Draft

ARDENWOOD TECHNOLOGY PARK PLANNED DISTRICT AMENDMENT

Focused Environmental Impact Report

Prepared for
City of Fremont

March 2016

Draft

ARDENWOOD TECHNOLOGY PARK PLANNED DISTRICT AMENDMENT

Focused Environmental Impact Report

Prepared for
City of Fremont

March 2016

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900
www.esassoc.com

Los Angeles

Oakland

Orlando

Palm Springs

Petaluma

Portland

Sacramento

San Diego

Santa Cruz

Seattle

Tampa

Woodland Hills

140953

OUR COMMITMENT TO SUSTAINABILITY | ESA helps a variety of public and private sector clients plan and prepare for climate change and emerging regulations that limit GHG emissions. ESA is a registered assessor with the California Climate Action Registry, a Climate Leader, and founding reporter for the Climate Registry. ESA is also a corporate member of the U.S. Green Building Council and the Business Council on Climate Change (BC3). Internally, ESA has adopted a Sustainability Vision and Policy Statement and a plan to reduce waste and energy within our operations. This document was produced using recycled paper.

TABLE OF CONTENTS

Ardenwood Technology Park Planned District Amendment
Draft Focused Environmental Impact Report

	Page
1. Introduction and Background	**1-1**
A. Environmental Review Context	1-1
B. EIR Guidance	1-2
C. Scope of EIR	1-3
D. Alternatives to the Project	1-3
E. Environmental Baseline	1-4
F. Organization of this EIR	1-4
G. Notice of Preparation	1-5
H. Intended Uses of the EIR	1-5
2. Summary	**2-1**
A. Project Description	2-1
B. Environmental Impacts and Mitigation Measures	2-1
C. Alternatives	2-2
D. Issues of Concern	2-2
3. Project Description	**3-1**
A. Project Background	3-1
B. Project Location and Setting	3-1
C. Project Characteristics	3-4
D. Project Objectives	3-8
E. Project Approvals	3-9
4. Environmental Setting, Impacts, and Mitigation Measures	**4-1**
A. Environmental Topics	4-1
B. Format of Environmental Topic Discussion, Impact Statements, and Mitigation Measures	4-1
C. Thresholds/Criteria of Significance	4-2
D. Impact Classifications	4-2
E. Environmental Baseline	4-3
F. Cumulative Analysis	4-3
4.A Air Quality	4.A-1
4.B Greenhouse Gas Emissions	4.B-1
4.C Noise	4.C-1
4.D Transportation	4.D-1

Page

5. Alternatives to the Project **5-1**
A. Introduction 5-1
B. Factors in the Selection of Alternatives 5-2
C. Project Objectives 5-2
D. Description and Analysis of Alternatives 5-3
E. Environmentally Superior Alternative 5-27
F. Alternatives Considered but Rejected 5-28

6. Other Statutory Sections **6-1**
A. Growth-Inducing Impacts 6-1
B. Significant Irreversible Changes 6-2
C. Cumulative Impacts 6-3
D. Significant and Unavoidable Environmental Impacts 6-3

7. Report Preparers **7-1**
A. Report Authors 7-1

Appendices

A. Notice of Preparation and Initial Study
B. Scoping Comment Letters
C. Ardenwood Technology Park Planned District Amendment
D. Air Quality Data
E. Traffic Impact Study

List of Figures

3-1 Project Site Location 3-2
3-2 Aerial View of Project Site 3-3
3-3 Project Site 3-5
4.C-1 Effects of Noise on People 4.C-2
4.C-2 Noise Measurements 4.C-6
4.C-3 City of Fremont Land Use Compatibility Guidelines for Community Noise Environment 4.C-8
4.D-1 Study Area 4.D-2
4.D-2 Existing Traffic Volumes 4.D-6
4.D-3 Transit System 4.D-8
4.D-4 Trip Distribution 4.D-17
4.D-5 Project Traffic Volumes 4.D-18
4.D-6 Existing Plus Project Traffic Volumes 4.D-20
4.D-7 Cumulative Plus Project Traffic Volumes 4.D-26
5-1 Near-Term Traffic Volumes 5-10
5-2 Reduced Development Alternative 1 5-13

List of Tables

2-1 Summary of Impacts and Mitigation Measures 2-3
3-1 Existing and Proposed Allowable Far and Floor Area 3-7
4.A-1 Summary of Air Quality Monitoring Data (2010–2014) 4.A-3
4.A-2 Ambient Air Quality Standards and Bay Area Attainment Status 4.A-9
4.A-3 Average Annual Daily Construction-Related Pollutant Emissions 4.A-15

Page

List of Tables (continued)

4.A-4	Construction-Related Health Impacts	4.A-16
4.A-5	Daily Operational-Related Pollutant Emissions	4.A-19
4.A-6	Annual Operational-Related Pollutant Emissions	4.A-19
4.A-7	Daily Combined Operational and Construction-related Pollutant Emissions	4.A-20
4.A-8	Annual Combined Operational and Construction-related Pollutant Emissions	4.A-20
4.A-9	Transportation Control Measures in the 2010 Clean Air Plan	4.A-23
4.B-1	Estimated Unmitigated Emissions of Greenhouse Gases	4.B-14
4.C-1	20-Minute Short-Term Ambient Noise Monitoring Results	4.C-7
4.C-2	24-Hour Long-Term Ambient Noise Monitoring Results	4.C-7
4.C-3	Exterior Noise Level Standards for New Industrial and Commercial Noise Sources	4.C-9
4.C-4	Reference Construction Equipment Noise Levels at 50 Feet	4.C-13
4.C-5	Summary of Traffic Noise Modeling Results (Existing/Existing Plus Project) Noise Exposure (L_{dn}) at 50 feet from Roadway Centerline	4.C-16
4.D-1	Existing Peak Hour Intersection Levels of Service (LOS)	4.D-5
4.D-2	Existing Freeway Levels of Service (LOS)	4.D-5
4.D-3	Existing Arterial Segment Levels of Service (LOS)	4.D-7
4.D-4	Signalized Intersection Level of Service Criteria	4.D-12
4.D-5	Freeway Segment Level of Service (LOS) Thresholds	4.D-13
4.D-6	Arterial Level of Service Criteria	4.D-13
4.D-7	Project Trip Generation Summary (Net Change in Office Park space)	4.D-15
4.D-8	Trip Generation Comparison by Sub-Area for Currently Allowed versus Proposed Floor Area Ratios	4.D-16
4.D-9	Trip Distribution Assumptions	4.D-19
4.D-10	Summary of Existing and Existing plus Project Peak Hour Intersection Levels of Service	4.D-21
4.D-11	Existing and Existing plus Project Freeway Levels of Service	4.D-22
4.D-12	Existing and Existing plus Project Arterial Segment Levels of Service	4.D-23
4.D-13	Study Intersections Identified in General Plan Mitigation Monitoring Program	4.D-24
4.D-14	Cumulative and Cumulative plus Project Peak Hour Intersection Levels of Service	4.D-25
4.D-15	Cumulative and Cumulative plus Project Freeway Levels of Service	4.D-28
4.D-16	Cumulative and Cumulative plus Project Arterial Segment Levels of Service	4.D-29
5-1	Average Daily Construction-related Pollutant Emissions, No Project Alternative	5-5
5-2	Daily Operational-related Pollutant Emissions, No Project Alternative	5-5
5-3	Annual Operational-related Pollutant Emissions, No Project Alternative	5-6
5-4	Daily Combined Operational and Construction-related Pollutant Emissions, No Project Alternative	5-6
5-5	Annual Combined Operational and Construction-related Pollutant Emissions	5-7
5-6	Estimated Unmitigated Emissions of Greenhouse Gases, No Project Alternative	5-7
5-7	Near-term (Existing to permitted) Trip Generation Summary	5-9
5-8	Existing and Existing plus No Project Alternative Peak Hour Intersection Levels of Service and Comparison to Proposed Project	5-11
5-9	Existing plus no Project Alternative Freeway Levels of Service (LOS)	5-12
5-10	Existing plus No Project Alternative Arterial Segment Levels of Service (LOS)	5-12
5-11	Average Daily Construction-related Pollutant Emissions, Reduced Development Alternative 1	5-15
5-12	Daily Operational-related Pollutant Emissions, Reduced Development Alternative 1	5-16

Page

List of Tables (continued)

5-13 Annual Operational-related Pollutant Emissions, Reduced Development Alternative 1 5-16
5-14 Daily Combined Operational and Construction-related Pollutant Emissions, Reduced Development Alternative 1 5-17
5-15 Annual Combined Operational and Construction-related Pollutant Emissions, Reduced Development Alternative 1 5-17
5-16 Reduced Development Alternative 1 - Estimated Unmitigated Emissions of Greenhouse Gases 5-18
5-17 Reduced Development Alternative 1 Trip Generation Summary 5-19
5-18 Average Daily Construction-related Pollutant Emissions, Reduced Development Alternative 2 5-21
5-19 Daily Operational-related Pollutant Emissions, Reduced Development Alternative 2 5-22
5-20 Annual Operational-related Pollutant Emissions, Reduced Development Alternative 2 5-22
5-21 Daily Combined Operational and Construction-related Pollutant Emissions, Reduced Development Alternative 2 5-23
5-22 Annual Combined Operational and Construction-related Pollutant Emissions, Reduced Development Alternative 2 5-24
5-23 Reduced Development Alternative 2 - Estimated Unmitigated Emissions of Greenhouse Gases 5-24
5-24 Reduced Development Alternative 2 Trip Generation Summary 5-26
5-25 Alternatives Impact Summary and Comparison 5-27

CHAPTER 1
Introduction and Background

A. Environmental Review Context

The City of Fremont, as lead agency, determined that preparation of an Environmental Impact Report (EIR) was necessary for the proposed Ardenwood Technology Park Planned District Amendment (the project) because there was "substantial evidence that the proposed project may have a significant effect on the environment" for specific topic areas. A Notice of Preparation (NOP) was prepared and circulated from May 14, 2015, to June 15, 2015. The NOP identified that air quality, greenhouse gas emissions, noise, and transportation would be the focus of the EIR (see **Appendix A**). The California Environmental Quality Act (CEQA) requires that, before a project with potentially significant environmental effects may be approved, an EIR must be prepared that fully describes the environmental effects of the project, identifies mitigation measures to lessen or eliminate adverse impacts, and examines feasible alternatives to the project. The information contained in the EIR is to be reviewed and considered by the lead agency prior to the ultimate decision to approve, disapprove, or modify the proposed project.

This Draft EIR is available for public review for the period indicated on the Public Notice of Availability of this document. During the public review period, written comments on the adequacy of the Draft EIR may be submitted to:

Steve Kowalski
City of Fremont
Planning Division
39550 Liberty Street
Fremont, CA 94538

Written comments may also be submitted via email to SKowalski@fremont.gov with "Ardenwood Technology Park Planned District Amendment Draft EIR" noted in the subject line.

Responses to all substantive comments received on the adequacy of the Draft EIR and submitted within the specified review period will be prepared and included in the Responses to Comments/Final EIR. Prior to approval of the project, the City of Fremont must certify the Final EIR and adopt a Mitigation Monitoring and Reporting Program (MMRP) for mitigation measures identified in the EIR, in accordance with the requirements of California Public Resources Code (PRC) § 21001.

B. EIR Guidance

This EIR has been prepared by the City of Fremont, as lead agency, in conformance with CEQA. It is intended to provide the information and environmental analyses necessary to assist the public's understanding of the project and its likely environmental consequences, and to assist public agency decision-makers in considering the approvals necessary to implement the proposed project. The proposed project is described to a sufficient level of detail in Chapter 3 of this document to identify and evaluate any associated environmental impacts.

The following provisions of the guidelines for implementing CEQA (known as the "CEQA *Guidelines*") help define the role of this EIR:

> **CEQA *Guidelines* § 15121(a): Informational Document.** An EIR is an informational document which will inform public agency decision-makers and the public generally of the significant environmental effect(s) of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project. The public agency shall consider the information in the EIR along with other information, which may be presented to the agency.
>
> **CEQA *Guidelines* § 15151: Standards for Adequacy of an EIR.** An EIR should be prepared with a sufficient degree of analysis to provide decision-makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure.

Further, CEQA states that the lead agency should not "approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects…" (PRC § 21002). If the lead agency approves the project despite residual significant adverse impacts that cannot be mitigated to less-than-significant levels, the agency must adopt a "Statement of Overriding Considerations" stating the reasons for its action in writing.

CEQA *Guidelines* § 15382 defines a significant effect on the environment as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project…" Therefore, in identifying the significant impacts of the project, this EIR concentrates on the project's substantial physical effects and on mitigation measures to avoid, reduce, or otherwise alleviate those effects.

C. Scope of EIR

Topics Addressed in this EIR

Pursuant to CEQA *Guidelines* § 15063(c)(3), through preparation of the Initial Study, the City concluded that additional environmental review in a Focused EIR is required for the following four topics:

- Air Quality
- Greenhouse Gas Emissions
- Noise
- Transportation

The environmental analyses for these topics are presented in Chapter 4 of this document.

Topics Not Addressed in Detail in this EIR Based on Preparation of the Initial Study

The information and analysis presented in the Initial Study provides substantial evidence for the conclusion, for all the issues listed below (i.e., those *not* addressed in detail in this EIR), that: 1) CEQA standards triggering preparation of further environmental review do not exist for those issues; and 2) impacts under these topics would be less than significant with incorporation of appropriate mitigation measures. Topics not addressed in this EIR in detail are listed below by impact determination category identified in Appendix G, the Environmental Checklist Form. These topics are, however, analyzed for full disclosure of the environmental determination, in the Initial Study, included within **Appendix A** of this EIR.

- Aesthetics
- Agriculture and Forestry Resources
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

D. Alternatives to the Project

CEQA requires that an EIR discuss a reasonable range of alternatives to the proposed project. This EIR describes and analyzes a reasonable range of alternatives, including a “No Project” alternative as required under CEQA (CEQA *Guidelines* § 15126.6[e]). Chapter 5 of this document discusses the environmental effects of each alternative, compares the environmental effects of each alternative with the environmental setting and with the effects of the project and each other alternative, and addresses the relationship of each alternative to the project objectives. The

determinations of the lead agency concerning the feasibility, acceptance, or rejection of each and all alternatives considered in this EIR will be addressed and resolved in the findings, when the City's decision makers consider approval of the project, as required by CEQA.

E. Environmental Baseline

Under CEQA, the environmental baseline for a proposed project analyzed in an EIR is typically the physical environmental conditions that exist in the vicinity of the project at the time the NOP is published (see **Appendix A**). The NOP for this project was published on May 14, 2015, and this is the date assumed for the "baseline" conditions against which the environmental impacts of the proposed project will be analyzed.

F. Organization of this EIR

This EIR is organized as follows:

- **Chapter 1, *Introduction and Background***, contains an overview of the document, the relevant CEQA requirements, and the intended use of the EIR.

- **Chapter 2, *Summary***, introduces the project and allows the reader to easily reference the analysis of potentially significant effects, proposed mitigation measures, residual environmental impacts after mitigation, if any, and alternatives to the project that reduce or avoid significant effects on the environment. Table 2-1, Summary of Impacts and Mitigation Measures, is provided at the end of Chapter 2.

- **Chapter 3, *Project Description***, identifies the project location and includes a description of the project, the objectives of the project, the anticipated phasing of the project, the required project approvals, and the other agencies that must consider aspects of the project.

- **Chapter 4, *Environmental Setting, Impacts and Mitigation Measures***, contains a discussion of the setting (existing conditions and regulatory framework), the environmental impacts (including cumulative impacts) that could result from the project, and the mitigation measures that would reduce or eliminate the identified adverse impacts. The project has been assessed for potential impacts during both construction and operation, and mitigation measures are identified accordingly. The criteria used to assess the significance of adverse environmental effects are identified, and the significance of the impact both before and after mitigation is reported.

- **Chapter 5, *Alternatives to the Project***, evaluates a reasonable range of alternatives to the proposed project. This chapter provides a discussion of the environmental impacts associated with each alternative, compares the relative impacts of each alternative to those of the project and the other alternatives, and discusses the relationship of the alternatives to the project objectives.

- **Chapter 6, *Other Statutory Sections***, discusses the project's potential for inducing growth and significant irreversible change, and summarizes cumulative impacts and significant and unavoidable impacts.

- **Chapter 7, *Report Preparers***, identifies the EIR preparers, including the lead agency staff and consultants. Persons and documents consulted during preparation of the EIR are listed in the Reference section in Chapter 4.

The Appendices includes the Notice of Preparation (NOP), comments received on the NOP, the Initial Study, supporting background documents, and technical information used in the impact analyses.

G. Notice of Preparation

An NOP was prepared by the City of Fremont to obtain comments from agencies and the public regarding issues to be addressed in the EIR. The NOP is included as **Appendix A** to the EIR.

On May 14, 2015, the City sent the NOP to governmental agencies and organizations and persons interested in the proposed project to solicit input and to identify any concerns or issues that should be included in the EIR. The NOP was circulated for 30 days, with the review period closing on June 15, 2015. Copies of the comments received in response to the NOP are included in **Appendix B**.

This EIR was prepared based on the comments received on the NOP and the project information provided. Environmental factors marked with an "X" below are addressed in this EIR. It was determined that the environmental factors not designated with an "X" below would not warrant further discussion in the EIR because they would not involve a potentially significant impact:

☐ Aesthetics	☐ Agricultural Resources	☒ Air Quality / GHG
☐ Biological Resources	☐ Cultural Resources	☐ Geology / Soils
☐ Hazards & Hazardous Materials	☐ Hydrology / Water Quality	☐ Land Use / Planning
☐ Mineral Resources	☒ Noise	☐ Population / Housing
☐ Public Services	☐ Recreation	☒ Transportation / Traffic
☐ Utilities / Service Systems	☒ Mandatory Findings of Significance	

H. Intended Uses of the EIR

This EIR provides the environmental information and evaluation necessary for the planning, construction, and operation of the proposed project. This EIR also provides the CEQA compliance documentation upon which the City's consideration of, and action on, all applicable approvals (collectively, "approvals") may be based. These include all approvals set forth in this EIR, as well as any additional approvals that may be necessary or useful to such activities such as planning, construction, operation, and maintenance.

References

California Environmental Quality Act (CEQA) Statutes and Guidelines; Public Resources Code 21000-21177) and California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387. 2014.

CHAPTER 2
Summary

A. Project Description

The Ardenwood Technology Park Planned District Amendment (proposed project) site consists of 32 parcels totaling approximately 147.7 acres bounded generally by Paseo Padre Parkway to the southwest, Kaiser Drive to the northwest, Ardenwood Boulevard to the northeast and State Route 84 (SR 84) to the southeast in the City of Fremont. The proposed project would rezone the 32 existing industrial parcels located within a portion of the Ardenwood Technology Park from Planned District P-81-15NN (portion), Planned District P-81-15NN(F) with Flood Combining District Overlay (portion) and Planned District P-2001-7(F) with Flood Combining District (portion) to a new Planned District P-2015-23(F) to allow the current maximum allowable floor area ratio (FAR) for those parcels to be increased from 0.35 up to 0.75 to enable more intensive Class A office, advanced manufacturing , and research and development uses, as well as small-scale retail/service uses to meet the everyday needs of employees. In addition, maximum building heights up to 115 feet would be permitted. The project is more fully described in Chapter 3 (Project Description) and the Ardenwood Technology Park Planned District Amendment dated August 2015 included in Appendix C.

B. Environmental Impacts and Mitigation Measures

Potentially significant environmental impacts of the proposed project are summarized in **Table 2-1**. This table is organized as follows: (1) list of impacts and mitigation measures identified in this EIR; and (2) impacts and mitigation measures identified in the Initial Study (see Appendix A). This table lists impacts and mitigation measures in two major categories: significant impacts that would remain significant even with mitigation (significant and unavoidable), and significant impacts that could be mitigated to a less than significant level (significant but mitigable). Refer to Appendix A for a summary of impacts that would be less than significant. For each significant impact, the table includes a summary of mitigation measure(s) and an indication of level of significance after implementation of mitigation measures. A complete discussion of the air quality, greenhouse gas emissions, noise and transportation impacts and associated mitigation measures are provided in Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures* of this EIR.

C. Alternatives

Chapter 5 of this EIR analyzes a range of reasonable alternatives to the proposed project. Per CEQA *Guidelines* § 15126.6(f), the lead agency identified the following reasonable range of project alternatives to be addressed in this EIR:

- No Project Alternative
- Reduced Development Alternative 1
- Reduced Development Alternative 2

The Alternatives discussion of this EIR was prepared in accordance with § 15126(d) of the CEQA *Guidelines* and focuses on alternatives that are capable of eliminating or reducing significant adverse effects associated with the proposed project while feasibly attaining most of the basic objectives. This EIR identifies the Reduced Development Alternative 2 as the "environmentally superior" alternative, as it would reduce, but not eliminate, significant and unavoidable impacts to air quality and transportation on the project site.

D. Issues of Concern

Issues of concern regarding the proposed project include air quality, greenhouse gas emissions, noise, and traffic and circulation. These issues are fully addressed in the analyses section, Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures* of this document.

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
EIR Mitigation Measures		
A. AIR QUALITY		
4.A-1: Development facilitated by the proposed project could potentially result in air quality impacts due to construction activities. (Less than Significant)	**Mitigation Measure 4.A-1**: **Construction Fugitive Dust Emissions**. The following BAAQMD Best Management Practices and additional mitigation measures for fugitive dust control shall be required for all construction activities within the project area. These measures will reduce fugitive dust emissions primarily during soil movement and grading, but also during vehicle and equipment movement on unpaved project sites: ***Basic Controls that Apply to All Construction Sites*** 1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. 2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. 4. All vehicle speeds on unpaved roads shall be limited to 15 mph. 5. All streets, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. 6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR). Clear signage shall be provided for construction workers at all access points. 7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. 8. A publicly visible sign shall be posted with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations. ***Additional Measures that Apply to All Construction Sites*** 1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
EIR Mitigation Measures (cont.)		
A. AIR QUALITY		
4.A-1 (cont.)	2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph. 3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity. 4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established. 5. All trucks and equipment, including their tires, shall be washed off prior to leaving the site. 6. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel. 7. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.	
4.A-2: Development facilitated by the proposed project could potentially generate operational emissions that would result in a considerable net increase of criteria pollutants and precursors for which the air basin is in nonattainment under an applicable federal or state ambient air quality standard. (Significant)	**Mitigation Measure 4.A-2: Energy Efficiency.** The following measures shall be implemented in the design for properties to be developed within the project area, where feasible and appropriate: • Install solar photovoltaic panels on building rooftops; • Install solar water heaters; • Use recycled water when available; • Exceed Building Code energy efficiency standards; and • Use water efficient irrigation systems.	Significant and Unavoidable for ROG, NOx and PM10
4.A-4: Development facilitated by the proposed project could potentially conflict with or obstruct implementation of the applicable air quality plan. (Significant)	**Mitigation Measure 4.A-4:** Implement Mitigation Measure 4.A-2	Significant and Unavoidable
4.A-5: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, could potentially result in a significant adverse cumulative air quality impact. (Significant)	**Mitigation Measure 4.A-5:** Implement Mitigation Measures 4.A-2.	Significant and Unavoidable

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
EIR Mitigation Measures (cont.)		
B. GREENHOUSE GAS EMISSIONS		
4.B-1: Implementation of the proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.(Significant)	**Mitigation Measure 4.B-1:** The applicant shall develop and implement a project-specific GHG Reduction Plan that would reduce GHG emissions to below the 4.6 metric tons of CO2e per service population per year (i.e., reduced GHG emissions by 1,319 metric tons of CO2e), prior to the granting of a certificate of occupancy for each new or renovated building of the proposed project. The project-specific GHG Reduction Plan shall be submitted to the City for approval as part of the initial application process for building permits so that the measures may be verified as present in building specifications. The project-specific GHG Reduction Plan, as implemented, shall include strategies that exceed those already identified in the project description or required by law. The project-specific GHG Reduction Plan shall include, but not be limited to, the following types of GHG reduction measures: 1. Install solar photovoltaic panels on building rooftops; 2. Install solar water heaters; 3. Use recycled water when available; 4. Exceed Building Code energy efficiency standards; and 5. Use water efficient irrigation systems.	Less than Significant
4.B-2: Implementation of the proposed project may conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of GHGs. (Significant)	**Mitigation Measure 4.B-2:** Implement Mitigation Measure 4.B-1.	Less than Significant
C. NOISE		
4.C-8: The proposed project could temporarily add to cumulative noise levels in the vicinity of the project site. (Significant)	**Mitigation Measure 4.C-1:** The project applicant shall incorporate the following requirements into the construction contract specifications: • Equipment and trucks used for construction will use the industry standard noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically-attenuating shields or shrouds, wherever feasible). • Stationary noise sources will be located as far from adjacent receptors, whenever feasible, and they will be muffled and enclosed within temporary sheds. Insulation barriers and other measures will be used to the extent feasible.	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
EIR Mitigation Measures (cont.)		
D. TRANSPORTATION		
4.D-1: Development facilitated by the proposed project would increase traffic volumes on the area roadway network, affecting the performance of intersections, freeways and arterial roadways. (Significant)	**Mitigation Measure 4.D-1:** The applicant shall work with the City of Fremont to establish a Transportation Demand Management (TDM) Program. The program should include strategies to reduce drive-alone vehicle trips in favor of walking, bicycling, taking transit or shuttles, carpooling or vanpooling. Typically, for business parks in suburban areas, TDM programs include elements such as carpool and vanpool incentives, subsidized transit passes, bicycle parking and bicyclist amenities, parking cash-out programs, and shuttles to transit hubs such as BART and Amtrak/ACE stations. The initial TDM Program shall include the goals and objectives of the TDM Program, including a target specifying the single occupant vehicle mode share, an annual monitoring program that includes surveys of all employers and employees, and annual reporting to City of Fremont staff to monitor compliance with the goals and objectives of the TDM Program. **Mitigation Measure 4.D-2**: The City of Fremont shall work with Caltrans to convert the existing shared left-turn/through lane on the SR 84 Westbound Off-Ramp at Ardenwood Boulevard to a shared left-turn/ through/right-turn lane, and optimize the signal timing at this signalized intersection. The applicant shall be responsible for funding the improvement.	Significant and Unavoidable
4.D-2: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, would result in significant cumulative transportation impacts. (Significant)		Significant and Unavoidable
Fremont Boulevard/Paseo Padre Parkway	**Mitigation Measure 4.D-3:** The City of Fremont shall amend the City's Capital Improvement Program to include widening of eastbound Paseo Padre Parkway at Fremont Boulevard to add an additional through lane, and converting the eastbound shared through/right-turn lane to a right-turn lane. Future project developer(s) shall contribute a proportional share toward the cost of the improvements.	Less than Significant
Decoto Road/Paseo Padre Parkway	**Mitigation Measure 4.D-4:** The City of Fremont shall amend the City's Capital Improvement Program to include adding a right-turn overlap signal phase for the eastbound Decoto Road approach to Paseo Padre Parkway, prohibit U-turns from northbound Paseo Padre Parkway, and optimize the signal timing. Future project developer(s) shall contribute a proportional share toward the cost of the improvements.	Less than Significant
Thornton Avenue/SR 84 Eastbound Ramps	**Mitigation Measure 4.D-5**: The City of Fremont shall work with Caltrans to widen the eastbound off-ramp to include an additional shared left-turn/through/right-turn lane, convert the existing through/right-turn lane to a right-turn lane, resulting in a three-lane approach consisting of one left-turn lane, one shared left-turn/through/right-turn lane, and one right-turn lane, and optimize the signal timing. Future project developer(s) shall pay a proportional share toward the cost of the improvements.	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
EIR Mitigation Measures (cont.)		
D. TRANSPORTATION (cont.)		
Freeway Segment Levels of Service	**Mitigation Measure 4.D-6**: There are no feasible mitigation measures to reduce the significant cumulative impacts on area freeways to less-than-significant levels.	Significant and Unavoidable
Arterial Segment Levels of Service	**Mitigation Measure 4.D-7**: There are no feasible mitigation measures to reduce the significant cumulative impacts on area arterials to less-than-significant levels.	Significant and Unavoidable
Initial Study Mitigation Measures		
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. (Less than Significant with Mitigation Incorporated)	**Mitigation Measure Bio-1:** To mitigate the identified potential impacts to occupation of the vacant parcels in the Planned District by burrowing owls, the following measures shall be adhered to: a) No more than 14 days prior to any ground-disturbing activities (regardless of time of year), a qualified biologist shall conduct a take avoidance survey for burrowing owls and report the findings to the City of Fremont. If no owls are found during this first survey, a final survey will be conducted within 48 hours prior to ground disturbance to confirm that burrowing owls are still absent and the results reported to the City of Fremont. If ground-disturbing activities are delayed or suspended for more than 14 days after the initial take avoidance survey, the property must be re-surveyed. All surveys shall be conducted in accordance with California Department of Fish and Wildlife (CDFW) 2012b guidelines. b) If burrowing owls are found on the property during the surveys, mitigation shall be required in accordance with CDFW 2012b guidelines. If the surveys identify breeding or wintering burrowing owls on or adjacent to the property, occupied burrows shall not be disturbed and shall be provided with protective buffers. Where avoidance is not feasible, an exclusion plan shall be implemented to encourage owls to move away from the work area prior to construction. The exclusion plan shall be subject to CDFW approval and monitoring requirements and approved by the City prior to issuance of a permit for ground disturbing activities.	Less than Significant
Initial Study Mitigation Measures (cont.)		
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	**Mitigation Measure Bio-2:** If project-related activities on any of the lots within the Planned District are scheduled to occur during the nesting season (February 1 through August 31 for protected raptors and migratory birds), a focused survey of the work area for active nests of such birds shall be conducted by a qualified biologist within 15 days prior to the	Less than Significant

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Mitigation Measures	Level of Significance after Mitigation
Significant with Mitigation Incorporated)	beginning of any project-related activities. If a lapse in project-related work of 15 days or longer occurs during the nesting season, another survey shall be required before project work can be reinitiated. If an active nest is found, the applicant or developer shall establish a buffer area that surrounds the nest location. The width of the buffer shall be determined by the survey biologist and shall be dependent on the location of the nest and the affected species. No project-related work or activities shall be permitted within the buffer area until the biologist has determined the nest is no longer active. The final determination shall be made by the City of Fremont Planning Manager upon receipt of the biologist's recommendation.	
Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5; directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; disturb any human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation Incorporated)	**Mitigation Measure Cult-1:** If any archaeological or paleontological resources or human remains are encountered during grading or site disturbance on any of the parcels within the Planned District, all work shall cease within a 200-foot radius of the discovery until it can be evaluated by a qualified archaeologist and/or paleontologist. Work shall not continue until the archaeologist/paleontologist conducts sufficient research and data collection to make a determination as to the significance of the resource. If the resource is determined to be significant and mitigation is required, the first priority shall be avoidance and preservation of the resource. If avoidance is not feasible, an alternative archaeological/paleontological management plan shall be prepared that may include excavation. If human remains are discovered, the Alameda County Coroner's office shall be notified as required by state law. All excavation and monitoring activities shall be conducted in accordance with the prevailing professional standards, as outlined in the CEQA Guidelines and by the California Office of Historic Preservation.	Less than Significant

CHAPTER 3
Project Description

A. Project Background

The Ardenwood Technology Park Planned District Amendment (project) would rezone 32 existing industrial parcels located within a portion of the Ardenwood Technology Park to enable more intensive Class A office, advanced manufacturing, and research and development uses, as well as small-scale retail/service uses to meet the everyday needs of employees. The project would rezone the existing parcels from Planned District P-81-15NN (portion), Planned District P-81-15NN(F) with Flood Combining District Overlay (portion) and Planned District P-2001-7(F) with Flood Combining District (portion) to a new Planned District P-2015-23(F).

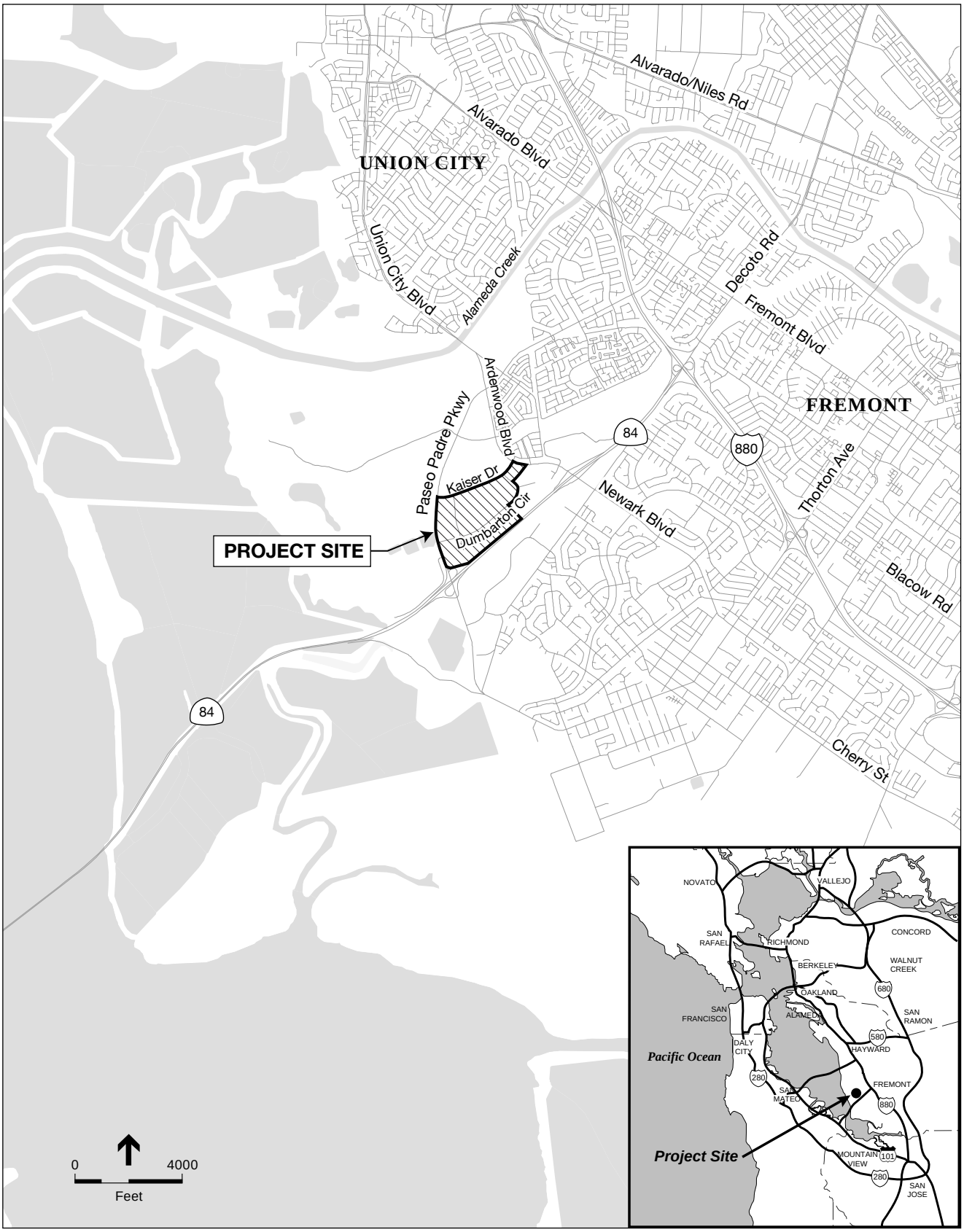
B. Project Location and Setting

The project site is located in the City of Fremont and consists of 32 parcels totaling approximately 147.7 acres bounded generally by Paseo Padre Parkway to the southwest, Kaiser Drive to the northwest, Ardenwood Boulevard to the northeast and State Route 84 (SR 84) to the southeast (**Figures 3-1** and **3-2**). The Coyote Hills Regional Park is located approximately one-half mile west of the project area. The closest residential development to the project area is the dormitory housing at DeVry University located at 34797 Ardentech Court approximately 800 feet (0.15 mile) to the east. A single-family residential development is also located directly across Ardenwood Boulevard to the northeast, while the nearest school, Snow Elementary School in Newark, is located approximately one-half mile away to the southeast across SR 84.

Nineteen of the parcels are currently developed with industrial buildings while the other 13 are currently vacant. All of the existing buildings are either one or two stories in height. All of the parcels are located within the Ardenwood Technology Park (ATP), which was originally created as part of the Ardenwood Forest - New Town development project approved by the City Council under Planned District P-81-15 in 1981.

Surrounding Land Uses

The industrial properties across Kaiser Drive to the north are designated Tech Industrial in the Land Use Element of the General Plan and zoned Planned District P-81-15A and P-81-15PP. The neighboring industrial properties along Dumbarton Circle and within Ardentech Court to the southeast are also designated Tech Industrial and zoned Planned District P-81-15NN. The vacant lands across Paseo Padre Parkway to the west and northwest are designated Open Space – Resource Conservation/Public in the General Plan and zoned Agricultural - A and Agricultural with Flood



Ardenwood Technology Park Planned District Rezoning EIR . 140953

SOURCE: ESRI; ESA

Figure 3-1

Project Site Location

SOURCE: Google Earth

Figure 3-2
Aerial View of Project Site

Combining District - A(F). The vacant parcel across Paseo Padre Parkway to the southwest is designated Industrial – Tech and zoned Restricted Industrial I-R(F) with Flood Combining District. The lands across SR 84 to the southeast lie within the City of Newark and are designated Special Industrial in that City's General Plan and zoned MT-1 High Technology Park District.

C. Project Characteristics

Purpose

The purpose of the project is to establish a framework to transition a low-scale 1980s business park into a 21st century employment district that encourages development of high-quality, distinctive corporate office and headquarter operations, research and development activities, advanced manufacturing and supportive services that would strengthen the local economy and provide opportunities for businesses to locate and expand in Fremont. Future development would integrate with existing business park uses as well as anticipated development on vacant lands west of the project site.

Proposed Land Use and Development Standards

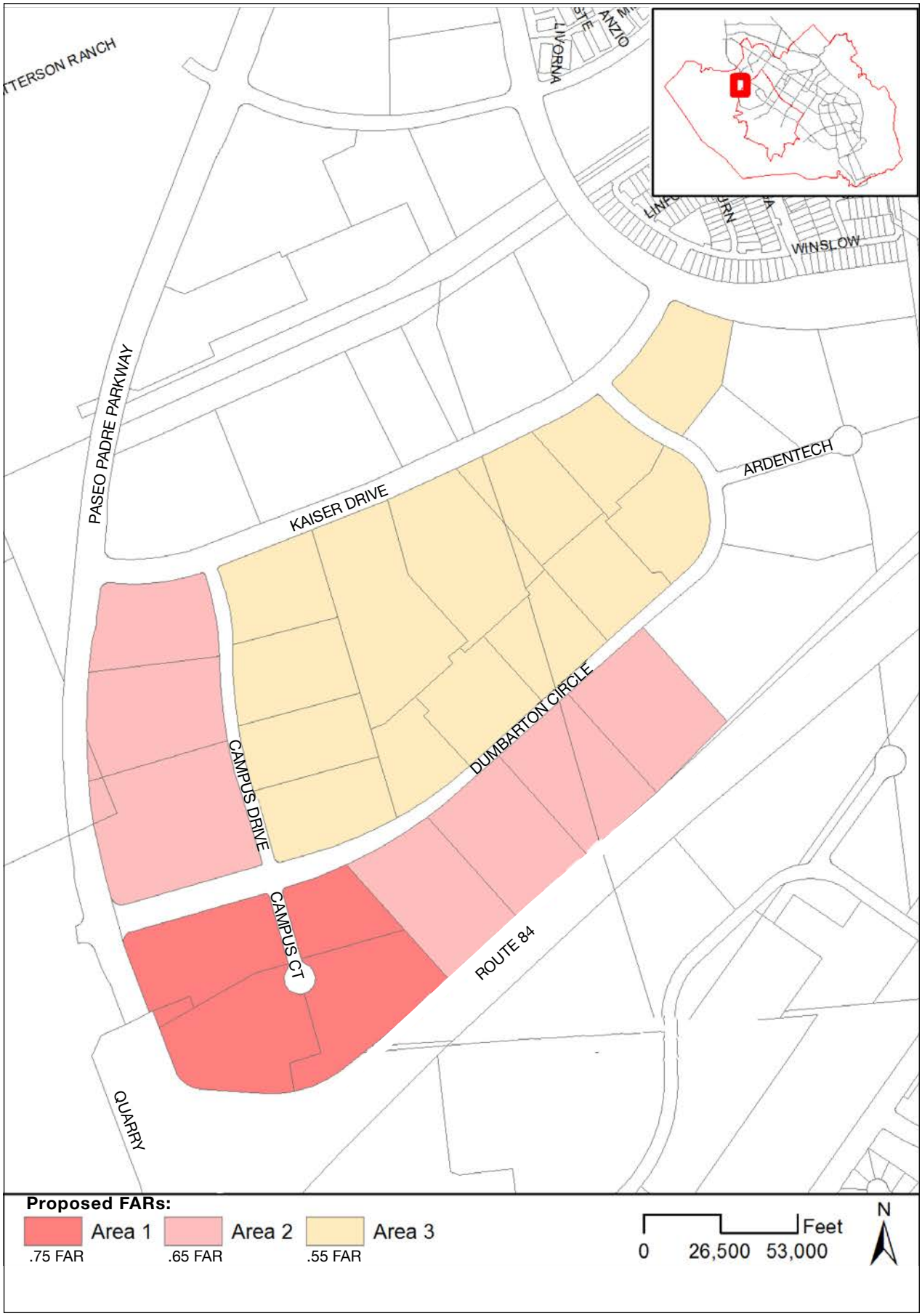
Comprising 32 parcels totaling approximately 148 acres, the project site is divided into the following three areas: Area 1 – Gateway Parcels (24.8 acres); Area 2 – Edge Parcels (50.5 acres); and Area 3 – Central Parcels (72.4 acres) (**Figure 3-3**).

Area 1 – Gateway Parcels

- Area 1 currently comprises five vacant parcels totaling 24.8 acres on Campus Court.
- Primary uses in this area would include: corporate/professional, administrative, research and development offices and a full-service hotel. Ancillary uses could include small-scale retail and services uses including restaurants, delis, dry cleaners, health clubs, banks and small retail establishments. Ancillary uses would be limited to no more than 10 percent of the total floor area within Area 1 and would be clustered within walking distance to the greatest number of employees.
- The maximum FAR would be 0.75 (0.55 minimum) and the maximum building height would be 115 feet.

Area 2 – Edge Parcels

- Area 2 comprises ten parcels totaling 50.5 acres located on Campus Drive and Dumbarton Circle. The majority of these parcels are currently developed with one- and two-story industrial and office buildings; however, three parcels on Campus Drive are vacant. Because the Dumbarton Circle parcels are occupied by newer two-story office buildings, it is envisioned that new development, at least initially, would be limited to the vacant parcels while existing development would transition to high intensity uses.



SOURCE: City of Fremont

Ardenwood Technology Park Planned District Rezoning EIR . 140953

Figure 3-3
Project Site

- Primary uses would include corporate/professional, administrative, and research and development offices, and advance manufacturing uses. Ancillary uses would include mall-scale retail and service uses including, but not limited to, restaurants, delis, dry cleaners, health clubs, banks and small retail establishments. Such uses would be limited to no more than 10 percent of the total floor area within Area 2 and would be clustered within walking distance to the greatest number of employees.
- The maximum FAR would be 0.65 (0.45 minimum) and the maximum building height would be 75 feet

Area 3 – Central Parcels

- Area 3 comprises 17 parcels totaling 72.4 acres. With the exception of one vacant parcel, all of these parcels are currently developed with one- and two-story industrial buildings. It is anticipated that these parcels would be redeveloped in the near term with high intensity corporate campus uses.
- Primary uses would include corporate/professional, administrative, and research and development offices, and advanced manufacturing uses. Ancillary uses would include small-scale retail and service uses including, but not limited to, restaurants, delis, dry cleaners, health clubs, banks and small retail establishments. Such uses would be limited to no more than 10 percent of the total floor area within Area 3 and would be clustered in one or two groupings within walking distance to the greatest number of employees.
- The maximum FAR would be 0.55 (0.35 minimum) and the maximum building height would be 75 feet.

Features Common to all Parcels

- **Setback Requirements:** Building setback requirements would be determined as part of the Discretionary Design Review Permit process and would be dependent upon overall building height and massing, the adjacent street section, and building code and emergency vehicle access requirements.
- **Parking:** 3.3 spaces would be required per 1,000 square feet of floor area. Car share and electric vehicle parking spaces would be included as set forth in Fremont Municipal Code (FMC) Section 18.183.172. Bicycle parking would be provided in accordance with FMC Section 18.183.135, which requires one space plus five percent of the required automobile parking for long-term use by building occupants, and four spaces plus five percent of the required automobile parking for short-term visitor use.
- **Landscape Standards:** Project landscaping would meet the requirements of the Water Efficient Landscape Ordinance through the use of xeriscape, drought tolerant and Bay friendly plants.
- **Art Program:** The Ardenwood Technology Park Art Program would install artwork throughout the district.

Proposed FAR Changes

The proposed FAR increase would change the allowable FAR in Area 1 – Gateway Parcels from 0.35 to 0.75, in Area 2 – Edge Parcels from 0.35 to 0.65, and in Area 3 – Central Parcels from 0.35 to 0.55. These proposed increases could potentially allow development of up to approximately 3,974,741 square feet overall. This represents approximately 1,722,754 square feet of additional floor area across the 32 parcels than would otherwise be allowed under the current maximum

0.35 FAR established in the General Plan for the Tech Industrial land use designation. Nineteen of the 32 parcels comprising approximately 96 acres or 65 percent of the project area are already developed. The existing floor area on developed parcels totals 1,387,181 square feet. Thus, the proposed FAR increase could allow approximately 2,587,560 square feet of additional floor area over existing developed floor area. However, up to 2,251,987 square feet could be developed under the existing allowable FAR, an increase of 1,722,754 square feet. For CEQA purposes, the project analyzed in this EIR is the 2,587,560 square feet, or the difference between existing developed square feet and proposed allowable square feet. **Table 3-1** shows the average FAR and floor area of existing development, existing allowable FAR and allowable floor area, and proposed allowable FAR and allowable floor area. Figure 3-3 shows the parcels subject to the proposed FAR increase.

TABLE 3-1
EXISTING AND PROPOSED ALLOWABLE FAR AND FLOOR AREA

Location	Average FAR for Existing Development	Existing Developed square feet	Existing Allowable FAR	Existing Allowable square feet	Proposed Allowable FAR	Proposed Allowable square feet
Area 1 – Gateway Parcels (five parcels)	**0**	0	0.35	377,643.5	0.75	809,236.5
Area 2 – Edge Parcels (10 parcels)	0.34	510,678	0.35	770,380.5	0.65	1,430,706
Area 3 – Central Parcels (17 parcels)	0.28	876,503	0.35	1,103,963	0.55	1,734,798
Totals:	**0.31**	**1,387,181**	**0.35**	**2,251,987**	**Varies**	**3,974,741**
Difference in square feet between Existing Allowable FAR and Proposed Allowable FAR:						**1,722,754**
Difference Between Existing Developed square feet and Proposed Allowable square feet:						**2,587,560**

The ATP currently has a maximum height limit of 75 feet and four stories, and as described above, these limitations would continue to remain in effect for Area 2 – Edge Parcels and Area 3 – Central Parcels. However, the height limit for the five parcels in Area 1 – Gateway Parcels that are adjacent to the intersection of Paseo Padre Parkway and SR 84 would be increased to a maximum of seven stories and 115 feet to allow a clustering of taller buildings at this location to serve as the future focal point of the technology park.

Access and Circulation

Access to the project area is provided via the intersections of Paseo Padre Parkway/Kaiser Drive, Paseo Padre Parkway/Dumbarton Circle, and Ardenwood Boulevard/Kaiser Drive. The Ardenwood Boulevard/Kaiser Drive intersection is signalized while Paseo Padre Parkway/Kaiser Drive and Paseo Padre Parkway/Dumbarton Circle are controlled by a one-way stop sign on both Kaiser Drive and Dumbarton Circle. The nearest freeway interchange is the SR 84/Thornton Avenue/Paseo Padre Parkway interchange located approximately one-quarter mile to the southwest of the intersection of Paseo Padre Parkway and Dumbarton Circle. Paseo Padre Parkway is classified as a primary arterial roadway in the Mobility Element of the General Plan, with two through lanes in each direction adjacent to the project site. Ardenwood Boulevard is

classified as a minor arterial roadway, with two through lanes in each direction adjacent to the project site. Kaiser Drive and Dumbarton Circle are both classified as collector streets. Kaiser Drive has two through lanes in each direction, while Dumbarton Circle has one through lane in each direction and a center left-turn lane.

Transportation Demand Management

The proposed amendment would require that each employer participate in a Transportation Demand Management (TDM) Program. The future TDM program would include, but would not be limited to, the following components:

- Shuttle program for employees to and from the BART station(s) and Centerville Train Station, which is served by the Altamont Commuter Express and the Capitol Corridor service.
- Vanpools
- Carpool and rideshare programs
- Indoor bicycle storage facilities and shower/locker facilities for employees
- Other incentives to encourage employees to use alternatives to the single occupant vehicle

Design Guidelines

Future development in the Ardenwood Technology Park would require distinctively innovative and sustainable architecture, site design, landscaping, and public art that foster and support an overall sense of a vibrant technology employment center. Area 1 is adjacent to State Route 84 and Paseo Padre Parkway, a highly visible location that is intended to be a focal point and gateway for both the City and the Technology Park. Likewise, Areas 2 and 3 should be developed with the highest level of design consistent with the overall goal of creating an architecturally distinctive employment district.

The focus of future development would be on research and development of new technologies that improve products and/or processes. Building and site design would create inviting and comfortable gathering spaces, reinforce the sense of collaboration and sharing of ideas, and provide opportunities to exhibit and promote the ideas and technologies that are being innovated within. Buildings and campuses would be linked by a network of pedestrian and bicycle paths, and landscaped open spaces.

D. Project Objectives

CEQA *Guidelines* Section 15124(b) requires that the project description of an EIR include a statement of objectives for the proposed project. The objectives for the proposed project are to:

- Promote high-quality, architecturally distinctive development
- Strengthen the identity of the Ardenwood Technology Park by creating a visual and functional gateway presence as viewed from State Route 84

- Create a strong local economy that attracts new businesses, in particular high-end office uses, to Fremont while providing opportunities for existing businesses to expand and grow
- Transition a low-scale 1980s business park into a 21st century Silicon Valley work place with an employment base that supports alternative modes of transportation through a robust transportation management demand (TDM) program
- Increase development potential within this City-identified priority industrial area

E. Project Approvals

The project would require the following approvals and discretionary actions from the City:

- Preliminary and Precise Planned District Rezoning
- Discretionary Design Review Permits for future development projects

Other approvals may be required from the following agencies:

- State of California Department of Transportation
- Bay Area Air Quality Management District (BAAQMD)
- Alameda County Water District (ACWD)
- Union Sanitary District (USD)

This page intentionally left blank

CHAPTER 4
Environmental Setting, Impacts, and Mitigation Measures

This chapter contains the analysis of the potential effects to environmental topics considered under CEQA from implementation of the Ardenwood Technology Park Planned District Amendment. This chapter describes the existing setting, the potential impacts that could result from the rezoning of the project area and relevant plans and policies that would minimize or avoid potential adverse environmental effects that could result. Finally, this chapter identifies mitigation measures necessary to reduce the potential impacts resulting from rezoning of the property.

The following provides an overview of the scope of the analysis included in this chapter and the methods for determining what impacts are significant.

A. Environmental Topics

This document is a Focused EIR in that it evaluates potential impacts on a limited number of environmental issue areas that the lead agency determined to be significant (CEQA *Guidelines* Section 15063(c)(3)). After preparation of the Initial Study Checklist (see **Appendix A**), the City of Fremont determined that the EIR would focus on the potentially significant impacts of the proposed project on air quality, greenhouse gas emissions, noise and transportation.

B. Format of Environmental Topic Discussion, Impact Statements, and Mitigation Measures

The environmental topic discussion includes two main subsections:

- *Existing Setting*, which includes baseline conditions, regulatory setting, and thresholds/criteria of significance; and
- *Impacts and Mitigation Measures*, which identifies and discusses the potential impacts and mitigation measures that would, to the extent possible, reduce or eliminate adverse impacts identified in this chapter.

This EIR identifies all impacts with an alpha-numeric designation that corresponds to the environmental topic addressed (e.g., “4.A” for Section 4.A, *Air Quality*). The topic designator is followed by a number that indicates the sequence in which the impact statement occurs within the

section. For example, "Impact 4.A-1" is the first (i.e., "1") air quality impact identified in the EIR. All impact statements are presented in bold text.

The impact classification (discussed below) of the project's effects prior to implementation of mitigation measures is stated in parentheses immediately following the impact statement.

Similarly, each mitigation measure is numbered to correspond with the impact that it addresses. Where multiple mitigation measures address a single impact, each mitigation measure is numbered sequentially. For example "Mitigation Measure 4.A-1" is the first mitigation identified to address the first air quality impact (i.e., "4.A-1"). All mitigation measure statements are presented in bold text.

C. Thresholds/Criteria of Significance

CEQA *Guidelines* § 15382 defines a significant effect on the environment as "*a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant.*" Determinations of significance vary with the physical conditions affected and the setting in which the change occurs. The significance criteria used in this EIR are the thresholds for determining significance of potential impacts and are based on Appendix G of the CEQA *Guidelines*.

D. Impact Classifications

The following level of significance classifications are used throughout the impact analysis in this EIR:

- **Less than Significant (LS) –** The impacts of the proposed project, either before or after implementation of standard conditions of approval and/or feasible mitigation measures, do not reach or exceed the defined Threshold/Criteria of Significance. Generally, no mitigation measure is required for a less than significant impact.

- **Significant (S)** – The impact of the proposed project is expected to reach or exceed the defined Threshold/Criteria of Significance. Feasible mitigation measures and/or standard conditions of approval may or may not be identified to reduce the significant impact to a less-than-significant level.

- **Less than Significant with Mitigation (LSM)** – The impact of the proposed project is expected to reach or exceed the defined Threshold/Criteria of Significance. Feasible mitigation measures and/or standard conditions of approval are identified to reduce the significant impact to a less than significant level.

- **Significant and Unavoidable (SU)** – The impact of the proposed project reaches or exceeds the defined Threshold/Criteria of Significance. No feasible mitigation measures are available to reduce the significant impact to a less-than-significant level. In these cases, feasible mitigation measures are identified to reduce the significant impact to the maximum

feasible extent, but the significant impact remains significant and unavoidable. Impacts are also classified as significant and unavoidable if a feasible mitigation measure is identified that would reduce the impact to a less-than-significant level, but the approval and/or implementation of the mitigation measure is not within the City's or a project applicant's sole control, in which case the analysis cannot presume implementation of the mitigation measure and the resulting less-than-significant impact. It is important to clarify that a significant and unavoidable impact is an impact classification that only applies *after* consideration of possible mitigation measures.

- **No Impact (N)** – No noticeable adverse effect on the environmental would occur.

E. Environmental Baseline

Overall, pursuant to CEQA *Guidelines* §15125(a), this EIR measures the physical impacts of the proposed project against a "baseline" of physical environmental conditions at and in the vicinity of the project site. The environmental "baseline" is the combined circumstances existing at the time the NOP of the EIR was published, which is May 14, 2015; unless otherwise specified, this is considered the "existing" condition for this EIR. The baseline condition relevant to the environmental topics are further discussed in each section of Chapter 4. Discussion of the baseline condition is detailed or restated in the Impacts Analysis to provide the most reader-friendly format and organization. The baseline also includes the policy and planning context for the proposed project, such as the existing design review policies and procedures that currently govern proposed development.

F. Cumulative Analysis

CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative impacts analysis is intended to describe the "incremental impact of the project when added to other closely related past, present, and reasonably foreseeable future projects." "Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." (CEQA *Guidelines* § 15355) The analysis of cumulative impacts is a two-phase process that first involves the determination of whether the project, together with other projects, would result in a significant impact. If there would be a significant cumulative impact of all such projects, the EIR must determine whether the project's incremental effect is cumulatively considerable, in which case, the project itself is deemed to have a significant cumulative effect. (CEQA *Guidelines* § 15130)

CEQA provides for two very different methods of identifying a project's cumulative impacts. The environmental document may provide either: (1) a list of past, present, and probable future projects producing related or cumulative impacts; or (2) a summary of projections contained in an adopted general plan or related planning document, or in a prior environmental document that has been adopted or certified, which described or evaluated regional or area-wide conditions contributing to the cumulative impact.

The cumulative conditions for the proposed project used projections from the City of Fremont's General Plan to identify area-wide conditions contributing to the cumulative impact. The context used for assessing cumulative impacts typically varies depending on the specific topic being analyzed to reflect the different geographic scope of different impact areas. For example, all development within the air basin contributes to regional emissions of criteria pollutants, while, for traffic, the cumulative development analysis is intended to capture all of the intersections considered in the traffic analysis for the proposed project. The transportation analyses (and transportation-related traffic and air quality), provides an evaluation of long-term conditions operation based on traffic volumes contained in the General Plan for year 2035. Accordingly, the geographic setting and other parameters of each cumulative analysis discussion can vary and are described under their respective cumulative analysis impact, in Section, 4.A, for air quality, 4.B for greenhouse gas emissions, 4.C for noise, 4.D for transportation, and in the respective sections of the Initial Study Checklist for the remaining topics.

Generally, cumulative development beyond the City limits could potentially result in only a minor incremental impact, not likely to be considerable, when added to the proposed project.

4.A Air Quality

Introduction

This section addresses the impacts of the Ardenwood Technology Park Planned District Amendment (proposed project) on ambient air quality and the exposure of people, especially sensitive individuals, to unhealthful pollutant concentrations, including the type and quantity of emissions that would be generated by construction and operation of the project. The analysis of emissions focuses on whether the proposed project would cause an exceedance of a state or national ambient air quality standard, a health based standard for exposure to toxic air contaminants (TACs), or a CEQA threshold recommended by the Bay Area Air Quality Management District (BAAQMD).

Environmental Setting

Physical Setting

Climate and Meteorology

Air quality is affected by the rate, amount and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction and air temperature, in combination with local surface topography (i.e., geographic features such as mountains, valleys and San Francisco Bay), determine the effect of air pollutant emissions on local air quality.

The project site is located in the City of Fremont and is within the boundaries of the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB encompasses the nine-county region, which is all of Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin and Napa counties, and the southern portions of Solano and Sonoma counties. The climate of the SFBAAB is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the west coast of North America. During winter, the Pacific high-pressure system shifts southward, allowing more storms to pass through the region. During summer and early fall, when few storms pass through the region, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone, and secondary particulates, such as nitrates and sulfates.

The project site is within the Southwestern Alameda County climatological subregion of the SFBAAB, with specific topographic and climatological conditions described in the BAAQMD *California Environmental Quality Act Air Quality Guidelines* (BAAQMD, 2012a). This climatological subregion stretches from Dublin Canyon to north of Milpitas. Its western boundary is defined by the San Francisco Bay and its eastern boundary by the East Bay hills. This subregion is indirectly affected by marine air flow. Marine air entering through the Golden Gate is blocked by the East Bay hills, forcing the air to diverge into northerly and southerly paths. The southern flow is directed down the bay, parallel to the hills, where it eventually passes over southwestern Alameda County. These sea breezes are strongest in the afternoon. The further from

the ocean the marine travels, the more the ocean's effect is diminished. Although the climate in this region is affected by sea breezes, it is affected less so than the regions further north and closer to the Golden Gate.

Winds are predominantly out of the northwest during the summer months. In the winter, winds are equally likely to be from the east. Easterly-southeasterly surface flow into southern Alameda County passes through three major gaps: Hayward/Dublin Canyon, Niles Canyon and Mission Pass. Areas north of the gaps experience winds from the southeast, while areas south of the gaps experience winds from the northeast. Wind speeds are moderate in this subregion, with annual average wind speeds close to the Bay measuring at about seven miles per hour (mph), while further inland they average six mph.

Data from the closest climate monitoring station—Western Regional Climate Center's (WRCC's) Newark, California station (COOPID 04144)—was used to characterize climate conditions in the study area. Over the period of record (1906-2015), the average summer (August) high and low temperatures were 77°F and 57°F, respectively. The average winter (January) high and low temperatures were 57.3°F and 40.6°F, respectively. Rainfall varies widely from year to year, with an annual average of 14.31 inches (Western Regional Climate Center, 2015).

Pollution potential is relatively high in this subregion during the summer and fall. When high pressure dominates, low mixing depths and Bay and ocean wind patterns can concentrate and carry pollutants from other cities to this area, adding to the locally emitted pollutant mix. The polluted air is then pushed up against the East Bay hills. In the wintertime, the air pollution potential in southwestern Alameda County is moderate. Air pollution sources include light and heavy industry, and motor vehicles. Increasing motor vehicle traffic and congestion in the subregion may increase southwestern Alameda County pollution as well as that of its neighboring subregions (BAAQMD, 2012a).

Existing Air Quality

Criteria Air Pollutants

As required by the federal Clean Air Act (CAA) passed in 1970, the United States Environmental Protection Agency (U.S. EPA) has identified six criteria air pollutants that are pervasive in urban environments, and for which state and national health-based ambient air quality standards have been established. The U.S. EPA calls these pollutants "criteria air pollutants" because the agency has regulated them by developing specific public health- and welfare-based criteria as the basis for setting permissible levels. Ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter and lead are the six criteria air pollutants. Notably, particulate matter is measured in two size ranges: PM10 for particles less than 10 microns in diameter, and PM2.5 for particles less than 2.5 microns in diameter.

BAAQMD and the California Air Resources Board (CARB) regional air quality monitoring network provide information on ambient concentrations of non-attainment criteria air pollutants. Data from these stations record existing air pollutant levels. Probable future levels of air quality in the project area can generally be inferred from ambient air quality measurements conducted at

the nearest monitoring stations by examining trends over time. The closest monitoring stations are in Hayward (La Mesa Drive) and San Jose (Piedmont Road). There had also previously been a station in Fremont (Chapel Way), but that site has been closed since 2010. **Table 4.A-1** shows a five-year (2010 through 2014) summary of monitoring data for ozone, PM10, and PM2.5, the three criteria air pollutants designated as non-attainment, recorded at the nearest stations.

TABLE 4.A-1
SUMMARY OF AIR QUALITY MONITORING DATA (2010–2014)

Pollutant	Applicable Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured[a]				
		2010	2011	2012	2013	2014
Ozone						
Fremont – Chapel Way Station						
- Days 1-hour State Std. Exceeded	>0.09 ppm[b]	1	ND	ND	ND	ND
- Max. 1-hour Conc. (ppm)		**0.120**	ND	ND	ND	ND
- Days 8-hour National Std. Exceeded	>0.075 ppm[c]	1	ND	ND	ND	ND
- Days 8-hour State Std. Exceeded	>0.07 ppm[b]	1	ND	ND	ND	ND
- Max. 8-hour Conc. (ppm)		**0.081**	ND	ND	ND	ND
Hayward – La Mesa Dr. Station						
- Days 1-hour State Std. Exceeded	>0.09 ppm[b]	ND	0	0	0	1
- Max. 1-hour Conc. (ppm)		ND	0.088	0.094	0.085	**0.096**
- Days 8-hour National Std. Exceeded	>0.075 ppm[c]	ND	0	0	0	0
- Days 8-hour State Std. Exceeded	>0.07 ppm[b]	ND	0	0	1	4
- Max. 8-hour Conc. (ppm)		ND	0.070	0.065	**0.075**	**0.075**
San Jose – Piedmont Rd. Station						
- Days 1-hour Std. Exceeded	>0.09 ppm[b]	5	1	1	0	0
- Max. 1-hour Conc. (ppm)		**0.126**	**0.098**	**0.101**	0.093	0.089
- Days 8-hour National Std. Exceeded	>0.075 ppm[c]	3	0	0	1	0
- Days 8-hour State Std. Exceeded	>0.07 ppm[b]	3	0	0	1	0
- Max. 8-hour Conc. (ppm)		**0.086**	0.067	0.062	**0.079**	0.066
Suspended Particulates (PM10)						
San Jose – Piedmont Rd. Station						
- Days Over 24-hour National Std.[d]	>150 µg/m^3 [c]	0	0	0	0	0
- Days Over 24-hour State Std.[d]	>50 µg/m^3 [b]	0	0	1	5	1
- Max. 24-hour Conc. (µg/m^3)		47	44	**60**	**58**	**55**
- Annual Average (µg/m^3)	>20 µg/m^3 [b]	19.5	19.2	18.8	**22.3**	19.9
Suspended Particulates (PM2.5)						
San Jose – Piedmont Rd. Station						
- Days Over 24-hour National Std.[d]	>35 µg/m^3 [c]	3	3	2	6	2
- Max. 24-hour Conc. (µg/m^3)		**41.5**	**50.5**	**38.4**	**57.7**	**60.4**
- Annual Average (µg/m^3)	>12 µg/m^3 [b]	8.8	9.9	9.1	**12.4**	8.4

NOTES:
Bold values are in excess of applicable standard.
conc. = concentration; ppm = parts per million; ppb=parts per billion;
µg/m3 = micrograms per cubic meter
ND = No data or insufficient data.

[a] Number of days exceeded is for all days in a given year, except for particulate matter. PM10 and PM2.5 are monitored every six days.
[b] State standard, not to be exceeded.
[c] Federal standard, not to be exceeded.
[d] Particulate matter sampling at San Jose is one out of every three days, for a total of approximately 120 samples per year.

SOURCE: BAAQMD, 2015a

While the data gathered at these monitoring stations may not necessarily reflect the unique meteorological environment of the project site nor the proximity of site-specific stationary and

street sources, it does present the nearest available benchmark and provide the reader with a reference point as to what the pollutants of greatest concern are in the region and the degree to which the area is out of attainment with specific air quality standards.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG, also sometimes referred to as volatile organic compounds or VOC by some regulating agencies) and nitrogen oxides (NOx). The main sources of ROG and NOx, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints and fuels. In the Bay Area, automobiles are the single largest source of ozone precursors. Ozone is referred to as a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process. Ozone causes eye irritation, airway constriction and shortness of breath, and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.

Carbon Monoxide

CO is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels. The single largest source of CO is motor vehicles; the highest emissions occur during low travel speeds, stop-and-go driving, cold starts and hard acceleration. Exposure to high concentrations of CO reduces the oxygen-carrying capacity of the blood and can cause headaches, nausea, dizziness, and fatigue, impair central nervous system function, and induce angina (chest pain) in persons with serious heart disease. Very high levels of CO can be fatal.

CO concentrations have declined dramatically in California due to existing controls and programs and most areas of the state including the project region have no problem meeting the state and federal CO standards. CO measurements and modeling were important in the early 1980s when CO levels were regularly exceeded throughout California. In more recent years, CO measurements and modeling have not been a priority in most California air districts due to the retirement of older polluting vehicles, fewer emissions from new vehicles and improvements in fuels. The clear success in reducing CO levels is evident in the first paragraph of the executive summary of the CARB *2004 Revision to the California State Implementation Plan for Carbon Monoxide Updated Maintenance Plan for Ten Federal Planning Areas* (CARB, 2004), shown below:

> "The dramatic reduction in carbon monoxide (CO) levels across California is one of the biggest success stories in air pollution control. Air Resources Board requirements for cleaner vehicles, equipment and fuels have cut peak CO levels in half since 1980, despite growth. All areas of the State designated as non-attainment for the federal 8-hour CO standard in 1991 now attain the standard, including the Los Angeles urbanized area. Even the Calexico area of Imperial County on the congested Mexican border had no violations of the federal CO standard in 2003. Only the South Coast and Calexico continue to violate the more protective State 8-hour CO standard, with declining levels beginning to approach that standard."

Particulate Matter (PM10 and PM2.5)

PM10 and PM2.5 are also termed respirable particulate matter and fine particulate matter, respectively, and are a class of air pollutants that consists of heterogeneous solid and liquid

airborne particles from manmade and natural sources. In the Bay Area, motor vehicles generate about one-half of the air basin's particulates, through tailpipe emissions as well as brake pad and tire wear. Wood burning in fireplaces and stoves, industrial facilities, and ground-disturbing activities such as excavation and grading during construction are other sources of such particulates. These particulates are small enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. Among the criteria pollutants that are regulated, particulates represent a serious ongoing health hazard. As long ago as 1999, BAAQMD was reporting, in its CEQA Guidelines, that studies had shown that elevated particulate levels contribute to the death of approximately 200 to 500 people per year in the Bay Area. Compelling evidence suggests that PM2.5 is by far the most harmful air pollutant in the Bay Area in terms of the associated impact on public health. A large body of scientific evidence indicates that both long-term and short-term exposure to PM2.5 can cause a wide range of health effects (e.g., aggravating asthma and bronchitis, causing visits to the hospital for respiratory and cardiovascular symptoms, and contributing to heart attacks and deaths) (BAAQMD, 2012a).

Nitrogen Dioxide (NO_2)

NO_2 is a reddish brown gas that is a byproduct of combustion processes. Automobiles and industrial operations are the main sources of NO_2. Aside from its contribution to ozone formation, NO_2 can increase the risk of acute and chronic respiratory disease and reduce visibility. NO_2 may be visible as a coloring component on high pollution days, especially in conjunction with high ozone levels. No NO_2 monitoring was conducted in the project vicinity. However, according to BAAQMD, the entire air basin, including the project area, is in attainment for the state and federal NO_2 standards (BAAQMD, 2015b).

Sulfur Dioxide (SO_2)

SO_2 is a colorless acidic gas with a strong odor. It is produced by the combustion of sulfur-containing fuels such as oil, coal and diesel. SO_2 has the potential to damage materials and can cause health effects at high concentrations. It can irritate lung tissue and increase the risk of acute and chronic respiratory disease (BAAQMD, 2012a). No SO_2 monitoring was conducted in the project vicinity. However, according to BAAQMD, the entire air basin, including the project area, is in attainment for the state and federal SO_2 standards (BAAQMD, 2015b).

Lead

Leaded gasoline (phased out in the United States beginning in 1973), lead based paint (on older houses and cars), smelters (metal refineries), and manufacturing of lead storage batteries have been the primary sources of lead released into the atmosphere. Lead has a range of adverse neurotoxic health effects, of which children are at special risk. Some lead-containing chemicals cause cancer in animals. Lead levels in the air have decreased substantially since leaded gasoline was eliminated. Ambient lead concentrations are only monitored on an as-warranted, site-specific basis in California.

Toxic Air Contaminants

TACs are air pollutants that may lead to serious illness or increased mortality, even when present in relatively low concentrations. Potential human health effects of TACs include birth defects,

neurological damage, cancer and death. There are hundreds of different types of TACs with varying degrees of toxicity. Individual TACs vary greatly in the health risk they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another.

TACs do not have ambient air quality standards but are regulated by BAAQMD using a risk-based approach. This approach uses a health risk assessment to determine what sources and pollutants to control, as well as the degree of control. A health risk assessment is an analysis in which human health exposure to toxic substances is estimated and considered together with information regarding the toxic potency of the substances to provide quantitative estimates of health risks.[1]

Roadway traffic, especially on State Route 84 (SR 84), would be the primary source of TACs in the project area. In addition, BAAQMD provides public source inventories of TAC emission sources within its jurisdiction, including the recently released (May 2012) Google Earth-based inventory of stationary source risks and hazards. This source indicates that there are nine permitted stationary TAC sources within 1,000 feet of the project. These include: (1-2) LBA Reality (34801 Campus Drive and 34781 Campus Drive); (3) Network Equipment Technologies Inc. (6900 Paseo Padre Parkway); (4-5) Amgen Fremont (6397 Kaiser Drive and 6701 Kaiser Drive); (6) iGATE Global Solutions Inc. (6528 Kaiser Drive); (7) Omron STI (6550 Dumbarton Circle); (8) Affymetrix Inc. (6519 Dumbarton Circle); and (9) Logitech (6505 Kaiser Drive). These sources are predominantly associated with commercial/office uses in the area.

Diesel Particulate Matter

CARB identified diesel particulate matter (DPM) as a TAC in 1998, primarily based on evidence demonstrating cancer effects in humans. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Mobile sources such as trucks and buses are among the primary sources of diesel emissions, and concentrations of DPM are higher near heavily traveled highways and rail lines with diesel locomotive operations. The estimated lifetime cancer risk from exposure to diesel exhaust is much higher than the risk associated with any other toxic air pollutant routinely measured in the region. The risk from DPM as determined by CARB declined from 750 in one million in 1990 to 570 in one million in 1995; by 2000, CARB estimated the average statewide cancer risk from DPM at 540 in one million (CARB, 2009a). This calculated cancer risk value from ambient air exposure in the Bay Area can be compared against the lifetime probability of being diagnosed with cancer in the United States, from all causes, which is more than 40 percent (based on a sampling of 17 regions nationwide), or greater than 400,000 in one million, according to the National Cancer Institute (National Cancer Institute, 2012).

[1] In general, a health risk assessment is required if BAAQMD concludes that projected emissions of a specific air toxic compound from a proposed new or modified source suggest a potential public health risk. Such an assessment generally evaluates chronic, long-term effects, calculating the increased risk of cancer as a result of exposure to one or more TACs.

Odor Emissions

As described by BAAQMD in its revised *CEQA Air Quality Guidelines* (BAAQMD, 2012a), odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., a coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity. The occurrence and severity of odor impacts depends on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors. Odor impacts should be considered for any proposed new odor sources located near existing receptors, as well as any new sensitive receptors located near existing odor sources. Generally, increasing the distance between the receptor and the odor source will mitigate odor impacts. BAAQMD provides examples of substantial odor sources, which include wastewater treatments plants, landfills, confined animal facilities, composting stations, food manufacturing plants, refineries and chemical plants.

Sensitive Receptors

Air quality does not affect every individual in the population in the same way, and some groups are more sensitive to adverse health effects than others. Population subgroups sensitive to the health effects of air pollutants include the elderly and the young, those with higher rates of respiratory disease such as asthma and chronic obstructive pulmonary disease, and with other environmental or occupational health exposures (e.g., indoor air quality) that affect cardiovascular or respiratory diseases. Land uses such as schools, children's day care centers, hospitals, and nursing and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Parks and playgrounds are considered moderately sensitive to poor air quality because persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality; however, exposure times are generally far shorter in parks and playgrounds than in residential locations and schools, which typically reduces overall exposure to pollutants. Residential areas are considered more sensitive to air quality conditions compared to commercial and industrial areas because people generally spend longer periods of time at their residences, with associated greater exposure to ambient air quality conditions.[2]

BAAQMD defines sensitive receptors as children, adults, and seniors occupying or residing in residential dwellings, schools, colleges and universities, daycares, hospitals, and senior-care facilities. Workers are not considered sensitive receptors because all employers must follow regulations set forth by the Occupation Safety and Health Administration (OSHA) to ensure the health and well-being of their employees (BAAQMD, 2012b).

[2] The factors responsible for variation in exposure are also often similar to factors associated with greater susceptibility to air quality health effects. For example, poorer residents may be more likely to live in crowded substandard housing and be more likely to live near industrial or roadway sources of air pollution.

Sensitive land uses surrounding the project area include residences and several schools. The closest residential land uses to the project area are single family residential homes located directly across Ardenwood Boulevard to the northeast and the dormitory housing at DeVry University to the east, each located about 200 feet from the project boundary. The nearest school, Snow Elementary School in Newark, is located approximately one-half mile from the project area to the southeast across SR 84.

Regulatory Framework

Development within the project site boundaries must comply with federal, state, regional and local regulations. This section discusses these requirements to the extent that they would affect future development of the proposed project.

Federal

Criteria Pollutants

The 1970 CAA (last amended in 1990) required the U.S. EPA to identify National Ambient Air Quality Standards (NAAQS or "national standards"), which are the concentrations of pollutants (with an adequate margin of safety) to which the public can be exposed without adverse health effects. They are designed to protect those segments of the public most susceptible to respiratory distress, including asthmatics, the very young, the elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels that are somewhat above ambient air quality standards before adverse health effects are observed.

Table 4.A-2, below, presents current national and state ambient air quality standards, as well as the Bay Area attainment status and common sources for each pollutant. Pursuant to the 1990 CAA amendments, the U.S. EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutants based on whether or not the national standards had been achieved. Table 4.A-2 shows the current attainment status of the project vicinity.

The CAA requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA amendments added requirements for states containing areas that violate the national standards to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, planning documents, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The U.S. EPA has responsibility to review all SIPs to determine if they conform to the mandates of the federal CAA amendments and will achieve air quality goals when implemented. If the U.S. EPA determines a SIP to be inadequate, it may prepare a Federal Implementation Plan (FIP) for the nonattainment area and may impose additional control measures. Failure to submit an approvable SIP or to implement the plan within mandated timeframes can result in sanctions being applied to transportation funding and stationary air pollution sources in the air basin.

TABLE 4.A-2
AMBIENT AIR QUALITY STANDARDS AND BAY AREA ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	Bay Area Attainment Status for California Standard	Federal Primary Standard	Bay Area Attainment Status for Federal Standard	Major Pollutant Sources
Ozone	8 hour	0.070 ppm	Non-Attainment	0.075 ppm	Non-Attainment	Formed when ROG and NOx react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 hour	0.090 ppm	Non-Attainment	---	---	
Carbon Monoxide	8 hour	9.0 ppm	Attainment	9.0 ppm	Attainment	Internal combustion engines, primarily gasoline-powered motor vehicles
	1 Hour	20 ppm	Attainment	35 ppm	Attainment	
Nitrogen Dioxide	Annual Average	0.030 ppm	---	0.053 ppm	Attainment	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads
	1 Hour	0.180 ppm	Attainment	0.100 ppm	Unclassified	
Sulfur Dioxide	Annual Average	---	---	0.03 ppm	Attainment	Fuel combustion, chemical plants, sulfur recovery plants and metal processing
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment	
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment	
Particulate Matter (PM10)	Annual Arithmetic Mean	20 μg/m3	Non-Attainment	---	---	Dust- and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays)
	24 hour	50 μg/m3	Non-Attainment	150 μg/m3	Unclassified	
Particulate Matter (PM2.5)	Annual Arithmetic Mean	12 μg/m3	Non-Attainment	12 μg/m3	Attainment	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.
	24 hour	---	---	35 μg/m3	Non-Attainment	
Lead	Calendar Quarter	---	---	1.5 μg/m3	Attainment	Present source: lead smelters, battery manufacturing & recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	1.5 μg/m3	Attainment	---	---	
Hydrogen Sulfide	1 hour	0.03 ppm	Unclassified	No Federal Standard	---	Geothermal Power Plants, Petroleum Production and refining
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	Unclassified	No Federal Standard	---	See PM2.5.

ppm=parts per million
μg/m3=micrograms per cubic meter

SOURCE: BAAQMD, 2015b; CARB, 2009b.

Toxic Air Contaminants

TACs are regulated under both state and federal laws. Federal laws use the term "Hazardous Air Pollutants" (HAPs) to refer to the same types of compounds that are referred to as TACs under State law. Both terms encompass essentially the same compounds. The 1977 CAA amendments required the U.S. EPA to identify National Emission Standards for Hazardous Air Pollutants (NESHAPs) to protect public health and welfare. These substances include certain VOCs, pesticides, herbicides and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 CAA amendments, 189 substances are regulated as HAPs.

State

Criteria Pollutants

Although the CAA established national ambient air quality standards, individual states retained the option to adopt more stringent standards and to include other pollution sources. California had already established its own air quality standards when federal standards were established and because of the unique meteorology in California, there is considerable diversity between the state and national ambient air quality standards, as shown in Table 4.A-2. California ambient standards tend to be at least as protective as national ambient standards and are often more stringent.

In 1988, California passed the California Clean Air Act (CCAA) (California Health and Safety Code Sections 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, but based on state ambient air quality standards rather than the federal standards. As indicated in Table 4.A-2, the SFBAAB is designated as "nonattainment" for state ozone, PM10 and PM2.5 standards. The SFBAAB is designated as "attainment" or "unclassified" for all other pollutants listed in the table.

The CCAA requires each air district in which state air quality standards are exceeded to prepare a plan that documents reasonable progress towards attainment. In the Bay Area, this requirement is met in BAAQMD's Clean Air Plan.

Toxic Air Contaminants

The Health and Safety Code defines TACs as air pollutants which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. The State Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). A total of 243 substances have been designated TACs under California law; they include the 189 (federal) HAPs adopted in accordance with AB 2728. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. Toxic air contaminant emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment and, if specific thresholds are violated, are required to communicate the results to the public in the form of notices and public meetings.

In August 1998, CARB identified DPM emissions from diesel-fueled engines as TACs. CARB subsequently developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (CARB, 2000). The document represents proposals to reduce diesel particulate emissions, with the goal of reducing emissions and associated health risks by 75 percent in 2010 and by 85 percent in 2020. The program aims to require the use of state-of-the-art catalyzed diesel particulate filters and ultra-low sulfur diesel fuel on diesel-fueled engines. New diesel engines meeting the interim Tier 4 emissions standards, and Tier 2 or Tier 3 engines retrofitted with a Level 3 Verified Diesel Emissions Control System, can reduce diesel particulate by approximately 85 percent compared to older equipment.

In April 2005, CARB published the *Air Quality and Land Use Handbook: A Community Health Perspective* (CARB, 2005). This handbook is intended to give guidance to local governments in the siting of sensitive land uses, such as residences, schools, daycare centers, playgrounds or medical facilities, near sources of air pollution.

Regional

Air Quality Plans

The 1977 federal CAA amendments require that regional planning and air pollution control agencies prepare a regional air quality plan to outline the measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve all standards specified in the CAA. The 1988 CCAA also requires development of air quality plans and strategies to meet state air quality standards in areas designated as non-attainment (with the exception of areas designated as non-attainment for the state PM standards). Maintenance plans are required for attainment areas that had previously been designated non-attainment in order to ensure continued attainment of the standards. Air quality plans developed to meet federal requirements are referred to as SIPs, discussed above.

Bay Area plans are prepared with the cooperation of BAAQMD, the Metropolitan Transportation Commission (MTC), and the Association of Bay Area Governments (ABAG). On September 15, 2010, BAAQMD adopted the most recent revision to the Clean Air Plan (CAP) - the *Bay Area 2010 Clean Air Plan* (BAAQMD, 2010). The 2010 CAP serves to:

- Update the *Bay Area 2005 Ozone Strategy* in accordance with the requirements of the CCAA to implement “all feasible measures” to reduce ozone;
- Consider the impacts of ozone control measures on particulate matter, air toxics and greenhouse gases in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2010 – 2012 timeframe.

BAAQMD Rules, Regulations, and CEQA Guidelines

BAAQMD is the regional agency responsible for rulemaking, permitting and enforcement activities affecting stationary sources in the Bay Area. BAAQMD does not have authority to

regulate emissions from motor vehicles. Specific rules and regulations adopted by BAAQMD limit the emissions that can be generated by various stationary sources and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants, but also TAC emission sources, which are subject to these rules are regulated through BAAQMD's permitting process and standards of operation. Through this permitting process, including an annual permit review, BAAQMD monitors generation of stationary emissions and uses this information in developing its air quality plans. Any sources of stationary emissions constructed as part of the project would be subject to the BAAQMD Rules and Regulations. Both federal and State ozone plans rely heavily upon stationary source control measures set forth in BAAQMD's Rules and Regulations.

With respect to construction activities associated with project development, applicable BAAQMD regulations relate to portable equipment (e.g., concrete batch plants, and gasoline- or diesel-powered engines used for power generation, pumps, compressors, pile drivers and cranes), architectural coatings and paving materials. Equipment used during project construction would be subject to the requirements of BAAQMD Regulation 2 (Permits), Rule 1 (General Requirements) with respect to portable equipment unless exempt under Rule 2-1-105 (Exemption, Registered Statewide Portable Equipment); BAAQMD Regulation 8 (Organic Compounds), Rule 3 (Architectural Coatings); and BAAQMD Regulation 8 (Organic Compounds), Rule 15 (Emulsified and Liquid Asphalts).

BAAQMD adopted updated *CEQA Air Quality Guidelines*, including new thresholds of significance in June 2010, and revised them in May 2011. The Air Quality Guidelines advise lead agencies on how to evaluate potential air quality impacts, including establishing quantitative and qualitative thresholds of significance. The thresholds BAAQMD adopted were set aside by an Alameda County Superior Court ruling in March 2012. In May 2012, BAAQMD updated its *CEQA Air Quality Guidelines* to continue to provide direction on recommended analysis methodologies, but without recommended quantitative significance thresholds (BAAQMD, 2012a). On August 13, 2013, the First District Court of Appeal ordered the trial court to reverse the judgment and upheld BAAQMD's CEQA thresholds. This case is now pending before the California Supreme Court, and BAAQMD has not formally re-instated the thresholds.

The air quality analysis below uses the previously adopted 2011 thresholds of BAAQMD to determine the potential impacts of the project. While the significance thresholds adopted by BAAQMD in 2011 are not currently recommended by the BAAQMD, these thresholds are based on substantial evidence identified in BAAQMD's 2009 *Justification Report* (BAAQMD, 2009) and are, therefore, used within this document.

Local Regulations

City of Fremont General Plan

The Fremont General Plan establishes the following goals and policies in the Conservation Element that are relevant to air quality:

Goal 7-7: Air Quality: Air quality improved over current conditions that meets or exceeds State and Regional standards.

- Policy 7-7.1: Cooperation to Improve Regional Air Quality – Support and coordinate air quality planning efforts with other local, regional, and State agencies to improve regional air quality.
- Policy 7-7.2: Reduce Air Contaminant Levels – Reduce City of Fremont air contaminant levels and particulate emissions below BAAQMD attainment levels, in particular, ozone and particulate matter levels.
- Policy 7-7.3: Land Use Planning to Minimize Health Impacts from Toxic Air Contaminants – Coordinate land use planning with air quality data and local transportation planning to reduce the potential for long-term exposure to TACs from permanent sources that affect the community.
- Policy 7-7.4: Air Quality Impact of Industry – Reduce the air quality impacts created by truck traffic, hazardous materials, and industry.

Thresholds of Significance

CEQA

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, air quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

- Conflict with or obstruct implementation of the applicable air quality plan(s);
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The first four criteria are analyzed below. The fifth criterion is not assessed further in this document since the Initial Study prepared for the proposed project determined that potential impacts from odors would be less than significant without mitigation.

Methodology

The methodology for analyzing air quality impacts is identified in BAAQMD's *CEQA Air Quality Guidelines*. Potential impacts are assessed by modeling the estimated daily emissions generated by project construction and project operations using the CalEEMod land use emissions model version 2013.2.2. Project emissions are then compared to the BAAQMD 2011 significance criteria, which include the following:

- Result in total construction emissions of ROGs, NOx, or PM2.5 (exhaust) of 10 tons per year or greater or 54 pounds per day or greater.
- Exceed a construction emission threshold for PM10 (exhaust) of 15 tons per year or greater, or 82 pounds per day or greater.
- For PM10 and PM2.5 as part of fugitive dust generated during construction, the BAAQMD Guidelines specify compliance with Best Management Practices as the threshold.
- Result in total operational emissions of ROG, NOx, or PM2.5 of 10 tons per year or greater, or 54 pounds per day or greater.
- Exceed an operational emission threshold for PM10 of 15 tons per year or greater, or 82 pounds per day.
- Result in carbon monoxide (CO) concentrations of 9.0 ppm (8-hour average) and 20.0 ppm (1-hour average) as estimated by roadway vehicle volumes exceeding 44,000 vehicles per hour at any intersection.
- For risks and hazards during construction and operations for both siting of a new source or receptor, the BAAQMD Guidelines specify an increase in cancer risk exposure by more than 10 in one million, or contribute to a hazard indices by a ratio of greater than 1.0, or incrementally increase local concentrations of PM2.5 by 0.3 micrograms per cubic meter ($\mu g/m^3$).

A project's contribution to cumulative impacts for criteria pollutants are considered significant if the project's impact individually would be significant (i.e., if it exceeds BAAQMD's quantitative thresholds).

With regard to cumulative impacts from PM2.5, a significant cumulative air quality impact would be considered to occur if localized annual average concentrations of PM2.5 would exceed 0.8 micrograms per cubic meter at any receptor from project operations in addition to existing emission sources and cumulative emissions sources within a 1,000-foot radius of the property line of the source or receptor.

With regard to cumulative impacts from TACs, a significant cumulative air quality impact would be considered to occur if the probability of contracting cancer for the maximally exposed individual (MEI) would exceed 100 in one million from all local sources, or if the project would expose persons to TACs such that a non-cancer chronic Hazard Index (HI) of 10.0 would be exceeded at any receptor as a result of project operations, and existing emission sources and cumulative emissions sources within a 1,000-foot radius of the project site. However, a project's construction or operational impacts would be considered to result in a considerable contribution to an identified cumulative health risk impact if the project's construction or operation activities would exceed the project-level health risk significance thresholds identified above.

Project Impacts and Mitigation Measures

Impact Analysis

Impact 4.A-1: Development facilitated by the proposed project could potentially result in air quality impacts due to construction activities. (Significant)

The project would result in the generation of criteria pollutants and TACs during short-term construction activities. These potential impacts are assessed below.

Criteria Air Pollutants

As described in the *Project Description*, 19 of the 32 parcels comprising approximately 96 acres or 65 percent of the project area are already developed. The existing floor area on developed parcels totals 1,387,181 square feet. Thus, the proposed FAR increase could allow approximately 2,587,560 square feet of additional floor area over existing floor area. The construction of the proposed office park and parking lot development and demolition of the existing onsite structures were modeled using CalEEMod (version 2013.2.2) assuming default construction phase durations over a period of about 120 months, commencing in January 2018 with completion in January 2028. Additional data and model outputs are included in Appendix D.

Project-related construction would generate air emissions through the use of heavy-duty construction equipment, from vehicle trips hauling materials, and from construction workers traveling to and from the project site. Mobile source emissions, primarily NOx, would be generated from the use of construction equipment such as excavators, bulldozers, wheeled loaders and fork lifts. During the finishing phase, paving operations and the application of asphalt, architectural coatings (i.e., paints) and other building materials would release ROGs. The assessment of construction air quality impacts considers each of these sources and recognizes that construction emissions can vary substantially from day to day, depending on the level of activity and the specific type of operation.

Unmitigated construction-related criteria pollutant exhaust emissions for the project are presented in **Table 4.A-3**. The estimated emissions consider the following basic construction phases: demolition; site preparation; excavation/grading; building construction; asphalt paving; and application of architectural coatings.

As shown in Table 4.A-3, maximum average daily regional emissions would not exceed the BAAQMD daily significance threshold for NOx during construction. Thus, the project would have a less-than-significant impact from construction-generated emissions of criteria air pollutants.

TABLE 4.A-3
AVERAGE ANNUAL DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS (pounds/day)[a]

Scenario	ROG	NOx	Exhaust PM10[b]	Exhaust PM2.5[b]
Unmitigated Emissions (2018 to 2028)	18.7	46.0	1.4	1.3
BAAQMD Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

NOTES:

a Emissions include results modeled with CalEEMod version 2013.2.2 with default phase durations, equipment, and on-road vehicle assumptions. Additional data and model outputs are included in Appendix D.

b BAAQMD's construction-related significance thresholds for PM10 and PM2.5 apply to exhaust emissions only and not to fugitive dust.

Fugitive Dust

Project-related demolition, site preparation, grading and other construction activities at the project site may cause wind-blown dust. Fugitive dust includes not only PM10 and PM2.5 but also larger particles that can represent a nuisance impact. For mitigation of fugitive dust emissions, BAAQMD recommends using specific best management practices (BMPs), which have been a practical and effective approach to control fugitive dust emissions. The guidelines note that individual measures have been shown to reduce fugitive dust by anywhere from 30 percent to more than 90 percent and conclude that projects that implement construction BMPs would reduce impacts associated with fugitive dust emissions to a less-than-significant level. To insure implementation of BMPs, they are identified herein as a mitigation measure. With implementation of Mitigation Measure 4.A-1, the project would have a less-than-significant impact from construction-generated emissions of fugitive dust.

Toxic Air Contaminants and PM2.5

Project-related construction activities would produce DPM and PM2.5 emissions due to combustion equipment such as loaders, backhoes and vendor truck trips. These emissions could result in elevated concentrations of DPM and PM2.5 at nearby receptors. These elevated concentrations could lead to an increase in the risk of cancer or other health impacts. Consequently, a health risk assessment was performed to determine the extent of increased cancer risks and hazard indices at the maximally exposed receptors. The health risk assessment was based on recommended methodology of Office of Environmental Health Hazard Assessment (OEHHA) and adopted by BAAQMD. The cancer risk to residential receptors assumes exposure would occur for eight hours per day, five days per week, to account for the active construction duration. Additionally, cancer risk estimates incorporate age sensitivity factors and daily breathing rates recommended by OEHHA (2012). This approach includes updated BAAQMD calculation procedures that factor in the increased susceptibility of infants and children to carcinogens as compared to adults.

Since the nearest undeveloped parcel is located across Ardenwood Boulevard from existing single family residences, these residences would be the maximally exposed receptors. In order to achieve the proposed higher FARs, most parcels within the project area are expected to be redeveloped; this could potentially expose sensitive receptors to high levels of TACs. The ISCST3 model was used to estimate maximum downwind concentrations and potential health risk at sensitive receptors resulting from construction activities, which are shown in **Table 4.A-4** below.

TABLE 4.A-4
CONSTRUCTION-RELATED HEALTH IMPACTS[a]

Residential MEI	Cancer Risk (persons per million)	Chronic Impact	PM2.5 Concentration (µg/m3)
Unmitigated Construction	4	0.001	<0.048
BAAQMD Significance Criteria	10	1	0.3
Significant Impact?	No	No	No

NOTE:

[a] Detailed assumptions and methodology of the HRA are included in Appendix D. Construction on the project parcel nearest sensitive residences (across Ardenwood Boulevard) was assumed to occur for one-year.

As shown in Table 4.A-4, the incremental cancer risk at the maximum exposed residential receptor of four in one million would not exceed the BAAQMD threshold of 10 in a million without mitigation. The unmitigated chronic HI and maximum annual PM2.5 concentration at the MEI would be about 0.001 and less than 0.05 $\mu g/m^3$, respectively, which would be below the applicable BAAQMD thresholds of 1.0 and 0.3 $\mu g/m^3$. In addition, mitigation measures would further reduce risk. Overall, health risk impacts from construction would be less than significant.

Mitigation Measures

Measure 4.A-1: Construction Fugitive Dust Emissions. The following BAAQMD Best Management Practices and additional mitigation measures for fugitive dust control shall be required for all construction activities within the project area. These measures will reduce fugitive dust emissions primarily during soil movement and grading, but also during vehicle and equipment movement on unpaved project sites:

Basic Controls that Apply to All Construction Sites

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph.
5. All streets, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
6. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of CCR). Clear signage shall be provided for construction workers at all access points.
7. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
8. A publicly visible sign shall be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Additional Measures that Apply to All Construction Sites

1. All exposed surfaces shall be watered at a frequency adequate to maintain minimum soil moisture of 12 percent. Moisture content can be verified by lab samples or moisture probe.
2. All excavation, grading, and/or demolition activities shall be suspended when average wind speeds exceed 20 mph.

3. Wind breaks (e.g., trees, fences) shall be installed on the windward side(s) of actively disturbed areas of construction. Wind breaks should have at maximum 50 percent air porosity.
4. Vegetative ground cover (e.g., fast-germinating native grass seed) shall be planted in disturbed areas as soon as possible and watered appropriately until vegetation is established.
5. All trucks and equipment, including their tires, shall be washed off prior to leaving the site.
6. Site accesses to a distance of 100 feet from the paved road shall be treated with a 6 to 12 inch compacted layer of wood chips, mulch, or gravel.
7. Sandbags or other erosion control measures shall be installed to prevent silt runoff to public roadways from sites with a slope greater than one percent.

Significance after Mitigation: The estimated construction emissions would not exceed the BAAQMD significance thresholds for criteria pollutants and impacts associated with localized emissions of fugitive dust would be considered less than significant with Mitigation Measure 4.A-1 incorporated. Potential impacts from TAC and PM2.5 concentrations and associated health risk would be less than significant without mitigation.

Impact 4.A-2: Development facilitated by the proposed project could potentially generate operational emissions that would result in a considerable net increase of criteria pollutants and precursors for which the air basin is in nonattainment under an applicable federal or state ambient air quality standard. (Significant)

In regards to long-term operations, the project would result in criteria pollutant emissions primarily from on-road vehicles, as well as from onsite area and energy sources (e.g., natural gas combustion for space and water heating, landscape maintenance, use of consumer products such as hairsprays, deodorants, cleaning products, etc.). However, since the project consists of office, advanced manufacturing, and research and development uses, it would not be a source of substantial TACs during operations. These potential impacts are assessed below.

Criteria Air Pollutants

Project site development would increase criteria air pollutant and precursor emissions, including ROG, NOx, PM10 and PM2.5 from a variety of emission sources, including onsite area and energy sources and mobile on-road sources. Exhaust emissions from on-road vehicle traffic associated with the project were calculated using the latest version of the CalEEMod program, which includes EMFAC2011 emission factors for on-road vehicles.

As part of the proposed project, future development would be required to implement Transportation Demand Management (TDM) measures, which would include increasing transit accessibility at the project site and establishment of a voluntary commute trip reduction program with employers to discourage single-occupancy vehicle trips and encourage alternative modes of transportation such as car-pooling, taking transit, walking and biking. The TDM measures may include, but are not limited to, a ride-sharing program for which 50 percent or greater of project employees are eligible, carpooling encouragement, preferential carpool parking, a transportation coordinator, and ride-

matching assistance. Other TDM measures could include: bicycle parking, showers and lockers in new buildings; discounted transit passes for employees; hiring a TDM coordinator for the ATP to work with on-site employers and employees to reduce vehicle trips; and providing car-share vehicles to allow employees who take transit to/from work to run errands during the day. However, since the project consists of an increase in permitted FAR and actual development details are unknown at this time, it would be speculative to attempt to quantify the emissions reduction from implementation of TDM measures. Therefore, TDM measures were not included in the emission analysis.

As provided in the Transportation Impact Study prepared for the project (W-Trans, 2016), the project would generate approximately 29,550 daily trips from the proposed FAR increase that would allow approximately 2,587,560 square feet of additional floor area over existing developed floor area. **Table 4.A-5** summarizes the daily mobile, energy and area emissions of criteria pollutants that would be generated by project development and compares them with BAAQMD thresholds. **Table 4.A-6** summarizes the annual emissions from project operations. As indicated in Tables 4.A-5 and 4.A-6, project-related operational emissions of ROG, NOx and PM10 would exceed the BAAQMD significance thresholds during operations and, thus, the project would have a significant impact in relation to operational emissions. Implementation of energy efficiency measures into the design for properties to be developed in the future would help to reduce operational emissions as described in Mitigation Measure 4.A-2.

TABLE 4.A-5
DAILY OPERATIONAL-RELATED POLLUTANT EMISSIONS (pounds/day)[a]

Project Sources	ROG	NOx	PM10	PM2.5
Area Sources	87.3	0	0	0
Energy Sources	1.1	10.4	0.8	0.8
Mobile Sources	68.9	164.8	161.9	45.8
Total Emissions	157.3	175.2	162.7	46.6
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:
[a] Emissions include results modeled with CalEEMod for project operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 4.A-6
ANNUAL OPERATIONAL-RELATED POLLUTANT EMISSIONS (tons/year)[a]

Project Sources	ROG	NOx	PM10	PM2.5
Area Sources	15.9	0	0	0
Energy Sources	0.2	1.9	0.1	0.1
Mobile Sources	8.8	21.6	21.1	6.0
Total Emissions	24.9	23.5	21.2	6.1
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:
[a] Emissions include results modeled with CalEEMod for annual project operations. Additional data and assumptions are in Appendix D.

The construction period for the proposed project is expected to occur over 10 years. Because there is a substantial amount of development already and as buildings are finished they would begin operation while the remainder of the site is being constructed, this would result in operational and construction emissions occurring at the same time. Since the exact construction schedule is unknown, the construction plus operational emissions were conservatively estimated by adding the average construction emissions to the maximum operational emissions. While this slightly overestimates total emissions, it would not change the significance findings for operational emissions. **Tables 4.A-7** and **4.A-8** show the maximum daily and annual construction and operational overlap, respectively. As shown, emissions of ROG, NOx and PM_{10} would remain above regulatory thresholds and would be considered significant and unavoidable for those three pollutants.

TABLE 4.A-7
DAILY COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS (pounds/day)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	18.70	46.00	1.40	1.30
Area Sources	87.30	0.00	0.00	0.00
Energy Sources	1.10	10.40	0.80	0.80
Mobile Sources	68.90	164.80	161.90	45.80
Total Emissions	157.30	175.20	162.70	46.60
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:
[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 4.A-8
ANNUAL COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	25.30	5.98	0.18	0.17
Area Sources	15.90	0.00	0.00	0.00
Energy Sources	0.20	1.90	0.10	0.10
Mobile Sources	8.80	21.60	21.10	6.00
Total Emissions	24.90	23.50	21.20	6.10
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:
[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

Mitigation Measures

Measure 4.A-2: Energy Efficiency. The following measures shall be implemented in the design for properties to be developed within the project area, where feasible and appropriate:

- Install solar photovoltaic panels on building rooftops;
- Install solar water heaters;
- Use recycled water when available;
- Exceed Building Code energy efficiency standards; and
- Use water efficient irrigation systems.

Significance after Mitigation: The project consists of an increase in permitted FAR and actual development details are unknown at this time. Although the degree of project-specific reduction measure implementation has not been incorporated into this emissions analysis, based on the substantial size of development allowed under the project, operational emissions would still result in significant environmental effects on air quality and contribute substantially to an existing air quality violation (ozone precursors and particulate matter). Therefore, this impact would remain significant and unavoidable for emissions of ROG, NOx and PM10.

The main health concern of exposure to ground-level ozone, for which ROG and NOx are ozone precursors, is effects on the respiratory system, especially on lung function. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema. The amount of concentrations of ground-level ozone in the atmosphere is influenced by the volume of air available for dilution, the temperature, and the intensity of ultraviolet light. In the Bay Area, the worst case conditions for ozone formation occur in the summer and early fall on warm, windless, sunny days (BAAQMD, 2013). Given these various factors, it is difficult to predict the magnitude of health effects from the project's exceedance of significance criteria for regional ROG and NOx emissions. The increase in emissions associated with the proposed project represents a fraction of total SFBAAB regional ROG and NOx emissions. As shown in Table 4.A-6, the proposed project would generate 24.9 tons per year of ROG and 23.5 tons per year of NOx, compared to 19,345 tons per year of ROG and 27,375 tons per year of NOx generated in Alameda County in 2012 (CARB, 2014). Table 4.A-1 shows that the most stringent applicable ozone standards have been exceeded at the nearest monitoring stations between 2010 and 2014. Additionally, PM10 particles are fine enough to be inhaled into the deepest parts of the human lung and can cause adverse health effects. PM10 can result in increased respiratory disease, lung damage, cancer, and premature death (CARB, 2009b). The proposed project's ROG, NOx and PM10 increases could contribute to air quality violations in the SFBAAB region by contributing to more days of ozone and PM10 exceedance or result in Air Quality Index value levels that are unhealthy for sensitive groups and other populations.

Impact 4.A-3: Development facilitated by the proposed project would not expose sensitive receptors to substantial carbon monoxide concentrations. (Less than Significant)

According to the BAAQMD 2011 *CEQA Air Quality Guidelines*, a project would result in a less-than-significant impact due to localized CO concentrations if the following screening criteria are met:

1. The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.
2. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.
3. The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The project would not exceed the standards established by the Alameda County Congestion Management Agency (ACCMA) and, therefore, would be consistent with ACCMA standards. In regards to the second and third criteria, intersection traffic volumes (including project traffic) would be substantially less than 44,000 and 24,000 vehicles per hour, respectively.

Based on the BAAQMD's criteria, project-related traffic would not exceed CO standards and, therefore, no further analysis was conducted for CO impacts. This impact would be considered less than significant on a project-level and cumulative basis.

Mitigation: None required.

Impact 4.A-4: Development facilitated by the proposed project could potentially conflict with or obstruct implementation of the applicable air quality plan. (Significant)

The most recently adopted air quality plan in the SFBAAB is the *2010 Clean Air Plan*, which is a roadmap showing how San Francisco Bay Area will achieve compliance with the state 1-hour ozone standard as expeditiously as practicable, and how the region will reduce transport of ozone and ozone precursors to neighboring air basins. The control strategy includes stationary-source control measures to be implemented through BAAQMD regulations; mobile-source control measures to be implemented through incentive programs and other activities; and transportation control measures to be implemented through transportation programs in cooperation with MTC, local governments, transit agencies, and others. The *2010 Clean Air Plan* also represents the Bay Area's most recent triennial assessment of the region's strategy to attain the state 1-hour ozone standard and replaces the *2005 Ozone Strategy*. Under BAAQMD's updated 2012 methodology, a determination of consistency with the most recently adopted Clean Air Plan, currently the *2010 Clean Air Plan*, must demonstrate that a plan or project supports the primary goals of the Clean Air Plan, includes applicable control measures of the Clean Air Plan, and would not disrupt or hinder implementation of any control measures of the Clean Air Plan.

BAAQMD guidance indicates that any project (i.e., project or plan) that does not support the primary goals of the Clean Air Plan would not be considered consistent with the Clean Air Plan. Specifically, if approval of a project would not result in significant and unavoidable air quality impacts, after application of all feasible mitigation, the project may be considered consistent with the Clean Air Plan. Conversely, if a proposed project is not consistent with the *2010 Clean Air Plan*, the proposed project would result in a significant impact. As discussed in Impact 4.A-2, the

development proposed under the Planned District Amendment would result in significant and unavoidable impacts related to emissions of criteria pollutants during operations. It does not necessarily follow that project development would not support the primary goals of the Clean Air Plan, because any project as large in scale and scope as the proposed project would, simply by virtue of its trip generation volume, exceed numerical thresholds for significance with respect to criteria pollutants. By this reasoning, population and/or employment growth beyond a certain scale would necessarily be considered non-supportive of the Clean Air Plan's goals. Because regional projections anticipate substantial population and employment growth, more important with respect to attainment of air quality standards is whether a project accommodates population and employment growth in a manner that would result in relatively less than average increases in emissions region-wide.

The proposed FAR increase under the project could allow approximately 2,587,560 square feet of additional floor area over existing floor area and 1,722,754 square feet over existing allowable floor area. The 2011 City of Fremont General Plan EIR assumed an average of two employees per 1,000 square feet of building square footage that would accommodate employment-generating land uses outside of a Priority Development Area (PDA) identified in Plan Bay Area, the regional land use and transportation plan (the project site is not within a PDA). However, because the transportation analysis in this EIR assumes that the entire project would be built out as office space, this analysis implicitly assumes a greater employment density than the generic assumption employed in the General Plan EIR, with more than three employees per 1,000 square feet.[3] Conservatively, using this assumption of three employees per 1,000 square feet of office space, the additional floor area allowed by the proposed project versus existing floor area could generate up to approximately 7,760 new jobs at full development potential.

The 1988 California Clean Air Act, Section 40919(d) requires regions to implement "transportation control measures to substantially reduce the rate of increase in passenger vehicle trips and miles traveled." Consistent with this requirement, one of the goals of the *2010 Clean Air Plan* is to reduce the number of trips and vehicle miles Bay Area residents travel in single-occupant vehicles through the implementation of five categories of transportation control measures (TCMs). **Table 4.A-9** identifies those five categories of TCMs that local governments should implement through local plans to be considered in conformance with the *2010 Clean Air Plan*.

TABLE 4.A-9
TRANSPORTATION CONTROL MEASURES IN THE 2010 CLEAN AIR PLAN

1.	Improve Transit Services (TCM A)
2.	Improve System Efficiency (TCM B)
3.	Encourage Sustainable Travel Behavior (i.e., voluntary employer-based trip reduction program) (TCM C)
4.	Support Focused Growth (Bicycle and Pedestrian friendliness) (TCM D)
5.	Implement Pricing Strategies (TCM E)

[3] This number is derived from comparing the Institute of Transportation Engineers (ITM) Trip Generation Manual (ITM, 2012) daily trip rate per employee with the trip rate per 1,000 square feet for office park (used in this analysis) and the incrementally smaller rates for general office. In each case, the number of employees per 1,000 square foot is approximately 3.3.

A review of the TCM's in Table 4.A-9 indicates that these measures lend themselves to application to large scale land use development projects. However, as noted above, development under the project would result in increased vehicle miles travelled (VMT) based on the new jobs at the site. Although the proposed rezoning would require that all employers at the project site implement TDM strategies, since the project consists of an increase in permitted FAR and actual development details are unknown at this time, implementation of these measures would be considered speculative.

BAAQMD has identified examples of how a plan may cause the disruption or delay of control measures, such as a project that may preclude an extension of a transit line or bike path or proposes excessive parking beyond parking requirements. Development on the project site would not disrupt or delay control measures. However, because the proposed project would generate operational emissions that would exceed the BAAQMD significance thresholds for ROG, NOx and PM10 and result in an increase in VMT associated with substantial new jobs at the site, the proposed project could potentially conflict with the *2010 Clean Air Plan*. Therefore, the project would result in a significant impact.

Mitigation Measure 4.A-4: Implement Mitigation Measure 4.A-2: Energy Efficiency.

Significance after Mitigation: As previously discussed under Impact 4.A-2, the project would result in operational emissions that would exceed the BAAQMD significance thresholds even after mitigation is applied. Implementation of Mitigation Measure 4.A-4 would incorporate energy efficiency strategies. However, since the project would increase the permitted FAR and actual development details are unknown at this time, implementation of Mitigation Measure 4.A-4 would be considered speculative. Therefore, the proposed project would potentially conflict with or obstruct implementation of the *2010 Clean Air Plan*, and the impact would be significant and unavoidable.

Cumulative Impact

The geographic context for changes in the air quality environment due to development of the project would be both regional and local. Ozone and particulates would be the primary pollutants of concern, and the cumulative context would comprise the SFBAAB, which includes a multitude of projects planned therein. This assessment is provided below in Impact 4.A-5.

As described above in Impact 4.A-1, the proposed project would not result in TACs from construction that would result in significant health risk at the nearest sensitive receptors. In addition, as noted in Impact 4.A-2, since the project consists of office, advanced manufacturing, and research and development uses, it would not be a source of substantial TACs during operations. Health risk impacts from the project would not be cumulatively considerable. Finally, the CO hotspot analysis included in Impact 4.A-3 assessed cumulative traffic volumes and determined the impact would not be cumulatively significant.

Impact 4.A-5: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, could potentially result in a significant adverse cumulative air quality impact. (Significant)

According to the BAAQMD, no single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards for regional criteria pollutants. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. There are many projects throughout the Bay Area that have been identified as having significant and unavoidable operational and construction-related regional pollutant impacts. Consequently, for assessment of cumulative regional pollutant impacts, BAAQMD has developed a methodology of assessing whether a project would have a cumulatively considerable contribution. According to the BAAQMD *Justification Report*, if a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions (BAAQMD, 2009).

As described in Impact 4.A-2, project operational emissions of ROG, NOx and PM10 would exceed the significance thresholds even with mitigation. Project impacts would, therefore, be significant. Because operational criteria pollutant emissions associated with the project would be significant and unavoidable, project emissions would make a cumulatively considerable contribution to emissions from other projects, which would result in cumulatively significant air quality impacts.

Mitigation Measure 4.A-5: Implement Mitigation Measure 4.A-2: Energy Efficiency.

Significance after Mitigation: Significant and Unavoidable.

References

Bay Area Air Quality Management District (BAAQMD), 2009. *Revised Draft Options and Justification Report California Environmental Quality Act Thresholds of Significance*, October 2009.

Bay Area Air Quality Management District (BAAQMD), 2010. *Bay Area 2010 Clean Air Plan*, adopted September 15, 2010. Available at http://www.baaqmd.gov.

Bay Area Air Quality Management District (BAAQMD), 2012a. *BAAQMD CEQA Guidelines, California Environmental Quality Act Air Quality Guidelines*, May 2012, http://www.baaqmd.gov/pln/ceqa/ceqa_guide.pdf.

Bay Area Air Quality Management District (BAAQMD), 2012b. *Recommended Methods for Screening and Modeling Local Risks and Hazards*, May 2012.

Bay Area Air Quality Management District (BAAQMD), 2013. *Air Pollutants*, available at http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Pollutants.aspx, page last reviewed January 30, 2013.

Bay Area Air Quality Management District (BAAQMD), 2015a. *Annual Bay Area Air Quality Summaries*, available at http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx, page last updated April 22, 2015.

Bay Area Air Quality Management District (BAAQMD), 2015b, *Air Quality Standards and Attainment* Status, available at http://hank.baaqmd.gov/pln/air_quality/ambient_air_quality.htm, as of April 22, 2015.

California Air Resources Board (CARB), 2000. *Risk Reduction Plan for Diesel-Fueled Engines and Vehicles*, October 2000.

California Air Resources Board (CARB), 2004. *2004 Revisions to the California State Implementation Plan for Carbon Monoxide*. July 22, 2004.

California Air Resources Board (CARB), 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*, April 2005.

California Air Resources, Board (CARB), 2009a. *California Almanac of Emissions and Air Quality - 2009 Edition*, Table 5-44 and Figure 5-12, http://www.arb.ca.gov/aqd/almanac/almanac09/chap509.htm.

California Air Resources Board (CARB), 2009b. *ARB Fact Sheet: Air Pollution Sources, Effects and Control*, http://www.arb.ca.gov/research/health/fs/fs2/fs2.htm, page last reviewed December 2009.

California Air Resources Board (CARB), 2014. *The California Almanac of Emissions and Air Quality – 2013 Edition*, available at http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm, page last reviewed May 21, 2014.

Institute of Transportation Engineers (ITS), 2012. *Trip Generation Manual, 9th edition*. Washington, DC. 2012

National Cancer Institute, 2012. Lifetime Risk (Percent) of Being Diagnosed with Cancer by Site and Race/Ethnicity, Both Sexes: 18 SEER Areas, 2007-2009 (Table 1.14). Accessed at: http://seer.cancer.gov/csr/1975_2009_pops09/results_merged/topic_lifetime_risk_diagnosis.pdf. Accessed on June 27, 2013.

W-Trans, 2016. *Traffic Impact Study for Ardenwood Business Park*, February 17, 2016.

Western Regional Climate Center (WRCC). 2015. *Newark, California (COOPID 04144) Station*. [http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca6144] Accessed October 8, 2015.

4.B Greenhouse Gas Emissions

Introduction

This section describes the environmental setting, regulatory framework, and potential greenhouse gas (GHG) impacts associated with construction and operation of the Ardenwood Technology Park Planned District Amendment (proposed project), and identifies feasible mitigation measures where appropriate.

Environmental Setting

Greenhouse Gases

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (International Panel on Climate Change [IPCC], 2007). Natural processes and human actions have been identified as the causes of this warming. The IPCC has concluded that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing greenhouse gas concentrations resulting from human activity such as fossil fuel burning and deforestation are believed to be responsible for most of the observed temperature increase. Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. Certain gases in the atmosphere naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. This is sometimes referred to as the "greenhouse effect" and the gases that cause it are called "greenhouse gases." Some GHGs occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are the principal GHGs. When concentrations of these gases exceed natural concentrations in the atmosphere, the greenhouse effect may be intensified. CO_2, CH_4 and N_2O occur naturally, and are also generated through human activity. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing[1] associated with agricultural practices and landfills. Other human-generated GHGs include fluorinated gases such as SFCs, PFCs and SF_6, which have much higher heat-absorption potential than CO_2, and are byproducts of certain industrial processes.

CO_2 is the reference gas for climate change because it is the predominant GHG emitted. The effect that each of the aforementioned gases can have on global warming is a combination of the mass of their emissions and their global warming potential (GWP). GWP indicates, on a pound-

[1] Off-gassing is defined as the release of chemicals under normal conditions of temperature and pressure.

for-pound basis, how much a gas is predicted to contribute to global warming relative to how much warming would be predicted to be caused by the same mass of CO_2. For example, CH_4 and N_2O are substantially more potent GHGs than CO_2, with GWPs of 21 and 310 times that of CO_2, respectively.

In emissions inventories, GHG emissions are typically reported in terms of pounds or metric tons of CO_2 equivalents (CO_2e). CO_2e are calculated as the product of the mass emitted of a given GHG and its specific GWP. While CH_4 and N_2O have much higher GWPs than CO_2, CO_2 is emitted in such vastly higher quantities that it accounts for the majority of GHG emissions in CO_2e, both from commercial developments (i.e., office, advanced manufacturing and research and development (R&D) uses) and human activity in general.

Potential Effects of Human Activity on GHG Emissions

Fossil fuel combustion, especially for the generation of electricity and powering of motor vehicles, has led to substantial increases in CO_2 emissions (and, thus, substantial increases in atmospheric concentrations). In 1994, atmospheric CO_2 concentrations were found to have increased by nearly 30 percent above pre-industrial (c. 1860) concentrations.

There is international scientific consensus that human-caused increases in GHGs have contributed and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include the displacement of thousands of coastal businesses and residences, impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity. As the California Air Resources Board (CARB) *Climate Change Scoping Plan* noted, the legislature in enacting Assembly Bill (AB) 32 found that global warming would cause detrimental effects to some of the state's largest industries, including agriculture, winemaking, tourism, skiing, commercial and recreational fishing, forestry, and the adequacy of electrical power generation. The *Climate Change Scoping Plan* states as follows: "The impacts of global warming are already being felt in California. The Sierra snowpack, an important source of water supply for the state, has shrunk 10 percent in the last 100 years. It is expected to continue to decrease by as much as 25 percent by 2050. World-wide changes are causing sea levels to rise – about 8 inches of increase has been recorded at the Golden Gate Bridge over the past 100 years – threatening low coastal areas with inundation and serious damage from storms" (CARB, 2008). AB 32 is discussed further below under Regulatory Setting.

Impacts of Climate Change

Ecosystem and Biodiversity Impacts

Climate change is expected to have effects on diverse types of ecosystems (United States Environmental Protection Agency (U.S. EPA), 2015a). As temperatures and precipitation change, seasonal shifts in vegetation would occur; this could affect the distribution of associated flora and fauna species. As the range of species shifts, habitat fragmentation could occur, with acute impacts on the distribution of certain sensitive species. The IPCC states that "20 percent to

30 percent of species assessed may be at risk of extinction from climate change impacts within this century if global mean temperatures exceed 2 to 3°C (3.6 to 5.4°F) relative to pre-industrial levels" (IPCC, 2007). Shifts in existing biomes could also make ecosystems vulnerable to encroachment by invasive species. Wildfires, which are an important control mechanism in many ecosystems, may become more severe and more frequent, making it difficult for native plant species to repeatedly re-germinate. In general terms, climate change is expected to put a number of stressors on ecosystems, with potentially catastrophic effects on biodiversity.

Human Health Impacts

Increasing temperatures could lead to hotter days and heat waves that are both more frequent and longer lasting than at present, potentially increasing heat-related illnesses and deaths. More frequent and/or more severe extreme weather could increase the risk of floods, strong winds, and other storm-related threats. Additionally, warmer temperatures could result in higher concentrations of air and water pollutants, adversely affecting human health. Finally, the above changes could combine to increase the spread of some food-, water-, and animal-borne diseases (U.S. EPA, 2015).

Greenhouse Gas Emissions Estimates

Global Emissions

According to the United Nations Framework Convention on Climate Change (UNFCCC), worldwide emissions of GHGs in 2004 were approximately 30 billion tons of CO_2e per year (UNFCCC, 2012). This includes both ongoing emissions from industrial and agricultural sources, but excludes emissions from land use changes.

U.S. Emissions

In 2009, the United States emitted about 6.7 billion metric tons of CO_2e or about 21 metric tons per year per person. Of the four major sectors nationwide — residential, commercial, industrial, and transportation — transportation accounts for the highest fraction of GHG emissions (approximately 33 percent); these emissions are entirely generated from direct fossil fuel combustion (U.S. EPA, 2011).

State of California Emissions

In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation. Emissions of CO_2 are byproducts of fossil fuel combustion. Methane, a highly potent GHG, results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. Nitrous oxide is also largely attributable to agricultural practices and soil management. The main natural carbon dioxide sinks, or reservoirs, are plants, the ocean and soil. Plants grab carbon dioxide from the atmosphere to use in photosynthesis; some of this carbon is transferred to soil as plants die and decompose. The oceans are a major carbon storage system for carbon dioxide. Marine animals also take up the gas for photosynthesis, while some carbon dioxide simply dissolves in the seawater. California produced approximately 459 million gross metric tons of CO_2e in 2012. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2012, accounting for 37 percent of total GHG emissions

in the state. This sector was followed by the industrial sector (22 percent) and the electric power sector (including both in-state and out-of-state sources) (21 percent) (CARB, 2014a).

City of Fremont Emissions

Community-level emissions for the City of Fremont totaled approximately 1,660,000 metric tons of CO_2e in 2005. The primary sources of these GHG emissions include on-road transportation (60 percent), commercial/industrial energy use (22 percent), and residential energy use (15 percent) (City of Fremont, 2012).

Regulatory Framework

The following sections provide federal, state and local regulations for energy as well as regulations for GHGs and global climate change. These agencies work jointly, as well as individually, to understand and regulate the effects of GHG emissions and resulting climate change through legislation, regulations, planning, policy-making, education, and a variety of programs.

Federal Regulations

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

The U.S. Supreme Court held that the U.S. EPA may consider regulation of motor vehicle GHG emissions. In *Massachusetts v. Environmental Protection Agency* et al., twelve states and cities, including California, together with several environmental organizations sued to require the U.S. EPA to regulate GHGs as pollutants under the Federal Clean Air Act (127 S. Ct. 1438 (2007)). The Supreme Court ruled that GHGs fit within the Act's definition of a pollutant and the U.S. EPA had the authority to regulate GHGs.

On December 7, 2009, the U.S. EPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- ***Endangerment Finding:*** The current and projected concentrations of the six key GHGs—CO_2, CH_4, N_2O, HFCs, PFCs and SF_6—in the atmosphere threaten the public health and welfare of current and future generations.
- ***Cause or Contribute Finding:*** The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the U.S. EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161) that required the U.S. EPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy…." The Reporting Rule will apply to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners whose operations generate more than this reporting limit (e.g., power plants, oil refineries, and some industrial uses) are required to submit an annual GHG

emissions report with detailed calculations of facility GHG emissions. The Reporting Rule also mandates recordkeeping and administrative requirements in order for the U.S. EPA to verify annual GHG emissions reports. The only facilities subject to the Reporting Rule in Fremont are the Tesla Motors factory and Tri-Cities Recycling.[2]

State Regulations

California Environmental Quality Act and Climate Change

Under CEQA lead agencies are required to disclose the reasonably foreseeable adverse environmental effects of projects they are considering for approval. GHG emissions have the potential to adversely affect the environment because they contribute to global climate change. In turn, global climate change has the potential to raise sea levels, alter rainfall and snowfall, and affect habitat.

Senate Bill 97

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is a prominent environmental issue requiring analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop and transmit to the California Natural Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, by 2009, and directed the Natural Resources Agency to certify or adopt those guidelines by January 2010. On December 30, 2009, the Natural Resources Agency adopted amendments to the State CEQA Guidelines, as required by SB 97. These State CEQA Guidelines amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in draft CEQA documents. The amendments became effective March 18, 2010.

Assembly Bill 1493

Assembly Bill (AB) 1493, approved in 2002, required CARB to develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty trucks and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state."

To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004, adding GHG emissions standards to California's existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes (i.e., any medium-duty vehicle with a gross vehicle weight [GVW] rating of less than 10,000 pounds and that is designed primarily for the transportation of persons), beginning with model year 2009. For passenger cars and light-duty trucks with a loaded vehicle weight (LVW) of 3,750 pounds or less, the GHG emission limits for model year 2016 are approximately 37 percent lower than the limits for the first year of the regulations, model year 2009. For light-duty trucks with an LVW of 3,751 pounds to a GVW of 8,500 pounds, as well as for medium-duty passenger vehicles, GHG emissions will be reduced approximately 24 percent between 2009 and 2016.

[2] U.S. EPA Facility Level Information on GHGs Tool (FLIGHT). Available on the internet at: http://ghgdata.epa.gov/ghgp/main.do; Reviewed November 17, 2015.

Because the so-called Pavley emissions standards (named for the bill's author, state Senator Fran Pavley) would impose stricter standards than those under the CAA, California applied to the U.S. EPA for a waiver under the CAA; this waiver was initially denied in 2008. In 2009, however, the U.S. EPA granted the waiver.

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change, then-Governor Arnold Schwarzenegger established Executive Order S-3-05, which sets forth the following target dates by which statewide GHG emissions would be progressively reduced: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; and by 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32 and the California Climate Change Scoping Plan

Assembly Bill 32 Requirements

In 2006, the California legislature passed AB 32 (California Health and Safety Code Division 25.5, Sections 38500, et seq.), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emissions limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25-percent reduction in emissions). AB 32 anticipates that the GHG reduction goals will be met, in part, through local government actions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments (municipal and community-wide) and notes that successful implementation of the plan relies on local governments' land use planning and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions.

Scoping Plan Provisions

Pursuant to AB 32, the CARB adopted a *Climate Change Scoping Plan* in December 2008 (re-approved by CARB on August 24, 2011) outlining measures to meet the 2020 GHG reduction goals. In order to meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels or about 15 percent from today's levels. The Scoping Plan recommends measures that are worth studying further, and that the State of California may implement, such as new fuel regulations. It estimates that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from transportation, energy, agriculture, forestry, and other sources could be achieved should the state implement all of the measures in the Scoping Plan. The Scoping Plan relies on the requirements of SB 375 (discussed below) to implement the carbon emission reductions anticipated from land use decisions.

The *First Update to the Climate Change Scoping Plan* describes progress made to meet near-term emissions goals of AB 32, defines California's climate change priorities and activities for the next few years, and describes the issues facing the State as it establishes a framework for achieving air quality and climate goals beyond the year 2020. In regards to achieving the 2050 GHG reduction goal, "progressing toward California's long-term climate goals will require that GHG reduction

rates be significantly accelerated. Emissions from 2020 to 2050 will have to decline at more than twice the rate of that which is needed to reach the 2020 statewide emissions limit" (CARB, 2014b).

Cap-and-Trade Program

The Scoping Plan identifies cap-and-trade as a key strategy for helping California reduce its GHG emissions (CARB, 2008). A cap-and-trade program sets the total amount of GHG emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. AB 32 required CARB to adopt the cap-and-trade regulation by January 1, 2011, and the program itself began in November 2012.

Carbon offset credits are created through the development of projects, such as renewable energy generation or carbon sequestration projects, that achieve the reduction of emissions from activities not otherwise regulated, covered under an emissions cap, or resulting from government incentives. Offsets are verified reductions of emissions whose ownership can be transferred to others. As required by AB 32, any reduction of GHG emissions used for compliance purposes must be real, permanent, quantifiable, verifiable, enforceable, and additional. Offsets used to meet regulatory requirements must be quantified according to the CARB-adopted methodologies, and CARB must adopt a regulation to verify and enforce the reductions. The criteria developed will ensure that the reductions are quantified accurately and are not double-counted within the system (CARB, 2008).

Executive Order S-1-07

Executive Order S-1-07, signed by then-Governor Arnold Schwarzenegger in 2007, proclaimed that the transportation sector is the main source of GHG emissions in California, at over 40 percent of statewide emissions. The order established a goal of reducing the carbon intensity of transportation fuels sold in California by a minimum of 10 percent by 2020. It also directed CARB to determine whether this Low Carbon Fuel Standard could be adopted as a discrete, early-action measure after meeting the mandates in AB 32. CARB adopted the Low Carbon Fuel Standard on April 23, 2009.

Senate Bills 1078 and 107 and Executive Orders S-14-08 and S-21-09

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

In November 2008, then-Governor Schwarzenegger signed Executive Order S-14-08, which expands the state's Renewable Portfolio Standard to 33 percent renewable power by 2020. In September 2009, then-Governor Schwarzenegger continued California's commitment to the Renewable Portfolio Standard by signing Executive Order S-21-09, which directs the CARB under its AB 32 authority to enact regulations to help the state meet its Renewable Portfolio Standard goal of 33 percent renewable energy by 2020.

The 33-percent-by-2020 goal was codified in April 2011 with Senate Bill X1-2, which was signed by Governor Edmund G. Brown, Jr. This new Renewable Portfolio Standard (RPS) preempts the CARB 33 percent Renewable Electricity Standard and applies to all electricity retailers in the state, including publicly owned utilities (POUs), investor-owned utilities, electricity service providers, and community choice aggregators. All of these entities must adopt the new RPS goals of 20 percent of retail sales from renewables by the end of 2013 and 25 percent by the end of 2016, with the 33 percent requirement being met by the end of 2020.

Senate Bill 1368

SB 1368 is the companion bill of AB 32 and was approved in 2006. It requires the California Public Utilities Commission (CPUC) to establish a GHG emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was also required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

Senate Bill 375

SB 375, approved in 2008, encourages housing and transportation planning on a regional scale, in a manner designed to reduce vehicle use and associated GHG emissions. As required under this law, CARB has assigned regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035. The targets apply to the regions in the State covered by the 18 Metropolitan Planning Organizations (MPOs), including the Association of Bay Area Governments (ABAG) in the Bay Area. If MPOs do not meet GHG reduction targets, transportation projects will not be eligible for funding programmed after 2012. CARB adopted regional reduction targets in 2010. For the Bay Area, the adopted reduction targets call for a 10 percent reduction by 2020 and a 16 percent reduction by 2035.

SB 375 also requires each MPO to include a Sustainable Communities Strategy (SCS) in their Regional Transportation Plan. The SCS must set forth a vision for growth for the region while taking into account transportation, housing, environmental and economic needs. The SCS will be the blueprint by which the region will meet its GHG emissions reductions target if there is a feasible way to do so.

Executive Order B-30-15

In April 2015, Governor Edmund G. Brown, Jr. signed Executive Order B-30-15 in order to establish an interim GHG reduction goal for California of 40 percent below 1990 levels by 2030. This target GHG reduction by 2030 would make it possible for California to reach the ultimate goal of reducing GHG emissions by 80 percent under 1990 levels by the year 2050.

Senate Bill 350

In October 2015, Governor Brown signed SB 350, which requires that 50 percent of the annual electricity generated and sold to California retail customers must be from eligible renewable

energy resources by December 31, 2030. Under the legislation, the State Energy Resources Conservation and Development Commission will establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030. The bill also require the California Public Utilities Commission to establish efficiency targets for electrical and gas corporations and requires local publicly owned electric utilities to establish annual targets for energy efficiency savings and demand reduction.

California Building Standards Code

Green Building Standards Code

On January 12, 2010, the California Building Standards Commission adopted the 2010 California Green Building Standards Code, otherwise known as CALGreen. (The 2013 version of CALGreen was adopted in 2013 and took effect in January 2014.) CalGreen is contained within Part 11 of the California Building Standards Code, otherwise known as the state Building Code, Title 24 of the California Code of Regulations. The list below identifies the most substantive CALGreen requirements. In addition, CALGreen encourages local governments to adopt more stringent voluntary provisions, known as Tier 1 and Tier 2 provisions, to further reduce air pollutant emissions, improve energy efficiency, and conserve natural resources. If a local government adopts one of the tiers, the provisions become mandates for all new construction within that jurisdiction. CALGreen includes the following provisions:

- A 20 percent mandatory reduction in indoor water use, along with fixture-specific restrictions on water flow
- Separate indoor and outdoor water meters to measure nonresidential buildings' indoor and outdoor water use, with a requirement for moisture-sensing irrigation systems for larger landscape projects
- Diversion of 50 percent of construction waste from landfills
- Mandatory periodic inspections of energy systems (i.e., heat furnace, air conditioner and mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies
- Mandatory use of low-pollutant-emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard.

Building Energy Efficiency Standards

The State of California also regulates building energy consumption under the state Building Code. The Building Energy Efficiency Standards, contained within Part 1 (Administrative Code) and Part 6 (Energy Code) of the Building Code, were developed by the CEC and apply to energy consumed for heating, cooling, ventilation, water heating and lighting in new residential and non-residential buildings. The CEC updates these standards periodically, with the most recent update in 2013.

Local Regulations

City of Fremont General Plan

The Fremont General Plan establishes the following goals and policies that are relevant to GHG emissions:

- Safety Policy 10-3.6 to evaluate proposed development in areas of the City subject to flooding impacts caused by rising sea levels.
- Land Use Policies 2-1.7 through 2-1.11 promoting Transit Oriented Development (TOD).
- Land Use Policy 2-3.8 promoting higher intensities near transit.
- Community Character Policy 4-4.1 promoting complete streets concepts.
- Public Facilities policies regarding increasing waste diversion and recycling and moving towards zero waste.
- Conservation policies regarding green buildings standards, promoting building retrofits, and supporting innovative financing mechanisms for energy conservation.
- Conservation policies regarding use of water-efficient landscaping and other water conservation measures.
- Conservation policies to promote use of reclaimed water.
- Mobility policies promoting public solar plug-in hybrid fueling stations, improved public transit, and promoting walking and cycling as alternatives to driving.
- Parks and Recreation policies related to use of artificial turf where feasible.
- Public Facilities policies to reduce water usage in City facilities.
- Community Character policies to expand the urban forest.
- Mobility and Land Use policies promoting connectivity between neighborhoods.

City of Fremont Climate Action Plan

Community-level emissions for the City of Fremont totaled approximately 1,660,000 metric tons of CO_2e in 2005. The City adopted a goal to reduce GHG emissions by 25 percent by 2020 from this 2005 baseline. GHG reduction strategies pertain to land use and mobility, energy, solid waste, water, and municipal services and operations (City of Fremont, 2012).

Thresholds of Significance

State CEQA Guidelines Section 15064.4 requires a lead agency to make a “good-faith effort” to “describe, calculate or estimate” GHG emissions in CEQA environmental documents. Section 15064.4 further states that the analysis of GHG impacts should include consideration of (1) the extent to which the project may increase or reduce GHG emissions; (2) whether the project emissions would exceed a locally applicable threshold of significance; and (3) the extent to which the project would comply with “regulations or requirements adopted to implement a

statewide, regional, or local plan for the reduction or mitigation of GHG emissions." The CEQA Guidelines do not, however, set a numerical threshold of significance for GHG emissions.

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, greenhouse gas emissions impacts resulting from the implementation of a proposed project would be considered significant if the project would:

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

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

Methodology

Both BAAQMD and the California Air Pollution Control Officers Association (CAPCOA) consider GHG impacts to be exclusively cumulative impacts (BAAQMD, 2012; CAPCOA, 2008); therefore, assessment of significance is based on a determination of whether the GHG emissions from a project represent a cumulatively considerable contribution to the global atmosphere. CEQA Guidelines Section 15064(h)(3) states that a project's incremental contribution to a cumulative effect is not cumulatively considerable if the project will comply with the requirements in a previously approved plan or mitigation program (including plans or regulations for the reduction of greenhouse gas emissions) that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area in which the project is located.

This analysis uses both a quantitative and a qualitative approach. Because the quantifiable thresholds developed by BAAQMD in its 2009 *Justification Report* were formulated based on AB 32 and California Climate Change Scoping Plan reduction targets for which its set of strategies were developed to reduce GHG emissions statewide, a project cannot exceed a numeric BAAQMD threshold without also conflicting with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs (the state Climate Change Scoping Plan). Therefore, if a project exceeds a numeric threshold and results in a significant cumulative impact, it would also result in a significant cumulative impact with respect to plan, policy, or regulation consistency, even though the project may incorporate measures and have features that would reduce its contribution to cumulative GHG emissions.

Separate thresholds of significance are established for operational emissions from stationary sources (such as generators, furnaces and boilers) and non-stationary sources (such as on-road vehicles). As no threshold has been established for construction-related emissions, the operational emissions thresholds are applied in this analysis. The threshold for stationary sources is 10,000 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant). For non-stationary sources, three separate thresholds have been established:

- Compliance with a Qualified Greenhouse Gas Reduction Strategy (i.e., if a project is found to be out of compliance with a Qualified Greenhouse Gas Reduction Strategy, its GHG emissions may be considered significant); or
- 1,100 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant); or
- 4.6 metric tons of CO_2e per service population per year (i.e., emissions above this level may be considered significant).[3] The quantitative threshold of 4.6 metric tons of CO_2e per service population per year proposed by BAAQMD in its 2009 *Justification Report* is applied to this analysis. If project construction or operational GHG emissions would exceed this threshold then, consistent with BAAQMD Guidelines, it would be considered to have a cumulatively considerable contribution of GHG emissions and a cumulatively significant impact on climate change.

GHG emissions resulting from the project were estimated using CalEEMod version 2013.2.2, with model data and assumptions included in **Appendix D**. Construction emissions were estimated for equipment and truck exhaust and construction worker vehicles. In regards to operations, vehicle trips assumed default trip lengths for urban land uses, which are embedded in CalEEMod. The model makes adjustments for implementation of Pavley vehicle standards and Low Carbon Fuel Standards. GHG emission sources associated with project operations would include direct electricity use, electricity used to pump water to and wastewater away from the project, and solid waste generation. GHG emissions from electricity use occur when electricity is produced by fossil fuel combustion. GHG emissions from water and wastewater transport are also indirect emissions resulting from the energy required to transport water from its source, and the energy required to treat wastewater and transport it to its treated discharge point. Solid waste emissions are generated when the increased waste generated by the project are taken to a landfill to decompose.

Consistent with CEQA Guidelines Section 15126.4(a), project-specific mitigation measures for any significant effects of greenhouse gas emissions may include, among others:

(1) Measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision;

(2) Reductions in emissions resulting from a project through implementation of project features, project design, or other measures;

(3) Off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions; and

(4) Measures that sequester greenhouse gases.

[3] Service population is the sum of residents plus employees expected for a development project.

Project Impacts and Mitigation Measures

Impact Analysis

Impact 4.B-1: Implementation of the proposed project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. (Significant)

BAAQMD's GHG emissions thresholds are based on direct emissions from a project's vehicle trip generation, onsite water and space heating, and other stationary sources, as well as indirect emissions from offsite electrical generation, solid waste generation, and water conveyance and treatment. The following activities associated with the proposed project could contribute to the generation of GHG emissions:

- ***Construction Activities.*** Construction equipment typically uses fossil-based fuels to operate. The combustion of fossil-based fuels creates GHGs such as CO_2, methane and N_2O. Methane is also emitted during the fueling of heavy equipment.
- ***Solid Waste Disposal Emissions.*** Resulting emissions associated with waste generation and disposal in landfills are indirect. Landfills emit anthropogenic methane from the anaerobic breakdown of material.
- ***Gas, Electricity and Water Use.*** Natural gas use results in the emissions of two GHGs: methane (the major component of natural gas) and CO_2 from the combustion of natural gas. Methane is released prior to initiation of combustion of the natural gas (as before a flame on a stove is sparked), and from the small amount of methane that is uncombusted in a natural gas flame. Electricity use can result in GHG production if the electricity is generated by combustion of fossil fuel. GHG emissions associated with treatment and transport of water is also included in the analysis below.
- ***Motor Vehicle Use.*** Transportation associated with the project would result in GHG emissions from the combustion of fossil fuels in daily automobile and truck trips. However, not all of these emissions would be "new" to the region or state since drivers would likely have relocated from another area. To be conservative, however, all vehicle trips predicted to be generated by the project scenarios in the Transportation analysis were assumed to be new trips in this analysis.

Construction emissions over the full buildout duration were estimated using CalEEMod and amortized assuming a 30-year development life after completion of construction (which is likely low, given that many buildings tend to remain in use for 50 years or longer), and added to overall project emissions for comparison to significance thresholds. Amortized GHG emissions associated with project construction would result in annualized generation of about 883 metric tons of CO_2e.

The proposed FAR increase under the project could allow approximately 2,587,560 square feet of additional floor area over existing floor area. In regards to operations, the CalEEMod model was used to estimate GHG emissions, which are depicted in **Table 4.B-1**.

TABLE 4.B-1
ESTIMATED UNMITIGATED EMISSIONS OF GREENHOUSE GASES
(metric tons CO_2E/year)[a]

Source	Emissions
Project Construction (Amortized)	883
Area Sources	0.05
Energy Sources	11,946.97
Mobile Sources	21,442.29
Waste Sources	1,115.94
Water Sources	1,615.84
Total Project GHG Emissions (Construction + Operations)	37,004.09
Operational GHG Emissions per Increase in Service Population (7,760 jobs)[b]	4.77
BAAQMD GHG Efficiency Threshold	*4.6*
Significant (Yes or No)?	*Yes*

[a] GHG emissions were calculated using the CalEEMod model for the project construction and operations. Additional assumptions and data are included in Appendix D.

[b] The net service population represents the incremental increase in jobs within the project site due to project development. The value does not include jobs associated with the existing land uses on the project site. Per service population is the total project GHG emissions divided by the total number of available jobs for the new development.

The 2011 City of Fremont General Plan EIR assumed an average of two employees per 1,000 square feet of building square footage that would accommodate employment-generating land uses outside of a Priority Development Area (PDA) identified in Plan Bay Area, the regional land use and transportation plan. (The project site is not within a PDA.) However, because the transportation analysis in this EIR assumes that the entire project would be built out as office space, this analysis implicitly assumes a greater employment density than the generic assumption employed in the General Plan EIR, with more than three employees per 1,000 square feet.[4] Conservatively using an assumption of three employees per 1,000 square feet of office space, the additional floor area allowed by the proposed project versus existing floor area could generate up to approximately 7,760 new jobs at full development potential. Table 4.B-1 indicates that the increased GHG emissions associated with the project would exceed BAAQMD's "efficiency threshold" of 4.6 metric tons of CO_2e per service population per year by about four percent. This would represent a potentially significant cumulative GHG impact without mitigation.

Mitigation Measures

Mitigation Measure 4.B-1: The applicant shall develop and implement a project-specific GHG Reduction Plan that would reduce GHG emissions to below the 4.6 metric tons of CO_2e per service population per year (i.e., reduced GHG emissions by 1,319 metric tons of CO_2e), prior to the granting of a certificate of occupancy for each new or renovated building of the proposed project. The project-specific GHG Reduction Plan shall be submitted to the City for

[4] This number is derived from comparing the Institute of Transportation Engineers (ITM) Trip Generation Manual (ITM, 2012) daily trip rate per employee with the trip rate per 1,000 square feet for office park (used in this analysis) and the incrementally smaller rates for general office. In each case, the number of employees per 1,000 square foot is approximately 3.3.

approval as part of the initial application process for building permits so that the measures may be verified as present in building specifications. The project-specific GHG Reduction Plan, as implemented, shall include strategies that exceed those already identified in the project description or required by law. The project-specific GHG Reduction Plan shall include, but not be limited to, the following types of GHG reduction measures:

1. Install solar photovoltaic panels on building rooftops;
2. Install solar water heaters;
3. Use recycled water when available;
4. Exceed Building Code energy efficiency standards; and
5. Use water efficient irrigation systems.

Significance after Mitigation: With the inclusion of Mitigation Measure 4.B-1, implementation of a project-specific GHG Reduction Plan would reduce GHG emissions to below the BAAQMD significance threshold. This would be achieved by implementing energy efficiency measures as part of the final project design such as installing solar photovoltaic panels on buildings roofs and installing solar water heaters. For example, according to the BAAQMD (BAAQMD, 2011), if the project were to obtain all of its electrical energy from roof top solar panels, this would reduce indirect electrical GHG emissions by one hundred percent. As shown in Table 4.B-1, project energy sources account for approximately 11,946.97 metric tons CO_{2e} per year. If the project were to obtain twelve percent of its electrical power from rooftop solar panels, operational emissions could be reduced by at most 1,433.6 metric tons CO2e per year, which would be enough to reduce the project's operational GHG emissions to below the BAAQMD significance threshold. This would represent a less-than-significant cumulative GHG impact.

Impact 4.B-2: Implementation of the proposed project may conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of GHGs. (Significant)

The City of Fremont has established a GHG reduction plan with GHG reduction strategies focused on land use and mobility, energy, solid waste, water, and municipal services and operations (City of Fremont, 2012), which parallel several measures discussed in Measure 4.B-1a. In addition, BAAQMD GHG efficiency metrics were developed for the emissions rates at the State level for the land use sector that would accommodate projected growth (as indicated by population and employment growth) under trend forecast conditions, and the emission rates needed to accommodate growth while allowing for consistency with the goals of AB 32 (i.e., 1990 GHG emissions levels by 2020) (BAAQMD, 2009). As indicated in Table 4.B-1, GHG emissions generated by construction and operation of the project would exceed the BAAQMD "efficiency threshold" of 4.6 metric tons of CO_2e per service population per year. As a result, the project would potentially conflict with adopted plans aimed at reducing GHG emissions.

Mitigation Measure 4.B-2: Implement Mitigation Measure 4.B-1.

Significance after Mitigation: Implementation of the above mitigation measure would ensure that GHG emissions would be less than the BAAQMD efficiency threshold and that the project would not impair attainment of GHG reduction goals established pursuant to AB 32 in the *Climate Change Scoping Plan*. This would represent a less-than-significant impact.

References

Bay Area Air Quality Management District (BAAQMD), 2009. *Revised Draft Options and Justification Report California Environmental Quality Act Thresholds of Significance*, October 2009.

Bay Area Air Quality Management District (BAAQMD), 2012, *BAAQMD CEQA Guidelines, California Environmental Quality Act Air Quality Guidelines*, May 2012, http://www.baaqmd.gov/pln/ceqa/ceqa_guide.pdf.

California Air Pollution Control Officers Association (CAPCOA), *CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*, January 2008.

California Air Resources Board, 2008. *Climate Change Scoping Plan*. Adopted December 11, 2008, re-approved by the CARB on August 24, 2011.

California Air Resources Board, 2014a. *California Greenhouse Gas Inventory for 2000-2012 — by Category Defined in the Scoping Plan*. March 24, 2014.

California Air Resources Board, 2014b. *First Update to the Climate Change Scoping Plan.* May 2014.

Climate Policy Initiative, 2015. California Carbon Dashboard. http://calcarbondash.org/ Accessed: November 13, 2015.

City of Fremont, 2012. *City of Fremont Climate Action Plan.* Adopted November 13, 2012.

Institute of Transportation Engineers (ITS), 2012. *Trip Generation Manual, 9th edition*. Washington, DC. 2012

Intergovernmental Panel on Climate Change (IPCC), 2007. *Climate Change 2007: Impacts, Adaptation, and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom. 2007.

United Nations Framework Convention on Climate Change, 2012. *Total CO_2 Equivalent Emissions without counting Land-Use, Land-Use Change and Forestry (LULUCF)*. http://unfccc.int/ghg_emissions_data/predefined_queries/items/3814.php. Accessed January 7, 2013. (For countries for which 2004 data was unavailable, the most recent year was used.)

United States Environmental Protection Agency, 2015a. *Climate Change – Ecosystems and Biodiversity.* http://www.epa.gov/climatechange/impacts-adaptation/ecosystems.html. Last updated July 21, 2015; accessed July 29, 2015.

United States Environmental Protection Agency, 2015b. *Climate Change – Health and Environmental Effects.* http://www.epa.gov/climatechange/impacts-adaptation/health.html#climate. Last updated July 21, 2015; accessed July 29, 2015.

United States Environmental Protection Agency, 2011. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009; Executive Summary, Table ES-2.* April 2011.

This page intentionally left blank

4.C Noise

Introduction

This section provides an overview of the existing noise environment at the proposed project site and surrounding area, the regulatory framework, an analysis of potential noise impacts that would result from implementation of the proposed project, and mitigation measures where appropriate.

Environmental Setting

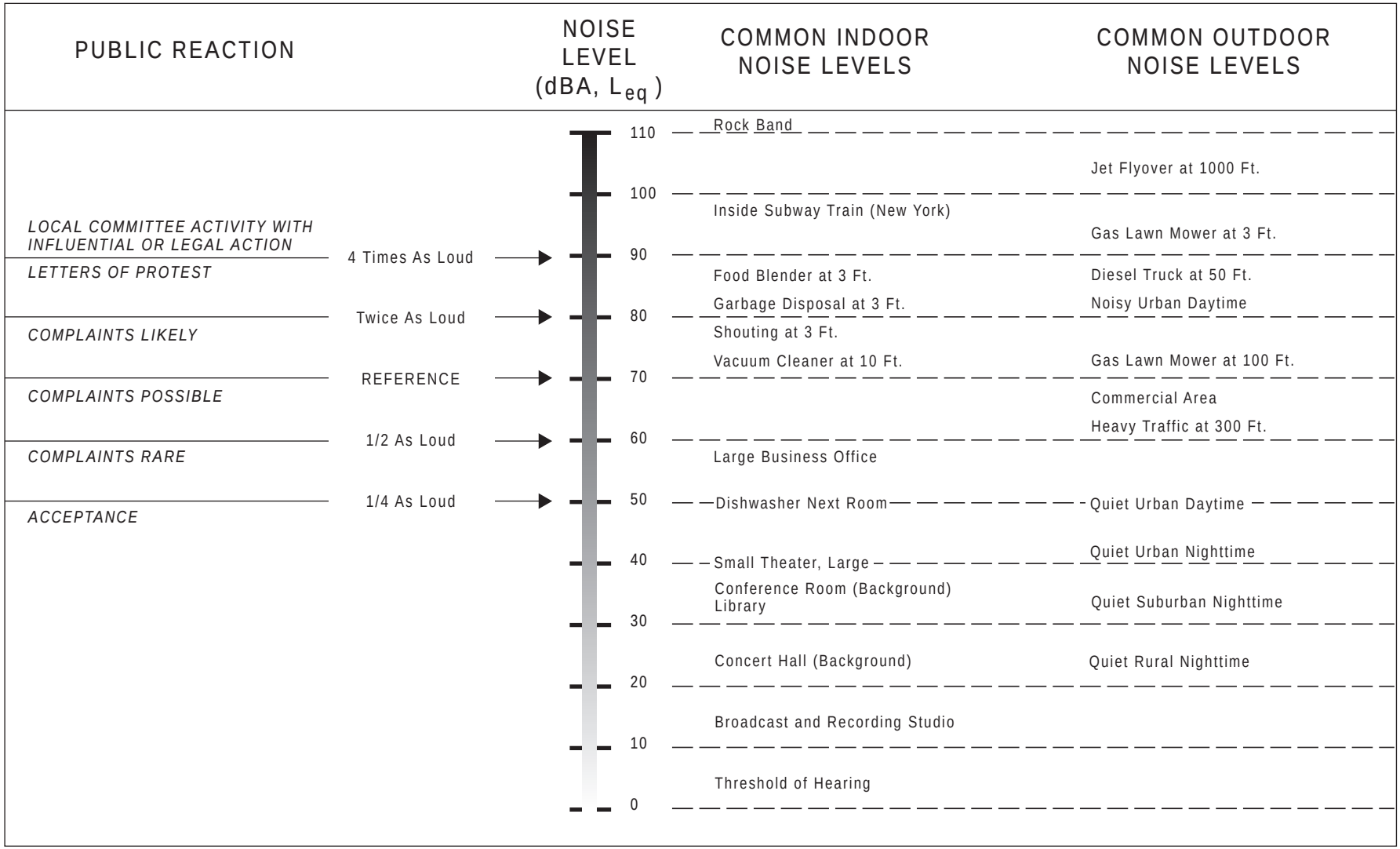
Technical Background and Noise Terminology

Noise can be generally defined as unwanted sound. Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level), which is measured in decibels (dB) with zero dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements. Some representative noise sources and their corresponding A-weighted noise levels are shown in **Figure 4.C-1**.

Noise exposure is a measure of noise over a period of time. Noise level is a measure of noise at a given time. Community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and atmospheric conditions. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual receptor. These successive additions of sound to the community noise environment vary the community noise level from instant to



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and Modified by ESA

Figure 4.C-1
Effects of Noise on People

instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts.

This time-varying characteristic of environmental noise is described using statistical noise descriptors. The noise descriptors used in this analysis are summarized below:

L_{eq}: Energy-equivalent sound level used to describe noise over a specified period of time, typically one hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: Instantaneous maximum noise level for a specified period of time.

L_{dn}: Twenty-four-hour day and night A-weighted noise exposure level which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises. Also abbreviated DNL.

CNEL: Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m. Similar to DNL.

As a general rule, in areas where the noise environment is dominated by traffic, the L_{eq} during the peak-hour traffic period is generally within one to two decibels of the L_{dn} at that location.

Effects of Noise on People

When a new noise is introduced to an environment, human reaction can be predicted by comparing the new noise to the ambient noise level, which is the existing noise level comprised of all sources of noise in a given location. In general, the more a new noise exceeds the ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response (Caltrans, 2013).

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence, the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for hard sites and 7.5 dBA for soft sites for each doubling of distance from the source. Hard sites are those with a reflective surface between the source and the receiver such as parking lots or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling of distance) is normally assumed for soft sites. Line sources (such as vehicle traffic noise along a road) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the source (Caltrans, 2013).

Noise levels may also be reduced by intervening structures, such as a row of buildings, a solid wall, or a berm located between the receptor and the noise source. According to the U.S. Department of Housing and Urban Development (HUD) *Noise Guidebook (HUD, 2009)*, standard building construction results in an exterior-to-interior noise reduction of 20 dBA with windows closed.

Fundamentals of Vibration

As described in the Federal Transit Administration's (FTA) *Transit Noise and Vibration Impact Assessment*, ground-borne vibration can be a serious concern for nearby neighbors, causing buildings to shake and rumbling sounds to be heard (FTA, 2006). In contrast to airborne noise, ground-borne vibration is not a common environmental problem. It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Some common sources of ground-borne vibration are trains, buses and heavy trucks on rough roads, and construction activities such as blasting, sheet pile-driving, and operating heavy earth-moving equipment.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings. The root mean square (RMS) amplitude is most frequently used to describe the effect of vibration on the human body. The RMS amplitude is defined as the average of the squared amplitude of the signal. Decibel notation (Vdb) is commonly used to express RMS. The decibel notation acts to compress the range of numbers required to describe vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors for vibration assessment include structures (especially older masonry structures), people who spend a lot of time indoors (especially residents, students, the elderly, and sick), and vibration sensitive equipment such as hospital analytical equipment and equipment used in computer chip manufacturing.

The effects of ground-borne vibration can include movement of the building floors, rattling of windows, shaking of items on shelves or hanging on walls, and rumbling sounds. In extreme cases, the vibration can cause damage to buildings. Building damage is not a factor for most projects, with the occasional exception of blasting and pile-driving during construction. Annoyance from vibration often occurs when the vibration exceeds the threshold of perception by only a small margin. A vibration level that causes annoyance can be well below the damage threshold for normal buildings.

Existing Noise-Sensitive Land Uses

Noise sensitive land uses are typically defined as residences, schools, places of worship, hospitals, and child care centers. The project area comprises 32 parcels totaling approximately 147.7 acres bounded generally by Paseo Padre Parkway to the southwest, Kaiser Drive to the northwest, Ardenwood Boulevard to the northeast, and State Route 84 (SR 84) to the southeast. The closest residential land use to the project area are single-family homes located approximately 230 feet northwest of the project site, across Ardenwood Boulevard. Other sensitive land uses near the project site include dormitory housing at DeVry University located on Ardentech Court approximately 800 feet away (0.15 mile), while the nearest school, Snow Elementary School in Newark, is located approximately one-half mile away to the southeast across SR 84.

Existing Noise Environment

The ambient noise environment surrounding the project site is primarily the result of traffic noise from SR 84, Kaiser Drive, Paseo Padre Parkway and Ardenwood Boulevard. Other noise sources in the area include aircraft overflights from Palo Alto Airport of Santa Clara County (located approximately seven miles from the project's southwestern boundary), train pass-by events along the Union Pacific Rail Road (UPRR) rail line tracks (located approximately 800 feet from the project's eastern boundary) and wildlife sounds such as birds chirping. The existing land uses within the project site are designated as industrial.

To quantify the existing ambient noise levels in the project vicinity, a noise survey was conducted within and near the project site. The noise measurement survey was conducted on May 14th and 15th, 2015, and consisted of three 20-minute short-term noise measurements and one 24-hour long-term noise measurement. These locations are illustrated on **Figure 4.C-2**. The area surrounding the project site is dominated by localized traffic noise, which was measured as high as 65.4 dBA L_{eq} at one location. The results of the 20-minute short-term noise measurement survey, which include the measured L_{eq} levels and descriptions of localized noise sources at all three monitoring locations, are presented in **Table 4.C-1**. The results of the 24-hour long-term noise measurement survey can be found in **Table 4.C-2**. All noise measurements were conducted using a Metrosonics Model db-308 sound level meter. The noise meter was calibrated before and after the noise measurement survey.

0 1000
Feet

Noise Measurements
ST – Short-Term
LT – Long-Term

SOURCE: Google Earth

Ardenwood Technology Park Planned District Rezoning EIR . 140953

Figure 4.C-2
Noise Measurements

TABLE 4.C-1
20-MINUTE SHORT-TERM AMBIENT NOISE MONITORING RESULTS

Measurement Location	Start time	L_{eq} (dBA)	L_{max} (dBA)	primary Noise Source(s)
ST-1	11:19 a.m.	61.9	75.9	Traffic along State Route 84
ST-2	11:47 a.m.	65.4	82.4	Traffic along Paseo Padre Parkway
ST-3	12.24 p.m.	65.2	80.9	Traffic along Ardenwood Boulevard

SOURCE: ESA, 2015

TABLE 4.C-2
24-HOUR LONG-TERM AMBIENT NOISE MONITORING RESULTS

Measurement Location	24-Hour L_{eq} (dBA)	L_{dn} (dBA)	L_{max} (dBA)
LT-1	62.5	67.4	80.9

SOURCE: ESA, 2015

Regulatory Framework

Federal Regulations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under 40 Code of Federal Regulations (CFR), Part 205, Subpart B. The federal truck pass-by noise standard is 80 dBA at 15 meters from the vehicle pathway centerline. These limits are implemented through regulatory controls on truck manufacturers.

State Regulations

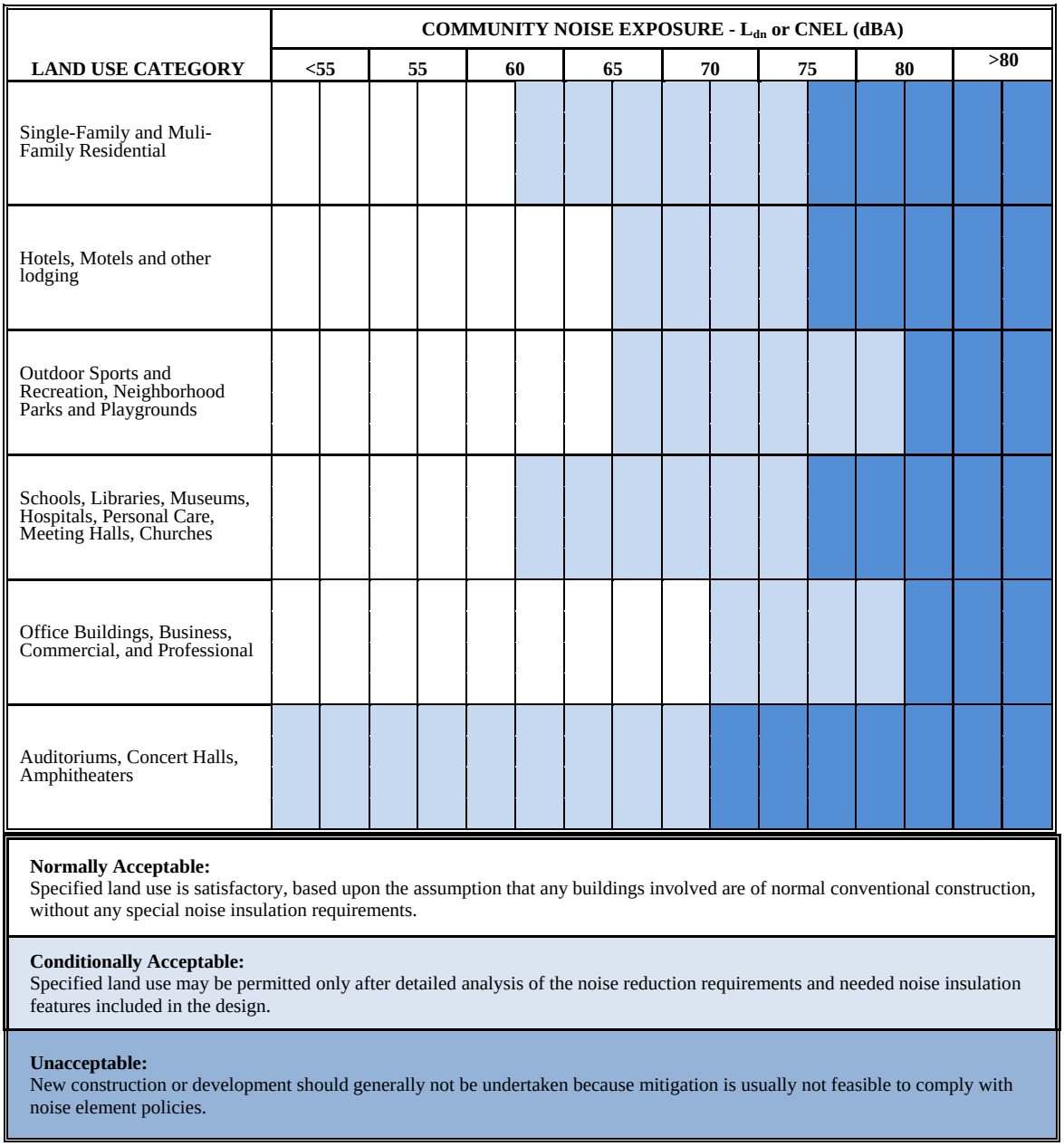
The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the state pass-by standard is consistent with the federal limit of 80 dB. The state pass-by standard for light trucks and passenger cars (less than 4.5 tons, gross vehicle rating) is also 80 dBA at 15 meters from the centerline. These standards are implemented through controls on vehicle manufacturers and by legal sanction of vehicle operators by state and local law enforcement officials.

Local Regulations

City of Fremont General Plan

The Fremont General Plan establishes the following goals and policies that are relevant to noise:

- Goal 10-8 and Policy 10-8.1 call for minimizing noise and vibration impacts to residents and property. Implementation 10-8.1.A and B sets forth the City's Land Use Compatibility for Community Noise Environment standards, which are provided in **Figure 4.C-3**.



Normally Acceptable:
Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable:
Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design.

Unacceptable:
New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies.

SOURCE: City of Fremont, 2011a

Figure 4.C-3
City of Fremont Land Use Compatibility Guidelines for Community Noise Environment

- Policy 10-8.10 calls for a vibration environment which meets acceptable guidelines as provided by the FTA.
- Policy 10-8.3 requires the evaluation of mitigation measures for projects under the following circumstances:
    1. The project would cause the L_{dn} to increase by 5 dBA or more but would remain below 60 dBA, or;
    2. The project would cause the L_{dn} to increase by 3 dBA or more and exceed 60 dBA, or;
    3. The project has the potential to generate significant adverse community response due to the unusual character of the noise.
- Policy 10-8.4 calls for controlling noise sources from commercial and industrial sources associated with new projects or developments to not exceed the noise level standards shown in **Table 4.C-3** as measured at any affected residential land use property line.

Policies 10-8.5, 10-8.6, 10-8.7, and 10-8.9 call for limiting construction noise, protecting sensitive uses, use of quiet paving materials, and controlling vibration. The Fremont General Plan establishes the following standards for exterior noise compatibility.

TABLE 4.C-3
EXTERIOR NOISE LEVEL STANDARDS FOR NEW INDUSTRIAL AND COMMERCIAL NOISE SOURCES

Category	Daytime - 7:00 a.m. - 10:00 p.m.	Nighttime - 10:00 p.m. - 7:00 a.m.
Hourly L_{eq}	50	45
Hourly L_{max}	70	65

SOURCE: City of Fremont, 2011a

Municipal Code

The City of Fremont's Municipal Code contains additional guidance with the intent to control noise and vibration, and to promote and maintain the health, safety, and welfare of its citizens. Portions of the City of Fremont Municipal Code with the potential to pertain to the proposed project are represented below.

Chapter 18.50 Industrial Districts

18.50.040 Performance standards

(1) Noise. At all property lines, as measured consistent with subsection (c) of this section, the maximum noise level generated by any user shall not exceed an L_{dn} level of 70 dBA when adjacent users are industrial or wholesale users. When adjacent to offices, retail, or sensitive industries, the noise level at all property lines shall be limited to an L_{dn} level of 65 dBA. When users are adjacent or contiguous to residential, park, or institutional uses, the maximum noise level shall not exceed an L_{dn} level of 60 dBA. Excluded from these standards are occasional sounds generated by the movement of railroad equipment, temporary construction activities or warning devices. Each of the noise level standards specified in this

section shall be reduced by five dBA for single-tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises when the site is adjacent to residential areas.

(2) Vibrations. No vibration shall be permitted which is discernible without instruments at any property line, as measured consistent with subsection (c) of this section.

18.160.010 Construction hours – Limitations.

(a) Except as modified herein, construction activity for development projects in any zoning district on any property within 500 feet of one or more residences, lodging facilities, nursing homes or inpatient hospitals shall be limited to the weekday hours of 7:00 a.m. to 7:00 p.m. and the Saturday or holiday hours of 9:00 a.m. to 6:00 p.m., while Sunday construction is not allowed. Construction activity for projects not located within 500 feet of residences, lodging facilities, nursing homes or inpatient hospitals shall be limited to the weekday hours of 6:00 a.m. to 10:00 p.m. and the weekend or holiday hours of 8:00 a.m. to 8:00 p.m.

(b) Resident homeowners and their uncompensated volunteer workers performing construction activity on their own single-family detached home shall be limited to the weekday hours of 7:00 a.m. to 8:00 p.m. and the weekend hours of 8:00 a.m. to 8:00 p.m.

(c) This section shall not apply to construction necessary to prevent or repair an emergency condition, as reasonably determined by the city manager's designee.

(d) Projects requiring a permit under the authority of this code shall have construction hours noted on the cover sheet of the construction plans.

(e) Projects requiring a permit under the authority of this code, except additions and alterations to single-family residential homes or lots, shall have an all-weather notice board conspicuously placed adjacent to the most visible public right-of-way for the duration of construction activity. The placement, format and content of the notice board shall be prescribed by city staff, and shall contain, at a minimum, summary project information, allowable construction hours, and city staff contact information.

(f) The city manager's designee shall have the authority to modify these hours under any of the following conditions:

(1) To facilitate staff supervision or inspection or when the applicant is required to comply with more restrictive provisions of this code, state or federal law.

(2) When, based upon the nature of nearby uses and/or site-specific considerations, he or she makes a finding that such modified construction hours are reasonably foreseeable to result in an equal or superior level of comfortable enjoyment of life and property by the community.

(3) When the project is located in a right-of-way or easement or on publicly owned property, and such modified hours, on balance, will minimize disruption to the community as a whole, such as to facilitate the orderly

flow of traffic or to reduce negative impacts on commercial or residential activity.

(g) Violations of the provisions of this section shall be considered a public nuisance as defined in Section 8.60.040 for purposes of enforcement and remedy. In addition to the provisions of Title 8, staff shall have the power to withhold inspections if construction hours are not observed.

Methodology

The analysis in this section focuses on the anticipated increases in ambient noise levels at existing noise-sensitive land uses with the implementation of full build-out of the proposed project.

An analysis of the temporary construction noise effects on nearby noise-sensitive land uses was assessed using methodology outlined in the Federal Highway Administration (FHWA) Road Construction Noise Model User's Guide (FHWA, 2006). This analysis is based on typical construction phases and equipment noise levels that are attenuated to nearest noise-sensitive land use. The modeled construction-related noise levels were modeled to gauge whether or not they would violate the City of Fremont Municipal Code warranting implementation of construction noise control measures.

Noise levels were calculated for local roadway segments that would result in increased traffic volumes due to the proposed project. The traffic noise levels were calculated from a reference distance of 50 feet for existing, existing plus project, cumulative, and cumulative plus project conditions. Traffic noise impacts were assessed using the FHWA Noise Prediction Model (RD-77-108) and the project traffic volumes provided by W-Trans (W-Trans, 2016). The model is based upon the Calveno reference noise factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle trip volume and speed.

For the purposes of this assessment, the methodology described in the FTA's Transit Noise and Vibration Impact Assessment (FTA, 2006) was used to evaluate project-related vibration effects to nearby sensitive land uses. No impact pile driving is anticipated to occur during construction of the proposed project. Other than construction, there are no appreciable sources of vibration proposed for the final development of the proposed project. As a result, only construction-related vibration impacts were assessed.

Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, noise impacts resulting from the implementation of the proposed project would be considered significant if the project would result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

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, expose people residing or working in the project area to excessive noise levels.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project.

The following analysis discusses the first four criteria; the fifth and sixth criteria are not discussed because the site lies outside a two-mile radius of a public airport or private airstrip.

Vibration. The project would result in a significant vibration impact if it would expose buildings to the FTA building damage ground-borne vibration threshold level of 0.2 PPV or if sensitive receptors would be exposed to a vibration level of 80 VdB for residential land uses, and 83 VdB for institutional land uses.

Stationary Source Noise. An off-site noise level at residences from project-related stationary sources that exceeds 50 dBA L_{eq} between the hours of 7:00 a.m. to 10:00 p.m. or 45 dBA L_{eq} between the hours of 10:00 p.m. and 7:00 a.m. would result in a significant noise impact.

Traffic Noise. For existing off-site sensitive receptors, the significance of project-related noise impacts can be determined by comparing estimated project-related noise levels to existing noise levels modeled at the property line of the sensitive land use (General Plan Noise Element Policy 10-8.3). Pursuant to the City's General Plan, where the existing traffic noise is less than 60 dB L_{dn} at the existing sensitive use, an increase of at least 5 dBA L_{dn} at the existing sensitive receptor due to project-related traffic increase would be considered significant. Where existing traffic noise levels are greater than 60 dBA L_{dn} at the sensitive use, an increase of 3 dBA L_{dn} would be considered significant (General Plan Noise Element Policy 10-8.3).

For new (proposed) onsite commercial and industrial uses, the significance of project-related noise impacts is determined based on a comparison of the project noise to the General Plan noise level standards in Figure 4.C-3. As shown in Figure 4.C-3, under the City's General Plan, the normally acceptable outdoor noise level for commercial, office and industrial land uses is 70 dBA L_{dn}/CNEL. Thus, exposure of new (proposed) commercial, office and industrial receptors to traffic noise levels that exceed 70 dBA L_{dn}/CNEL would be considered significant.

Construction Noise. Noise impacts from short-term construction activities could result in a significant impact if short-term construction activity occurs outside of the allowed daytime hours permitted by the City of Fremont Noise Ordinance. The City’s General Plan and Municipal Code do not provide guidance as to what would be considered a substantial noise increase associated with construction activities. For this analysis, a substantial noise increase would occur if construction noise were to exceed the ambient noise levels by 10 dBA or more, which, as

explained above, represents a perceived doubling of loudness. This noise level is used here to assess whether daytime construction-related noise levels would cause a substantial temporary or periodic increase in ambient noise levels at sensitive receptor locations near the project site.

Project Impacts and Mitigation Measures

Impact Analysis

Impact 4.C-1: Construction activities associated with the proposed project would not expose sensitive receptors to noise levels in excess of adopted standards or cause a substantial temporary increase in ambient noise levels. (Less than Significant)

Construction activity noise levels at and near the construction areas would fluctuate depending on the particular type, number, and duration of uses of various pieces of construction equipment. Construction-related material haul trips would raise ambient noise levels along haul routes, depending on the number of haul trips made and types of vehicles used. In addition, certain types of construction equipment generate impulsive noises (such as pile driving), which can be particularly disruptive. Pile driving, however, is not proposed during project construction. **Table 4.C-4** shows typical noise levels produced by various types of construction equipment.

TABLE 4.C-4
REFERENCE CONSTRUCTION EQUIPMENT NOISE LEVELS AT 50 FEET

Type of Equipment	L_{max}, dBA	Hourly L_{eq}, dBA/% Use
Backhoe	80	76/40%
Concrete Mixer Truck	85	81/40%
Loader	85	81/40%
Pneumatic Tools	85	82/50%
Air Compressor	81	77/40%

NOTES: % used during the given time period (usually an hour – Hourly L_{eq}) were obtained from the FHWA Roadway Construction Noise Model User's Guide, (FHWA, 2006).

SOURCE: Federal Transit Administration, 2006.

According to the City's Municipal Code (Section 18.160.010 (a)), construction activity for development projects in any zoning district on any property within 500 feet of one or more residences, lodging facilities, nursing homes or inpatient hospitals shall be limited to the weekday hours of 7:00 a.m. to 7:00 p.m. and the Saturday or holiday hours of 9:00 a.m. to 6:00 p.m., while Sunday construction is not allowed. Any onsite construction activities occurring outside of these hours would be considered a violation of the City's Municipal Code and result in a significant impact.

The nearest off-site noise-sensitive land use to the proposed project are single-family homes located approximately 230 feet northeast of the project site, across Ardenwood Boulevard. As indicated in Table 4.C-1 in the Setting, the existing noise level at short-term measurement location ST-3, nearest these residences, was 65.2 dBA, Leq. Because this measurement was taken at midday, it is presumed that greater traffic volumes during the peak commute hours would

result in a somewhat greater noise level and, therefore, this midday noise reading can reasonably be assumed to represent the 24-hour noise level.[1] Noise from construction activities generally attenuates at a rate of 6 to 7.5 dB per doubling of distance from the source. Assuming an attenuation rate of 6 dB per doubling of distance and all of construction equipment listed in Table 4.C-4 operating at the same time, the nearest noise-sensitive land use to the project site would be exposed to a noise level of approximately 73 dBA L_{eq}. These noise levels would not exceed ambient noise levels at the nearest sensitive receptors by more than 10 dBA and, therefore, construction noise would not result in a substantial temporary noise increase.

Mitigation: None Required.

Impact 4.C-2: Construction of the proposed project would not result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. (Less than Significant)

Construction activities would include excavation, site preparation work, foundation work, and new building, framing and finishing. Construction activities may generate perceptible vibration when heavy equipment or impact tools such as jackhammers or hoe rams are used. Pile driving can cause excessive vibration. Because specific construction details are unknown at this point, this analysis presumes that no pile driving would be required during future project construction.

The potential use of bulldozers during fine-site grading would be expected to generate the highest vibration levels during construction. Vibration levels would vary depending on soil conditions, construction methods, and equipment used. Large bulldozers typically generate vibration levels of 78 VdB and 0.045 in/sec PPV at a distance of 50 feet, which would fall below the 80 VdB threshold for human annoyance and the 0.2 PPV threshold for building damage. Consequently, existing residences near the project site would not be affected by substantial groundborne vibration and this impact would be considered less than significant.

Mitigation: None Required.

Impact 4.C-3: The proposed project would generate additional traffic on local area roadways that would increase traffic noise exposure relative to existing conditions. (Less than Significant)

Most of the noise generated by implementation of the project would primarily be traffic-generated noise. The proposed project would contribute to an increase in local traffic volumes, resulting in higher noise levels along local roadways. Using algorithms from the FHWA's Highway Traffic Noise Prediction Model (FHWA-RD-77-108) and the estimated project traffic

[1] Short-term noise measurements during the peak traffic hours approximate the day-night noise level (generally within 2 dBA), according to the Caltrans document "Technical Noise Supplement to the Traffic Noise Analysis Protocol," Sept. 2013; p. 2-56 (http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf).

volumes provided by W-Trans (W-Trans, 2016), traffic noise levels were analyzed for eight roadway segments. The segments analyzed and results of the modeling are shown in **Table 4.C-5.**

As shown in **Table 4.C-5**, the greatest effect on ambient levels would occur at the existing commercial land uses located along SR 84, between Thornton Avenue and Ardenwood Boulevard, where traffic noise would increase by as much as 1.7 dBA L_{dn}. All other roadways analyzed would be expected to experience a traffic noise increase no greater than 1 dBA L_{dn}. According to the City of Fremont General Plan Policy 10-8.3, where the existing traffic noise level receptors are less than 60 dB L_{dn} at the existing sensitive use, an increase of at least 5 dBA L_{dn} at the existing sensitive receptor due to roadway improvement projects would be considered significant and where existing traffic noise levels are greater than 60 dBA L_{dn} at the sensitive use, an increase of 3 dBA L_{dn} would be considered significant. The highest increase in traffic noise at the commercial sensitive land uses (located adjacent to a roadway segment affected by the proposed project) is 1.7 dBA L_{dn}, which would not result in a substantial increase in traffic noise. In addition, all existing residential land uses located adjacent to roadways that would be affected by the proposed project would not experience a substantial increase in traffic noise. Consequently, none of the roadway segments analyzed would result in a significant increase in traffic noise from the proposed project versus the existing scenario. Therefore, impacts from traffic noise associated with the proposed project would be less than significant.

Mitigation: None Required.

Impact 4.C-4: Implementation of the proposed project would not expose new commercial land uses to noise levels in excess of the City of Fremont noise standard. (Less than Significant)

With respect to new (proposed) onsite commercial land uses, consisting of office buildings, advanced manufacturing and research and development (R&D) facilities, the City of Fremont General Plan Policy 10-8.1 requires that outdoor areas of new projects are constructed such as they are not exposed to noise levels that exceed the City's noise standard. Therefore, an impact would be considered significant if new commercial receptors are exposed to transportation-related noise levels above 70 dBA L_{dn}.

The nearest high volume roadway to the project area is SR 84. Increase in traffic volumes along SR 84, between Thornton Avenue and Ardenwood Boulevard, would increase noise levels to 78.9 dBA L_{dn} at 50 feet from the roadway centerline, as shown in Table 4.C-5. The proposed and existing onsite commercial buildings are located proximately 300 feet from SR 84 center line. At this distance, the closest onsite commercial building would be exposed to a traffic noise level of approximately 67.2 dBA L_{dn}, which would not exceed the City's noise standard for commercial uses. Therefore, future onsite commercial land uses located adjacent to SR 84, between Thornton Avenue and Ardenwood Boulevard, would not result in future traffic noise levels exceeding the City of Fremont applied traffic noise standards and, therefore, the associated impact would be considered less than significant.

TABLE 4.C-5
SUMMARY OF TRAFFIC NOISE MODELING RESULTS (EXISTING/EXISTING PLUS PROJECT)
NOISE EXPOSURE (L_{DN}) AT 50 FEET FROM ROADWAY CENTERLINE

Roadway Segment	Traffic Noise Level, dBA, L_{dn}[1]							
	Existing	Existing Plus Project	Incremental Increase	Significant? (Yes or No)[2]	Cumulative Near Term No Project	Cumulative Near Term Plus Project	Incremental Increase	Cumulatively Considerable? (Yes or No)3
	A	B	(B - A)		C	D	(D - C)	
1. I-880, Decoto Rd. to Alvarado Rd.	84.0	84.4	0.4	No	85.3	85.6	0.3	No
2. I-880, Thornton Ave. to Decoto Rd.	84.2	84.6	0.4	No	85.0	85.4	0.4	No
3. SR 84, Toll Plaza to Thornton Ave.	78.5	78.8	0.2	No	80.2	80.4	0.2	No
4. SR 84, Thornton Ave. to Ardenwood Blvd.	77.1	78.9	1.7	No	79.4	80.5	1.1	No
5. Decoto Rd., I-880 to Fremont Blvd.	72.7	73.4	0.7	No	75.0	75.4	0.4	No
6. Decoto Rd., Fremont Blvd. to Paseo Padre Pkwy.	72.1	72.5	0.3	No	74.6	74.8	0.2	No
7. Fremont Blvd., to Thornton Ave. to Decoto Rd.	71.9	72.4	0.4	No	74.6	74.8	0.2	No
8. Fremont Blvd., Decoto Rd. to Paseo Padre Pkwy.	71.9	71.9	0.0	No	73.7	73.8	0.0	No

BOLD values show potentially significant noise increases prior to any mitigation.

1 Noise levels 50 feet from roadway were determined using FHWA Traffic Noise Prediction Model (FHWA RD-77-108).

2 Where existing traffic noise levels at receptors are less than 60 dBA L_{dn} at the existing sensitive use, an increase of at least 5 dBA L_{dn} at the exiting sensitive receptor will be considered significant. Where existing traffic noise levels are greater than 60 dBA L_{dn} at the sensitive use an increase of 3 dBA L_{dn} will be considered significant. (General Plan Noise Policy 10-8.3)

3 Cumulative increase greater than 3 dBA increase in noise is considered cumulatively significant.

SOURCE: ESA, 2015

Mitigation: None Required.

Impact 4.C-5: The proposed project could locate commercial uses near an existing rail line. Future commercial land uses could potentially be exposed to exterior noise exposure from train noise. (Less than Significant)

There is a UPRR freight rail line that runs north-south near the project's eastern boundary. The rail line is located approximately 800 feet east of the project site. UPRR has not published existing or future rail line volumes. However, according to the Federal Transit Administration's (FTA) Guidance Manual for Transit Noise and Vibration Impact Assessment (FTA, 2006), the estimated existing noise exposure for a railroad line at a distance between 500 to 800 feet is 50 dBA L_{dn}. Consequently, the future planned commercial uses, consisting of office buildings, advanced manufacturing and research and R&D facilities, proposed within the project area would be exposed to rail noise of approximately 50 dBA L_{dn}. These noise levels would be below the City's compatibility noise standard for commercial land uses. In addition, there are buildings between the UPRR rail line and the project site that would partially shield onsite commercial buildings from freight train pass-by events, which would further attenuate noise levels. Consequently, the noise levels generated by freight train traffic along the UPRR rail line, 800 feet east of the project site, would be less than 70 dBA L_{dn}. Therefore, this impact would be considered less than significant.

Mitigation: None Required.

Impact 4.C-6: The proposed project could locate commercial uses near an existing rail line. Future commercial uses could be exposed to vibration from train pass-by events. (Less than Significant)

Freight transport operations along the UPRR rail line, 800 east of the project site, has a potential to generate excessive groundborne vibration levels at onsite commercial land uses, consisting of office buildings, advanced manufacturing and research and R&D facilities. According to the FTA Guidance Manual for Transit Noise and Vibration Impact Assessment (FTA, 2006), the typical ground-surface vibration levels for light rail trains traveling at a speed of 50 miles per hour and at a distance of 300 feet is approximately 67 VdB or 0.0089 in/sec PPV. The project site is located approximately 800 feet from the UPRR rail line centerline. At this distance the nearest commercial land use would be exposed to a vibration level of approximately 54.2 VdB or 0.002 in/sec PPV, which is substantially less than the FTA vibration impact threshold of 75 VdB for commercial land uses and 0.2 in/sec PPV for building damage. Consequently, vibration from a train pass-by along the existing UPRR rail line east of the project site would not expose people to substantial vibration levels and would result in a less-than-significant impact.

Mitigation: None Required.

Impact 4.C-7: The proposed project could be affected by existing stationary (non-transportation) noise sources. (Less than Significant)

Noise from stationary (non-transportation) sources in the vicinity of the proposed project area could exceed the applicable 45 dBA L_{eq} nighttime exterior noise exposure limit established within the City's General Plan (Policy 10-8.4). Some areas adjacent to industrial/commercial areas could be subject to loading noise and late or 24-hour operations noise. Other stationary noise sources would include noise generated by heating, ventilation and air conditioning units (HVAC). Typically, noise levels of 66 dB L_{eq} at a distance of 50 feet could be generated during loading dock activities (ESA, 2008). These data include noise generated by truck arrivals and departures from the unloading area, trucks backing into the docks (including backup beepers), air brakes, and other related truck unloading noise. HVAC units typically generate noise levels of approximately 55 dBA L_{eq} at a reference distance of 100 feet from the operating units during maximum heating or air conditioning operations (Bolt, Baranek, and Newman, 1971). The closest noise sensitive uses to the project site are located approximately 800 feet away. At this distance, the closest residential land uses to the project site would be exposed to approximately 41.9 and 36.9 dBA L_{eq} during loading/unloading activities and HVAC operations, respectively. The noise levels generated by both of these activities would be below the City's maximum allowed exterior noise standard for stationary sources, respectively. Therefore, this would be considered a less-than-significant impact.

Mitigation: None Required.

Cumulative Impact

Geographic Context

The geographic context for changes in the noise and vibration environment due to development of the proposed project would be localized in mainly an urban area of the City of Fremont, as well as along roadways that would serve the proposed project. In order to contribute to a cumulative construction noise impact, another project in close proximity would have to be constructed at the same time as the proposed project. According to the City of Fremont General Plan EIR (City of Fremont, 2011b), there are several major construction projects that may take place within the City of Fremont in the foreseeable future, which includes work on the Bay Area Rapid Transit (BART) extensions to San Jose, and possible grade separation projects that may take place during the construction and operation period of the proposed project.

Impact 4.C-8: The proposed project could temporarily add to cumulative noise levels in the vicinity of the project site. (Significant)

There are cumulative projects currently in the planning process that could add to project-related construction noise levels. These projects could be located in close proximity to the project site and could be constructed at the same time and duration as the proposed project. Construction activities could adversely affect off-site noise-sensitive land uses if located within close proximity of where project-related construction would occur. If project-related activities were to coincide

with another development, the combined effect could result in the exposure of off-site noise-sensitive land uses to higher noise levels than what was previously predicted under the proposed project. As a result, construction noise associated with the proposed project would be considered a temporary significant cumulative impact.

Mitigation Measure 4.C-1: The project applicant shall incorporate the following requirements into the construction contract specifications:

- Equipment and trucks used for construction shall use the industry standard noise control techniques (e.g., improved mufflers, equipment redesign, use of intake silencers, ducts, engine enclosures, and acoustically-attenuating shields or shrouds).
- Stationary noise sources shall be located as far from adjacent receptors, whenever feasible, and shall be muffled and enclosed within temporary sheds. Insulation barriers and other measures shall be used to the extent feasible.

Significance after Mitigation: Less than Significant.

Impact 4.C-9: Increases in traffic from the proposed project, in combination with other development, would not result in cumulatively considerable noise increases. (Less than Significant)

Traffic noise levels were predicted in terms of the L_{dn} at a representative distance of 50 feet from the center of the roadways for the cumulative (2035) and cumulative (2035) plus project conditions using the FHWA Traffic Noise Model. These predictions used the same modeling methodology presented above. Results of this analysis are summarized in Table 4.C-5.

The proposed project would add traffic volumes to local roadways, particularly along SR 84, between Thornton Avenue and Ardenwood Boulevard, which would result in increased traffic noise levels. As shown in Table 4.C-5, the proposed project would not be a contributor to future cumulative traffic noise levels. Along SR 84, the proposed project would increase cumulative traffic noise levels by up to 1.1 dBA L_{dn}, which would not exceed the City's substantial noise increase threshold. All other local roadway segments analyzed near the project site showed a traffic noise increase of less than 1 dBA L_{dn}. In addition, all existing residential land uses located adjacent to roadways that would be affected by the proposed project would not experience a substantial increase in traffic noise. Consequently, none of the roadway segments analyzed would result in a significant increase in traffic noise from the proposed project versus the cumulative scenario. Therefore, impacts from traffic noise associated with the proposed project would be less than significant.

Mitigation: None Required.

Impact 4.C-10: Traffic from the proposed project, in combination with other development, would not expose new commercial land uses to noise levels in excess of the City of Fremont noise standard. (Less than Significant)

As previously stated, General Plan Policy 10-8.1 requires that outdoor areas of new projects are constructed such as they are not exposed to noise levels that exceed the City's noise standard. Therefore, an impact would be considered significant if new commercial receptors, consisting of office buildings, advanced manufacturing and research and R&D facilities, are exposed to transportation-related noise levels above 70 dBA L_{dn}.

The nearest high volume roadway to the project area is SR 84. Increase in traffic volumes along SR 84, between Thornton Avenue and Ardenwood Boulevard, would increase noise levels to 80.5 dBA L_{dn} at 50 feet from the roadway centerline, as shown in Table 4.C-5. The proposed and existing onsite buildings are located approximately 300 feet from SR 84 center line. At this distance, the closest onsite building would be exposed to a traffic noise level of approximately 68.8 dBA L_{dn}, which would not exceed the City's noise standard for commercial uses. Therefore, future onsite land uses located adjacent to SR 84, between Thornton Avenue and Ardenwood Boulevard, would not result in future traffic noise levels exceeding the City of Fremont applied traffic noise standards and, therefore, the associated impact would be considered less than significant.

Mitigation: None Required.

References

Bolt, Baranek, and Newman. *USEPA Noise from Construction Equipment and Operations, Building Equipment*, and Home Appliances. 1971.

California Department of Transportation (Caltrans). *Technical Noise Supplement to the Traffic Noise Analysis Protocol.* September 2013.

City of Fremont, 2011a. *City of Fremont General Plan, Noise Element.* Adopted 2011.

City of Fremont, 2011b. *City of Fremont General Plan EIR*. July 2011.

California Department of Transportation (Caltrans). *Caltrans Transportation Laboratory Noise Manual.* 1982.

Department of Housing and Urban Development (HUD). *HUD Noise Guidebook*. March 2009.

Environmental Science Associates (ESA). *Fresh & Easy Distribution Truck Noise Stu*dy. December 3, 2008.

Environmental Scientist Associates (ESA). *Ardenwood Project Noise Measurement Survey.* May 15, 2015.

Federal Transit Administration (FTA). *Transit Noise and Vibration Impact Assessment*, 2006.

Federal Highway Administration (FHWA). *FHWA highway traffic noise prediction model (FHWA-RD-77-108)*. December 1978.

Federal Highway Administration (FHWA). *FHWA Roadway Construction Noise Model User's Guide*. January 2006.

State of California. *General Plan Guidelines.* Governor's Office of Planning and Research, 1998.

U.S. Department of Housing and Urban Development (HUD). *Noise Guidebook, 2009.*

W-Trans, Traffic Volumes for Ardenwood Project, February 17, 2016.

This page intentionally left blank

4.D Transportation

Introduction

This section describes the existing transportation setting, including the roadway, transit, pedestrian and bicycle networks serving the project site, and a summary of transportation regulations applicable to the project. Thresholds of significance are presented, as is an analysis of potential effects associated with implementation of the proposed project. Descriptions and analyses presented within this section are based on a traffic impact study (February 17, 2016) prepared by W-Trans Transportation Consultants, which is included in this EIR as **Appendix E**.

Environmental Setting

Roadway Network

The City of Fremont roadway network is comprised of freeways, arterials, parkways, collector streets and local streets. **Figure 4.D-1** illustrates the roadway network.

Regional Roadways

Interstate 880 (I-880) is a major regional freeway that runs in the north-south direction through Fremont, serving the East Bay and South Bay, and connecting State Route 17 (SR 17) in San Jose to I-980 in Oakland. In the vicinity of the study area it has three mixed-use lanes plus a High Occupancy Vehicle lane in each direction. I-880 currently serves approximately 216,000 vehicles per day in this area, including approximately 14,200 vehicles during the peak hour (Caltrans, 2015). I-880 provides access to the study area via the interchanges at Decoto Road and Alvarado Boulevard / Fremont Boulevard.

State Route 84 (SR 84) runs in the east-west direction connecting U.S. 101 on the peninsula and I-880 in Fremont. The roadway has six lanes (three lanes in each direction) and becomes Decoto Road east of I-880. In the vicinity of the study area, it serves approximately 65,000 vehicles per day, including approximately 5,900 vehicles during the peak hour (Caltrans, 2015). SR 84 provides access to the study area via the interchanges at Ardenwood Boulevard/Newark Boulevard and Paseo Padre Parkway/Thornton Avenue.

Local Roadways

Paseo Padre Parkway runs in the east-west direction in the proximity of the project site from SR 84 to Decoto Road, and in the north-south direction from Decoto Road to Mission Boulevard. The number of lanes varies from four to six. Paseo Padre Parkway is the major arterial that would carry most of the project trips from and to other areas. The major access on the west side of the project site would be connected to Paseo Padre Parkway.

Ardenwood Boulevard is an arterial running north-south between Alameda Creek/Fremont City Limits and SR 84, having two through lanes in each direction. The arterial runs along a small section of the east project frontage and provides an access alternative to Paseo Padre Parkway.

SOURCE: W-TRANS 2015

Figure 4.D-1
Study Area

Alvarado Boulevard is an arterial running north-southeast between Union City Boulevard and I-880. The roadway segment north of Lake Arrowhead Avenue has four lanes, and south of Lake Arrowhead Avenue there are six lanes.

Thornton Avenue is oriented north-south near the project site from SR 84 to Willow Street and in the east-west direction from Willow Street to Paseo Padre Parkway. The arterial's number of lanes varies from two lanes to four lanes plus a center two-way left turn lane. Thornton Avenue would serve as a major route for project trips from and to I-880.

Decoto Road runs in the east-west direction from Mission Boulevard to I-880. West of I-880, Decoto Road becomes SR 84. The arterial's number of lanes varies from four to five. Currently, it carries a traffic volume of 35,600 vehicles per day in the vicinity of the project (City of Fremont, 2015).

Fremont Boulevard runs north-south between I-880 and the south city limit. The arterial has four to six lanes. Currently it carries a traffic volume of 24,500 vehicles per day in the vicinity of I-880 (City of Fremont, 2015).

Traffic Operating Conditions

Operating conditions during the weekday a.m. and p.m. peak periods were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward - bound commute.

Study Area

The study area was selected based on the potential for project impacts and includes the following 11 signalized intersections:

1. Alvarado Boulevard / I-880 Southbound Off-Ramp – Deep Creek Road
2. Fremont Boulevard / I-880 Northbound Ramps
3. Fremont Boulevard / Paseo Padre Parkway
4. Decoto Road / Paseo Padre Parkway
5. Decoto Road / Fremont Boulevard
6. Decoto Road / I-880 Northbound Ramps
7. Decoto Road / I-880 Southbound Ramps
8. Ardenwood Boulevard / SR 84 Westbound Ramps
9. Paseo Padre Parkway / SR 84 Westbound Ramps
10. Thornton Avenue / SR 84 Eastbound Ramps
11. Ardenwood Boulevard / Paseo Padre Parkway

In addition, the study area includes the following 16 road segments (eight freeway segments and eight arterial segments):

1. I-880, northbound, from Decoto Road to Alvarado Road
2. I-880, southbound, from Alvarado Road to Decoto Road
3. I-880, northbound, from Thornton Avenue to Decoto Road
4. I-880, southbound, from Decoto Road to Thornton Avenue
5. SR 84, eastbound, from Toll Plaza to Thornton Avenue
6. SR 84, westbound, from Thornton Avenue to Toll Plaza
7. SR 84, eastbound, from Thornton Avenue to Ardenwood Boulevard
8. SR 84, westbound, from Ardenwood Boulevard to Thornton Avenue
9. Decoto Road, eastbound, from I-880 to Fremont Boulevard
10. Decoto Road, westbound, from Fremont Boulevard to I-880
11. Decoto Road, eastbound, from Fremont Boulevard to Paseo Padre Parkway
12. Decoto Road, westbound, from Paseo Padre Parkway to Fremont Boulevard
13. Fremont Boulevard, northbound, from Thornton Avenue to Decoto Road
14. Fremont Boulevard, southbound, from Decoto Road to Thornton Avenue
15. Fremont Boulevard, northbound, from Decoto Road to Paseo Padre Parkway
16. Fremont Boulevard, southbound, from Paseo Padre Parkway to Decoto Road

Level of Service Conditions

Level of Service (LOS) is used to characterize traffic operating conditions on various types of facilities (intersections and roadways) based on traffic volumes and roadway capacity using a series of six letter designations. Generally, LOS A represents free-flow conditions and LOS F represents forced flow or breakdown conditions. LOS methodologies for intersections, freeways and arterials are described below under “Methodology” (page 4.D-12), and the City of Fremont General Plan policy regarding LOS standards is described below under “Thresholds of Significance” (Page 4.D-14).

Intersections. Traffic volume data was collected on February 26, 2015, while local schools were in session. As shown in **Table 4.D-1**, all of the study intersections currently are operating acceptably at LOS D or better (or LOS E where that standard applies). The existing traffic volumes are shown in **Figure 4.D-2**.

TABLE 4.D-1
EXISTING PEAK HOUR INTERSECTION LEVELS OF SERVICE (LOS)

Study Intersection	AM Peak Hour		PM Peak Hour	
	Delay	LOS	Delay	LOS
1. Alvarado Blvd/I-880 SB Off-Ramp-Deep Creek Road	27.1	C	28.6	C
2. Fremont Boulevard/I-880 Northbound Ramps	14.1	B	17.7	B
3. Fremont Boulevard/Paseo Padre Parkway	41.5	D	43.5	D
4. Decoto Road/Paseo Padre Parkway	50.4	D	65.5	E
5. Decoto Road/Fremont Boulevard	42.3	D	43.6	D
6. Decoto Road/I-880 Northbound Ramps	25.8	C	15.4	B
7. Decoto Road/I-880 Southbound Ramps	3.5	A	5.3	A
8. Ardenwood Boulevard/SR 84 Westbound Ramps	28.0	C	16.1	B
9. Paseo Padre Parkway/SR 84 Westbound Ramps	13.0	B	6.7	A
10. Thornton Ave/SR 84 Eastbound Ramps	10.9	B	32.6	C
11. Ardenwood Boulevard/Paseo Padre Parkway	30.2	C	38.2	D

NOTES: Delay is measured in average seconds per vehicle

SOURCE: W-Trans, 2016

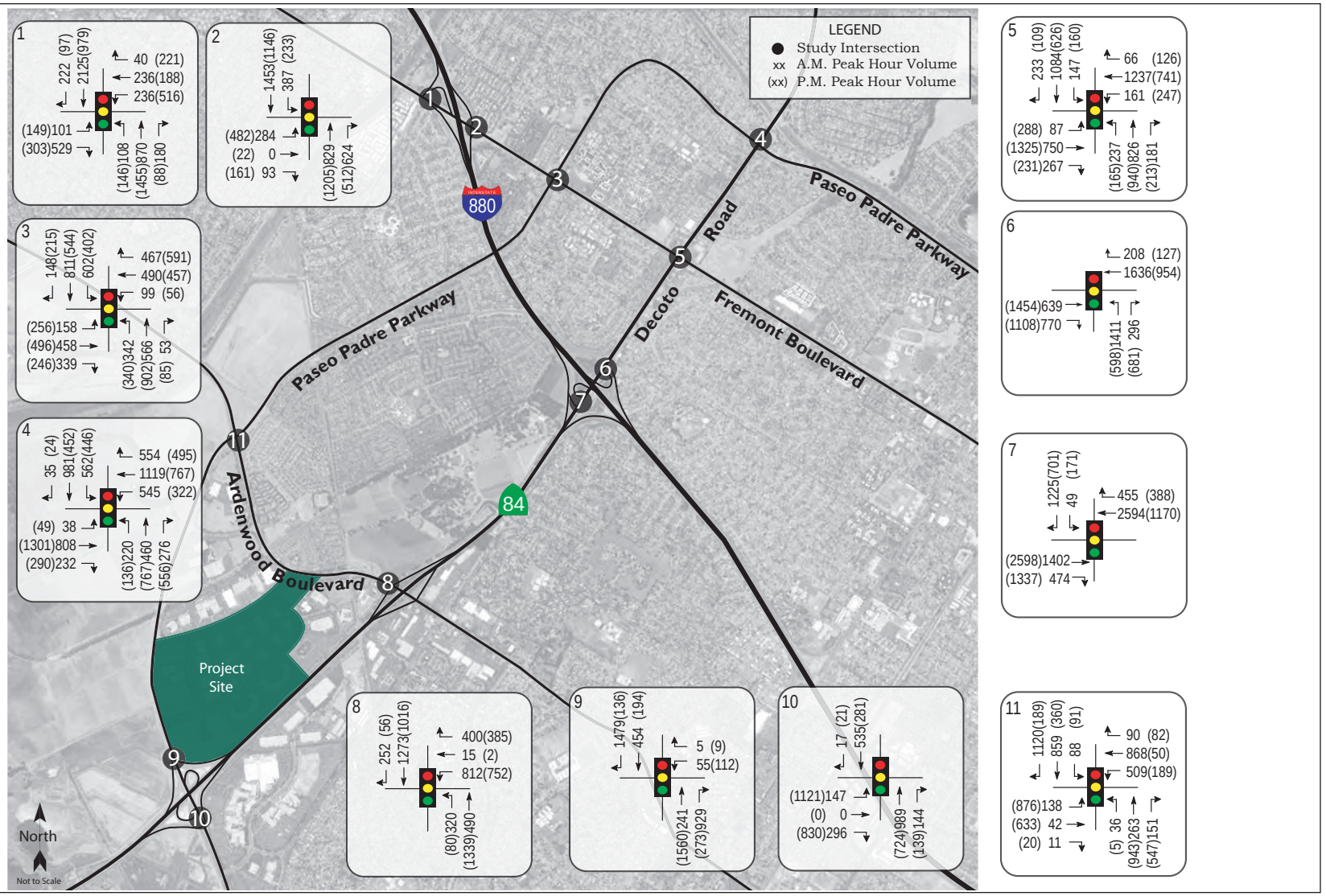
Freeway Segments. Current freeway traffic volume data is available through the online Caltrans Performance Management System, referred to as PeMS (website: pems.dot.ca.gov). Average hourly traffic volumes on weekdays for the period between April 5 and May 4, 2015 were obtained through this system and translated into volume-to-capacity (V/C) ratios. As shown in **Table 4.D-2**, all of the study freeway segments are operating acceptably at LOS E or better except for southbound I-880 between Decoto Road and Thornton Avenue, which operates at LOS F during the p.m. peak hour.

TABLE 4.D-2
EXISTING FREEWAY LEVELS OF SERVICE (LOS)

Segment	From	To	Direction	AM Peak Hour		PM Peak Hour	
				V/C	LOS	V/C	LOS
1. I-880	Decoto Rd	Alvarado Rd	Northbound	0.66	B	0.79	C
	Alvarado Rd	Decoto Rd	Southbound	0.94	E	0.85	D
2. I-880	Thornton Ave	Decoto Rd	Northbound	0.87	D	0.91	E
	Decoto Rd	Thornton Ave	Southbound	0.96	E	**1.08**	**F**
3. SR 84	Toll Plaza	Thornton Ave	Eastbound	0.22	A	0.90	E
	Thornton Ave	Toll Plaza	Westbound	0.74	C	0.19	A
4. SR 84	Thornton Ave	Ardenwood Blvd	Eastbound	0.18	A	0.63	B
	Ardenwood Blvd	Thornton Ave	Westbound	0.72	C	0.23	A

NOTES: V/C = Volume to Capacity ratio; **Bold** = unacceptable operation

SOURCE: W-Trans, 2016



SOURCE: W-TRANS 2015

Figure 4.D-2
Existing Traffic Volumes

Arterial Roadway Segments. Existing roadway segment volumes were provided by the City of Fremont. The arterial segment analysis uses these traffic volumes along with the number of travel lanes to estimate average vehicle speeds and levels of service along the corridor. All four of the study segments are on the Alameda County Transportation Commission (ACTC) network and have an LOS E standard. As shown in **Table 4.D-3**, all of the study arterial segments are currently operating acceptably at LOS E or better, except for eastbound Decoto Road between I-880 and Fremont Boulevard, which is operating at LOS F during the p.m. peak hour.

TABLE 4.D-3
EXISTING ARTERIAL SEGMENT LEVELS OF SERVICE (LOS)

				AM Peak Hour		PM Peak Hour	
Segment	**From**	**To**	**Direction**	**Speed**	**LOS**	**Speed**	**LOS**
1. Decoto Rd	I-880	Fremont Blvd	Eastbound	30	B	**8**	**F**
	Fremont Blvd	I-880	Westbound	21	D	38	A
2. Decoto Rd	Fremont Blvd	Paseo Padre	Eastbound	37	A	27	C
	Paseo Padre	Fremont Blvd	Westbound	19	D	31	B
3. Fremont Blvd	Thornton Ave	Decoto Rd	Northbound	30	B	22	D
	Decoto Rd	Thornton Ave	Southbound	17	D	28	C
4. Fremont Blvd	Decoto Rd	Paseo Padre	Northbound	29	B	23	C
	Paseo Padre	Decoto Rd	Southbound	32	B	37	A

NOTES: Speed reported in miles per hour; Bold = unacceptable operation

SOURCE: W-Trans, 2016

Public Transit Service

Figure 4.D-3 illustrates the existing transit routes within the project study area.

AC Transit

Alameda-Contra Costa County (AC) Transit provides bus transit service to the cities in the East Bay. There are numerous bus routes that run along major streets in Fremont, connecting to the adjacent cities of Union City and Newark. The following bus routes currently operate in the project study area.

Route SB runs between the Transbay Terminal in San Francisco and the intersection of Stevenson Boulevard and Cedar Boulevard, in Fremont. In the vicinity of the project site, it travels along Ardenwood Boulevard and Union City Boulevard, and operates with 30-minute headways. Route SB provides commuter travel, as it only operates on weekdays, and only in the westbound direction between 5:25 a.m. and 9:00 a.m., and only in the eastbound direction between 4:00 p.m. and 8:00 p.m.

SOURCE: W-TRANS 2015

Figure 4.D-3
Transit System

Route U runs between the Stanford Oval in Palo Alto and the Fremont BART station. In the vicinity of the project site, it travels along SR 84 and stops at the Ardenwood Park-and-Ride lot on the west side of Ardenwood Boulevard north of SR 84, and operates with 60-minute headways. Route U provides commuter travel, as it only operates on weekdays, and only in the westbound direction between 5:55 a.m. and 9:20 a.m., and only in the eastbound direction between 2:45 p.m. and 7:00 p.m.

Route 232 runs between Newpark Mall in the City of Newark and the Fremont BART station, also stopping at the Union City BART station. In the vicinity of the project site, it travels along Paseo Padre Parkway and Ardenwood Boulevard, and operates with 60-minute headways on weekdays between 5:30 a.m. and 7:30 p.m., and during the weekend between 7:30 a.m. and 7:30 p.m.

The Ardenwood Park-and-Ride lot is located near the intersection of SR 84 and Ardenwood Boulevard and serves several AC Transit Transbay Lines including Route SB, Route U, and the Dumbarton Express. The Ardenwood Express Bus Park–and-Ride Improvement Project, completed in 2009, increased the parking lot's capacity and enhanced amenities such as landscaping, bus bulbs and waiting areas.

BART

The BART system provides rail service between San Mateo, San Francisco, Alameda, and Contra Costa counties, with a station in Fremont near Mowry Avenue and Civic Center Drive, and a station in Union City off Decoto Road. The project site is located approximately five miles from the Union City BART station, and approximately seven miles from the Fremont BART station.

Santa Clara Valley Transportation Authority

The Santa Clara County Valley Transportation Authority (VTA) has jurisdiction over public transit in Santa Clara County, and currently operates four local bus routes with service to the Fremont BART station. Routes 120, 140, 180 and 181 would serve project trips as a connector to other services. All of these routes travel along Mission Boulevard, Stevenson Boulevard and Civic Center where connecting service to AC Transit Routes 99, 200, 232, 801 and U is provided. These AC Transit routes provide direct service to the project study area, connecting VTA routes to the Ardenwood Technology Park.

The Dumbarton Express

This service is provided on weekdays as an express bus service across the Dumbarton Bridge, connecting Union City, Fremont, Newark, Menlo Park and Palo Alto. Dumbarton Express service is provided through a consortium of AC Transit, BART, Union City Transit, Caltrain, SamTrans, and VTA. Route DB and DB1 provide service from the Union City BART station to the Stanford Oval and the Stanford research park respectively. Route DB runs from 5:20 a.m. to 8:50 p.m. with headways of 10 to 30 minutes depending on the time of day. Route DB1 runs from 5:25 a.m. to 8:45 p.m., but with no service in the middle of the day between 8:50 a.m. and 1:30 p.m. Route DB1 has headways ranging from 15 minutes to 25 minutes. No weekend service is provided on either route.

Pedestrian and Bicycle Circulation

Policy 11-9.6 of the North Fremont Community Plan (found in the Community Plans Element of the General Plan) seeks to make North Fremont neighborhoods less auto-dependent, including improving pedestrian and bicycle connections.

Pedestrian Facilities

Pedestrian traffic flow is relatively light in the vicinity of the project site. More activity is noticeable in the vicinity of the commercial areas of Newark off of Newark Boulevard (south of SR 84-Decoto Road), and also north of SR 84 and east of Ardenwood Boulevard in the residential areas of the Ardenwood development.

There are currently sidewalks only on the south side of Paseo Padre Parkway. On Ardenwood Boulevard north of Paseo Padre Parkway, there are sidewalks on the east side of the street only. South of Paseo Padre Parkway, there are sidewalks on both sides of the road.

Bicycle Facilities

Both the *2011 General Plan* and the *2012 City of Fremont Bicycle Master Plan* indicate existing and planned bicycle facilities in the vicinity of the project. The system consists of three classifications of bicycle facilities:

- Class I facilities (bike path) are completely separated, with paved right-of-way (shared with pedestrians) which excludes general motor vehicle traffic.
- Class II facilities (bike lane) provide a striped and stenciled lane for one-way bike travel on a street or highway.
- Class III facilities (bike route) share a roadway with motor vehicle traffic and are only identified by signage.

In the vicinity of the project site, bicycle lanes (Class II) are provided on Paseo Padre Parkway and Ardenwood Boulevard. A Class I bike path travels alongside Patterson Ranch Road between Paseo Padre Parkway and Coyote Hills Regional Park. Another Class I bike path, providing regional access, travels along the northern boundary of Coyote Hills Regional Park and along the south side of Alameda Creek from the park east through the City of Fremont, with a terminus east of Mission Boulevard at SR 84/Niles Canyon Boulevard. To the east of the project site, there is a 0.53-mile Class 1 bike path starting from the Ardenwood Historic Farm to I-880.

Future planned facilities include: Class I bike paths alongside Paseo Padre Parkway between Commerce Drive and Ardenwood Boulevard, and alongside Ardenwood Boulevard between Paseo Padre Parkway and the existing Alameda Creek trail; Class II bike lanes on Kaiser Drive between Paseo Padre Parkway and Ardenwood Boulevard; and a Class III bike route on Commerce Drive.

Regulatory Framework

State Regulations

California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for operations and maintenance of the state highway system, and serves as a reviewing agency for Environmental Impact Reports (EIRs) to ensure that proposed projects would not have a significant impact on state highway facilities.

Regional

Metropolitan Transportation Commission

The majority of federal, state and local financing available for transportation projects is allocated at the regional level by the Metropolitan Transportation Commission (MTC), the transportation planning, coordinating and financing agency for the nine-county Bay Area. The current Regional Transportation Plan (RTP), which is combined with the region's Sustainable Communities Strategy (SCS), is known as Plan Bay Area and was adopted by the MTC in July 2013. Plan Bay Area specifies a detailed set of investments and strategies throughout the region from 2013 through 2040 to maintain, manage and improve the surface transportation system based upon local land use and growth projections. Plan Bay Area specifies how anticipated federal, state and local transportation funds will be spent in the Bay Area during the next 25 years. Most of this "committed funding" will go toward maintaining the region's existing transportation infrastructure.

Alameda County Transportation Commission

The Alameda County Transportation Commission (ACTC), through its Congestion Management Program (CMP), oversees how roads of regional significance function, and requires local jurisdictions to evaluate the impact of proposed land use changes (i.e., General Plan amendments, and developments with trip-generating potential of more than 100 new peak-hour vehicle trips) on the regional transportation systems.

Local Regulations

City of Fremont General Plan

The Fremont General Plan establishes the following goals and policies that are relevant to transportation:

- Goal 3-1: Complete Streets, and Policies 3-1.1, 3-1.2, 3-1.3, 3-1.5 and 3-1.7 call for providing City streets that serve multiple modes of transportation while enhancing Fremont's appearance and character.
- Goal 3-2: Reducing Vehicle Miles Traveled, and Policies 3-2.1, 3-2.2, 3-2.3 and 3-2.7 establish an objective of improving mobility in Fremont while reducing the growth of vehicle miles traveled.
- Goal 3-3: Accessibility, Efficiency, and Connectivity, and Policies 3-3.2 and 3.3-8 call for maximizing the efficiency of the transportation network, and its ability to connect the city, minimize travel distances, and increase mobility for all residents.

- Goal 3-4: Balancing Mobility and Neighborhood Quality, and Policies 3.4-2 and 3-4.4 promote a transportation system that balances speed and convenience with the desire to have walkable neighborhoods and an enhanced sense of place.

Methodology

Potential impacts associated with the proposed project were determined on the basis of the anticipated increased vehicle trips generated by full development of the project, and analysis of changes to existing and forecasted cumulative conditions caused by those increased trips. The analysis identifies significant adverse impacts of the proposed project on the surrounding transportation system and recommends appropriate mitigation measures.

Project Trip Generation and Trip Distribution Estimates

Vehicle trip generation estimates were developed using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation Manual*, 9th Edition, 2012 for the "Office Park" land use. Trip distribution assumptions were first developed at the regional level using census commute data for employees working in the City of Fremont, and then refined to the local level in consideration of major residential areas, and knowledge of typical travel patterns in the City.

Level of Service Analysis Methodologies

Intersections. The study intersections are all controlled by traffic signals and were evaluated using the signalized methodology from the Highway Capacity Manual (HCM). This methodology is based on factors including traffic volumes, green time for each movement, phasing, whether or not the signals are coordinated, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing. The ranges of delay associated with the various levels of service are indicated in **Table 4.D-4**.

TABLE 4.D-4
SIGNALIZED INTERSECTION LEVEL OF SERVICE CRITERIA

LOS A	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
LOS B	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
LOS C	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
LOS D	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
LOS E	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
LOS F	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

SOURCE: Transportation Research Board, *Highway Capacity Manual*, 2000

Freeway Segments. The General Plan EIR indicates the correlation between average travel speed (mph), volume-to-capacity (v/c) ratio and LOS for freeway segments and the LOS thresholds as shown in **Table 4.D-5**.

Arterial Roadway Segments. The roadway segment LOS methodology in the HCM is the basis of the analysis performed for the study road segments. This method does not address the capacity of a facility, but rather determines a LOS based on average through-vehicle travel speed. Therefore, the slower the average travel speed, the worse the LOS. As described in the HCM, there are various arterial classifications with different free-flow travel speeds and, hence, different LOS speeds. The relationship between arterial classification and LOS speed is presented in **Table 4.D-6**.

TABLE 4.D-5
FREEWAY SEGMENT LEVEL OF SERVICE (LOS) THRESHOLDS

LOS	Average Travel Speed (mph)	V/C Ratio	Maximum Traffic Volumes (vphpl)
A	≥ 60	0.35	700
B	≥ 55	0.58	1,000
C	≥ 49	0.75	1,500
D	≥ 41	0.90	1,800
E	≥ 30	1.00	2,000
F	< 30	Variable	-

NOTES: mph = miles per hour; v/c = volume to capacity; vphpl = vehicles per hour per lane

SOURCE: *City of Fremont General Plan Final Environmental Impact Report*, 2011

TABLE 4.D-6
ARTERIAL LEVEL OF SERVICE CRITERIA

Arterial Class	I	II	III	IV
Range of Free Flow Speeds (mph)	55 to 45	45 to 35	35 to 30	35 to 25
Typical Free Flow Speed (mph)	50	40	35	30
Level of Service	**Average Travel Speed (mph)**			
A	> 42	> 35	> 30	> 25
B	> 34	> 28	> 24	> 19
C	> 27	> 22	> 18	> 13
D	> 21	> 17	> 14	> 9
E	> 16	> 13	> 10	> 7
F	≤ 16	≤ 13	≤ 10	≤ 7

SOURCE: *Highway Capacity Manual*, Transportation Research Board, 2000

Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, transportation impacts resulting from the implementation of the proposed project would be considered significant if a project would:

- Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the congestion management agency for designated roads or highways.
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Substantially increase hazards due to a design feature. (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Result in inadequate emergency access.
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

In the context of the first two Checklist Items above, the following thresholds of significance apply:

Intersections.

- General Plan Policy 3-4.2 provides for variable LOS standards that recognize the character of adjacent land uses, differing functions of streets and differing modes of transportation along streets. The City of Fremont LOS standard for an acceptable operation is generally defined as LOS D or better during peak hours at all City-operated signalized intersections and LOS E for locations identified as a regional arterial in the Alameda County CMP (the intersections of Decoto Road / Paseo Padre Parkway and Decoto Road / Fremont Boulevard).
- Based on Caltrans LOS standards, an acceptable operating level of service is defined as LOS D or better. This applies to state-controlled facilities.

Freeway Segments. ACTC requires the evaluation of facilities within the study area that are designated in the CMP. The level of service performance standard for a CMP facility is LOS E. While freeway operation is analyzed in this EIR, the City of Fremont has no significance criteria to establish whether a project would result in a significant impact to facilities already operating at LOS F. For the purpose of this analysis, a potentially-significant project impact is assumed to occur if project-generated traffic causes operation to drop to LOS F, or increases the freeway volume-to-capacity ratio by 0.01 or greater on segments already forecast to operate at LOS F.

Arterial Segments. For the purpose of this analysis, the level of service standard used for the study arterial segments is LOS E. While arterial segment operation is analyzed in this EIR, the City of Fremont has no significance criteria to establish whether a project would result in a significant impact. For the purposes of this analysis, a potentially-significant project impact is assumed to occur if project-generated traffic causes an arterial segment to drop to LOS F, or decreases average travel speeds by one mile-per-hour or more on segments already forecast to operate at LOS F.

There would be no project impact related to changes in air traffic patterns because the project area is about 15 miles from both the Oakland and San Jose airports, and the proposed project would not substantially affect air traffic patterns.

Project Impacts and Mitigation Measures

Impact Analysis

Impact 4.D-1: Development facilitated by the proposed project would increase traffic volumes on the area roadway network, affecting the performance of intersections, freeways and arterial roadways. (Significant)

Trip Generation

As stated above, the anticipated trip generation for the proposed project was estimated using standard rates published in the ITE *Trip Generation Manual*, 9th Edition. The project would allow for 1,722,754 square feet of additional development beyond that contemplated by the current General Plan. As compared to what exists at the site, 2,587,560 square feet could be developed under the proposed project. As shown in **Table 4.D-7**, the estimated net increase in trip generation is as follows:

- From Existing Conditions to the proposed project, the intensified development would result in a total of 29,550 daily trips, including 4,425 trips during the a.m. peak hour and 3,830 trips during the p.m. peak hour.
- From the permitted conditions (FAR 0.35) to the proposed project, the intensified development would result in a total of 19,674 daily trips, including 2,946 trips during the a.m. peak hour and 2,550 trips during the p.m. peak hour.

TABLE 4.D-7
PROJECT TRIP GENERATION SUMMARY
(NET CHANGE IN OFFICE PARK SPACE)

Scenario	Units (ksf)	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Existing to Proposed	2,587.56	11.42	29,550	1.71	4,425	3,938	487	1.48	3,830	536	3,294
Permitted to Proposed	1,722.75	11.42	19,674	1.71	2,946	2,622	324	1.48	2,550	357	2,193

NOTE: ksf = 1,000 square feet

SOURCE: W-Trans, 2016, using ITE, *Trip Generation Manual*, 9th Edition, 2012.

Table 4.D-8 includes further detail on the trip generation assumptions by Ardenwood Technology Park sub-area, including a comparison of the total trips that would be expected by area under the current General Plan versus those that could occur upon adoption of the proposed Planned District Amendment allowing higher floor area ratios. In total, the project would increase both square footage and number of trips generated beyond what is currently allowed under the existing General Plan by approximately 76 percent.

TABLE 4.D-8
TRIP GENERATION COMPARISON BY SUB-AREA
FOR CURRENTLY ALLOWED VERSUS PROPOSED FLOOR AREA RATIOS

Ardenwood Technology Park Sub-Areas		**Weekday**		**AM Peak**		**PM Peak**	
Scenario	**Building Area**	**Rate**	**Trips**	**Rate**	**Trips**	**Rate**	**Trips**
Area 1 – Gateway Parcels							
Proposed 0.75 FAR	809.236 ksf	11.42	9,241	1.71	1,384	1.48	1,198
Current 0.35 FAR	377.643 ksf	11.42	4,313	1.71	646	1.48	559
Increase	*431.592 ksf*		*4,928*				
Area 2 – Edge Parcels							
Proposed 0.65 FAR	1,430.706 ksf	11.42	16,339	1.71	2,447	1.48	2,117
Current 0.35 FAR	770.380 ksf	11.42	8,798	1.71	1,317	1.48	1,140
Increase	*660.326ksf*		*7,541*				
Area 3 – Central Parcels							
Proposed 0.55 FAR	1,734.799 ksf	11.42	19,811	1.71	2,967	1.48	2,568
Current 0.35 FAR	1,103.963 ksf	11.42	12,607	1.71	1,888	1.48	1,634
Increase	*630.836 ksf*		*7,204*				
Summary							
Proposed Total FAR	3,974.741 ksf		45,391		6,798		5,883
Current Total FAR	2,251.987 ksf		25,718		3,851		3,333
Increase	**1,722.754 ksf**		**19,673**		**2,947**		**2,550**

NOTES: ksf = 1,000 square feet; trip rates are for "Office Park" (ITE land use #750);
FAR = floor area ratio; total trips may differ slightly from those shown in Table 4.D-7 due to rounding

SOURCE: W-Trans, 2016, using ITE, *Trip Generation Manual*, 9th Edition, 2012.

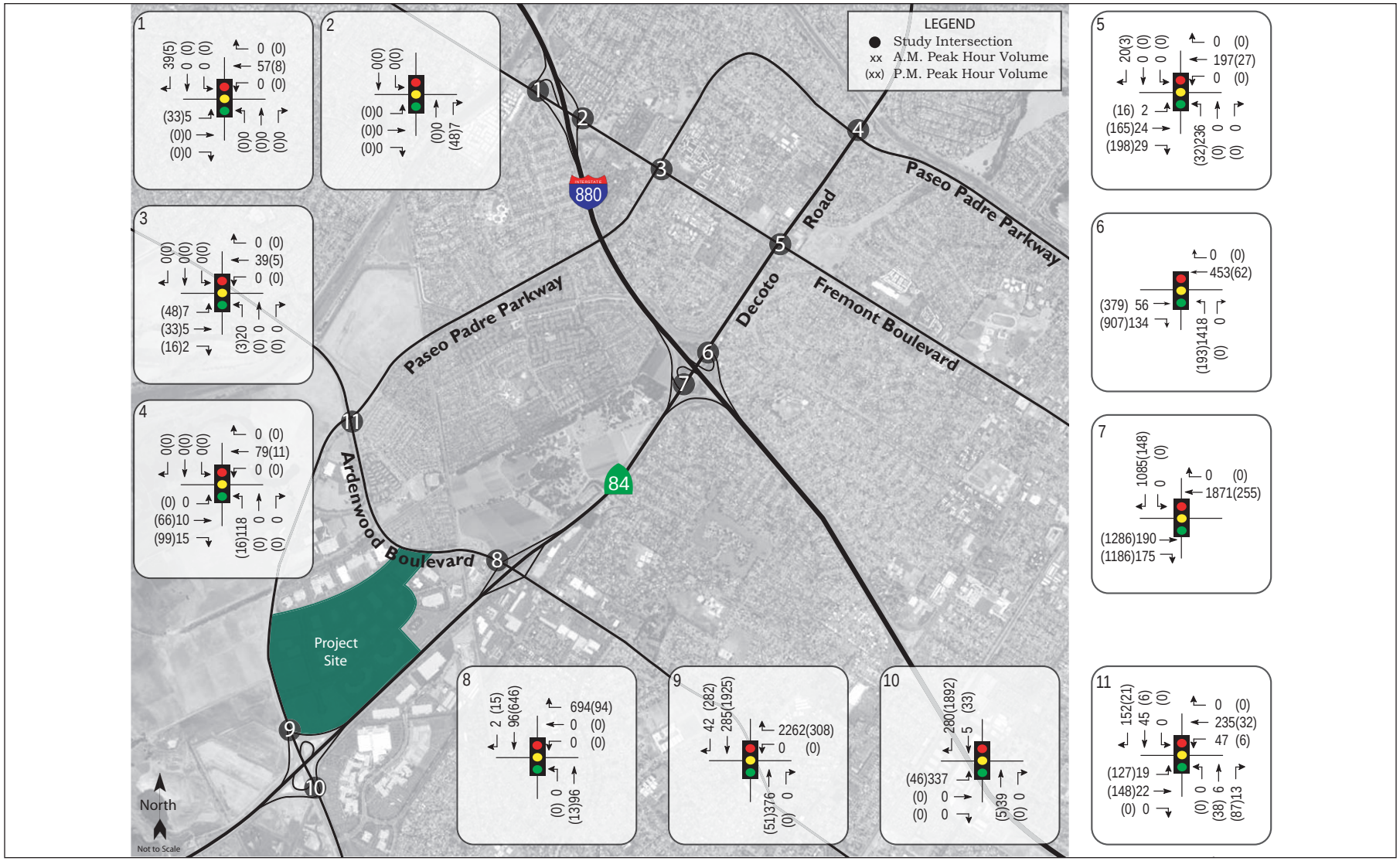
Trip Distribution

As described above, trip distribution assumptions were first developed at the regional level, and then refined to the local level. The project trip distribution is summarized in **Table 4.D-9**, and shown in **Figure 4.D-4**. Project-added volumes are shown in **Figure 4.D-5**.

SOURCE: W-TRANS 2015

Ardenwood Technology Park Planned District Rezoning EIR . 140953

Figure 4.D-4
Trip Distribution



SOURCE: W-TRANS 2015

Figure 4.D-5
Project Traffic Volumes

TABLE 4.D-9
TRIP DISTRIBUTION ASSUMPTIONS

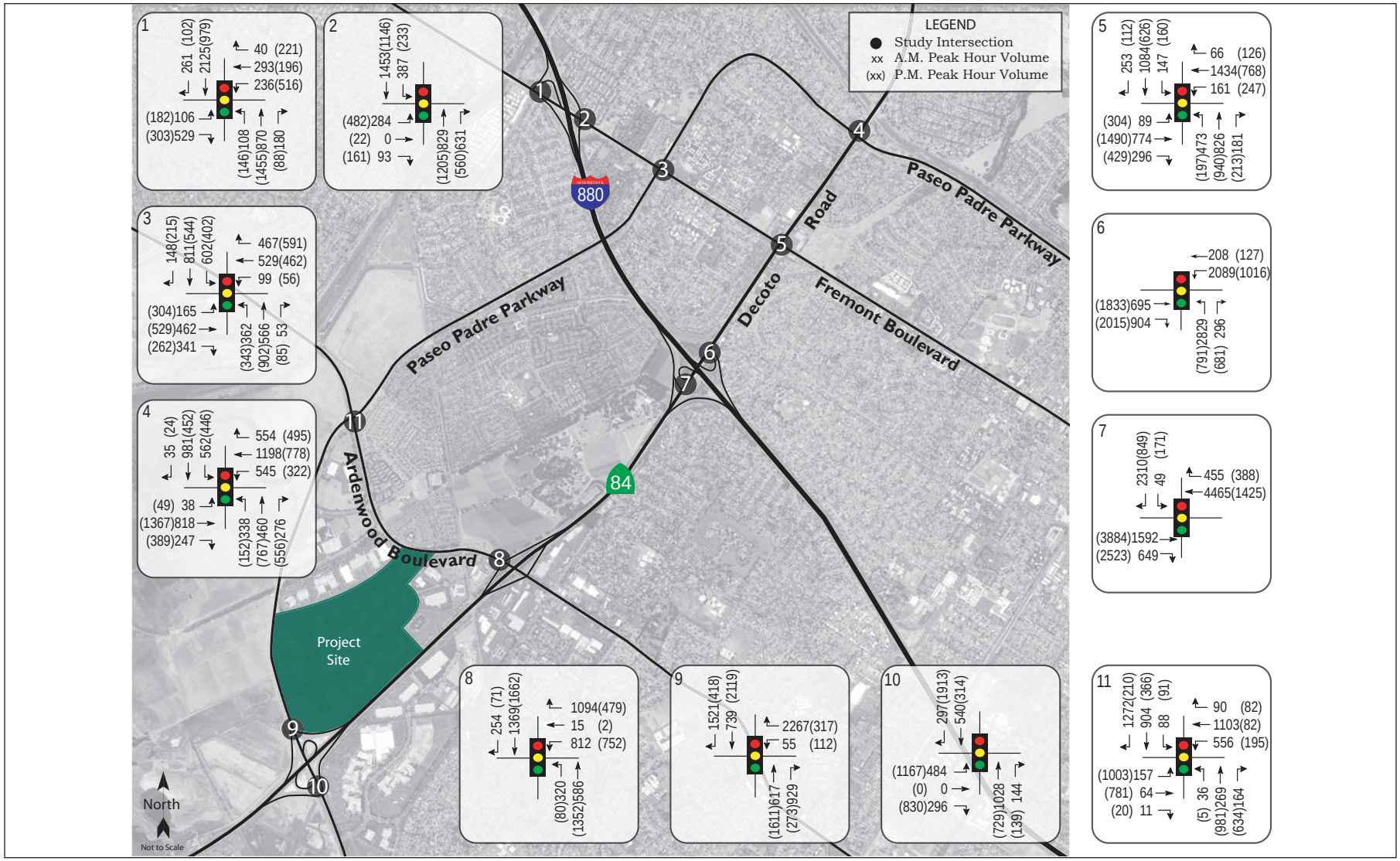
Origin/Destination	Distribution
I-880 North	29%
I-880 South	36%
SR 84 (Dumbarton Bridge)	9%
Fremont Boulevard – south of Decoto Road	6%
Ardenwood Boulevard North	5%
Ardenwood Neighborhood Area	4%
Paseo Padre Pkwy – south of Decoto Road	3%
Northgate Neighborhood Area	2%
Decoto Road – east of Paseo Padre Pkwy	2%
Newark Boulevard	2%
Alvarado Boulevard North	1%
Thornton Avenue	1%
TOTAL	**100%**

SOURCE: W-Trans, 2016

Existing Plus Project Conditions

Intersection Levels of Service. Existing plus Project traffic volumes are shown in **Figure 4.D-6**. The levels of service for the study intersections are summarized in **Table 4.D-10**. Under Existing plus Project Conditions, all of the study intersections would continue operating acceptably, except the following four intersections, at which drivers would experience a significant impact:

6. Decoto Road / I-880 Northbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
7. Decoto Road / I-880 Southbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
8. Ardenwood Boulevard / SR 84 Westbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
9. Paseo Padre Parkway / SR 84 Westbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)



SOURCE: W-TRANS 2015

Figure 4.D-6
Existing Plus Project Traffic Volumes

TABLE 4.D-10
SUMMARY OF EXISTING AND EXISTING PLUS PROJECT PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Existing		Existing plus Project		Significant Impact?	
Study Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. Alvarado Blvd / I-880 SB Off-Ramp-Deep Creek Rd	27.1/C	28.6/C	31.1/C	30.5/C	No	No
2. Fremont Blvd / I-880 Northbound Ramps	14.1/B	17.7/B	14.1/B	17.6/B	No	No
3. Fremont Blvd / Paseo Padre Pkwy	41.4/D	43.5/D	41.8/D	44.2/D	No	No
4. Decoto Road / Paseo Padre Pkwy	50.4/D	65.5/D	52.5/D	68.5/E	No	No
5. Decoto Road / Fremont Boulevard	42.3/D	43.6/D	65.5/E	44.4/D	No	No
6. Decoto Road / I-880 Northbound Ramps	25.8/C	15.4/B	**208.1/F**	19.0/B	**Yes**	No
7. Decoto Road / I-880 Southbound Ramps	3.5/A	5.3/A	**146.1/F**	5.8/A	**Yes**	No
8. Ardenwood Blvd / SR 84 Westbound Ramps	28.0/C	16.1/B	**107.6/F**	17.3/B	**Yes**	No
9. Paseo Padre Pkwy / SR 84 Westbound Ramps	13.0/B	6.7/A	**644.0/F**	23.1/C	**Yes**	No
10. Thornton Ave / SR 84 Eastbound Ramps	10.9/B	32.6/C	27.5/C	35.7/D	No	No
11. Ardenwood Blvd / Paseo Padre Pkwy	30.2/C	38.2/D	31.7/C	47.1/D	No	No

NOTES: Results are displayed as Delay/LOS; Delay is measured in average seconds per vehicle;
LOS = Level of Service; **Bold** = deficient operation
SOURCE: W-Trans, 2016

The significant impacts at Intersections 6, 7, and 9 would be partially mitigated with implementation of Mitigation Measure 4.D-1. Implementation of Mitigation Measure 4.D-2 would reduce the impact at Intersection 8 to a less-than-significant level.

Mitigation Measures

Mitigation Measure 4.D-1: The applicant shall work with the City of Fremont to establish a Transportation Demand Management (TDM) Program. The program should include strategies to reduce drive-alone vehicle trips in favor of walking, bicycling, taking transit or shuttles, carpooling or vanpooling. Typically, for business parks in suburban areas, TDM programs include elements such as carpool and vanpool incentives, subsidized transit passes, bicycle parking and bicyclist amenities, parking cash-out programs, and shuttles to transit hubs such as BART and Amtrak/ACE stations. The initial TDM Program shall include the goals and objectives of the TDM Program, including a target specifying the single occupant vehicle mode share, an annual monitoring program that includes surveys of all employers and employees, and annual reporting to City of Fremont staff to monitor compliance with the goals and objectives of the TDM Program.

Implementation of the Transportation Demand Management (TDM) Program, required by Mitigation Measure 4.D-1, may partially mitigate project impacts. Typically, for business parks in suburban areas, TDM programs include elements such as carpool and vanpool incentives, transit passes, bicycle parking and bicyclist amenities, and shuttles to transit hubs such as BART and Amtrak/ACE stations. However, because the efficacy of the TDM Program cannot be guaranteed, the impact would remain significant and unavoidable.

Mitigation Measure 4.D-2: The City of Fremont shall work with Caltrans to convert the existing shared left-turn/through lane on the SR 84 Westbound Off-Ramp at Ardenwood

Boulevard to a shared left-turn/ through/right-turn lane, and optimize the signal timing at this signalized intersection. The applicant shall be responsible for funding the improvement.

This mitigation would require lane restriping. Because the City of Fremont does not have the authority to implement this mitigation (i.e., would need Caltrans to approve it), the impact is considered significant and unavoidable. However, if Caltrans were to approve implementation of this mitigation measure, traffic conditions would improve to an acceptable LOS D during the a.m. peak hour (reducing the impact to a less-than-significant level).

Significance after Mitigation: Significant and Unavoidable

Freeway Segment Levels of Service. The levels of service for the freeway segments are summarized in **Table 4.D-11**. Under Existing plus Project Conditions, the project would significantly contribute to, or be responsible for, unacceptable operating conditions on the following four freeway segments, on which drivers would experience a significant impact:

- I-880 southbound, from Alvarado Road to Decoto Road (degrade to unacceptable LOS F during the a.m. peak hour)
- I-880 northbound, from Thornton Avenue to Decoto Road (degrade to unacceptable LOS F during the a.m. peak hour)
- I-880 southbound, from Decoto Road to Thornton Avenue (worsen [increase in v/c ratio would exceed the threshold of significance] under prevailing unacceptable LOS F conditions during the p.m. peak hour)
- SR 84 westbound, from Ardenwood Boulevard to Thornton Avenue (degrade to unacceptable LOS F during the a.m. peak hour)

TABLE 4.D-11
EXISTING AND EXISTING PLUS PROJECT FREEWAY LEVELS OF SERVICE

				Existing		Existing plus Project		Change	
Segment	**From**	**To**	**Direction**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. I-880	Decoto Road	Alvarado Road	Northbound	0.66/B	0.80/C	0.67/B	0.89/D	0.01	0.09
	Alvarado Road	Decoto Road	Southbound	0.94/E	0.85/D	**1.09/F**	0.87/D	**0.15**	0.02
2. I-880	Thornton Ave	Decoto Road	Northbound	0.87/D	0.91/E	**1.06/F**	0.93/E	**0.19**	0.02
	Decoto Road	Thornton Ave	Southbound	0.95/E	**1.08/F**	0.98/E	**1.24/F**	0.03	**0.16**
3. SR 84	Toll Plaza	Thornton Ave	Eastbound	0.22/A	0.90/E	0.28/A	0.91/E	0.06	0.01
	Thornton Ave	Toll Plaza	Westbound	0.74/C	0.19/A	0.75/C	0.23/A	0.01	0.04
4. SR 84	Thornton Ave	Ardenwood Blvd	Eastbound	0.18/A	0.63/B	0.23/A	0.94/E	0.05	0.31
	Ardenwood Blvd	Thornton Ave	Westbound	0.72/C	0.23/A	**1.14/F**	0.29/A	**0.43**	0.06

NOTES: Results are displayed as Volume to Capacity (V/C) ratio / Level of Service;
Change = difference in V/C ratio between no-project and project conditions; **Bold** = significant impact
SOURCE: W-Trans, 2016

Mitigation Measures

There are no feasible mitigation measures to reduce the significant project impacts on area freeways.

The impacts could be partially mitigated with implementation of the proposed TDM Program, as described above. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Arterial Segment Levels of Service. The levels of service for the arterial segments are summarized in **Table 4.D-12**. Under Existing plus Project Conditions, the project would significantly contribute to, or be responsible for, unacceptable operating conditions on the following two arterial segments, on which drivers would experience a significant impact:

- Decoto Road eastbound, from I-880 to Fremont Road (worsen [decrease in travel speed would exceed the threshold of significance] under prevailing unacceptable LOS F conditions during the p.m. peak hour)
- Decoto Road westbound, Fremont Road to I-880 (degrade to unacceptable LOS F during the a.m. peak hour)

TABLE 4.D-12
EXISTING AND EXISTING PLUS PROJECT ARTERIAL SEGMENT LEVELS OF SERVICE

				Existing		Existing plus Project		Change	
Segment	**From**	**To**	**Direction**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. Decoto Road	I-880	Fremont Blvd	Eastbound	30/B	**8/F**	29/B	**4/F**	-1	**-4**
	Fremont Blvd	I-880	Westbound	21/D	38/A	**13/F**	37/A	**-8**	-1
2. Decoto Road	Fremont Blvd	Paseo Padre	Eastbound	37/A	27/C	37/A	24/C	0	-3
	Paseo Padre	Fremont Blvd	Westbound	19/D	31/B	14/E	30/B	-5	-1
3. Fremont Blvd	Thornton Ave	Decoto Road	Northbound	30/B	22/D	22/D	21/D	-8	-1
	Decoto Road	Thornton Ave	Southbound	17/D	28C	16/E	21/D	-1	-7
4. Fremont Blvd	Decoto Road	Paseo Padre	Northbound	29/B	23/C	28/B	22/C	-1	-1
	Paseo Padre	Decoto Road	Southbound	32/B	37/A	31/B	37/A	-1	0

NOTES: Results are displayed as Speed (miles per hour) / Level of Service;
Change = difference in Speed between no-project and project conditions; **Bold** = significant impact
SOURCE: W-Trans, 2016

Mitigation Measures

There are no feasible mitigation measures to reduce the significant project impacts on area arterial segments. The impacts could be partially mitigated with implementation of the proposed TDM Program, as described above. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Cumulative Impact

Impact 4.D-2: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, would result in significant cumulative transportation impacts. (Significant)

The Cumulative No-Project scenario provides an evaluation of long-term conditions operation based on traffic volumes contained within the General Plan for year 2035, which includes development of the permitted FAR of 0.35 and associated trips during the a.m. and p.m. peak periods. This condition does not include traffic volumes generated by the proposed project.

The General Plan EIR Mitigation Monitoring Program identifies mitigation measures at several of the study intersections (see **Table 4.D-13**). For the purposes of identifying the potential impacts associated only with the proposed project, these mitigation measures are assumed to be in place by 2035 and are included in the Cumulative No-Project and Cumulative plus Project scenarios.

The Cumulative plus Project scenario provides an evaluation of operation based on Cumulative traffic volumes with 0.35 FAR plus volumes generated by full development of the proposed project during the a.m. and p.m. peak periods. The increase in FAR from permitted conditions (FAR 0.35) to the proposed intensified development (ranging from 0.55 up to 0.75 FAR) would result in a total of approximately 19,674 daily trips, including 2,946 trips during the a.m. peak hour and 2,550 trips during the p.m. peak hour.

TABLE 4.D-13
STUDY INTERSECTIONS IDENTIFIED IN GENERAL PLAN MITIGATION MONITORING PROGRAM

Intersection	General Plan Mitigation	Resulting LOS and Impact Determination
1. Alvarado Boulevard/ Deep Creek Road	Convert right-turn lane on I-880 Southbound off-ramp to a free right turn lane	LOS E, SU
3. Fremont Boulevard/ Paseo Padre Pkwy	Convert right-turn lane on westbound Paseo Padre to a free right turn lane	LOS D, LTS
4. Paseo Padre Pkwy/ Decoto Road	Modify the Paseo Padre Pkwy and Decoto Road approaches to include three through lanes in each direction	LOS F, SU
5. Fremont Boulevard/ Decoto Road	Modify both Fremont Boulevard approaches to include dual left turn lanes	LOS E, LTS
6. I-880 Northbound Ramps / Decoto Road	Modify the Decoto Road approaches to include three through lanes in each direction; widen off-ramp to include dual left-turn lanes and dual right-turn lanes	LOS E, SU
7. I-880 Southbound Ramps / Decoto Road	Modify the westbound Decoto Road approach to include a third through lane	LOS C; LTS

NOTES: LOS=Level of Service; SU=Significant and Unavoidable Impact; LTS=Less Than Significant Impact (with mitigation)
SOURCE: City of Fremont, *Final Environmental Impact Report: Fremont Draft General Plan Update*, 2011

Intersection Levels of Service. As shown in **Table 4.D-14**, the project would contribute to, or be responsible for, unacceptable operating conditions at the following seven intersections during one or both peak hours under Cumulative plus Project conditions. Cumulative plus Project traffic volumes are shown in **Figure 4.D-7**.

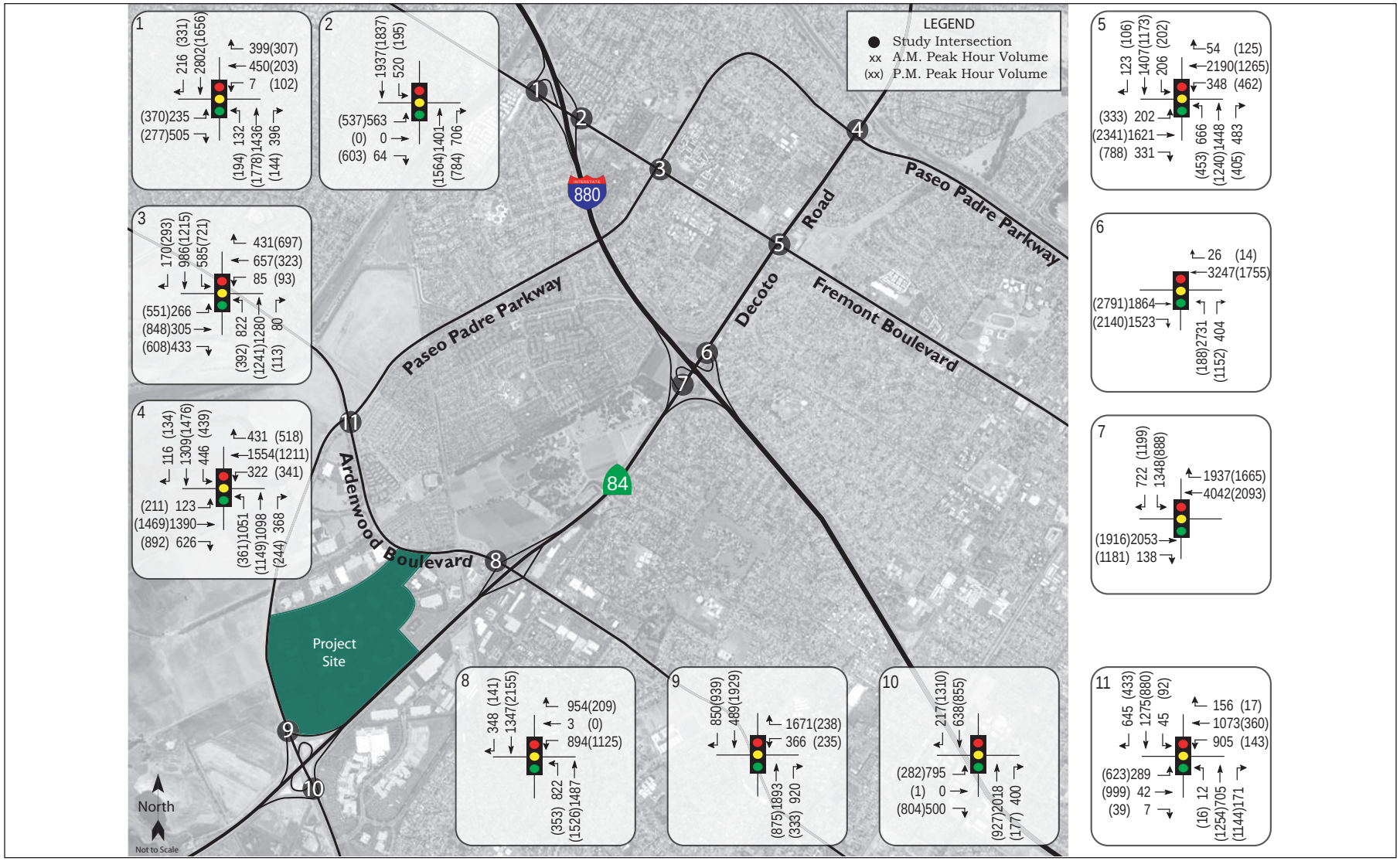
1. Alvarado Boulevard/I-880 Southbound Off-Ramp – Deep Creek Road
3. Fremont Boulevard/Paseo Padre Parkway
4. Decoto Road/Paseo Padre Parkway
5. Decoto Road/Fremont Boulevard
6. Decoto Road/I-880 Northbound Ramps
9. Paseo Padre Parkway/SR 84 Eastbound Ramps
10. Thornton Avenue/SR 84 Eastbound Ramps

TABLE 4.D-14
CUMULATIVE AND CUMULATIVE PLUS PROJECT
PEAK HOUR INTERSECTION LEVELS OF SERVICE

	Cumulative		Cumulative plus Project		Significant Impact?	
Study Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. Alvarado Boulevard/ I-880 SB Off-Ramp-Deep Creek Road	**66.6/E**	52.5/D	**74.9/E**	**55.6/E**	**Yes**	**Yes**
2. Fremont Blvd/I-880 Northbound Ramps	21.0/C	19.0/B	21.1/C	19.9/B	No	No
3. Fremont Blvd/Paseo Padre Pkwy	39.7/D	53.6/D	40.0/D	**55.6/E**	No	**Yes**
4. Decoto Road/Paseo Padre Pkwy	**81.1/F**	**81.1/F**	**88.4/F**	**89.5/F**	**Yes**	**Yes**
5. Decoto Road/Fremont Boulevard	69.7/E	75.9/E	**87.9/F**	**89.9/F**	**Yes**	**Yes**
6. Decoto Road/I-880 Northbound Ramps	73.4/E	27.2/C	**190.2/F**	35.3/D	**Yes**	No
7. Decoto Road/I-880 Southbound Ramps	31.5/C	15.1/B	73.8/E	16.5/B	No	No
8. Ardenwood Blvd/SR 84 Westbound Ramps	27.1/C	19.1/B	28.0/C	23.0/C	No	No
9. Paseo Padre Pkwy/SR 84 Westbound Ramps	16.2/B	10.5/B	**126.9/F**	14.7/B	**Yes**	No
10. Thornton Ave/SR 84 Eastbound Ramps	38.8/D	28.5/C	**68.7/E**	28.6/C	**Yes**	No
11. Ardenwood Blvd/Paseo Padre Pkwy	37.4/D	29.8/C	38.5/D	31.5/C	No	No

NOTES: Results include mitigation identified in the General Plan EIR (see Table 4.D-13);
Delay is measured in average seconds per vehicle; LOS = Level of Service;
Results are displayed as Delay/LOS; **Bold** values = unacceptable operation;
Cumulative = included 2035 General Plan mitigation measures (see Table 4.D-13)
SOURCE: W-Trans, 2016

The significant cumulative impacts at Intersections 1, 5, 6 and 9 would be partially mitigated with implementation of Mitigation Measure 4.D-1. Implementation of Mitigation Measures 4.D-3, 4.D-4, and 4.D-5, described below, would reduce the impacts to less-than-significant levels at Intersections 3, 4 and 10, respectively.



SOURCE: W-TRANS 2015

Figure 4.D-7
Cumulative Plus Project Traffic Volumes

Fremont Boulevard/Paseo Padre Parkway. With the mitigation measures included in the General Plan, this intersection was projected to operate acceptably at LOS D during both peak hours in the General Plan EIR. Upon the addition of project-generated traffic, however, operations would deteriorate to LOS E during the p.m. peak hour, which is considered a significant cumulative impact.

> **Mitigation Measure 4.D-3:** The City of Fremont shall amend the City's Capital Improvement Program to include widening of eastbound Paseo Padre Parkway at Fremont Boulevard to add an additional through lane, and converting the eastbound shared through/right-turn lane to a right-turn lane. Future project developer(s) shall contribute a proportional share toward the cost of the improvements.

With implementation of this mitigation measure, operations would improve to an acceptable LOS D. The significance after mitigation would be less than significant.

Decoto Road/Paseo Padre Parkway. Despite implementation of mitigation measures included in the General Plan, the General Plan EIR identifies this intersection as operating at LOS F during both peak hours at buildout, and designates the impact as significant and unavoidable. The project would be expected to add 7.3 seconds of average vehicle delay to the intersection during the a.m. peak hour and 8.4 seconds during the p.m. peak hour, which is considered a significant cumulative impact for both peak hours.

> **Mitigation Measure 4.D-4:** The City of Fremont shall amend the City's Capital Improvement Program to include adding a right-turn overlap signal phase for the eastbound Decoto Road approach to Paseo Padre Parkway, prohibit U-turns from northbound Paseo Padre Parkway, and optimize the signal timing. Future project developer(s) shall contribute a proportional share toward the cost of the improvements.

With implementation of this mitigation measure, operations would improve to LOS E, with the vehicle delay lower than under Cumulative No-Project conditions, which would no longer be considered a significant impact. The significance after mitigation would be less than significant.

Thornton Avenue/SR 84 Eastbound Ramps. The addition of project-generated traffic would degrade the a.m. peak hour operating conditions to LOS F, which would be considered a significant cumulative impact.

> **Mitigation Measure 4.D-5:** The City of Fremont shall work with Caltrans to widen the eastbound off-ramp to include an additional shared left-turn/through/right-turn lane, convert the existing through/right-turn lane to a right-turn lane, resulting in a three-lane approach consisting of one left-turn lane, one shared left-turn/through/right-turn lane, and one right-turn lane, and optimize the signal timing. Future project developer(s) shall pay a proportional share toward the cost of the improvements.

Because the City of Fremont does not have the authority to implement this mitigation (i.e., would need Caltrans to approve it), the impact is considered significant and unavoidable. However, if Caltrans were to approve implementation of this mitigation measure, traffic conditions would improve to an acceptable LOS C; the significance after mitigation would be less than significant.

Significance after Mitigation: Significant and Unavoidable

As stated above, implementation of the Transportation Demand Management (TDM) Program, required by Mitigation Measure 4.D-1, may partially mitigate project impacts. Typically, for business parks in suburban areas, TDM programs include elements such as carpool and vanpool incentives, transit passes, bicycle parking and bicyclist amenities, and shuttles to transit hubs such as BART and Amtrak/ACE stations. However, because the efficacy of the TDM Program cannot be guaranteed, the impact would remain significant and unavoidable.

Freeway Segment Levels of Service. As shown in **Table 4.D-15**, the project would significantly contribute to, or be responsible for, unacceptable operating conditions on the following five freeway segments during one or both peak hours under Cumulative plus Project Conditions:

1a. I-880 northbound from Decoto Road to Alvarado Road during the p.m. peak hour

1b. I-880 southbound from Alvarado Road to Decoto Road during both peak hours

2a. I-880 northbound between Thornton Avenue and Decoto Road during the a.m. peak hour

2b. I-880 southbound between Decoto Road and Thornton Avenue during both peak hours

4a. SR 84 eastbound between Thornton Avenue and Ardenwood Boulevard during the p.m. peak hour

TABLE 4.D-15
CUMULATIVE AND CUMULATIVE PLUS PROJECT FREEWAY LEVELS OF SERVICE

				Cumulative		Cumulative plus Project		Change	
Segment	**From**	**To**	**Direction**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. I-880	Decoto Road	Alvarado Road	Northbound	0.93/E	**1.04/F**	0.94/E	**1.11/F**	0.01	**0.07**
	Alvarado Road	Decoto Road	Southbound	**1.29/F**	**1.15/F**	**1.40/F**	**1.16/F**	**0.10**	**0.01**
2. I-880	Thornton Ave	Decoto Road	Northbound	0.97/E	0.94/E	**1.07/F**	0.96/E	**0.10**	0.02
	Decoto Road	Thornton Ave	Southbound	**1.09/F**	**1.07/F**	**1.11/F**	**1.18/F**	**0.02**	**0.11**
3. SR 84	Toll Plaza	Thornton Ave	Eastbound	0.49/A	**1.12/F**	0.53/A	**1.12/F**	0.04	0.01
	Thornton Ave	Toll Plaza	Westbound	0.92/E	0.56/A	0.92/E	0.59/A	0.00	0.03
4. SR 84	Thornton Ave	Ardenwood Blvd	Eastbound	0.39/A	0.92/E	0.42/A	**1.14/F**	0.03	**0.22**
	Ardenwood Blvd	Thornton Ave	Westbound	0.76/C	0.45/A	0.97/E	0.48/A	0.21	0.03

NOTES: Results are displayed as Volume to Capacity (V/C) ratio / Level of Service; Change = difference in V/C ratio between no-project and project conditions; **Bold** = significant impact
SOURCE: W-Trans, 2016

Mitigation Measure 4.D-6: There are no feasible mitigation measures to reduce the significant cumulative impacts on area freeways to less-than-significant levels.

The impacts could be partially mitigated with implementation of the proposed TDM Program, as described above. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Arterial Segment Levels of Service. As shown in **Table 4.D-16**, under Cumulative plus Project Conditions, the project would have a significant cumulative impact on the following six study segments during either the morning or evening peak period:

1a. Decoto Road eastbound from I-880 to Fremont Boulevard during the p.m. peak hour

1b. Decoto Road westbound from Fremont Boulevard to I-880 during the a.m. peak hour

2a. Decoto Road eastbound from Fremont Boulevard to Paseo Padre Parkway during the p.m. peak hour

2b. Decoto Road westbound from Paseo Padre Parkway to Fremont Boulevard during the a.m. peak hour

3a. Fremont Boulevard northbound from Thornton Avenue to Decoto Road during the a.m. peak hour

3b. Fremont Boulevard southbound from Decoto Road to Thornton Avenue during the p.m. peak hour

TABLE 4.D-16
CUMULATIVE AND CUMULATIVE PLUS PROJECT ARTERIAL SEGMENT LEVELS OF SERVICE

				Cumulative		Cumulative plus Project		Change	
Segment	**From**	**To**	**Direction**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. Decoto Road	I-880	Fremont Blvd	Eastbound	18/D	**5/F**	17/D	**4/F**	-1	**-1**
	Fremont Blvd	I-880	Westbound	**9/F**	24/C	**7/F**	24/C	**-2**	0
2. Decoto Road	Fremont Blvd	Paseo Padre	Eastbound	18/D	**12/F**	17/D	**11/F**	-1	**-1**
	Paseo Padre	Fremont Blvd	Westbound	**10/F**	27/C	**9/F**	26/C	**-1**	-1
3. Fremont Blvd	Thornton Ave	Decoto Road	Northbound	**12/F**	18/D	**10/F**	18/D	**-2**	0
	Decoto Road	Thornton Ave	Southbound	19/D	15/E	18/D	**13/F**	-1	**-2**
4. Fremont Blvd	Decoto Road	Paseo Padre	Northbound	17/E	25/C	17/E	25/C	0	0
	Paseo Padre	Decoto Road	Southbound	30/B	22/D	30/B	22/D	0	0

NOTES: Results are displayed as Speed (miles per hour) / Level of Service; Change = difference in Speed between no-project and project conditions; **Bold** = a significant impact
SOURCE: W-Trans, 2016

Mitigation Measure 4.D-7: There are no feasible mitigation measures to reduce the significant cumulative impacts on area arterials to less-than-significant levels.

The impacts could be partially mitigated with implementation of the proposed TDM Program, as described above. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Significance after Mitigation: Significant and Unavoidable

Impact 4.D-3: Development facilitated by the proposed project would not substantially increase hazards due to a design feature or incompatible uses. (Less than Significant)

The project site is served by an existing roadway network, and development facilitated by the proposed project would not alter that system of roads (i.e., would not construct any new roads that could affect traffic safety). Also, the land uses envisioned by the proposed project would be compatible (consistent) with the current uses on the project site. Impacts would be less than significant.

Mitigation: None Required.

Impact 4.D-4: Development facilitated by the proposed project would not result in inadequate emergency access. (Less than Significant)

The project site is served by an existing roadway network that fully accommodates vehicle access including access by emergency vehicles (fire, police, ambulance). Development facilitated by the proposed project would not alter vehicle access to the site. Impacts would be less than significant.

Mitigation: None Required.

Impact 4.D-5: Development facilitated by the proposed project would increase traffic volumes on the area roadway network, affecting the performance of public transit and non-motorized travel modes (i.e., pedestrians and bicyclists). (Less than Significant)

Public Transit

Currently, AC Transit operates several routes within the vicinity of the project site. Routes SB, U, 232 and the Dumbarton Express buses stop at the Ardenwood Park-and-Ride lot, located on the northwest corner of Ardenwood Boulevard/SR 84 Westbound Ramps, approximately one-half to three-quarters of a mile from the project site. While both local and regional transit lines run near the project site, existing stops are too far from the site to be a comfortable walking distance, which is generally considered to be one-quarter mile. While not a significant impact of the project, the City of Fremont would work with AC Transit to establish bus stops closer to Ardenwood Technology Park as the building occupancy increases and can support additional transit service.

As described in Impact 4.D-1, after implementation of mitigation measures, area intersections would operate at acceptable levels of service. The levels of vehicle delay experienced at area intersections (including by transit vehicles) would not be substantial, and the project impact on the performance of public transit would be less than significant.

Pedestrian Circulation

The Ardenwood Technology Park currently has sidewalks along all roadway frontages as well as sidewalks along constructed building frontages. New buildings that are constructed would be required to have sidewalks installed along their frontages. Internal pedestrian circulation would be improved with additional marked pedestrian crossings in appropriate locations determined by the City of Fremont Public Works Department. The project impact on pedestrian circulation would be less than significant.

Bicycle Circulation

Bike lanes exist in the vicinity of the project site along Ardenwood Boulevard and Paseo Padre Parkway in addition to a bike path. Bicycle facility connectivity would be improved with the installation of bike lanes along Kaiser Drive, Dumbarton Circle and Campus Drive.

Bicycle parking requirements are provided in the 2011 *Fremont Bicycle Master Plan* and Fremont Zoning Ordinance. For office land uses, one space for each 20,000 square feet of floor area of short-term parking and one space for each 10,000 square feet of floor area of long-term parking is required. Therefore, the site would require a total of 259 long-term and 129 short-term bicycle parking spaces. The number of bicycle spaces required accounts for all new development at the site. Per the Bicycle Master Plan, at large employment centers “lockers and showers should be encouraged to facilitate bicycle use.”

Because bicycle facilities (in-street lanes and an off-street path) are available, and with the expectation that the bicycle parking spaces would be required consistent with the Bicycle Master Plan and Fremont Zoning Ordinance, the project impact on bicycle circulation would be less than significant.

Mitigation: None Required.

References

AC Transit, Maps and Schedules, 2015, http://www.actransit.org/maps/

BART, Schedules, 2015, http://www.bart.gov/stations/schedules/

California Department of Transportation (Caltrans), 2015, Performance Management System, http://pems.dot.ca.gov

California Department of Transportation (Caltrans), 2010, *2010 Collision Data on California State Highways*

California Highway Patrol (CHP), 2009-2013, *Statewide Integrated Traffic Records System (SWITRS)*,

The Dumbarton Express, 2015, http://dumbartonexpress.com/

Fremont, City of, 2012, *City of Fremont Bicycle Master Plan*, Alta Planning + Design

Fremont, City of, 2011, *City of Fremont General Plan*.

Fremont, City of, 2011, *Final Environmental Impact Report: Fremont Draft General Plan Update*, Lamphier-Gregory

Fremont, City of, 2015, *Fremont Municipal Code*, Code Publishing Company

Institute of Transportation Engineers (ITE), 2012, *Trip Generation Manual*, 9th Edition

Santa Clara Valley Transportation Authority (VTA), 2015, http://www.vta.org

Transportation Research Board, 2000, *Highway Capacity Manual*

Transportation Research Board, 2010, *Highway Capacity Manual*

CHAPTER 5
Alternatives to the Project

A. Introduction

CEQA *Guidelines* §15126.6 requires than an EIR describe and evaluate a range of reasonable alternatives to the project or to the location of the project that could avoid or substantially lessen any of the significant effects of the project and feasibly attain most of its basic objectives. The CEQA Guidelines further require discussion of the "No Project" Alternative.

The CEQA *Guidelines* generally define "feasible" to mean an alternative that is capable of being accomplished in a successful manner within a reasonable amount of time, taking into account economic, environmental, social, technological, and legal factors. In addition, the following may be taken into consideration when assessing the feasibility of alternatives: site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, and the ability of the proponent to attain site control (CEQA *Guidelines* § 15126.6(f)(1)). As stated in § 15126.6(f)(3) of the CEQA *Guidelines*, "An EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative."

The requirement that an EIR evaluate alternatives to the proposed project, or alternatives that address the location of the proposed project, is a broad one; the primary intent of the alternatives analysis is to disclose other ways that the objectives of the project could be attained while reducing the magnitude of, or avoiding, the environmental impacts of the proposed project. The description or evaluation of alternatives does not need to be exhaustive. In addition, an EIR need not describe or evaluate the environmental effects of alternatives in the same level of detail as the proposed project, but must include enough information to allow meaningful evaluation, analysis, and comparison with the proposed project.

CEQA requires that an environmentally superior alternative be selected among the alternatives. In general, the environmentally superior alternative is defined as that alternative with the least adverse impacts on the project site and its surrounding environment. When the "No Project" Alternative is the environmentally superior alternative, an EIR must also identify an environmentally superior alternative among the other alternatives (CEQA *Guidelines* §15126.6 (e)(2).)

The following alternatives are evaluated in this chapter of the Draft EIR:

- No Project Alternative
- Reduced Development Alternative 1
- Reduced Development Alternative 2

The purpose of this chapter is to describe and evaluate the alternatives to the proposed Ardenwood Technology Park Planned District Amendment, as proposed. The alternatives were developed to reduce or eliminate the significant or potentially significant adverse environmental effects that would result from implementation of the proposed project as identified in Chapter 4 of this EIR.

B. Factors in the Selection of Alternatives

The CEQA *Guidelines* recommend that an EIR briefly describe the rationale for selecting the alternatives to be discussed, identify any alternatives that were considered by the lead agency but were rejected as infeasible, and briefly explain the reasons underlying the lead agency's determination (CEQA *Guidelines* § 15126.6(c)). The following factors were considered in identifying the reasonable range of alternatives to the project for this EIR:

- The extent to which the alternative would accomplish most of the basic goals and objectives of the project
- The extent to which the alternative would avoid or lessen the identified significant environmental effects of the project
- The feasibility of the alternative, taking into account site suitability, availability of infrastructure, general plan consistency, and consistency with other applicable plans and regulatory limitations
- The extent to which an alternative contributes to a "reasonable range" of alternatives necessary to permit a reasoned choice
- The requirement of the CEQA *Guidelines* to consider a No Project Alternative and to identify an "environmentally superior" alternative in addition to the No Project Alternative (CEQA *Guidelines* § 15126.6 (e))

C. Project Objectives

As discussed in Chapter 3 of the EIR, the following are the identified objectives for the project:

- Promote high-quality, architecturally distinctive development
- Strengthen the identity of the Ardenwood Technology Park by creating a visual and functional presence as viewed from State Route 84
- Create a strong local economy that attracts new businesses, in particular high-end office uses, to Fremont while providing opportunities for existing businesses to expand and grow

- Transition a low-scale 1980s business park into a 21st century Silicon Valley work place with an employment base that supports alternative modes of transportation through a robust transportation management demand (TDM) program
- Increase development potential within this city-identified priority industrial area

D. Description and Analysis of Alternatives

A description of each alternative is followed by a discussion of its impacts and how the alternative would differ from the impacts of the proposed project. As permitted by CEQA, the significant effects of the alternatives are discussed in less detail than are the effects of the proposed project (CEQA *Guidelines*, § 15126.6(d)). However, the analysis is conducted at a sufficient level of detail to provide decision-makers adequate information to fully evaluate the alternatives and to approve any of the alternatives without further environmental review, should that be the desire of the decision-makers if the proposed project is not approved.

No Project Alternative

Consideration of a No Project Alternative is required under CEQA. Under this alternative, no Planned District Amendment would occur at the site and the project area would continue to be developed under the existing allowable 0.35 FAR. The parcels that comprise the project area are currently developed with 1,387,181 square feet of floor area and an additional 864,806 square feet could be developed for a total of 2,251,987 square feet under the 0.35 FAR.

According to Section 15126.6(e)(3)(A) of the state CEQA Guidelines, when a project consists of the revision of an existing land use or regulatory plan, the No Project Alternative "will be the continuation of the existing plan, policy, or operation into the future." Here, the proposed project is a revision of the Ardenwood Technology Park Planned District. The No Project Alternative, therefore, assumes the potential future development of an additional 864,806 square feet or the difference between the existing developed floor area and the existing allowable floor area.

Under the No Project Alternative, the site would continue to develop under the existing allowable FAR until it reaches the permitted limit of 0.35. Because of the Ardenwood Technology Park's 1980s-era layout, and based on current tenancy, it would be likely that future buildout of the site would attract light industrial and research and development firms, rather than primarily office tenants, as anticipated under the proposed project.

Compliance of No Project Alternative with Project Objectives

This alternative would partially meet some of the project objectives for the proposed project as the development that would occur under the existing permitted FAR could satisfy some of these objectives. For example, the No Project Alternative could, to some extent, promote high-quality, architecturally distinctive development and strengthen the identity of the Ardenwood Technology Park by creating a visual and functional presence as viewed from State Route 84. These objectives could be partially realized without the proposed project as they are not entirely dependent on a change in FAR, although it is likely that the existing FAR would somewhat limit the return on investment for new construction, which might constrain the degree to which a

project sponsor would be willing to expend on building design and site amenities. In particular, replacement of existing one- and two-story buildings could be less economically feasible than under the proposed project, which would allow taller building heights. The remaining objectives related to potential opportunities to attract new businesses to Fremont and for existing businesses to expand and grow, and increase development potential, would likewise not be fully met, because both of the lesser magnitude of permitted development and because the shorter, smaller buildings that would be expected to be built under the current FAR could limit the attractiveness of the site to major office users. Regarding the ability to provide a TDM Program, this would likely be less effective given the lesser employment density under this alternative, leading to availability of fewer alternatives to single-occupancy vehicles. The No Project Alternative, if selected, would restrain development potential by limiting growth to the currently permitted FAR for each parcel.

Impacts

The following sub-sections briefly describe environmental impacts associated with the No Project Alternative. It is noted that, with the exception of air quality, greenhouse gas (GHG) emissions, noise and transportation, the evaluation of the impacts below with respect to the proposed project is contained in the Initial Study and included, along with the Notice of Preparation, in Appendix A of this Draft EIR. The cumulative impacts of the No Project Alternative were analyzed in the Fremont General Plan Update EIR.

Aesthetics

Under the No Project Alternative, development would continue as permitted under the existing FAR, and the existing building height limit of 75 feet and four stories would remain unchanged. As there are no unusual or important resources such as rock outcroppings or historic structures on any of the subject parcels, existing visual conditions would remain unaffected at the site. Impacts would be less than significant, as with the proposed project.

Air Quality and Greenhouse Gas Emissions

With the No Project Alternative, projected development (the difference between the existing developed floor area and existing allowable floor area) would be 864,806 square feet. To evaluate the potential air quality impacts under the No Project Alternative, office park and parking lot development were modeled using CalEEMod (version 2013.2.2) assuming default construction phase durations over a period of about 10 years, commencing in January 2018 with completion in January 2028.[1]

Construction

Unmitigated and mitigated construction-related criteria pollutant exhaust emissions for the No Project Alternative are presented in **Table 5-1**. The estimated emissions consider the following basic construction phases: site preparation; excavation/grading; building construction; asphalt paving; and application of architectural coatings.

[1] While there is no specific predicted build-out projected for development under the existing FAR, the No Project Alternative uses the same estimated build-out as the proposed project for comparison purposes.

TABLE 5-1
AVERAGE DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS, NO PROJECT ALTERNATIVE (pounds/day)[a]

Scenario	ROG	NOx	Exhaust PM10[b]	Exhaust PM2.5[b]
Unmitigated Emissions (2018 to 2028)	12.0	48.4	1.5	1.4
BAAQMD Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod version 2013.2.2 with default phase durations, equipment, and on-road vehicle assumptions. Additional data and model outputs are included in Appendix D.

[b] BAAQMD's construction-related significance thresholds for PM10 and PM2.5 apply to exhaust emissions only and not to fugitive dust.

As shown in Table 5-1, maximum average daily regional emissions would not exceed the BAAQMD daily significance thresholds. Thus, the No Project Alternative would have a less than significant impact from construction emissions.

Operational

As provided in the Transportation Impact Study for the project (W-Trans, 2016) and shown in Table 5-7, the No Project Alternative would generate approximately 9,876 daily trips from 864,806 square feet of additional floor area over existing floor area. **Table 5-2** summarizes the daily mobile, energy, and area emissions of criteria pollutants that would be generated under the No Project Alternative and compares them with BAAQMD thresholds. **Table 5-3** summarizes the annual emissions from No Project Alternative operations. As indicated in Tables 5-2 and 5-3, project-related operational emissions of ROG would exceed the BAAQMD significance thresholds during operations and, thus, the project would have a significant impact in relation to regional operational emissions, as would the proposed project (although emissions related to the No Project Alternative would be less and would exceed thresholds for two of four pollutants in Table 5-2, versus three of four with the proposed project).

TABLE 5-2
DAILY OPERATIONAL-RELATED POLLUTANT EMISSIONS, NO PROJECT ALTERNATIVE (pounds/day)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	45.3	0	0	0
Energy Sources	0.4	3.5	0.3	0.3
Mobile Sources	23.0	50.0	54.1	15.3
Total Emissions	68.7	53.5	54.4	15.6
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	No	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-3
ANNUAL OPERATIONAL-RELATED POLLUTANT EMISSIONS, NO PROJECT ALTERNATIVE (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	8.3	0	0	0
Energy Sources	0.1	0.6	0.1	0.1
Mobile Sources	2.9	7.2	7.1	2.0
Total Emissions	11.3	7.8	7.2	2.1
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	No	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

Under the No Project Alternative, construction of anticipated build-out at the currently permitted FAR is projected to occur over a period of approximately ten years and, therefore, an overlap of operational and construction emissions could occur. Because the projected construction schedule is unknown, a conservative calculation was estimated for construction plus operational emissions by adding the average construction emissions to the maximum operational emissions. While this slightly overestimates total emissions, it would not change the significance findings for operational emissions. **Tables 5-4** and **5-5** show the maximum daily and annual construction and operational overlap, respectively. As shown, emissions of ROG and NOx would exceed significance thresholds and impacts would be considered significant and unavoidable for those two pollutants, while impacts associated with the proposed project would be significant and unavoidable for ROG, NOx and PM_{10}.

TABLE 5-4
DAILY COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS, NO PROJECT ALTERNATIVE (pounds/day)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	12	48.4	1.5	1.4
Area Sources	45.3	0	0	0
Energy Sources	0.4	3.5	0.3	0.3
Mobile Sources	23.0	50.0	54.1	15.3
Total Emissions	80.7	101.9	55.9	17
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-5
ANNUAL COMBINED OPERATIONAL
AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	1.6	6.3	0.2	0.2
Area Sources	8.3	0	0	0
Energy Sources	0.1	0.6	0.1	0.1
Mobile Sources	2.9	7.2	7.1	2.0
Total Emissions	12.9	14.1	7.4	2.3
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

GHG Emissions

BAAQMD's GHG emissions thresholds are calculated from direct emissions from vehicle trip generation, onsite water and space heating, and other stationary sources, as well as indirect emissions from offsite electrical generation, solid waste generation, and water conveyance and treatment. The GHG emitting activities associated with the No Project Alternative are the same as those for the proposed project.

Emissions from the No Project Alternative include construction emissions over the full buildout duration as estimated using CalEEMod and amortized assuming a 30-year development lifetime and added to overall project emissions for comparison to significance thresholds. In regards to operations, the CalEEMod model was used to estimate GHG emissions, which are depicted in **Table 5-6**.

TABLE 5-6
ESTIMATED UNMITIGATED EMISSIONS OF GREENHOUSE GASES,
NO PROJECT ALTERNATIVE (metric tons CO_2E/year)[a]

Source	Emissions
Project Construction (Amortized)	883.04
Area Sources	0.02
Energy Sources	4,186.60
Mobile Sources	7,166.29
Waste Sources	365.88
Water Sources	529.78
Total Project GHG Emissions (Construction + Operations)[b]	13,131.60
Operational GHG Emissions per Increase in Service Population (2,584 jobs)[a]	5.06
BAAQMD GHG Efficiency Threshold	*4.6*
Significant (Yes or No)?	*Yes*

[a] The net service population represents the incremental increase in jobs within the project site due to the No Project Alternative development. The value does not include jobs associated with the existing land uses on the project site. Per service population emissions is the total project emissions divided by the number of employees. Assumes 3 employees per 1,000 square feet for office use.

[b] Total project GHG emissions are the sum of the amortized construction emissions plus the total operational emissions.

Table 5-6 indicates that the increased GHG emissions associated with the No Project Alternative would exceed BAAQMD's "efficiency threshold" of 4.6 metric tons of CO_2e per service population per year. Per service population emissions are the total project emissions divided by the anticipated employees from this alternative. This would represent a potentially significant cumulative GHG impact. The Fremont General Plan Update EIR considered cumulative impacts of a No Project Alternative and identified significant and unavoidable impacts for global climate change. The City subsequently adopted a Statement of Overriding Conditions.

Biological Resources

Potential impacts to sensitive species or nesting birds (including construction-related noise impacts) could occur with the No Project Alternative. To reduce this impact, implementation of Mitigation Measures Bio-1 and Bio-2, identified in the Initial Study prepared for the project and requiring preconstruction surveys for burrowing owls or nesting birds, would be required at the time specific development projects are proposed under the No Project Alternative. Impacts would be less than significant, similar to the proposed project.

Cultural and Historical Resources

There are no identified historical resources on any of the 32 subject parcels in the project area. In addition, there are no known archaeological or paleontological resources, however, there is a possibility that unrecorded resources exist within the project area, which could be unearthed during grading activities under the No Project Alternative. Mitigation Measure Cult-1, identified in the Initial Study for this project, would be applied to specific development proposals to reduce potential impacts to archaeological or paleontological resources by requiring cessation of work and adherence to specific professional protocols should a discovery be made during excavation. Impacts would be less than significant, similar to the proposed project.

Noise

As with the proposed project, noise impacts that could result from construction of future development under the No Project Alternative would be less than significant. Operational noise effects would likewise be less than significant, as with the proposed project.

Transportation

Under the No Project Alternative, traffic and transportation impacts are analyzed through a Near-Term Conditions scenario, which provides an evaluation of operation based on existing traffic volumes plus traffic generated by the full development of the permitted FAR of 0.35 during the a.m. and p.m. peak periods. The change from Existing Conditions to the permitted FAR of 0.35 would result in a total of 9,876 additional daily trips, including 1,479 trips during the a.m. peak hour and 1,280 trips during the p.m. peak hour. A summary of the trip generation for the Near-Term Condition is provided in **Table 5-7**.

TABLE 5-7
NEAR-TERM (EXISTING TO PERMITTED) TRIP GENERATION SUMMARY

Scenario (Net Change) Land Use	Units (ksf)	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Office Park	864.81	11.42	9,876	1.71	1,479	1,316	163	1.48	1,280	179	1,101

NOTE: ksf = 1,000 square feet
SOURCE: W-Trans, 2016, using ITE, *Trip Generation Manual*, 9th Edition, 2012.

Intersection Levels of Service

Under Near-Term Conditions, all of the study intersections are projected to operate acceptably at LOS D (or LOS E where the standard applies) or better overall, except the Decoto Road / I-880 Northbound Ramps intersection (LOS E during the a.m. peak hour). The Near-Term traffic volumes are shown in **Figure 5-1**. The LOS for the study intersections are summarized in **Table 5-8**, which also presents a comparison to effects of the proposed project. Effects would be less than significant at all intersections with the exception of Decoto Road / I-880 Northbound Ramps, where the effect would be significant in the a.m. peak hour. This impact was also identified in the General Plan Update EIR as significant and unavoidable and a Statement of Overriding Considerations was adopted. Overall, intersection effects would be substantially less severe than those of the proposed project.

Freeway Operation

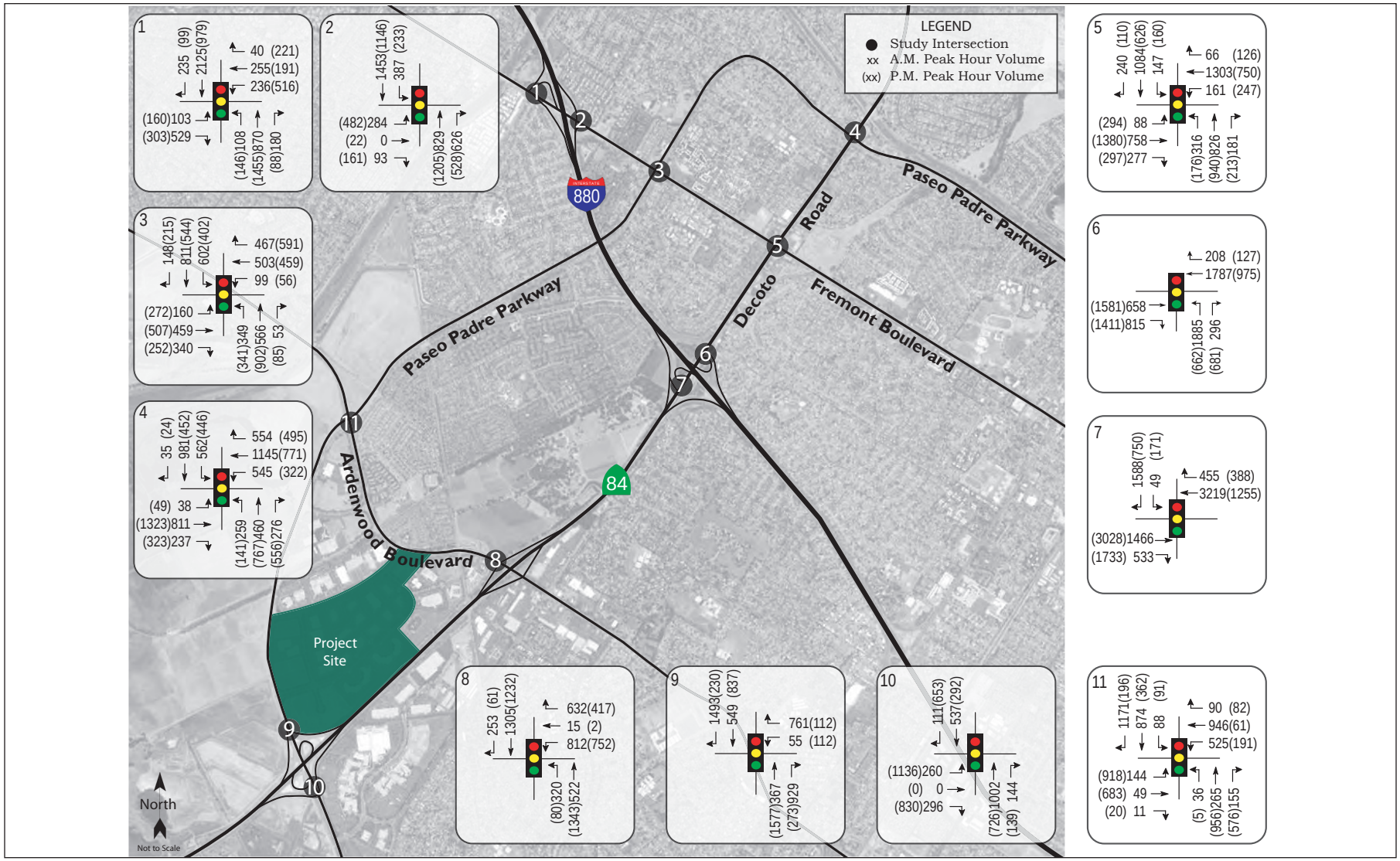
Based on Near-Term traffic volumes, all of the study freeway segments would operate acceptably at LOS E or better except for southbound I-880 between Decoto Road and Thornton Avenue, which is projected to continue operating at LOS F. A summary of the freeway levels of service is shown in **Table 5-9**. Effects would be less substantial than those with the proposed project, and would be less than significant except on I-880 between Decoto Road and Thornton Avenue in the p.m. peak-hour southbound direction. As with the proposed project, this impact would be significant and unavoidable.

Arterial Segment Operation

Eastbound Decoto Road between I-880 and Fremont Boulevard is expected to operate unacceptably at LOS F during the p.m. peak hour under Near-Term Conditions. A summary of the arterial segment LOS is shown in **Table 5-10**. Effects would be less substantial than with the proposed project, and would be less than significant, except on Decoto Road eastbound between I-880 and Fremont Boulevard in the p.m. peak hour. As with the proposed project, this impact would be significant and unavoidable.

Other Issues

Other issues were found to entail less than significant impacts in the Initial Study Checklist completed for the project (see Appendix A) and briefly summarized. Effects of the No Project Alternative would likewise be less than significant because this alternative would result in lesser intensity of development.



SOURCE: W-TRANS 2015

Figure 5-1
Near-Term Traffic Volumes

TABLE 5-8
EXISTING AND EXISTING PLUS NO PROJECT ALTERNATIVE
PEAK HOUR INTERSECTION LEVELS OF SERVICE AND COMPARISON TO PROPOSED PROJECT

	Existing		Existing plus No Project Alternative		Significant Impact?		Existing plus Project		Significant Impact?	
Study Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
1. Alvarado Blvd / I-880 SB Off-Ramp-Deep Creek Rd	27.1/C	28.6/C	28.3/C	29.1/C	No	No	31.1/C	30.5/C	No	No
2. Fremont Blvd / I-880 Northbound Ramps	14.1/B	17.7/B	14.1/B	17.7/B	No	No	14.1/B	17.6/B	No	No
3. Fremont Blvd / Paseo Padre Pkwy	41.4/D	43.5/D	41.6/D	43.7/D	No	No	41.8/D	44.2/D	No	No
4. Decoto Road / Paseo Padre Pkwy	50.4/D	65.5/D	51.0/D	66.4/E	No	No	52.5/D	68.5/E	No	No
5. Decoto Road / Fremont Boulevard	42.3/D	43.6/D	46.7/D	42.8/D	No	No	65.5/E	44.4/D	No	No
6. Decoto Road / I-880 Northbound Ramps	25.8/C	15.4/B	**70.6/E**	16.1/B	**Yes**	No	**208.1/F**	19.0/B	**Yes**	No
7. Decoto Road / I-880 Southbound Ramps	3.5/A	5.3/A	20.4/C	3.7/A	No	No	**146.1/F**	5.8/A	**Yes**	No
8. Ardenwood Blvd / SR 84 Westbound Ramps	28.0/C	16.1/B	36.8/D	16.0/B	No	No	**107.6/F**	17.3/B	**Yes**	No
9. Paseo Padre Pkwy / SR 84 Westbound Ramps	13.0/B	6.7/A	42.2/D	7.3/A	No	No	**644.0/F**	23.1/C	**Yes**	No
10. Thornton Ave / SR 84 Eastbound Ramps	10.9/B	32.6/C	11.5/B	33.5/C	No	No	27.5/C	35.7/D	No	No
11. Ardenwood Blvd / Paseo Padre Pkwy	30.2/C	38.2/D	30.7/C	40.3/D	No	No	31.7/C	47.1/D	No	No

NOTES: Results are displayed as Delay/LOS; Delay is measured in average seconds per vehicle;
LOS = Level of Service; **Bold** = deficient operation
SOURCE: W-Trans, 2016

TABLE 5-9
EXISTING PLUS NO PROJECT ALTERNATIVE FREEWAY LEVELS OF SERVICE (LOS)

Segment	From	To	Direction	AM Peak Hour		PM Peak Hour	
				V/C	LOS	V/C	LOS
1. I-880	Decoto Rd	Alvarado Rd	Northbound	0.66	B	0.83	C
	Alvarado Rd	Decoto Rd	Southbound	0.99	E	0.86	D
2. I-880	Thornton Ave	Decoto Rd	Northbound	0.93	E	0.92	E
	Decoto Rd	Thornton Ave	Southbound	0.96	E	**1.13**	**F**
3. SR 84	Toll Plaza	Thornton Ave	Eastbound	0.24	A	0.91	E
	Thornton Ave	Toll Plaza	Westbound	0.74	C	0.21	A
4. SR 84	Thornton Ave	Ardenwood Blvd	Eastbound	0.19	A	0.73	C
	Ardenwood Blvd	Thornton Ave	Westbound	0.86	C	0.25	A

NOTES: V/C = Volume to Capacity ratio; **Bold** = unacceptable operation

SOURCE: W-Trans, 2016

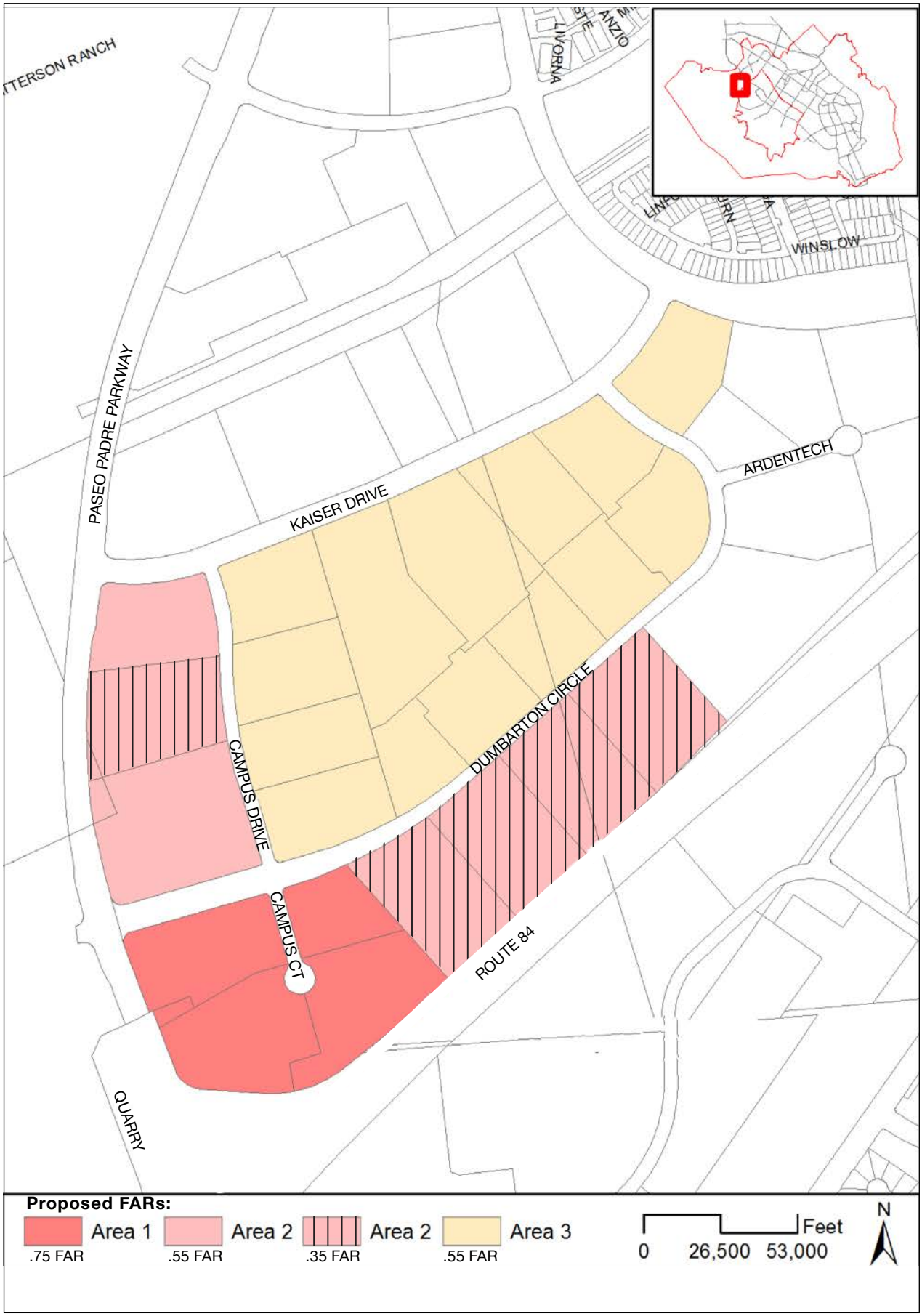
TABLE 5-10
EXISTING PLUS NO PROJECT ALTERNATIVE
ARTERIAL SEGMENT LEVELS OF SERVICE (LOS)

Segment	From	To	Direction	AM Peak Hour		PM Peak Hour	
				Speed	LOS	Speed	LOS
1. Decoto Rd	I-880	Fremont Blvd	Eastbound	30	B	**7**	**F**
	Fremont Blvd	I-880	Westbound	18	D	38	A
2. Decoto Rd	Fremont Blvd	Paseo Padre	Eastbound	37	A	26	C
	Paseo Padre	Fremont Blvd	Westbound	17	D	31	B
3. Fremont Blvd	Thornton Ave	Decoto Rd	Northbound	27	C	21	D
	Decoto Rd	Thornton Ave	Southbound	17	E	26	C
4. Fremont Blvd	Decoto Rd	Paseo Padre	Northbound	29	B	22	C
	Paseo Padre	Decoto Rd	Southbound	31	B	37	A

NOTES: Speed reported in miles per hour; **Bold** = unacceptable operation
SOURCE: W-Trans, 2016

Reduced Development Alternative 1

Under Reduced Development Alternative 1, seven of the existing ten parcels in Area 2 would be excluded from the Ardenwood Technology Park Planned District Amendment. These parcels are currently developed and no change in the existing allowable FAR would occur. Future development of these parcels would be limited to the existing FAR of 0.35. The three remaining undeveloped parcels in Area 2 would be allowed an FAR of 0.55, which would be a reduction from 0.65 FAR proposed by the Planned District Amendment. Maximum development allowed under this alternative would be reduced by 538,377 square feet from 2,587,560 square feet of additional floor area under the Planned District Amendment to 2,049,182 square feet, which represents a reduction of approximately 21 percent. Refer to **Figure 5-2** for a depiction of Reduced Development Alternative 1.



SOURCE: City of Fremont

Ardenwood Technology Park Planned District Rezoning EIR . 140953

Figure 5-2

Reduced Development Alternative 1

Compliance of Reduced Development Alternative 1 with Project Objectives

This alternative would meet most of the project objectives for the proposed project as the development that would occur under the Reduced Development Alternative 1 could satisfy some of these objectives. For example, Reduced Development Alternative 1 could promote high-quality, architecturally distinctive development and strengthen the identity of the Ardenwood Technology Park by creating a visual and functional presence as viewed from State Route 84. These objectives could be realized under Alternative 1 because the increased scale of development allowed under this alternative would encourage an investment in new construction, which would promote high-quality building design and site amenities. The remaining objectives, which related to potential opportunities to attract new businesses to Fremont, for existing businesses to expand and grow, for an increase in development potential, and development of a robust TDM Program, could also be met due to the greater magnitude of permitted development under this alternative, which could make the site more attractive to major office users. Reduced Development Alternative 1, if selected, would promote development potential by increasing growth beyond the currently permitted FAR for each parcel, with the exception of seven parcels in Area 2.

Impacts

The following sub-sections briefly describe environmental impacts associated with Reduced Development Alternative 1. It is noted that, with the exception of air quality, GHG emissions, noise and transportation, the evaluation of the impacts below with respect to the proposed project is contained in the Initial Study and included, along with the Notice of Preparation, in Appendix A of this Draft EIR.

Aesthetics

Under Reduced Development Alternative 1, development would continue as permitted under the existing FAR for seven developed parcels in Area 2. The remaining three undeveloped parcels in Area 2 would be allowed an FAR of 0.55 (reducing the development intensity from the proposed project). As with the proposed project, Reduced Development Alternative 1 would maintain the existing building height limit of 75 feet and four stories in Areas 2 and 3, and Area 1 would allow a maximum building height of 115 feet. As there are no unusual or important resources such as rock outcroppings or historic structures on any of the subject parcels, existing visual conditions would remain unaffected at the site. Impacts would be less than significant, as with the proposed project.

Air Quality and Greenhouse Gas Emissions

With Reduced Development Alternative 1, the projected development (the difference between the existing floor area and what would be allowed under Reduced Development Alternative 1) would be 2,049,182 square feet. To evaluate the potential air quality impacts under the Reduced Development Alternative 1, office park and parking lot development were modeled using

CalEEMod (version 2013.2.2) assuming default construction phase durations over a period of about 10 years, commencing in January 2018 with completion in January 2028.[2]

Unmitigated construction-related criteria pollutant exhaust emissions for Reduced Development Alternative 1 are presented in **Table 5-11**. The estimated emissions consider the following basic construction phases: site preparation; excavation/grading; building construction; asphalt paving; and application of architectural coatings.

TABLE 5-11
AVERAGE DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 1 (pounds/day)[a]

Scenario	ROG	NOx	Exhaust PM10[b]	Exhaust PM2.5[b]
Unmitigated Emissions (2018 to 2028)	15.68	42.30	1.43	1.33
BAAQMD Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod version 2013.2.2 with default phase durations, equipment, and on-road vehicle assumptions. Additional data and model outputs are included in Appendix D.

[b] BAAQMD's construction-related significance thresholds for PM10 and PM2.5 apply to exhaust emissions only and not to fugitive dust.

As shown in Table 5-11, maximum average daily regional emissions would not exceed the BAAQMD daily significance thresholds. Thus, Reduced Development Alternative 1 would have a less-than-significant impact from construction emissions.

Reduced Development Alternative 1 would generate approximately 23,402 weekday vehicle trips from existing conditions to proposed FARs that would allow approximately 2,049,182 square feet of additional floor area over existing floor area. **Table 5-12** summarizes the daily mobile, energy, and area emissions of criteria pollutants that would be generated under the Reduced Development Alternative 1 and compares them with BAAQMD thresholds. **Table 5-13** summarizes the annual emissions from Reduced Development Alternative 1 operations. As indicated in Tables 5-12 and 5-13, project-related operational emissions of ROG and NOx would exceed the BAAQMD significance thresholds during operations and, thus, Reduced Development Alternative 1 would have a significant impact in relation to regional operational emissions, as would the proposed project (although emissions related to Reduced Development Alternative 1 would be less substantial than the proposed project, it would still exceed daily and annual thresholds for three of four criteria pollutants in Tables 5-12 and 5-13, similar to the proposed project).

[2] While there is no specific predicted build-out projected for development under the existing FAR, the Reduced Development Alternative 1 uses the same estimated build-out as the proposed project for comparison purposes.

TABLE 5-12
DAILY OPERATIONAL-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 1 (pounds/day)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	74.06	0.00	0.00	0.01
Energy Sources	0.90	8.22	0.62	0.62
Mobile Sources	54.55	130.48	128.86	36.30
Total Emissions	129.51	138.70	129.49	36.93
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-13
ANNUAL OPERATIONAL-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 1 (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	13.51	0.00	0.00	0.00
Energy Sources	0.17	1.50	0.11	0.11
Mobile Sources	6.94	17.09	16.75	4.76
Total Emissions	20.62	18.59	16.86	4.88
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

To reduce operational impacts, implementation of a TDM Program would be less effective due to smaller employment density and fewer alternatives to single-occupancy vehicles. Energy efficiency measures (such as Mitigation Measure 4.A-2) could be feasible but the overall effectiveness would be reduced given that less new construction would be anticipated, since many existing buildings might remain. Therefore, this impact would remain significant and unavoidable for emissions of ROG, NOx and PM_{10}.

Under Reduced Development Alternative 1, the construction period is anticipated to last 10 years with construction and operation occurring concurrently. As buildings are finished they would begin operation while the remainder of the site is being constructed. This would result in operational and construction emissions occurring at the same time. Because the projected construction schedule is unknown, a conservative calculation was estimated for construction plus operational emissions by adding the average construction emissions to the maximum operational emissions. While this slightly over estimates total emissions, it would not change the significance findings for operational emissions. **Tables 5-14** and **5-15** show the maximum daily and annual

construction and operational overlap respectively. As shown, emissions of ROG, NOx and PM_{10} would be above significance thresholds and impacts would be considered significant and unavoidable for those three pollutants. While the same pollutants would exceed thresholds as with the proposed project, Reduced Development Alternative 1 would result in less pollutant emissions on a daily and annual basis than the proposed project.

TABLE 5-14
DAILY COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 1 (pounds/day)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	15.68	42.30	1.43	1.33
Area Sources	74.06	0.00	0.00	0.01
Energy Sources	0.90	8.22	0.62	0.62
Mobile Sources	54.55	130.48	128.86	36.30
Total Emissions	145.19	181.01	130.92	36.93
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-15
ANNUAL COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 1 (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	2.04	5.50	0.19	0.17
Area Sources	13.51	0.00	0.00	0.00
Energy Sources	0.17	1.50	0.11	0.11
Mobile Sources	6.94	17.09	16.75	4.76
Total Emissions	22.66	24.09	17.05	5.05
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

BAAQMD's GHG emissions thresholds are based on direct emissions from a project's vehicle trip generation, onsite water and space heating, and other stationary sources, as well as indirect emissions from offsite electrical generation, solid waste generation, and water conveyance and treatment. The GHG emitting activities associated with Reduced Development Alternative 1 are the same as those for the proposed project.

Emissions from Reduced Development Alternative 1 include construction emissions over the full buildout duration as estimated using CalEEMod and amortized assuming a 30-year development lifetime and added to overall project emissions for comparison to significance thresholds. In regards to operations, the CalEEMod model was used to estimate GHG emissions, which are depicted in **Table 5-16**.

TABLE 5-16
REDUCED DEVELOPMENT ALTERNATIVE 1 - ESTIMATED UNMITIGATED EMISSIONS OF GREENHOUSE GASES (metric tons CO_2E/year)[a]

Source	Emissions
Project Construction (Amortized)	747.34
Area Sources	0.04
Energy Sources	9,518.93
Mobile Sources	16,980.64
Waste Sources	866.95
Water Sources	1,255.13
Total Project GHG Emissions (Construction + Operations)[b]	29,369.03
Operational GHG Emissions per Increase in Service Population (6,148 jobs)[a]	4.78
BAAQMD GHG Efficiency Threshold	*4.6*
Significant (Yes or No)?	*Yes*

[a] The net service population represents the incremental increase in jobs within the project site due to Reduced Development Alternative 1 development. The value does not include jobs associated with the existing land uses on the project site. Per service population emissions is the total project emissions divided by the number of employees. Assumes 3 employees per 1,000 square feet for office use.

[b] Total project GHG emissions are the sum of the amortized construction emissions plus the total operational emissions.

Table 5-16 indicates that the increased GHG emissions associated with Reduced Development Alternative 1 would exceed BAAQMD's "efficiency threshold" of 4.6 metric tons of CO_2e per service population per year. The amount of development decreases with respect to this alternative and, therefore, results in less overall emissions than the proposed project. However, because less development is proposed under this alternative than under the proposed project fewer jobs would be created. This results in greater per service population emissions for Reduced Development Alternative 1, which would result in a potentially significant cumulative GHG impact without mitigation. Per service population emissions are the total emissions for this alternative divided by the number of onsite employees. With the inclusion of Mitigation Measure 4.B-1, implementation of a project-specific GHG Reduction Plan would reduce GHG emissions to below the BAAQMD significance threshold. This would be achieved by implementing energy efficiency measures as part of the final project design such as installing solar photovoltaic panels on buildings roofs and installing solar water heaters. This would represent a less-than-significant cumulative GHG impact, similar to the proposed project.

Biological Resources

Potential impacts to sensitive species or nesting birds (including construction-related noise impacts) could occur with Reduced Development Alternative 1. To reduce this impact, implementation of

mitigation measures Bio-1 and Bio-2, identified in the Initial Study for this project and requiring preconstruction surveys for burrowing owls or nesting birds, would be required at the time specific development projects are proposed under Reduced Development Alternative 1. Impacts would be less than significant, similar to the proposed project.

Cultural and Historical Resources

There are no identified historical resources on any of the 32 subject parcels in the project area. In addition, that are no known archaeological or paleontological resources, however, there is a possibility that unrecorded resources exist within the project area, which could be unearthed during grading activities under Reduced Development Alternative 1. Implementation of Mitigation Measure Cult-1, identified in the Initial Study for this project, would be applied to specific development proposals to reduce potential impacts to archaeological or paleontological resources by requiring cessation of work and adherence to specific professional protocols should a discovery be made during excavation. Impacts would be less than significant, similar to the proposed project.

Noise

As with the proposed project, noise impacts that could result from construction of future development under the Reduced Development Alternative 1 would be less than significant. The proposed project would generate approximately 29,550 daily trips and the Reduced Development Alternative 1 would generate approximately 23,402 daily trips from the proposed FAR increase that would allow approximately 2,587,560 square feet and 2,049,182 square feet, respectively, of additional floor area over existing developed floor area. Since the resulting reduction of daily trip rates as compared to the proposed project would result in an overall reduction in traffic volumes, the traffic noise impacts from the Reduced Development Alternative 1 would be less than those found under the proposed project. Therefore, there would be no substantial increases in traffic noise at any of the intersections analyzed that would result in a potentially significant impact. Traffic noise from Reduced Development Alternative 1 would be less than the proposed project.

Transportation

Vehicle trip generation under Reduced Development Alternative 1 would be approximately 21 percent lower than under the proposed project (see **Table 5-17**). The change from existing condition to Reduced Development Alternative 1 would result in a total of 23,402 additional daily trips, including 3,504 trips during the a.m. peak hour and 3,033 trips during the p.m. peak hour.

TABLE 5-17
REDUCED DEVELOPMENT ALTERNATIVE 1 TRIP GENERATION SUMMARY

Scenario (Net Change) Land Use	Units (ksf)	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Office Park	2,049.182	11.42	23,402	1.71	3,504	3,119	385	1.48	3,033	425	2,608

NOTE: ksf = 1,000 square feet
SOURCE: W-Trans, 2016, using ITE, *Trip Generation Manual*, 9th Edition, 2012.

Intersection Levels of Service

The impact of Reduced Development Alternative 1 would be less than under the proposed project because of the above-described reduced trip generation. However, the increased vehicle delay during the a.m. peak hour would cause a significant impact at the intersections of Decoto Road / I-880 Northbound Ramps (#6), Decoto Road / I-880 Southbound Ramps (#7), Ardenwood Boulevard / SR 84 Westbound Ramps (#8), and Paseo Padre Parkway / SR 84 Westbound Ramps (#9), similar to the proposed project. As with the proposed project, the impacts at Intersections #6, #7 and #9 would be significant and unavoidable because the success rate of the proposed TDM Program cannot be guaranteed. Overall, intersection effects would be less severe than those of the proposed project, but impacts would remain significant and unavoidable with the exception of the intersection of Ardenwood Boulevard / SR 84 Westbound Ramps, which could be mitigated to a less than significant level.

Freeway and Arterial Segment Operation

As would be the case for intersection LOS, the freeway and arterial segment effects would be less severe than those of the proposed project, but impacts would remain significant and unavoidable.

Other Issues

Other issues were found to entail less than significant impacts in the Initial Study Checklist completed for the project (see Appendix A) and briefly summarized. Effects of Reduced Development Alternative 1 would likewise be less than significant because this alternative would result in lesser intensity of development.

Reduced Development Alternative 2

Under the Reduced Development Alternative 2, future development would be allowed at increased FARs as proposed in the Ardenwood Technology Park Planned District Amendment. However, the uses allowed in Area 1 would be those associated with an office park and the uses allowed in Areas 2 and 3 would be those associated with research and development. As discussed in other sections of the EIR, the proposed project utilized the office park trip generation rate for the entire project area.

Compliance of Reduced Development Alternative 2 with Project Objectives

This alternative would meet most of the project objectives for the proposed project as the development that would occur under Reduced Development Alternative 2 could satisfy some of these objectives. For example, Reduced Development Alternative 2 could promote high-quality, architecturally distinctive development and strengthen the identity of the Ardenwood Technology Park by creating a visual and functional presence as viewed from State Route 84. These objectives could be realized under Reduced Development Alternative 2 because the increased scale of development allowed under this alternative would encourage an investment in new construction, which would promote high-quality building design and site amenities. The remaining objectives related to potential opportunities to attract new businesses to Fremont, for existing businesses to expand and grow, increased development potential, and development of a

robust TDM Program, could also be met due to the greater magnitude of permitted development under this alternative, which could make the site more attractive to a combination of research and development and office users. The Reduced Development Alternative 2, if selected, would promote development potential by increasing growth beyond the currently permitted FAR for each parcel.

Impacts

Aesthetics

Under Reduced Development Alternative 2, development would be allowed at the same increased FARs as proposed in the Ardenwood Technology Park Planned District Amendment. As with the proposed project, Reduced Development Alternative 2 would maintain the existing building height limit of 75 feet and four stories in Areas 2 and 3, and Area 1 would allow a maximum building height of 115 feet. As there are no unusual or important resources such as rock outcroppings or historic structures on any of the subject parcels, existing visual conditions would remain unaffected at the site. Potential aesthetic impacts would be less than significant, as with the proposed project.

Air Quality and Greenhouse Gas Emissions

With Reduced Development Alternative 2, the projected development (the difference between the existing floor area and what would be allowed under Reduced Development Alternative 2) would be 2,587,560 square feet, the same as the proposed project. However, the uses allowed in Area 1 would be those associated with an office park, and in Areas 2 and 3 allowed uses would be those associated with research and development. To evaluate the potential air quality impacts under the Reduced Development Alternative 2, office park and parking lot development were modeled using CalEEMod (version 2013.2.2) assuming default construction phase durations over a period of about 10 years, commencing in January 2018 with completion in January 2028.[3]

Unmitigated construction-related criteria pollutant exhaust emissions for Reduced Development Alternative 2 are presented in **Table 5-18**. The estimated emissions consider the following basic construction phases: site preparation; excavation/grading; building construction; asphalt paving; and application of architectural coatings.

TABLE 5-18
AVERAGE DAILY CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 2 (pounds/day)[a]

Scenario	ROG	NOx	Exhaust PM10[b]	Exhaust PM2.5[b]
Unmitigated Emissions (2018 to 2028)	19.15	49.89	1.61	1.50
BAAQMD Construction Threshold	54	54	82	54
Significant Impact?	No	No	No	No

NOTES:

[a] Emissions include results modeled with CalEEMod version 2013.2.2 with default phase durations, equipment, and on-road vehicle assumptions. Additional data and model outputs are included in Appendix D.

[b] BAAQMD's construction-related significance thresholds for PM10 and PM2.5 apply to exhaust emissions only and not to fugitive dust.

[3] While there is no specific predicted build-out projected for development under the existing FAR, Reduced Development Alternative 2 uses the same estimated build-out as the proposed project for comparison purposes.

As shown in Table 5-18, maximum average daily regional emissions would not exceed the BAAQMD daily significance thresholds. Thus, the Reduced Development Alternative 2 would have a less than significant impact from construction emissions.

Reduced Development Alternative 2 would generate approximately 23,201 weekday trips from existing conditions to proposed FARs that would allow approximately 2,587,560 square feet of additional floor area over existing floor area. **Table 5-19** summarizes the daily mobile, energy, and area emissions of criteria pollutants that would be generated under Reduced Development Alternative 2 and compares them with BAAQMD thresholds. **Table 5-20** summarizes the annual emissions from operations of this alternative. As indicated in Tables 5-19 and 5-20, project-related operational emissions of ROG and NOx would exceed the BAAQMD significance thresholds during operations and, thus, Reduced Development Alternative 2 would have a significant impact in relation to regional operational emissions, as would the proposed project (although emissions related to the Reduced Development Alternative 2 would be less substantial than the proposed project, it would still exceed daily and annual thresholds for three of four criteria pollutants in Tables 5-19 and 5-20 , similar to the proposed project).

TABLE 5-19
DAILY OPERATIONAL-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 2 (POUNDS/DAY)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	87.13	0.00	0.00	0.00
Energy Sources	1.37	12.48	0.95	0.95
Mobile Sources	54.07	129.35	127.12	35.98
Total Emissions	142.57	141.82	128.07	36.93
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-20
ANNUAL OPERATIONAL-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 2 (TONS/YEAR)[a]

Sources	ROG	NOx	PM10	PM2.5
Area Sources	15.90	0.00	0.00	0.00
Energy Sources	0.25	2.28	0.17	0.17
Mobile Sources	6.95	17.11	16.76	4.77
Total Emissions	23.09	19.38	16.93	4.94
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

As with the proposed project, implementation of a TDM Program as a mitigation measure could be required, however, since the project consists of an increase in permitted FAR and actual development details are unknown at this time, implementation of a TDM would be considered speculative. Energy efficiency measures (such as Mitigation Measure 4.A-2) could be feasible but the overall effectiveness would be the same as the proposed project. Therefore, this impact would remain significant and unavoidable for emissions of ROG, NOx and PM_{10}.

Under Reduced Development Alternative 2, the construction period is anticipated to last 10 years with construction and operation occurring concurrently. As buildings are finished they would begin operation while the remainder of the site is being constructed. This would result in operational and construction emissions occurring at the same time. Because the projected construction schedule is unknown, a conservative calculation was estimated for construction plus operational emissions by adding the average construction emissions to the maximum operational emissions. While this slightly over estimates total emissions, it would not change the significance findings for operational emissions. **Tables 5-21** and **5-22** show the maximum daily and annual construction and operational overlap respectively. As shown, emissions of ROG, NOx and PM_{10} would be above significance thresholds and would be considered significant and unavoidable for those three pollutants. While the same pollutants would exceed thresholds as with the proposed project, Reduced Development Alternative 2 would result in less pollutant emissions on a daily and annual basis than the proposed project.

BAAQMD's GHG emissions thresholds are based on direct emissions from a project's vehicle trip generation, onsite water and space heating, and other stationary sources, as well as indirect emissions from offsite electrical generation, solid waste generation, and water conveyance and treatment. The GHG emitting activities associated with Reduced Development Alternative 2 are the same as those for the proposed project.

TABLE 5-21
DAILY COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 2 (POUNDS/DAY)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	19.15	49.89	1.61	1.50
Area Sources	87.13	0.00	0.00	0.00
Energy Sources	1.37	12.48	0.95	0.95
Mobile Sources	54.07	129.35	127.12	35.98
Total Emissions	161.72	191.72	129.68	38.43
BAAQMD Operational Threshold	54	54	82	54
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for Permitted development operations during the Winter season. Additional data and assumptions are in Appendix D.

TABLE 5-22
ANNUAL COMBINED OPERATIONAL AND CONSTRUCTION-RELATED POLLUTANT EMISSIONS, REDUCED DEVELOPMENT ALTERNATIVE 2 (tons/year)[a]

Sources	ROG	NOx	PM10	PM2.5
Construction	2.49	6.49	0.21	0.20
Area Sources	15.90	0.00	0.00	0.00
Energy Sources	0.25	2.28	0.17	0.17
Mobile Sources	6.95	17.11	16.76	4.77
Total Emissions	25.58	25.87	17.14	5.14
BAAQMD Operational Threshold	10	10	15	10
Significant Impact?	Yes	Yes	Yes	No

NOTES:

[a] Emissions include results modeled with CalEEMod for annual Permitted development operations. Additional data and assumptions are in Appendix D.

Emissions from Reduced Development Alternative 2 include construction emissions over the full buildout duration as estimated using CalEEMod and amortized assuming a 30-year development lifetime and added to overall project emissions for comparison to significance thresholds. In regards to operations, the CalEEMod model was used to estimate GHG emissions, which are depicted in **Table 5-23**.

TABLE 5-23
REDUCED DEVELOPMENT ALTERNATIVE 2 - ESTIMATED UNMITIGATED EMISSIONS OF GREENHOUSE GASES (METRIC TONS CO_2E/YEAR)[a]

Source	Emissions
Project Construction (Amortized)	860.10
Area Sources	0.05
Energy Sources	10,562.46
Mobile Sources	16,995.01
Waste Sources	593.11
Water Sources	2,584.17
Total Project GHG Emissions (Construction + Operations)[b]	31,594.90
Operational GHG Emissions per Increase in Service Population (6,469 jobs)[a]	4.88
BAAQMD GHG Efficiency Threshold	*4.6*
Significant (Yes or No)?	*Yes*

[a] The net service population represents the incremental increase in jobs within the project site due to Reduced Development Alternative 2 development. The value does not include jobs associated with the existing land uses on the project site. Assumes 3 employees per 1,000 square feet for office use and 2 employees per 1,000 square feet for R&D use.

[b] Total project GHG emissions are the sum of the amortized construction emissions plus the total operational emissions.

Table 5-23 indicates that the increased GHG emissions associated with the project would exceed BAAQMD's "efficiency threshold" of 4.6 metric tons of CO_2e per service population per year. Under Reduced Development Alternative 2, the area of proposed development is the same as the proposed project, but the land use types would vary. This would result in less overall emissions for this alternative than projected for the proposed project. However, the number of employees

would also decrease, as only about half of the development is assumed to be the more intensive office use, with the remaining research and development use assumed at a density of two employees per 1,000 feet. Per service population emissions are the total emissions for this alternative divided by the anticipated number of employees. This would represent a potentially significant cumulative GHG impact without mitigation. With the inclusion of Mitigation Measure 4.B-1, implementation of a project-specific GHG Reduction Plan would reduce GHG emissions to below the BAAQMD significance threshold. This would be achieved by implementing energy efficiency measures as part of the final project design such as installing solar photovoltaic panels on buildings roofs and installing solar water heaters. This would represent a less-than-significant cumulative GHG impact, similar to the proposed project.

Biological Resources

Potential impacts to sensitive species or nesting birds (including construction-related noise impacts) could occur with Reduced Development Alternative 2. To reduce this impact, implementation of mitigation measures Bio-1 and Bio-2, identified in the Initial Study for this project and requiring preconstruction surveys for burrowing owls or nesting birds, would be required at the time specific development projects are proposed under this alternative to reduce this impact. Impacts would be less than significant, similar to the proposed project.

Cultural and Historical Resources

There are no identified historical resources on any of the 32 subject parcels in the project area. In addition, that are no known archaeological or paleontological resources, however, there is a possibility that unrecorded resources exist within the project area, which could be unearthed during grading activities under Reduced Development Alternative 2. Mitigation Measure Cult-1, identified in the Initial Study for this project, would be applied to specific development proposals to reduce potential impacts to archaeological or paleontological resources by requiring cessation of work and adherence to specific professional protocols should a discovery be made during excavation. Impacts would be less than significant, similar to the proposed project.

Noise

As with the proposed project, noise impacts that could result from construction of future development under the Reduced Development Alternative 2 would be less than significant. The proposed project would generate approximately 29,550 daily trips and the Reduced Development Alternative 2 would generate approximately 23,201 daily trips from the proposed FAR increase that would allow approximately 2,587,560 square feet of office park uses and 2,587,560 square feet of office park/research and development uses (1,296,398 square feet of office park uses and 1,291,162 square feet of research and development uses), respectively, of additional floor area over existing developed floor area. Since the resulting reduction of daily trip rates as compared to the proposed project would result in an overall reduction in traffic volumes, the traffic noise impacts from the Reduced Development Alternative 2 would be less than those found under the proposed project. Therefore, there would be no substantial increases in traffic noise at any of the intersections analyzed that would result in a potentially significant impact. Traffic noise from Reduced Development Alternative 2 would be less than the proposed project.

Transportation

Vehicle trip generation under Reduced Development Alternative 2 would be approximately 22 percent lower than under the proposed project (see **Table 5-24**). The change from existing condition to Reduced Development Alternative 2 would result in a total of 23,201 additional daily trips, including 3,419 trips during the a.m. peak hour and 3,022 trips during the p.m. peak hour.

TABLE 5-24
REDUCED DEVELOPMENT ALTERNATIVE 2 TRIP GENERATION SUMMARY

Scenario (Net Change) Land Use	Units (ksf)	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Office Park	1,296.398	11.42	14,805	1.71	2,217	1,973	244	1.48	1,919	269	1,650
R&D Center	1,291.162	6.50	8,396	0.93	1,202	998	204	0.85	1,103	165	938
Total			**23,201**		**3,419**	**2,971**	**448**		**3,022**	**434**	**2,588**

NOTE: ksf = 1,000 square feet
SOURCE: W-Trans, 2016, using ITE, *Trip Generation Manual*, 9th Edition, 2012.

Intersection Levels of Service

The impact of Reduced Development Alternative 2 would be less than under the proposed project because of the above-described reduced trip generation. However, the increased vehicle delay during the a.m. peak hour would cause a significant impact at the intersections of Decoto Road / I-880 Northbound Ramps (#6), Decoto Road / I-880 Southbound Ramps (#7), Ardenwood Boulevard / SR 84 Westbound Ramps (#8), and Paseo Padre Parkway / SR 84 Westbound Ramps (#9), similar to the proposed project. As with the proposed project, the impacts at Intersections #6, #7 and #9 also would be significant and unavoidable because the success rate of the proposed TDM Program cannot be guaranteed. Overall, intersection effects would be less severe than those of the proposed project, but impacts would remain significant and unavoidable with the exception of the intersection of Ardenwood Boulevard / SR 84 Westbound Ramps, which could be mitigated to a less than significant level.

Freeway and Arterial Segment Operation

As would be the case for intersection levels of service, the freeway and arterial segment effects would be less severe than those of the proposed project, but would remain significant and unavoidable.

Other Issues

Other issues were found to entail less than significant impacts in the Initial Study Checklist completed for the project (see Appendix A) and briefly summarized. Effects of Reduced Development Alternative 2 would likewise be less than significant because this alternative would result in reduced trip generation.

E. Environmentally Superior Alternative

A summary table showing the differences between the alternatives and the proposed project (after mitigation) is provided in **Table 5-25**.

TABLE 5-25
ALTERNATIVES IMPACT SUMMARY AND COMPARISON

Impact	No Project	Reduced Development Alternative 1	Reduced Development Alternative 2	Proposed Project
Air Quality: Construction Emissions	Less than Significant ⇩	Less than Significant ⇩	Less than Significant ⇩	Less than Significant with Mitigation
Air Quality: Operational Emissions	Significant and Unavoidable ⇩	Significant and Unavoidable ⇩	Significant and Unavoidable ⇩	Significant and Unavoidable
Transportation and Traffic	Significant and Unavoidable ⇩	Significant and Unavoidable ⇩	Significant and Unavoidable ⇩	Significant and Unavoidable
Aesthetics	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Biological Resources	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
Cultural Resources	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation	Less than Significant with Mitigation
Geology and Soils	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Greenhouse Gases	Significant and Unavoidable	Less than Significant with Mitigation ⇧	Less than Significant with Mitigation ⇧	Less than Significant with Mitigation
Hazards and Hazardous Materials	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Hydrology and Water Quality	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Land Use and Planning	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Noise	Less than Significant with Mitigation ⇩	Less than Significant with Mitigation ⇩	Less than Significant with Mitigation ⇩	Less than Significant with Mitigation
Population and Housing	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Public Services and Utilities	Less than Significant	Less than Significant	Less than Significant	Less than Significant
Recreation	Less than Significant	Less than Significant	Less than Significant	Less than Significant

NOTES: ⇧/⇩ - The impact is more/less severe than compared to the proposed project.

The color gradients in the table are a visual representation of the significance findings with the lightest or absence of color representing the least amount of impact, and the darkest shade representing a severe impact.

SOURCE: Environmental Science Associates

CEQA requires that an environmentally superior alternative be identified. While a No Project Alternative is often the environmentally superior alternative to a project, in this case, the No Project Alternative would result in a significant and unavoidable impact from GHG emissions. Under the proposed project and the alternatives, the implementation of mitigation measures would reduce the GHG emissions to a level that is under the BAAQMD's efficiency threshold. However, because further development of the site under the No Project Alternative would be limited by the existing

Planned Development zoning regulations, there would be no implementation of mitigation and, therefore, the No Project Alternative would have a significant and unavoidable impact with respect to the emission of GHGs. In addition, the No Project Alternative would not be consistent with the project objectives, which are presented above and in Chapter 3.

Reduced Development Alternative 2 would be the environmentally superior alternative as it would meet all of the project objectives while also reducing, although not eliminating, some of the impacts identified for the proposed project related to air quality and transportation. In addition, the operational GHG emissions per increase in service population is slightly less for Reduced Development Alternative 2 than it is for the proposed project. While they would both exceed the BAAQMD GHG Efficiency Threshold, implementation of mitigation measures would reduce emissions to below the significance threshold.

F. Alternatives Considered but Rejected

CEQA Guidelines § 15126.6 sets forth several requirements regarding the consideration of alternatives in an EIR. This section and related case law hold that alternatives that are not reasonable or are infeasible need not be discussed at length; alternatives that do not offer substantial environmental advantages over the project can be rejected from consideration; and alternatives that do not accomplish most of the basic objectives of the project can be excluded from detailed analysis. Accordingly, this section briefly summarizes alternatives considered but rejected from further analysis.

Designation of parcels as General Office

Under this alternative, the Ardenwood Technology Park parcels would be classified as General Office land use. General Office would limit the allowable type of development to office buildings and is used particularly if information is known about the individual buildings. Because this land use is less general than the Office Park classification, it could be more restrictive. It was rejected from further analyses because it did not meet the goals and objectives of the project.

Designation of a portion of the parcels as Business Park

Under this alternative, the Ardenwood Technology Park parcels would be classified as Business Park land use. Business parks consist of a group of flex-type or incubator one- or two-story buildings served by a common roadway system. The tenant space is flexible and lends itself to a variety of uses. The average mix is 20 to 30 percent office/commercial and 70 to 80 percent industrial/warehousing. Because the proposed project would primarily be for office uses, the Business Park land use did not meet these needs as well as Office Park. It was rejected from further analyses because it did not meet the goals and objectives of the project.

Alternative Location

The City did not identify any sites other than the Ardenwood Technology Park because the project is “location specific.” The purpose of this project is to establish a framework to transition a low-scale 1980s business park into a 21st century employment district that encourages development of high-quality, distinctive corporate office and headquarter operations, research and

development activities, advanced manufacturing and supportive services that will create a strong local economy and provide opportunities for businesses to locate and expand in Fremont – capitalizing on the State Route 84 gateway opportunity where Fremont connects directly to the Peninsula. The project proposes to increase development potential within this City-identified priority industrial area. No other sites in the area met these criteria. Accordingly, no Alternative Location (off-site alternative) has been carried forward for detailed analysis.

This page intentionally left blank

CHAPTER 6
Other Statutory Sections

Consistent with CEQA *Guidelines* § 15126.2, this section summarizes the growth-inducing effects, significant irreversible environmental changes, significant unavoidable environmental effects, and effects found to be less than significant associated with the proposed project. Cumulative impacts are separately discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures.

A. Growth-Inducing Impacts

The CEQA *Guidelines* require that an EIR evaluate the growth-inducing impacts of a proposed action (§ 15126.2(d)). A growth-inducing impact is defined by the CEQA *Guidelines* as:

> *[T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth .... It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.*

A project can have direct and/or indirect growth-inducement potential. Direct growth inducement would result if a project involved construction of new housing. A project can have indirect growth-inducement potential if it would establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) that would encourage development of new housing for employees, or if it would involve a substantial construction effort creating short-term employment opportunities. Similarly, under CEQA, a project would indirectly induce growth if it would remove an obstacle to additional growth and development, such as removing a constraint on a required public service. Infrastructure projects could also indirectly stimulate growth by enhancing access to properties, or increasing their desirability for development.

Increases in population could tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The CEQA *Guidelines* also require analysis of the characteristics of projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The timing, magnitude and location of land development and population growth are based on various interrelated land use and economic variables. Key variables include regional economic trends, market demand for residential and non-residential uses, land availability and cost, the availability and quality of transportation facilities and public services, proximity to employment centers, the supply and cost of housing, and regulatory policies or conditions. Since a general plan

defines the location, type and intensity of growth, it is the primary means of regulating development and growth in California.

Growth from the Proposed Planned District Amendment

The project does not propose to alter or develop any residential uses on-site; therefore, the proposed project would not directly induce substantial population growth. However, the project proposes a Planned District Amendment that would allow an increase in FAR from 0.35 up to 0.75, allowing for additional floor area within the project area. As discussed in the Population and Housing section of the Initial Study, the 2011 General Plan EIR assumed an average of 2.07 employees per 1,000 square feet of building space that would accommodate industrial and research and development land uses. However, the proposed project would accommodate office park uses and would be subject to the standard employment calculation of three employees per 1,000 square feet. Using this assumption, the additional floor area allowed by the proposed project versus existing floor area could generate up to approximately 7,760 new jobs at full development potential. The California Employment Development Department indicates that, for the year 2014, the City of Fremont had 5,300 unemployed persons for an unemployment rate of 4.6 percent (EDD, 2016). As such, the project is not likely to induce substantial indirect population growth within the City of Fremont.

While the proposed project would increase employment in Fremont, the increased demand for commercial services would also be met by the proposed Planned District Amendment, which would allow the following additional uses within the project area in order to serve the expected employee populations: restaurants and cafes, personal services such as dry cleaners and fitness clubs, daycare facilities for children of company employees only, and other similar services. Thus, no significant growth-inducing impacts would result from the project.

B. Significant Irreversible Changes

CEQA *Guidelines* § 15126.2(c) specifies that an EIR discuss potential impacts associated with a proposed project that may be considered to be significant and irreversible for the following reasons:

- Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes the removal or non-use thereafter unlikely
- Primary impacts (e.g., removal of agricultural lands) and, particularly, secondary impacts (such as a highway improvement that provides access to a previously inaccessible area) generally commit future generations to similar uses
- Irreversible damage can result from environmental accidents associated with the project

Adoption of the proposed project is expected to result in the increase in developable area of vacant, undeveloped and/or underutilized properties in the project area. Subsequent development within the project area would involve a long-term commitment to these uses. It is unlikely that

circumstances would arise that would justify the return of the land to its previous condition. Because the development facilitated by the proposed project would occur within an urban area surrounded by similar or compatible uses, any changes within the project area resulting from the increase in FAR would not be significant. Furthermore, development within the project area would be permitted under the existing Planned District at lower FARs and, thus, could occur regardless of the proposed project.

Because the proposed project would amend the Planned District regulations, it would indirectly commit materials to the construction and redevelopment of the project area. Construction resulting from the proposed project and ongoing occupation would result in the use of energy, including nonrenewable fossil fuels.

State and local laws and regulations that are administered and enforced by the City would reduce risks associated with the routine use, storage, and transportation of hazardous materials in connection with construction activities to acceptable levels. After construction, the proposed development would not emit hazardous materials and/or be expected to pose an unacceptable risk of accidental release of hazardous substances. Consequently, adherence to existing federal, state, and local regulations, the General Plan and Fremont Municipal Code would reduce impacts to less-than-significant levels.

C. Cumulative Impacts

The approach used in this EIR for cumulative impact analysis is described in the introduction to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. The analysis of each environmental topic included in Chapter 4 evaluates possible cumulative impacts considering regional development in combination with the build-out of the proposed project.

As noted below, under D., Significant and Unavoidable Environmental Impacts, construction and operation of the proposed project in combination with proposed development in the surrounding area would result in significant and unavoidable impacts under cumulative conditions related to air quality and transportation.

D. Significant and Unavoidable Environmental Impacts

Section 21100(b)(2)(A) of CEQA requires an EIR to identify significant environmental effects that cannot be avoided if a project is implemented. Impacts that remain significant and unavoidable after mitigation include:

> **Impact 4.A-2:** Development facilitated by the proposed project could potentially generate operational emissions that would result in a considerable net increase of criteria pollutants and precursors for which the air basin is in nonattainment under an applicable federal or state ambient air quality standard.

- The project consists of an increase in permitted FAR and actual development details are unknown at this time. Although the degree of project-specific reduction measure implementation has not been incorporated into this emissions analysis, based on the

substantial size of development allowed under the project, operational emissions would still result in significant environmental effects on air quality and contribute substantially to an existing air quality violation (ozone precursors and particulate matter). Therefore, this impact would remain significant and unavoidable for emissions of ROG, NOx and PM10.

Impact 4.A-4: Development facilitated by the proposed project could potentially conflict with or obstruct implementation of the applicable air quality plan.

- As previously discussed under Impact 4.A-2, the project would result in operational emissions that would exceed the BAAQMD significance thresholds even after mitigation is applied. Implementation of Mitigation Measure 4.A-4 would incorporate energy efficiency strategies. However, since the project would increase the permitted FAR and actual development details are unknown at this time, implementation of Mitigation Measure 4.A-4 would be considered speculative. Therefore, the proposed project would potentially conflict with or obstruct implementation of the 2010 Clean Air Plan, and the impact would be significant and unavoidable.

Impact 4.A-5: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, could potentially result in a significant adverse cumulative air quality impact.

- As described in Impact 4.A-2, project operational emissions of ROG, NOx and PM10 would exceed the significance thresholds even with mitigation. Project impacts would, therefore, be significant. Because operational criteria pollutant emissions associated with the project would be significant and unavoidable, project emissions would make a cumulatively considerable contribution to emissions from other projects, which would result in cumulatively significant air quality impacts.

Impact 4.D-1: Development facilitated by the proposed project would increase traffic volumes on the area roadway network, affecting the performance of intersections, freeways and arterial roadways.

Intersection Levels of Service. Existing plus Project traffic volumes are shown in Section 4.D, Transportation in Figure 4.D-6 and the levels of service for the study intersections are summarized in Table 4.D-10. Under Existing plus Project Conditions, all of the study intersections would continue operating acceptably, except the following four intersections, at which drivers would experience a significant impact:

6. Decoto Road / I-880 Northbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
7. Decoto Road / I-880 Southbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
8. Ardenwood Boulevard / SR 84 Westbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)
9. Paseo Padre Parkway / SR 84 Westbound Ramps (degrade to unacceptable LOS F during the a.m. peak hour)

- The significant impacts at Intersections 6, 7 and 9 would be partially mitigated with implementation of Mitigation Measure 4.D-1. Implementation of Mitigation Measure 4.D-2 would reduce the impact at Intersection 8 to a less-than-significant level.

Freeway Segment Levels of Service. Under Existing plus Project Conditions, the project would significantly contribute to, or be responsible for, unacceptable operating conditions on four freeway segments, on which drivers would experience a significant impact.

- The impacts could be partially mitigated with implementation of a Transportation Demand Management (TDM) Program. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Arterial Segment Levels of Service. Under Existing plus Project Conditions, the project would significantly contribute to, or be responsible for, unacceptable operating conditions on two arterial segments, on which drivers would experience a significant impact.

- The impacts could be partially mitigated with implementation of a TDM Program. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Impact 4.D-2: The proposed project, combined with cumulative development, including past, present, and reasonably foreseeable future development, would result in significant cumulative transportation impacts.

Freeway Segment Levels of Service. The project would significantly contribute to, or be responsible for, unacceptable operating conditions on five freeway segments during one or both peak hours under Cumulative plus Project Conditions.

1a. I-880 northbound from Decoto Road to Alvarado Road during the p.m. peak hour

1b. I-880 southbound from Alvarado Road to Decoto Road during both peak hours

2a. I-880 northbound between Thornton Avenue and Decoto Road during the a.m. peak hour

2b. I-880 southbound between Decoto Road and Thornton Avenue during both peak hours

4a. SR 84 eastbound between Thornton Avenue and Ardenwood Boulevard during the p.m. peak hour

- The impacts could be partially mitigated with implementation of the proposed TDM Program. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

Arterial Segment Levels of Service. Under Cumulative plus Project Conditions, the project would have a significant cumulative impact on six study segments during either the morning or evening peak period.

1a. Decoto Road eastbound from I-880 to Fremont Boulevard during the p.m. peak hour

1b. Decoto Road westbound from Fremont Boulevard to I-880 during the a.m. peak hour

2a. Decoto Road eastbound from Fremont Boulevard to Paseo Padre Parkway during the p.m. peak hour

2b. Decoto Road westbound from Paseo Padre Parkway to Fremont Boulevard during the a.m. peak hour

3a. Fremont Boulevard northbound from Thornton Avenue to Decoto Road during the a.m. peak hour

3b. Fremont Boulevard southbound from Decoto Road to Thornton Avenue during the p.m. peak hour

- The impacts could be partially mitigated with implementation of the proposed TDM Program. However, because the efficacy of the TDM Program cannot be guaranteed, the cumulative impacts would remain significant and unavoidable.

References

State of California Employment Development Department (EDD), 2016. Labor Force and Unemployment Rate for Cities and Census Designated Places, available online at http://www.labormarketinfo.edd.ca.gov/data/labor-force-and-unemployment-for-cities-and-census-areas.html, City of Fremont 2014, accessed January 28, 2016.

CHAPTER 7
Report Preparers

A. Report Authors

Lead Agency

City of Fremont

Kristie Wheeler	Planning Manager
Ingrid Rademaker	Principal Planner
Steve Kowalski	Associate Planner

Consultants

Environmental Science Associates

Karl Heisler	Project Director
Erin Higbee-Kollu	Project Manager
Jack Hutchison, P.E.	Traffic and Transportation
Matt Morales and Stan Armstrong	Air Quality, Noise, and Greenhouse Gas Emissions
Ron Teitel	Graphics
Lisa Bautista	Word Processing

W-Trans

Mark Spencer, P.E.	Principal
Smadar Boardman	Associate Engineer

This page intentionally left blank