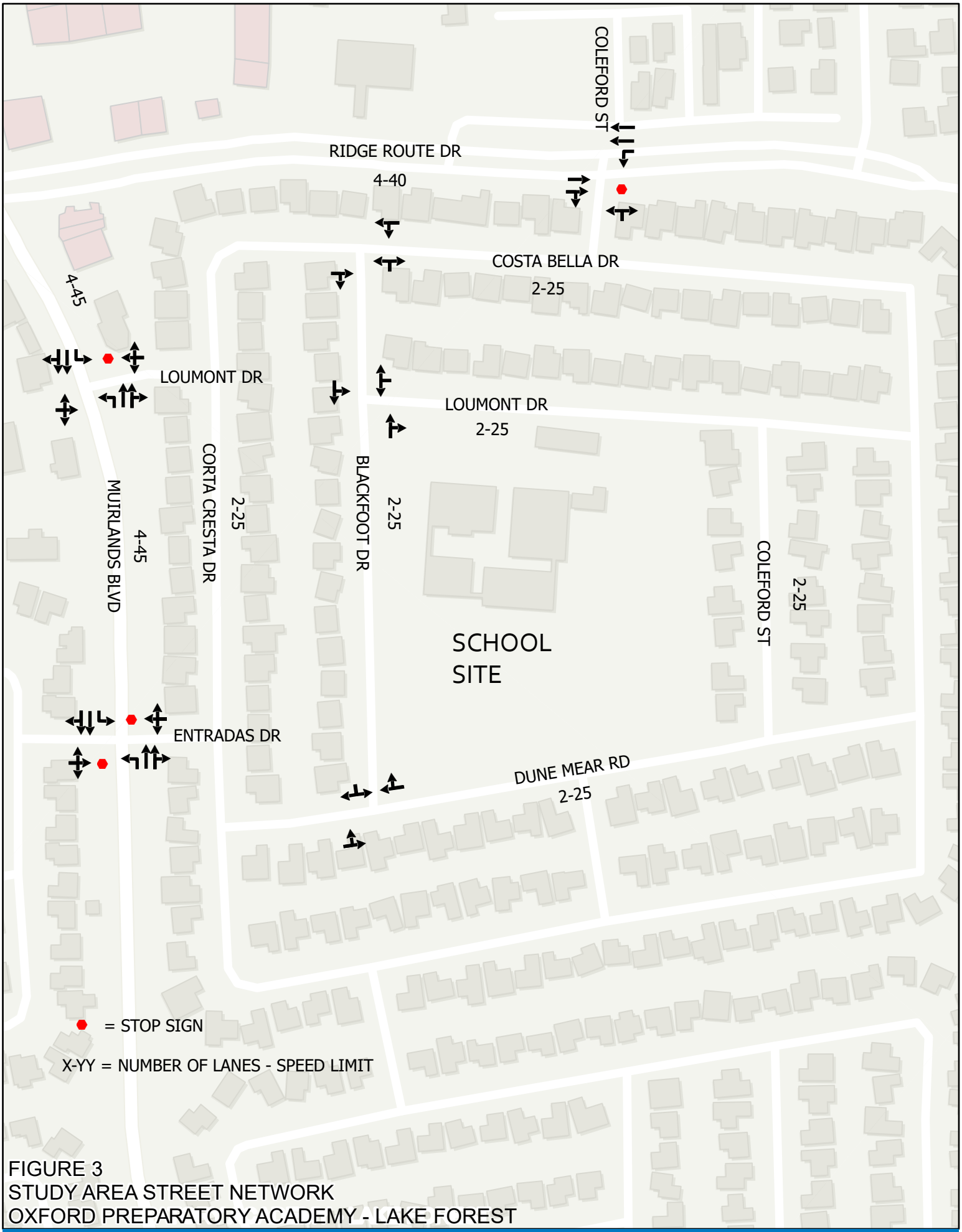

FIGURE 3
STUDY AREA STREET NETWORK
OXFORD PREPARATORY ACADEMY - LAKE FOREST

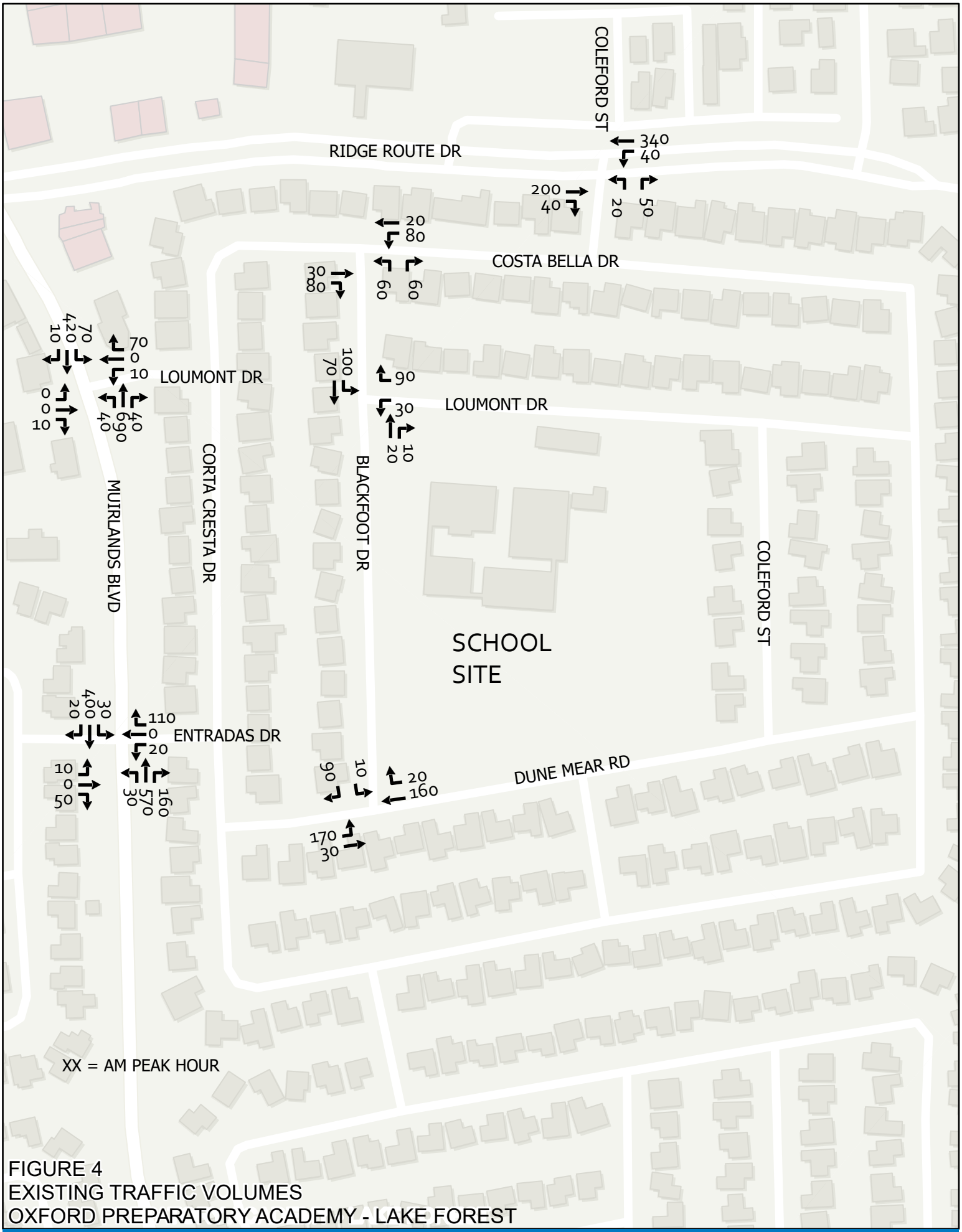

FIGURE 4
EXISTING TRAFFIC VOLUMES
OXFORD PREPARATORY ACADEMY - LAKE FOREST

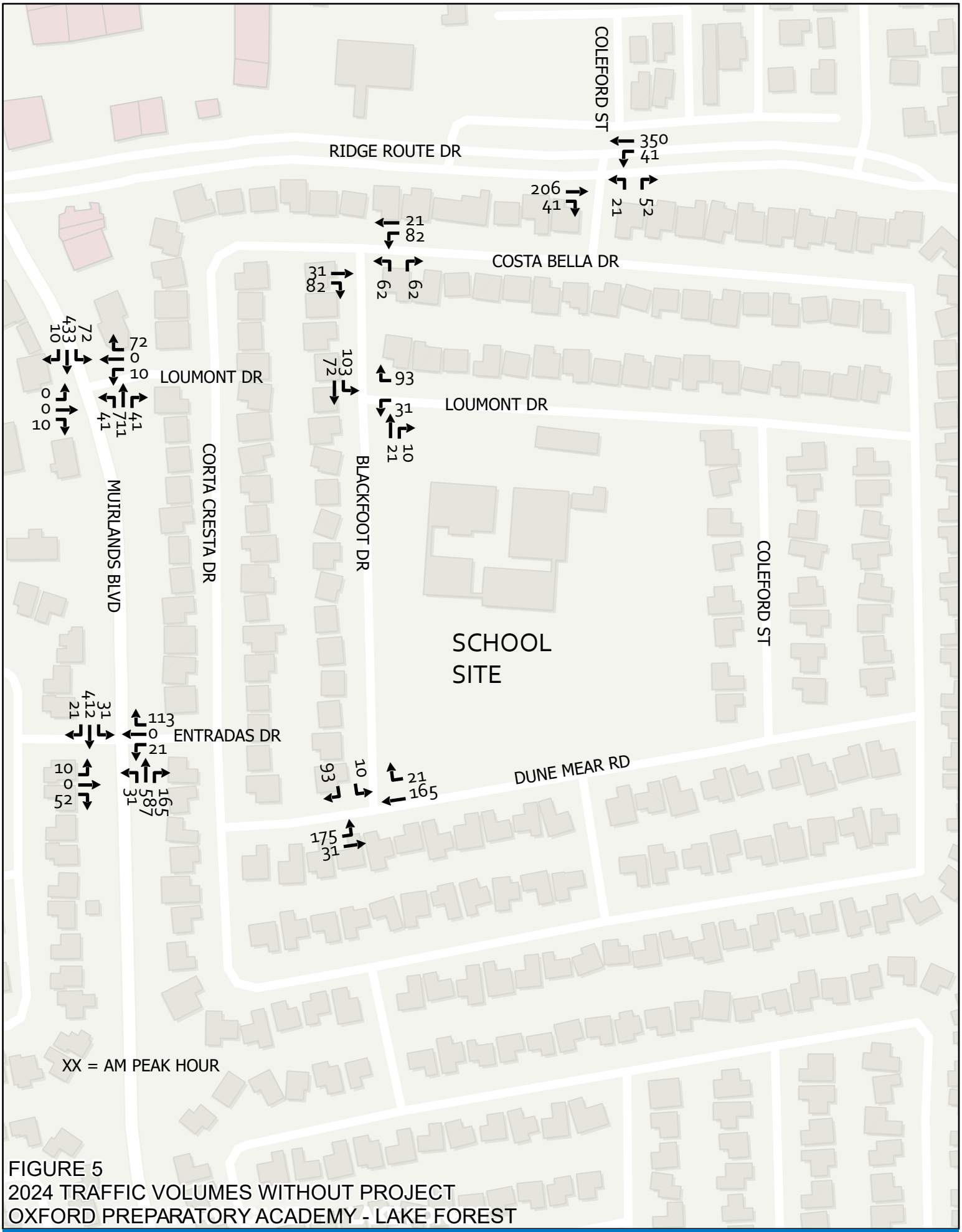

FIGURE 5
2024 TRAFFIC VOLUMES WITHOUT PROJECT
OXFORD PREPARATORY ACADEMY - LAKE FOREST

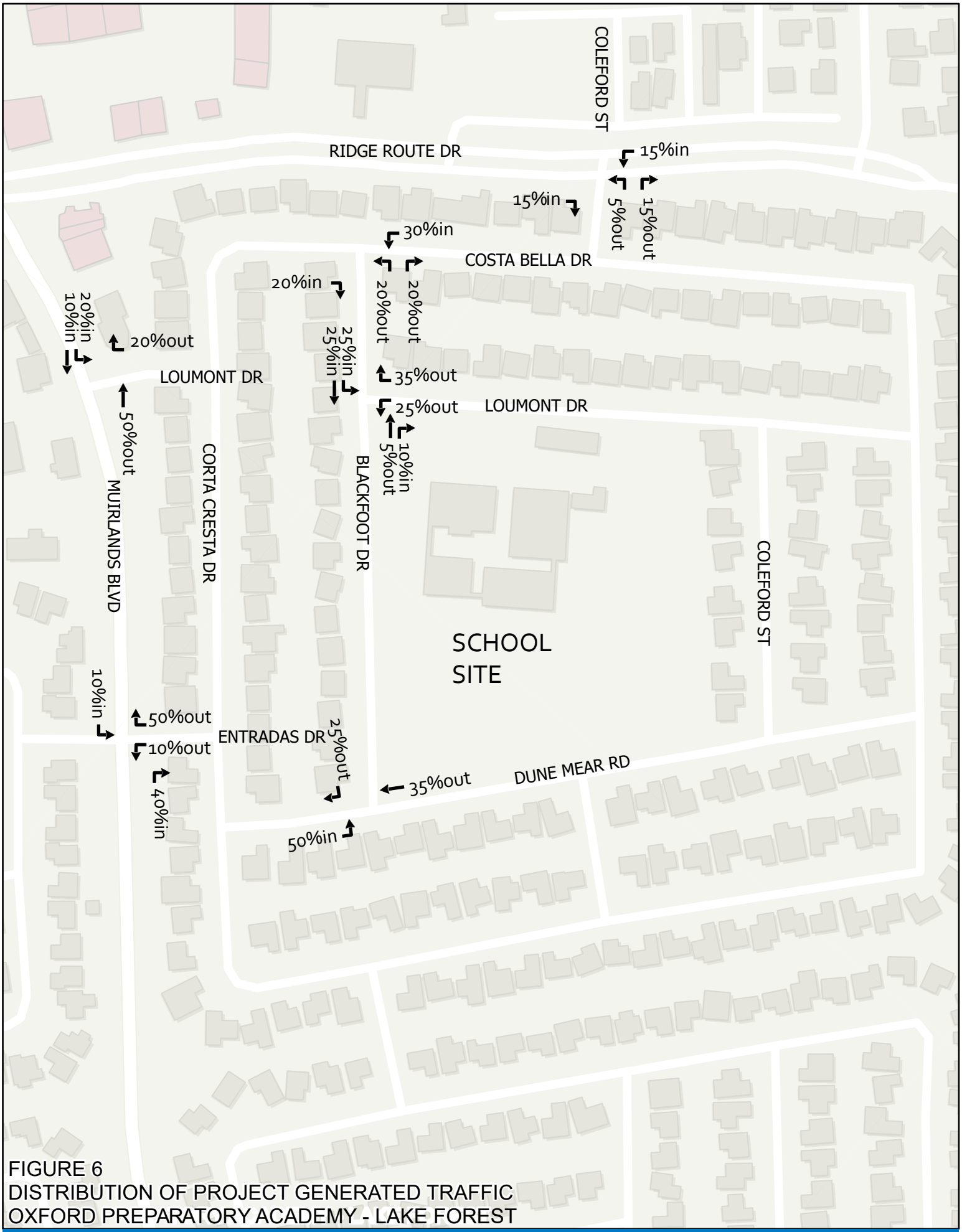

FIGURE 6
DISTRIBUTION OF PROJECT GENERATED TRAFFIC
OXFORD PREPARATORY ACADEMY - LAKE FOREST

FIGURE 7
PROJECT GENERATED TRAFFIC
OXFORD PREPARATORY ACADEMY - LAKE FOREST

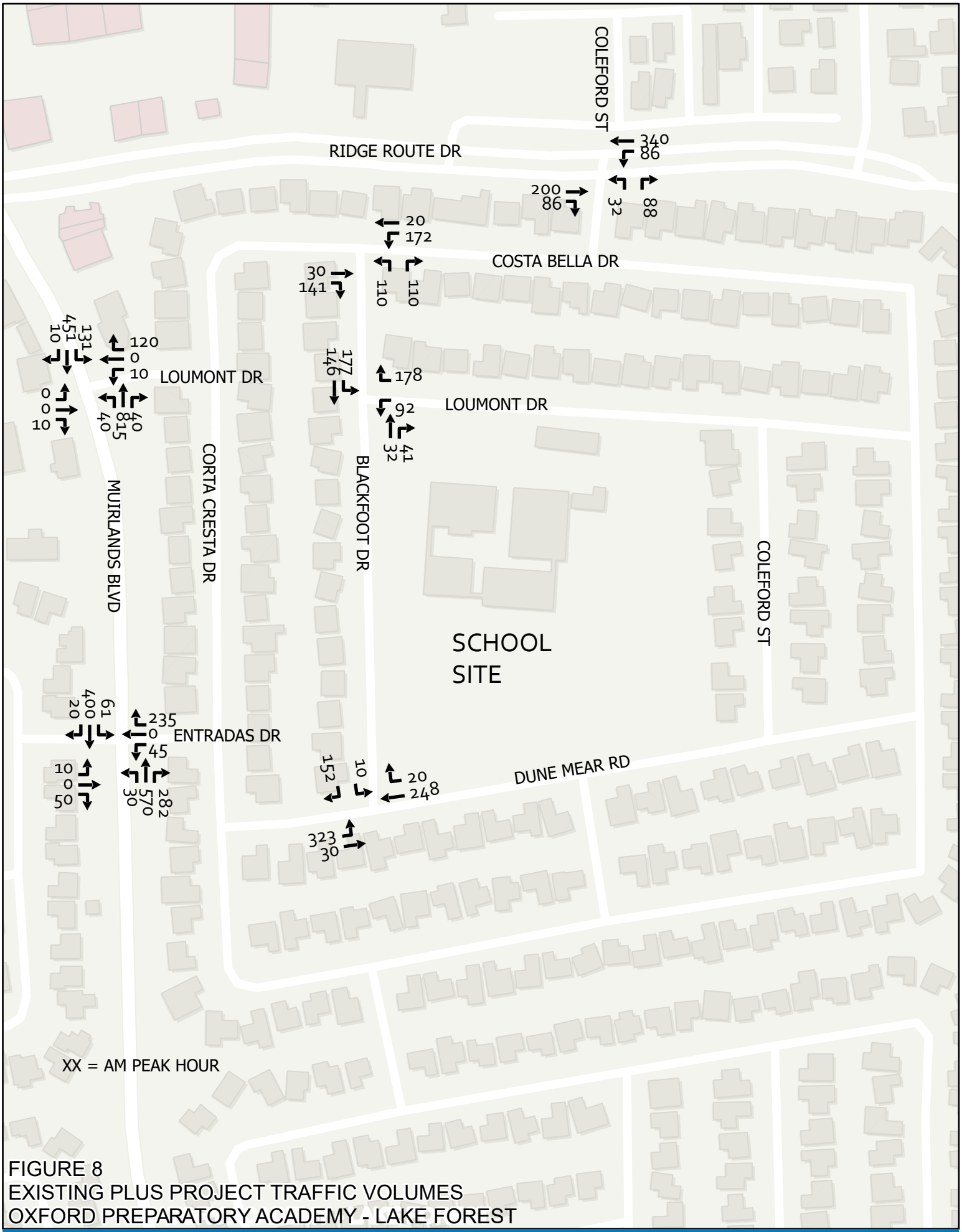

FIGURE 8
EXISTING PLUS PROJECT TRAFFIC VOLUMES
OXFORD PREPARATORY ACADEMY - LAKE FOREST

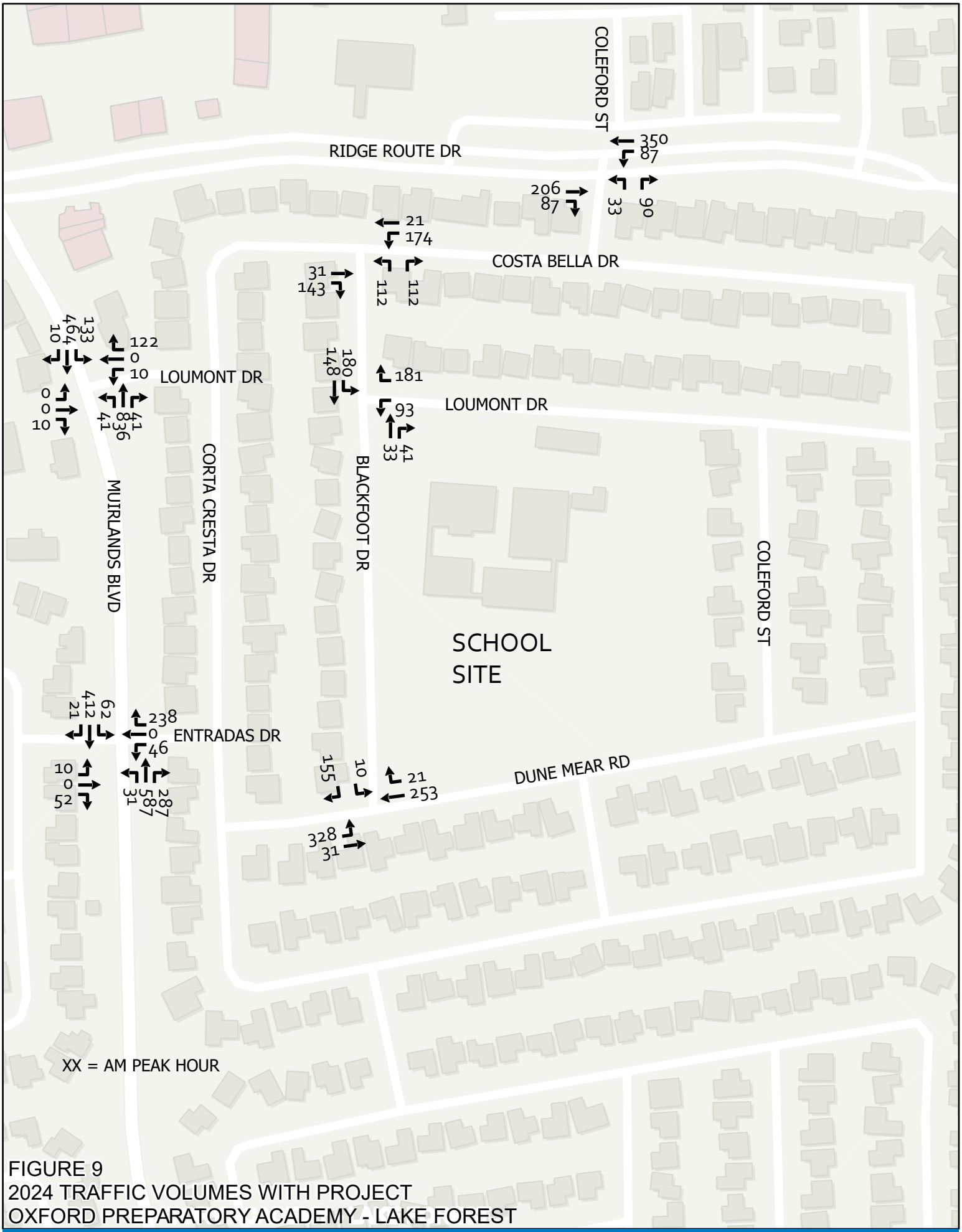

FIGURE 9
2024 TRAFFIC VOLUMES WITH PROJECT
OXFORD PREPARATORY ACADEMY - LAKE FOREST

LEVEL OF SERVICE
CALCULATION SHEETS
ICU METHODOLOGY

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Costa Bella Drive

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	60	0.071*	110	0.129*
NBT	0	0	0	0	0	0
NBR	S	S	60	S	110	S
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	1	1700	30	0.065*	30	0.101*
EBR	S	S	80	S	141	S
WBL	S	S	80	0.047*	172	0.101*
WBT	1	1700	20	0.059	20	0.113
WBR	0	0	0	0	0	0
Sum of Critical V/C Ratios				0.183		0.331
Clearance Interval				0.050		0.050
ICU Value				0.233		0.381
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Loumont Drive

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	0	0	0	0	0	0
NBT	1	1700	20	0.018	32	0.043
NBR	S	S	10	S	41	S
SBL	S	S	100	0.059	177	0.104
SBT	1	1700	70	0.100*	146	0.190*
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	1	1700	30	0.071*	92	0.159*
WBT	0	0	0	0	0	0
WBR	S	S	90	S	178	S
Sum of Critical V/C Ratios				0.171		0.349
Clearance Interval				0.050		0.050
ICU Value				0.221		0.399
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Dune Mear Road

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	1	1700	10	0.059*	10	0.095*
SBT	0	0	0	0	0	0
SBR	S	S	90	S	152	S
EBL	S	S	170	0.100*	323	0.190*
EBT	1	1700	30	0.118	30	0.208
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	1	1700	160	0.106*	248	0.158*
WBR	S	S	20	S	20	S
Sum of Critical V/C Ratios				0.265		0.443
Clearance Interval				0.050		0.050
ICU Value				0.315		0.493
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Muirlands Boulevard/Loumont Drive

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	40	0.024	40	0.024
NBT	2	3400	690	0.215*	815	0.251*
NBR	S	S	40	S	40	S
SBL	1	1700	70	0.041*	131	0.077*
SBT	2	3400	420	0.126	451	0.136
SBR	S	S	10	S	10	S
EBL	S	S	0	0	0	0
EBT	1	1700	0	S	0	S
EBR	S	S	10	0.006	10	0.006
WBL	S	S	10	0.006	10	0.006
WBT	1	1700	0	0.047*	0	0.076*
WBR	S	S	70	S	120	S
Sum of Critical V/C Ratios				0.303		0.404
Clearance Interval				0.050		0.050
ICU Value				0.353		0.454
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Muirlands Boulevard/Entradas Drive

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	30	0.018	30	0.018
NBT	2	3400	570	0.215*	570	0.251*
NBR	S	S	160	S	282	S
SBL	1	1700	30	0.018*	61	0.036*
SBT	2	3400	400	0.124	400	0.124
SBR	S	S	20	S	20	S
EBL	S	S	10	0.006*	10	0.006*
EBT	1	1700	0	0.035	0	0.035
EBR	S	S	50	S	50	S
WBL	S	S	20	0.012	45	0.026
WBT	1	1700	0	0.076*	0	0.165*
WBR	S	S	110	S	235	S
Sum of Critical V/C Ratios				0.315		0.458
Clearance Interval				0.050		0.050
ICU Value				0.365		0.508
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Ridgeroute Drive/Coleford Street

Time Period: AM Peak Hour

Scenario: Existing Conditions

Direction/ Movement	# Of Lanes	Capacity	Existing Conditions		Existing Plus Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	S	S	20	S	32	S
NBT	0	0	0	0	0	0
NBR	1	1700	50	0.041*	88	0.071*
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	2	3400	200	0.071	200	0.084*
EBR	S	S	40	S	86	S
WBL	1	1700	40	0.024	86	0.051*
WBTL	2	3400	340	0,100*	340	0.100
WBR	0	0	0	0	0	0
Sum of Critical V/C Ratios				0.141		0.206
Clearance Interval				0.050		0.050
ICU Value				0.191		0.256
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Costa Bella Drive

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	62	0.073*	112	0.132*
NBT	0	0	0	0	0	0
NBR	S	S	62	S	112	S
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	1	1700	31	0.066*	31	0.102*
EBR	S	S	82	S	143	S
WBL	S	S	82	0.048*	174	0.102*
WBT	1	1700	21	0.061	21	0.115
WBR	0	0	0	0	0	0
Sum of Critical V/C Ratios				0.187		0.336
Clearance Interval				0.050		0.050
ICU Value				0.237		0.386
Level of Service				A		A

NOTE: "S" indicates shared lane. "*" indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Loumont Drive

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	0	0	0	0	0	0
NBT	1	1700	21	0.018	33	0.044
NBR	S	S	10	S	41	S
SBL	S	S	103	0.061	180	0.106
SBT	1	1700	72	0.103*	148	0.193*
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	0	0	0	0	0	0
EBR	0	0	0	0	0	0
WBL	1	1700	31	0.073*	93	0.161*
WBT	0	0	0	0	0	0
WBR	S	S	93	S	181	S
Sum of Critical V/C Ratios				0.176		0.354
Clearance Interval				0.050		0.050
ICU Value				0.226		0.404
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Blackfoot Drive/Dune Mear Road

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	0	0	0	0	0	0
NBT	0	0	0	0	0	0
NBR	0	0	0	0	0	0
SBL	1	1700	10	0.061*	10	0.097*
SBT	0	0	0	0	0	0
SBR	S	S	93	S	155	S
EBL	S	S	175	0.103*	328	0.193*
EBT	1	1700	31	0.121	31	0.211
EBR	0	0	0	0	0	0
WBL	0	0	0	0	0	0
WBT	1	1700	165	0.109*	253	0.161*
WBR	S	S	21	S	21	S
Sum of Critical V/C Ratios				0.273		0.451
Clearance Interval				0.050		0.050
ICU Value				0.323		0.501
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Muirlands Boulevard/Loumont Drive

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	41	0.024	41	0.024
NBT	2	3400	711	0.221*	836	0.258*
NBR	S	S	41	S	41	S
SBL	1	1700	72	0.042*	133	0.078*
SBT	2	3400	433	0.130	464	0.139
SBR	S	S	10	S	10	S
EBL	S	S	0	0	0	0
EBT	1	1700	0	S	0	S
EBR	S	S	10	0.006	10	0.006
WBL	S	S	10	0.006	10	0.006
WBT	1	1700	0	0.048*	0	0.078*
WBR	S	S	72	S	122	S
Sum of Critical V/C Ratios				0.311		0.414
Clearance Interval				0.050		0.050
ICU Value				0.361		0.464
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Muirlands Boulevard/Entradas Drive

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	1	1700	31	0.018	31	0.018
NBT	2	3400	587	0.221*	587	0.257*
NBR	S	S	165	S	287	S
SBL	1	1700	31	0.018*	62	0.036*
SBT	2	3400	412	0.127	412	0.127
SBR	S	S	21	S	21	S
EBL	S	S	10	0.006*	10	0.006*
EBT	1	1700	0	0.036	0	0.036
EBR	S	S	52	S	52	S
WBL	S	S	21	0.012	46	0.027
WBT	1	1700	0	0.079*	0	0.167*
WBR	S	S	113	S	238	S
Sum of Critical V/C Ratios				0.324		0.466
Clearance Interval				0.050		0.050
ICU Value				0.374		0.516
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE CALCULATIONS
INTERSECTION CAPACITY UTILIZATION METHODOLOGY

Jurisdiction: City of Lake Forest

Project: Oxford Preparatory Academy

Intersection: Ridgeroute Drive/Coleford Street

Time Period: AM Peak Hour

Scenario: Year 2024

Direction/ Movement	# Of Lanes	Capacity	2024 Without Project		2024 With Project	
			Peak Hour Traffic Volume	V/C Ratio	Peak Hour Traffic Volume	V/C Ratio
NBL	S	S	21	S	33	S
NBT	0	0	0	0	0	0
NBR	1	1700	52	0.043*	90	0.072*
SBL	0	0	0	0	0	0
SBT	0	0	0	0	0	0
SBR	0	0	0	0	0	0
EBL	0	0	0	0	0	0
EBT	2	3400	206	0.073	206	0.086*
EBR	S	S	41	S	87	S
WBL	1	1700	41	0.024	87	0.051*
WBTL	2	3400	350	0,103*	350	0.103
WBR	0	0	0	0	0	0
Sum of Critical V/C Ratios				0.146		0.209
Clearance Interval				0.050		0.050
ICU Value				0.196		0.259
Level of Service				A		A

NOTE: “S” indicates shared lane. “*” indicates critical movement.

LEVEL OF SERVICE
CALCULATION SHEETS
HIGHWAY CAPACITY MANUAL METHODOLOGY

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*1/7/24*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Blackfoot Dr/Costa Bella Dr*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Costa Bella Drive* | North/South Street: *Blackfoot Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*31*	*143*	*174*	*21*	
Peak-Hour Factor, PHF	*1.00*	*0.67*	*0.67*	*0.67*	*0.67*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*46*	*213*	*259*	*31*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*112*		*112*			
Peak-Hour Factor, PHF	*0.67*	*1.00*	*0.67*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*167*	*0*	*167*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*259*		*334*				
C (m) (veh/h)		*1317*		*481*				
v/c		*0.20*		*0.69*				
95% queue length		*0.73*		*5.29*				
Control Delay (s/veh)		*8.4*		*27.8*				
LOS		*A*		*D*				
Approach Delay (s/veh)	--	--		*27.8*				
Approach LOS	--	--		*D*				

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*1/8/2024*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Blackfoot Dr/Loumont Dr*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Loumont Drive* | North/South Street: *Blackfoot Drive*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*33*	*41*	*180*	*148*	
Peak-Hour Factor, PHF	*1.00*	*0.67*	*0.67*	*0.67*	*0.67*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*49*	*61*	*268*	*220*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*93*		*181*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.67*	*1.00*	*0.67*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*138*	*0*	*270*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (veh/h)		*268*		*408*				
C (m) (veh/h)		*1493*		*531*				
v/c		*0.18*		*0.77*				
95% queue length		*0.65*		*6.88*				
Control Delay (s/veh)		*7.9*		*30.8*				
LOS		*A*		*D*				
Approach Delay (s/veh)	--	--	*30.8*					
Approach LOS	--	--	*D*					

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*7/9/2023*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Blackfoot Dr/Dune Mear Rd*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Dune Mear Road* | North/South Street: *Blackfoot Drive*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*328*	*31*			*253*	*21*
Peak-Hour Factor, PHF	*0.67*	*0.67*	*0.67*	*0.67*	*0.67*	*0.67*
Hourly Flow Rate, HFR (veh/h)	*489*	*46*	*0*	*0*	*377*	*31*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*10*		*155*
Peak-Hour Factor, PHF	*0.67*	*1.00*	*0.67*	*0.67*	*1.00*	*0.67*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*14*	*0*	*231*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*489*						*245*	
C (m) (veh/h)	*1162*						*483*	
v/c	*0.42*						*0.51*	
95% queue length	*2.13*						*2.82*	
Control Delay (s/veh)	*10.3*						*19.9*	
LOS	*B*						*C*	
Approach Delay (s/veh)	--	--					*19.9*	
Approach LOS	--	--					*C*	

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*7/9/2023*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Muirlands Blvd/Loumont Dr*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Loumont Drive* | North/South Street: *Muirlands Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*41*	*836*	*41*	*133*	*464*	*10*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*43*	*880*	*43*	*140*	*488*	*10*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*	*TR*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*0*	*0*	*10*	*10*	*0*	*122*
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*10*	*10*	*0*	*128*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (veh/h)	*43*	*140*		*138*			*10*	
C (m) (veh/h)	*1076*	*748*		*387*			*795*	
v/c	*0.04*	*0.19*		*0.36*			*0.01*	
95% queue length	*0.12*	*0.68*		*1.58*			*0.04*	
Control Delay (s/veh)	*8.5*	*10.9*		*19.4*			*9.6*	
LOS	*A*	*B*		*C*			*A*	
Approach Delay (s/veh)	--	--	*19.4*			*9.6*		
Approach LOS	--	--	*C*			*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*1/8/2024*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Muirlands Blvd/Entradas Dr*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Entradas Drive* | North/South Street: *Muirlands Blvd*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*31*	*587*	*287*	*62*	*412*	*21*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*31*	*592*	*289*	*62*	*416*	*21*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*2*	*0*	*1*	*2*	*0*
Configuration	*L*	*T*	*TR*	*L*	*T*	*TR*
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*10*	*0*	*52*	*46*	*0*	*238*
Peak-Hour Factor, PHF	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*	*0.99*
Hourly Flow Rate, HFR (veh/h)	*10*	*0*	*52*	*46*	*0*	*240*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*LTR*			*LTR*	

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*	*L*		*LTR*			*LTR*	
v (veh/h)	*31*	*62*		*286*			*62*	
C (m) (veh/h)	*1134*	*776*		*399*			*447*	
v/c	*0.03*	*0.08*		*0.72*			*0.14*	
95% queue length	*0.08*	*0.26*		*5.47*			*0.48*	
Control Delay (s/veh)	*8.3*	*10.0*		*33.8*			*14.3*	
LOS	*A*	*B*		*D*			*B*	
Approach Delay (s/veh)	--	--	*33.8*			*14.3*		
Approach LOS	--	--	*D*			*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*R Garland*
Agency/Co.	*Saddleback Valley USD*
Date Performed	*7/9/2023*
Analysis Time Period	*AM Peak Hour*

Site Information

Intersection	*Ridgeroute Dr/Coleford St*
Jurisdiction	*City of Lake Forest*
Analysis Year	*2024 With Project*

Project Description *Oxford Preparatory Academy*

East/West Street: *Ridgeroute Drive* | North/South Street: *Coleford Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*206*	*87*	*87*	*350*	
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*0*	*216*	*91*	*91*	*368*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*1*	*2*	*0*
Configuration		*T*	*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*33*		*90*			
Peak-Hour Factor, PHF	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*	*0.95*
Hourly Flow Rate, HFR (veh/h)	*34*	*0*	*94*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (veh/h)		*91*		*128*				
C (m) (veh/h)		*1265*		*667*				
v/c		*0.07*		*0.19*				
95% queue length		*0.23*		*0.71*				
Control Delay (s/veh)		*8.1*		*11.7*				
LOS		*A*		*B*				
Approach Delay (s/veh)	--	--		*11.7*				
Approach LOS	--	--		*B*				

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