Appendix A Notice of Preparation and Public Comment Letters

Appendices

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Community Development Department
Planning Division

415 Diamond Street, P.O. Box 270
Redondo Beach, California 90277-0270
www.redondo.org

tel: 310 318-0637
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NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT AND NOTICE OF PUBLIC SCOPING MEETING

To: State Clearinghouse, Responsible Agencies, and Interested Individuals

From: City of Redondo Beach, Community Development Department
415 Diamond Street
Redondo Beach, California 90277

Date: June 1, 2023

Subject: Notice of Preparation of a Draft Environmental Impact Report, Notice of Public Review Period, and Notice of Public Scoping Meeting

Project: Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment

Lead Agency: City of Redondo Beach

Scoping Meeting: The Scoping Meeting will be held on **June 8, 2023,** from **6:00 PM to 8:00 PM** at **Redondo Beach Main Library, Second Floor Conference Room, 303 N. Pacific Coast Highway, Redondo Beach, CA 90277.**

PROJECT SUMMARY: California state law requires each city and county to adopt a comprehensive, long-term general plan (Govt. Code § 65300). The City's General Plan represents the community's vision of its future: it also serves as the blueprint guiding the city. The City will use the goals and policies of the General Plan as a basis from which to make their land use, housing, mobility, infrastructure (Capital Improvements), and open space and parks decisions. Redondo Beach has selected the year 2050 as its planning horizon.

The City is updating four of the State-required elements that make up the General Plan: the Land Use, Open Space and Conservation, Safety, and Noise elements. Updates to these elements will be accompanied by associated revisions to the City's Zoning Code and Local Coastal Program needed to make consistent and implement the updated goals and policies. In addition, updates to the General Plan Land Use designations will be reviewed pursuant to the City Charter, Article XXVII, Area of Major Changes in Allowable Land Use.

NOTICE OF PREPARATION: Pursuant to Public Resources Code Section 21165 and the California Environmental Quality Act Guidelines (CEQA Guidelines) Section 15050, the City of Redondo Beach (City) is the Lead Agency responsible for preparation of an Environmental Impact Report (EIR) addressing potential impacts associated with the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment (LCPA) for the project described below. In compliance with Section 15082 of the CEQA Guidelines, the City of Redondo Beach is sending this Notice of Preparation (NOP) to responsible agencies, interested parties, and trustee agencies that may be affected by the project.

PROJECT LOCATION: Redondo Beach is in the South Bay region of Los Angeles County. It is bordered to the north by Hermosa Beach, Manhattan Beach, Hawthorne, and El Segundo; to the east by Torrance and Lawndale; to the south by the Palos Verdes Peninsula; and to the west by the Pacific Ocean. A regional location map depicting Redondo Beach and neighboring cities is on Figure 1. For purposes of the General Plan Update, the project planning area includes the entire geographic area of the city, which has a total land area of approximately 3,970 acres (6.2 square miles). As depicted on Figure 1, *Project Area*, the City of Redondo Beach is developed with a variety of land uses, such as established residential neighborhoods, commercial corridors, industrial complexes, public facilities, and parks.

PROJECT DESCRIPTION: Below is a summary of the elements that have been revised as part of the updated General Plan —Land Use, Open Space and Conservation, Noise, and Safety elements. These will be accompanied by associated revisions to the Zoning Code and Local Coastal Program. Updates to the General Plan Land Use element will also be analyzed pursuant to the City Charter, Article XXVII, Area of Major Changes in Allowable Land Use.

For more information on each element, please visit the City's website: www.redondo.org/depts/community_development/planredondo/default.asp.

LAND USE ELEMENT: The Land Use element describes policy direction and criteria for development, including building intensity and population density. Land use designations are used to depict the general distribution, location, and extent of public and private uses of land. The key components of this element are the policy framework, that is, the goals and policies that guide land-use decisions and help shape future development and public investment; the land use plan, including the land use plan and designations; the special policy areas discussions; buildout assumptions and the implementation actions.

The Land Use element ensures the provision of a range of land uses to support the community's vision of diverse housing options and a vibrant economy and provides direction on how land uses should relate to one another to safeguard safety and compatibility.

LAND USE DESIGNATIONS AND PLAN: The land use plan consists of three primary components: the land use designations with intensities, the land use map, and the buildout totals associated with the map. The land use designations establish the types and intensity of land uses. In this context, intensity can refer to dwelling units per acre, land coverage, floor area ratio, or some combination of development metric, as shown in Table 1. The land use plan displays the pattern, distribution, and intensity of land use designations across the entire city, down to the parcel level. Table 1 outlines the definitions of each of the existing and proposed designations. Figure 2 shows the fundamental pattern of existing land uses, Figure 3 shows the current General Plan land uses, and Figure 4 depicts proposed General Plan land uses.

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
Residential*			
R-1	Up to and including 8.8 du/ac	Up to and including 8.8 du/ac	Single-family residential uses.
R-1-A	Up to and including 17.5 du/ac	Up to and including 17.5 du/ac	Single-family residential uses.

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
R-2	Up to and including 14.6 du/ac	Up to and including 14.6 du/ac	Single-family residential uses, duplexes, townhomes, condominiums, apartments.
R-3	Up to and including 17.5 du/ac	Up to and including 17.5 du/ac	Single-family residential uses, duplexes, townhomes, condominiums, apartments.
RMD	Up to and including 23.3 du/ac	Up to and including 23.3 du/ac	Single-family residential uses, duplexes, townhomes, condominiums, apartments.
RH	Up to and including 28 du/ac	Min. 20 du/ac Max. 30 du/ac	Single-family residential uses, duplexes, townhomes, condominiums, apartments. It is recommended that residential projects in this designation include an affordable component. Maximum FAR 1.50, minimum density of 20 dwelling units per acre and a maximum density of 30 dwelling units per acre, density may increase consistent with state law for affordable units.
** Notes:* *1) For properties within a residential overlay area, the maximum density allowed within the overlay shall prevail.* *2) Existing commercial uses within residential land use districts shall be considered legally conforming.*			
Commercial			
Neighborhood Commercial (CN)	--	Max. FAR 0.50 Max FAR 1.50 for Artesia and Aviation Boulevard Special Policy Areas	Provides for commercial districts with uses that complement adjacent residential neighborhoods. Allowed uses include retail, restaurants, personal services, office, hotel,* kenneling,* and similar uses. The intent of this designation is to provide goods and services that meet the needs of residents and businesses. Buildings in the CN districts should front the street with rear, alley loaded parking where feasible. Where CN designations contain existing residential uses, they shall be allowed to remain and shall be considered conforming; however, no new residential units are permitted. Maximum FAR 0.50 (except for the Artesia and Aviation Boulevard Special Policy Areas, where the Maximum FAR is 1.50). **Conditionally permitted subject to zoning code.*
Coastal Commercial (CC)	Per Redondo Beach Pier Master Plan and Local Coastal Program (LCP)	Per Redondo Beach Pier Master Plan and Local Coastal Program (LCP)	Provides for coastal and recreation-oriented commercial retail and service uses.
C-1	FAR 0.35	FAR 0.35	Retail commercial, eating and drinking establishments, household goods, food sales, drugstores, building materials and supplies, professional offices, personal services, cultural facilities, and similar uses.
C-2	FAR 0.50	FAR 0.50	Same uses as C-1 and movie theaters, and overnight accommodations; except Riviera Village where no "footprint" exceeding 30,000 sq. ft. is permitted for a single use for food sales, retail goods, or other large volume uses.
C-3	FAR 0.70	FAR 0.70	Same uses as C-2.
C-4	FAR 1.00	FAR 1.00	Same uses as C-2.

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
C-5	a. FAR 0.70 b. FAR 0.70 c. FAR 1.00 d. FAR 1.50 e. N/A	a. FAR 0.70 b. FAR 0.70 c. FAR 1.00 d. FAR 1.50 e. N/A	a. Retail commercial, personal and business services, professional offices, household supply and furnishings, eating and drinking establishments, drug stores, entertainment, automobile related sales, car wash, and similar uses. b. Automobile and marine related repair (west side of Catalina Avenue). c. Light industrial and wholesale uses (west side of Catalina Avenue). d. Storage and self-storage (west side of Catalina Avenue). e. Boat and recreational vehicle outdoor storage (west side of Catalina Avenue).
Mixed-Use			
Mixed-Use Transit Center (MU-TC)		Max. FAR 1.50 Up to and including 30 du/ac	Provides for an integrated mix of both community and regional serving commercial retail, service, office, entertainment, hotel and residential uses in close proximity to transit stations. Mixed-use transit center development should be of high quality and designed to be pedestrian-oriented and integrated with existing surrounding uses. This designation also allows for public uses such as libraries, parks, museums, and cultural facilities. Configurations include ground floor commercial with residential units on upper floors or stand-alone commercial, office and residential development.
Mixed-Use Low (MU-1)	a. All uses permitted in C-2, except large-scale single use food sales and retail facilities "footprints" exceeding 30,000 square feet. Floor: area ratio 0.5. b. Residential units on the second floor and higher integrated with commercial; provided that impacts are mitigated. Floor area ratio: 1.5; provided that all density exceeding 0.7 is developed for residential units to a maximum density of 35 units per net acre. c. Single-family residential, duplexes, townhomes, condominiums, apartments. 35 units per net acre; minimum	Commercial Only: 0.35-0.50 FAR Commercial and Residential together: Max. FAR 1.50 (all density exceeding 0.70 FAR must be residential units) Up to and including 30 du/ac	Provides for an integrated mix of commercial retail, service, office, entertainment, and residential uses. Uses can be mixed in a vertical or horizontal configuration. Mixed-use development should be of high quality and designed to integrate with existing surrounding uses. Configurations include ground floor commercial with residential units on upper floors or stand-alone commercial or office development. This designation is intended to encourage pedestrian-oriented development that has a strong emphasis on creating a safe and attractive streetscape. It is recommended that residential projects in this designation include an affordable component. Maximum FAR 1.50 and density up to and including 30 dwelling units per acre, density may increase consistent with state law for affordable units.

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
	development site is the entire block face.		
Mixed-Use Medium Low (MU-2)	a. All uses permitted in C-2, except large-scale single use food sales and retail facilities "footprints" exceeding 30,000 square feet. Floor area ratio: 0.7. b. Residential units. 35 units per net acre. c. Residential units on the second floor and higher integrated with commercial; provided that impacts are mitigated. Floor area ratio: 1.5; provided that all density exceeding 0.7 is developed for residential units to a maximum density of 35 units per net acre.	Commercial Only: 1.00 FAR Commercial and Residential together: Max. FAR 1.50 (all density exceeding 0.70 FAR must be residential units) Up to and including 35 du/ac.	Provides for an integrated mix of commercial retail, service, office, entertainment, and residential uses in the City's activity centers. Uses can be mixed in a vertical or horizontal configuration. Mixed-use development should be of high quality, designed to integrate with existing surrounding uses. Configurations include ground floor commercial or office with residential units or office uses on upper floors or standalone commercial or office development. This designation is intended to encourage pedestrian-oriented environments that have a strong emphasis on creating a safe and attractive streetscape. It is recommended that residential projects in this designation include an affordable component. Maximum FAR 1.50 and density up to and including 35 dwelling units per acre, density may increase consistent with state law for affordable units.
Mixed-Use (MU-3)	a. All uses permitted in C-2, except large-scale single use food sales and retail facilities "footprints" exceeding 30,000 square feet. Floor area ratio: 1.0. b Residential units on the second floor and higher; provided that impacts are mitigated. Floor area ratio: 1.5; provided that all density exceeding 0.7 is developed for residential units and densities exceeding 35 units per net acre are developed as affordable units.	--	Current mixed-use designations MU-1 and MU-2 were combined into proposed designation Mixed Use Low (MU-1). Current mixed-use designation MU-3 has been re-numbered in the proposed plan to MU-2. The proposed plan does not include an MU-3 designation.
Industrial			
I-1	FAR 0.7	FAR 1.00	Light industrial, research and development, "office park" facilities, manufacture of spacecraft and associated aerospace systems, supporting commercial uses (e.g., restaurants, banks, copiers, and similar uses), educational and governmental facilities, and day care centers.

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
I-2	FAR 1.00	FAR 1.00	Same uses as I-1.
I-3	FAR 0.7	FAR 1.00	Same uses as I-1, and building material sales, furniture stores, vehicles sales and services, maintenance and repair services, restaurants, banks, photocopies, and similar uses.
Industrial Flex (IF)	--	Max. FAR 1.00	Provides for an integrated mix of light industrial and commercial and/or office uses such as: commercial, research and development, incubator space, creative or technology-based businesses, offices, hotel, and supporting commercial uses. The overall character in this designation is intended to create a creative/tech incubator district with supporting uses.
Public/Institutional/Open Space			
Public (P)	N/A	--	Governmental administrative and capital facilities, parks, schools, libraries, hospitals and associated medical offices, public cultural facilities, public open space, utility easements, and other public uses.
Overlays (PD)	N/A	--	Offices shall be located at the rear or above the first floor of structures whose ground floor is occupied by pedestrian-oriented uses (e.g., retail sales and restaurants).
Public/Institutional (PI)	--	Max. FAR 0.75 for all properties except: Max. FAR 1.25 at City Hall bounded by PCH, Broadway, Carnelian St, and Diamond St Max. FAR 1.25 at the Annex site on Northeast Corner of PCH and Vincent St Subject to Planning Commission Design Review	Provides for governmental administrative and capital facilities, schools, libraries, hospitals and associated medical offices, public cultural facilities, and other public uses, ancillary parks, recreation and open spaces. Maximum FAR 0.75/1.25 (subject to Planning Commission Design Review).
Public/Utility (U)	--	Max. FAR 0.10	Provides for utility uses including easements with public access for recreation and parking. Maximum FAR 0.10.
Parks and Open Space (OS)	--	Max. FAR 0.20	Provides for public open space, passive park uses, sports fields, active recreation uses, and coastal-related recreational activities as well as accompanying public facilities such as restrooms, picnic pavilions, parking facilities, and lifeguard towers. Maximum FAR 0.20.
Residential Overlay (-R) North Tech Kingsdale South Bay Marketplace	--	Min. 20 du/ac Max. 55 du/ac	An overlay is a planning tool used to provide flexibility in land use designations. This designation allows uses that differ from or are in addition to, the underlying General Plan land use. This flexibility can help the City respond to State-mandated housing requirements and increase development options in different market conditions. The Residential Overlay allows residential infill projects in six areas of the city: The North Tech District, the northern portion of the Kingsdale neighborhood, the area immediately south of

Table 1: Current and Proposed Land Use Designations

Land Use Designation	Current Maximum Density/Intensity	Proposed Maximum Density/Intensity	Description
South of Transit Center 190th Street FedEx			the city's transit center, the area south of the Galleria, several areas along 190th Street, and an area along south Pacific Coast Highway east of Palos Verdes Boulevard. The North Tech District, and the areas south of the transit center and Galleria are all in close proximity to existing or future Metro stations, which provide access to existing or planned transportation alternatives. Properties with the Residential Overlay designation may be developed as the underlying land use designation (industrial, industrial flex, or commercial depending on the location) and also have the option of developing as infill residential without the need for a General Plan amendment. The Residential Overlay is intended to encourage the development of affordable housing by providing added land use flexibility that could allow for the integration of new residential housing opportunities in close proximity to transit, job centers, and commercial service centers. Residential uses in the overlay area may be stand-alone projects, horizontal mixed use, or vertical mixed use. Residential projects must have a minimum density of 20 dwelling units per acre, and a maximum density of 55 dwelling units per acre.

BUILDOUT: Table 2 reflects the anticipated amount of development anticipated by the 2050 planning horizon of the proposed General Plan. For purposes of the EIR, Table 2 is assumed to be the potential for housing units, nonresidential building square footage, and jobs that is likely to be generated consistent with the proposed Land Use Plan. (see Figure 4). Table 2 does not represent full buildout where every parcel would be developed to its maximum capability, but an informed projection of development potential by 2050.

Table 2 Existing and Proposed Land Use Summary

Scenario	Acres	Number of Housing Units	Total Population	Nonresidential Square Feet	Employment (Number of Jobs)
Existing Conditions	3,973	30,431[1]	70,311[2]	11,826,277[3]	28,638
Proposed General Plan (2050)	3,973	35,387[1]	81,231[2]	17,508,276[3]	36,627
Potential Growth	--	4,956	10,920	5,681,999	7,989

Notes:

1. Includes accessory dwelling units (ADUs) and assisted living units.
2. Includes people living in dwelling units, ADUs, assisted living units, and group quarters.
3. Includes square-footage of commercial uses with group quarters (such as memory care facilities).

SPECIAL POLICY AREAS: The Land Use element has identified seven areas of the city that warrant special policy direction due to the role they play in the city, as a gateway, corridor, district, or activity center. The purpose of identifying these areas is to create additional policy direction to preserve or enhance the special character of these areas. Table 3 describes the special policy areas, which will be further discussed in the EIR.

Table 3 Special Policy Area

Special Policy Area	Policy Direction
North Redondo Tech District (SPA-1)	A thriving jobs center of innovation that has regional transit connectivity.
Artesia Boulevard (SPA-2)	An active and revitalized corridor that serves as the "main street" of North Redondo through the thoughtful implementation of placemaking, mobility, parking, land use, and economic development strategies.
Aviation Boulevard (SPA-3)	An active and revitalized corridor that provides local-serving commercial and office uses and prioritizes improvements that generate connectivity to the surrounding neighborhoods through thoughtful implementation of placemaking, mobility, parking, land use, and economic development strategies.
Galleria (SPA-4)	A mixed-use transit node that serves as a regional draw for commercial uses and a center for new innovative jobs and high-density housing.
North PCH (SPA-5a) Central PCH (SPA-5b) Torrance Boulevard (SPA-5c)	Corridors that are neighborhood serving and provide visual gateways, connectivity, and access into the city.
South PCH (SPA-6)	Maintain the South PCH corridor as a neighborhood-serving commercial district and the primary visitor-serving hospitality location in south Redondo with safe pedestrian and bicycle access to the Riviera Village and beaches.
Riviera Village (SP-7)	Maintain Riviera Village as a low-density, local-serving commercial district that is identifiable as a distinct "village-like" environment characterized by a high level of pedestrian activity.

OPEN SPACE AND CONSERVATION ELEMENT: The Open Space and Conservation Element serves as both the open space and conservation elements required by the California Government Code. The combined Open Space and Conservation element sets goals for Redondo Beach parks, public spaces, recreational facilities and programs, community events, and the conservation of natural resources. New General Plan policies aim to expand the types, locations, and amount of parks, open spaces, and public spaces available for use throughout the city, ensure that facilities meet the needs of residents of all ages and abilities, promote revitalization of the harbor, preserve and protect public viewpoints, and protect and expand the City's natural resources, to support the City's guiding principle of ensuring a high quality of life, both in areas of future change and established Redondo Beach neighborhoods.

SAFETY ELEMENT: The Safety element is a State-required general plan element that identifies potential natural and human-created hazards that could affect the city's residents, businesses, visitors, and services. The Safety element is divided into six sections that address required and supplementary issues, as identified in California Government Code Section 65302(g). The six sections are: emergency preparedness, response, and recovery; geologic and seismic hazards; flooding and sea level rise; hazardous materials; fire hazards; and additional climate change hazards. The safety element includes ten primary goals, with associated policies, that aim to minimize the effects of these hazards and will be examined in the EIR.

NOISE ELEMENT: The Noise element identifies and assesses the community's existing noise environment and provides updated guidance to proactively reduce noise and land use compatibility problems according to projected noise contours. The element addresses key noise and vibration issues that include general community noise concerns, land use and noise compatibility, and stationary and mobile noise sources. The goals and policies in this element provide the framework to achieve and maintain acceptable noise levels associated with various land uses and activities to support the existing regulations mitigating noise.

ZONING CODE UPDATES: Updates to the zoning code will include modifications for consistency with the proposed General Plan, recently adopted Housing Element, and in the context of State laws such as Senate Bills 35 and 330. Revisions to the zoning code will address topics such as emergency shelters and how they are permitted, parking requirements for emergency shelters, amendments to density bonus provisions, amendments to zoning districts to clarify additional areas and new provisions related to supportive housing, Low Barrier Navigation Centers, single room occupancy (SRO) units, and employee housing (where permitted and the level of review required). New zoning requirements for areas designated with "Residential Overlays" shall also be prepared, along with revisions to the zoning code definitions (mainly to reflect changes to floor-area ratio) and more prescriptive direction for kennel uses (where permitted to make compatible with General Plan Land Use Designation definition).

Revisions to the Harbor/Civic Center Specific Plan (HCCSP) will also be prepared to reflect new land use designations and densities specified by the General Plan, although they will not require zoning code amendments because the HCCSP was adopted by resolution.

LOCAL COASTAL PROGRAM: Updates to the Local Coastal Program will include revisions to the Coastal Land Use Plan Map (to reflect changes to designation names for the beachfront properties and others) and edits to the Implementing Plan.

ARTICLE XXVII OF THE CITY CHARTER: In addition to the analysis required of all California cities under General Plan Law and CEQA, the City of Redondo Beach adopted Article XXVII with the passage of Measure DD in 2008. Article XXVII calls for a public vote whenever a major change in allowable land use is proposed.

Article XXVII requires that the areas of major changes in allowable land uses under the proposed General Plan be studied relative to both the as-built conditions and the current General Plan. Therefore, the EIR will analyze Article XXVII Buildout (maximum) relative to existing conditions and the maximum buildout potential under the current General Plan land use designations and zoning for areas of major changes in allowable uses.

POTENTIAL ENVIRONMENTAL EFFECTS: The EIR will analyze the following environmental topics in comprehensive detail:

- ✓ Aesthetics
- ✓ Air Quality
- ✓ Biological Resources
- ✓ Cultural Resources
- ✓ Energy
- ✓ Geology and Soils
- ✓ Greenhouse Gas Emissions
- ✓ Hazards and Hazardous Materials
- ✓ Hydrology and Water Quality
- ✓ Land Use and Planning
- ✓ Noise
- ✓ Population and Housing
- ✓ Public Services
- ✓ Recreation
- ✓ Transportation
- ✓ Utilities and Service Systems
- ✓ Tribal Cultural Resources

The city is fully urbanized and, as noted in the California Department of Conservation Farmland Mapping and Monitoring Program, has no agricultural land. Similarly, the Timberland Conservation and Fire Resiliency Program does not show any timberland in the city. The city is not in any governmental databases monitoring mineral resources, including the Active Mines and Mineral Plants Database and the Mineral Resources Data System. The CAL FIRE Fire Hazard Severity Zone Map indicates that there are no fire hazard zones in or near the city. Therefore, agriculture and forestry resources, mineral resources, and wildfire will not be discussed in the EIR.

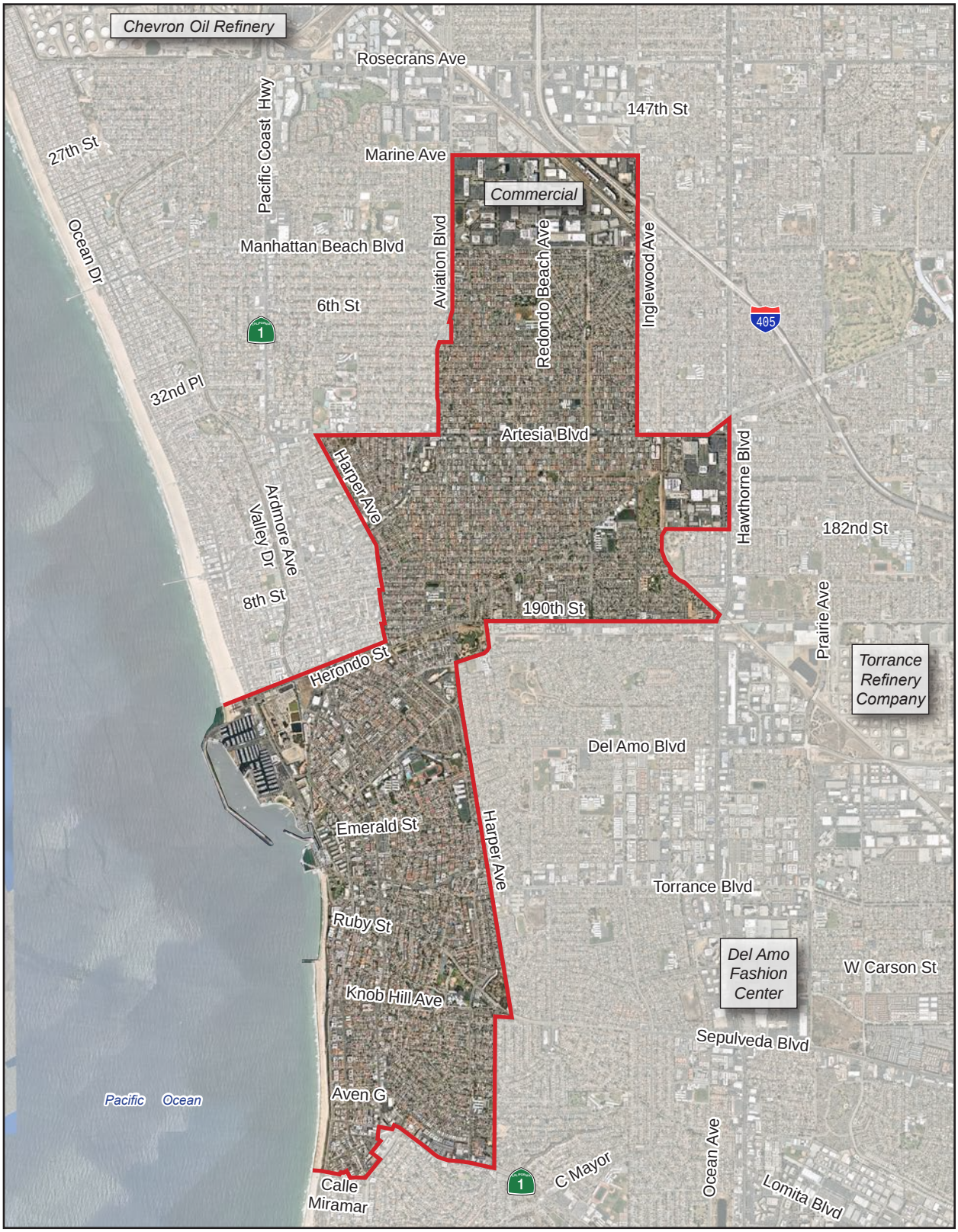
PUBLIC REVIEW PERIOD: Pursuant to CEQA Guidelines Section 15082, responsible and trustee agencies and other interested parties, including members of the public, must submit any comments in response to this notice no later than 30 days after receipt. The NOP is available for a 30-day public review period beginning **June 1, 2023**, and ending **June 30, 2023**.

RESPONSES AND COMMENTS: The City will accept written comments only during the public review period. Please indicate a contact person for your agency or organization and send your written comments to:

City of Redondo Beach
Sean Scully, Planning Manger
Community Development Department
415 Diamond Street
Redondo Beach, California 90277
Email: GeneralPlanEIR@redondo.org

SCOPING MEETING: As a part of the NOP process, the City will conduct a public Scoping Meeting to present the proposed project and environmental process and to receive public comments and suggestions regarding the proposed project. The Scoping Meeting will be held on **June 8, 2023,** from **6:00 PM to 8:00 PM** at **Redondo Beach Main Library, Second Floor Conference Room, 303 N. Pacific Coast Highway, Redondo Beach, CA 90277.**

Figure 1 - Project Area Map



City of Redondo Beach

Note: The City boundary extends 3 miles into the Pacific Ocean, which is not shown on this exhibit.

Source: City of Redondo Beach, 2023.

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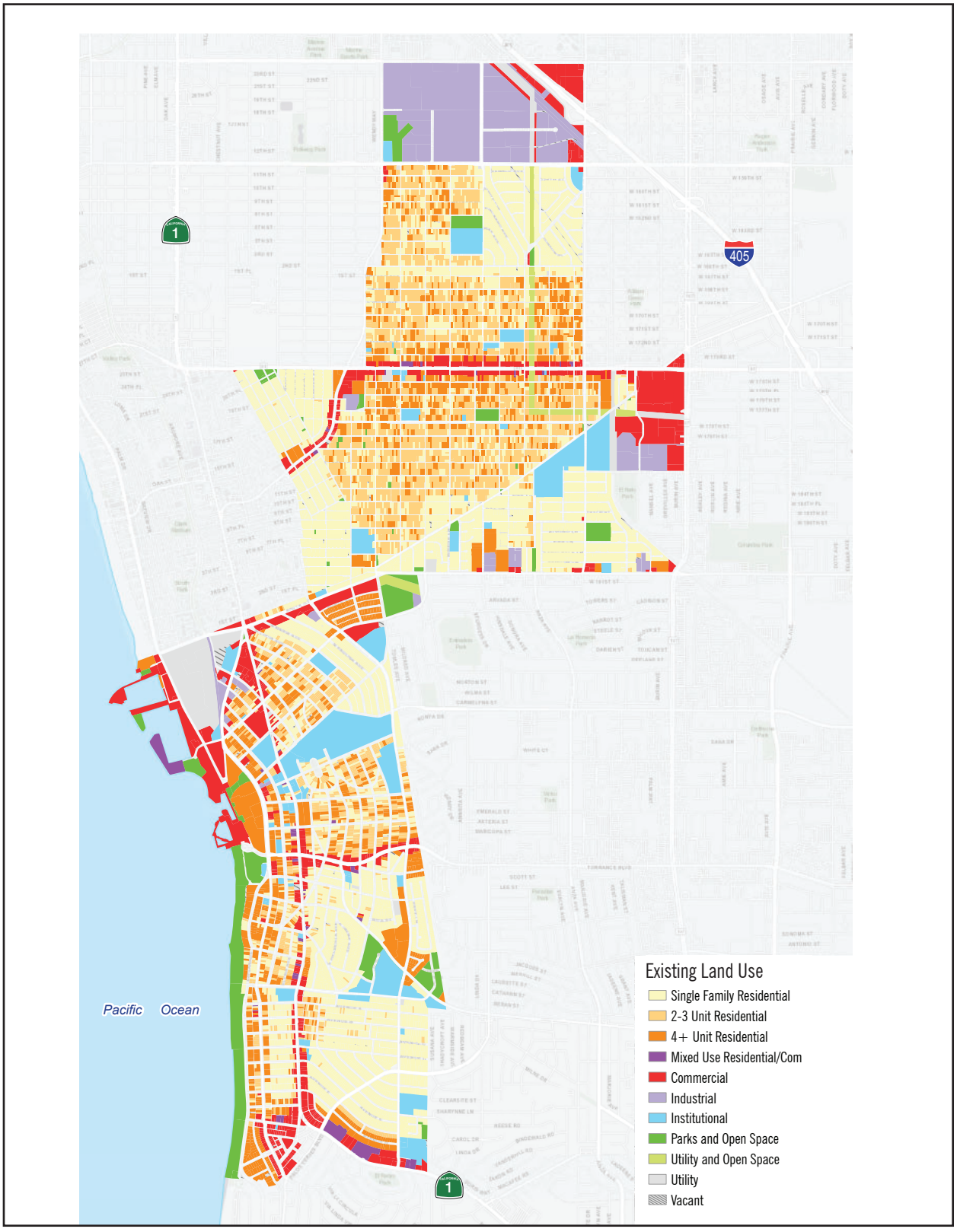
Scale (Miles)

PlaceWorks

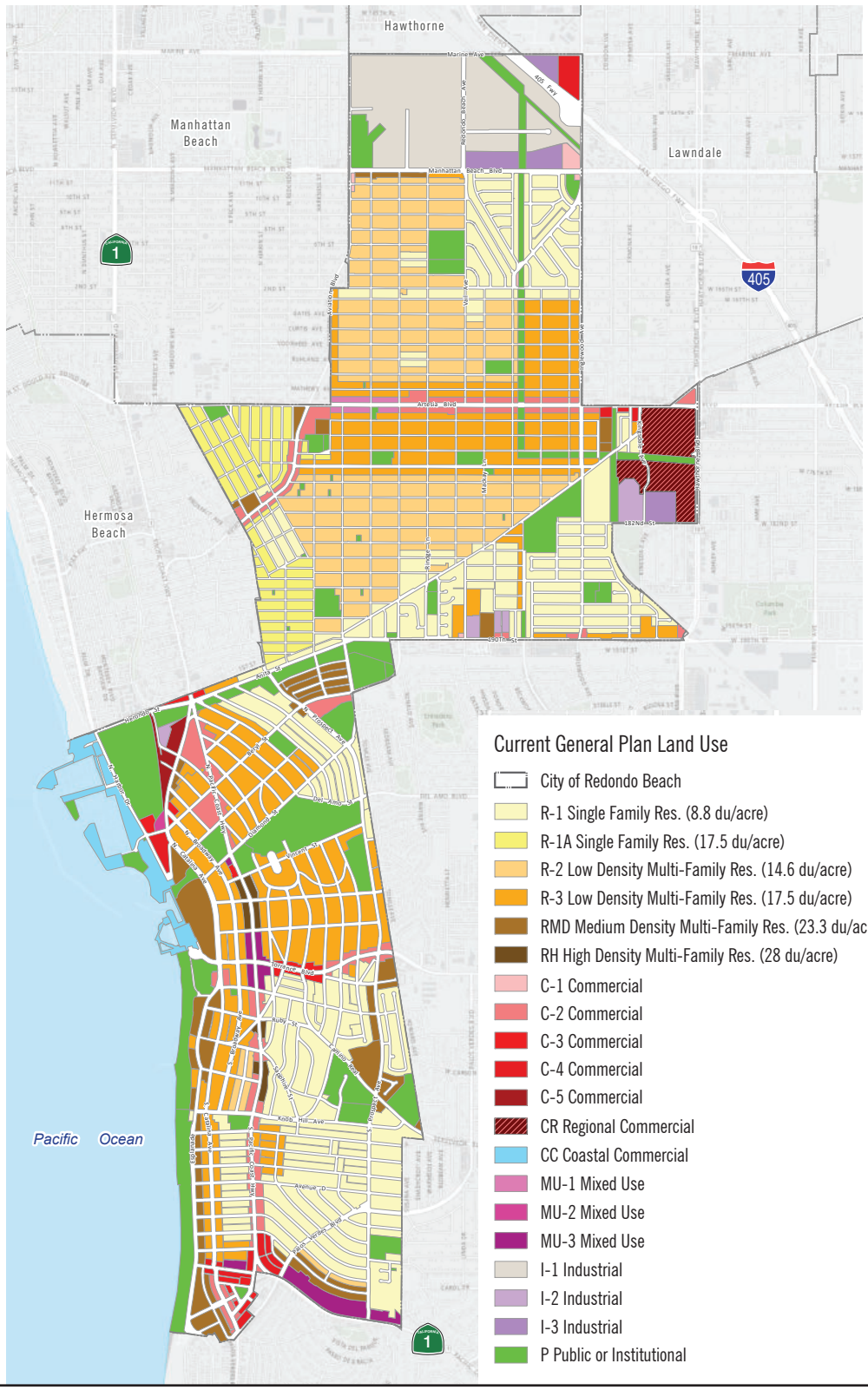
Figure 2 - Existing Land Uses



Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

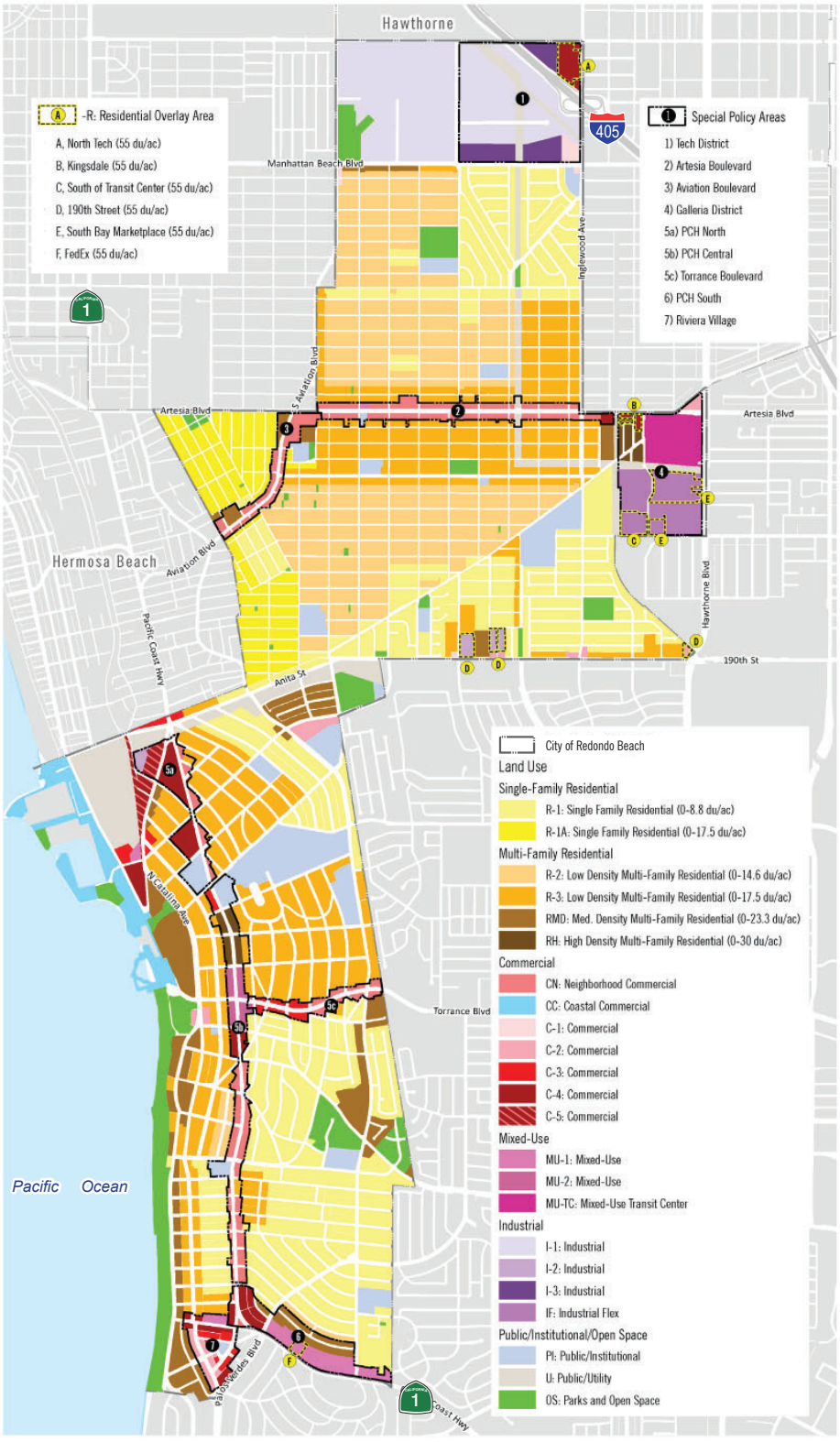
Figure 3 - Current Land Use Plan



Source: City of Redondo Beach, 2023.

PlaceWorks

Figure 4 - Proposed Land Use Plan



0 3,750
Scale (Feet)

Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

From:	OPR State Clearinghouse
To:	Zachariasen, Judith@DOC; GeneralPlanEIR
Cc:	OPR State Clearinghouse; OLRA@DOC
Subject:	RE: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment_NOP - SCH Number 2023050732
Date:	Monday, June 19, 2023 2:43:29 PM
Attachments:	image001.png

Thank you for your submittal, the SCH is in receipt of your comments.

Mikayla Vaba
State Clearinghouse
(916) 445-0613
mikayla.vaba@opr.ca.gov

From: Zachariasen, Judith@DOC <Judith.Zachariasen@conservation.ca.gov>
Sent: Monday, June 19, 2023 1:37 PM
To: GeneralPlanEIR@redondo.org
Cc: OPR State Clearinghouse <State.Clearinghouse@opr.ca.gov>; OLRA@DOC <OLRA@conservation.ca.gov>
Subject: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment_NOP - SCH Number 2023050732

Dear Sean Scully,

The California Geological Survey (CGS) has received the Notice of Preparation of a Draft Environmental Impact Report (DEIR) for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment Project. This email conveys the following recommendations from CGS concerning geologic issues related to the project area:

1. Liquefaction Hazards

   Parts of the City of Redondo Beach are located within an earthquake zone of required investigation (ZORI) for liquefaction mapped by CGS. The DEIR and supporting documents should address this hazard as it relates to zoning and the design of proposed structures. Additional information is available at the links below:
   https://maps.conservation.ca.gov/cgs/EQZApp/app/
   https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps

2. Tsunami Hazards

Portions of the City of Redondo Beach are located within a Tsunami Hazard Area (THA) mapped by CGS. The
purpose of a THA is to assist cities and counties in identifying their exposure to tsunami hazards. It is intended for local jurisdictional, coastal evacuation planning uses only. The City should consider addressing tsunami hazards in the DEIR. Additional information is available at the link below:
https://maps.conservation.ca.gov/cgs/informationwarehouse/ (Tsunami Hazard Area menu tab)

Parts of the City of Redondo Beach are also located within the Tsunami Design Zone within the California Building Code (CBC). The CBC requires certain design standards for essential/critical or larger structures. The City should evaluate what the Tsunami Risk Category is for project structures and the effect on zoning and the design of the proposed structures. The following website provides additional information regarding the Tsunami Design Zone:
https://asce7tsunami.online/

3. Ground Shaking Hazards

The City of Redondo Beach does not currently include an Earthquake Fault Zone mapped by CGS. However, several Quaternary-age faults are nearby, and the site could be subject to significant ground shaking. The DEIR and supporting documents shouldaddress this hazard as it relates to zoning and the design of the proposed structures. Additional information about ground shaking hazard can be obtained at the following sites:
https://usgs.maps.arcgis.com/apps/webappviewer/index.html?id=14d2f75c7c4f4619936dac0d14e1e468
https://earthquake.usgs.gov/scenarios/catalog/bssc2014/

If you have any additional comments or questions, please feel free to call or email.

Thank you,
Judy Zachariasen

Judith Zachariasen, PhD, PG, CEG
Senior Engineering Geologist
Fault Zoning Unit Supervisor
Seismic Hazards Program
California Geological Survey

California Department of Conservation
715 P Street, MS 1900, Sacramento, CA 95814
T: (916) 879-2844
E: judith.zachariasen@conservation.ca.gov

Jennifer Kelley

From: Hart, Leslie@Wildlife <Leslie.Hart@Wildlife.ca.gov>
Sent: Wednesday, June 21, 2023 9:11 AM
To: Sean Scully
Cc: Wilkins, Eric@Wildlife; Jennifer Kelley; Wendy Nowak; Halley Grundy
Subject: RE: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Good morning Sean,

Thank you for your response and letting me know. This is very helpful.

Best regards,
Leslie

Leslie Hart
Environmental Scientist
California Department of Fish and Wildlife
Marine Region - Environmental Review and Water Quality Project
3030 Old Ranch Parkway, Suite 400, Seal Beach, CA 90740
Leslie.Hart@wildlife.ca.gov
www.wildlife.ca.gov

Every Californian should conserve water. Find out how at:

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From: Sean Scully <Sean.Scully@redondo.org>
Sent: Wednesday, June 21, 2023 9:01 AM
To: Hart, Leslie@Wildlife <Leslie.Hart@Wildlife.ca.gov>
Cc: Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>; Jennifer Kelley <jkelley@placeworks.com>; 'Wendy Nowak' <wnowak@placeworks.com>; Halley Grundy <hgrundy@placeworks.com>
Subject: RE: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Good morning Ms. Hart,

Apologies for the delayed reply!

To answer your question… There are no updates/components to the General Plan update that affect/change properties/areas that are below the mean high water.

Please let me know if you have any additional questions/comments.

Thank you!

Sean Scully
Planning Manager
Community Development Department, Planning Division
415 Diamond Street, Door "2"
Redondo Beach, CA 90277
Tel 310-318-0637/1+2405
Fax 310-372-8021
sean.scully@redondo.org
www.redondo.org

From: Hart, Leslie@Wildlife <Leslie.Hart@Wildlife.ca.gov>
Sent: Tuesday, June 20, 2023 12:33 PM
To: Sean Scully <Sean.Scully@redondo.org>
Cc: Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>
Subject: RE: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Good afternoon Mr. Scully,

I am following up with my question on whether there are any components of the Redondo Beach General Plan Update that are below the mean high water.

Any information you can provide would be greatly appreciated.

Thank you,
Leslie

Leslie Hart
Environmental Scientist
California Department of Fish and Wildlife
Marine Region - Environmental Review and Water Quality Project
3030 Old Ranch Parkway, Suite 400, Seal Beach, CA 90740
Leslie.Hart@wildlife.ca.gov
www.wildlife.ca.gov

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From: Hart, Leslie@Wildlife
Sent: Monday, June 12, 2023 11:13 AM
To: sean.scully@redondo.org
Cc: Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>
Subject: RE: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Good morning Mr. Scully,

I am just following up to see if you had a chance to see my previous email regarding the Notice of Preparation of a Draft EIR for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment.

Any information you can provide regarding whether there are any components of the plan that are below the mean high water would be greatly appreciated.

Thank you,
Leslie

Leslie Hart
Environmental Scientist
California Department of Fish and Wildlife
Marine Region - Environmental Review and Water Quality Project
3030 Old Ranch Parkway, Suite 400, Seal Beach, CA 90740
Leslie.Hart@wildlife.ca.gov
www.wildlife.ca.gov

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From: Hart, Leslie@Wildlife
Sent: Tuesday, June 6, 2023 12:27 PM
To: sean.scully@redondo.org
Cc: Wilkins, Eric@Wildlife <Eric.Wilkins@wildlife.ca.gov>
Subject: Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Good afternoon Mr. Scully,

The Department of Fish and Wildlife's Marine Region is currently reviewing the Notice of Preparation of a Draft EIR for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment, SCH #2023050732. I noticed that there will be updates to the Local Coastal Program, and was curious if any components of the plan are below the mean high water. If so, it would be helpful to know what these are components are.

Any information you can provide would be greatly appreciated.

Thank you,
Leslie

Leslie Hart
Environmental Scientist
California Department of Fish and Wildlife
Marine Region - Environmental Review and Water Quality Project
3030 Old Ranch Parkway, Suite 400, Seal Beach, CA 90740
Leslie.Hart@wildlife.ca.gov
www.wildlife.ca.gov

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SaveOurWater.com · Drought.CA.gov

From:	Huffman, Mandy
To:	GeneralPlanEIR
Subject:	NOP Response to Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment
Date:	Thursday, June 22, 2023 1:41:38 PM
Attachments:	image002.png DMS-#6952964-v2- Response_Letter_to_City_of_Redondo_Beach_re__NOP_for_Redondo_Beach_General_Plan.PDF

Dear Mr. Scully:

Attached please find Los Angeles County Sanitation Districts' response to the subject project.

Sincerely,

Mandy Huffman *(she/her/hers)*
Environmental Planner • Wastewater Planning
562-908-4288 ext. 2743
mandyhuffman@lacsd.org

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Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

June 22, 2023

Ref. DOC 6934827

VIA EMAIL GeneralPlanEIR@redondo.org

Mr. Sean Scully, Planning Manager
City of Redondo Beach
Community Development Department
415 Diamond Street
Redondo Beach, CA 90211

Dear Mr. Scully:

NOP Response to
Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment

The Los Angeles County Sanitation Districts (Districts) received a Notice of Preparation (NOP) of a Draft Environmental Impact Report for the subject project on May 30, 2023. The City of Redondo Beach (City) is located within the jurisdictional boundaries of District No. 5 and the South Bay Cities Sanitation District. We offer the following comments regarding sewerage service:

1. The Districts own, operate, and maintain six (6) wastewater pumping plants in the City that serve the local community: Green Lane, Herondo, Gertruda Avenue, Diamond Street, Clifton, and Hollywood Riviera Pumping Plants. Green Lane Pumping Plant is located at 2108 Green Lane and its emergency generator is located at 1928 Nelson Avenue. The other pumping plants are located at 200 Herondo Street, 601 North Gertruda Avenue, 145 North Catalina Avenue, 1960½ South Prospect Avenue, and 1901 Esplanade, respectively. Pursuant to California Government Code 53091, the Districts are exempt from the City's Building and Zoning Codes. The Districts do not object to the proposed land use specified in the draft General Plan at the locations of our pumping plants provided that any subsequent ordinances or regulations that may stem from any updates to the land use do not impact or otherwise limit our ability to continue to operate, maintain, or repair these critical wastewater conveyance facilities that serve the local community.

2. The Districts own, operate, and maintain the large trunk sewers that form the backbone of the regional wastewater conveyance system. Local collector and/or lateral sewer lines are the responsibility of the jurisdiction in which they are located. As such, the Districts cannot comment on any deficiencies in the sewerage system in the City except to state that presently no deficiencies exist in Districts' facilities that serve the City.

3. Wastewater generated by the residents and businesses in the City is treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 million gallons per day (mgd) and currently processes an average flow of 243.1 mgd.

4. The Districts should review all future individual developments within the City to determine whether or not sufficient trunk sewer capacity exists to serve each development and if Districts' facilities will be affected by the development. This is accomplished through the Districts' Will Serve Program, information for which can be found on our website at Will Serve Program.

5. The expected average wastewater flow from the City, described in the NOP as an additional 4,956 residential units and 5,681,999 square feet of non-residential uses, is approximately 2.8 mgd. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, under Services, then Wastewater Program and Permits and select Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.

6. The Districts are empowered by the California Health and Safety Code to charge a fee to connect facilities (directly or indirectly) to the Districts' Sewerage System or to increase the strength or quantity of wastewater discharged from connected facilities. This connection fee is used by the Districts for its capital facilities. Payment of a connection fee may be required before this project is permitted to discharge to the Districts' Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, under Services, then Wastewater (Sewage) and select Rates & Fees. In determining the impact to the Sewerage System and applicable connection fees, the Districts will determine the user category (e.g. Condominium, Single Family Home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, please contact the Districts' Wastewater Fee Public Counter at (562) 908-4288, extension 2727.

7. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service but is to advise the City that the Districts intend to provide this service up to the levels that are legally permitted and to inform the City of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2743, or mandyhuffman@lacsd.org.

Very truly yours,

Mandy Huffman

Mandy Huffman
Environmental Planner
Facilities Planning Department

MNH:mnh

From:	Truong, Cassie
To:	GeneralPlanEIR
Subject:	Redondo Beach General Plan - Metro Comments
Date:	Monday, June 26, 2023 7:32:59 AM
Attachments:	Handbook.pdf 230626_RedondoBeach.pdf

Greetings,

Thank you for the opportunity to comment on the Redondo Beach General Plan. Attached are Metro's comments. Please kindly reply to confirm receipt.

If there are any questions, please let me know.

Best,
Cassie

Cassie Truong
LA Metro
Transportation Planner, Development Review Team
Transit Oriented Communities
213.418.3489
metro.net | facebook.com/losangelesmetro | @metrolosangeles
Metro's mission is to provide world-class transportation for all.

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

213.922.2000 Tel
metro.net

Metro

June 26, 2022

Sean Scully, Planning Manager
City of Redondo Beach
415 Diamond Street
Redondo Beach, CA 90277

Sent via email: generalplaneir@redondo.org

RE: Redondo Beach General Plan
Notice of Preparation of Environmental Impact Report (EIR)

Dear Mr. Scully:

Thank you for coordinating with the Los Angeles County Metropolitan Transportation Authority (Metro) regarding the proposed General Plan 2050 (Plan) located in the City of Redondo Beach (City). Metro's mission is to provide a world-class transportation system that enhances quality of life for all who live, work, and play within Los Angeles County. As the County's mass transportation planner, builder and operator, Metro is constantly working to deliver a regional system that supports increased transportation options and associated benefits, such as improved mobility options, air quality, health and safety, and access to opportunities.

Metro is committed to working with local municipalities, developers, and other stakeholders across Los Angeles County on transit-supportive planning and developments to grow ridership, reduce driving, and promote walkable neighborhoods. Transit Oriented Communities (TOCs) are places (such as corridors or neighborhoods) that, by their design, allow people to drive less and access transit more. TOCs maximize equitable access to a multi-modal transit network as a key organizing principle of land use planning and holistic community development.

Per Metro's area of statutory responsibility pursuant to sections 15082(b) and 15086(a) of the Guidelines for Implementation of the California Environmental Quality Act (CEQA: Cal. Code of Regulations, Title 14, Ch. 3), the purpose of this letter is to provide the City with specific detail on the scope and content of environmental information that should be included in the Environmental Impact Report (EIR) for the Project. Effects of a project on transit systems and infrastructure are within the scope of transportation impacts to be evaluated under CEQA.[1]

Project Description
The Project include updates to the Land Use, Open Space and Conservation, Noise, and Safety elements of the General Plan. The sections will be accompanied by associated revisions to the Zoning Code and Local Coastal Program.

Recommendations for EIR Scope and Content

Transit Services and Facilities

The Plan and EIR should include updated information on existing and planned transit services and facilities within the Plan area. In particular, Metro's NextGen Bus Plan (completed in December 2021) should be used as a resource to determine the location of high-frequency bus services and stops within the Plan area. For more information, visit the NextGen Bus Plan's website at https://www.metro.net/projects/nextgen/. Please also refer to Metro's 2020 Long Range Transportation Plan and Measure M Expenditure Plan.

C Line Extension to Torrance

The C Line Extension to Torrance is a 4.5-mile light rail project that would extend the C Line from the existing Marine Station in Redondo Beach to the new Torrance Transit Center with two new stations. Metro released a Draft Environmental Impact Report (DEIR) for this project on January 26, 2023, and concluded public comments on March 27, 2023. The DEIR evaluated three alignments: Metro ROW Elevated/At-Grade Alignment, Trench Option, and Hawthorn Option.

The Metro Board of Directors (Board) is anticipated to meet in the fall of 2023 to vote for a Locally Preferred Alternative during a public Board meeting. All comments received during the DEIR public commenter period will be formally responded to in the Final EIR anticipated in 2024.

Additional information on the C Line Extension to Torrance can be found on their project webpage at https://www.metro.net/projects/green-line-extension/.

Adjacency to Metro-owned Right-of-Way (ROW) and Facilities

The Plan area includes Metro-owned ROW and transit facilities for Metro Rail and Metro Bus. This includes the C Line and planned C Line Extension to Torrance Project. Bus and trains operate 24 hours a day, seven days a week in these facilities.

The EIR's transportation section should analyze potential impacts on Metro facilities within the Plan area, and identify mitigation measures or project design features as appropriate. Metro recommends reviewing the Metro Adjacent Development Handbook (available at https://www.metro.net/devreview) to identify issues and best practices for development standards arising from adjacency to Metro infrastructure. In addition, Metro recommends that the Plan include a policy encouraging applicants to coordinate with Metro during the City's Planning and Building review process if the subject parcel is within a 100-foot buffer of Metro infrastructure. Such projects should also comply with the Adjacent Development Handbook.

Transit Supportive Planning: Recommendations and Resources

Considering the Plan area's inclusion of Marine Station, the future Redondo Beach Transit Center, and key bus lines, Metro would like to identify the potential synergies associated with transit-oriented development:

1. Land Use: Metro supports development of commercial and residential properties near transit stations and understands that increasing development near stations represents a mutually beneficial opportunity to increase ridership and enhance transportation options for the users

of developments. Metro encourages the City to be mindful of the Marine Station and future Redondo Beach Transit Center within the Plan area and include strategies to orient pedestrian pathways towards the Stations.

2. Transit Connections and Access: Given the Plan area's inclusion of Marine Station and future Redondo Beach Transit Center, the Plan should include policies and/or design standards to accommodate transfer activity between bus and rail customers that will occur along the sidewalks and public spaces. Metro completed the Metro Transfers Design Guide, a best practice document on transit improvements. This can be accessed online at https://www.metro.net/about/station-design-projects/

4. Walkability: Metro strongly encourages the installation of wide sidewalks, pedestrian lighting, a continuous canopy of shade trees, enhanced crosswalks with ADA-compliant curb ramps, and other amenities along all public street frontages of the development site to improve pedestrian safety and comfort to access the Marine Station and future Redondo Beach Transit Center. The City should consider requiring the installation of such amenities as part of the conditions of approval of projects within the Plan area.

5. Access: The Plan should address first-last mile connections to transit, encouraging development that is transit accessible with bicycle and pedestrian-oriented street design connecting transportation with housing and employment centers. For reference, please view the First Last Mile Strategic Plan, authored by Metro and the Southern California Association of Governments (SCAG), available on-line at: http://media.metro.net/docs/sustainability_path_design_guidelines.pdf

6. Active Transportation: Metro encourages the City to promote bicycle use through adequate short-term bicycle parking, such as ground-level bicycle racks, as well as secure and enclosed long-term bicycle parking, such as bike lockers or a secured bike room, for guests, employees, and residents. Bicycle parking facilities should be designed with best practices in mind, including: highly visible siting, effective surveillance, easy to locate, and equipment installed with preferred spacing dimensions, so they can be conveniently accessed. Additionally, the Plan should help facilitate safe and convenient connections for pedestrians, people riding bikes, and transit users to/from the destinations within the Plan area.

7. Wayfinding: Wayfinding signage should be considered as part of the Plan to help people navigate through the Plan area to all modes of transportation. Any temporary or permanent wayfinding signage with content referencing Metro services, or featuring the Metro brand and/or associated graphics (such as bus or rail pictograms) requires review and approval by Metro Art & Design.

8. Art: Metro Arts & Design encourages the thoughtful integration of art and culture into public spaces and should be consulted for any proposals for public art and/or placemaking facing Metro ROW.

9. Multi-modal Connections: With an anticipated increase in traffic, Metro encourages an analysis of impacts on non-motorized transportation modes and consideration of improved non-motorized access to the Plan area and nearby transit services, including pedestrian connections and bike lanes/paths. Appropriate analyses could include multi-modal LOS calculations, pedestrian audits, etc.

10. Parking: Metro encourages the incorporation of transit-oriented, pedestrian-oriented parking provision strategies such as the reduction or removal of minimum parking requirements for specific areas and the exploration of shared parking opportunities. These strategies could be pursued to reduce automobile-orientation in design and travel demand.

Metro looks forward to continuing to collaborate with the City to effectuate policies and implementation activities that promote transit oriented communities. If you have any questions regarding this letter, please contact me by phone at 213.547.4326, by email at DevReview@metro.net, or by mail at the following address:

Metro Development Review
One Gateway Plaza
MS 99-22-1
Los Angeles, CA 90012-2952

Sincerely,

Cassie Truong
Transportation Planner, Development Review Team
Transit Oriented Communities

Attachments and links:

- Adjacent Development Handbook: https://www.metro.net/devreview

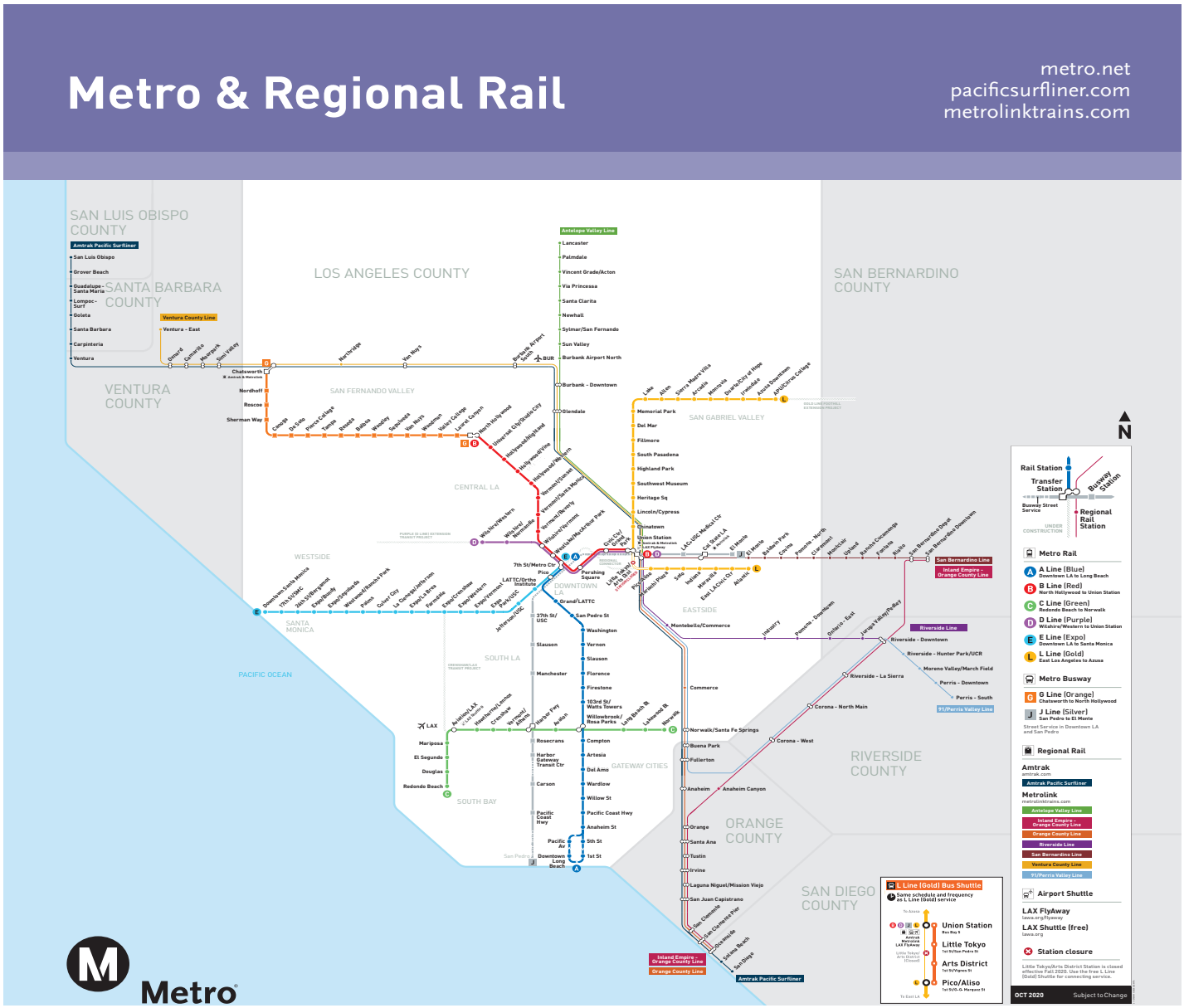
Los Angeles County
Metropolitan Transportation Authority

METRO ADJACENT DEVELOPMENT HANDBOOK

A GUIDE FOR CITIES AND DEVELOPERS

February 2021

Metro and Regional Rail Map



Metro is currently undertaking the largest rail infrastructure expansion effort in the United States. A growing transit network presents new opportunities to catalyze land use investment and shape livable communities.

Table of Contents

Quick Overview

Purpose of Handbook

The Metro Adjacent Development Handbook (Handbook) is intended to provide information and guide coordination for projects adjacent to, below, or above Metro transit facilities (e.g. right-of-way, stations, bus stops) and services.

Overarching Goal
By providing information and encouraging early coordination, Metro seeks to reduce potential conflicts with transit services and facilities, and identify potential synergies to expand mobility and improve access to transit.

Intended Audience
The Handbook is a resource for multiple stakeholder groups engaged in the development process, including:

- Local jurisdictions who review, entitle, and permit development projects,
- Developers,
- Property owners,
- Architects, engineers, and other technical consultants,
- Builders/contractors,
- Utility companies, and
- other Third Parties.

Handbook Content
The Handbook includes:

- **Introduction** of Metro's Development Review coordination process, common concerns, and typical stages of review.
- **Information** on best practices during three key coordination phases to avoid potential conflicts or create compatibility with the Metro transit system:
  - Planning & Conceptual Design,
  - Engineering & Technical Review, and
  - Construction Safety & Monitoring.
- **Glossary** with definitions for key terms used throughout the Handbook.

RULE OF THUMB: 100 FEET

Metro's Development Review process applies to projects that are within 100 feet of Metro transit facilities.

While the Handbook summarizes key concerns and best practices for adjacency conditions, it does not replace Metro's technical requirements and standards.

Prior to receiving approval for any construction activities adjacent to, above, or below Metro facilities, Third Parties must comply with the Metro Adjacent Construction Design Manual, available on Metro's website.

Contact Us
For questions, contact the Development Review Team:

- Email: devreview@metro.net
- Phone: 213.418.3484
- Online In-take Form: https://jpropublic.metro.net/in-take-form

Additional Information & Resources

- Metro Development & Construction Coordination website: https://www.metro.net/devreview
- Metro GIS/KML ROW Files: https://developer.metro.net/portfolio-item/metro-right-of-way-gis-data
- Metrolink Standards and Procedures: https://www.metrolinktrains.com/about/agency/engineering--construction

Metro will continue to revise the Handbook, as needed, to reflect updates to best practices in safety, operations, and transit-supportive development.

Background

Who is Metro?

The Los Angeles County Metropolitan Transportation Authority (Metro) plans, funds, builds, and operates rail, bus, and other mobility services (e.g. bikeshare, microtransit) throughout Los Angeles County (LA County). On average, Metro moves 1.3 million people each day on buses and trains. With funding from the passage of Measure R (2008) and Measure M (2016), the Metro system is expanding. Over the next 40 years, Metro will build over 60 new stations and over 100 miles of transit right-of-way (ROW). New and expanded transit lines will improve mobility across LA County, connecting riders to more destinations and expanding opportunities for development that supports transit ridership. Metro facilities include:

Metro Rail: Metro operates heavy rail (HRT) and light rail (LRT) transit lines in underground tunnels, along streets, off-street in dedicated ROW, and above street level on elevated structures. Heavy rail trains are powered by a "third rail" along the tracks. Light rail vehicles are powered by overhead catenary systems (OCS). To support rail operations, Metro owns and maintains traction power substations (TPSS), maintenance yards, and other infrastructure.

Metrolink/Regional Rail: Metro owns a majority of the ROW within LA County on which the Southern California Regional Rail Authority (SCRRA) operates Metrolink service. Metrolink is a commuter rail system with seven lines that span 388 miles across five counties, including: Los Angeles, Orange, Riverside, San Bernardino, Ventura, and North San Diego. As a SCRRA member agency and property owner, Metro reviews development activity adjacent to Metro-owned ROW on which Metrolink operates, and coordinates with Metrolink on any comments or concerns. Metrolink has its own set of standards and processes, see link on page 1.

Metro Bus Rapid Transit (BRT): Metro operates accelerated bus transit, which acts as a hybrid between rail and traditional bus service. Metro BRT may operate in a dedicated travel lane within a street or freeway, or off-street along dedicated ROW. Metro BRT stations may be located on sidewalks within the public right-of-way, along a median in the center of streets, or off-street on Metro-owned property.

Metro Bus: Metro operates 170 bus lines across more than 1,400 square miles in LA County. The fleet serves over 15,000 bus stops with approximately 2,000 buses. Metro operates "Local" and "Rapid" bus service within the street, typically alongside vehicular traffic, though occasionally in "bus-only" lanes. Metro bus stops are typically located on sidewalks within the public right-of-way, which is owned and maintained by local jurisdictions. Metro's NextGen Bus Plan re-envisions bus service across LA County to make service improvements that better serve riders.

Why is Metro interested in adjacent development?

Metro Supports Transit Oriented Communities: Metro is redefining the role of the transit agency by expanding mobility options, promoting sustainable urban design, and helping transform communities throughout LA County. Metro seeks to partner with local, state, and federal jurisdictions, developers, property owners and other stakeholders across LA County on transit-supportive planning and developments to grow ridership, reduce driving, and promote walkable neighborhoods. Transit Oriented Communities (TOCs) are places (such as corridors or neighborhoods) that, by their design, allow people to drive less and access transit more. TOCs maximize equitable access to a multi-modal transit network as a key organizing principle of land use planning and holistic community development.

Adjacent Development Leads to Transit Oriented Communities: Metro supports private development adjacent to transit as this presents a mutually beneficial opportunity to enrich the built environment and expand mobility options. By connecting communities, destinations, and amenities through improved access to public transit, adjacent developments have the potential to:

- reduce auto dependency,
- reduce greenhouse gas emissions,
- promote walkable and bikeable communities that accommodate more healthy and active lifestyles,
- improve access to jobs and economic opportunities, and
- create more opportunities for mobility – highly desirable features in an increasingly urbanized environment.

Opportunity: Acknowledging an unprecedented opportunity to influence how the built environment develops along and around transit and its facilities, Metro has created this document. The Handbook helps ensure compatibility between private development and Metro's transit infrastructure to minimize operational, safety, and maintenance issues. It serves as a crucial first step to encourage early and active collaboration with local stakeholders and identify potential partnerships that leverage Metro initiatives and support TOCs across LA County.

Metro Purview & Concerns

Metro Purview for Review & Coordination

Metro is interested in reviewing development, construction, and utility projects within 100 feet of Metro transit facilities, real estate assets, and ROW – as measured from the edge of the ROW outward – both to ensure the structural safety of existing or planned transit infrastructure and to maximize integration opportunities with adjacent development. The Handbook seeks to:

- Improve communication and coordination between developers, jurisdictions, and Metro.
- Identify common concerns associated with developments adjacent to Metro ROW.
- Highlight Metro operational needs and requirements to ensure safe, continuous service.
- Prevent potential impacts to Metro transit service or infrastructure.
- Maintain access to Metro facilities for riders and operational staff.
- Avoid preventable conflicts resulting in increased development costs, construction delays, and safety impacts.
- Streamline the review process to be transparent, clear, and efficient.
- Assist in the creation of overall marketable and desirable developments.

Key Audiences for Handbook

The Handbook is intended to be used by:

- Local jurisdictions who review, entitle, and permit development projects and/or develop policies related to land use, development standards, and mobility,
- Developers, property owners,
- Architects, engineers, design consultants,
- Builders/contractors,
- Entitlement consultants,
- Environmental consultants,
- Utility companies, and
- other Third Parties.

Metro Assets & Common Concerns for Adjacent Development

The table on the facing page outlines common concerns for development projects and/or construction activities adjacent to Metro transit facilities and assets. These concerns are discussed in greater detail in the following chapters of the Handbook.

METRO ASSETS	COMMON ADJACENCY CONCERNS
 **UNDERGROUND ROW** Transit operates below ground in tunnels.	• Excavation near tunnels and infrastructure • Clearance from support structures (e.g. tiebacks, shoring, etc) • Coordination with utilities • Clearance from ventilation shafts, surface penetrations (e.g. emergency exits) • Surcharge loading of adjacent construction • Explosions • Noise and vibration/ground movement • Storm water drainage
 **AERIAL ROW** Transit operates on elevated guideway, typically supported by columns.	• Excavation near columns and support structures • Column foundations • Clearance from OCS • Overhead protection and crane swings • Setbacks from property line for maintenance activities to occur without entering ROW • Coordination with utilities • Noise reduction (e.g. double-paned windows)
 **AT-GRADE ROW** Transit operates in dedicated ROW at street level; in some cases tracks are separated from adjacent property by fence or wall.	• Pedestrian and bicycle movements and safety • Operator site distance/cone of visibility • Clearance from OCS • Crane swings and overhead protection • Trackbed stability • Storm water drainage • Noise/vibration • Driveways near rail crossings • Setbacks from property line for maintenance activities to occur without entering ROW • Utility coordination
 **BUS STOPS** Metro operates bus service on city streets. Bus stops are located on public sidewalks.	• Lane closures and re-routing service during construction • Temporary relocation of bus stops • Impacts to access to bus stops
 **NON-REVENUE/OPERATIONAL** Metro owns and maintains property to support operations (e.g. bus and rail maintenance facilities, transit plazas, traction power substations, park-and-ride parking lots).	• Excavation and clearance from support structures (e.g. tiebacks, shoring, etc) • Ground movement • Drainage • Utility coordination • Access to property

Metro Coordination Process

Typical Stages of Metro Review and Coordination

Early coordination helps avoid conflicts between construction activities and transit operations and maximizes opportunities to identify synergies between the development project and Metro transit services that are mutually beneficial.

*Phases above may include fees for permits and reimbursement of Metro staff time for review and coordination.

Coordination Goal: Metro encourages developers to consult with the Development Review Team early in the design process to ensure compatibility with transit infrastructure and minimize operational, safety, and maintenance issues with adjacent development. The Development Review team will serve as a case manager to developers and other Third Parties to facilitate the review of plans and construction documents across key Metro departments.

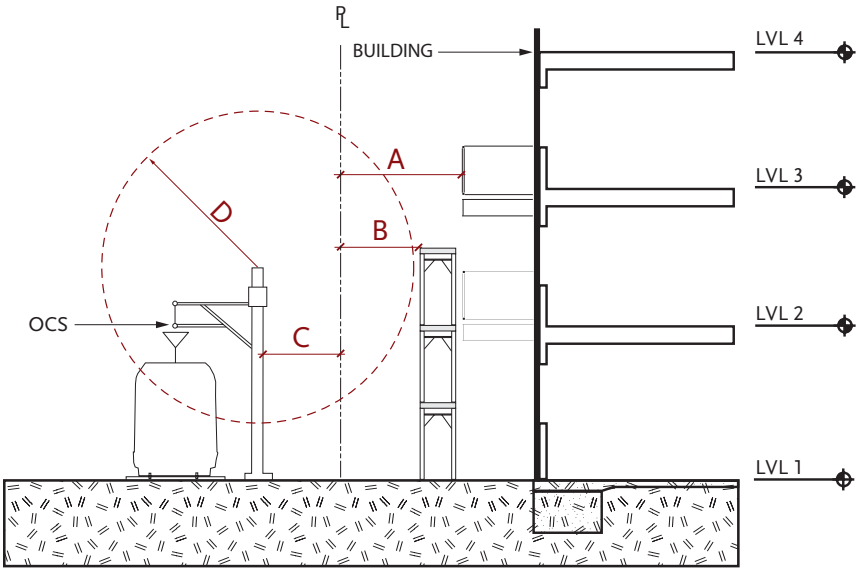
Level of Review: Not all adjacent projects will require significant review and coordination with Metro. The level of review depends on the Project's proximity to Metro, adjacency conditions, and the potential to impact Metro facilities and/or services. For example, development projects that are excavating near Metro ROW or using cranes near transit facilities require a greater level of review and coordination. Where technical review and construction monitoring is needed, Metro charges fees for staff time, as indicated by asterisk in the above diagram.

Permit Clearance: Within the City of Los Angeles, Metro reviews and clears Building & Safety permits for projects within 100 feet of Metro ROW, pursuant to Zoning Information 1117. To ensure timely clearance of these permits, Metro encourages early coordination as noted above.

To begin consultation, submit project information via an online In-Take Form, found on Metro's website. Metro staff will review project information and drawings to screen the project for any potential impacts to transit facilities or services, and determine if require further review and coordination is required. The sample sections on the facing page illustrate adjacency condition information that helps Metro complete project screening.

Contact:
Metro Development Review Team
Website: https://www.metro.net/devreview
Online In-take Form: https://jpropublic.metro.net/in-take-form
Email: devreview@metro.net
Phone: 213.418.3484

Sample Section: Adjacency Conditions



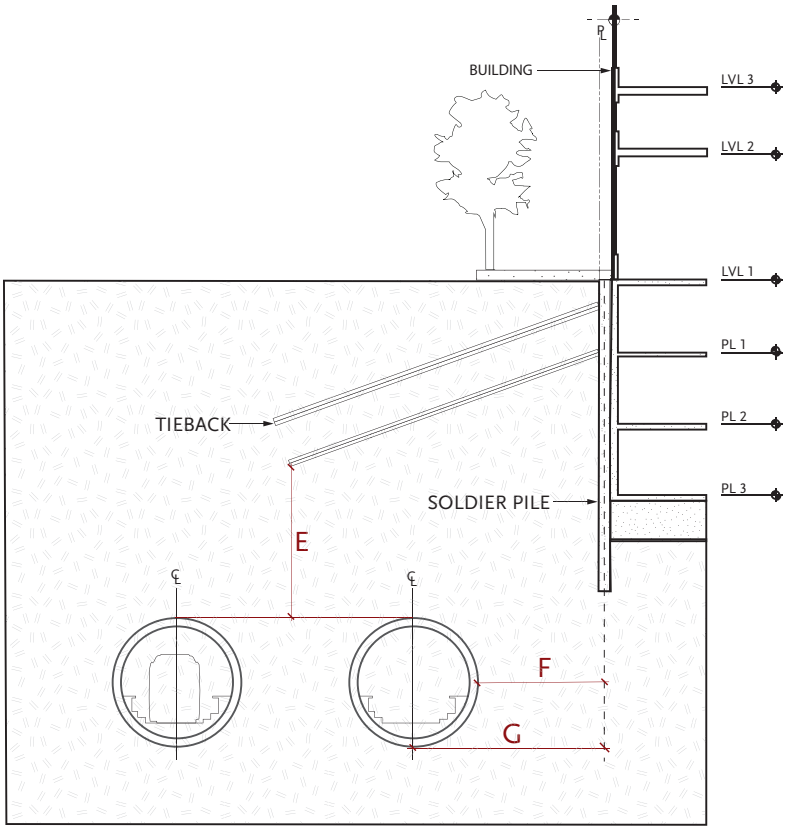
AT-GRADE CONDITION

A. Distance from property line to nearest permanent structure (e.g. building facade, balconies, terraces). Refer to Section 1.3 Building Setback of Handbook.

B. Distance from property line to nearest temporary construction structures (e.g. scaffolding).

C. Distance from property line to nearest Metro facility.

D. Clearance from nearest temporary and/or permanent structure to overhead catenary system (OCS). Refer to Section 1.4, OCS Clearance of Handbook.



BELOW-GRADE CONDITION

E. Vertical distance from top of Metro tunnel to closest temporary and/or permanent structure (e.g. tiebacks, foundation). Refer to Section 2.2, Proximity to Tunnels & Underground Infrastructure of Handbook.

F. Horizontal distance from exterior tunnel wall to nearest structure.

G. Horizontal distance from Metro track centerline to nearest structure.

Best Practices

Best Practices for Developer Coordination

Metro encourages developers of projects adjacent to Metro ROW and/or Real Estate Assets to take the following steps to facilitate Metro project review and approval:

1. **Review Metro resources and policies:** The Metro Development & Construction Coordination website and Handbook provide important information for those interested in constructing on, adjacent, over, or under Metro ROW, non-revenue property, or transit facilities. Developers and other Third Parties should familiarize themselves with these resources and keep in mind common adjacency concerns when planning a project.

2. **Contact Metro early during design process:** Metro welcomes the opportunity to provide feedback early in project design, allowing for detection and resolution of important adjacency issues, identification of urban design and system integration opportunities, and facilitation of permit approval. Metro encourages project submittal through the online In-Take Form to begin consultation.

3. **Maintain communication:** Frequent communication with Metro during project design and construction will reinforce relationships and allow for timely project completion. Contact us at devreview@metro.net or at 213.418.3484.

Best Practices for Local Jurisdiction Notification

To improve communication between Metro and the development community, Metro suggests that local jurisdictions take the following steps to notify property owners of coordination needs for properties adjacent to Metro ROW by:

- **Updating GIS and parcel data:** Integrate Metro ROW files into the City/County GIS and/or Google Earth Files for key departments (e.g. Planning, Public Works, Building & Safety) to notify staff of Metro adjacency and need for coordination during development approval process.Download Metro's ROW files here.

- **Flag Parcels:** Create an overlay zone as part of local Specific Plan(s) and/or Zoning Ordinance(s) to tag parcels that are within 100 feet Metro ROW and require coordination with Metro early during the development process [e.g. City of Los Angeles Zone Information and Map Access System (ZI-1117)].

- **Provide Resources:** Direct all property owners and developers interested in parcels within 100 feet of Metro ROW to Metro's resources (e.g. website, Handbook).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Site Plan & Conceptual Design

Site Plan & Conceptual Design

1.1 Supporting Transit Oriented Communities

Transit-oriented communities (TOCs) are places that, by their design, make it more convenient to take transit, walk, bike or roll than to drive. By working closely with the development community and local jurisdictions, Metro seeks to ensure safe construction near Metro facilities and improve compatibility with adjacent development to increase transit ridership.

RECOMMENDATION: Consider site planning and building design strategies to that support transit ridership, such as:

- Leveraging planning policies and development incentives to design a more compelling project that capitalizes on transit adjacency and economy of scales.
- Programming a mix of uses to create lively, vibrant places that are active day and night.
- Utilizing Metro policies and programs that support a healthy, sustainable, and welcoming environment around transit service and facilities.
- Prioritizing pedestrian-scaled elements to create spaces that are comfortable, safe, and enjoyable.
- Activating ground floor with retail and outdoor seating/activities to bring life to the public environment.
- Reducing and screening parking to focus on pedestrian activity.
- Incorporating environmental design elements that help reduce crime (e.g. windows and doors that face public spaces, lighting).

The Wilshire/Vermont Metro Joint Development project leveraged existing transit infrastructure to catalyze a dynamic and accessible urban environment. This project accommodates portal access into the Metro Rail system and on-street bus facilities.

1.2 Enhancing Access to Transit

Metro seeks to create a comprehensive, integrated transportation network and supports infrastructure and design that allows safe and convenient access to its multi-modal services. Projects in close proximity to Metro's services and facilities present an opportunity to enhance the public realm and connections to/from these services for transit riders as well as users of the developments.

RECOMMENDATION: Design projects with transit access in mind. Project teams should capitalize on the opportunity to improve the built environment and enhance the public realm for pedestrians, bicyclists, persons with disabilities, seniors, children, and users of green modes. Metro recommends that projects:

- Orient major entrances to transit service, making access and travel safe, intuitive, and convenient.
- Plan for a continuous canopy of shade trees along all public right-of-way frontages to improve pedestrian comfort to transit facilities.
- Add pedestrian lighting along paths to transit facilities and nearby destinations.
- Integrate wayfinding and signage into project design.
- Enhance nearby crosswalks and ramps.
- Ensure new walkways and sidewalks are clear of any obstructions, including utilities, traffic control devices, trees, and furniture.
- Design for seamless, multi-modal pedestrian connections, making access easy, direct, and comfortable.

The City of Santa Monica leveraged investments in rail transit and reconfigured Colorado Avenue to form a multi-modal first/last mile gateway to the waterfront from the Downtown Santa Monica Station. Photo by PWP Landscape Architecture

1.3 Building Setback

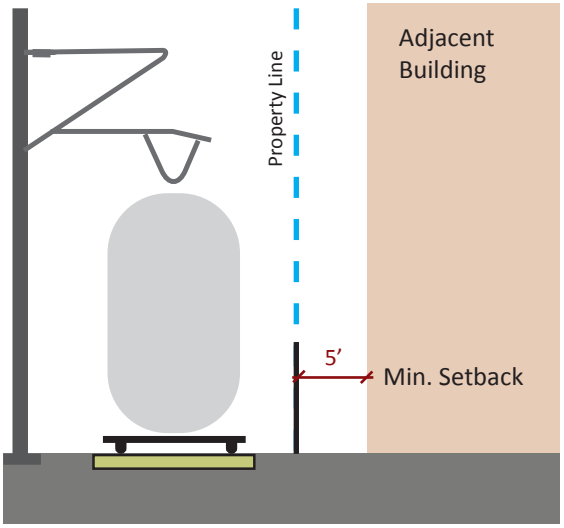
Buildings and structures with a zero lot setback that closely abut Metro ROW can pose concerns to Metro during construction. Encroachment onto Metro property to construct or maintain buildings is strongly discouraged as this presents safety hazards and may disrupt transit service and/or damage Metro infrastructure.

RECOMMENDATION: Include a minimum setback of five (5) feet from the property line to building facade to accommodate the construction and maintenance of structures without the need to encroach upon Metro property. As local jurisdictions also have building setback requirements, new developments should comply with the greater of the two requirements.

Entry into the ROW by parties other than Metro and its affiliated partners requires written approval. Should construction or maintenance of a development necessitate temporary or ongoing access to Metro ROW, a Metro Right of Entry Permit must be requested and obtained from Metro Real Estate for every instance access is required. Permission to enter the ROW is granted solely at Metro's discretion.

Coordination between property owners of fences, walls, and other barriers along property line is recommended. See Section 1.5.

Refer to Section 3.2 – Track Access and Safety for additional information pertaining to ROW access in preparation for construction activities.



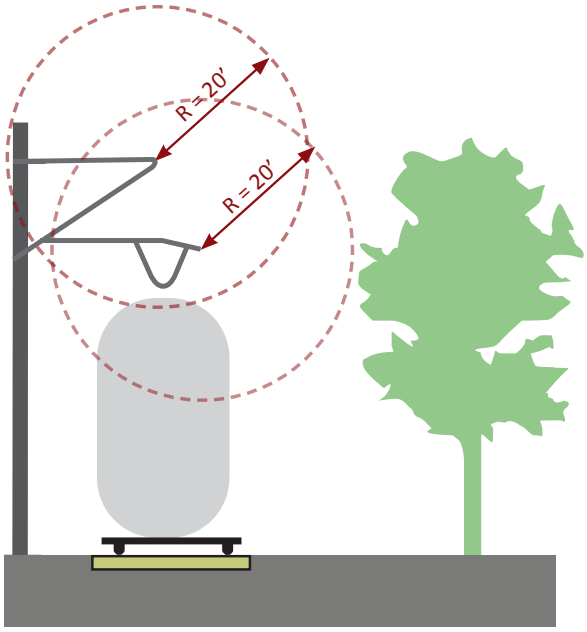
A minimum setback of five (5) feet between an adjacent structure and Metro ROW is strongly encouraged to allow project construction and ongoing maintenance without encroaching on Metro property.

1.4 Overhead Catenary System (OCS) Clearance

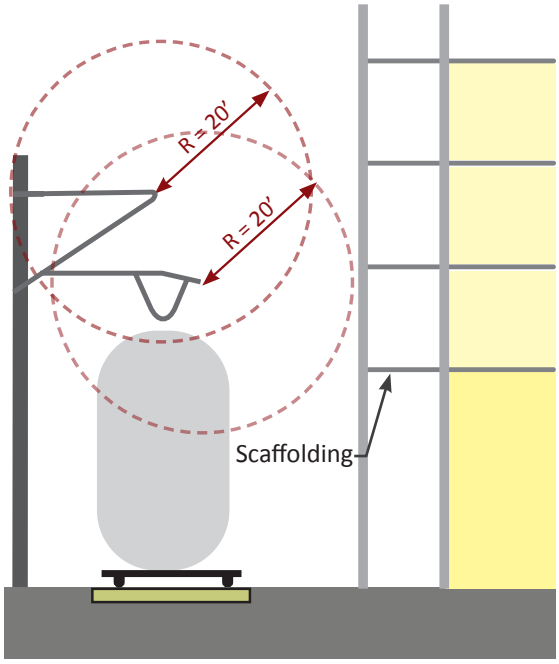
Landscaping and tree canopies can grow into the OCS above light rail lines, creating electrical safety hazards as well as visual and physical impediments for trains. Building appurtenances facing rail ROW, such as balconies, may also pose safety concerns to Metro operations as objects could fall onto the OCS.

RECOMMENDATION: Design project elements facing the ROW to avoid potential conflicts with Metro transit vehicles and infrastructure. Metro recommends that projects:

- Plan for landscape maintenance from private property and prevent growth into Metro ROW. Property owners will not be permitted to access Metro property to maintain private development.
- Design buildings such that balconies do not provide building users direct access to Metro ROW.
- Maintain building appurtenances and landscaping at a minimum distance of ten (10) feet from the OCS and support structures. If Transmission Power (TP) feeder cable is present, twenty (20) feet from the OCS and support structures is required. Different standards will apply for Metro Trolley Wires, Feeder Cables (wires) and Span Wires.



Adjacent structures and landscaping should be sited and maintained to avoid conflicts with the rail OCS.



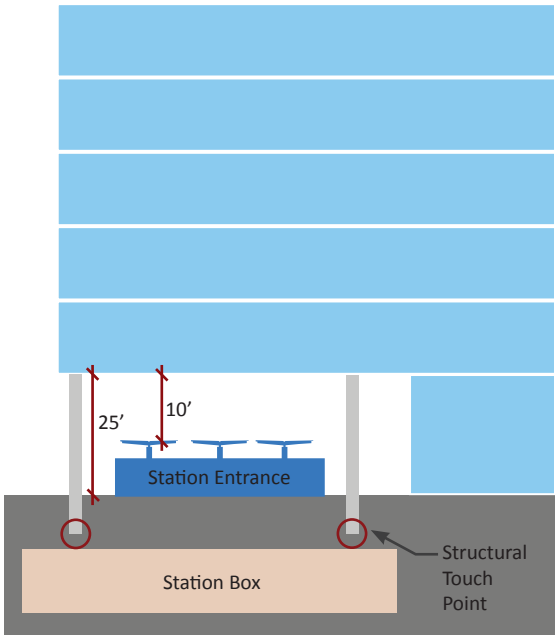
Scaffolding and construction equipment should be staged to avoid conflicts with the rail OCS.

1.5 Underground Station Portal Clearance

Metro encourages transit-oriented development. Where development is planned above station entrances, close coordination is needed for structural safety as well as access for patrons, operations, and maintenance. Below are key design rules of thumb for development planned to cantilever over an entrance to an underground Metro Rail station.

RECOMMENDATION:

1. Preserve 25 feet clearance at minimum from plaza grade and the building structure above.
2. Preserve 10 feet clearance at minimum between portal roof and building structure above.
3. Coordinate structural support system and touchdown points to ensure a safe transfer of the building loads above the station portal.
4. Coordinate placement of structural columns and amenities (e.g. signage, lighting, furnishings) at plaza level to facilitate direct and safe connections for people of all mobile abilities to and from station entrance(s).
5. Develop a maintenance plan for the plaza in coordination with Metro.



Projects that propose to cantilever over Metro subway portals require close coordination with Metro Engineering.

1.6 Shared Barrier Construction & Maintenance

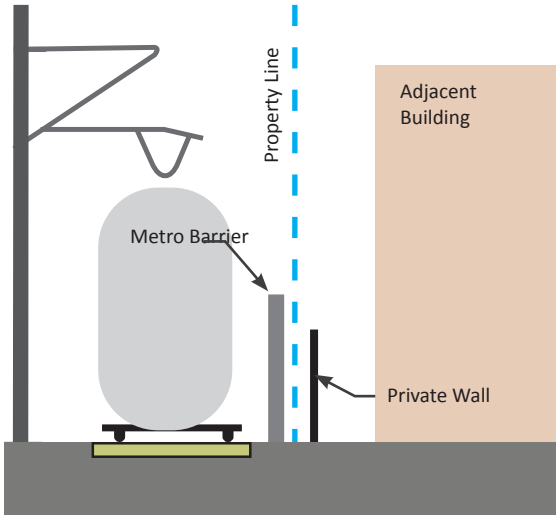
In areas where Metro ROW abuts private property, barrier construction and maintenance responsibilities can be a point of contention with property owners. When double barriers are constructed, the gap created between the Metro-constructed fence and a private property owner's fence can accumulate trash and make regular maintenance challenging without accessing the other party's property.

RECOMMENDATION: Coordinate with Metro Real Estate to create a single barrier condition along the ROW property line. With an understanding that existing conditions along ROW boundaries vary throughout LA County, Metro recommends the following, in order of preference:

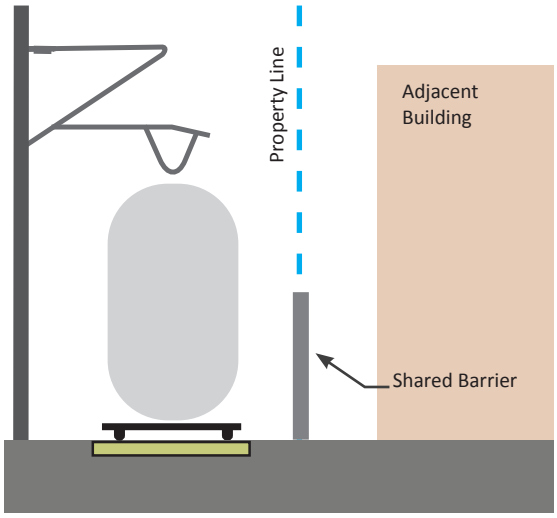
- **Enhance existing Metro barrier:** if structural capacity allows, private property owners and developers should consider physically affixing improvements onto and building upon Metro's existing barrier. Metro is amenable to barrier enhancements such as increasing barrier height and allowing private property owners to apply architectural finishes to their side of Metro's barrier.

- **Replace existing barrier(s):** if conditions are not desirable, remove and replace any existing barrier(s), including Metro's, with a new single "shared" barrier built on the property line.

Metro is amenable to sharing costs for certain improvements that allow for clarity in responsibilities and adequate ongoing maintenance from adjacent property owners without entering Metro's property. Metro Real Estate should be contacted with case-specific questions and will need to approve shared barrier design, shared financing, and construction.



Double barrier conditions allow trash accumulation and create maintenance challenges for Metro and adjacent property owners.



Metro prefers a single barrier condition along its ROW property line.

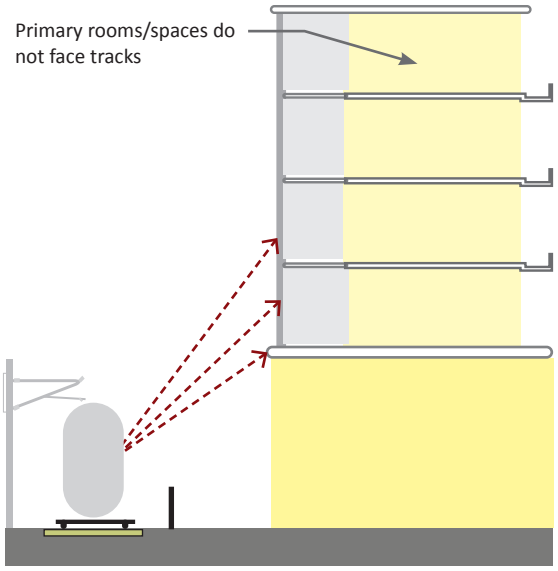
1.7 Project Orientation & Noise Mitigation

Metro may operate in and out of revenue service 24 hours per day, every day of the year, which can create noise and vibration (i.e. horns, power washing). Transit service and maintenance schedules cannot be altered to avoid noise for adjacent developments. However, noise and vibration impacts can be reduced through building design and orientation.

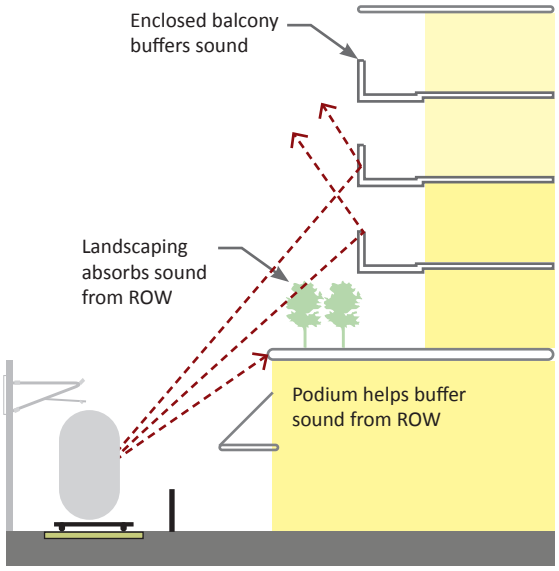
RECOMMENDATION: Use building orientation, programming, and design techniques to reduce noise and vibration for buildings along Metro ROW:

- Locate secondary or "back of house" rooms (e.g. bathrooms, stairways, laundry rooms) along ROW, rather than primary living spaces that are noise sensitive (e.g. bedrooms and family rooms).
- Use upper level setbacks and locate living spaces away from ROW.
- Enclose balconies.
- Install double-pane windows.
- Include language disclosing potential for noise, vibration, and other impacts due to transit proximity in terms and conditions for building lease or sale agreements to protect building owners/sellers from tenant/buyer complaints.

Developers are responsible for any noise mitigation required, which may include engineering designs for mitigation recommended by Metro or otherwise required by local municipalities. A recorded Noise Easement Deed in favor of Metro may be required for projects within 100 feet of Metro ROW to ensure notification to tenants and owners of any proximity issues.



Building orientation can be designed to face away from tracks, reducing the noise and vibration impacts.



Strategic placement of podiums and upper-level setbacks on developments near Metro ROW can reduce noise and vibration impacts.

1.8 At-Grade Rail Crossings

New development is likely to increase pedestrian activity at rail crossings. Safety enhancements may be needed to upgrade existing rail crossings to better protect pedestrians.

RECOMMENDATION: Coordinate with Metro, the California Public Utilities Commission (CPUC), and any other transit operators using the crossing (e.g. Metrolink) to determine if safety enhancements are needed for nearby rail crossings.

While Metro owns and operates the rail ROW, the CPUC regulates all rail crossings. Contact the CPUC early in the design process to determine if they will require any upgrades to existing rail crossings. The CPUC may request to review development plans and hold a site visit to understand future pedestrian activity. Metro's Corporate Safety Department can support the developer in coordination with the CPUC.

Gates and pedestrian arms are common types of safety elements for pedestrians at rail crossings.

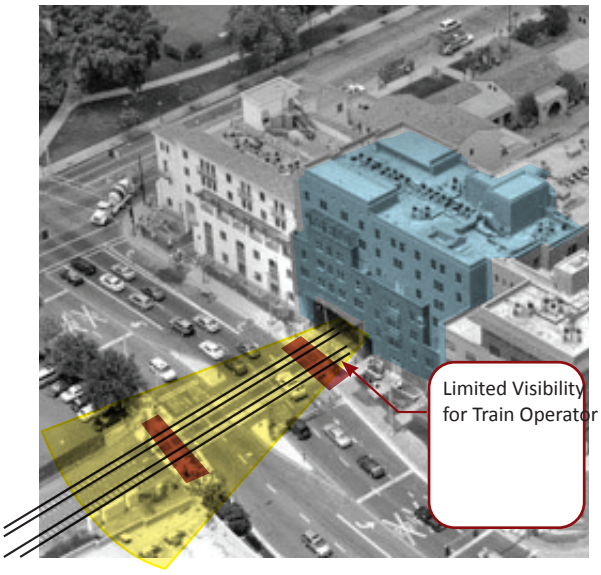
Safety elements of a gate and pedestrian arms have been constructed at the Monrovia Station.

1.9 Sight-Lines at Crossings

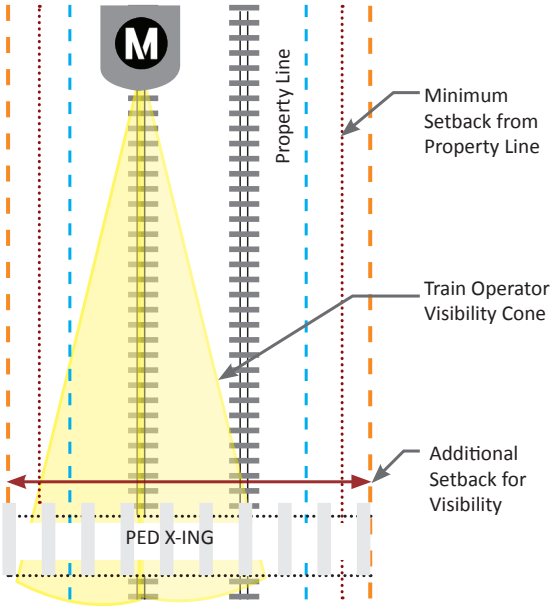
Developments adjacent to Metro ROW can present visual barriers to transit operators approaching vehicular and pedestrian crossings. Buildings and structures in close proximity to transit corridors can reduce sight-lines and create blind corners where operators cannot see pedestrians. This requires operations to reduce train speeds, which decreases efficiency of transit service.

RECOMMENDATION: Design buildings to maximize transit service sight-lines at crossings, leaving a clear cone of visibility to oncoming vehicles and pedestrians.

Metro Rail Operations will review, provide guidance, and determine the extent of operator visibility for safe operations. If the building envelope overlaps with the visibility cone near pedestrian and vehicular crossings, a building setback may be necessary to ensure safe transit service. The cone of visibility at crossings and required setback will be determined based on vehicle approach speed.



Limited sight-lines for trains approaching street crossings create unsafe conditions.



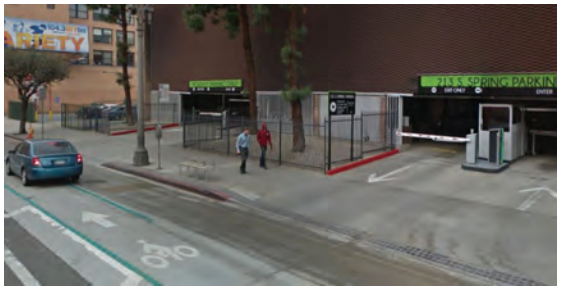
Visibility cones allow train operators to respond to safety hazards.

1.10 Driveway/Access Management

Driveways adjacent to on-street bus stops can create conflict for pedestrians walking to/from or waiting for transit. Additionally, driveways accessing parking lots and loading zones at project sites near Metro Rail and BRT crossings can create queuing issues along city streets and put vehicles in close proximity to fast moving trains and buses, which pose safety concerns.

RECOMMENDATION: Site driveways and other vehicular entrances to avoid conflicts with pedestrians, bicycles, and transit vehicles by:

- Placing driveways along side streets and alleys, away from on-street bus stops and transit crossings to minimize safety conflicts between active ROW, transit vehicles, and people, as well as queuing on streets.
- Locating vehicular driveways away from transit crossings or areas that are likely to be used as waiting areas for transit services.
- Placing loading docks away from sidewalks where transit bus stop activity is/will be present.
- Consolidating vehicular entrances and reduce width of driveways.
- Using speed tables to slow entering/exiting automobiles near pedestrians.
- Separating pedestrian walkways to minimize conflict with vehicles.
- Encouraging safe non-motorized travel.



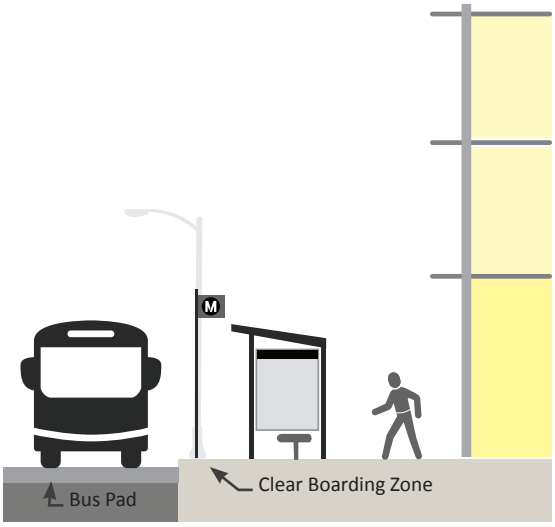
Driveways in close proximity to each other compromise safety for those walking to/from transit and increase the potential for vehicle-pedestrian conflicts.

1.11 Bus Stop & Zones Design

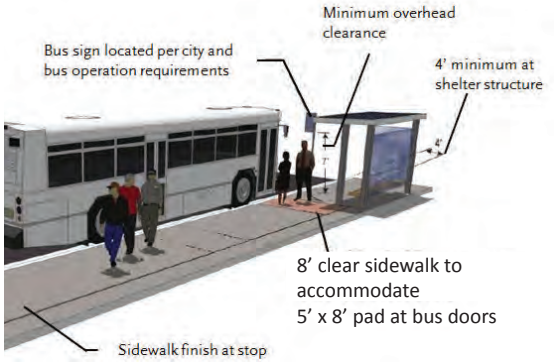
Metro Bus serves over 15,000 bus stops throughout the diverse landscape that is LA County. Typically located on sidewalks within public right-of-way owned and maintained by local jurisdictions, existing bus stop conditions vary from well-lit and sheltered spaces to uncomfortable and unwelcoming zones. Metro is interested in working with developers and local jurisdictions to create a vibrant public realm around new developments by strengthening multi-modal access to/ from Metro transit stops and enhancing the pedestrian experience.

RECOMMENDATION: When designing around existing or proposed bus stops:

- Review Metro's Transit Service Policy, which provides standards for design and operation of bus stops and zones for near-side, far-side, and mid-block stops.
- Review Metro's Transfers Design Guide for more information at https://www.metro.net/projects/station-design-projects/
- Accommodate 5' x 8' landing pads at bus doors (front and back door, which are typically 23 to 25 feet apart).
- Locate streetscape elements (e.g. tree planters, street lamps, benches, shelters, trash receptacles and newspaper stands) outside of bus door zones to protect transit access and ensure a clear path of travel.
- Install a concrete bus pad within each bus stop zone to avoid street asphalt damage.
- Replace stand-alone bus stop signs with bus shelters that include benches and adequate lighting.
- Design wide sidewalks (15' preferred) that accommodate bus landing pads as well as street furniture, landscape, and user travel space.
- Consider tree species, height, and canopy shape (higher than 14' preferred) to avoid vehicle conflicts at bus stops. Trees should be set back from the curb and adequately maintained to prevent visual and physical impediments for buses when trees reach maturity. Avoid planting of trees that have an invasive and shallow root system.



A concrete bus pad should be located at bus stops and bus shelters should be located along sidewalks to ensure an accessible path of travel to a clear boarding area.



Well-designed and accessible bus stops are beneficial amenities for both transit riders and users of adjacent developments.

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Engineering & Technical Review

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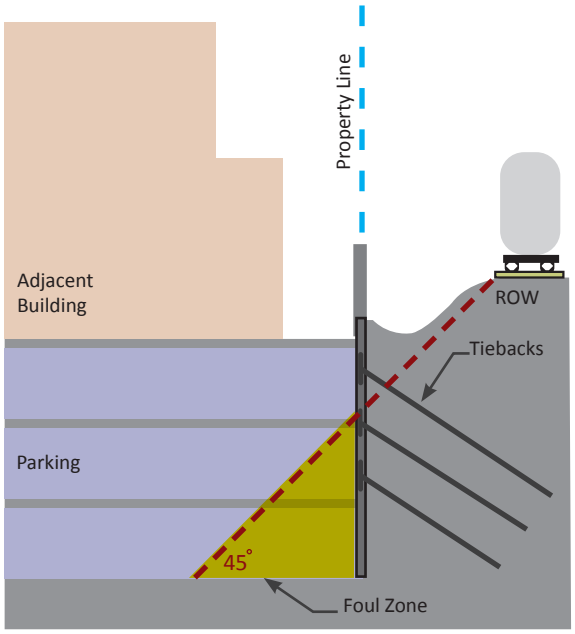
2.1 Excavation Support System Design

Excavation near Metro ROW has the potential to disturb adjoining soils and jeopardize support of existing Metro infrastructure. Any excavation which occurs within the geotechnical foul zone relative to Metro infrastructure is subject to Metro review and approval and meet Cal/OSHA requirements. This foul zone or geotechnical zone of influence shall be defined as the area below a track-way as measured from a 45-degree angle from the edge of the rail track ballast. Construction within this vulnerable area poses a potential risk to Metro service and requires additional Metro Engineering review.

RECOMMENDATION: Coordinate with Metro Engineering staff for review and approval of the excavation support system drawings and calculations prior to the start of excavation or construction. Tiebacks encroaching into Metro ROW may require a tieback easement or license, at Metro's discretion.

Any excavation/shoring within Metrolink operated and maintained ROW will require compliance with SCRRA Engineering standards and guidelines.

See page 7 for a sample section showing Metro adjacent conditions.



An underground structure located within the ROW foul zone would require additional review by Metro.

2.2 Proximity to Tunnels & Underground Infrastructure

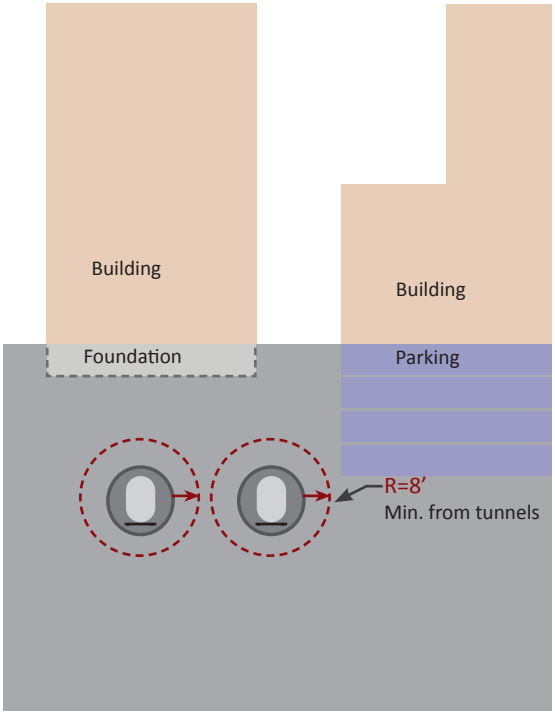
Construction adjacent to, over, or below underground Metro facilities (tunnels, stations and appendages) is of great concern and should be coordinated closely with Metro Engineering.

RECOMMENDATION: Coordinate with Metro early in the design process when proposing to build near underground Metro infrastructure. Metro typically seeks to maintain a minimum eight (8) foot clearance from existing Metro facilities to new construction (shoring or tiebacks). It will be incumbent upon the developer to demonstrate, to Metro's satisfaction, that both the temporary support of construction and the permanent works do not adversely affect the structural integrity, safety, or continued efficient operation of Metro facilities.

Dependent on the nature of the adjacent construction, Metro will need to review the geotechnical report, structural foundation plans, sections, shoring plan sections and calculations.

Metro may require monitoring where such work will either increase or decrease the existing overburden (i.e. weight) to which the tunnels or facilities are subjected. When required, the monitoring will serve as an early indication of excessive structural strain or movement. See Section 3.4, Excavation Drilling/Monitoring for additional information regarding monitoring requirements.

See page 7 for a sample section showing Metro adjacent conditions.

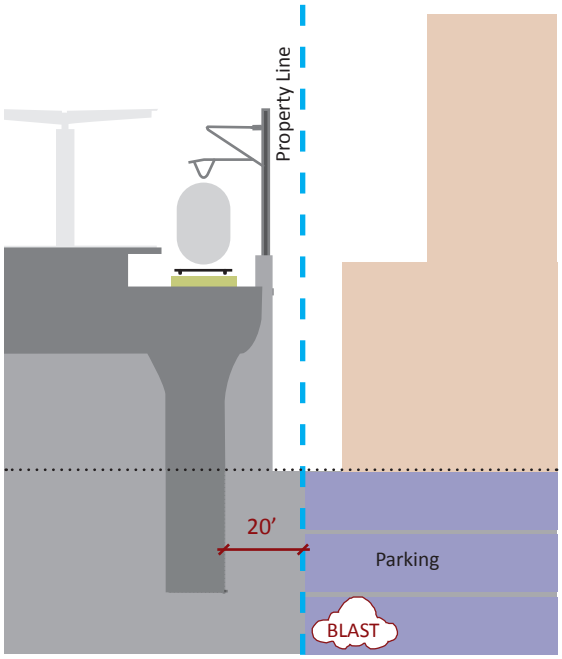


Adjacent project structures in close proximity to underground Metro infrastructure will require additional review by Metro.

2.3 Protection from Explosion/Blast

Metro is obligated to ensure the safety of public transit infrastructure from potential explosive sources which could originate from adjacent underground structures or from at-grade locations, situated below elevated guideways or near stations. Blast protection setbacks or mitigation may be required for large projects constructed near critical Metro facilities.

RECOMMENDATION: Avoid locating underground parking or basement structures within twenty (20) feet from an existing Metro tunnel or facility (exterior face of wall to exterior face of wall). Adjacent developments within this 20-foot envelope may be required to submit a Threat Assessment and Blast/Explosion Study for Metro review and approval.



An underground structure proposed within twenty (20) feet of a Metro structure may require a Threat Assessment and Blast/Explosion Study.

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Construction Safety & Management

Construction Safety & Management

3.1 Pre-Construction Coordination

Metro is concerned with impacts to service requiring rail single line tracking, line closures, speed restrictions, and bus bridging occurring as a result of adjacent project construction. Projects that will require work over, under, adjacent, or on Metro property or ROW and include operation of machinery, scaffolding, or any other potentially hazardous work are subject to evaluation in preparation for and during construction to maintain safe transit operations and passenger well-being.

RECOMMENDATION: Following an initial screening of the project, Metro may determine that additional on-site coordination may be necessary. Dependent on the nature of the adjacent construction, developers may be requested to perform the following as determined on a case-by-case basis:

- Submit a construction work plan and related project drawings and specifications for Metro review.
- Submit a contingency plan, show proof of insurance coverage, and issue current certificates.
- Provide documentation of contractor qualifications.
- Complete pre-construction surveys, perform baseline readings, and install movement instrumentation.
- Complete readiness review and perform practice run of transit service shutdown per contingency plan.
- Designate a ROW observer or other safety personnel and an inspector from the project's construction team.
- Establish a coordination process for access and work in or adjacent to ROW for the duration of construction.

Project teams will be responsible for the costs of adverse impacts to Metro transit operations caused by work on adjacent developments, including remedial work to repair damage to Metro property, facilities, or systems. Additionally, a Construction Monitoring fee may be assessed based on an estimate of required level of effort provided by Metro.

All projects adjacent to Metrolink infrastructure will require compliance with SCRRA Engineering Standards and Guidelines.

Metro may need to monitor development construction near Metro facilities.

3.2 Track Access and Safety

Permission from Metro is required to enter Metro property for rail construction and maintenance along, above, or under Metro ROW as these activities can interfere with Metro utilities and service and pose a safety hazard to construction teams and transit riders. Track access is solely at Metro's discretion and is discouraged to prevent electrocution and collisions with construction workers or machines.

RECOMMENDATION: Obtain and/or complete the following to work in or adjacent to Metro Rail ROW:

1. **Construction Work Plan:** Dependent on the nature of adjacent construction, Metro may request a construction work plan, which describes means and methods and other construction plan details, to ensure the safety of transit operators and riders.

2. **Safety Training:** All members of the project construction team will be required to attend Metro Rail Safety Training before commencing work activity. Training provides resources and procedures when working near active rail ROW.

3. **Right of Entry Permit/Temporary Construction Easement:** All access to and activity on Metro property, including easements necessary for construction of adjacent projects, must be approved through a Right-of-Entry Permit and/or a Temporary Construction Easement obtained from Metro Real Estate and may require a fee.

4. **Track Allocation:** All work on Metro Rail ROW must receive prior approval from Metro Rail Operations Control. Track Allocation identifies, reserves, and requests changes to normal operations for a specific track section, line, station, location, or piece of equipment to allow for safe use by a non-Metro entity. If adjacent construction is planned in close proximity to active ROW, flaggers must be used to ensure safety of construction workers and transit riders.

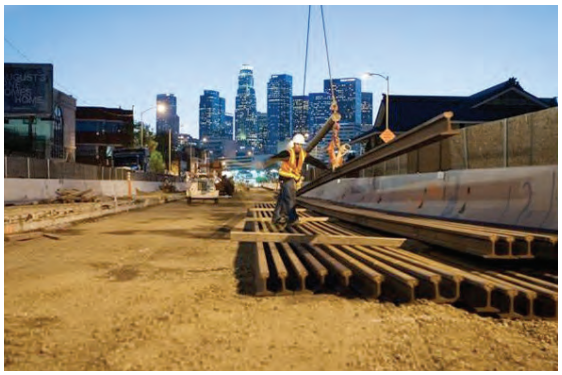
Trained flaggers ensure the safe crossing of pedestrians and workers of an adjacent development.

3.3 Construction Hours

Building near active Metro ROW poses safety concerns and may require limiting hours of construction which impact Metro ROW to night or off-peak hours so as not to interfere with Metro revenue service. To maintain public safety and access for Metro riders, construction should be planned, scheduled, and carried out in a way to avoid impacts to Metro service and maintenance.

RECOMMENDATION: In addition to receiving necessary construction approvals from the local jurisdiction, all construction work on or in close proximity to Metro ROW must be scheduled through the Track Allocation Process, detailed in Section 3.2.

Metro prefers that adjacent construction with potential to impact normal, continuous Metro operations take place during non-revenue hours (approximately 1am-4am) or during non-peak hours to minimize impacts to service. The developer may be responsible for additional operating costs resulting from disruption to normal Metro service.



Construction during approved hours ensures the steady progress of adjacent development construction and minimizes impacts to Metro's transit service.

3.4 Excavation/Drilling Monitoring

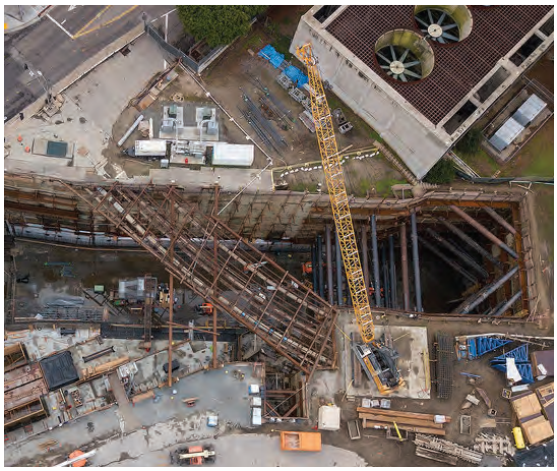
Excavation is among the most hazardous construction activities and can pose threats to the structural integrity of Metro's transit infrastructure.

RECOMMENDATION: Coordinate with Metro Engineering to review and approve excavation and shoring plans during design and development, and well in advance of construction (see Sections 2.1 and 2.2).

Geotechnical instrumentation and monitoring will be required for all excavations occurring within Metro's geotechnical zone of influence, where there is potential for adversely affecting the safe and efficient operation of transit vehicles. Monitoring of Metro facilities due to adjacent construction may include the following as determined on a case-by-case basis:

- Pre- and post-construction condition surveys
- Extensometers
- Inclinometers
- Settlement reference points
- Tilt-meters
- Groundwater observation wells
- Movement arrays
- Vibration monitoring

Excavation and shoring plans must be reviewed by Metro to ensure structural compatibility with Metro infrastructure and safety during adjacent development construction.



A soldier pile wall used for Regional Connector station at 2nd/Hope.

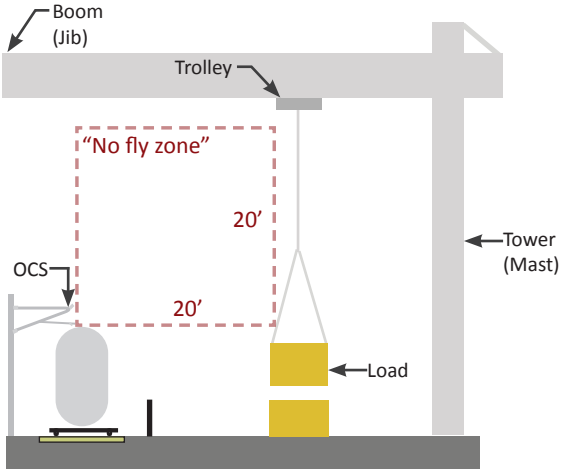
3.5 Crane Operations

Construction activities adjacent to Metro ROW may require moving large, heavy loads of building materials and machinery using cranes. Cranes referenced here include all power-operated equipment that can hoist, lower, and horizontally move a suspended load. To ensure safety for Metro riders, operators, and transit facilities, crane operations adjacent to Metro ROW must follow the safety regulations and precautions below and are subject to California Occupational Safety and Health Administration (Cal/OSHA) standards.

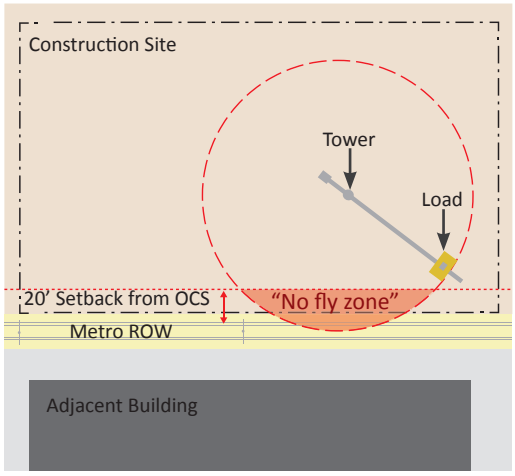
RECOMMENDATION:
Coordinate with Metro to discuss construction methods and confirm if a crane work plan is required. Generally, crane safety near Metro's ROW and facilities largely depends on the following factors: 1) Metro's operational hours and 2) swinging a load over or near Metro power lines and facilities. Note:

1. Clearance: A crane boom may travel over energized Metro OCS only if it maintains a vertical 20-foot clearance and the load maintain a horizontal 20-foot clearance.
2. Power: Swinging a crane boom with a load over Metro facilities or passenger areas is strictly prohibited during revenue hours. To swing a load in the "no fly zone" (see diagrams to right), the construction team must coordinate with Metro to de-energize the OCS.
3. Weathervaning: When not in use, the crane boom may swing 360 degrees with the movement of the wind, including over energized Metro OCS, only if the trolley is fully retracted towards the crane tower and not carrying any loads.
4. Process: Developers and contractors must attend Metro Track Allocation (detailed in Section 3.2) to determine if Metro staff support is necessary during crane erection and load movement.
5. Permit: Developers must apply for a Metro Right-of-Entry permit to swing over Metro facilities.

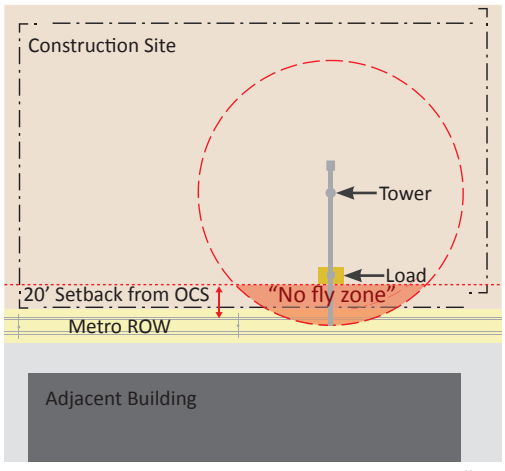
Project teams will bear all costs associated with impacts to Metro Rail operations and maintenance.



Cranes and construction equipment should be staged to avoid conflicts with the rail OCS.



Plan View: Crane swing and load are restricted near Metro ROW.



Plan View: While crane boom swings over "no fly zone," the trolley and load are retracted to maintain clearance from OCS.

3.6 Construction Barriers & Overhead Protection

During construction, falling objects can damage Metro facilities and pose a safety concern to the riders accessing them.

RECOMMENDATION: Erect vertical construction barriers and overhead protection compliant with Metro and Cal/OSHA requirements to prevent objects from falling into Metro ROW or areas designed for public access to Metro facilities. A protection barrier shall be constructed to cover the full height of an adjacent project and overhead protection from falling objects shall be provided over Metro ROW as necessary. Erection of the construction barriers and overhead protection for these areas shall be done during Metro non-revenue hours.

Overhead protection is required when moving heavy objects over Metro ROW or in areas designated for public use.

Constructed above is a wooden box over the entrance portal for overhead protection at the 4th/Hill Station.

3.7 Pedestrian & Emergency Access

Metro's riders rely on the consistency and reliability of access and wayfinding to and from stations, stops, and facilities. Construction on adjacent property must not obstruct pedestrian access, fire department access, emergency egress, or otherwise present a safety hazard to Metro operations, its employees, riders, and the general public. Fire access and safe escape routes within all Metro stations, stops, and facilities must be maintained at all times.

Sidewalk access is blocked for a construction project, forcing pedestrians into the street or to use less direct paths to the Metro facility.

RECOMMENDATION: Ensure pedestrian and emergency access from Metro stations, stops, and transit facilities is compliant with the Americans with Disabilities Act (ADA) and maintained during construction:

- Temporary fences, barricades, and lighting should be installed and watchmen provided for the protection of public travel, the construction site, adjacent public spaces, and existing Metro facilities.
- Temporary signage should be installed where necessary and in compliance with the latest California Manual on Uniform Traffic Control Devices (MUTCD) and in coordination with Metro Art and Design Standards.
- Emergency exits shall be provided and be clear of obstructions at all times.
- Access shall be maintained for utilities such as fire hydrants, stand pipes/connections, and fire alarm boxes as well as Metro-specific infrastructure such as fan and vent shafts.

3.8 Impacts to Bus Routes & Stops

During construction, bus stop zones and routes may need to be temporarily relocated. Metro needs to be informed of activities that require stop relocation or route adjustments in order to ensure uninterrupted service.

RECOMMENDATION: During construction, maintain or relocate existing bus stops consistent with the needs of Metro Bus Operations. Design of temporary and permanent bus stops and surrounding sidewalk areas must be compliant with the ADA and allow passengers with disabilities a clear path of travel to the transit service. Existing bus stops must be maintained as part of the final project. Metro Bus Operations Control Special Events Department and Metro Stops & Zones Department should be contacted at least 30 days before initiating construction activities.

Temporary and permanent relocation of bus stops and layover zones will require coordination between developers, Metro, and other municipal bus operators and local jurisdictions.

3.9 Utility Coordination

Construction has the potential to interrupt utilities that Metro relies on for safe operations and maintenance. Utilities of concern to Metro include, but are not limited to, condenser water piping, potable/fire water, storm and sanitary sewer lines, and electrical/ telecommunication services.

RECOMMENDATION: Coordinate with Metro Real Estate during project design to gauge temporary and permanent utility impacts and avoid conflicts during construction.

The contractor shall protect existing above-ground and underground Metro utilities during construction and coordinate with Metro to receive written approval for any utilities pertinent to Metro facilities that may be used, interrupted, or disturbed.

When electrical power outages or support functions are required, approval must be obtained through Metro Track Allocation in coordination with Metro Real Estate for a Right of Entry Permit.

To begin coordination with Metro Real Estate, visit www.metro.net/devreview and select the drop-down "Utility Project Coordination."

Coordination of underground utilities is critical to safely and efficiently operate Metro service.

3.10 Air Quality & Ventilation Protection

Hot or foul air, fumes, smoke, steam, and dust from adjacent construction activities can negatively impact Metro facilities, service, and users.

RECOMMENDATION: Ensure that hot or foul air, fumes, smoke, and steam from adjacent facilities are discharged beyond 40 feet from existing Metro facilities, including but not limited to ventilation system intake shafts and station entrances. Should fumes be discharged within 40 feet of Metro intake shafts, a protection panel around each shaft shall be required.

A worker breaks up concrete creating a cloud of silica dust.

Glossary

Cone of Visibility
A conical space at the front of moving transit vehicles allowing for clear visibility of travel way and/or conflicts.

Construction Work Plan (CWP)
Project management document outlining the definition of work tasks, choice of technology, estimation of required resources and duration of individual tasks, and identification of interactions among the different work tasks.

Flagger/Flagman
Person who controls traffic on and through a construction project. Flaggers must be trained and certified by Metro Rail Operations prior to any work commencing in or adjacent to Metro ROW.

Geotechnical Foul Zone
Area below a track-way as measured from a 45-degree angle from the edge of the rail track ballast.

Guideway
A channel, track, or structure along which a transit vehicle moves.

Heavy Rail Transit (HRT)
Metro HRT systems include exclusive ROW (mostly subway) trains up to six (6) cars long (450') and utilize a contact rail for traction power distribution (e.g. Metro Red Line).

Joint Development (JD)
JD is the asset management and real estate development program through which Metro collaborates with developers to build housing, retail, and other amenities on Metro properties near transit, typically through ground lease. JD projects directly link transit riders with destinations and services throughout LA County.

Light Rail Transit (LRT)
Metro LRT systems include exclusive, semi-exclusive, or street ROW trains up to three (3) cars long (270') and utilize OCS for traction power distribution (e.g. Metro Blue Line).

Measure R
Half-cent sales tax for LA County approved in November 2008 to finance new transportation projects and programs. The tax expires in 2039.

Measure M
Half-cent sales tax for LA County approved in November 2016 to fund transportation improvements, operations and programs, and accelerate projects already in the pipeline. The tax will increase to one percent in 2039 when Measure R expires.

Metrolink
A commuter rail system with seven lines throughout Los Angeles, Orange, Riverside, San Bernardino, Ventura, and North San Diego counties governed by the Southern California Regional Rail Authority (SCRRA).

Metro Adjacent Construction Design Manual
Volume III of the Metro Design Criteria & Standards, which outlines the Metro adjacent review procedure as well as operational requirements when constructing over, under, or adjacent to Metro facilities, structures, and property.

Metro Bus
Metro "Local" and "Rapid" bus service runs within the street, typically alongside vehicular traffic, though occasionally in "bus-only" lanes.

Metro Bus Rapid Transit (BRT)
High quality bus service that provides faster and convenient service through the use of dedicated ROW, branded vehicles and stations, high frequency and intelligent transportation systems, all-door boarding, and intersection crossing priority. Metro BRT may run within dedicated ROW or in mixed flow traffic on streets.

Metro Design Criteria and Standards
A compilation of documents that govern how Metro transit service and facilities are designed, constructed, operated, and maintained.

Metro Rail
Urban rail system serving LA County consisting of six lines, including two subway lines and four light rail lines.

Metro Rail Design Criteria (MRDC)
Volume IV of the Metro Design Criteria & Standards which establishes design criteria for preliminary engineering and final design of a Metro Rail Project.

Metro Transit Oriented Communities
Land use planning and community development program that seeks to maximize access to transportation as a key organizing principle and promote equity and sustainable living by offering a mix of uses close to transit to support households at all income levels, as well as building densities, parking policies, urban design elements, and first/last mile facilities that support ridership and reduce auto dependency.

Noise Easement Deed
Easement granted by property owners abutting Metro ROW acknowledging noise due to transit operations and maintenance.

Overhead Catenary System (OCS)
One or more electrified wires situated over a transit ROW that transmit power to light rail trains via pantograph, a current collector mounted on the roof of an electric vehicle. Metro OCS is supported by hollow poles placed between tracks or on the outer edge of parallel tracks.

Right of Entry Permit
Written approval granted by Metro Real Estate to enter Metro ROW and property.

Right of Way (ROW)
Legal right over property reserved for transportation purposes to construct, protect, maintain and operate transit services.

Southern California Regional Rail Authority (SCRRA)
A joint powers authority made up of an 11-member board representing the transportation commissions of Los Angeles, Orange, Riverside, San Bernardino and Ventura counties. SCRRA governs and operates Metrolink service.

Threat Assessment and Blast/Explosion Study
Analysis performed when adjacent developments are proposed within twenty (20) feet from an existing Metro tunnel or facility.

Track Allocation/Work Permit
Permit granted by Metro Rail Operations Control to allocate a section of track and perform work on or adjacent to Metro Rail ROW. This permit should be submitted for any work that could potentially foul the envelope of a train.

Wayfinding
Signs, maps, and other graphic or audible methods used to convey location and directions to travelers.

metro.net/projects/devreview/

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
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West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

June 2, 2023

Sean Scully
City of Redondo Beach
415 Diamond St.
Redondo Beach, CA 90277

Re: 2023050732, Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment, Los Angeles County

Dear Mr. Scully:

The Native American Heritage Commission (NAHC) has received the Notice of Preparation (NOP), Draft Environmental Impact Report (DEIR) or Early Consultation for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code §21000 et seq.), specifically Public Resources Code §21084.1, states that a project that may cause a substantial adverse change in the significance of a historical resource, is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, §15064.5 (b) (CEQA Guidelines §15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an Environmental Impact Report (EIR) shall be prepared. (Pub. Resources Code §21080 (d); Cal. Code Regs., tit. 14, § 5064 subd.(a)(1) (CEQA Guidelines §15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources within the area of potential effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code §21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code §21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code §21084.3 (a)). **AB 52 applies to any project for which a notice of preparation, a notice of negative declaration, or a mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. §800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments.

Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

- **a.** A brief description of the project.
- **b.** The lead agency contact information.
- **c.** Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code §21080.3.1 (d)).
- **d.** A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code §21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code §21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or Environmental Impact Report. (Pub. Resources Code §21080.3.1(b)).

- **a.** For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code §65352.4 (SB 18). (Pub. Resources Code §21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:

- **a.** Alternatives to the project.
- **b.** Recommended mitigation measures.
- **c.** Significant effects. (Pub. Resources Code §21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:

- **a.** Type of environmental review necessary.
- **b.** Significance of the tribal cultural resources.
- **c.** Significance of the project's impacts on tribal cultural resources.
- **d.** If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code §21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code §6254 (r) and §6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code §21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:

- **a.** Whether the proposed project has a significant impact on an identified tribal cultural resource.
- **b.** Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code §21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code §21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:

a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or

b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code §21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code §21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code §21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code §21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code §21084.3 (b). (Pub. Resources Code §21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:

a. Avoidance and preservation of the resources in place, including, but not limited to:

i. Planning and construction to avoid the resources and protect the cultural and natural context.

ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

i. Protecting the cultural character and integrity of the resource.

ii. Protecting the traditional use of the resource.

iii. Protecting the confidentiality of the resource.

c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

d. Protecting the resource. (Pub. Resource Code §21084.3 (b)).

e. Please note that a federally recognized California Native American tribe or a non-federally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code §815.3 (c)).

f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code §5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An Environmental Impact Report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:

a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code §21080.3.1 and §21080.3.2 and concluded pursuant to Public Resources Code §21080.3.2.

b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.

c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code §21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code §21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code §65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf.

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code §65352.3 (a)(2)).

2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.

3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code §65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code §5097.9 and §5097.993 that are within the city's or county's jurisdiction. (Gov. Code §65352.3 (b)).

4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:

- **a.** The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
- **b.** Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/.

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (https://ohp.parks.ca.gov/?page_id=30331) for an archaeological records search. The records search will determine:

- **a.** If part or all of the APE has been previously surveyed for cultural resources.
- **b.** If any known cultural resources have already been recorded on or adjacent to the APE.
- **c.** If the probability is low, moderate, or high that cultural resources are located in the APE.
- **d.** If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- **a.** The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
- **b.** The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:

a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.

a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, §15064.5(f) (CEQA Guidelines §15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.

b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.

c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code §7050.5, Public Resources Code §5097.98, and Cal. Code Regs., tit. 14, §15064.5, subdivisions (d) and (e) (CEQA Guidelines §15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

cc: State Clearinghouse

From:	IGR – Intergovernmental Review
To:	GeneralPlanEIR
Cc:	Frank Wen
Subject:	SCAG Comments on the NOP of a DEIR for the Redondo Beach GPU, Zoning Code Update and LCP Amendment [SCAG NO. IGR10894]
Date:	Thursday, June 22, 2023 4:03:33 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png IGR10894 NOP Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment.pdf

*CAUTION: Email is from an external source; **Stop, Look, and Think** before opening attachments or links.*

Good afternoon,

Please find attached SCAG Comments on the Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment [SCAG NO. IGR10894].

Please contact me at (213) 630-1427 or IGR@scag.ca.gov if you have any questions or difficulties with the attached file.

If you wish to submit documents for IGR review, please submit it online via the IGR webpage or via email to IGR@scag.ca.gov.

Thank you!

Intergovernmental Review (IGR) Program
Annaleigh Ekman (she/her), Senior Regional Planner
Tel: (213) 630-1427
IGR@scag.ca.gov

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS
900 Wilshire Blvd., Ste. 1700, Los Angeles, CA 90017

SCAG
INNOVATING FOR A BETTER TOMORROW

SOUTHERN CALIFORNIA
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June 22, 2023

Sean Scully, Planning Manager
Redondo Beach, Community Development Department
415 Diamond Street
Redondo Beach, California 90277
Phone: (310) 318-0637
E-mail: GeneralPlanEIR@redondo.org

Subject: SCAG Comments on the Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment [SCAG NO. IGR10894]

Dear Sean Scully:

Thank you for submitting the Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment ("proposed project") to the Southern California Association of Governments (SCAG) for review and comment. SCAG is responsible for providing informational resources to regionally significant plans, projects, and programs per the California Environmental Quality Act (CEQA) to facilitate the consistency of these projects with SCAG's adopted regional plans, to be determined by the lead agencies.[1]

Pursuant to Senate Bill (SB) 375, SCAG is the designated Regional Transportation Planning Agency under state law and is responsible for preparation of the Regional Transportation Plan (RTP) including the Sustainable Communities Strategy (SCS). SCAG's feedback is intended to assist local jurisdictions and project proponents to implement projects that have the potential to contribute to attainment of Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS) goals and align with RTP/SCS policies. Finally, SCAG is the authorized regional agency for Intergovernmental Review (IGR) of programs proposed for Federal financial assistance and direct Federal development activities, pursuant to Presidential Executive Order 12372.

SCAG staff has reviewed the Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment in Los Angeles County. The proposed project includes updates to the Land Use, Open Space and Conservation, Safety, and Noise elements accompanied by revisions to the City's Zoning Code and Local Coastal Program for consistency.

When available, please email environmental documentation to IGR@scag.ca.gov providing, at a minimum, the full public comment period for review.

If you have any questions regarding the attached comments, please contact the IGR Program, attn.: Annaleigh Ekman, Senior Regional Planner, at (213) 630-1427 or IGR@scag.ca.gov. Thank you.

Sincerely,

Frank Wen, Ph.D.
Manager, Planning Strategy Department

[1] Lead agencies such as local jurisdictions have the sole discretion in determining a local project's consistency with the 2020 RTP/SCS (Connect SoCal) for the purpose of determining consistency for CEQA.

COMMENTS ON THE NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE REDONDO BEACH GENERAL PLAN UPDATE, ZONING CODE UPDATE AND LOCAL COASTAL PROGRAM AMENDMENT [SCAG NO. IGR10894]

CONSISTENCY WITH CONNECT SOCAL

SCAG provides informational resources to facilitate the consistency of the proposed project with the adopted 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS or Connect SoCal). For the purpose of determining consistency with CEQA, lead agencies such as local jurisdictions have the sole discretion in determining a local project's consistency with Connect SoCal.

CONNECT SOCAL GOALS

The SCAG Regional Council fully adopted Connect SoCal in September 2020. Connect SoCal, also known as the 2020 – 2045 RTP/SCS, builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. The long-range visioning plan balances future mobility and housing needs with goals for the environment, the regional economy, social equity and environmental justice, and public health. The goals included in Connect SoCal may be pertinent to the proposed project. These goals are meant to provide guidance for considering the proposed project. Among the relevant goals of Connect SoCal are the following:

SCAG CONNECT SOCAL GOALS	
Goal #1:	*Encourage regional economic prosperity and global competitiveness*
Goal #2:	*Improve mobility, accessibility, reliability and travel safety for people and goods*
Goal #3:	*Enhance the preservation, security, and resilience of the regional transportation system*
Goal #4:	*Increase person and goods movement and travel choices within the transportation system*
Goal #5:	*Reduce greenhouse gas emissions and improve air quality*
Goal #6:	*Support healthy and equitable communities*
Goal #7:	*Adapt to a changing climate and support an integrated regional development pattern and transportation network*
Goal #8:	*Leverage new transportation technologies and data-driven solutions that result in more efficient travel*
Goal #9:	*Encourage development of diverse housing types in areas that are supported by multiple transportation options*
Goal #10:	*Promote conservation of natural and agricultural lands and restoration of habitats*

For ease of review, we encourage the use of a side-by-side comparison of SCAG goals with discussions of the consistency, non-consistency or non-applicability of the goals and supportive analysis in a table format. Suggested format is as follows:

SCAG CONNECT SOCAL GOALS		
Goal		Analysis
Goal #1:	*Encourage regional economic prosperity and global competitiveness*	*Consistent: Statement as to why;* *Not-Consistent: Statement as to why;* *Or* *Not Applicable: Statement as to why;* *DEIR page number reference*
Goal #2:	*Improve mobility, accessibility, reliability and travel safety for people and goods*	*Consistent: Statement as to why;* *Not-Consistent: Statement as to why;* *Or* *Not Applicable: Statement as to why;* *DEIR page number reference*
etc.		etc.

Connect SoCal Strategies

To achieve the goals of Connect SoCal, a wide range of land use and transportation strategies are included in the accompanying twenty (20) technical reports. Of particular note are multiple strategies included in Chapter 3 of Connect SoCal intended to support implementation of the regional Sustainable Communities Strategy (SCS) framed within the context of focusing growth near destinations and mobility options; promoting diverse housing choices; leveraging technology innovations; supporting implementation of sustainability policies; and promoting a Green Region. To view Connect SoCal and the accompanying technical reports, please visit the Connect SoCal webpage. Connect SoCal builds upon the progress from previous RTP/SCS cycles and continues to focus on integrated, coordinated, and balanced planning for land use and transportation that helps the SCAG region strive towards a more sustainable region, while meeting statutory requirements pertinent to RTP/SCSs. These strategies within the regional context are provided as guidance for lead agencies such as local jurisdictions when the proposed project is under consideration.

DEMOGRAPHICS AND GROWTH FORECASTS

A key, formative step in projecting future population, households, and employment through 2045 for Connect SoCal was the generation of a forecast of regional and county level growth in collaboration with expert demographers and economists on Southern California. From there, jurisdictional level forecasts were ground-truthed by subregions and local agencies, which helped SCAG identify opportunities and barriers to future development. This forecast helps the region understand, in a very general sense, where we are expected to grow, and allows SCAG to focus attention on areas that are experiencing change and may have increased transportation needs. After a year-long engagement effort with all 197 jurisdictions one-on-one, 82 percent of SCAG's 197 jurisdictions provided feedback on the forecast of future growth for Connect SoCal. SCAG also sought feedback on potential sustainable growth strategies from a broad range of stakeholder groups – including local jurisdictions, county transportation commissions, other partner agencies, industry groups, community-based organizations, and the general public. Connect SoCal utilizes a bottom-up approach in that total projected growth for each jurisdiction reflects feedback received from jurisdiction staff, including city managers, community development/planning directors, and local staff. Growth at the neighborhood level (i.e., transportation analysis zone (TAZ) reflects entitled projects and adheres to current general and specific plan maximum densities as conveyed by jurisdictions (except in cases where entitled projects and development agreements exceed these capacities as calculated by SCAG). Neighborhood level growth projections also feature strategies that help to reduce greenhouse gas emissions (GHG) from automobiles and light trucks to achieve Southern California's GHG reduction target, approved by the California Air Resources Board (CARB) in accordance with state planning law. Connect SoCal's Forecasted Development Pattern is utilized for long range modeling purposes and does not supersede actions taken by elected bodies on future development, including entitlements and development agreements. SCAG does not have the authority to implement the plan -- neither through decisions

about what type of development is built where, nor what transportation projects are ultimately built, as Connect SoCal is adopted at the jurisdictional level. Achieving a sustained regional outcome depends upon informed and intentional local action. To access jurisdictional level growth estimates and forecasts for years 2016 and 2045, please refer to the Connect SoCal Demographics and Growth Forecast Technical Report. The growth forecasts for the region and applicable jurisdictions are below.

	Adopted SCAG Region Wide Forecasts				Adopted City of Redondo Beach Forecasts			
	Year 2020	**Year 2030**	**Year 2035**	**Year 2045**	**Year 2020**	**Year 2030**	**Year 2035**	**Year 2045**
Population	19,517,731	20,821,171	21,443,006	22,503,899	68,819	70,333	71,108	72,873
Households	6,333,458	6,902,821	7,170,110	7,633,451	29,410	30,057	30,388	31,057
Employment	8,695,427	9,303,627	9,566,384	10,048,822	26,184	26,891	27,249	28,334

MITIGATION MEASURES

SCAG staff recommends that you review the Final Program Environmental Impact Report (Final PEIR) for Connect SoCal for guidance, as appropriate. SCAG's Regional Council certified the PEIR and adopted the associated Findings of Fact and a Statement of Overriding Considerations (FOF/SOC) and Mitigation Monitoring and Reporting Program (MMRP) on May 7, 2020 and also adopted a PEIR Addendum and amended the MMRP on September 3, 2020 (please see the PEIR webpage and scroll to the bottom of the page for the PEIR Addendum). The PEIR includes a list of project-level performance standards-based mitigation measures that may be considered for adoption and implementation by lead, responsible, or trustee agencies in the region, as applicable and feasible. Project-level mitigation measures are within responsibility, authority, and/or jurisdiction of project-implementing agency or other public agency serving as lead agency under CEQA in subsequent project- and site- specific design, CEQA review, and decision-making processes, to meet the performance standards for each of the CEQA resource categories.

ENVIRONMENTAL JUSTICE

Per Senate Bill 1000 (SB 1000), local jurisdictions in California with disadvantaged communities are required to develop an Environmental Justice (EJ) Element or consider EJ goals, policies, and objectives in their General Plans when updating two or more General Plan Elements. The City of Redondo Beach does not have any disadvantaged communities but if the City would like to consider environmental justice in its General Plan Update SCAG staff recommends that you review the Environmental Justice Technical Report and the updated Environmental Justice Toolbox, which is a resource document to assist local jurisdictions in developing EJ-related goals and policies regarding solutions for EJ-related community issues.

From:	Sam Wang
To:	GeneralPlanEIR
Subject:	South Coast AQMD Staff's Comments on Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment Project
Date:	Thursday, June 29, 2023 11:27:31 PM
Attachments:	LAC230601-03 NOP Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment Project.pdf

Dear Mr. Scully,

Attached are South Coast AQMD staff's comments on Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment Project (South Coast AQMD Control Number: LAC230601-03). Please contact me if you have any questions regarding these comments.

Regards,
Sam

Sam Wang
Program Supervisor, CEQA IGR
Planning, Rule Development & Implementation
South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765
(909) 396-2649
swang1@aqmd.gov

South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

SENT VIA E-MAIL: June 30, 2023

GeneralPlanEIR@redondo.org
Sean Scully, Planning Manger
City of Redondo Beach
Community Development Department
415 Diamond Street
Redondo Beach, CA 90277

Notice of Preparation of a Draft Environmental Impact Report for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment Project (Proposed Project)

South Coast Air Quality Management District (South Coast AQMD) staff appreciates the opportunity to comment on the above-mentioned document. Our comments are recommendations on the analysis of potential air quality impacts from the Proposed Project that should be included in the Draft Environmental Impact Report (EIR). Please send a copy of the Draft EIR upon its completion and public release directly to South Coast AQMD as copies of the Draft EIR submitted to the State Clearinghouse are not forwarded. **In addition, please send all appendices and technical documents related to the air quality, health risk, and greenhouse gas analyses and electronic versions of all emission calculation spreadsheets, and air quality modeling and health risk assessment input and output files (not PDF files). Any delays in providing all supporting documentation for our review will require additional review time beyond the end of the comment period.**

CEQA Air Quality Analysis

Staff recommends that the Lead Agency use South Coast AQMD's CEQA Air Quality Handbook and website[1] as guidance when preparing the air quality and greenhouse gas analyses. It is also recommended that the Lead Agency use the CalEEMod[2] land use emissions software, which can estimate pollutant emissions from typical land use development and is the only software model maintained by the California Air Pollution Control Officers Association.

South Coast AQMD has developed both regional and localized significance thresholds. South Coast AQMD staff recommends that the Lead Agency quantify criteria pollutant emissions and compare the emissions to South Coast AQMD's CEQA regional pollutant emissions significance thresholds[3] and localized significance thresholds (LSTs)[4] to determine the Proposed Project's air quality impacts. The localized analysis can be conducted by either using the LST screening tables or performing dispersion modeling.

The Lead Agency should identify any potential adverse air quality impacts that could occur from all phases of the Proposed Project and all air pollutant sources related to the Proposed Project. Air quality impacts from both construction (including demolition, if any) and operations should be calculated.

[1] South Coast AQMD's CEQA Handbook and other resources for preparing air quality analyses can be found at: http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook.
[2] CalEEMod is available free of charge at: www.caleemod.com.
[3] South Coast AQMD's CEQA regional pollutant emissions significance thresholds can be found at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf.
[4] South Coast AQMD's guidance for performing a localized air quality analysis can be found at: http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook/localized-significance-thresholds.

Construction-related air quality impacts typically include, but are not limited to, emissions from the use of heavy-duty equipment from grading, earth-loading/unloading, paving, architectural coatings, off-road mobile sources (e.g., heavy-duty construction equipment) and on-road mobile sources (e.g., construction worker vehicle trips, material transport trips, and hauling trips). Operation-related air quality impacts may include, but are not limited to, emissions from stationary sources (e.g., boilers and air pollution control devices), area sources (e.g., solvents and coatings), and vehicular trips (e.g., on- and off-road tailpipe emissions and entrained dust). Air quality impacts from indirect sources, such as sources that generate or attract vehicular trips, should be included in the analysis. Furthermore, emissions from the overlapping construction and operational activities should be combined and compared to South Coast AQMD's regional air quality CEQA ***operational*** thresholds to determine the level of significance.

The California Air Resources Board's (CARB) *Air Quality and Land Use Handbook: A Community Health Perspective*[5] is a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process with additional guidance on strategies to reduce air pollution exposure near high-volume roadways available in CARB's technical advisory[6].

The South Coast AQMD's *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*[7] includes suggested policies that local governments can use in their General Plans or through local planning to prevent or reduce potential air pollution impacts and protect public health. It is recommended that the Lead Agency review this Guidance Document as a tool when making local planning and land use decisions.

Mitigation Measures

In the event that the Proposed Project results in significant adverse air quality impacts, CEQA requires that all feasible mitigation measures that go beyond what is required by law be utilized to minimize these impacts. Any impacts resulting from mitigation measures must also be analyzed. Several resources to assist the Lead Agency with identifying potential mitigation measures for the Proposed Project include South Coast AQMD's CEQA Air Quality Handbook,[8] South Coast AQMD's Mitigation Monitoring and Reporting Plan for the 2022 Air Quality Management Plan,[9] and Southern California Association of Government's Mitigation Monitoring and Reporting Plan for the 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy.[10].

Mitigation measures for operational air quality impacts from mobile sources that the Lead Agency should consider in the Draft EIR may include the following:

- Require zero-emissions (ZE) or near-zero emission (NZE) on-road haul trucks such as heavy-duty trucks with natural gas engines that meet the CARB's adopted optional NOx emissions standard at 0.02 grams per brake horsepower-hour (g/bhp-hr), if and when feasible. Given the state's clean truck rules and regulations aiming to accelerate the utilization and market

[5] CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* can be found at: http://www.arb.ca.gov/ch/handbook.pdf.
[6] CARB's technical advisory can be found at: https://www.arb.ca.gov/ch/landuse.htm.
[7] South Coast AQMD. 2005. *Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning*. Available at: http://www.aqmd.gov/docs/default-source/planning/air-quality-guidance/complete-guidance-document.pdf.
[8] https://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook
[9] South Coast AQMD's 2022 Air Quality Management Plan can be found at: http://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan (Chapter 4 - Control Strategy and Implementation).
[10] Southern California Association of Governments' 2020-2045 RTP/SCS can be found at: https://www.connectsocal.org/Documents/PEIR/certified/Exhibit-A_ConnectSoCal_PEIR.pdf.

penetration of ZE and NZE trucks such as the Advanced Clean Trucks Rule[11] and the Heavy-Duty Low NOx Omnibus Regulation[12], ZE and NZE trucks will become increasingly more available to use. The Lead Agency should require a phase-in schedule to incentive the use of these cleaner operating trucks to reduce any significant adverse air quality impacts. South Coast AQMD staff is available to discuss the availability of current and upcoming truck technologies and incentive programs with the Lead Agency. At a minimum, require the use of 2010 model year[13] that meet CARB's 2010 engine emissions standards at 0.01 g/bhp-hr of particulate matter (PM) and 0.20 g/bhp-hr of NOx emissions or newer, cleaner trucks. Include environmental analyses to evaluate and identify sufficient electricity and supportive infrastructures in the Energy and Utilities and Service Systems Sections in the CEQA document, where appropriate. Include the requirement in applicable bid documents, purchase orders, and contracts. Operators shall maintain records of all trucks associated with project construction to document that each truck used meets these emission standards, and make the records available for inspection. The Lead Agency should conduct regular inspections to the maximum extent feasible to ensure compliance.

- Limit the daily number of trucks allowed at the Proposed Project to levels analyzed in the Final CEQA document. If higher daily truck volumes are anticipated to visit the site, the Lead Agency should commit to re-evaluating the Proposed Project through CEQA prior to allowing this higher activity level.
- Provide electric vehicle (EV) charging stations or at a minimum, provide the electrical infrastructure and electrical panels should be appropriately sized. Electrical hookups should be provided for truckers to plug in any onboard auxiliary equipment.

Mitigation measures for operational air quality impacts from other area sources that the Lead Agency should consider in the Draft EIR may include the following:

- Maximize use of solar energy by installing solar energy arrays.
- Use light colored paving and roofing materials.
- Utilize only Energy Star heating, cooling, and lighting devices, and appliances.
- Use of water-based or low VOC cleaning products that go beyond the requirements of South Coast AQMD Rule 1113.

Design considerations for the Proposed Project that the Lead Agency should consider to further reduce air quality and health risk impacts include the following:

- Clearly mark truck routes with trailblazer signs, so that trucks will not travel next to or near sensitive land uses (e.g., residences, schools, day care centers, etc.).
- Design the Proposed Project such that truck entrances and exits are not facing sensitive receptors and trucks will not travel past sensitive land uses to enter or leave the Proposed Project site.
- Design the Proposed Project such that any check-in point for trucks is inside the Proposed Project site to ensure that there are no trucks queuing outside.

[11] CARB. June 25, 2020. *Advanced Clean Trucks Rule*. Accessed at: https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks.

[12] CARB has recently passed a variety of new regulations that require new, cleaner heavy-duty truck technology to be sold and used in state. For example, on August 27, 2020, CARB approved the Heavy-Duty Low NOx Omnibus Regulation, which will require all trucks to meet the adopted emission standard of 0.05 g/hp-hr starting with engine model year 2024. Accessed at: https://ww2.arb.ca.gov/rulemaking/2020/hdomnibuslownox.

[13] CARB adopted the statewide Truck and Bus Regulation in 2010. The Regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet particulate matter filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent. More information on the CARB's Truck and Bus Regulation is available at: https://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm.

- Design the Proposed Project to ensure that truck traffic inside the Proposed Project site is as far away as feasible from sensitive receptors.
- Restrict overnight truck parking in sensitive land uses by providing overnight truck parking inside the Proposed Project site.

Health Risk Reduction Strategies

Many strategies are available to reduce exposures, including, but are not limited to, building filtration systems with MERV 13 or better, or in some cases, MERV 15 or better is recommended; building design, orientation, location; vegetation barriers or landscaping screening, etc. Enhanced filtration units are capable of reducing exposures. However, enhanced filtration systems have limitations. For example, in a study that South Coast AQMD conducted to investigate filters[14], a cost burden is expected to be within the range of $120 to $240 per year to replace each filter panel. The initial start-up cost could substantially increase if an HVAC system needs to be installed and if standalone filter units are required. Installation costs may vary and include costs for conducting site assessments and obtaining permits and approvals before filters can be installed. Other costs may include filter life monitoring, annual maintenance, and training for conducting maintenance and reporting. In addition, because the filters would not have any effectiveness unless the HVAC system is running, there may be increased energy consumption that the Lead Agency should evaluate in the Draft EIR. It is typically assumed that the filters operate 100 percent of the time while residents are indoors, and the environmental analysis does not generally account for the times when the residents have their windows or doors open or are in common space areas of the project. These filters have no ability to filter out any toxic gases. Furthermore, when used filters are replaced, replacement has the potential to result in emissions from the transportation of used filters at disposal sites and generate solid waste that the Lead Agency should evaluate in the Draft EIR. Therefore, the presumed effectiveness and feasibility of any filtration units should be carefully evaluated in more detail prior to assuming that they will sufficiently alleviate exposures to diesel particulate matter emissions.

South Coast AQMD staff is available to work with the Lead Agency to ensure that air quality, greenhouse gas, and health risk impacts from the Proposed Project are accurately evaluated and mitigated where feasible. If you have any questions regarding this letter, please contact me at swang1@aqmd.gov.

Sincerely,

Sam Wang

Sam Wang
Program Supervisor, CEQA IGR
Planning, Rule Development & Implementation

SW
LAC230601-03
Control Number

[14] This study evaluated filters rated MERV 13 or better. Accessed at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/aqmdpilotstudyfinalreport.pdf. Also see 2012 Peer Review Journal article by South Coast AQMD: https://onlinelibrary.wiley.com/doi/10.1111/ina.12013.

Community Development Department
Planning Division

415 Diamond Street, P.O. Box 270
Redondo Beach, California 90277-0270
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COMMENT CARD

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Scoping Meeting

June 8, 2023 at 6:00 PM

Consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines, the following 20 environmental topics would be analyzed further in the Draft EIR:

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

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

PLEASE DO NOT ALLOW BCHD TO CHANGE THEIR ZONING FROM "PUBLIC COMMUNITY FACILITY" TO A "FOR PROFIT" ENTITY. THE PROPOSED BCHD CAMPUS WILL PROVIDE VIRTUALLY NO BENEFIT TO BEACH CITY RESIDENTS.

Name: ALAN ISRAEL

Address: 416 N. LUCIA AVE REDONDO BEACH CA 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

More To Sea redondo BEACH

Community Development Department
Planning Division

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- Wildfire*

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print): I do NOT want there to be any more Senior assisted living buildings built on the grounds of the former South Bay Hospital Grounds foot print. There are enough of these surrounding this site in Torrance & adjacent to. Publically Zoned land has already been leased out to the Kensington Assisted Living Facility (Pat + Knoll Hill) for 2 generations (50 years, a calculated risk of the School District at the expense of the neighborhood impact.) Redondo Bch cannot risk that again with RCFland. Land use planning is already being compromised by SB9 + 10. No more leeway on land use.

Name: Barbara Harkins

Address: 503 N. Paulina Ave. Redondo Beach Ca 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

More To Sea™ redondo BEACH

Community Development Department
Planning Division

415 Diamond Street, P.O. Box 270
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COMMENT CARD

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Scoping Meeting

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- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities/Service Systems
- Wildfire*

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

I RETIRED FROM R.P.P.D JANUARY 1982. AT THAT TIME IT WAS CONSIDERED THE POLICE PARKING WAS OUT DATED AND OVER CROWDED. 41 YEARS AGO! PLANS HAVE BEEN MADE TO CORRECT THIS PROBLEM BUT I HAVE NOT SEEN ANY SOLUTIONS.

Name: EDWARD STARK

Address: 2211 EARLE CT, REDONDO BEACH, CA 90278

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

-----Original Message-----
From: R Crisa <dr_cr@msn.com>
Sent: Friday, June 30, 2023 3:06 PM
To: GeneralPlanEIR <GeneralPlanEIR@redondo.org>
Subject: Objections to BCHD overbuilding

[You don't often get email from dr_cr@msn.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

CAUTION: Email is from an external source; Stop, Look, and Think before opening attachments or links.

I am against the proposed assisted care senior high rise building at the BCHD location. Also, we need more parkland designations. Our environment , beach and inland all need the best protection it can get. The AES property, at least most of it ,needs to be zoned as parkland.
Thank you
Josephine Hrzina and Richard Crisa
Sent from my iPhone

More To Sea redondo BEACH

Community Development Department
Planning Division

415 Diamond Street, P.O. Box 270
Redondo Beach, California 90277-0270
www.redondo.org

tel: 310 318-0637
fax: 310 372-8321

COMMENT CARD

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Scoping Meeting

June 8, 2023 at 6:00 PM

Consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines, the following 20 environmental topics would be analyzed further in the Draft EIR:

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

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print): I WONDER: WHO ARE THE PERSONS "RUNNING" THE BEACH CITIES HD"... PRESENTLY THEY ARE ANONYMOUS TO THE LOCAL PUBLIC. THESE PERSONS SHOULD NOT BE ALLOWED TO CHANGE ANY ZONING LAW ON ANY PART OF THE RCHD FOOTPRINT. THIS IS SOMEONE'S TOXIC BRAINCHILD. STOP IT NOW. WE DO NOT need A RENTABLE UNIT GOING FOR 12K PER MONTH — BECAUSE THEY HAVE A GREAT VIEW!! NO LOCAL RB PERSON WILL EVER PAY 12K/MO TO STAY. THIS FACILITY SITS ON PUBLIC LAND. NOTHING OF SIGNIFICANCE SHOULD CHANGE. PLANS NEED TO BE REDRAWN AND SCALED BACK — LEAVING GARDENS & CONTEMPLATIVE OPEN SPACES.

Name: JEFFREY L. ANDERSON, RN, MS.

Address: 410 N. BROADWAY #C, REDONDO BEACH, CA 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

From: Mark Nelson (Home Gmail) <menelson@gmail.com>
Sent: Wednesday, June 7, 2023 7:00 PM
To: Sean Scully <Sean.Scully@redondo.org>; CityClerk <CityClerk@redondo.org>; GeneralPlanEIR <GeneralPlanEIR@redondo.org>
Subject: June 8, 2023 DEIR Scoping Meeting Comments

Comments for NOP, Scoping Meeting and Planning Commissioners:

TABLE 1 - likely to require a full EIR
In my opinion, all unchanged or reduced densities, heights, etc. pose no environmental impact and can safely be excluded from the detailed analysis.

I am concerned that the changes to RH from Units <28 to 20<Units<30 is a clear and unequivocal damage and requires environmental assessment.

It is unclear what impacts of the changes to CN are, and therefore, I believe that it does need any assessment absent historic data of CN development that would help clarify the operation of the CN without the changes.

I find all MU's to require analysis, as I see now way ex ante to understand the direction of the environmental impacts. Nor do I understand the direction of the impacts of MU-3 termination.

The increase in the I (Ind) FARs unequivocally increases impacts and requires analysis.

The FARs in PI and PU cannot be subject to any level of increase by the Planning Commission in order to conduct a valid CEQA. I cannot understand what "subject to PC" means in the case of PI, but no interpretation can be to increase FAR.

The residential overlays appear to require full analysis, as they significantly increase density and impacts.

TABLE 2
The proposed and potential growth are both severe and likely to have significant negative impacts. Therefore, they need to be subject to the full EIR process and assumed as a baseline.

TABLE 3
The impacts of the special policy areas appear to be significant and negative. They will require full EIR analysis of all categories.

NOISE ELEMENT
I find the noise element to be very vague and impossible to analyze without more detail. Therefore, it will require a fuller definition and a full EIR.

All in all, the changes proposed to the built environment by this plan are severe, underdefined, and require full EIR analysis.

Please note that email correspondence with the City of Redondo Beach, along with attachments, may be subject to the California Public Records Act, and therefore may be subject to disclosure unless otherwise exempt. The City of Redondo Beach shall not be responsible for any claims, losses or damages resulting from the use of digital data that may be contained in this email.

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Planning Division

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COMMENT CARD

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Scoping Meeting

June 8, 2023 at 6:00 PM

Consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines, the following 20 environmental topics would be analyzed further in the Draft EIR:

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- Land Use/Planning/Zoning
- Mineral Resources*
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources – returned to them
- Utilities/Service Systems
- Wildfire*

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print): I am most concerned about Zoning issues as dictated by SB 9 + 10 - which should go to a ballot vote in Next major election in CA. RF 1 residential zoning should be respected as doing away with it without provision for parking, yard space produces mental health problems AND does Not solve the homeless issue. Rent controlled areas more likely does.

I am asking that you make your 3rd area of "attention" the contentious BCHD proposal of the "Healthy Living Campus" which is a land grab of public PCF land, long designated for infrastructure or park land for the benefit of the 3) Communities supporting it with their property tax dollars. BCHD's overreach of a main building the height of the Staple Center for profit that very few residents could afford – $13k/month, which they will sell to anyone who has the $ Do Not give up the PCF zoning to them + burden surrounding schools + neighborhoods

Name:

Address:

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

Mary Ruth Ewell
415 N. Maria Ave.
Redondo Beach, CA 90277-3044

Mary Ruth Ewell, Senior resident
310-487-0162

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Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

This is all wrong - Does nothing to enhance Redondo Beach - will impact traffic and the zoning should not allow this - Been here for 69 yrs and am appalled you would do this

Name: Mary Carron James

Address: 400 N. Lucia - Redondo Beach

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

-----Original Message-----
From: mary watkins <327marywatkins@gmail.com>
Sent: Friday, June 30, 2023 2:35 PM
To: GeneralPlanEIR <GeneralPlanEIR@redondo.org>
Subject: Comments on General Plan Update

[You don't often get email from 327marywatkins@gmail.com. Learn why this is important at https://aka.ms/LearnAboutSenderIdentification]

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1)That the City not approve any zoning changes which will increase density of residential housing units, and mitigate so far as is possible the addition of units to R1 lots recently permitted by the State.
2)NO zoning change to the former South Bay Hospital site, especially as it is presently being promoted by BCHD.
Question: would it be possible in the General Plan Update to dissolve or withdraw from Beach Cities Health District? Ideally, the functions of this redundant and uselessly self-perpetuating body and its assigned income from property taxes should revert to the cities it purports to serve.
3) Forgive me if the following doesn't fall into any of your general plan categories, but: Can SOMETHING be done to assist RUHS with its horrendous parking shortage?
Those of us on the north side of the school along Del Amo are fed up with our street parking being nearly 100% filled up by students during school hours, and after hours and weekends by school and intramural events. Perhaps a share of land for additional parking (the old hospital site?).

In closing, I would like to thank the employees of the City of Redondo Beach past and present for their devotion to duty, and the outstanding job they have done for the residents. In my dealings with them, they could not have been more helpful and courteous. This is a wonderful city to live in, and I am I grateful to have moved here with my mother in 1963.

Mr. Scully, I wish you and the rest of the City staff all the best in the work you are undertaking on the General Plan.

Sincerely,
Mary Watkins
401 N Lucia Ave
Redondo Beach CA 90277

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Community Development Department
Planning Division

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- Public Services
- Recreation
- Transportation
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- Wildfire*

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

I have lived in Redondo Bch. most of my entire life & DONT WANT anymore high-rise establishments erected. Instead of a huge facility that would ONLY accomodate "the wealthy" why not put a city-park where ALL residents of Redondo, Hermosa & Manhattan Beaches could partake & enjoy.

Name: Michelle LaMontagne

Address: 1732 Aviation Blvd. ~ #104 Redondo Beach, Calif. 90278

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

B.C.H.D. land is Zoned for Public Community Facilities + they

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* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

I am concerned about the new Beach Cities Health building too big, too expansive. And too much $$$ for residency.

Also, I do not agree with the 4-on a lot for Redondo. Manhattan and Hermosa are so overcrowded, and parking is always an issue. This will only do the same for RB.

Name: Monica Siverts

Address: 555 N. Harbor Dr. #42, Redondo Beach, CA 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

RUTAN
RUTAN & TUCKER, LLP

Joseph D. Larsen
Direct Dial: (714) 641-3418
E-mail: jlarsen@rutan.com

June 26, 2023

VIA E-MAIL AND
FIRST CLASS MAIL

City of Redondo Beach
Sean Scully, Planning Manager
Community Development Department
415 Diamond Street
Redondo Beach, California 90277

Email: GeneralPlanEIR@redondo.org,
Sean.Scully@redondo.org

Re: Notice of Preparation of a Draft Environmental Impact Report
Notice of Public Review Period, and Notice of Public Scoping Meeting

Dear Mr. Scully:

We are writing on behalf of Beach Cities Health District ("BCHD"), a public agency that provides a wide range of preventive health services to the South Bay residents, including those in the City of Redondo Beach (the "City"). BCHD is concerned about that portion of the City's proposed update to its General Plan Land Use Element that would affect BCHD's 9.35-acre campus at 514 North Prospect Avenue (the "Campus").

The Campus is currently improved with medical offices, community wellness and memory care facilities, a maintenance building, and a parking structure. The floor area of the existing improvements on the Campus equate to approximately 312,900 square feet. The Campus has a public or institutional (P) land use designation in the City's General Plan and is zoned as a community facility ("P-CF") under the City's zoning code. Currently, there is no specified maximum Floor Area Ratio ("FAR") for P-CF zoned parcels. Instead, the carefully crafted language of the existing General Plan allows for flexibility in terms of use by subjecting development to discretionary design review. (Redondo Muni Code § 10-2.1116.)

However, the proposed General Plan update, without any cogent explanation or rationale, sets a maximum FAR on the Campus at 0.75. This is extremely troubling because, upon adoption, it would make the existing improvements on the Campus nonconforming and virtually eliminate the possibility of modernizing BCHD's outdated and seismically deficient Campus.

The building on the Campus was originally constructed in 1958 and, because of its age and seismic deficiencies, must be replaced. Indeed, a seismic retrofit of the Campus is economically unfeasible. Moreover, due to their age, the Campus' existing buildings require substantial annual maintenance and, within the near future, BCHD's annual maintenance costs for the Campus are

expected to exceed its annual operational revenues. If prolonged, this operational deficit will lead to a reduction in BCHD programs and may ultimately lead to insolvency. As a result, BCHD is in the process of modernizing the Campus in a way that will more efficiently connect City residents with health and wellness services, programs, and facilities. Since 2017, BCHD has engaged in public outreach to plan and design its Campus. The proposed modernization includes a residential care facility for the elderly (which will consist of memory care and assisted living units), and space for a program for all-inclusive care for the elderly, community services and a youth wellness center. More information is available online at https://www.bchdcampus.org/faq.

Upon adoption, the proposed FAR would significantly undermine the viability of BCHD's redevelopment of the Campus and thereby seriously compromises its ability to continue its mission of providing necessary public services, including preventative health care to the City and surrounding community. Without modernization in the coming years, BCHD will be unable to function at the Campus – resulting in a loss of necessary public health services to the Beach Cities area.

Notably, the proposed maximum FAR is not consistently applied to all properties with a public or institutional (P) land use designation in the General Plan and zoned P-CF. For example, properties within the City's civic center and the City-owned property at the northeast corner of Pacific Coast Highway and Vincent Street have a proposed maximum FAR of 1.25. However, other properties with a public or institutional (P) land use designation, including the Campus and school sites within the City, have a maximum FAR of 0.75. It's important to note, however, that school sites have a different use and zone designation – school facilities (P-SF) – and may be exempt from local land use regulations under the Government Code. This means that BCHD's Campus is the only property of its size with a public or institutional (P) land use designation in the General Plan and zoned P-CF affected by this proposed limitation.

For the reasons set forth herein, BCHD respectfully request that the City eliminate the proposed maximum FAR of 0.75 for the Campus or, alternatively, make the minimum FAR of 1.25 uniform across all properties with a public or institutional (P) land use designation in the General Plan and zoned P-CF.

A. THE PROPOSED FAR REQUIREMENTS FOR PROPERTIES WITH A PUBLIC OR INSTITUTIONAL (P) LAND USE DESIGNATION VIOLATE GOVERNMENT CODE § 65852.

The proposed FAR requirements violate the uniformity requirements of the Planning & Zoning Law. As required under Section 65852 of the Government Code, with regards to zoning districts: "All such regulations shall be uniform for each class or kind of building or use of land throughout each zone, but the regulation in one type of zone may differ from those in other types of zones." In *Neighbors in Support of Appropriate Land Use v. Tuolumne County* (2007), the courts held that "the foundations of zoning would be undermined. . .if local governments could grant favored treatment to some owners on a purely ad hoc basis. Cities and counties

unquestionably have the power to rezone and their decisions to do so are entitled to great deference; but rezoning, even of the smallest parcels, still necessarily respects the principle of uniformity. This is because a rezoning places a parcel within a general category of parcels (those in the new zone), all of which are subject to the same zoning regulations. The county's action in this case, by contrast, placed the [landowner's] land in a class by itself."

Similarly, there appears to be one parcel of its size with a public or institutional (P) land use designation and P-CF zoning designation subject to this proposed maximum FAR of 0.75 – the Campus. Why? Because the other similarly situated properties in the City with a public or institutional (P) land use designation and P-CF zoning designation are owned and controlled by the City, for which there is a different maximum FAR of 1.25.[1] In essence, the City is seeking to establish a parcel-specific land-use restriction which limits the Campus to a unique 0.75 FAR not shared by its own public or institutional (P) designated properties of a similar size and use.

B. THE PROPOSED MAXIMUM FAR OF 0.75 WOULD VIOLATE BCHD'S RIGHTS TO DUE PROCESS.

The Due Process Clause of the Fourteenth Amendment to the United States Constitution prohibits a state from depriving a person of life, liberty, or property without due process of law. (*See also* Cal. Con., art. I, sec. 7.) The touchstone of substantive due process is the protection of the individual against arbitrary government action; the due process clause was intended to prevent government officials from abusing their power or employing it as an instrument of oppression. (*Wolff v. McDonnell*, 418 U.S. 539, 558 (1974); *Collins v. City of Harker Heights* (1992) 503 U.S. 115, 126.) A violation of substantive due process rights occurs if a government agency's actions are (1) irrational or arbitrary or (2) not rationally related to a legitimate government interest. (*Village of Euclid v. Ambler Realty Co.* (1926) 272 U.S. 365; *Lingle v. Chevron* (2005) 544 U.S. 528.) The test is disjunctive. Thus, a property owner need only demonstrate facts to support one of the two bases in order to state a viable due process claim.

If the City were to adopt the proposed 0.75 FAR for the Campus, its actions would be arbitrary and irrational, and would constitute an abuse of power, subjecting it to liability under the Due Process Clause. In *Arnel Development Co. v. City of Costa Mesa* (1981) 126 Cal.App.3d 330, 337, the court ruled that enactment of an initiative measure downzoning property was arbitrary and discriminatory where enacted without considering appropriate planning criteria and for sole and specific purpose of defeating a single development. (*See also Fry v City of Hayward* (N.D. Cal. 1988) 701 F.Supp. 179 [zoning restrictions applicable to just one of several open space areas in City invalidated for denial of equal protection], *Del Monte Dunes, Ltd. v. City of Monterey* (9th

[1] The school properties that have a public or institutional land use designation are not similarly situated. They are zoned P-SF and, for school related purposes, generally provide for large open park areas. Regardless, unlike the Campus, school properties may be exempted from local land use regulations (Gov. Code 53094(b)) and the proposed 0.75 FAR maximum.

Cir. 1990) 920 F.2d 1496, 1508 [allegations that city council approved a 190 unit project with conditions that had been substantially met, then same council members abruptly changed course and rejected the project motivated not by legitimate regulatory concerns, but by political pressure from neighbors to preserve property as open space, could constitute arbitrary and irrational conduct] and *Herrington v. County of Sonoma* (9th Cir. 1987) 834 F.2d 1488 [denial of subdivision and subsequent downzoning of property violated property owner's due process rights given evidence that county's general plan/subdivision inconsistency determination was irrational and arbitrary and aimed at defeating particular development project].)

Here, if the City were to adopt the proposed 0.75 for the Campus, it would be engaging in the same conduct that the court invalidated in the *Arnel* and *Fry* cases. Specifically, approval of the proposed 0.75 FAR would constitute irrational and arbitrary conduct not based on appropriate planning criteria and for the sole and specific purpose of defeating the redevelopment of the Campus.

A planning regulation cannot be aimed at or discriminate against a particular property owner or applicant. (*See, e.g.*, G*&D Holland Construction Co. v. City of Marysville* (1970) 12 Cal.App.3d 989, 994 [when the police power has been exercised in such a manner as to oppress or discriminate against an individual or individuals or against a particular parcel of land, it will be overturned]; *see also Lockary v. Kayfetz* (9th Cir. 1990) 917 F.2d 1150, 1155-1156 [if agency's moratorium on issuance of new water hookups based on a water shortage was pre-textual, as alleged, owners could state viable substantive due process and equal protection claims].) The proposed 0.75 FAR here is plainly and unmistakably aimed at blocking redevelopment of the Campus. Because the proposed 0.75 FAR is an arbitrary and discriminatory action aimed at one particular user, it is not reasonably related to a legitimate state interest. (*See, e.g., Lockary, supra,* 917 F.2d at 1155 [court observes that the reasonable relationship test "will not sustain conduct by state officials that is malicious, irrational or plainly arbitrary."].)

In sum, enactment of the proposed 0.75 FAR, which subjects the Campus to different or more burdensome requirements than imposed on similarly situated properties, would deprive BCHD of its constitutionally protected right to due process.

C. ADOPTION OF THE PROPOSED 0.75 FOR THE CAMPUS WOULD VIOLATE BCHD'S RIGHT TO EQUAL PROTECTION.

The Fourteenth Amendment to the United States Constitution provides that no state shall deny to any person within its jurisdiction the equal protection of the laws. (*See also* Cal. Con., art. I, sec. 7.) The concept of equal protection has been defined to mean that no person or class of persons may be denied the same protection of law that is enjoyed by other persons or other classes in like circumstances. (*Hawn v. County of Ventura* (1977) 73 Cal.App.3d 1009, 1018.) A claimant must show that the state "has adopted a classification that affects two or more *similarly situated* groups in an unequal manner." (*Walgreen Co. v. City & County of San Francisco* (2010) 185

Cal.App.4th 424, 434 [emphasis in the original].) An equal protection challenge to a regulation that does not involve a suspect class or fundamental right must nevertheless bear a reasonable relationship to a legitimate state interest. (*Young v. American Mini Theaters* (1976) 427 U.S. 50.) "[A] deliberate, irrational discrimination, even if it is against one person (or other entity) rather than a group, is actionable under the equal protection clause." (*World Outreach Conference Center v. City of Chicago* (7th Cir. 2009) 591 F.3d 531, 538.)

The term spot zoning is used to describe a zoning action that violates the principle of equal protection because of its discriminatory nature. (*See, e.g., Ross v. City of Yorba Linda* (1991) 1 Cal. App.4th 954 [denial of rezoning to allow property owner to develop their property at densities similar to those on surrounding parcels, was arbitrary and discriminatory and thus unlawful]; and *Kissinger v. City of Los Angeles*, 161 Cal.App.2d 454, 460 (1958) [downzoning of island surrounded by multi-family residential and commercial uses to single family use found to be improper].)

Here, the Campus is designated for public uses by the General Plan and zoned P-CF. The only other parcels of comparable size in the City that are likewise improved or designated for such uses are City-owned properties. However, the proposed General Plan update carves out an exemption to the proposed 0.75 FAR for those City-owned properties. As in *Ross*, "the City's arbitrary line-drawing is antithetical to the individual right to equal protection of the law." (1 Cal.App.4th at 962.) Enactment of the proposed 0.75 for the Campus would thus constitute arbitrary and discriminatory spot zoning in violation of BCHD's right to equal protection.

Considering the foregoing, enactment of the proposed 0.75 for the Campus, which subjects the Campus to different or more burdensome requirements than imposed on similarly situated properties, would deprive BCHD of its constitutionally protected right to equal protection under the law.

D. THE CITY'S DRAFT ENVIRONMENTAL IMPACT REPORT MUST CONSIDER THE LOSS OF PUBLIC SERVICES, INCLUDING THE LOSS OF PREVENTATIVE HEALTH CARE AND ASSISTED LIVING, RESULTING FROM THE PROPOSED MAXIMUM FAR OF 0.75 ON THE CAMPUS.

BCHD serves as a vital hub for public services, offering preventative health care, educational programs, community events, and outreach initiatives. These activities contribute significantly to the well-being of the community. Restricting BCHD's ability to replace outdated and seismically deficient buildings on the Campus would inevitably result in a loss of space and resources needed to deliver these essential services, significantly diminishing the overall quality of life in the area. The draft EIR for the General Plan update must adequately analyze and disclose the potential impacts of the proposed FAR on BCHD's campus and its ability to provide public services. Moreover, it must provide a justification or rationale for imposing such a FAR on

Campus, particularly when other properties with the same land use designation and zoning are permitted a higher FAR of 1.25.

In addition to examining the direct environmental impacts associated with the proposed maximum FAR of 0.75 for the campus, the City must also consider the indirect displacement effects likely to ensue from the proposed loss of public health services at the Campus. (*See, e.g.*, *Muzzy Ranch Co. v. Solano County Airport Land Use Comm'n* (2007) 41 Cal.4th 372, 383 [California Supreme Court observes that the impact of development in other areas resulting from a ban on development within one jurisdiction must be considered in the CEQA process].) Practical considerations should also be taken into account by the City with respect to the proposed maximum FAR. Given that the City already has discretionary design review authority over development within the public or institutional land use area, the maximum FAR of 0.75 appears unnecessary to achieve the City's stated aesthetic and economic goals.

E. BY LIMITING THE ABILITY TO PROVIDE ONGOING RESIDENTIAL CARE FOR THE CITY'S ELDERLY COMMUNITY, THE PROPOSED FAR OF 0.75 IS INCONSISTENT WITH THE CITY'S HOUSING ELEMENT.

The Campus is important in providing assisted living options for seniors in the City. The City's 6th Cycle 2021-2029 Housing Element acknowledges that elderly residents and individuals with disabilities have unique housing needs. (Housing Element, pg. 28.) In the City, disabled individuals make up 6.5% of the population, with 45% of them being aged 65 and older. (*Ibid*.) Independent living difficulties are common among these elderly residents. (Housing Element, Table H-18.) However, housing options for persons with disabilities, including community care facilities, are limited in the City. Indeed, the City only has six residential care facilities for the elderly, with a total capacity of 282 beds. (2021-2029 Housing Element, pg. 30.) One of these facilities is located on the Campus.

The need for suitable housing options for persons with disabilities, including community care facilities, is crucial. In fact, the staff report for the Campus' 2006 Conditional Use Permit to convert part of its full-service community center into an assisted living facility explicitly emphasizes the urgent need for a residential care facility to cater to elderlcy individuals who require living assistance while desiring to remain in the South Bay area. However, the proposed FAR of 0.75 for the Campus limits its ability to provide ongoing residential care for the City's elderly community, which goes against the City's commitment to addressing their specialized housing needs. Moreover, any refusal to make reasonable accommodations in rules, policies or practices when such accommodation is necessary to afford disabled seniors with equal opportunity to residential care would violate the federal Fair Housing Act (42 U.S.C. §§ 3601-3631) and/or California's Unruh Civil Rights Act.

F. THE PROPOSED MAXIMUM FAR OF 0.75 LIKELY VIOLATES SENATE BILLS 330 AND 8 (HOUSING CRISIS ACT OF 2019).

Governor Gavin Newsom enacted the Housing Crisis Act of 2019 ("HCA"), also known as SB 330 (Chapter 654, Statutes of 2019), on October 9, 2019, as a response to the housing crisis in California. The provisions of the HCA were later extended through SB 8 (Chapter 161, Statutes of 2021), signed by Governor Newsom on September 16, 2021.

One aspect of the HCA involves limitations on making changes to land use or zoning that would reduce residential density or the intensity of land uses compared to what was allowed under the regulations in effect on January 1, 2018. The law includes various factors in its definition of "less intensive use," including reductions in FAR.

Currently, the Campus permits residential care facilities. In fact, the City has identified potential locations for such facilities on the BCHD Campus to ensure compliance with SB 330. However, the proposed 0.75 FAR, which imposes stricter limitations on the Campus beyond what was allowed on January 1, 2018, would make even the existing facilities nonconforming. This would likely violate the HCA.

G. THE CITY FAILED TO PROVIDE BCHD WITH AN ADEQUATE OPPORTUNITY TO BE INVOLVED IN THE PREPARATION OF THE GENERAL PLAN UPDATE, AS REQUIRED BY GOV. CODE §§ 65351, 65352, PRIOR TO BEING SUBMITTED TO ENVIRONMENTAL REVIEW.

According to Government Code § 65351, the City is required to involve public agencies in the preparation of any amendment to the General Plan. Furthermore, Government Code § 65352 mandates that the City refer any proposed action to amend the General Plan to specified governmental entities, including any special district, such as BCHD, that may be significantly affected by the proposed amendment. Each of these governmental agencies must be given a minimum of 45 days to review and comment on the proposed amendment.

BCHD did not receive any notice of the General Plan update, including the proposed maximum FAR, until being served with the Notice of Preparation of Draft EIR. By failing to involve BCHD in the process, the City allowed land use practices that will compromise BCHD's ability to continue its mission of providing necessary public services, including preventative health care to the City and surrounding community, to be included in the proposed General Plan update that is being submitted for environmental review.

****

In summary, given the numerous constitutional, statutory and procedural infirmities associated with the proposed 0.75 for the Campus (as set forth above), we trust that the City will

act appropriately and remove the maximum FAR for the Campus and, instead, leave the matter to the City's design review, as currently is the case. Alternatively, the City should ensure that a uniform maximum of 1.25 FAR is applied uniformly to all similarly situated properties with a public or institutional land use designation and zoned C-PF.

We appreciate your consideration of BCHD's views on this matter. In the meantime, please do not hesitate to contact me with any questions concerning this correspondence.

Very truly yours,

RUTAN & TUCKER, LLP

Joseph D. Larsen

JDL

cc: Tom Bakaly, CEO, Beach Cities Health District (Tom.Bakaly@bchd.org)
Monica Suua, CFO, Beach Cities Health District (Monica.Suua@bchd.org)
Michael W. Webb, City Attorney, City of Redondo Beach (Michael.Webb@redondo.org)

From:	Carvalho, Pamela
To:	GeneralPlanEIR; Sean Scully
Cc:	Larsen, Joseph; Carvalho, Pamela; Tom.Bakaly@bchd.org; Monica.Suua@bchd.org; Michael Webb
Subject:	BCHD Comment Letter re Notice of Preparation of Draft EIR (037374.0001 JDL)
Date:	Monday, June 26, 2023 2:12:17 PM
Attachments:	image001.png BCHD Comment Letter re Notice of Preparation of Draft EIR(19245138.8).pdf

Dear Mr. Scully,
Please find the attached correspondence being sent via U.S. Mail to you today.
Thank you.

Pamela Carvalho
Legal Assistant for Bob Owen, Joseph D. Larsen, Hans Van Ligten, Peter Howell and Allison LeMoine-Bui

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RUTAN
RUTAN & TUCKER, LLP

More To Sea redondo BEACH

Community Development Department
Planning Division

415 Diamond Street, P.O. Box 270
Redondo Beach, California 90277-0270
www.redondo.org

tel: 310 318-0637
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COMMENT CARD

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Scoping Meeting

June 8, 2023 at 6:00 PM

Consistent with Appendix G of the California Environmental Quality Act (CEQA) Guidelines, the following 20 environmental topics would be analyzed further in the Draft EIR:

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

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

BC HD must abide by the current zoning laws. We do not need "units", renting @ $ 12K month. Most RB residents cannot not afford this so this is for the benefit of visitors "to enjoy the view"!! This developement on public land needs to be ~~scaled~~ Scaled back and to leave some open space.!!

Name: Sheila Anderson

Address: 410 N. Broadway Unit C RB 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

More To Se
redor
BEA

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- X Aesthetics
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- X ~~Air Quality~~
- Biological Resources
- Cultural Resources
- Energy
- Geology/Soils
- Greenhouse Gas Emissions
- X Hazards/Hazardous Materials
- X ~~Hydrology and Water Quality~~
- X Land Use/Planning
- Mineral Resources*
- X Noise
- X Population and Housing
- X Public Services
- Recreation
- X ~~Transportation~~ /TRAFFIC
- Tribal Cultural Resources
- X Utilities/Service Systems
- Wildfire*

* *Topics to be addressed in Impacts Found not to be Significant section of EIR*

Please identify any comments or concerns you may have regarding the Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment Draft, including any additional environmental topic areas, potential mitigation measures, or project alternatives (please print):

AS YOU CAN SEE BY OUR ADDRESS, OUR HOME IS DIRECTLY ACROSS THE STREET FROM THE PROPERTY IN QUESTION. WE BOUGHT THIS HOUSE IN 1976, RAISED OUR 2 CHILDREN HERE, AND ARE NOW IN OUR MID-70'S, LIVING OUT OUR RETIREMENT YEARS. WE HAVE ALREADY BEEN THROUGH THE CONSTRUCTION OF THE MEDICAL BLDGS @ 510 + 520, TAKING AWAY SOME BEAUTIFUL VIEWS! OUR UNDERSTANDING IS THAT THE BCHD LAND IS PUBLIC COMMUNITY FACILITIES DESIGNATED, IT APPEARS THAT THE DEVELOPERS WANT TO USE IT FOR "PROFIT."

Name: TOM + CAROL McGARRY Tom & Carol McGarry

Address: 523 N. PROSPECT AVE, RB 90277

Please return this comment card to Planning Manager Sean Scully at the end of the Scoping Meeting or fold in half, tape, and mail to the City of Redondo Beach using the address provided (see reverse). Comments may also be submitted via email to GeneralPlanEIR@redondo.org. **Comments must be submitted by June 30, 2023.**

WE ARE NOT ON BOARD WITH ANY EXCEPTION TO THE CURRENT DESIGNATION/ZONING OF THAT PROPERTY BEING CHANGED FROM PUBLIC COMMUNITY FACILITIES TO SOMETHING ALLOWING DEVELOPERS TO MAKE A TON OF MONEY AT OUR EXPENSE + INCONVENIENCE!

Appendix B Buildout Methodology

Appendices

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Appendix A– General Plan Buildout Methodology

MEMORANDUM

DATE	January 31, 2024, and clarifications added July 22, 2024
TO	Sean Scully, Acting Community Development Director
FROM	Wendy Nowak, AICP, Principal Halley Grundy, Senior Associate Asher Kaplan, Associate
SUBJECT	General Plan Land Use Buildout Methodology
PROJECT	Redondo Beach General Plan Update

This technical document outlines the methodology used to establish the development projections for the City of Redondo Beach's General Plan Update, Land Use Element, which will be used for analyzing potential impacts in the Programmatic Environmental Impact Report (PEIR). Part 1 of this memorandum establishes the methodology for estimating existing land use conditions; Part 2 documents the assumptions applied to estimate buildout of the Current General Plan (1992); Part 3 presents the projected buildout estimates resulting from the Proposed Land Use Plan. This analysis reflects the methodology used to estimate growth for the Proposed Land Use Plan. This memorandum also serves as a general reference for City staff, elected officials, and the public.

Background

All California cities are required to identify development projections (i.e., a "buildout analysis") in their general plan. While a high-level summary of buildout projections is usually documented in a general plan the accompanying PEIR typically documents a more detailed comparison of the proposed change in dwelling units, households, residents, jobs, and non-residential square footage compared to existing conditions. This estimate is important as it provides a foundation for the City to plan for roads, water service, parks, recreation, and other infrastructure and services to support current and future residents and businesses. This memo also discloses the buildout that was anticipated under the Current General Plan when that plan was authored in 1992. Current General Plan estimates are provided as a reference, but analysis in the PEIR will compare the estimated buildout of the proposed plan to existing conditions.

Purpose, Design and Limitations

This memorandum summarizes methodology and factors used to calculate existing and buildout conditions for the purposes of the General Plan and its analysis through a PEIR. All figures are estimates generated using the best available data for analysis at a citywide level, with additional detail provided by specific land use zones.

Whenever possible, the figures generated were derived from authoritative data sources, including U.S. census, American Community Survey, and California Department of Finance. Such sources are subject to their own error rates and may summarize data at different geographic levels or in different categories. Authoritative data was supplemented by City staff input and City-maintained data on building and development. When more precise data was not available, aerial imagery was used to estimate existing conditions as described in Part 1 of this memo.

Geographic Information System (GIS) software was used to conduct geographic specific analysis. Estimates were generated at the parcel level, verified at the Traffic Analysis Zone (TAZ) level (a geography that typically consists of several City blocks), and then aggregated up for the citywide estimates described herein. All estimates herein have been rounded, and there may be small discrepancies throughout due to rounding and aggregation of data.

Figures generated for existing estimates were compared to aggregated or citywide totals from authoritative sources, understanding that such comparisons are primarily for the purpose of determining order-of-magnitude accuracy, as discussed in part 1 of this memo. Current General Plan buildout estimates, as identified in 1992, were recreated to the extent possible as described in Part 2 of this memo. Future buildout estimates resulting from the Proposed Land Use Plan were calculated according to the assumptions described in Part 3 of this memo.

It is important to note that the buildout figures represent an informed but estimated projection of a future condition. The actual construction of development will likely vary by parcel and planning area in terms of location and mix of uses. The analysis in the General Plan PEIR provides a programmatic assessment of potential impacts, enabling tiering for future projects that are consistent with the assumptions on some CEQA topics (other project-level impacts will still need to be evaluated through the appropriate environmental clearance under CEQA).

Part 1: Existing Conditions (Baseline)

For the purpose of the California Environmental Quality Act (CEQA) the City's existing conditions (existing on-the-ground number of dwelling units, households, population, nonresidential building square footage, and employment) serve as the baseline for the General Plan PEIR analysis. A General Plan PEIR is required to compare the potential impacts of the Proposed General Plan against existing conditions.

EXISTING LAND USE: UNITS, HOUSEHOLDS, POPULATION, NON-RESIDENTIAL SQUARE FEET, AND JOBS

The City of Redondo Beach provided existing land use data in GIS to record on-the-ground uses and serve as baseline conditions. Eleven land use categories classify land use by parcel within city boundaries. Every city parcel is designated with a specific land use category and its associated acreage. Building square footage was derived from Los Angeles County Assessor parcel data. The following methodology is proposed to calculate, households, population, non-residential square footage, and employment. Table 1, City of Redondo Beach General Plan Update Existing Land Use Buildout provides the buildout results of the methodology outlined below.

1.1 Existing residential units from the Existing Land Use Inventory

GIS data provided by the City identified the number of units associated with each parcel, totaling 30,431 dwelling or housing units. This estimate is within a 2% difference of the California Department of Finance (CA DOF) information, which estimated 31,049 total housing units in the City (January 2023). The 2020 decennial census reports 30,999 total units, a difference of 1.8% from the GIS estimate. The GIS-derived estimate of 30,431 is also close to the 2016-2021 American Community Survey 5–Year Estimates (2021 ACS) of 31,015 units as well as the 2015–2019 American Community Survey 5–Year Estimates (2019 ACS) of 30,024 units, the latter of which is cited in the City's 2021-2029 Housing Element. This degree of difference is within an acceptable range according to best practices for city-wide buildout analyses. Extensive research and ground-truthing were employed to verify the City's GIS-based existing land use database and the number of housing units.

1.2 Existing households in Redondo Beach: [dwelling unit] x [occupancy rate]

At any given time, a percentage of existing housing units in Redondo Beach are occupied; the others are vacant (referred to as occupancy and vacancy rates, respectively). In terms of this estimate methodology, "households" represent the number of units that were occupied. In April 2023, the CA DOF estimated a vacancy rate of approximately 4.9%, indicating an occupancy rate of approximately 95.1%. To estimate households, the total number of housing units (30,431) is multiplied by the

occupancy rate (95.1%) to arrive at the number of households in Redondo Beach. Using this method results in an estimate of 28,945 households. This varies by approximately 2% from the January 2023 CA DOF population data estimate of 29,525 households and by less than 1% from the estimate of 29,002 cited in the Housing Element, which refences data from the 2019 ACS. This degree of difference is within an acceptable range according to best practices for a city-wide buildout analysis.

1.3 Existing population in Redondo Beach: [households] x [persons per household]

To estimate the existing population, persons per household (pph) rates are applied to the estimated number of existing households, (see the prior section for a discussion on estimating existing households).

Data from the CA DOF and the US census were examined to identify an appropriate pph estimate. The CA DOF estimates show a small but steady decline in pph since January 2020. In 2020, the average number of persons per household (pph) for Redondo Beach was 2.37. In 2023, the estimate dropped to 2.30 pph. Census data reported in the American Community Survey, on the other hand, has shown the opposite trend, reporting 2.43 pph in the 2019 ACS, and 2.45 pph in the 2021 ACS. Because these two sources showed conflicting trends, the 2019 ACS estimate (2.43 pph) was used to provide a conservative estimate without overestimating the existing population.

When this rate is applied to the household estimate in the City's GIS data, the current population estimate is 70,191 people living in households, which is added to the estimate of people living in other types of situations (memory care, unhoused population, etc.) for a total of 70,311 people. This estimate is within 1.8% of the 2020 decennial census (71,576 people), it is less than 1% more than the 2020 CA DOF population estimate (70,242 people), and it is within 1% of the 2021 ACS estimate (70,998 estimate). This degree of difference is within an acceptable range according to best practices for a city-wide buildout analysis.

The 2019 ACS, cited in the 2021-2029 Housing Element Update, reports a total population of 67,423. This is a 4.3% percent difference compared to the estimates derived from the GIS data (70,311 people). Because the 2019 ACS estimate differs from later vintages of ACS data, the decennial census, and newer CA DOF estimates, the more recent data (discussed in the prior paragraph) was deemed a more appropriate benchmark.

1.4 Existing Non-residential building square footage: [GIS Assessor Parcel Data]

To determine existing non-residential square footage for Redondo Beach, data from the County of Los Angeles Assessor was joined to parcel data provided by the City. Where assessor data for a parcel was missing, the square footage was estimated using City building records and, in some cases, when records were lacking, building footprints and aerial imagery.

This analysis results in an estimate of 11,826,277 square feet of non-residential development, as noted in Table 1, *City of Redondo Beach General Plan Update Existing Land Use Buildout*.

1.5 Existing jobs: [nonresidential building square footage] / [employment generation factor]

Employment generation factors represent the average amount of building square footage (or acreage depending on use) typically required per employee. To estimate existing jobs, the nonresidential building square footage was divided by the employment generation factor.

Employment generation factors were derived from the U.S. census Longitudinal Employer-Household Dynamics (LEHD) data, County Assessor's data, and based on best practices for estimating future employment for city-wide general planning efforts. The employment generation rates used are documented in Table 2, *City of Redondo Beach General Plan Updated Employment Generation Rates*.

When applied, the rates in Table 2 estimate approximately 28,638 existing jobs. While this estimate exceeds 2019 LEHD employment estimate (27,550 jobs) LEHD data excludes many employees who conduct work associated with national security, because one of Redondo's largest employers includes segments that fall under this category, it is likely that numerous jobs within the City are not captured in

the LEHD data. Accounting for this deficit, the estimate falls within an acceptable range according to best practices for city-wide buildout analyses.

TABLE 1. City of Redondo Beach General Plan Update Existing Land Use Estimates (Currently on the Ground)

Land Use (as-built)	Acres	% of Total Acres	Dwelling Units	Bldg. SQ FT	Households	Population	Employment	Students[2]	Hotel Rooms[3]	Hospital Beds[4]
Vacant	11.9	0.3%	-	-	-	-	-	-	-	-
Single Family Residential	998.5	25.1%	8,394	-	7,983	19,390	-	-	-	-
2-3 Units	536.9	13.5%	7,406	-	7,043	17,100	-	-	-	-
4 or More Units	431.5	10.9%	14,285	-	13,585	33,004	-	-	-	-
Mixed Use Res/Com	25.0	0.6%	250	525,392	238	577	1,051	-	-	-
Commercial[1]	318.7	8.0%	-	5,239,913[1]	-	-	14,971	-	789	-
Industrial[5]	263.3	6.6%	-	4,978,121	-	-	8,297	-	-	-
Institutional[6]	230.2	5.8%	96	875,799	96	240	4,246	9,803	-	201
Parks and Open Space	154.0	3.9%	-	-	-	-	61	-	-	-
Utility and Open Space	30.5	0.8%	-	-	-	-	3	-	-	-
Utility	85.5	2.2%	-	207,052	-	-	9	-	-	-
Right-of-Way	885.9	22.3%			-	-	-	-	-	-
Grand Total	**3,973.0**	**100%**	30,431	11,826,277	28,945	**70,311**	**28,638**	**9,803**	**789**	**201**

NOTES:
1) Includes 744,936 sq. ft of Hotel/Motel, Source: LA County Accessor Parcel Data
2) Student Enrollment Source: CDE DataQuest, 2017
3) Source: LA County Accessor Parcel Data, a total of 14 hotels
4) Source: http://www.hospital-data.com/hospitals/AMI-SOUTH-BAY-HOSPITAL-REDONDO-BEACH.html, LA County Accessor Parcel Data does not provide sq. ft, for the Beach Cities Health District
5) AES building in the "Industrial" category is existing but non-operational. The building's 204,727 sq. ft. are included in the building sq. footage, but no employment is estimated in the "Employment" column for this site.
6) Institutional population estimate includes 120 people living in the Silverado memory care facility and it assumes 1.25 people per household in assisted living facilities. Memory care facilities are included in the non-residential sq. ft. estimates. Assisted living units are included as dwelling units.

All estimates have been rounded, there may be small discrepancies due to rounding and aggregation of parcel data.

TABLE 2. City of Redondo Beach General Plan Updated Employment Generation Rates

Land Use	Sq. Ft./Employee
Mixed Use Res/Com	500
Commercial	350
Industrial*	600 / 1000*
Institutional	200
Parks and Open Space	2.5**
Utility and Open Space	10**
Utility	4**

NOTE:

* All existing industrial uses are estimated to house 1 employee per 600 sq. ft. of gross floor area. Projected future industrial uses are estimated to create 1 job per 600 sq. ft. of gross floor area *except* for those properties with a proposed general plan designation of I-1 in the area North of Manhattan Beach Boulevard and West of Redondo Beach Avenue, where projected future industrial uses are estimated to create 1 job per 1000 sq. ft. of gross floor area.

** Employment generation in these categories is measured by acres/employee rather than sq. ft./employee and augmented by employment data provided by the City where available. Source: ICMA/NRPA Best Practices, PlaceWorks.

Part 2: Current General Plan Projections

Redondo Beach's Current General Plan (1992) estimates refer to the realistic development expected under its current (approved) land use plan. The maximum permitted buildout that was estimated in 1992, when the Land Use Element was last updated, and is included in the City's Current General Plan (1992) is provided in Table 3. This table reflects the development that was anticipated to occur if all properties were developed for the uses and densities anticipated in 1992 by the Current General Plan. The 1992 projections did not assume full buildout of the plan, but a detailed methodology was not included, so it is unclear how growth was projected.

Technology has improved significantly since 1992, so updated parcel-based acreages derived from Los Angeles County Assessor data was pulled to calculate the growth anticipated to occur under the Current General Plan with updated acreages and shown by Current Land Use Designations. The result is shown in Table 4, *Current General Plan Land Use Designations and Potential for Development*. The numbers in Table 4 vary from those shown in the 1992 General Plan and Table 3, because Table 4 is based on more accurate acreages and the 1992 General Plan did not include a detailed methodology describing the assumptions that informed how the buildout was calculated. Estimates of the current General Plan are provided for comparative purposes, and it will inform the qualitative analysis of the "No project" alternative in the environmental analysis.

Note: Approximately 18 percent of residential parcels (designated as R-1, R-1A, R-2, R-3, RM, or RH in the Current General Plan) contain legal non-conforming uses with homes built at a higher density than what is allowed under the Current General Plan. Per the City's municipal code, these existing non-conforming homes are allowed to remain as-is, and in specific circumstances could be rebuilt with the same number of units (see section 3.7 for more information on non-conforming uses), so it is likely that the same number of existing non-conforming homes would remain. The maximum buildout estimates published in the Current General Plan (1992) shown in Table 3, and reproduced with updated acreage information in Table 4, do not include the legal non-conforming homes that would be allowed to remain. Because the estimates do not account for these existing non-conforming homes, the actual number of units that could be built in the City under the Current General Plan is higher than shown in the tables.

The following assumptions were used to determine the projections for the Current Redondo Beach General Plan (shown in Table 4). Table 4 also includes the maximum density and intensity allowed by the Current General Plan within each land use designation.

2.1 Current General Plan dwelling units: [parcel acreage] x [anticipated density for land use designations]

Dwelling unit projections were estimated by multiplying the acreage of each parcel by the anticipated density for different land use designations. To determine an estimate, a residential density assigned for each land use designation was multiplied by the acreage of each parcel to determine the total number of housing units that exist or could be accommodated. As previously noted, the estimated maximum permitted buildout from the City's Current General Plan is provided in Table 3, this information can also be found the City's Current General Plan, Land Use Element (1992).

2.2 Current General Plan households: [dwelling units] x [occupancy rate]

The housing occupancy rate assumed for the Current General Plan is consistent with that assumed for Existing Land Use: 95.1 percent based on data from the April 2023 CA DOF, as noted in Part 1. A standard assumption is used because it will accurately reflect the averages of economic recessions and booms.

2.3 Current General Plan population: [households] x [persons per household]

Since 2010 the City of Redondo Beach has seen a relatively stable pattern of average household size, decreasing slightly (0.5 percent) over the past 5 years. It is reasonable to assume that in the future, average household size in Redondo Beach will largely reflect existing conditions. Based on data from the

April 2020 CA DOF information noted in Part 1, the persons per household (pph) factor used to estimate population for the Current General Plan is 2.43 pph.

2.4 Current General Plan non-residential building square footage: [parcel square footage] x [anticipated FAR]

Building intensities for non-residential uses are measured by floor area ratio (FAR). FAR refers to the ratio of the total floor area of a building (building footprint times number of building stories) to the total square footage of that parcel. FAR calculations do not include floor areas for parking structures or outdoor open storage. Redondo Beach's non-residential designations include a maximum FAR, but only set minimum standards in the three mixed-use designations. Because a parcel or group of parcels, especially in non-residential development, is often built at a lower intensity than allowed due to physical site constraints, zoning requirements (namely setbacks and parking), development regulations, and building product type, the anticipated FAR assigned to each non-residential designation was estimated slightly below the maximum FAR for each category.

2.5 Current General Plan calculation of employment: [non-residential building square footage] / [employment generation factor]

Employment generation factors represent the average amount of building square footage typically required per employee and are customized based on the land use designation; dividing the nonresidential building square footage by the employment generation factor results in an estimate of the number of jobs at buildout. The resulting employment number represents a count of the total number of jobs associated with a given amount of building square footage. This includes both full- and part-time jobs and is not a full-time equivalent measure. To estimate employment that is projected to result from the development projected under the Current General Plan, the same factors included in Table 2, *City of Redondo Beach General Plan Update Employment Generation Rates*, were applied to estimate employment for buildout of the Current General Plan (1992).

TABLE 3. Current General Plan Estimated Maximum Permitted General Plan Development Buildout (1992) (From the 1992 General Plan)

Land Use	Total City-Wide Development (Dwelling Units)	Total City-Wide Development (Square feet)
Single Family Residential	9,807	
Free Standing Multi-Family Residential	21,875	
Mixed Use	1,541	1,574,498
Retail	-	2,995,600
Retail/Office	-	3,526,848
Industrial	-	8,237,246
Public or Institutional	-	-
Total	**33,223**	**16,334,192**

Source: City of Redondo Beach General Plan Land Use Element, 1992

TABLE 4. Current General Plan Land Use Designations and Potential for Development (Estimates Recalculated per Methodology Described in Part 2)

Current General Plan (1992) Land Use Designation		Acres	% of Total Acres	Maximum DU/Acre or FAR	Dwelling Units	Households	Population	Bldg. Sq. Ft	Employment
Single Family Residential	R-1	752.7	19%	8.80	6,624	6,294	15,294	-	-
Single Family Residential	R-1A	121.7	3%	17.50	2,130	2,024	4,917	-	-
Low Density Multi-Family Residential	R-2	472.3	12%	14.60	6,896	6,552	15,922	-	-
Low Density Multi-Family Residential	R-3	544.7	14%	17.50	9,535	9,059	22,014	-	-
Medium Density Multi-Family Residential	RMD	146.0	4%	23.30	3,402	3,233	7,855	-	-
High Density Multi-Family Residential	RH	12.4	0%	28.00	349	331	805	-	-
Commercial	C-1	6.2	0%	0.35	-	-	0	81,358	232
Commercial	C-2	103.6	3%	0.50	-	-	0	1,807,471	5,164
Commercial	C-3	15.7	0%	0.70	-	-	0	347,117	992
Commercial	C-4	30.4	1%	1.00	-	-	0	1,190,268	3,401
Commercial	C-5	12.2	0%	0.70 - 1.5	-	-	0	320,645	916
Regional Commercial	CR	59.9	2%	1.0 – 1.5	2,095	1,991	4,837	2,346,418	6,704
Coastal Commercial	CC	56.8	1%	0.35	-	-	0	494,217	1,412
Mixed Use	MU-1	8.5	0%	35 / 0.5	296	281	684	184,010	368
Mixed Use	MU-2	1.7	0%	35 / 0.7	58	56	135	52,172	104
Mixed Use	MU-3	32.0	1%	35 / 1.0	1,119	1,063	2,584	1,251,859	2,504
Industrial	I-1	206.0	5%	0.70	-	-	0	6,281,199	10,469
Industrial	I-2	21.2	1%	1.00	-	-	0	832,355	1,387
Industrial	I-3	36.8	1%	0.70	-	-	0	1,123,798	1,873
Public or Institutional	P	446.4	11%	-	-	-	0	-	-
Right-of-Way	ROW	885.8	22%	N/A	N/A	N/A	N/A	N/A	N/A
Grand Total		**3,973.0**	**100%**	**N/A**	**32,504**	**30,883**	**75,046**	**16,312,887**	**33,174**

Source: PlaceWorks, 2022 and City of Redondo Beach General Plan, 1992

Part 3: Proposed Land Use Plan Estimates

The Proposed Land Use Plan estimates project development reasonably likely to occur under the proposed land use plan by the horizon year, 2050.

3.1 PROPOSED PLAN

In coordination with the General Plan Advisory Committee and City Council, the City identified seven areas that warranted special policy direction due to the unique role they play in the City either as a gateway, corridor, district or activity center. The Land Use Element focuses on land use changes within these Special Policy Areas (SPAs), in jobs centers, and on Housing Element Sites. The City also proposed new designations to clarify the intent of public and institutional uses and added proposed maximum floor area ratios to comply with State law. Collectively these areas constitute the proposed "Areas of Change" and they represent the places with the most potential for redevelopment and growth in the City.

Outside of these areas, growth was expected on vacant properties, undeveloped properties, properties where City staff was aware of entitled, approved, and submitted projects at the time the buildout model was comprehensively updated in the spring of 2022 (and updated with minor edits at the time the Notice to Proceed (NOP) was released on June 1, 2023), and on properties with a certified EIR for a development project. Additionally, residential growth was expected to occur in established residential neighborhoods, where no changes are proposed, through natural neighborhood intensification also referred to as "residential recycling" (a common occurrence in the City when a single-family home is rebuilt with 2 or more units on a lot), through lot splits, and through the construction of accessory dwelling units (ADUs).

Buildout Approach

Density and intensity standards are provided in the general plan to convey the maximum scale and intensity for broad land use categories. Zoning standards are then applied at a parcel level to guide and control density and intensity at a development project level. When calculating buildout, a jurisdiction is permitted to assume that every single parcel will develop at the maximum permitted density/intensity. However, this assumption of absolute buildout runs the risk of overestimating the amount of building space and residential units within the identified planning horizon (in this case the year 2050) because, due to market and other factors, it is unlikely that every single parcel will develop with the maximum density/intensity in the planning horizon. Overestimating buildout can lead to unnecessary concerns and an unsupported overstatement of potential impacts or planning issues, as well as a misallocation of current and future public funds. Accordingly, the City of Redondo Beach General Plan calculated a reasonable buildout scenario for projecting growth through 2050.

CEQA and supporting case law allow lead agencies, in this case the City, to study reasonable buildout scenarios in an EIR that allows for tiering, as is the case for the General Plan PEIR. In the case of a citywide, long-range, planning effort, like the general plan update, it is not possible to know exactly how every property in the City will develop by 2050, so reasonable assumptions must be made to understand the potential impacts of the proposed plan. Under this approach, the PEIR presents a comprehensive assessment of the potential impacts of the general plan update but does not assess project-specific impacts of potential future projects that would occur during buildout, which are required to comply with CEQA as applicable. The lead agency responsible for reviewing those potential future projects will determine the level of any CEQA review needed, and the scope of that analysis will depend on the specifics of the particular project. For purposes of the current environmental review, the PEIR, is not required to analyze environmental impacts for speculative hypothetical future development as part of the "project," and may calculate a buildout scenario that adequately identifies the significant effects of implementing the proposed plan.

It is reasonable to assume that not every property in the City will redevelop to the maximum capacity allowed by the density and intensity standards identified in the proposed plan by 2050. The following sections describe the assumptions and methodology the City employed to model a reasonable buildout scenario for the proposed plan that adequately identifies the significant effects of implementing the proposed plan.

Reasonable Citywide Growth by Type of Use

Residential Growth

The Proposed Plan

The proposed plan seeks to preserve established residential neighborhoods while planning for change in areas required by the Housing Element. These include the creation of six residential overlay areas to promote affordable housing development, map changes to adjust where residential high (RH) and mixed-use land uses are allowed, definition changes to increase to the maximum density allowed within RH zones (see Table 2.1), and several revisions to the City's mixed-use designations.

Some of the changes to the mixed-use designations are required by the Housing Element, but the Land Use Plan also reflects General Plan Advisory Committee recommendations to reduce the maximum density of mixed-use development in the commercial corridors and concentrate new mixed-use growth on properties with deeper lots, where development at the densities and intensities desired was more feasible. Mixed-use designations are identified in areas where recent mixed-use projects have developed, areas required by the Housing Element, and areas with deeper lots as shown on the General Plan Land Use Plan. The Housing Element estimated residential capacity based on the revised definitions and densities identified in the proposed plan.

Overall, the proposed plan would allow for additional development capacity (in addition to existing uses) of nearly 6,700 units if every property with remaining development capacity were redeveloped to the maximum standards allowed.

Comparison Points

In comparison, The SCAG 2024 SoCal Connect, projected an increase of just 1,700 households between 2019 and 2050 in Redondo Beach. SCAG based their projections on many factors including past trends, but they did not account for the City's need to accommodate, plan for, and study the impacts of implementing of the 2021-2029 Housing Element, so PlaceWorks and the City determined that the buildout for the general plan would need to study residential growth well beyond the estimates of the 2024 SoCal Connect to adequately identify the significant impacts of land use changes required to implement the 2021-2029 Housing Element as well as additional development that may occur outside of Housing Element sites.

Housing Element Growth (2021 -2029)

The 2021-2029 Housing Element required the City to plan for 2,635 units (based on a Regional Housing Needs Allocation (RHNA) of 2,490 units plus a required 10 percent buffer for lower income sites outlined in Table 5). The Housing Element had to demonstrate that each site identified could reasonably support development at the income levels considered and demonstrate that development could be built within the Housing Element Planning Cycle (2021-2029). As shown in Table 5, the City's Housing Element ultimately identified capacity for 3,722 units through the various projects (CREDITS) and strategies analyzed. The buildout incorporates growth consistent with the capacities identified in the Housing Element. The Housing Element included a rigorous analysis of the realistic capacity of each site, providing a reasonable estimate to adequately identify the significant impacts associated with implementing the Housing Element. It also represents reasonable growth that is likely to occur on each site by 2050.

Other Residential Growth

In addition to the growth identified in the Housing Element, it is reasonable to assume that residential growth would occur beyond the planning horizon for the Housing Element and that mixed-use areas and established residential properties, not identified in the Housing Element, would see additional redevelopment. To address this, approximately 80 percent of residential parcels (not identified in the Housing Element) with capacity to develop 1 or more additional units, were projected to develop consistent with the density assumptions identified in Table 8 and the methodology described in Section 3.2. In addition, all of the properties with a Mixed-Use Low (MU-1) and Mixed-Use Medium Low (MU-2) land use classification that were not identified in the Housing Element and had remaining capacity for residential units were projected to grow consistent with the FAR and density assumptions identified in Table 7 and using the methodology described in Section 3.2.

There are also several existing non-residential uses within residential land use categories. While the City does not maintain an amortization schedule that would require non-conforming uses to transition over a specified period of time, the competitive real estate market, limited available land resources, and high value of residential land, provide incentive for some of the non-residential uses within residential land use categories to transition to housing over time. One religious institution along PCH has already closed, and other institutions and commercial uses may follow suit over the next twenty years. To reflect this trend, 50 percent of the legal non-conforming and conditionally permitted uses in residential land use districts that were also within a SPA are projected to transition to housing by 2050, while the remaining non-residential uses will not change.

A summary of the housing element growth relative to the overall residential growth is included in Table 5. Overall residential growth and distribution of growth between SPAs and other areas of the City is included in Table 6.

TABLE 5. Housing Element Sites Inventory Relative to Proposed Growth

Proposed General Plan Land Use	Existing Housing Units (2023)	Housing Element Sites Inventory to Accommodate RHNA Requirements (2021-2029)					Total Housing Growth Projected for Proposed Project (2023-2050)	Total Housing Units Projected for Proposed Project (Existing 2023 + Growth by 2050)
		Housing Site Category	Lower	Moderate	Above Moderate	Total Capacity in Sites Inventory (by 2029)		
R-2: Multifamily Residential	5,972	Residential Recycling[4]	-	-	358	358	637	6,609
R-3: Multifamily Residential	10,546	CREDIT (Alcast Foundry)[3]	-	-	36	593	602	11,148
		Residential Recycling[4]	4	507	30			
		Housing on Church Properties[4]	-	20[7]	-			
RMD: Multifamily Residential	5,879	Residential Recycling[4]	-	14	-	14	15	5,894
RH: Multifamily Residential	263	Residential Recycling[5]	-	63	-	85	133	396
		Housing on Church Properties[4]	12	6[7]	-			
MU-1: Mixed-Use	159	CREDIT (Legado)[3]	-	-	115	241	542	701
		Mixed Use Dev (MU-1)[6]	104	22	-			
MU-2: Mixed-Use	42	Mixed Use Dev (MU-2)[4]	-	51	-	51	279	321
MU-TC: Mixed-Use Transit Center	-	CREDIT (South Bay Galleria)[3]	30	-	270	650	700	700
		South Bay Galleria Phase 2[4]	70	-	280			
A: North Tech (C-4-R)	-	Residential Overlay[6]	35	-	140	175	180	180
B: Kingsdale (C-4-R & RH-R)	13	Residential Overlay[6]	18	-	107	125	113	126
C: South of Transit Center (IF-R)	-	Residential Overlay[6]	273	-	-	273	273	273
D: 190th Street (C-2-R & I-2-R)	-	Residential Overlay[6]	331	-	-	331	331	331
E: South Bay Marketplace (IF-R)	-	Residential Overlay[6]	486	-	-	486	486	486
F: FedEx (MU-1-R)	-	Residential Overlay[6]	80	-	-	80	80	80
CN: Neighborhood Commercial	185	CREDIT (Moonstone/ Project Home key)[3]	20	-	-	20	20	205
ADUs (distributed throughout residential neighborhoods)	n/a[2]	Anticipated ADUs[3]	144	14	82	240	624	624
Total	**30,431[1,2]**	**Units Accommodated in Housing Element**	**1,607**	**697**	**1,418**	**3,722**	**4,956[1]**	**35,387[1]**
		RHNA	1,444	490	556	2,490		
		RHNA with 10% No Net Loss Buffer (Lower Income)	1,589	490	556	2,635		
		Buffer Provided - additional units (percent over RHNA)	163 (11%)	207 (42%)	862 (155%)	1,232 (49%)		

1. The table only itemizes land use categories where housing element sites were identified. The totals for existing units, total housing unit growth, and total projected units, however, include estimates for All Land Use Categories in the City including the following categories that are not represented in the table (R-1, R-1a, CN – Artesia and Aviation Blvd. SPAs, C-3, C-4, CC, PI)
2. Existing ADUs are considered in the total number of units, but they were not itemized.
3. Units in this category are counted as credits toward the RHNA because they are ADUs or part of an entitled, approved or under review project (see Table H-42 in the Housing Element for details)
4. Units in this category do not require land use or zoning changes (see Tables H-43 and B-1 in the Housing Element for details)
5. RH Residential Recycling include 13 units that do not land use or zoning changes (see Tables H-43 and B-1 in the Housing Element for details) and 50 units that require land use and zoning changes (see Table B-2 in the Housing Element for details)
6. Units in this category require land use and zoning changes (see Tables H-43 and B-2 in the Housing Element for details)
7. Table H-43 in the Housing Element notes that R-3 land uses accommodate 26 moderate income units on church properties while RH land uses accommodate 0 moderate income units on the same. Table B-1 in the Housing Element shows R-3 land uses accommodating 20 moderate income units on church properties while RH land uses accommodate 6 moderate income units on church properties. In all cases, church properties accommodate a total of 26 moderate income units. This table reflects the R-3/RH division detailed in Table B-1 of the Housing Element.

Commercial Growth

The Proposed Plan

Changes to commercial land uses are located within SPAs. Many changes are intended to encourage reinvestment and redevelopment by increasing the development potential within select commercial corridors to allow for larger buildings. The Land Use Plan also establishes a new Commercial Neighborhood (CN) land use designation, applied to SPAs covering the City's corridors and gateways (along PCH and Artesia, Aviation, and Torrance Boulevards). The CN designation aims to foster commercial districts with uses that support adjacent residential neighborhoods and provide goods and services for residents and businesses in a pedestrian-oriented environment.

The Land Use Plan also redesignates some of the existing residential properties within the PCH corridor from residential (RH and R-3) to Commercial (CN and C-4) to allow for uses that are more compatible with the location adjacent to one of the City's busiest thoroughfares or abutting a large shopping center. Provisions in the zoning ordinance would allow existing residential uses to remain, but new residential development would only be allowed, as required by State law.

Overall, the proposed plan accommodates additional commercial development capacity (in addition to existing uses) of 5.2 million square feet if every commercial and mixed-use site in the City was developed to the maximum intensity allowed.

Market Factors

The 2017 Market Demand Analysis prepared by BAE, however, determined that the market within the City of Redondo Beach (at the time of the report) would support up to 894,000 square feet of additional commercial (generally including: retail, dining, entertainment, hospitality, and office) by 2040. It also noted that certain types of "destination retail centers" with a unique location, amenities and a mix of retail goods with food and entertainment may have the potential to support additional square footage. A key factor used to project demand for commercial uses in 2040 was the projected population, which references the 2012 SCAG estimates for population growth by 2040. The 2012 SCAG growth estimates were approximately 56 percent lower than proposed plan buildout projections because they were supported by less current data, and they did not account for additional population from proposed changes due to the Housing Element, and larger population growth may support additional commercial uses more than anticipated in the 2017 report. A lot has also changed in the commercial landscape since the market study was prepared. The City and the region continue to feel the impacts of the COVID-19 pandemic, and evolving changes in the post-pandemic market leave uncertainty around future market demand, but generally indicate that it is extremely unlikely that all sites with commercial development potential would see redevelopment by 2050.

Other Factors

In addition to a limited but uncertain, future market demand for commercial uses, there are several commercial areas in the City where maximum development is unlikely to occur due to existing development on some properties being newer and/or performing well – indicating it is unlikely to see significant redevelopment. In some areas site constraints limit how much of the property could be developed (based on geometry, slope, or other constraints of the land), a future project may have operational requirements that do not allow for full buildout, or zoning requirements combined with site limitations may reduce how much of the maximum building footprint could be developed.

General Buildout Assumptions

Given the limiting factors and the large capacity for commercial uses, PlaceWorks and the City concluded that the City should not assume a maximum theoretical buildout for commercial properties, but should forecast and plan for growth beyond the 2017 market demand in order to adequately identify the significant impacts associated with commercial uses without grossly overestimating the growth likely to occur by 2050. Ultimately PlaceWorks and the City recommended that the City plan for approximately 50 percent of the remaining growth potential in commercial designations to develop by 2050, and 30 percent of the commercial growth potential in mixed-use areas to develop by 2050. A smaller factor was used to project mixed-use commercial growth because the existing building stock in many of the mixed-use areas is newer and unlikely to redevelop by 2050. Additionally, some of the larger mixed-use areas have existing entitlements that provide more certainty about what is likely to develop by 2050, and the strong demand for housing coupled with the presence of Housing Element Sites – and

required land uses changes, indicates that housing development may reduce the overall commercial capacity of several mixed use areas. The resulting estimate equates to a citywide growth factor roughly 140 percent higher than the 2017 market demand, providing a conservative estimate for Study. This growth was projected in areas throughout the City as described in Section 3.5.

A summary of the overall commercial growth and distribution of growth between SPAs and other areas of the City is included in Table 6.

Industrial and Industrial Flex Growth

The Proposed Plan

Industrial land use changes are focused around existing and future metro stations. North of Manhattan Beach Boulevard (near the existing metro station) the Land Use Plan preserves opportunities for new jobs to develop when market conditions allow by preserving existing industrial areas and increasing the amount of development that could occur (See Figure 2.1 for locations and Table 2.1 for the proposed increases in floor area ratio (FAR)). Within the Galleria SPA (near the planned metro station) the Land Use Plan establishes an Industrial Flex (IF) designation (see Table 2.1), to preserve existing industrial areas while providing for an integrated mix of light industrial, commercial, and office uses in a creative/tech incubator district to create opportunities to live and work in proximity to resources and transit if housing is built within the Housing Element Residential Overlay.

Overall, the proposed plan would allow for an additional development capacity (in addition to existing uses) of 7.27 million square feet of industrial and industrial flex uses if every industrial and industrial flex site in the City was developed to the maximum intensity allowed.

Market Factors

PlaceWorks' research on logistics found that there is insufficient industrially zoned land region-wide to accommodate the long-term demand for warehousing development. This has led warehousing developers to consolidate old smaller industrial properties for redevelopment for warehousing. In turn, this has put pressure on other industrial uses, both those leasing industrial facilities and those needing to expand. Overall, industrial vacancy rates throughout the region are at historical lows, and the pandemic has had little to no impact on market demand.

Other Factors

Industrial growth potential is isolated to the industrial areas north of Manhattan Beach Boulevard, the industrial flex areas south of the Galleria, and the industrial property in the North PCH SPA. Many properties in these areas are already built out, some with newer structures that are unlikely to be redeveloped by 2050. There are also properties and potential uses where maximum development would be unlikely to occur due to site constraints, the operational needs of the proposed use, and potential zoning requirements for specific uses.

General Buildout Assumptions

Given the limiting factors, PlaceWorks and the City concluded that the City should not assume a maximum theoretical buildout for Industrial and Industrial Flex properties, but should forecast and plan for more growth than could be accommodated on properties with older buildings to allow for flexibility in how and where industrial and industrial flex areas may develop while adequately identifying the significant impacts associated with industrial uses identified in the proposed plan, without overestimating the growth likely to occur by 2050. Ultimately PlaceWorks and the City recommended that the City plan for approximately 50 percent of the remaining growth potential in industrial and industrial flex designations to develop by 2050. This growth was distributed throughout the City as described in Section 3.5 and Table 8.

A summary of the overall industrial and industrial flex growth and distribution of growth between SPAs and other areas of the City is included in Table 6.

Public, Institutional, and Open Space Uses

The Proposed Plan

Changes to Public, Institutional, and Open Space designations divide a single land use designation for public uses into three designations to better depict the general character of the uses allowed on each site. The designations include Public Institutional (PI), Public/Utility (U), and Parks and Open Space (OS). The divided designations also establish a maximum FAR, which was not previously included in the General Plan. The maximum FARs (0.75 for institutional (with an exception allowing up to 1.25 on 2 properties), 0.20 for Public/Utility, and 0.10 for Parks and Open Spaces) were added to comply with State law requiring cities to establish standards of population density and building intensity for the various districts covered by the plan (Gov. Code Section 65302).

Public, Open Space, and Institutional Uses.

When considering buildout conditions, the need for new public and institutional development building space is often minimal in a built out city, even when new residential and nonresidential growth is forecast throughout the balance of the city. Often, the incremental increased need for public services is accommodated within existing building and property footprints. While some facilities may get redesigned and rebuilt (due to aging of infrastructure or buildings), the average intensity of building space for public and institutional development is primarily driven by the intensity of existing facilities, almost all of which are currently far below (less than half) of the maximum allowable FAR.

Existing uses in the Public Institutional land use category where the FAR in the proposed plan has been set to 0.75 include: 12 public schools, 1 private school, 2 fire stations, a water storage facility and adjacent open space area, the City Yard, the parking lot in Riviera Village, the North Redondo Beach Library, the Kensington Assisted Living Community (developed on school property), and Beach Cities Health District. Estimates for existing uses on public and private school sites and the library range from 0.15 FAR to 0.37 FAR. Other uses (water towers, parking lots, and City Yard) range from 0.00 to 0.09 FAR. The two fire stations are built at 0.28 and 0.53 FAR, respectively.

The Kensington Assisted Living Community building is built at an FAR of approximately 0.65. While assisted living units have aspects of both residential and non-residential uses, they must be analyzed as either a residential use or a non-residential use in the technical studies of the PEIR to avoid double-counting associated impacts. The PEIR conservatively analyzed all assisted living facilities in the City as residential uses. The Beach Cities Health District is an existing non-conforming use that currently exceeds (by 0.02) the maximum FAR of 0.75; however, the buildout assumes 0.85 FAR to align with the proposed development plan/program in the property's proposed Healthy Living Campus Master Plan FEIR. In addition to these uses, City Hall and the City Annex site at the northeast corner of PCH and Vincent St., are included in the Public Institutional land use, but the proposed plan allows up to 1.25 maximum FAR on these sites, which aligns with the existing maximum FAR in the P-CIV zoning that applies to those sites.

Moreover, in contrast with commercial and industrial uses, the shape and size of public and institutional uses are subject to different market forces and are less predictably driven by the maximum development intensity allowed (including but not limited to availability of funding and community and political priorities). Additionally, there are few (if any) large-scale regional or state forecast estimates that study how these types of uses are expected to change over the long term. And some public uses (like schools) are not legally subject to local regulations such as FAR (for school-related uses). Unlike public and institutional uses, change in commercial and industrial uses is largely driven by speculative development, which is likely to occur when the future income of a property (usually in terms of sales price or rent) would adequately offset the costs to redevelop the property and warrant investment in redevelopment. Speculative commercial and industrial projects are subject to local and regional market forces, which can be reasonably studied and correlated to the types of development likely to occur under proposed regulatory intensities (through analysis of past trends and market comparisons). These uses are also considered in other forecast models (like SCAG's SoCal connect), which can help to provide a general benchmark for anticipated changes. Because such models do not exist for public and institutional uses and because of the reasons identified at the beginning of this paragraph, it is reasonable to use other metrics, discussed below, to adequately assess the impacts of public and institutional uses under the proposed plan.

Finally, with the exception of the Beach Cities Health District site and the school properties, where change was anticipated as described below, correspondence with other public and institutional entities indicated that there were no known plans

regarding expansion of existing facilities, and a hypothetical potential redevelopment was only anticipated to occur on a small proportion of existing facilities, but it was too speculative to predict which facilities may see a net increase in building square footage.

Based on this information, to adequately study the impacts of the anticipated uses under proposed plan in these areas, buildout estimates were assessed based on the type of anticipated use on each site as follows:

Schools**.** Impacts due to school uses (public and private) are measured by the number of students attending each school site rather than the size of the building. The buildout assumed student estimates consistent with the 2020 SCAG activity-based traffic model to project future student counts, resulting in a city-wide estimate of 10,707 students attending schools in the City of Redondo Beach by the horizon year. This estimate was distributed across existing school sites by the SCAG model. The horizon year estimate in student population is generally aligned (within 6%) with recent student population totals. Minimal changes in yearly student populations are anticipated over time.

Beach Cities Health District**.** At the time the NOP was issued, a Final EIR (SCH No. SCH Number 2019060258), studying the impacts of the Healthy Living Campus Master Plan on the Beach Cities Health District site, certified by Beach Cities Health District as the lead agency, had been completed, but a complete application for entitlement had not been submitted to the City. The Healthy Living Campus Master Plan Project studied in the final EIR exceeded the maximum FAR assigned to the site (0.75) under the proposed plan. To provide a conservative estimate, and to use the best available data, while not grossly overestimating what may develop under the proposed plan, the general plan buildout estimated growth consistent with the site development plan/program for phases 1 and 2, as described in the project description of the Healthy Living Campus Master Plan FEIR. The buildout estimated the following future uses: Phase 1: Assisted Living: 157 units (203,700 sf); Memory Care: 50,000 sf (120 beds); PACE: 14,000 sf; Community Services: 6,270 sf; Youth Wellness Center: 9,100 sf. Phase 2: Wellness Pavilion: 37,150 sf; Aquatics Center (indoor area): 24,000 sf; Center for Health and Fitness: 20,000 sf), which is equivalent to an FAR of 0.85 FAR (including all building square footage noted above).

Note: Assisted living units, have aspects of both residential and non-residential uses, but they must be analyzed as either a residential use or a non-residential use in the technical studies of the PEIR to avoid double-counting associated impacts. The PEIR conservatively analyzed all assisted living facilities in the City as residential uses. Where FARs for facilities with assisted living are identified, however, the FAR includes the building square footage associated with the assisted living facility.

Area of no growth**.** There are several areas within the Public Institutional land use category where the proposed plan did not anticipate change.

- Areas such as the parking lot at Riviera Village, the City Yard, and the water storage facility with adjacent open space were not expected to change because the proposed plan anticipated existing uses would remain and any significant development of the sites would preclude the existing use.
- The Kensington Assisted Living Community was also projected with no change, though it was analyzed as a residential use to more accurately capture infrastructure impacts. This facility was recently constructed, and it is unlikely that the site would be redeveloped by 2050.

In these areas, the buildout model estimated no increase in building square footage.

Service-based uses**.** Development, or redevelopment of the remaining public uses including, the North Redondo Beach Library, fire stations, the Civic Center, the City annex site, and the vacant property along Torrance Blvd., are not typically driven by market conditions, and the size of resulting projects are rarely dictated by the allowable FAR. Because the City is built out, the proposed plan anticipated that any increase in services within these uses would be accommodated on existing sites and within existing building footprints. At the time of the NOP, there were no known plans for expansion of existing libraries and there were no known deficiencies in the Redondo Beach Police Department (RBPD) or Fire Department (RBFD). There were also no known plans to expand physical police facilities and there were no intended improvements or expansions of the existing fire stations. These assumptions were later confirmed in 2023 service letter responses from the Fire

Department, Police Department, and Library Services (Appendix E of the PEIR). There were also no known plans to expand City Hall, redevelop the City annex site, or develop the vacant property on Torrance Blvd. In these areas, because there were no known plans for expansion and no speculative hypothetical future development was anticipated to occur on existing properties, the buildout model estimated no increase in building square footage on these properties.

Open Space (OS)
Open Space uses include existing parks, parkettes, beaches, and two school playgrounds adjacent to park sites. Uses on these properties are expected to remain as park and open space uses, though the implementing zone for the two properties associated with school sites will be zoned consistent with other school properties. In these areas, the buildout model estimated no increase in building square footage.

Public Utility (U)
Existing uses in the Public Utility land use category include the AES Powerplant, SCE easements, and the rail easement between Marine Avenue and Inglewood Avenue. In these areas, the buildout model estimated no increase in building square footage.

A summary of the overall public and institutional growth and distribution of growth between SPAs and other areas of the City is included in Table 6.

TABLE 6. Citywide Change and Distribution by Area

Type of Growth	Citywide Change[1]	Percent of Citywide Growth by Area									
		Outside of SPAs	Special Policy Areas (SPAs)								
			Tech District	Artesia Blvd	Aviation Blvd	Galleria District	PCH North	PCH Central	Torrance Blvd	PCH South	Riviera Village
Residential (all designations with residential change)	+4.3 thousand Units[2]	36% 190th RO: 8% Res. Recycling: 24% BCHD: 4%[2] other: 1%	4%	-	-	39%	-	7%	<1%	12%	1%
Accessory Dwelling Units	+624 ADUs	100%	-	-	-	-	-	-	-	-	-
Commercial (commercial and mixed-use designations)	+2.3 mil Sq. Ft.	<1%	1%	39%	20%	15%	9%	14%	2%	-3%	2%
Industrial (industrial and industrial flex designations)	+3.6 mil Sq. Ft.	47% (I-1 area west of Tech District)	37%	-	-	13%	3%	-	-	-	-
Public / Institutional (PI, OS, U, and ROW designations)	+103 thousand Sq. Ft.[2]	100% (BCHD)[2]	-	-	-	-	-	-	-	-	-
Loss of nonconforming/ conditionally permitted uses in residential areas (residential designations)	- 105 thousand Sq. Ft.	100% (throughout residential designations)	-	-	-	-	-	-	-	-	-

1. All estimates are rounded. Total residential change is an increase of approximately 4.9 thousand dwelling units, and a non-residential increase of 5.7 million square feet (commercial and industrial change, less the loss of non-conforming / conditionally permitted uses – see Note 2 for how Public/Institutional Square footage is handled.)
2. The projected change in Public/Institutional uses was limited to the future buildout of BCHD, which was estimated based on the development plan/program identified in the project description of the FEIR for the healthy living campus project including: Phase 1: Assisted Living: 157 units (203,700 sf); Memory Care: 50,000 sf (120 beds); PACE: 14,000 sf; Community Services: 6,270 sf; Youth Wellness Center: 9,100 sf. Phase 2: Wellness Pavilion: 37,150 sf; Aquatics Center (indoor area): 24,000 sf; Center for Health and Fitness: 20,000 sf), which is equivalent to an FAR of 0.85 FAR (this FAR includes the square footage associated with the assisted living facility).
   This table is intended to illustrate orders of magnitude change and show what kinds of uses are growing and shrinking, so it includes BOTH the unit growth AND the Square Footage associated with the assisted living facility – and this is the only table in the buildout methodology or PEIR where it is included as BOTH types of uses. Assisted living units, have aspects of both residential and non-residential uses, but they must be analyzed as either a residential use or a non-residential use in the technical studies of the PEIR to avoid double-counting impacts. The PEIR conservatively analyzed all assisted living facilities in the City as a residential use to more accurately capture infrastructure impacts at a programmatic level. Where FARs for facilities with assisted living are identified, however, the FAR includes the building square footage associated with the assisted living facility.

Abbreviations: 190th RO: 190th St. Residential Overlay Area, Res. Recycling: Housing growth attributed to the redevelopment of existing residential properties with more intense uses, BCHD: Beach Cities Health District.

3.2 HOUSING PROJECTIONS | DWELLING UNITS (DU)

Housing projections estimate the number of units anticipated to develop under the proposed general plan by 2050. These assumptions align with the proposed General Plan including the proposed Land Use Plan as well as the adopted 2021-2029 Housing Element. As described in Section 3.1, the 2050 buildout scenario estimates a reasonable 2050 buildout scenario.

In addition to the growth described in Section 3.1, the City has a diverse portfolio of existing housing. Much of the existing housing stock was built prior to the last update of the General Plan in 1993, and much of the housing became legal non-conforming after the 1993 General Plan went into effect. In fact, approximately 18 percent of residential parcels (designated as R-1, R-1A, R-2, R-3, RMD, or RH in the Current General Plan) contain legal non-conforming uses with homes built at a higher density than what is allowed under either the Current General Plan (1993) or the Proposed General Plan (2024). Because City regulations allow these homes to remain, the 2024 realistic projections assume that these homes will remain as built.

To ensure that existing non-conforming homes were properly projected, dwelling unit projections were estimated by adding the net change in units to the existing units.

Proposed Land Use Plan units: [existing units] + [net change in units]

The assumptions, described under "Estimating Net Change" detail when and where changes in the number of dwelling units were estimated to occur by 2050, consistent with the general approach described in Section 3.1. A detailed description outlining how the net change in dwelling units was projected is included under "Housing Projection Methodologies."

The existing units were derived from the existing land use estimates described in Part 1 of this memo.

Estimating Net Change

Residential Designations
(designated as R-1, R-1A, R-2, R-3, RMD, or RH in the Proposed General Plan)
Growth was projected on the following types of properties:

- Vacant areas. Properties without any buildings that would allow for housing were projected using methodology 1, described in "Housing Projection Methodologies.".
- Areas of change. Where land uses were changed as part of the proposed project to allow higher density housing or a different mix of uses were projected using the "Anticipated Residential Density" in Table 8 and methodology 1, described in "Housing Projection Methodologies."
- Residential Recycling. In the last 20 years, much of the residential growth in the City has been the result of the addition of new housing units on existing multi-family lots where development is not currently built out to the maximum density permitted. It is anticipated these multi-family lots with remaining capacity in medium density zones (R-2 and R-3) will continue to redevelop with two to three units in accordance with existing (and proposed) permitted densities. Several R-2 and R-3 sites with viable remaining development capacity were identified as parcels available to fulfill the City's moderate income housing requirements in the 2021-2029 Housing Element. Growth on these sites were projected consistent with the 2021-2029 Housing Element, Chapter 2.2.4, Section A, Part 3, heading "RHNA Residential Recycling." In addition, approximately 80 percent of sites with remaining capacity that were not identified in the Housing Element were projected to build out using the "Anticipated Residential Density" in Table 8 and using methodology 1, described in "Housing Projection Methodologies."
- Church properties. The 2021-2029 Housing Element identified several church properties with RH and R-3 designations where housing may be built. Housing growth was projected consistent with the 2021-2029 Housing Element.
- Legal non-conforming and conditionally permitted non-residential uses. To reflect trends toward transitioning to housing, as described in Section 3.1, fifty percent of the legal non-conforming and conditionally permitted uses in residential land use districts that were also within a SPA are projected to transition to housing consistent with the "Anticipated Residential Density" for the land use category in Table 8 and using methodology 2, described in "Housing Projection Methodologies."

- **All other residential properties including those with legal non-conforming residential uses.** The projections assumed that there would be no change in the number of units on remaining properties, unless they fell within a residential overlay or mixed-use area, or included an anticipated project as described below. The buildout also accounted for the development of accessory dwelling units throughout residential areas, as described below.

  Note: Approximately 18 percent of residential parcels (designated as R-1, R-1A, R-2, R-3, RMD, or RH in the Current General Plan) contain legal non-conforming uses with homes built at a higher density than what is allowed under either the Current General Plan or the Proposed Land Use Plan. Per the City's municipal code, these existing non-conforming homes are allowed to remain as-is, and in specific circumstances could be rebuilt with the same number of units (see section 3.7 for more information on non-conforming uses), so it is likely that the same number of existing non-conforming homes would remain. This methodology assumes the long-term continuance of these legal non-conforming homes, and it assumes that individual parcels with remaining capacity may intensify.

Residential Overlay Areas (Housing projections)
(designated with a "-R" suffix in the Proposed General Plan)

The Proposed General Plan includes a Residential Overlay designation that will be applied to various areas, with the goal of dispersing new housing opportunities throughout the City, consistent with the 2021-2029 Housing Element. The Overlay is applied to areas deemed suitable for the development of housing affordable to lower income households consistent with State law. The allowable density in the Residential Overlay designation is 55.0 DU/AC. Dwelling units in these areas were projected consistent with the number of units quoted in the 2021-2029 Housing Element for each site. Estimates for non-residential growth in these areas is explained under section 3.5 *Non-Residential Building Square Footage*.

Mixed-Use Designations (Housing projections)
(designated as MU-1, MU-2, MU-TC in the Proposed General Plan)
Housing growth was projected on the following types of properties:

- **MU-1 Artesia Boulevard SPAs.** It is assumed that the existing mixed use project will remain with no net change.

- **MU-1 and MU-2 properties within other SPAs.** Properties designed MU-1 and MU-2 within other SPAs in the Proposed General Plan were projected to develop to the anticipated density, as noted in Table 8. Dwelling Unit projections were estimated using Methodology 1, described in "Housing Projection Methodologies." Non-residential development on these properties is described in Section 3.5.

- **MU-TC properties.** All properties designated as MU-TC are part of the Galleria project area, which is also noted in the Housing Element. Units were projected consistent with the figures quoted in the housing element plus 50 units City staff anticipated, as noted in Table 7.

- **All other mixed-use properties.** Housing was projected using the anticipated density noted in Table 8 and methodology 1, described in "Housing Projection Methodologies." Non-residential development was projected as described in Section 3.5.

Estimates for non-residential growth in mixed-use areas is explained under section 3.5 *Non-Residential Building Square Footage*.

Accessory Dwelling Units (ADUs)
(allowed on all properties that allow for residential development)

Per regulations set forth in the City's municipal code (as required for compliance with State ADU laws), accessory dwelling units are allowed on properties that allow residential uses. An analysis of ADUs in the City's Housing Element documents ADU development since 2017. Based on these trends, the Housing Element estimates growth of 30 ADUs per year through 2029. The Housing Element was required to make a conservative growth estimate to satisfy the criteria of State law. Due to

current demand for housing, limited available land resources, and the high value of residential land in Redondo Beach, it is likely that production of ADUs will continue to increase after 2029. This methodology assumes that 240 ADUs will be built by 2029, consistent with the Housing Element, and that the number of ADUs added yearly will increase by 1% annually as the cost to build ADUs decreases, and demand increases, for an estimated total of 624 ADUs by 2050.

Anticipated projects

Approved projects were projected to the number of units entitled or identified as the development plan/program in the project description of a certified environmental impact report, as noted in Table 7. The change in units was estimated by subtracting any existing units on the sites from the proposed or entitled units.

Existing Residential Units in Commercial Land Use Designations

There are several existing homes on properties that do not allow for residential uses. These properties were projected to remain as-built, so no change in units was projected.

Housing Projection Methodologies

Methodology 1. Housing by anticipated density

[net change in units] = ([parcel acreage] x [anticipated density for land use designations]) – [existing units]

Growth is estimated according to the anticipated density for that land use category. For areas where land uses were changed to allow higher density residential uses and/or a different mix of uses, it's assumed that all parcels would grow according to the anticipated density. Dwelling unit growth projections for both were estimated by multiplying the acreage of each parcel by the anticipated density for different land use designations and subtracting any existing residential uses on that parcel. The anticipated density for each land use designation is provided in Table 8. The buildout estimates for the Proposed Land Use Plan is provided in Table 9.

Methodology 2. Transition of non-residential uses within Special Policy Areas to residential uses

[net change in units] = ([0.50 x parcel acreage] x [anticipated density for land use designations]) – [existing units]

To estimate this figure, the properties impacted were identified using GIS software by first isolating parcels within SPAs and identifying which properties had a proposed residential designation. Those parcels were then filtered down to those with existing non-residential uses.

On the identified properties, dwelling unit growth was projected by multiplying fifty percent of the acreage of each parcel by the anticipated density for different land use designations and subtracting any existing residential uses on that parcel (if there were both residential and non-residential uses on a property). The anticipated density for each land use designation is provided in Table 8. The buildout estimates for the Proposed Land Use Plan is provided in Table 9.

3.3 HOUSEHOLD PROJECTIONS

Households represent occupied housing units. Based on data from the U.S. census, discussed in Part 1, the housing occupancy rate for all dwelling unit types not listed below is assumed to be 95.1 percent based on data from the 2023 CA DOF. This is consistent with that assumed for Existing Land Use. Table 9 at the end of this document shows the total anticipated households expected within the horizon year.

Occupancy rates for other types of housing or living situations were estimated as follows:

- ADUs (89.0% occupancy)
- Assisted Living Facilities (100% occupancy)
- Beds in group quarters (memory care facilities, etc.) (100% occupancy)

Households are calculated by multiplying the projected units by the occupancy rate:

Proposed Land Use Plan households: [units] x [occupancy rate]

3.4 POPULATION PROJECTIONS

The persons per household (pph) factor used to estimate population for the Proposed Land Use Plan was derived from the traffic model published by the Southern California Association of Governments (SCAG), which estimated a citywide average of 2.359 pph for all dwelling unit types not listed below. This estimate was in line with DOF figure Based on data from the U.S. census, discussed in Part 1. Table 9 at the end of this document shows the total anticipated population at the completion of the buildout period for the Proposed Land Use Plan.

Population estimates for other types of housing or living situations were estimated as follows:

- ADUs (1.98 persons per household)
- Assisted living facilities (1.25 persons per household)
- Memory care facilities (1 person per bed)

Population is calculated by multiplying the projected households by the pph:

Proposed Land Use Plan population: [households] x [persons per household]

3.5 NON-RESIDENTIAL BUILDING SQUARE FOOTAGE PROJECTIONS

The projected non-residential building square footage was estimated by adding the existing square footage to the estimated net growth in square footage. The existing square footage was derived from the existing land use estimates described in Part 1 of this memo.

The estimated net growth in square footage resulting from the Proposed Land Use Plan was derived by applying the assumptions outlined in the following sections. The following assumptions detail when and where changes in non-residential uses were assumed and include a detailed description of the methodology used to project the anticipated changes in non-residential building square footage.

Proposed non-residential building square footage: [existing square footage] + [net change in square footage]

NOTE: Many of the methodologies described in the following sections project non-residential growth based on the allowed and anticipated building intensities. For non-residential uses, these are generally measured by floor area ratio (FAR). FAR refers to the ratio of the total floor area of a building (building footprint times number of building stories) to the total square footage of that parcel. FAR calculations do not include floor areas for parking structures or outdoor open storage. To determine future projections for Redondo Beach, an anticipated FAR within the allowed intensity range for each proposed land use designation was determined and can be found in Table 8.

Estimating Net Change

Commercial & Industrial Designations

(designated as CN, C-1, C-2, C-3, C-4, C-5, CC, I-1, I-2, I-3, IF in the Proposed General Plan)

- Vacant areas. All vacant lots in non-residential land use categories were assumed to build out to the anticipated FAR for that land use category, consistent with methodology 3, described in "Non-Residential Projection Methodologies."
- Areas of change. Areas of change include those with a proposed land use change or proposed revision to the land use definition that would change the maximum FAR. Non-residential square footage in these areas was projected using methodology 3, described in "Non-Residential Projection Methodologies."
- Areas of intensification. Areas of intensification include Special Policy Areas where the Proposed Land Use Plan did not change the mix of uses allowed or the maximum FAR, but where existing uses are built out below the anticipated FAR. For the purposes of analyzing the impacts of the Proposed General Plan, it is assumed that policy

direction in the Special Policy Areas will encourage redevelopment, resulting in an increase in building square footage in these areas, resulting in growth according to the anticipated FAR for each land use category. Non-residential square footage in these areas was projected using methodology 3, described in "Non-Residential Projection Methodologies.".

Public & Open Space Designations
(designated as PI, U, OS, and ROW in the Proposed General Plan)

Public and Open Space designation are projected to remain with no change, except for anticipated projects included in Table 7, as discussed in Section 3.1.

Residential Overlay Areas (Non-residential projections)
(designated with a "-R" suffix in the Proposed General Plan)

The Proposed General Plan includes a Residential Overlay designation that will be applied to various areas, with the goal of dispersing new housing opportunities throughout the City, consistent with the 2021-2029 Housing Element. The Overlay is applied to areas deemed suitable for the development of housing affordable to lower income households consistent with State law. Dwelling units in these areas were projected consistent with the number of units quoted in the 2021-2029 Housing Element for each site. The 2021-2029 Housing Element also included descriptions of how these areas could develop to support high density housing. These descriptions informed the below approach to projecting non-residential uses:

- A. North Tech. Existing non-residential square footage to remain unchanged (Housing expected to develop in parking areas).
- B. Kingsdale. Existing non-residential square footage to be replaced by new project with non-residential square footage at 0.5 FAR (Housing expected as part of an integrated new project).
- C. South of Transit Center. Remove all existing non-residential square footage and replace with 100 percent residential project.
- D. 190th street. Remove non-residential square footage on properties identified in the housing element and replace with 100 percent residential project. Note: one property within the overlay area was not identified in the housing element. Projections on this site assumed existing uses would remain.
- E. South Bay Marketplace. Existing non-residential square footage to remain unchanged (Housing expected to develop in parking areas).
- F. FedEx. Remove all existing non-residential square footage and replace with 100 percent residential project.

As noted in Section 3.2, Housing Projections, housing on all sites was projected consistent with the 2021-2029 Housing Element.

Mixed-Use Designations (Non-residential projections)
(designated as MU-1, MU-2, MU-TC in the Proposed General Plan)
Housing growth was projected on the following types of properties:

- MU-1 Artesia Boulevard SPAs. It is assumed that the existing mixed-use project will remain with no net change.

- MU-1 and MU-2 properties within other SPAs. Properties designed MU-1 and MU-2 in the Proposed General Plan were projected to develop to the anticipated FAR, as noted Table 8. Dwelling Unit projections were estimated using Methodology 3, described in "Non-Residential Projection Methodologies."

- MU-TC properties. All properties designated as MU-TC are part of the Galleria project area, which is also noted in the Housing Element. Units were projected as described in Section 3.2 and noted in Table 7.

- All other properties. Non-residential square footage was projected to remain with no net change.

Estimates for housing growth in these areas is explained under section 3.2 Housing projections.

Anticipated Projects

Approved projects were projected to the amount of non-residential square footage entitled or studied in an environmental impact report, as noted in Table 7. The change in units was estimated by subtracting any existing units on the sites from the proposed or entitled units.

Existing Non-residential uses in residential Land Use Designations

Section 3.2 Housing Projections describes several circumstances where existing non-residential uses were expected to transition to housing. On these properties the existing non-residential square footage was reduced to zero on the sites or portions of sites expected to transition to residential uses.

Non-Residential Projection Methodologies

Methodology 3. Non-residential by anticipated FARs

[net change in square footage] = ([parcel square footage] x [anticipated FAR]) – [existing square footage]

Non-residential square footage projections were estimated by multiplying the square footage of each parcel by the anticipated FAR for different land use designations. The existing square footage was then subtracted from this amount to show the isolated change in square footage. The buildout estimates for the Proposed Land Use Plan are provided in Table 9.

3.6 EMPLOYMENT PROJECTIONS

Employment generation factors represent the average amount of building square footage typically required per employee and are customized based on the land use designation, dividing the nonresidential building square footage by the employment generation factor results in an estimate of the number of jobs each land use category will create by the horizon year. The resulting employment number represents a count of the total number of jobs associated with a given amount of building square footage. This includes both full- and part-time jobs and is not a full-time equivalent measure. The factors identified in Table 2, *City of Redondo Beach General Plan Update Employment Generation Rates*, were used to estimate total employment by the horizon year.

Employment is calculated by dividing the projected building square footage by the employment generation:

Projected employment: [non-residential building square footage] / [employment generation factor]

3.7 EXISTING NON-CONFORMING USES

There are legal non-conforming uses throughout the City. Existing non-conforming uses are parcels of land within a city's jurisdiction that contain uses or activities that are not consistent with the parcel's designated land use or prescribed density or intensity (according to the Current General Plan Land Use Map/Element). Some buildings may have conformed with the City's General Plan when they were developed, but then became non-conforming later, when the parcel's land use designation was changed during an update to the Land Use Element. Some examples of non-conforming uses include commercial businesses operating on a residential property, an apartment building within a commercial-only land use designation, and homes built at a higher density than what would be allowed on the site under the Current General Plan.

The City's municipal code allows legal non-conforming uses to remain as built. In specific circumstances, the municipal code allows for properties to be rebuilt with the same number of dwelling units and/or square feet as currently exists, even if the current use, number of units, or total square footage would not be allowed under the Current General Plan. In these cases, the non-conforming land use is considered "grandfathered in" and can continue without conforming to the designation in the Land Use Element.

While the City does not require legal non-conforming uses to transition to conforming uses, the current real estate market, limited available land resources, and value of residential land, provide incentives for non-residential uses within residential land use categories to transition to housing. To reflect this demand, this methodology assumes that legal non-conforming uses with residential capacity will transition to residential and develop with the maximum number of units permitted (unless the property is too small to accommodate a housing unit). Legal non-conforming residential uses are projected to remain as-built.

TABLE 7. Dwelling Units and Square Footage Growth Assumed for Approved and Pending/Potential Projects

Development Name (Proposed LUC)	Total Dwelling Unit	Non-Residential Square Feet
Galleria (MU-TC)	700	1,293,144[1]
Legado (MU-1)	115	21,539
Alcast Foundry (R-3)	36	0
Catalina Village (R-3)	32	3,036
Project Homekey (Moonstone) (CN)	20	0
Beach Cities Health District (PI)[2]	157	160,520[2]

1) Total square footage includes the entitled square footage less 300,000 sq. ft. for apartment buildings in the Galleria Project.

2) Sourced from Beach Cities Health District Final EIR development plan/program described in the project description, including the following Phase 1: Assisted Living: 157 units (203,700 sf); Memory Care: 50,000 sf (120 beds); PACE: 14,000 sf; Community Services: 6,270 sf; Youth Wellness Center: 9,100 sf. Phase 2: Wellness Pavilion: 37,150 sf; Aquatics Center (indoor area): 24,000 sf; Center for Health and Fitness: 20,000 sf), which is equivalent to an FAR of 0.85 FAR (this FAR includes all of the building square footage listed above).

Assisted living units, have aspects of both residential and non-residential uses, but they must be analyzed as either a residential use or a non-residential use in the technical studies of the PEIR to avoid double-counting impacts. The PEIR conservatively analyzed all assisted living facilities in the City as a residential use to more accurately capture infrastructure impacts at a programmatic level. Where FARs for facilities with assisted living are identified, however, the FAR includes the building square footage associated with the assisted living facility.

Memory care facilities are included in non-residential square footage.

TABLE 8. Proposed Land Use Plan Anticipated Density and Intensity

Land Use Designation	Maximum Density/Intensity (allowed under Proposed General Plan)	Anticipated Residential Density (Used in buildout projections)	Anticipated Non-Residential Intensity (Used in buildout projections)
Single-Family Residential			
R-1: Single Family Residential	Up to and including 8.8 du/ac	8.8 du/ac	n/a
R-1A: Single Family Residential (Small Lot)	Up to and including 17.5 du/ac	17.5 du/ac	n/a
Multi-Family Residential			
R-2: Multifamily Residential	Up to and including 14.6 du/ac	14.6 du/ac	n/a
R-3: Multifamily Residential	Up to and including 17.5 du/ac	17.5 du/ac	n/a
RMD: Multifamily Residential	Up to and including 23.3 du/ac	23.3 du/ac	n/a
RH: Multifamily Residential	Up to and including 30.0 du/ac	30.0 du/ac	n/a
Mixed Use			
MU-1: Mixed-Use	Commercial Only: 0.35-0.50 FAR // Commercial and Residential together: Max. FAR 1.50 (all density exceeding 0.70 FAR must be residential units) Up to and including 30 du/ac.	30 du/ac	0.70 FAR
MU-2: Mixed-Use	Commercial Only: 1.00 FAR // Commercial and Residential together: Max. FAR 1.50 (all density exceeding 0.70 FAR must be residential units) Up to and including 35 du/ac.	35 du/ac	0.70 FAR
MU-TC: Mixed-Use Transit Center	Max. FAR 1.50 // Up to and including 30 du/ac	See Table 5	
Housing Element Residential Overlays			
A: North Tech (C-4-R)	55.0 du/ac	Per 2021-2029 Housing Element	n/a (existing to remain)
B: Kingsdale (C-4-R & RH-R)	55.0 du/ac	Per 2021-2029 Housing Element	0.50 FAR
C: South of Transit Center (IF-R)	55.0 du/ac	Per 2021-2029 Housing Element	n/a (residential only)
D: 190th Street (C-2-R & I-2-R)	55.0 du/ac	Per 2021-2029 Housing Element	n/a (residential only)
E: South Bay Marketplace (IF-R)	55.0 du/ac	Per 2021-2029 Housing Element	n/a (existing to remain)
F: FedEx (MU-1-R)	55.0 du/ac	Per 2021-2029 Housing Element	n/a (residential only)
Commercial			
CN: Neighborhood Commercial	FAR 0.50	n/a	0.40 FAR
CN: Neighborhood Commercial (Artesia & Aviation Blvd SPAs)	FAR 1.50 in SPA-3 and SPA-4	n/a	1.00 FAR
C-1: Commercial	FAR 0.35	n/a	0.35 FAR
C-2: Commercial	FAR 0.50	n/a	0.50 FAR
C-3: Commercial	FAR 0.70	n/a	0.70 FAR
C-4: Commercial	FAR 1.00	n/a	0.50 FAR
C-5: Commerical[1]	Varies by proposed use (Max FAR 1.50)	n/a	0.70 FAR
CC: Coastal Commercial	Per Harbor/Civic Center Specific Plan and LCP	n/a	no growth
Industrial			
I-1: Industrial	FAR 1.00	n/a	0.75 FAR
I-2: Industrial	FAR 1.00	n/a	1.00 FAR
I-3: Industrial	FAR 1.00	n/a	0.75 FAR
IF: Industrial Flex	FAR 1.00	n/a	0.75 FAR
Public / Open Space			
PI: Public/Institutional[1]	FAR 0.75	See Table 5	
U: Utility	FAR 0.10	n/a	n/a
OS: Parks and Open Space	FAR 0.20	n/a	n/a
ROW: Right of Way	-	n/a	n/a

1) i) In some cases land uses were assumed to buildout to their maximum potential and in other cases they were assumed at a lower density or intensity as described in this methodology report. The Anticipated Non-residential intensity was estimated based an examination of properties throughout Redondo Beach and Southern California with similar development to what was envisioned for each land use in the proposed plan, and then calibrated through iterative modeling to achieve the citywide growth estimates identified in Section 3.1; ii) The maximum FAR in PI: Public/Institutional is 1.25 on 2 sites, as described in Section 3.1. iii) The maximum FAR on C-5 sites varies by proposed use, see Table 2.1 in the General Plan for details.

2) See Section 3.1 and the 2021-2029 Housing Element Residential Sites Inventory for a narrative description of the residential overlay areas, and table H-43 in the Housing Element for development capacity estimates.

TABLE 9. Proposed Land Use Plan Anticipated Density and Intensity

Land Use Designation	Acres	% Total Acres	Dwelling Units[2]	ADUs[3]	Occupancy	Households	PPH	Population[4]	Non-Residential Bldg SQ FT[5]	Employment[6]
Single-Family Residential										
R-1: Single Family Residential	746.8	18.8%	5,100	393	95.1% / 89% (ADU)	5,200	2.359/1.98 (ADU)	12,141	203,477	992
R-1A: Single Family Residential (Small Lot)	121.7	3.1%	1,886	0	95.1%	1,794	2.359	4,232	1,373	4
Multi-Family Residential										
R-2: Multifamily Residential	471.9	11.9%	6,482	127	95.1% / 89% (ADU)	6,277	2.359/1.98 (ADU)	14,770	-	-
R-3: Multifamily Residential	542.7	13.7%	11,051	97	95.1% / 89% (ADU)	10,596	2.359/1.98 (ADU)	24,969	281,241	1,028
RMD: Multifamily Residential	146.0	3.7%	5,887	7	95.1% / 89% (ADU)	5,605	2.359/1.98 (ADU)	13,222	25,957	91
RH: Multifamily Residential	13.4	0.3%	396	-	95.1%	377	2.359	889	69,374	315
Mixed Use										
MU-1: Mixed-Use	22.6	0.6%	701	-	95.1%	666	2.359	1,572	537,906	1,076
MU-2: Mixed-Use	9.1	0.2%	321	-	95.1%	305	2.359	720	278,678	557
MU-TC: Mixed-Use Transit Center	29.8	0.8%	700	-	95.1%	666	2.359	1,571	1,293,144	2,586
Housing Element Residential Overlays										
A: North Tech (C-4-R)	8.0	0.2%	180	-	95.1%	171	2.359	404	106,747	305
B: Kingsdale (C-4-R & RH-R)	2.4	0.1%	126	-	95.1%	85	2.359	283	51,876	104
C: South of Transit Center (IF-R)	6.2	0.2%	273	-	95.1%	260	2.359	613	-	-
D: 190th Street (C-2-R & I-2-R)	7.9	0.2%	331	-		37	2.359	743	14,036	23
E: South Bay Marketplace (IF-R)	17.2	0.4%	486	-	95.1%	462	2.359	1,090	246,147	656
F: FedEx (MU-1-R)	1.8	0.0%	80	-	95.1%	76	2.359	180	-	-
Commercial										
CN: Neighborhood Commercial	33.5	0.8%	205	-	95.1%	195	0.00	460	676,891	1,934
CN: Neighborhood Commercial (Artesia & Aviation Blvd SPAs)	47.4	1.2%	58	-		55		130	2,052,851	5,903
C-1: Commercial	6.2	0.2%	-	-	-	-	0.00	-	88,349	252
C-2: Commercial	17.1	0.4%	-	-	95.1%	-	0.00	-	301,061	907
C-3: Commercial	16.4	0.4%	1	-	95.1%	1	0.00	2	395,562	1,173
C-4: Commercial	39.3	1.0%	17	-	95.1%	16	0.00	38	1,114,704	3,185
C-5: Commerical[1]	12.2	0.3%	-	-	-	-	0.00	-	292,293	835
CC: Coastal Commercial	55.0	1.4%	229	-	95.1%	218	0.00	514	256,639	700
Industrial										
I-1: Industrial	206.0	5.2%	-	-	0.0%	-	0.00	-	6,925,087	8,742
I-2: Industrial	2.6	0.1%	-	-	0.0%	-	0.00	-	114,929	192
I-3: Industrial	25.6	0.6%	-	-	0.0%	-	0.00	-	835,611	1,393
IF: Industrial Flex	29.4	0.7%	-	-	0.0%	-	0.00	-	961,596	2,747
Public / Open Space										
PI: Public/Institutional[1]	160.1	4.0%	253	-	95.1%	253	1.25	436	170,170	851
U: Utility	131.5	3.3%	-	-	0.0%	-	0.00	-	212,577	17
OS: Parks and Open Space	156.8	3.9%	-	-	0.0%	-	0.00	-	-	59
ROW: Right of Way	886.4	22.3%	-	-	0.0%	-	0.00	-	-	-
Total	**3973.0**	**100%**	**34,763**	**624**		**33,314**		**78,978**	**17,508,276**	**36,627**

1) In some cases land uses were assumed to buildout to their maximum potential and in other cases they were assumed at a lower density or intensity based on local trends and 2021-2029 Housing Element estimates.
2) Commercial designations with projected housing units, reflect parcels with existing homes that are projected to remain and project homekey (moonstone).
3) Accessory Dwelling Units
4) Residential dwelling units are assumed to have a 95% occupancy rate (5% vacancy rate); accessory dwelling units utilized an 86% occupancy rate.
5) Residential designations with projected building square footage, reflect parcels where existing institutional and commercial land uses exist and are not projected to convert to residential uses by 2050.
6) See Table 2 for employment generation rates.

All estimates have been rounded, there may be small discrepancies due to rounding and aggregation of data.

Appendix C Air Quality and Greenhouse Gas Emissions

Appendices

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Land Use Statistics - Redondo Beach, Los Angeles County

	Existing Conditions	Current GP	Proposed GP	Change from Existing		Change from the Current GP	
	2023	1992	2050	Change	%	Change	%
Housing Units	30,431	32,504	35,387	4,956	16%	2,883	9%
Population	70,311	75,046	78,978	8,667	12%	3,932	5%
Non-Residential SQFT	11,826,277	16,312,887	17,508,276	5,681,999	48%	1,195,389	7%
Employment	28,638	33,174	36,627	7,989	28%	3,453	10%
Service Population	**98,949**	**108,220**	**115,605**	**16,656**	17%	**7,385**	7%

AQMP Consistency Analysis

Comparison of the Change in Population and VMT in Redondo Beach (O-D Method)

Category	Existing	Current GP	Proposed GP	Change from Existing		Change from the Current GP	
				Change	%	Change	%
Population	70,311	75,046	78,978	8,667	12%	3,932	5%
Employment	28,638	33,174	36,627	7,989	28%	3,453	10%
SP	98,949	108,220	115,605	16,656	17%	7,385	7%
VMT per Day	1,398,064	1,395,544	1,664,444	266,380	19%	268,899	19%
VMT/SP	14.13	12.90	14.40	0.3	2%	1.5	12%

Note Origin-Destination (O-D) Methodology is not the same methodology for SB 743, which considers only commute-trip VMT. Modeling of vehicle miles traveled (VMT) provided by Fehr & Peers is based on Southern California Association of Governments Regional Transportation Model (SCAG RTM). VMT from passenger vehicles and trucks that have an origin or destination in the City using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375).

Redondo Beach Community GHG Emissions Inventory and Forecast

Category	Existing		General Plan Update		Increase		Current General Plan	
	TOTAL		**TOTAL**		**TOTAL**		**TOTAL**	
Building Electricity	112,885	27%	115,490	28%	2,605	2%	107,068	29%
Building Natural Gas	59,329	14%	73,289	18%	13,960	24%	67,583	18%
On-Road Transportation	187,753	46%	162,967	40%	-24,786	-13%	137,610	38%
Off-Road Vehicles and Equipment	8,125	2.0%	8,893	2%	768	9%	8,725	2%
Solid Waste/Landfills	6,292	1.5%	7,068	2%	776	12%	6,716	2%
Refrigerants	33,262	8%	37,362	9%	4,100	12%	35,502	10%
Water Use	2,125	0.5%	1,647	0%	-478	-22%	1,542	0%
Wastewater Treatment	968	0%	995	0%	27	3%	932	0%
Total Community Emissions	**410,739**	100%	**407,712**	100%	**-3,028**	**-1%**	**365,678**	100%
Service Population (SP)	98,949	NA	115,605	NA	16,656	17%	108,220	NA
$MTCO_2e$/SP	4.2	NA	3.5	NA	-0.6	-15%	3.4	NA
Trajectory to AB 1279	**61,611**	-85%	**Does not Achieve Target**					

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Fifth Assessment Report (AR5).

The emissions inventory and forecast is based on activity data for the City of Redondo Beach. This emissions inventory methodology identifies GHG emissions produced within a jurisdiction and captures direct and indirect emissions generated by land uses in a community. The activity data methodology allows a direct comparison between a community's GHG emissions and that identified by CARB in the AB 32 and SB 32 inventory and forecast prepared for the scoping plan. Unlike a "consumption-based" GHG emissions inventory, an activity-based emissions inventory does not capture lifecycle emissions associated with consumptions of goods. While a consumption-based emissions inventory approach may document GHG emissions associated with the final demand (regardless of where the were generated), a consumption-based emissions inventory excludes emissions associated with products produced within the jurisdiction but consumed elsewhere. For these reasons, an activity-based emissions inventory was determined to be most applicable for determining significant impacts under CEQA.

Excludes GHG emissions natural gas use from Permitted Sources within the City.

City of Redondo Beach Community Criteria Air Pollutant Emissions Inventory and Forecast

Sources

[1] Source: Fehr & Peers 2023; EMFAC2021 Version 1.0.2 Emissions Rates. Los Angeles Sub-Area.

[2] Sources: SoCalGas 2023 and CalEEMod User's Guide for natural gas criteria air pollutant emission rates. Excludes criteria air pollutant emissions natural gas use from Permitted Sources within the City.

[3] Source: OFFROAD 2021 Version 1.0.3.

[4] Source: CalEEMod 2022 User's Guide

Existing (2023)

Phase	Existing (2023) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	69	482	3,322	11	79	30
Energy[2]	16	286	150	2	23	23
Offroad Equipment[3]	308	220	6,756	0	9	7
Consumer Products[4]	1,100	0	0	0	0	0
Total	**1,493**	**987**	**10,229**	**14**	**112**	**60**

Existing in 2050

Phase	Existing Land Uses (2050) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	23	162	1,592	8	72	25
Energy[2]	16	286	150	2	23	23
Offroad Equipment[3]	308	220	6,756	0	9	7
Consumer Products[4]	1,100	0	0	0	0	0
Total	**1,447**	**668**	**8,499**	**10**	**105**	**55**

City of Redondo Beach Community Criteria Air Pollutant Emissions Inventory and Forecast

General Plan Update (2050)

Phase	Project Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	28	228	1,863	10	93	32
Energy[2]	20	354	192	2	28	28
Offroad Equipment[3]	338	240	7,487	0	10	7
Consumer Products[4]	1,340	0	0	0	0	0
Total	**1,726**	**822**	**9,542**	**13**	**131**	**68**

NET CHANGE from Existing Land Uses (2050)

Phase	Net Change Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	4	66	270	2	20	7
Energy[2]	4	68	43	0	5	5
Offroad Equipment[3]	30	20	730	0	1	0
Consumer Products[4]	240	0	0	0	0	0
Total	**279**	**154**	**1,044**	**2**	**26**	**13**
SCAQMD Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**

NET CHANGE from Existing Conditions (2023) - Friant Ranch

Phase	Net Change (2050-2023) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	-42	-253	-1,460	-1	13	2
Energy[2]	4	68	43	0	5	5
Offroad Equipment[3]	30	20	730	0	1	0
Consumer Products[4]	240	0	0	0	0	0
Total	**232**	**-165**	**-686**	**-1**	**19**	**8**
SCAQMD Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceeds Threshold	**Yes**	**No**	**No**	**No**	**No**	**No**

Current General Plan

Phase	Project Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Transportation[1]	23	198	1,556	8	79	27
Energy[2]	19	326	178	2	26	26
Offroad Equipment[3]	330	235	7,319	0	10	7
Consumer Products[4]	1,200	0	0	0	0	0
Total	**1,572**	**760**	**9,053**	**11**	**115**	**61**

Energy Data Requests to SCE and SoCalGas

Southern California Edison (SCE) and Clean Power Alliance (CPA). 2023, April 28. Energy Report for Redondo Beach. **Request ID SCE29161316515** (2018 through 2022)

	Annual Kwh[1]					**Interpolated[3]**	**Average**
Category	2018	2019	2020	2021	2022	2023	(2020-2023)
Non-Residential[2]	317,032,164	370,581,847	377,830,061	396,913,089	385,683,915	394,662,876	388,772,485
Residential	139,511,756	229,801,628	273,628,815	267,246,051	269,632,403	266,172,677	269,169,987
Total kwh	456,543,920	600,383,475	651,458,876	664,159,140	655,316,318	660,835,554	657,942,472

Notes:

[1] Since 2017, Redondo Beach has been served by the Clean Power Alliance (CPA). CPA usage data included for years 2019-2022.

[2] Non-Residential category includes commercial, industrial and agricultural land uses. May inbclude permitted sources if there are major industries within the City.

[3] Interpolated Year 2023 usage based on years 2020-2022.

Weighted Average

SCE

	Total Usage (KWH) by Rate Category						
Rate of Category	**2018**	**2019**	**2020**	**2021**	**2022**	**Total (2020-2022)**	**SCE Proportion**
Non-Residential (Commercial, Industrial and Agricultural)	317,032,164	313,610,793	297,670,659	314,017,906	305,867,461	917,556,026	0.79
Residential	139,511,756	139,224,215	146,886,401	140,812,539	140,156,987	427,855,927	0.53
						Total SCE Proportion	**1.32**

CPA

	Total Usage (KWH) by Rate Category						
Rate of Category	**2018**	**2019**	**2020**	**2021**	**2022**	**Total (2020-2022)**	**CPA Proportion**
Non-Residential (Commercial, Industrial and Agricultural)	na	56,971,054	80,159,402	82,895,183	79,816,454	242,871,039	0.21
Residential	na	90,577,413	126,742,414	126,433,512	129,475,416	382,651,342	0.47
Notes						**Total CPA Proportion**	**0.68**

Omitted 2018-2019 since partial data available.

SoCalGas. 2023, April 28. Natural Gas Use in Redondo Beach (2020-2022).

	Annual Therms[1]			**Interpolated[2]**	**Average**
Category	2020	2021	2022	2023	(2020-2023)
Commercial	2,439,435	2,678,951	2,474,386	2,565,875	2,539,662
Industrial	3,681	5,669	1,709	1,714	3,193
Single-Family Residential	4,773,329	4,702,470	4,297,226	4,114,905	4,471,983
Multi-Family Residential	4,314,218	4,327,697	3,997,160	3,895,967	4,133,761
Total Therms	11,530,663	11,714,787	10,770,481	10,578,462	11,148,598

Notes:

[1] May exclude natural gas use from Industrial (Permitted) Sources within the City.

[2] Interpolated Year 2023 usage based on years 2020-2022.

City of Redondo Beach Energy

SCE, Clean Power Alliance (CPA), and SoCalGas Emission Factors

	lbs/MMBTU	lbs/MMBTU	lbs/MMBTU	lbs/MMBTU
	CO_2	CH_4	N_2O	**CO_2e**
All Years	117	0.01040	0.00020	**117.3**
	MT/Therm	**MT/Therm**	**MT/Therm**	**MT/Therm**
	CO_2	CH_4	N_2O	**CO_2e**
All Years	0.00531	4.72E-07	9.07E-09	**0.005**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-4, Natural Gas Emissions Factors (pounds per MMBTU).

Southern California Edison

	Intensity factor			
	CO_2 lbs/MWH	CH_4 lbs/MWH	N_2O lbs/MWH	**CO_2e** lbs/MWh
2023	348.637	0.033	0.004	**350.6**
2050	260.788	0.033	0.004	**262.8**
	CO_2 MTons/MWH	CH_4 MTons/MWH	N_2O MTons/MWH	MTons/MWh
2023	0.158	1.50E-05	1.81E-06	**0.159**
2050	0.118	1.50E-05	1.81E-06	**0.119**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-3, Electricity Utility Greenhouse Gas Emissions Factors

Notes

In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and encourages the state's electricity to come from carbon-free resources by 2050.

Clean Power Alliance (CPA)

Participation Rate **93.70%** Carbon Intensity

Year	Intensity factor			
	CO_2 lbs/MWH	CH_4 lbs/MWH	N_2O lbs/MWH	**CO_2e** lbs/MWh
2023	429.901	0.033	0.004	**431.885**
2050	330.693	0.033	0.004	**332.677**
	CO_2 MTons/MWH	CH_4 MTons/MWH	N_2O MTons/MWH	MTons/MWh
2023	0.195	1.50E-05	1.81E-06	**0.196**
2050	0.150	1.50E-05	1.81E-06	**0.151**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-3, Electricity Utility Greenhouse Gas Emissions Factors

Notes

Participation rate for CPA for the Clean Power (Default for Redondo Beach) is based on the CPA 2022 Impact Report, 2023, June. https://cleanpoweralliance.org/wp-content/uploads/2023/06/ImpactReport2022.pdf.

In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and encourages the state's electricity to come from carbon-free resources by 2050.

Weighted Average

Year	Intensity factor			
	CO_2 lbs/MWH	CH_4 lbs/MWH	N_2O lbs/MWH	**CO_2e** lbs/MWh
2023	376.267	0.033	0.004	378.251
2050	284.556	0.033	0.004	286.540
	CO_2 MTons/MWH	CH_4 MTons/MWH	N_2O MTons/MWH	MTons/MWh
2023	0.171	1.50E-05	1.81E-06	**0.172**
2050	0.129	1.50E-05	1.81E-06	**0.130**

Notes

Weighted average calculated based on proportion of annual electricity usage data (2020-2022) for CPA vs SCE.

GHG Emissions from Energy Use

	SCE	SoCalGas
Actual Energy Use	**MWH/YR**	**Therms**
Commercial	NA	2,539,662
Industrial	NA	3,193
Residential	269,170	8,605,743
Non-Residential	388,772	NA
City Total	657,942	11,148,598

Notes

Based on averaged (2020-2023) data for existing energy and natural gas usage

Existing emissions based on the weighted average carbon intensity for SCE and CPA.

Forecast Methodology	**Existing**	**Proposed Project**	**Current GP**
Residential - Dwelling Units	30,431	35,387	32,504
Nonresidential - Square footage	11,826,277	17,508,276	16,312,887

MWH per Unit per year 8.8	Therms per Unit per year 283
MWH per SQFT per year 0.03	Therms per SQFT per year 0.2

Notes

Forecasted emissions are based on the weighted average carbon intensity for SCE and CPA.

	Existing	**Proposed Project**	**Current GP**
Electricity		**MWH**	
Nonresidential	388,772	575,560	536,264
Residential	269,170	313,007	287,506
Total	657,942	888,567	823,770
Electricity		**MTCO2e**	
Nonresidential	66,703	74,808	69,700
Residential	46,182	40,683	37,368
Total Electricity	**112,885**	**115,490**	**107,068**

	Existing	**Proposed Project**	**Current GP**
Natural Gas		**Therms**	
Nonresidential	2,542,855	3,764,584	3,507,554
Residential	8,605,743	10,007,276	9,191,978
Total	11,148,598	13,771,860	12,699,532
Natural Gas		**MTCO2e**	
Nonresidential	13,532	20,034	18,666
Residential	45,797	53,255	48,917
Total Natural Gas	**59,329**	**73,289**	**67,583**

Criteria Air Pollutants from Natural Gas

Rate	lbs/MBTU					
Natural Gas	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	0.0054	0.0922	0.0392	0.0006	0.0075	0.0075
Non-Residential	0.0054	0.0980	0.0824	0.0006	0.0075	0.0075

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-4, Natural Gas Emissions Factors (pounds per MMBTU).

Redondo Beach	Existing	Proposed Project	Current GP
		Therms	
Residential	8,605,743	10,007,276	9,191,978
Nonresidential	2,542,855	3,764,584	3,507,554
Total	11,148,598	13,771,860	12,699,532

Natural Gas	Existing lbs/day					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	13	217	92	1	18	18
Nonresidential	4	68	57	0	5	5
TOTAL	16	286	150	2	23	23

Natural Gas	Current GP lbs/day					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	14	232	99	2	19	19
Nonresidential	5	94	79	1	7	7
TOTAL	19	326	178	2	26	26

Natural Gas	Proposed Project lbs/day					
	ROG	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Residential	15	253	107	2	21	21
Nonresidential	6	101	85	1	8	8
TOTAL	20	354	192	2	28	28

Area Sources - Consumer Products

Residential Consumer Product Use		
	Emissions = EF x Building Area	
Statewide (2008)	EF =	2.14E-05 lbs/sqft/day
South Coast AQMD Rule 1143	**EF =**	**1.98E-05 lbs/sqft/day**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Appendix D3 - Consumer Products Use.

AVERAGE HOUSING SQFT ASSUMPTIONS

Year Structure was Built	Percent of Housing Stock [a]	Average Square Feet of New Single Family Homes[b]	Average Square Feet (Weighted)
2020 or Later	0.20%	2,448	5
2010 to 2019	3.50%	2,524	88
2000 to 2009	6.60%	2,404	159
1990 to 1999	7.80%	2,116	165
1980 to 1989	15.50%	1,819	282
1979 or earlier	66.30%	1,699	1,127
Total	100%		1,826

Sources/Notes:

a. United States Census Bureau, Selected Housing Characteristics, City of Redondo Beach, 2022. Table DP04. American Community Survey 1-Year Estimates, Year structure built.

https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2019/

b. United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. https://www.census.gov/construction/chars/completed.html

	Existing	Proposed Project	Current GP
Housing Units	30,431	35,387	32,504
Residential SQFT	55,553,219	67,683,029	60,626,886
lbs VOC per day	1,100	1,340	1,200

Area Sources

Source: OFFROAD2021 v.1.0.5, Los Angeles County, Year 2023. https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0

OFFROAD Estimate based on:

Agricultural Equipment	Based on the percentage of agricultural acreage within the City compared to the County of Los Angeles (Los Angeles County, Department of Agricultural Commissioner/Weights& Measures 2023)
Construction Equipment	Based on the percentage of housing permits in Redondo Beach compared to the Los Angeles County (HUD 2023)
Light Commercial and Industrial Equipment	Based on the percentage of employment in Redondo Beach compared to Los Angeles County (US Census 2023)
Lawn & Garden	Based on the percentage of housing units in Redondo Beach compared to Los Angeles County (US Census 2023)

Sources

Construction (Housing Permits)

Source: Housing and Urban Development (HUD). 2023, Accessed December 7, 2023. SOCDS Building Permits Database. https://socds.huduser.gov/permits/

Housing Units

Source: U.S. Census Bureau. American Community Survey, Data Profiles, Accessed December 7, 2023. https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/

Employment

Source: U.S. Census Bureau. LED Extraction Tool, Accessed December 7, 2023. http://lehd.ces.census.gov/

Existing	ROG Exhaust	NO_x Exhaust	CO Exhaust	SO_2 Exhaust	PM_{10} Exhaust	$PM_{2.5}$ Exhaust*	CO2
Construction Equipment	11	49	174	0	4	3	1,464
Lawn & Garden	217	27	2,446	0	2	2	1,345
Light Commercial / Industrial Equipment	80	144	4,136	0	3	2	5,316
TOTAL	308	220	6,756	0	9	7	8,125

Proposed General Plan		ROG Exhaust	NO_x Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM2.5 Exhaust*	CO2
	Forecast Adjusted for:	lbs/day						MT/yr
Construction Equipment	Similar to historic	11	49	174	0	4	3	1,464
Lawn & Garden	Proportional to housing growth	238	29	2,677	0	3	2	1,472
Light Commercial / Industrial Equipment	Proportional to employment growth	90	161	4,635	0	3	2	5,957
TOTAL		338	240	7,487	0	10	7	8,893

Current General Plan		ROG Exhaust	NO_x Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM2.5 Exhaust*	CO2
	Forecast Adjusted for:	lbs/day						MT/yr
Construction Equipment	Similar to historic	11	49	174	0	4	3	1,464
Lawn & Garden	Proportional to housing growth	232	29	2,612	0	3	2	1,436
Light Commercial / Industrial Equipment	Proportional to employment growth	88	157	4,533	0	3	2	5,825
TOTAL		330	235	7,319	0	10	7	8,725

Los Angeles County OFFROAD2021

Source: OFFROAD 2021 v.1.0.5 https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0
Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Los Angeles County OFFROAD2021

Source: OFFROAD 2021 v.1.0.5 https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0

Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Construction and Mining

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
Los Angeles	2023	Construction and Mining - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	690975.0573	0.015995	0.119434	0.082024	2.01E-04	0.006406	0.005893	21.26393	7.04E+03
Los Angeles	2023	Construction and Mining - Bucket	Aggregate	Aggregate	Diesel	16569.30489	0.000263	0.001621	0.00184	4.83E-06	9.14E-05	8.41E-05	0.5099	1.69E+02
Los Angeles	2023	Construction and Mining - Compactor	Aggregate	Aggregate	Diesel	26868.9247	0.00034	0.002398	0.003412	7.83E-06	9.93E-05	9.14E-05	0.826859	2.74E+02
Los Angeles	2023	Construction and Mining - Concrete Mixer	Aggregate	Aggregate	Diesel	2480.13873	3.02E-05	0.000249	0.000292	7.23E-07	8.28E-06	7.62E-06	0.076323	2.53E+01
Los Angeles	2023	Construction and Mining - Concrete Pump	Aggregate	Aggregate	Diesel	24835.13995	0.000413	0.003181	0.003068	7.24E-06	0.000129	0.000118	0.764272	2.53E+02
Los Angeles	2023	Construction and Mining - Crane less than 35ton	Aggregate	Aggregate	Diesel	12110.91822	0.000248	0.00222	0.002093	3.53E-06	0.000121	0.000112	0.372699	1.23E+02
Los Angeles	2023	Construction and Mining - Cranes	Aggregate	Aggregate	Diesel	594969.3216	0.011741	0.100532	0.067802	1.73E-04	5.62E-03	5.17E-03	18.30947	6.06E+03
Los Angeles	2023	Construction and Mining - Crawler Tractors	Aggregate	Aggregate	Diesel	1779441.606	4.01E-02	0.307718	0.228699	5.19E-04	1.78E-02	1.64E-02	5.48E+01	1.81E+04
Los Angeles	2023	Construction and Mining - Crushing/Processing Equipment	Aggregate	Aggregate	Diesel	97821.91922	0.000864	0.005135	0.008631	2.85E-05	0.00022	0.000202	3.01E+00	9.97E+02
Los Angeles	2023	Construction and Mining - Excavators	Aggregate	Aggregate	Diesel	5699831.107	9.71E-02	0.683274	0.691703	1.66E-03	3.24E-02	2.98E-02	1.75E+02	5.81E+04
Los Angeles	2023	Construction and Mining - Graders	Aggregate	Aggregate	Diesel	808296.4964	0.017976	0.140787	0.081865	2.36E-04	0.008196	0.00754	24.87435	8.24E+03
Los Angeles	2023	Construction and Mining - Hopper Tractor Trailer	Aggregate	Aggregate	Diesel	1653.020363	1.35E-05	4.84E-05	0.0001	4.82E-07	2.64E-06	2.43E-06	0.05087	1.68E+01
Los Angeles	2023	Construction and Mining - Misc - Asphalt Pavers	Aggregate	Aggregate	Gasoline	38498.34129	5.89E-03	0.004983	0.226275	9.67E-06	2.08E-03	1.57E-03	0.644666	2.13E+02
Los Angeles	2023	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Gasoline	25511.43085	1.65E-03	2.22E-03	0.063069	6.36E-06	6.01E-04	4.54E-04	5.70E-01	1.89E+02
Los Angeles	2023	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	160.7202756	0.000518	0.00327	0.001901	4.69E-08	0.000111	8.36E-05	0.004941	1.64E+00
Los Angeles	2023	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Gasoline	125869.824	6.85E-02	4.16E-02	1.996972	3.27E-05	1.85E-02	1.40E-02	7.69E-05	2.55E-02
Los Angeles	2023	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Diesel	236.3961895	6.37E-04	0.003995	0.003099	6.90E-08	0.000141	1.06E-04	7.27E-03	2.41E+00
Los Angeles	2023	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Gasoline	170529.8974	5.51E-02	0.039436	1.804269	4.41E-05	2.11E-02	1.60E-02	1.522225	5.04E+02
Los Angeles	2023	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Diesel	9231.70569	0.000331	0.002413	0.002424	3.57E-06	8.42E-05	7.44E-05	2.84E-01	9.40E+01
Los Angeles	2023	Construction and Mining - Misc - Cranes	Aggregate	Aggregate	Gasoline	21279.5	6.13E-04	1.52E-03	0.033352	5.15E-06	3.53E-05	2.67E-05	5.07E-01	1.68E+02
Los Angeles	2023	Construction and Mining - Misc - Crushing/Proc. Equipment	Aggregate	Aggregate	Gasoline	862.050214	0.000403	0.000275	0.013821	2.19E-07	0.000171	0.000129	5.28E-07	1.75E-04
Los Angeles	2023	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Gasoline	13232.45618	7.20E-03	0.004749	1.89E-01	3.41E-06	2.06E-03	1.55E-03	3.30E-02	1.09E+01
Los Angeles	2023	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Diesel	19.04401661	6.41E-05	0.000405	0.000219	5.56E-09	1.36E-05	1.03E-05	5.85E-04	1.94E-01
Los Angeles	2023	Construction and Mining - Misc - Excavators	Aggregate	Aggregate	Diesel	136.1879843	4.58E-04	0.002896	0.001564	3.97E-08	9.74E-05	7.36E-05	4.19E-03	1.39E+00
Los Angeles	2023	Construction and Mining - Misc - Other	Aggregate	Aggregate	Gasoline	32430.25	0.00029	0.001041	0.026886	8.08E-06	5.83E-05	4.41E-05	0.813864	2.69E+02
Los Angeles	2023	Construction and Mining - Misc - Other	Aggregate	Aggregate	Diesel	505.4772711	0.001351	0.008477	0.006652	1.47E-07	2.96E-04	2.23E-04	1.55E-02	5.15E+00
Los Angeles	2023	Construction and Mining - Misc - Pavers	Aggregate	Aggregate	Diesel	35.89368832	0.000121	0.000763	0.000412	1.05E-08	2.58E-05	1.95E-05	0.001104	3.65E-01
Los Angeles	2023	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Gasoline	238842.456	0.116599	0.078748	3.442779	6.16E-05	3.64E-02	2.75E-02	0.581013	1.92E+02
Los Angeles	2023	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Diesel	60.86764429	0.000205	1.29E-03	6.99E-04	1.78E-08	4.35E-05	3.29E-05	1.87E-03	6.20E-01
Los Angeles	2023	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Gasoline	85173.20879	0.048226	3.04E-02	1.347148	2.20E-05	1.23E-02	9.31E-03	5.25E-05	1.74E-02
Los Angeles	2023	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Diesel	169.991981	0.000435	0.002726	0.002284	4.96E-08	9.59E-05	7.24E-05	0.005226	1.73E+00
Los Angeles	2023	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Gasoline	125748.6293	0.025819	0.021576	0.903282	3.05E-05	0.008929	0.006746	1.830017	6.06E+02
Los Angeles	2023	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Diesel	1042.438989	0.003012	0.018946	0.013174	3.04E-07	0.000652	0.000493	3.20E-02	1.06E+01
Los Angeles	2023	Construction and Mining - Misc - Rough Terrain Forklifts	Aggregate	Aggregate	Gasoline	150117.2	0.003847	0.010903	0.17939	3.58E-05	0.000256	0.000194	3.67E+00	1.22E+03
Los Angeles	2023	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Gasoline	79526.2	0.002193	0.00559	0.116374	1.88E-05	0.000133	0.000101	1.91E+00	6.32E+02
Los Angeles	2023	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	23.93332603	8.05E-05	0.000509	0.000275	6.98E-09	1.71E-05	1.29E-05	7.36E-04	2.44E-01
Los Angeles	2023	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Gasoline	2413.225307	0.001166	0.000837	0.03861	6.16E-07	0.000474	0.000358	1.52E-06	5.03E-04
Los Angeles	2023	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Diesel	6712.803308	0.006913	0.04343	0.036619	2.35E-06	0.001527	0.001159	2.06E-01	6.83E+01
Los Angeles	2023	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Gasoline	282610.5845	0.03975	0.030785	1.345641	7.31E-05	0.013282	0.010035	5.24E+00	1.74E+03
Los Angeles	2023	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Diesel	7056.810082	0.02378	0.150323	0.080984	2.06E-06	0.00516	0.003899	2.17E-01	7.18E+01
Los Angeles	2023	Construction and Mining - Misc - Surfacing Equipment	Aggregate	Aggregate	Gasoline	103471.0793	0.063179	0.044456	1.626461	2.65E-05	0.019189	0.014498	6.38E-05	2.11E-02
Los Angeles	2023	Construction and Mining - Misc - Tampers/Rammers	Aggregate	Aggregate	Gasoline	13981.66282	0.005877	0.004479	0.225625	3.64E-06	0.003215	0.002429	9.92E-06	3.29E-03
Los Angeles	2023	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Gasoline	51078.1	0.000938	0.002622	0.071424	1.19E-05	8.6E-05	6.5E-05	1.23E+00	4.08E+02
Los Angeles	2023	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	650.445669	0.002189	0.013833	0.007471	1.90E-07	0.000465	0.000351	2.00E-02	6.62E+00
Los Angeles	2023	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Gasoline	233856.7271	0.047404	0.038589	1.708471	5.89E-05	0.016889	0.01276	3.36E+00	1.11E+03
Los Angeles	2023	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Diesel	877.0785616	0.002755	0.017376	0.01055	2.56E-07	0.00059	0.000446	2.70E-02	8.93E+00
Los Angeles	2023	Construction and Mining - Nurse Rig Other	Aggregate	Aggregate	Diesel	146.8085067	3.8E-06	2.55E-05	3.04E-05	4.28E-08	2.44E-06	2.25E-06	4.52E-03	1.50E+00

Los Angeles County OFFROAD2021

Source: OFFROAD 2021 v.1.0.5 https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0

Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Los Angeles	2023	Construction and Mining - Off-Highway Tractors	Aggregate	Aggregate	Diesel	1017543.649	0.024608	0.139038	0.148361	2.97E-04	0.008501	0.007821	3.13E+01	1.04E+04
Los Angeles	2023	Construction and Mining - Off-Highway Trucks	Aggregate	Aggregate	Diesel	2423929.164	0.04555	0.352781	0.214397	7.07E-04	0.016404	0.015092	7.46E+01	2.47E+04
Los Angeles	2023	Construction and Mining - Other Construction Equipment	Aggregate	Aggregate	Diesel	1155460.25	0.023667	0.18565	0.141327	3.37E-04	0.009962	0.009165	3.56E+01	1.18E+04
Los Angeles	2023	Construction and Mining - Other Material Handling Equipment	Aggregate	Aggregate	Diesel	359747.6921	0.006391	0.04849	0.039107	1.05E-04	0.002531	0.002328	1.11E+01	3.67E+03
Los Angeles	2023	Construction and Mining - Pavers	Aggregate	Aggregate	Diesel	364691.2196	0.00751	0.051362	0.047718	1.06E-04	0.002786	0.002563	1.12E+01	3.72E+03
Los Angeles	2023	Construction and Mining - Paving Equipment	Aggregate	Aggregate	Diesel	405257.5099	0.006544	0.043137	0.048817	1.18E-04	0.002316	0.002131	1.25E+01	4.13E+03
Los Angeles	2023	Construction and Mining - Rollers	Aggregate	Aggregate	Diesel	953557.8081	0.025266	0.156054	0.180452	2.78E-04	9.19E-03	8.46E-03	29.3446	9.72E+03
Los Angeles	2023	Construction and Mining - Rough Terrain Forklifts	Aggregate	Aggregate	Diesel	1194655.043	0.018294	0.147565	0.217434	3.48E-04	6.71E-03	6.17E-03	3.68E+01	1.22E+04
Los Angeles	2023	Construction and Mining - Rubber Tired Dozers	Aggregate	Aggregate	Diesel	217334.3132	0.007651	0.059637	0.048453	6.34E-05	0.003774	0.003472	6.688203	2.21E+03
Los Angeles	2023	Construction and Mining - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	4146598.622	0.080986	0.558385	0.460818	1.21E-03	3.06E-02	2.82E-02	1.28E+02	4.23E+04
Los Angeles	2023	Construction and Mining - Scrapers	Aggregate	Aggregate	Diesel	2164321.635	0.075395	0.640556	0.488041	6.31E-04	0.038797	0.035694	66.6044	2.21E+04
Los Angeles	2023	Construction and Mining - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1970813.864	0.040516	0.323254	0.369959	0.000575	0.014424	0.01327	60.64943	2.01E+04
Los Angeles	2023	Construction and Mining - Spray Truck	Aggregate	Aggregate	Diesel	23763.78032	0.000503	0.003401	0.003527	6.93E-06	0.000205	0.000189	0.731302	2.42E+02
Los Angeles	2023	Construction and Mining - Spreader Tractor Trailer	Aggregate	Aggregate	Diesel	2975.208475	5.5E-05	0.000428	0.000214	8.67E-07	1.68E-05	1.54E-05	0.091558	3.03E+01
Los Angeles	2023	Construction and Mining - Spreader Truck	Aggregate	Aggregate	Diesel	18774.20035	0.000288	0.001684	0.002012	5.47E-06	0.000104	9.61E-05	0.577753	1.91E+02
Los Angeles	2023	Construction and Mining - Surfacing Equipment	Aggregate	Aggregate	Diesel	192761.9338	0.003487	0.025179	0.018847	5.62E-05	0.001335	0.001228	5.932017	1.96E+03
Los Angeles	2023	Construction and Mining - Tank Truck	Aggregate	Aggregate	Diesel	41314.8687	0.000632	0.003721	0.002873	1.20E-05	0.000183	0.000168	1.271416	4.21E+02
Los Angeles	2023	Construction and Mining - Tanker Truck Trailer	Aggregate	Aggregate	Diesel	3179.985102	4.64E-05	0.000248	0.000443	9.27E-07	1.24E-05	1.14E-05	0.09786	3.24E+01
Los Angeles	2023	Construction and Mining - Telescopic Handler	Aggregate	Aggregate	Diesel	82999.84116	0.000816	0.008423	0.013748	2.42E-05	0.000261	0.00024	2.554221	8.46E+02
Los Angeles	2023	Construction and Mining - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	5510785.336	0.130007	0.859024	0.931515	0.001606	0.053695	0.0494	169.5878	5.62E+04
Los Angeles	2023	Construction and Mining - Trenchers	Aggregate	Aggregate	Diesel	189956.0912	0.006345	0.039969	0.031298	5.54E-05	0.00245	0.002254	5.845671	1.94E+03
Los Angeles	2023	Construction and Mining - Vacuum Truck	Aggregate	Aggregate	Diesel	61717.77319	0.001248	0.008736	0.006718	1.80E-05	4.39E-04	4.04E-04	1.89929	6.29E+02
Los Angeles	2023	Construction and Mining - Water Truck	Aggregate	Aggregate	Diesel	183316.3892	0.003861	0.028029	0.016573	5.34E-05	0.001524	0.001402	5.641342	1.87E+03
TOTAL CONSTRUCTION OFFROAD						3.43E+07	1.23E+00	5.69E+00	2.01E+01	9.92E-03	4.43E-01	3.80E-01	1.02E+03	3.38E+05
ESTIMATED Redondo Beach (g/yr; tpd; MTY)						148,342	5.34E-03	2.46E-02	8.72E-02	4.29E-05	1.92E-03	1.65E-03	4.42E+00	1,464
ESTIMATED Redondo Beach (lbs/day)							11	49	174	0	4	3		

TOTAL HOUSING PERMITS: https://socds.huduser.gov/permits/						
	2018	**2019**	**2020**	**2021**	**2022**	**Average**
Los Angeles County	22,009	21,565	20,903	23,284	26,572	22,867
Redondo Beach	117	116	46	117	237	99
Percent in the City	0.5%	0.5%	0.2%	0.5%	0.9%	0.4%

Los Angeles County OFFROAD2021

Source: OFFROAD 2021 v.1.0.5 https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0

Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Lawn and Garden

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
Los Angeles	2023	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Gasoline	2064824.74	2.31095	0.075983	6.872809	5.29E-04	0.028922	0.021847	36.57708	1.21E+04
Los Angeles	2023	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Gasoline	1221152.241	2.092829	0.073379	3.700701	0.000313	0.015581	0.011776	19.69537	6.52E+03
Los Angeles	2023	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Gasoline	22422.16337	0.003311	0.001157	0.153227	5.83E-06	7.08E-06	5.35E-06	0.34899	1.16E+02
Los Angeles	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Diesel	1272.086629	4.68E-05	0.000296	0.00016	3.71E-07	9.95E-06	7.52E-06	0.039109	1.29E+01
Los Angeles	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Gasoline	4938683.269	0.642782	0.379849	29.97796	0.00133	0.008674	0.006555	83.08371	2.75E+04
Los Angeles	2023	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Gasoline	5317362.436	3.877773	0.13449	19.31857	0.001355	0.056862	0.042982	98.81072	3.27E+04
Los Angeles	2023	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Gasoline	108789.7818	0.012669	0.005117	0.718367	2.82E-05	3.9E-05	2.94E-05	1.74412	5.78E+02
Los Angeles	2023	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Diesel	636.755688	2.06E-05	0.000142	0.000113	1.86E-07	4.97E-06	3.76E-06	0.019576	6.48E+00
Los Angeles	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Gasoline	8553236.356	1.129478	0.575661	61.29787	0.002189	0.005291	0.004002	129.0962	4.27E+04
Los Angeles	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Diesel	511301.6753	0.018053	0.117483	0.072733	0.000149	0.003997	0.00302	15.71941	5.21E+03
Los Angeles	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Gasoline	4644.431859	0.000538	2.55E-04	0.035502	1.26E-06	1.62E-06	1.22E-06	0.06693	2.22E+01
Los Angeles	2023	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Gasoline	99531.15332	0.031298	0.004867	0.577431	2.67E-05	6.54E-05	4.93E-05	1.653023	5.47E+02
Los Angeles	2023	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Gasoline	3959471.393	2.464348	0.149108	14.74546	1.01E-03	0.02155	0.016291	74.47386	2.47E+04
Los Angeles	2023	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Lawn and Garden - Misc - Wood Splitters	Aggregate	Aggregate	Gasoline	894601.9674	0.128426	0.059969	5.783697	2.32E-04	6.23E-04	4.70E-04	14.453	4.79E+03
TOTAL LAWN & GARDEN						2.77E+07	1.27E+01	1.58E+00	1.43E+02	7.17E-03	1.42E-01	1.07E-01	4.76E+02	1.58E+05
ESTIMATED Redondo Beach						236,423	0	0	1	0	0	0	4	1,345
ESTIMATED Redondo Beach (lbs/day)							217	27	2,446	0	2	2	8,122	

HOUSING UNITS https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/	Existing
Housing Units in Los Angeles County (2022)	3,599,561
Housing Units in Redondo Beach	30,725
Percent in the City	0.9%

Los Angeles County OFFROAD2021

Source: OFFROAD 2021 v.1.0.5 https://arb.ca.gov/emfac/offroad/emissions-inventory/734f4db2e46922e819848a53e86b1b8cdcfc10b0

Construction includes: Over 25 horsepower, self-propelled, diesel equipment only subjected to In-Use Regulation; AND Under 25 horsepower equipment not subject to the In-Use Regulation

Model Output: OFFROAD2021 (v1.0.5) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2021 Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Light Commercial and Industrial

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
Los Angeles	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Gasoline	8267415.548	0.923716	0.573723	55.38794	0.002099	0.00328	0.00344	131.0471	4.34E+04
Los Angeles	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Diesel	255716.6041	0.008793	0.054425	0.064316	9.67E-05	0.002162	0.002046	7.861727	2.60E+03
Los Angeles	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Light Commercial - Misc - Gas Compressors	Aggregate	Aggregate	Nat Gas	3188439.25	0	0.181923	2.130155	0	0	0	58.06617	1.92E+04
Los Angeles	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Gasoline	13686753.96	2.913654	1.091577	83.30132	0.003554	0.007594	0.008563	225.3625	7.46E+04
Los Angeles	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Diesel	1189299.362	0.034536	0.25491	0.215984	0.000409	0.008174	0.009029	36.56371	1.21E+04
Los Angeles	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Nat Gas	102539.45	0	0.006188	0.053241	0	0	0	1.893946	6.27E+02
Los Angeles	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Gasoline	5740854.929	0.708021	0.308909	40.95939	0.001465	0.001182	0.001555	87.10467	2.88E+04
Los Angeles	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Diesel	6123.730709	0.000156	0.001298	0.001066	2.09E-06	3.84E-05	4.38E-05	0.188267	6.23E+01
Los Angeles	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Gasoline	1866507.118	0.18719	0.098423	8.448882	0.000475	0.001542	0.001334	35.83745	1.19E+04
Los Angeles	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Diesel	657661.5838	0.020399	0.140941	0.126199	0.000228	0.004694	0.005099	20.21909	6.69E+03
Los Angeles	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Gasoline	3717789.629	0.43356	0.228783	23.70637	0.00095	0.002471	0.002477	60.59522	2.01E+04
Los Angeles	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Diesel	1323891.509	0.043524	0.28076	0.301208	0.000488	0.010648	0.010476	40.7016	1.35E+04
Los Angeles	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
Los Angeles	2023	Industrial - Aerial Lifts	Aggregate	Aggregate	Diesel	722025.1189	0.01071	0.114777	0.13017	0.00021	0.004001	0.003681	22.21946	7.36E+03
Los Angeles	2023	Industrial - Boom	Aggregate	Aggregate	Diesel	723170.6786	0.010383	0.113838	0.133865	0.000211	0.002754	0.002534	22.25471	7.37E+03
Los Angeles	2023	Industrial - Forklifts	Aggregate	Aggregate	Diesel	3194417.239	0.06332	0.478705	0.582424	0.000931	0.024718	0.02274	98.30436	3.26E+04
Los Angeles	2023	Industrial - Garbage Refuse	Aggregate	Aggregate	Diesel	34740.90574	0.000382	0.002513	0.002227	1.01E-05	9.8E-05	9.01E-05	1.06911	3.54E+02
Los Angeles	2023	Industrial - Garbage Transfer	Aggregate	Aggregate	Diesel	6336.17066	6.41E-05	0.000335	0.000393	1.85E-06	1.54E-05	1.42E-05	0.194988	6.46E+01
Los Angeles	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Gasoline	664698.6526	0.055355	0.050482	1.964241	0.000169	0.015404	0.011639	14.31356	4.74E+03
Los Angeles	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Diesel	1029.331837	0.003125	0.019731	0.012644	3E-07	0.000698	0.000528	0.031646	1.05E+01
Los Angeles	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Electric	13919.22461	0.000895	0.006968	0.253517	5.42E-07	0.000682	0.000515	2.23E-05	7.39E-03
Los Angeles	2023	Industrial - Misc - Forklifts	Aggregate	Aggregate	Gasoline	20939150.92	0.457479	2.084271	50.4794	0.00473	0.03293	0.02488	472.2171	1.56E+05
Los Angeles	2023	Industrial - Misc - Forklifts	Aggregate	Aggregate	Electric	1531.676125	0.000166	0.000737	0.026412	5.96E-08	8.14E-05	6.15E-05	2.04E-06	6.77E-04
Los Angeles	2023	Industrial - Misc - Forklifts	Aggregate	Aggregate	Nat Gas	51261052.6	0	4.068975	37.65805	0	0.082495	0	927.6029	3.07E+05
Los Angeles	2023	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Gasoline	359285.7753	0.023598	0.030619	1.861603	9.07E-05	0.000516	0.00039	6.514635	2.16E+03
Los Angeles	2023	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	790.3563159	0.0024	0.0156	0.009707	2.31E-07	0.000531	0.000401	0.024299	8.05E+00
Los Angeles	2023	Industrial - Misc - Other Material Handling Equipment	Aggregate	Aggregate	Gasoline	157059.5	0.003325	0.015853	0.179517	3.74E-05	0.000269	0.000203	3.856153	1.28E+03
Los Angeles	2023	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Gasoline	1189825.05	0.031457	0.085415	2.665397	0.000304	0.001915	0.001447	27.16288	8.99E+03
Los Angeles	2023	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	213.5243013	0.000613	0.004052	0.002707	6.23E-08	0.000139	0.000105	0.006565	2.17E+00
Los Angeles	2023	Industrial - Mower	Aggregate	Aggregate	Diesel	393671.466	0.009917	0.071931	0.081486	0.000115	0.003294	0.003031	12.11477	4.01E+03
Los Angeles	2023	Industrial - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	963264.3294	0.025636	0.169605	0.142337	0.000281	0.00974	0.008961	29.6433	9.82E+03
Los Angeles	2023	Industrial - Other Truck	Aggregate	Aggregate	Diesel	582278.0645	0.009183	0.05814	0.049854	0.00017	0.002852	0.002624	17.91891	5.93E+03
Los Angeles	2023	Industrial - Railcars or Track Cars	Aggregate	Aggregate	Diesel	44991.92645	0.000652	0.004172	0.005105	1.31E-05	0.000208	0.000191	1.384573	4.58E+02
Los Angeles	2023	Industrial - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	187635.3962	0.005285	0.034812	0.034462	5.47E-05	0.002087	0.00192	5.774254	1.91E+03
Los Angeles	2023	Industrial - Tow Tractor	Aggregate	Aggregate	Diesel	1213.072786	2.3E-05	0.000258	7.56E-05	3.54E-07	8.37E-06	7.7E-06	0.037331	1.24E+01
Los Angeles	2023	Industrial - Yard Goat	Aggregate	Aggregate	Diesel	1550228.081	0.026762	0.150749	0.230918	0.000452	0.0077	0.007084	47.70641	1.58E+04
TOTAL LIGHT COMMERCIAL + INDUSTRIAL OFFROAD						1.23E+08	6.01E+00	1.08E+01	3.11E+02	1.76E-02	2.35E-01	1.37E-01	2.42E+03	8.00E+05
ESTIMATED Redondo Beach						8.17E+05	4.00E-02	7.18E-02	2.07E+00	1.17E-04	1.56E-03	9.11E-04	1.61E+01	5,316
ESTIMATED Redondo Beach (lbs/day)							80	144	4,136	0	3	2	32,110	

EMPLOYMENT: http://lehd.ces.census.gov/	Existing
Employment in Los Angeles County (2023 Q4)	4,309,220
Employment in Redondo Beach	28,638
Percent in the City	0.66%

Solid Waste Disposal

Waste Generated for Los Angeles Regional Agency (LARA)

Year	Quarter	Landfill
2023	1	1,372,361
2023	2	1,485,100
2022	3	1,270,970
2022	4	1,246,214
Total		5,374,645

	Total Disposal for LARA Cities	Percent of Disposal for City
Los Angeles Area Integrated Waste Management Authority	5,374,645	78,704

Scenario	Population	from Existing
Existing	70,311	NA
Proposed GP	78,978	12%
Current GP	75,046	7%

Source: CalRecycle. 2023, December (accessed). RDRS Report 1: Overall Jurisdiction Tons for Disposal and Disposal Related Uses https://www2.calrecycle.ca.gov/RecyclingDisposalReporting/Reports/OverallJurisdictionTonsForDisposal

Landfill Emission Tool (version 1.09.24.2021) CH_4 Model Results.

Based on the Los Angeles Area Integrated Waste Management Authority K-Factor

	Existing		Proposed Project		Current GP	
	CH_4 Tons	$MTCO_2e$ w/LFG Capture 2022 TOTAL	CH_4 Tons	$MTCO_2e$ w/LFG Capture 2050 TOTAL	CH_4 Tons	$MTCO_2e$ w/LFG Capture 2050 TOTAL
Year 1	214	1,358	240	1,525	228	1,449
Year 2	1,484	9,425	1,667	10,587	1,584	10,060
Year 3 (PEAK)	**1,666**	**10,579**	**1,871**	**11,883**	1,778	**11,291**
Year 4	1,633	10,369	1,834	11,647	1,743	11,067
Year 5	1,601	10,164	1,798	11,417	1,708	10,848
Year 6	1,569	9,962	1,762	11,191	1,674	10,633
Year 7	1,538	9,765	1,727	10,969	1,641	10,423
Year 8	1,507	9,572	1,693	10,752	1,609	10,216
Year 9	1,477	9,382	1,660	10,539	1,577	10,014
Year 10	1,448	9,197	1,627	10,330	1,546	9,816
Year 11	1,420	9,014	1,595	10,126	1,515	9,622
Year 12	1,391	8,836	1,563	9,925	1,485	9,431
Year 13	1,364	8,661	1,532	9,729	1,456	9,244
Year 14	1,337	8,489	1,502	9,536	1,427	9,061
Year 15	1,310	8,321	1,472	9,347	1,399	8,882
Year 16	1,284	8,157	1,443	9,162	1,371	8,706
Year 17	1,259	7,995	1,414	8,981	1,344	8,534
Year 18	1,234	7,837	1,386	8,803	1,317	8,365
Year 19	1,210	7,682	1,359	8,628	1,291	8,199
Year 20	1,186	7,529	1,332	8,458	1,266	8,037
Year 21	1,162	7,380	1,305	8,290	1,240	7,877
Year 22	1,139	7,234	1,280	8,126	1,216	7,721
Year 23	1,117	7,091	1,254	7,965	1,192	7,569
Year 24	1,095	6,951	1,229	7,807	1,168	7,419
Year 25	1,073	6,813	1,205	7,653	1,145	7,272
Year 26	1,052	6,678	1,181	7,501	1,122	7,128
Year 27	1,031	6,546	1,158	7,353	1,100	6,987
Year 28	1,010	6,416	1,135	7,207	1,078	6,848
Year 29	990	6,289	1,112	7,064	1,057	6,713
Year 30	971	6,165	1,090	6,925	1,036	6,580
Year 31	952	6,043	1,069	6,787	1,016	6,449
Year 32	933	5,923	1,048	6,653	996	6,322
Year 33	914	5,806	1,027	6,521	976	6,197
Year 34	896	5,691	1,007	6,392	956	6,074
Year 35	878	5,578	987	6,266	938	5,954
Year 36	861	5,468	967	6,141	919	5,836
Year 37	844	5,359	948	6,020	901	5,720
Year 38	827	5,253	929	5,901	883	5,607
Year 39	811	5,149	911	5,784	865	5,496
Year 40	795	5,047	893	5,669	848	5,387
Year 41	779	4,947	875	5,557	832	5,280
Year 42	764	4,849	858	5,447	815	5,176
Year 43	749	4,753	841	5,339	799	5,073
Year 44	734	4,659	824	5,233	783	4,973
Year 45	719	4,567	808	5,130	768	4,874
Year 46	705	4,476	792	5,028	752	4,778
Year 47	691	4,388	776	4,929	737	4,683
Year 48	677	4,301	761	4,831	723	4,591
Year 49	664	4,216	746	4,735	709	4,500
Year 50	651	4,132	731	4,642	695	4,411
Year 51	638	4,050	716	4,550	681	4,323
Year 52	625	3,970	702	4,460	667	4,238
Year 53	613	3,892	688	4,371	654	4,154
Year 54	601	3,815	675	4,285	641	4,071
Year 55	589	3,739	661	4,200	628	3,991
Year 56	577	3,665	648	4,117	616	3,912
Year 57	566	3,592	635	4,035	604	3,834
Year 58	555	3,521	623	3,955	592	3,758
Year 59	544	3,452	611	3,877	580	3,684
Year 60	533	3,383	598	3,800	569	3,611
60 YR Avg (Average Annual)	**991**	**6,292**	**1,113**	**7,068**	**1,058**	**6,716**

Source: Landfill Emissions Tool Version 1.09.24.2021. and data from CalRecycle. Biogenic CO_2 emissions are not included.

Notes:

LFG capture Efficiency	0.75	AR5 CH_4 GWP	28	Tons to metric Tons	0.9071847

[1] Waste generation based on three year average waste commitment for Los Angeles Area Integrated Waste Management Authority obtained from CalRecycle.

[2] Significant CH_4 production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Consequently, the highest CH_4 emissions from waste disposal in a given year are reported.

[3] Decomposition based on an average annual rainfall of 17 inches per year average (anaerobic decomposition factor (k) of 0.02) for the Los Angeles Area Integrated Waste Management Authority.

[4] The Landfill Gas Estimator only includes the landfill gas (LFG) capture in the landfill gas heat output and therefore the reduction and emissions from landfill gas capture are calculated separately. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75 percent. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.3.

Water and Wastewater

Water Demand for Redondo Beach Provided by Fuscoe Engineering (February 2024)

Note: current GP is estimated based on Service Population and assumes similar conservation measures.

Water	Existing	Proposed Project	Current GP
Million Gallons Per Day (MGD)	5,601,192	6,544,171	6,126,121
Acre Feet Per Year	6,274	7,330	6,862
MGY TOTAL	2,044	2,389	2,236
Wastewater	**Existing**	**Proposed Project**	**Current GP**
Gallons per year	1,858,574,901	2,171,472,112	2,032,755,607
Gallons per day	5,091,986	5,949,239	5,569,193
AFY	5,704	6,664	6,238
MGY TOTAL	1,859	2,171	2,033

Direct Emissions from Wastewater Treatment

Wastewater Treatment Type	BIOGENIC CO_2 MT/Gallon	CH_4 MT/Gallon	N_2O MT/Gallon	Non-Biogenic CO_2e MT/Gallon
Aerobic	3.90E-07	1.34E-09	8.52E-10	2.63E-07
Anaerobic (Facultative Lagoons)	3.90E-07	4.01E-07	8.52E-10	1.15E-05
Septic	0.00E+00	2.50E-07	8.52E-10	7.23E-06

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-35, Annual Wastewater Treatment Direct Emission Factors (short ton per gallon)

Aerobic	Existing	Proposed Project	Current Plan
Non-Biogenic CO_2e TOTAL =	489	572	535

Water and Wastewater

Energy for Water Conveyance, Treatment, Distribution, and Wastewater Treatment

Location	Supply (Water Conveyance)	Water Treatment	Water Distribution	Total Water	Wastewater Treatment
see Tab G-33			kWhr/million gallons		
South Coast	3,044	725	1,537	5,306	1,501
San Francisco Bay	1,182	754	2,998	4,934	1,542
Central Coast	1,577	754	1,537	3,868	1,542
Tulare Lake	1,506	748	166	2,420	1,519
North Coast	620	754	1,537	2,911	1,542
San Joaquin River	827	748	166	1,741	1,519
Colorado River	2,304	748	166	3,218	1,519
Sacramento River	698	748	166	1,612	1,519
South Lahontan	1,953	748	1,537	4,238	1,519
North Lathontan	541	748	166	1,455	1,519

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-32, Water Energy Intensity Factors by Hydrologic Region and Process (kWh per million gallon).

Southern California Edison

	Intensity factor			CO_2e
	CO_2 lbs/MWH[1]	CH_4 lbs/MWH[2]	N_2O lbs/MWH[2]	lbs/MWh
2023	348.637	0.033	0.004	**350.62**
2050	260.788	0.033	0.004	**262.77**
	CO_2 MTons/MWH[1]	CH_4 MTons/MWH[2]	N_2O MTons/MWH[2]	MTons/MWh
2023	0.158	1.50E-05	1.81E-06	**0.16**
2050	0.118	1.50E-05	1.81E-06	**0.12**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-3, Electricity Utility Greenhouse Gas Emissions Factors

Water and Wastewater

Clean Power Alliance (CPA)

Participation Rate	**93.70%**			**CO_2e**
	CO_2 lbs/MWH[1]	CH_4 lbs/MWH[2]	N_2O lbs/MWH[2]	lbs/MWh
2023	429.901	0.033	0.004	**438.65**
2050	330.693	0.033	0.004	**339.44**
	CO_2 MTons/MWH[1]	CH_4 MTons/MWH[2]	N_2O MTons/MWH[2]	MTons/MWh
2023	0.195	0.000	0.000	**0.20**
2050	0.150	0.000	0.000	**0.15**

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide. Table G-3, Electricity Utility Greenhouse Gas Emissions Factors

Notes

Participation rate for CPA for the Clean Power (Default for Redondo Beach) is based on the CPA 2022 Impact Report, 2023, June. https://cleanpoweralliance.org/wp-content/uploads/2023/06/ImpactReport2022.pdf.

In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and encourages the state's electricity to come from carbon-free resources by 2050.

Weighted Average

Year	**Intensity factor**			**CO_2e**
	CO_2 lbs/MWH	CH_4 lbs/MWH	N_2O lbs/MWH	lbs/MWh
2023	376.267	0.033	0.004	378.251
2050	284.556	0.033	0.004	286.540
	CO_2 MTons/MWH	CH_4 MTons/MWH	N_2O MTons/MWH	MTons/MWh
2023	0.171	0.000	0.000	0.172
2050	0.129	0.000	0.000	0.130

Notes

Weighted average calculated based on proportion of annual electricity usage data (2020-2022) for CPA vs SCE.

Water and Wastewater

GHG Emissions from Energy Associated with Water/Wastewater

Energy Associated with Water Use	Existing Mwh	Proposed Project Mwh	Current GP Mwh
TOTAL Water Use	10,848	12,674	11,864
TOTAL Wastewater Generation	2,790	3,259	3,051
Total Water/Wastewater	13,637	15,933	14,916

GHG Emissions from Energy Associated with Water Use/Wastewater Generation	Existing $MTCO_2e$	Proposed Project $MTCO_2e$	Current GP $MTCO_2e$
TOTAL Water Use	2,125	1,647	1,542
TOTAL Wastewater Generation	479	424	397
Total Water/Wastewater	2,604	2,071	1,939

Total GHGs

GHG Emissions from Water/Wastewater Use	Existing $MTCO_2e$	Proposed Project $MTCO_2e$	Current GP $MTCO_2e$
TOTAL Water Use	2,125	1,647	1,542
TOTAL Wastewater Generation	968	995	932
Total Water/Wastewater	**3,093**	**2,643**	**2,474**

Refrigerants

Refrigerants	$MTCO_2e$	
2019 Statewide Refrigerant Use (AR4)	$MTCO_2e$	18,618,116
US Census 2022 California Population	People	39,356,104
	MT/person	0.47

	Existing	Proposed Project	Current GP
Population	70,311	78,978	75,046
MTCO2e	33,262	37,362	35,502

Source: CARB. Greenhouse Gas Emissions Inventory Query Tool for years 2000 to 2020 (15th Edition) - Query Results. Main Activity: Use of substitutes for ozone depleting substances Activity Subset: Refrigeration and Air Conditioning. AR 4. https://ww2.arb.ca.gov/applications/greenhouse-gas-emission-inventory-0

U.S. Census Bureau. 2023. Table DP05 2022: ACS 5-Year Demographics and Housing Estimates. https://data.census.gov/table?g=040XX00US06&tid=ACSDP5Y2019.DP05.

City of Redondo Beach VMT

Source: Fehr & Peers 2023. Based on the Southern California Association of Governments Regional Transportation Model (SCAG RTM)

	Daily VMT			Total Daily VMT	Total with RTAC		Service Population	VMT/SP	VMT/SP w RTAC
	IX	XI	II			%			
Existing	1,395,688	1,396,156	2,142	2,793,986	1,398,064	100%	98,949	28.2	14.1
Passenger Vehicles	1,290,112	1,291,335	2,083	2,583,530	1,292,806	92%			
Trucks	105,575	104,822	59	210,456	105,258	8%			
Current GP	1,394,144	1,393,250	1,847	2,789,242	1,395,544	100%	108,220	25.8	12.9
Passenger Vehicles	1,250,141	1,251,000	1,803	2,502,944	1,252,374	90%			
Trucks	144,003	142,250	44	286,297	143,171	10%			
GP Update	1,665,083	1,658,508	2,648	3,326,239	1,664,444	100%	115,605	28.8	14.4
Passenger Vehicles	1,501,997	1,496,463	2,557	3,001,017	1,501,787	90%			
Trucks	163,086	162,045	91	325,223	162,657	10%			

Notes: Total may not add to 100% due to rounding.

IX = Internal-External

XI = External- Internal

II = Internal-Internal

Modeling of vehicle miles traveled (VMT) provided by Fehr & Peers is based on Southern California Association of Governments Regional Transportation Model (SCAG RTM). VMT from passenger vehicles and trucks that have an origin or destination in the City using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375). For accounting purposes, there are three types of trips:

» Vehicle trips that originated and terminated within the City (Internal-Internal, I-I). Using the accounting rules established by RTAC, 100 percent of the length of these trips, and their emissions, are attributed to the City.

» Vehicle trips that either originated or terminated (but not both) within the City (Internal-External or External-Internal, I-X and X-I). Using the accounting rules established by RTAC, 50 percent of the trip length for these trips is attributed to the City.

» Vehicle trips that neither originated nor terminated within the City. These trips are commonly called pass-through trips (External-External, X-X). Using the accounting rules established by RTAC, these trips are not counted towards the City's VMT or emissions.

Redondo Beach — TRANSPORTATION SECTOR

Source: EMFAC2021 V 1.0.2, Web Database - Emissions Rates. Los Angeles Sub Area. Based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Global Warming Potentials (GWPs)

Note: MTons = metric tons; CO_2e = carbon dioxide-equivalent.

Criteria Air Pollutant Emissions

	lbs/day					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
Existing (2023)	69	482	3,322	11	79	30
Existing (2050)	23	162	1,592	8	72	25
Proposed General Plan (2050)	28	228	1,863	10	93	32
Change from Existing Land Uses (2050)	**4**	**66**	**270**	**2**	**20**	**7**
Change from Existing Conditions (2023)	-42	-253	-1,460	-1	13	2
Current General Plan (2050)	23	198	1,556	8	79	27
Change from Current General Plan	4	31	307	2	14	5

GHG EMISSIONS

	MTons/year			
	CO_2	**CH_4**	**N_2O**	**CO_2e**
Existing (2023)	185,456	34	273	187,753
Proposed General Plan (2050)	161,147	2	7	162,967
Change from Existing	**-24,310**	**-32**	**-266**	**-24,786**
Current General Plan (2050)	136,030	1	6	137,610
Change from Current General Plan	25,116	0	1	25,356

Note: MTons = metric tons; CO_2e = carbon dioxide-equivalent.

Year 2023 Existing: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	92%	8%
EMFAC Default	93%	7%

Daily VMT	1,398,064							lbs/day	
Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.03%	0.03%	0.10	1.82	0.32	0.01	0.10	0.06
All Other Buses	Natural Gas	0.01%	0.01%	0.00	0.04	0.58	0.00	0.01	0.00
LDA	Gasoline	47.96%	47.83%	18.40	70.96	1,291.48	4.29	27.11	9.65
LDA	Diesel	0.10%	0.10%	0.15	0.83	1.49	0.01	0.15	0.11
LDA	Electricity	2.51%	2.50%	0.00	0.00	0.00	0.00	0.95	0.27
LDA	Plug-in Hybrid	1.44%	1.43%	0.08	0.15	11.03	0.07	0.57	0.19
LDT1	Gasoline	4.14%	4.13%	6.42	25.30	274.58	0.44	2.76	1.07
LDT1	Diesel	0.00%	0.00%	0.01	0.04	0.05	0.00	0.01	0.01
LDT1	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.01%	0.01%	0.00	0.00	0.04	0.00	0.00	0.00
LDT2	Gasoline	22.77%	22.71%	11.71	61.03	728.02	2.51	14.02	5.01
LDT2	Diesel	0.07%	0.07%	0.05	0.13	0.41	0.01	0.06	0.03
LDT2	Electricity	0.10%	0.10%	0.00	0.00	0.00	0.00	0.04	0.01
LDT2	Plug-in Hybrid	0.20%	0.20%	0.01	0.02	1.47	0.01	0.08	0.02
LHD1	Gasoline	1.76%	1.81%	1.87	10.48	65.49	0.36	4.88	1.70
LHD1	Diesel	0.83%	0.86%	2.63	35.23	7.28	0.13	2.99	1.38
LHD2	Gasoline	0.25%	0.26%	0.18	1.51	7.18	0.06	0.81	0.28
LHD2	Diesel	0.37%	0.38%	1.13	13.56	2.87	0.07	1.46	0.66
MCY	Gasoline	0.34%	0.34%	12.43	5.80	135.43	0.02	0.19	0.08
MDV	Gasoline	12.71%	12.68%	10.89	56.55	527.61	1.72	7.98	2.87
MDV	Diesel	0.15%	0.15%	0.09	0.51	1.43	0.02	0.13	0.07
MDV	Electricity	0.11%	0.11%	0.00	0.00	0.00	0.00	0.04	0.01
MDV	Plug-in Hybrid	0.10%	0.10%	0.01	0.01	0.76	0.00	0.04	0.01
MH	Gasoline	0.05%	0.06%	0.13	0.78	3.84	0.03	0.10	0.03
MH	Diesel	0.02%	0.02%	0.04	2.25	0.18	0.01	0.10	0.07
Motor Coach	Diesel	0.03%	0.03%	0.01	1.70	0.11	0.02	0.12	0.05
OBUS	Gasoline	0.06%	0.06%	0.11	0.89	2.78	0.03	0.10	0.03
PTO	Diesel	0.04%	0.04%	0.03	3.62	0.32	0.02	0.01	0.01
PTO	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.02%	0.02%	0.05	0.35	0.97	0.01	0.04	0.01
SBUS	Diesel	0.01%	0.01%	0.06	3.54	0.15	0.00	0.04	0.03
SBUS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	0.01%	0.03	0.37	6.83	0.00	0.03	0.01
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.01%	0.01%	0.00	0.21	0.02	0.00	0.03	0.01
T6 CAIRP Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.05%	0.05%	0.09	2.37	0.31	0.02	0.13	0.07
T6 Instate Delivery Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.05%	0.05%	0.03	1.17	0.13	0.02	0.10	0.04
T6 Instate Delivery Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.15%	0.15%	0.12	4.19	0.47	0.05	0.32	0.15
T6 Instate Delivery Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.06%	0.06%	0.02	1.38	0.11	0.02	0.11	0.04
T6 Instate Delivery Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.01	0.14	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	0.07%	0.07%	0.11	3.23	0.40	0.02	0.19	0.10
T6 Instate Other Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.16%	0.17%	0.07	3.35	0.33	0.05	0.33	0.13

T6 Instate Other Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.14%	0.15%	0.12	4.30	0.49	0.05	0.33	0.15
T6 Instate Other Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.07%	0.02	1.66	0.13	0.02	0.14	0.06
T6 Instate Other Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.01	0.17	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.04	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.04%	0.04%	0.01	0.87	0.06	0.01	0.07	0.03
T6 Instate Tractor Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.08	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.01%	0.01%	0.00	0.14	0.01	0.00	0.02	0.01
T6 Public Class 4	Diesel	0.01%	0.01%	0.01	1.03	0.03	0.00	0.02	0.01
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.01%	0.01%	0.01	0.71	0.02	0.00	0.01	0.01
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.01%	0.01%	0.01	1.44	0.04	0.00	0.02	0.01
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.04%	0.04%	0.06	6.56	0.19	0.01	0.11	0.06
T6 Public Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.01%	0.00	0.01	0.34	0.00	0.01	0.00
T6 Utility Class 5	Diesel	0.01%	0.01%	0.00	0.14	0.01	0.00	0.02	0.01
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.29%	0.30%	0.64	4.69	16.65	0.15	0.53	0.18
T7 CAIRP Class 8	Diesel	0.48%	0.49%	0.19	23.56	1.15	0.22	2.17	0.95
T7 CAIRP Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.02	0.42	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	0.57%	0.59%	0.21	26.39	1.18	0.26	2.55	1.10
T7 NOOS Class 8	Diesel	0.21%	0.21%	0.08	10.36	0.50	0.10	0.94	0.42
T7 POAK Class 8	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POLA Class 8	Diesel	0.39%	0.40%	0.14	19.84	1.14	0.19	1.75	0.74
T7 POLA Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.00%	0.01%	0.00	0.06	1.19	0.00	0.02	0.01
T7 Public Class 8	Diesel	0.05%	0.06%	0.13	17.50	0.56	0.03	0.34	0.18
T7 Public Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.02%	0.02%	0.01	0.23	4.44	0.00	0.08	0.03
T7 Single Concrete/Transit Mix	Diesel	0.02%	0.02%	0.01	0.56	0.04	0.01	0.07	0.03
T7 Single Concrete/Transit Mix	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00%	0.00	0.01	0.30	0.00	0.01	0.00
T7 Single Dump Class 8	Diesel	0.04%	0.04%	0.02	2.08	0.14	0.02	0.18	0.07
T7 Single Dump Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.04	0.70	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	0.12%	0.12%	0.05	4.45	0.29	0.06	0.51	0.20
T7 Single Other Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	0.00	0.09	1.82	0.00	0.03	0.01
T7 SWCV Class 8	Diesel	0.03%	0.03%	0.00	14.44	0.01	0.04	0.25	0.09
T7 SWCV Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.07%	0.07%	0.14	3.17	23.47	0.00	0.57	0.20
T7 Tractor Class 8	Diesel	0.39%	0.40%	0.18	19.52	1.02	0.18	1.72	0.73
T7 Tractor Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.01%	0.01%	0.01	0.13	2.50	0.00	0.05	0.02
T7 Utility Class 8	Diesel	0.01%	0.01%	0.00	0.24	0.02	0.00	0.03	0.01
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	0.04	0.27	1.87	0.00	0.00	0.00
UBUS	Gasoline	0.01%	0.01%	0.01	0.09	0.15	0.01	0.04	0.01
UBUS	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00

UBUS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.15%	0.16%	0.18	3.29	186.37	0.00	0.69	0.23
	Total	100%	100%	69.35	481.51	3322.46	11.39	79.50	29.86

Year 2023 Existing: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	92%	8%
EMFAC Default	93%	7%

		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**485,128,177**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
All Other Buses	Diesel	0.03%	0.03%	152.60	0.00	0.02	158.99
All Other Buses	Natural Gas	0.01%	0.01%	31.49	0.02	0.01	33.72
LDA	Gasoline	47.96%	47.83%	68,360.34	0.74	1.18	68,694.34
LDA	Diesel	0.10%	0.10%	125.04	0.00	0.02	130.30
LDA	Electricity	2.51%	2.50%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.44%	1.43%	1,061.30	0.00	0.00	1,062.59
LDT1	Gasoline	4.14%	4.13%	7,046.69	0.22	0.27	7,123.93
LDT1	Diesel	0.00%	0.00%	2.04	0.00	0.00	2.13
LDT1	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.01%	0.01%	3.85	0.00	0.00	3.85
LDT2	Gasoline	22.77%	22.71%	39,939.86	0.46	0.77	40,156.50
LDT2	Diesel	0.07%	0.07%	117.53	0.00	0.02	122.45
LDT2	Electricity	0.10%	0.10%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.20%	0.20%	141.39	0.00	0.00	141.56
LHD1	Gasoline	1.76%	1.81%	5,654.61	0.06	0.09	5,680.53
LHD1	Diesel	0.83%	0.86%	2,080.49	0.02	0.33	2,167.89
LHD2	Gasoline	0.25%	0.26%	937.97	0.01	0.01	941.88
LHD2	Diesel	0.37%	0.38%	1,087.32	0.01	0.17	1,132.95
MCY	Gasoline	0.34%	0.34%	321.49	0.30	0.06	346.80
MDV	Gasoline	12.71%	12.68%	27,322.63	0.40	0.62	27,497.51
MDV	Diesel	0.15%	0.15%	320.21	0.00	0.05	333.60
MDV	Electricity	0.11%	0.11%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.10%	0.10%	73.05	0.00	0.00	73.14
MH	Gasoline	0.05%	0.06%	484.94	0.00	0.01	486.96
MH	Diesel	0.02%	0.02%	99.68	0.00	0.02	103.85
Motor Coach	Diesel	0.03%	0.03%	268.57	0.00	0.04	279.79
OBUS	Gasoline	0.06%	0.06%	469.67	0.00	0.01	471.53
PTO	Diesel	0.04%	0.04%	396.77	0.00	0.06	413.34
PTO	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.02%	0.02%	96.10	0.00	0.00	96.94
SBUS	Diesel	0.01%	0.01%	76.55	0.00	0.01	79.76
SBUS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	0.01%	112.29	0.31	0.02	127.03
T6 CAIRP Class 4	Diesel	0.00%	0.00%	3.58	0.00	0.00	3.73
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	4.90	0.00	0.00	5.11
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	12.60	0.00	0.00	13.12
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.01%	0.01%	74.87	0.00	0.01	78.00
T6 CAIRP Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.06	0.00	0.00	0.06
T6 Instate Delivery Class 4	Diesel	0.05%	0.05%	251.13	0.00	0.04	261.64
T6 Instate Delivery Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.75	0.00	0.00	0.80
T6 Instate Delivery Class 5	Diesel	0.05%	0.05%	262.64	0.00	0.04	273.61
T6 Instate Delivery Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.59	0.00	0.00	0.63
T6 Instate Delivery Class 6	Diesel	0.15%	0.15%	799.19	0.00	0.13	832.59

Year 2023 Existing: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
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		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**485,128,177**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T6 Instate Delivery Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	1.96	0.00	0.00	2.10
T6 Instate Delivery Class 7	Diesel	0.06%	0.06%	317.26	0.00	0.05	330.51
T6 Instate Delivery Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	7.64	0.00	0.00	8.18
T6 Instate Other Class 4	Diesel	0.07%	0.07%	384.90	0.00	0.06	401.00
T6 Instate Other Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	1.02	0.00	0.00	1.10
T6 Instate Other Class 5	Diesel	0.16%	0.17%	903.77	0.00	0.14	941.51
T6 Instate Other Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	1.88	0.00	0.00	2.01
T6 Instate Other Class 6	Diesel	0.14%	0.15%	798.17	0.00	0.13	831.52
T6 Instate Other Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	1.80	0.00	0.00	1.92
T6 Instate Other Class 7	Diesel	0.07%	0.07%	395.52	0.00	0.06	412.04
T6 Instate Other Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	9.46	0.01	0.00	10.13
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	13.28	0.00	0.00	13.83
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.03	0.00	0.00	0.03
T6 Instate Tractor Class 7	Diesel	0.04%	0.04%	182.33	0.00	0.03	189.95
T6 Instate Tractor Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	4.57	0.00	0.00	4.89
T6 OOS Class 4	Diesel	0.00%	0.00%	2.04	0.00	0.00	2.12
T6 OOS Class 5	Diesel	0.00%	0.00%	2.79	0.00	0.00	2.91
T6 OOS Class 6	Diesel	0.00%	0.00%	7.17	0.00	0.00	7.47
T6 OOS Class 7	Diesel	0.01%	0.01%	49.23	0.00	0.01	51.29
T6 Public Class 4	Diesel	0.01%	0.01%	49.81	0.00	0.01	51.89
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	4.19	0.00	0.00	4.49
T6 Public Class 5	Diesel	0.01%	0.01%	34.26	0.00	0.01	35.69
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	3.85	0.00	0.00	4.12
T6 Public Class 6	Diesel	0.01%	0.01%	42.31	0.00	0.01	44.08
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	3.62	0.00	0.00	3.88
T6 Public Class 7	Diesel	0.04%	0.04%	233.74	0.00	0.04	243.51
T6 Public Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.01%	20.49	0.01	0.00	21.97
T6 Utility Class 5	Diesel	0.01%	0.01%	49.67	0.00	0.01	51.75
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.24	0.00	0.00	0.25
T6 Utility Class 6	Diesel	0.00%	0.00%	9.29	0.00	0.00	9.68
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.09	0.00	0.00	0.09
T6 Utility Class 7	Diesel	0.00%	0.00%	12.95	0.00	0.00	13.49
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.13	0.00	0.00	0.14
T6TS	Gasoline	0.29%	0.30%	2,455.34	0.02	0.04	2,465.46
T7 CAIRP Class 8	Diesel	0.48%	0.49%	3,682.35	0.00	0.58	3,836.13

Year 2023 Existing: Greenhouse Gas Emissions

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		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**485,128,177**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T7 CAIRP Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	12.14	0.01	0.00	13.08
T7 NNOOS Class 8	Diesel	0.57%	0.59%	4,354.06	0.00	0.69	4,535.89
T7 NOOS Class 8	Diesel	0.21%	0.21%	1,582.65	0.00	0.25	1,648.75
T7 POAK Class 8	Diesel	0.00%	0.00%	0.34	0.00	0.00	0.35
T7 POLA Class 8	Diesel	0.39%	0.40%	3,194.34	0.00	0.50	3,327.74
T7 POLA Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.00%	0.01%	31.39	0.02	0.01	33.76
T7 Public Class 8	Diesel	0.05%	0.06%	459.77	0.00	0.07	478.99
T7 Public Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.02%	0.02%	130.60	0.11	0.03	140.62
T7 Single Concrete/Transit Mix	Diesel	0.02%	0.02%	143.24	0.00	0.02	149.22
T7 Single Concrete/Transit Mix	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00%	10.89	0.01	0.00	11.73
T7 Single Dump Class 8	Diesel	0.04%	0.04%	331.00	0.00	0.05	344.83
T7 Single Dump Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	18.60	0.01	0.00	20.01
T7 Single Other Class 8	Diesel	0.12%	0.12%	971.07	0.00	0.15	1,011.62
T7 Single Other Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	56.25	0.05	0.01	60.59
T7 SWCV Class 8	Diesel	0.03%	0.03%	584.62	0.00	0.09	609.03
T7 SWCV Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.07%	0.07%	443.49	0.67	0.09	486.33
T7 Tractor Class 8	Diesel	0.39%	0.40%	3,042.49	0.00	0.48	3,169.55
T7 Tractor Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.01%	0.01%	80.66	0.06	0.02	86.83
T7 Utility Class 8	Diesel	0.01%	0.01%	60.23	0.00	0.01	62.75
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	12.60	0.00	0.00	12.94
UBUS	Gasoline	0.01%	0.01%	105.42	0.00	0.00	105.75
UBUS	Diesel	0.00%	0.00%	3.98	0.00	0.00	4.14
UBUS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.15%	0.16%	1,943.67	1.98	0.40	2,104.05
	Total	100%	100%	185456.43	33.55	273.08	187752.82

Source: EMFAC2021 (v1.0.2) Emission Rates

Region Type: Sub-Area
Region: Los Angeles
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

			g/mile															2.205E-03
Vehicle Category	Fuel	VMT Total	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM 2.5 Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	% of VMT
All Other Buses	Diesel	82728.50	1.00E-01	1.91E+00	3.33E-01	1.03E-02	5.17E-02	1.20E-02	4.40E-02	1.08E-01	4.95E-02	3.00E-03	1.54E-02	6.79E-02	1.09E+03	4.65E-03	1.72E-01	0.03%
All Other Buses	Natural Gas	19541.03	7.59E-03	1.57E-01	2.60E+00	0.00E+00	7.45E-04	1.20E-02	4.40E-02	5.68E-02	6.85E-04	3.00E-03	1.54E-02	1.91E-02	8.92E+02	5.31E-01	1.82E-01	0.01%
LDA	Gasoline	133132108.02	1.25E-02	4.81E-02	8.76E-01	2.91E-03	1.59E-03	8.00E-03	8.80E-03	1.84E-02	1.46E-03	2.00E-03	3.08E-03	6.54E-03	2.95E+02	3.19E-03	5.09E-03	47.96%
LDA	Diesel	279606.02	4.99E-02	2.69E-01	4.81E-01	2.43E-03	3.25E-02	8.00E-03	8.94E-03	4.94E-02	3.10E-02	2.00E-03	3.13E-03	3.62E-02	2.57E+02	2.32E-03	4.04E-02	0.10%
LDA	Electricity	6967760.76	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.37E-03	1.24E-02	0.00E+00	2.00E-03	1.53E-03	3.53E-03	0.00E+00	0.00E+00	0.00E+00	2.51%
LDA	Plug-in Hybrid	3983693.82	1.73E-03	3.51E-03	2.50E-01	1.51E-03	8.23E-04	8.00E-03	4.13E-03	1.30E-02	7.57E-04	2.00E-03	1.45E-03	4.20E-03	1.53E+02	5.51E-04	6.45E-04	1.44%
LDT1	Gasoline	11498860.94	5.04E-02	1.99E-01	2.16E+00	3.48E-03	2.82E-03	8.00E-03	1.09E-02	2.17E-02	2.59E-03	2.00E-03	3.81E-03	8.40E-03	3.52E+02	1.12E-02	1.34E-02	4.14%
LDT1	Diesel	2649.86	3.30E-01	1.52E+00	1.80E+00	4.19E-03	2.69E-01	8.00E-03	1.25E-02	2.89E-01	2.57E-01	2.00E-03	4.36E-03	2.64E-01	4.42E+02	1.53E-02	6.97E-02	0.00%
LDT1	Electricity	27045.91	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.39E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	0.01%
LDT1	Plug-in Hybrid	15799.37	1.58E-03	3.20E-03	2.29E-01	1.38E-03	4.97E-04	8.00E-03	4.14E-03	1.26E-02	4.57E-04	2.00E-03	1.45E-03	3.91E-03	1.40E+02	5.04E-04	5.89E-04	0.01%
LDT2	Gasoline	63204640.70	1.67E-02	8.72E-02	1.04E+00	3.58E-03	1.66E-03	8.00E-03	1.04E-02	2.00E-02	1.52E-03	2.00E-03	3.63E-03	7.15E-03	3.63E+02	4.15E-03	6.98E-03	22.77%
LDT2	Diesel	203904.18	2.06E-02	5.61E-02	1.81E-01	3.13E-03	6.99E-03	8.00E-03	1.02E-02	2.51E-02	6.69E-03	2.00E-03	3.55E-03	1.22E-02	3.31E+02	9.57E-04	5.21E-02	0.07%
LDT2	Electricity	271839.39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.36E-03	1.24E-02	0.00E+00	2.00E-03	1.52E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00	0.10%
LDT2	Plug-in Hybrid	559555.60	1.64E-03	3.32E-03	2.37E-01	1.43E-03	6.30E-04	8.00E-03	4.14E-03	1.28E-02	5.79E-04	2.00E-03	1.45E-03	4.03E-03	1.45E+02	5.23E-04	6.12E-04	0.20%
LHD1	Gasoline	4875651.46	3.35E-02	1.87E-01	1.17E+00	6.35E-03	1.22E-03	8.00E-03	7.80E-02	8.72E-02	1.13E-03	2.00E-03	2.73E-02	3.04E-02	6.42E+02	6.64E-03	1.04E-02	1.76%
LHD1	Diesel	2309885.27	9.91E-02	1.33E+00	2.75E-01	4.73E-03	2.29E-02	1.20E-02	7.80E-02	1.13E-01	2.19E-02	3.00E-03	2.73E-02	5.22E-02	4.99E+02	4.60E-03	7.86E-02	0.83%
LHD2	Gasoline	707424.21	2.23E-02	1.86E-01	8.85E-01	7.26E-03	1.09E-03	8.00E-03	9.10E-02	1.00E-01	1.00E-03	2.00E-03	3.19E-02	3.49E-02	7.34E+02	4.74E-03	1.11E-02	0.25%
LHD2	Diesel	1017094.14	9.72E-02	1.16E+00	2.46E-01	5.61E-03	2.25E-02	1.20E-02	9.10E-02	1.26E-01	2.15E-02	3.00E-03	3.19E-02	5.64E-02	5.92E+02	4.51E-03	9.33E-02	0.37%
MCY	Gasoline	942493.49	1.19E+00	5.56E-01	1.30E+01	1.93E-03	2.28E-03	4.00E-03	1.20E-02	1.83E-02	2.14E-03	1.00E-03	4.20E-03	7.34E-03	1.96E+02	1.82E-01	3.89E-02	0.34%
MDV	Gasoline	35296866.04	2.79E-02	1.45E-01	1.35E+00	4.39E-03	1.74E-03	8.00E-03	1.07E-02	2.04E-02	1.60E-03	2.00E-03	3.73E-03	7.33E-03	4.44E+02	6.42E-03	1.00E-02	12.71%
MDV	Diesel	417108.58	2.00E-02	1.11E-01	3.09E-01	4.17E-03	9.39E-03	8.00E-03	1.05E-02	2.79E-02	8.99E-03	2.00E-03	3.69E-03	1.47E-02	4.40E+02	9.31E-04	6.94E-02	0.15%
MDV	Electricity	292645.80	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.35E-03	1.24E-02	0.00E+00	2.00E-03	1.52E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00	0.11%
MDV	Plug-in Hybrid	281038.15	1.69E-03	3.42E-03	2.44E-01	1.47E-03	7.88E-04	8.00E-03	4.14E-03	1.29E-02	7.25E-04	2.00E-03	1.45E-03	4.17E-03	1.49E+02	5.34E-04	6.20E-04	0.10%
MH	Gasoline	150959.24	7.33E-02	4.48E-01	2.22E+00	1.76E-02	1.53E-03	1.20E-02	4.36E-02	5.71E-02	1.41E-03	3.00E-03	1.53E-02	1.97E-02	1.78E+03	1.60E-02	2.64E-02	0.05%
MH	Diesel	54121.46	6.90E-02	3.62E+00	2.91E-01	9.66E-03	9.47E-02	1.60E-02	4.33E-02	1.54E-01	9.06E-02	4.00E-03	1.52E-02	1.10E-01	1.02E+03	3.20E-03	1.61E-01	0.02%
Motor Coach	Diesel	83893.73	1.46E-02	1.77E+00	1.15E-01	1.68E-02	1.90E-02	1.20E-02	8.86E-02	1.20E-01	1.82E-02	3.00E-03	3.10E-02	5.22E-02	1.77E+03	6.78E-04	2.79E-01	0.03%
OBUS	Gasoline	153201.69	6.20E-02	5.07E-01	1.58E+00	1.68E-02	8.51E-04	1.20E-02	4.40E-02	5.69E-02	7.82E-04	3.00E-03	1.54E-02	1.92E-02	1.70E+03	1.27E-02	2.40E-02	0.06%
PTO	Diesel	105925.77	2.38E-02	2.98E+00	2.62E-01	1.96E-02	4.92E-03	0.00E+00	0.00E+00	4.92E-03	4.70E-03	0.00E+00	0.00E+00	4.70E-03	2.07E+03	1.11E-03	3.27E-01	0.04%
PTO	Electricity	48.83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00%
SBUS	Gasoline	59008.66	7.24E-02	5.23E-01	1.43E+00	8.92E-03	1.16E-03	8.00E-03	4.68E-02	5.60E-02	1.07E-03	2.00E-03	1.64E-02	1.95E-02	9.02E+02	1.45E-02	2.80E-02	0.02%
SBUS	Diesel	33210.41	1.64E-01	9.29E+00	3.88E-01	1.21E-02	5.47E-02	1.20E-02	4.68E-02	1.14E-01	5.23E-02	3.00E-03	1.64E-02	7.17E-02	1.28E+03	7.63E-03	2.01E-01	0.01%
SBUS	Electricity	19.10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.34E-02	3.54E-02	0.00E+00	3.00E-03	8.20E-03	1.12E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
SBUS	Natural Gas	36139.20	6.78E-02	8.88E-01	1.65E+01	0.00E+00	4.48E-03	1.20E-02	4.68E-02	6.33E-02	4.12E-03	3.00E-03	1.64E-02	2.35E-02	1.72E+03	4.74E+00	3.51E-01	0.01%
T6 CAIRP Class 4	Diesel	1790.70	1.09E-02	4.70E-01	5.05E-02	1.05E-02	7.55E-03	1.20E-02	4.30E-02	6.26E-02	7.22E-03	3.00E-03	1.51E-02	2.53E-02	1.11E+03	5.07E-04	1.74E-01	0.00%
T6 CAIRP Class 4	Electricity	1.22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.53E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 5	Diesel	2456.78	6.69E-03	4.16E-01	3.89E-02	1.05E-02	5.27E-03	1.20E-02	4.30E-02	6.03E-02	5.04E-03	3.00E-03	1.51E-02	2.31E-02	1.10E+03	3.11E-04	1.74E-01	0.00%
T6 CAIRP Class 5	Electricity	1.42	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.53E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 6	Diesel	6415.64	8.84E-03	4.04E-01	4.39E-02	1.03E-02	6.41E-03	1.20E-02	4.30E-02	6.14E-02	6.14E-03	3.00E-03	1.51E-02	2.42E-02	1.09E+03	4.11E-04	1.71E-01	0.00%
T6 CAIRP Class 6	Electricity	7.71	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.53E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 7	Diesel	40229.92	5.79E-03	4.47E-01	3.86E-02	9.76E-03	5.13E-03	1.20E-02	4.30E-02	6.01E-02	4.91E-03	3.00E-03	1.51E-02	2.30E-02	1.03E+03	2.69E-04	1.62E-01	0.01%
T6 CAIRP Class 7	Electricity	22.56	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.53E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 7	Natural Gas	38.02	6.55E-03	1.37E-01	2.33E+00	0.00E+00	6.32E-04	1.20E-02	4.30E-02	5.56E-02	5.81E-04	3.00E-03	1.51E-02	1.86E-02	8.07E+02	4.58E-01	1.64E-01	0.00%
T6 Instate Delivery Class 4	Diesel	127730.11	5.97E-02	1.62E+00	2.11E-01	1.03E-02	3.08E-02	1.20E-02	4.38E-02	8.66E-02	2.95E-02	3.00E-03	1.53E-02	4.78E-02	1.09E+03	2.77E-03	1.72E-01	0.05%
T6 Instate Delivery Class 4	Electricity	44.76	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.19E-02	3.39E-02	0.00E+00	3.00E-03	7.67E-03	1.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Delivery Class 4	Natural Gas	471.35	7.78E-03	1.26E-01	2.49E+00	0.00E+00	8.85E-04	1.20E-02	4.38E-02	5.67E-02	8.14E-04	3.00E-03	1.53E-02	1.92E-02	8.79E+02	5.45E-01	1.79E-01	0.00%
T6 Instate Delivery Class 5	Diesel	132608.03	1.99E-02	7.67E-01	8.57E-02	1.04E-02	1.15E-02	1.20E-02	4.38E-02	6.73E-02	1.10E-02	3.00E-03	1.53E-02	2.93E-02	1.10E+03	9.24E-04	1.73E-01	0.05%
T6 Instate Delivery Class 5	Electricity	34.02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.19E-02	3.39E-02	0.00E+00	3.00E-03	7.67E-03	1.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Delivery Class 5	Natural Gas	376.04	7.77E-03	1.28E-01	2.49E+00	0.00E+00	8.76E-04	1.20E-02	4.38E-02	5.67E-02	8.06E-04	3.00E-03	1.53E-02	1.91E-02	8.71E+02	5.43E-01	1.77E-01	0.00%
T6 Instate Delivery Class 6	Diesel	405510.74	2.50E-02	9.02E-01	1.02E-01	1.03E-02	1.40E-02	1.20E-02	4.38E-02	6.98E-02	1.34E-02	3.00E-03	1.53E-02	3.17E-02	1.09E+03	1.16E-03	1.72E-01	0.15%
T6 Instate Delivery Class 6	Electricity	137.13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.19E-02	3.39E-02	0.00E+00	3.00E-03	7.67E-03	1.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Delivery Class 6	Natural Gas	1241.58	7.69E-03	1.33E-01	2.51E+00	0.00E+00	8.41E-04	1.20E-02	4.38E-02	5.67E-02	7.73E-04	3.00E-03	1.53E-02	1.91E-02	8.73E+02	5.38E-01	1.78E-01	0.00%
T6 Instate Delivery Class 7	Diesel	161949.41	8.31E-03	7.41E-01	5.71E-02	1.03E-02	5.53E-03	1.20E-02	4.38E-02	6.14E-02	5.29E-03	3.00E-03	1.53E-02	2.36E-02	1.08E+03	3.86E-04	1.71E-01	0.06%
T6 Instate Delivery Class 7	Electricity	20.21	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.19E-02	3.39E-02	0.00E+00	3.00E-03	7.67E-03	1.07E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Delivery Class 7	Natural Gas	4781.04	7.52E-03	1.48E-01	2.56E+00	0.00E+00	7.66E-04	1.20E-02	4.38E-02	5.66E-02	7.05E-04	3.00E-03	1.53E-02	1.90E-02	8.85E+02	5.26E-01	1.80E-01	0.00%
T6 Instate Other Class 4	Diesel	194317.32	5.11E-02	1.45E+00	1.79E-01	1.04E-02	2.84E-02	1.20E-02	4.37E-02	8.41E-02	2.72E-02	3.00E-03	1.53E-02	4.55E-02	1.10E+03	2.37E-03	1.73E-01	0.07%
T6 Instate Other Class 4	Electricity	15.39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Other Class 4	Natural Gas	638.64	7.45E-03	1.39E-01	2.49E+00	0.00E+00	7.76E-04	1.20E-02	4.37E-02	5.65E-02	7.14E-04	3.00E-03	1.53E-02	1.90E-02	8.87E+02	5.21E-01	1.81E-01	0.00%
T6 Instate Other Class 5	Diesel	453243.29	1.28E-02	6.44E-01	6.33E-02	1.05E-02	7.75E-03	1.20E-02	4.37E-02	6.34E-02	7.41E-03	3.00E-03	1.53E-02	2.57E-02	1.10E+03	5.94E-04	1.74E-01	0.16%
T6 Instate Other Class 5	Electricity	115.86	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Other Class 5	Natural Gas	1198.10	7.43E-03	1.41E-01	2.50E+00	0.00E+00	7.67E-04	1.20E-02	4.37E-02	5.65E-02	7.05E-04	3.00E-03	1.53E-02	1.90E-02	8.69E+02	5.20E-01	1.77E-01	0.00%
T6 Instate Other Class 6	Diesel	401790.50	2.71E-02	9.32E-01	1.07E-01	1.04E-02	1.58E-02	1.20E-02	4.37E-02	7.15E-02	1.51E-02	3.00E-03	1.53E-02	3.34E-02	1.10E+03	1.26E-03	1.73E-01	0.14%
T6 Instate Other Class 6	Electricity	101.26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Other Class 6	Natural Gas	1135.45	7.29E-03	1.50E-01	2.52E+00	0.00E+00	7.07E-04	1.20E-02	4.37E-02	5.64E-02	6.50E-04	3.00E-03	1.53E-02	1.89E-02	8.76E+02	5.10E-01	1.78E-01	0.00%
T6 Instate Other Class 7	Diesel	201239.85	9.05E-03	7.18E-01	5.65E-02	1.03E-02	6.00E-03	1.20E-02	4.37E-02	6.17E-02	5.74E-03	3.00E-03	1.53E-02	2.40E-02	1.09E+03	4.20E-04	1.71E-01	0.07%
T6 Instate Other Class 7	Electricity	46.78	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Other Class 7	Natural Gas	5956.45	7.54E-03	1.36E-01	2.49E+00	0.00E+00	8.20E-04	1.20E-02	4.37E-02	5.65E-02	7.54E-04	3.00E-03	1.53E-02	1.90E-02	8.80E+02	5.27E-01	1.79E-01	0.00%
T6 Instate Tractor Class 6	Diesel	6703.46	1.18E-02	5.82E-01	5.93E-02	1.04E-02	7.63E-03	1.20E-02	4.37E-02	6.33E-02	7.30E-03	3.00E-03	1.53E-02	2.56E-02	1.10E+03	5.48E-04	1.73E-01	0.00%
T6 Instate Tractor Class 6	Electricity	2.89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Tractor Class 6	Natural Gas	20.14	7.93E-03	1.05E-01	2.39E+00	0.00E+00	9.92E-04	1.20E-02	4.37E-02	5.67E-02	9.12E-04	3.00E-03	1.53E-02	1.92E-02	8.67E+02	5.55E-01	1.77E-01	0.00%
T6 Instate Tractor Class 7	Diesel	97335.93	9.06E-03	7.76E-01	5.79E-02	9.82E-03	6.04E-03	1.20E-02	4.37E-02	6.17E-02	5.78E-03	3.00E-03	1.53E-02	2.41E-02	1.04E+03	4.21E-04	1.63E-01	0.04%
T6 Instate Tractor Class 7	Electricity	13.93	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.65E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Tractor Class 7	Natural Gas	2880.77	7.41E-03	1.44E-01	2.52E+00	0.00E+00	7.64E-04	1.20E-02	4.37E-02	5.65E-02	7.02E-04	3.00E-03	1.53E-02	1.90E-02	8.78E+02	5.19E-01	1.79E-01	0.00%
T6 OOS Class 4	Diesel	1020.06	1.41E-02	5.35E-01	5.96E-02	1.05E-02	9.24E-03	1.20E-02	4.30E-02	6.43E-02	8.84E-03	3.00E-03	1.51E-02	2.69E-02	1.11E+03	6.54E-04	1.74E-01	0.00%
T6 OOS Class 5	Diesel	1399.34	7.31E-03	4.30E-01	4.07E-02	1.05E-02	5.57E-03	1.20E-02	4.30E-02	6.06E-02	5.32E-03	3.00E-03	1.51E-02	2.34E-02	1.10E+03	3.40E-04	1.74E-01	0.00%
T6 OOS Class 6	Diesel	3656.50	1.12E-02	4.54E-01	5.07E-02	1.03E-02	7.66E-03	1.20E-02	4.30E-02	6.27E-02	7.33E-03	3.00E-03	1.51E-02	2.54E-02	1.09E+03	5.19E-04	1.71E-01	0.00%
T6 OOS Class 7	Diesel	26587.33	5.72E-03	4.50E-01	3.85E-02	9.71E-03	5.12E-03	1.20E-02	4.30E-02	6.01E-02	4.89E-03	3.00E-03	1.51E-02	2.29E-02	1.03E+03	2.66E-04	1.62E-01	0.01%
T6 Public Class 4	Diesel	25127.75	3.11E-02	3.57E+00	1.06E-01	1.04E-02	1.90E-02	1.20E-02	4.33E-02	7.44E-02	1.82E-02	3.00E-03	1.52E-02	3.64E-02	1.10E+03	1.45E-03	1.73E-01	0.01%
T6 Public Class 4	Electricity	0.24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.58E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 4	Natural Gas	2769.85	7.41E-03	1.10E-01	2.28E+00	0.00E+00	8.96E-04	1.20E-02	4.33E-02	5.62E-02	8.24E-04	3.00E-03	1.52E-02	1.90E-02	8.38E+02	5.19E-01	1.71E-01	0.00%
T6 Public Class 5	Diesel	17013.90	3.15E-02	3.65E+00	1.05E-01	1.06E-02	1.86E-02	1.20E-02	4.33E-02	7.40E-02	1.78E-02	3.00E-03	1.52E-02	3.60E-02	1.11E+03	1.46E-03	1.76E-01	0.01%
T6 Public Class 5	Electricity	0.32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.58E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 5	Natural Gas	2536.64	7.34E-03	1.16E-01	2.32E+00	0.00E+00	8.69E-04	1.20E-02	4.33E-02	5.62E-02	7.99E-04	3.00E-03	1.52E-02	1.90E-02	8.40E+02	5.14E-01	1.71E-01	0.00%
T6 Public Class 6	Diesel	20835.20	5.68E-02	6.04E+00	1.66E-01	1.06E-02	3.60E-02	1.20E-02	4.33E-02	9.13E-02	3.44E-02	3.00E-03	1.52E-02	5.26E-02	1.12E+03	2.64E-03	1.77E-01	0.01%
T6 Public Class 6	Electricity	3.59	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.58E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 6	Natural Gas	2378.25	7.59E-03	9.62E-02	2.22E+00	0.00E+00	9.72E-04	1.20E-02	4.33E-02	5.63E-02	8.94E-04	3.00E-03	1.52E-02	1.91E-02	8.44E+02	5.31E-01	1.72E-01	0.00%
T6 Public Class 7	Diesel	115788.26	4.57E-02	4.94E+00	1.40E-01	1.06E-02	3.06E-02	1.20E-02	4.33E-02	8.59E-02	2.93E-02	3.00E-03	1.52E-02	4.74E-02	1.12E+03	2.12E-03	1.76E-01	0.04%
T6 Public Class 7	Electricity	10.85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.58E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 7	Natural Gas	13549.88	7.77E-03	8.48E-02	2.18E+00	0.00E+00	1.05E-03	1.20E-02	4.33E-02	5.64E-02	9.67E-04	3.00E-03	1.52E-02	1.91E-02	8.37E+02	5.44E-01	1.71E-01	0.00%
T6 Utility Class 5	Diesel	26023.61	6.32E-03	4.80E-01	3.78E-02	1.00E-02	4.31E-03	1.20E-02	4.33E-02	5.96E-02	4.12E-03	3.00E-03	1.52E-02	2.23E-02	1.06E+03	2.94E-04	1.67E-01	0.01%
T6 Utility Class 5	Natural Gas	155.75	7.05E-03	1.31E-01	2.37E+00	0.00E+00	7.37E-04	1.20E-02	4.33E-02	5.61E-02	6.78E-04	3.00E-03	1.52E-02	1.88E-02	8.41E+02	4.93E-01	1.71E-01	0.00%
T6 Utility Class 6	Diesel	4889.49	5.55E-03	4.88E-01	3.75E-02	9.96E-03	4.11E-03	1.20E-02	4.33E-02	5.94E-02	3.94E-03	3.00E-03	1.52E-02	2.21E-02	1.05E+03	2.58E-04	1.66E-01	0.00%
T6 Utility Class 6	Natural Gas	57.88	6.71E-03	1.54E-01	2.47E+00	0.00E+00	5.91E-04	1.20E-02	4.33E-02	5.59E-02	5.43E-04	3.00E-03	1.52E-02	1.87E-02	8.38E+02	4.69E-01	1.71E-01	0.00%
T6 Utility Class 7	Diesel	6789.73	4.41E-03	4.00E-01	3.39E-02	1.00E-02	3.64E-03	1.20E-02	4.33E-02	5.90E-02	3.48E-03	3.00E-03	1.52E-02	2.16E-02	1.06E+03	2.05E-04	1.66E-01	0.00%
T6 Utility Class 7	Electricity	6.22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.58E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Utility Class 7	Natural Gas	87.49	6.70E-03	1.54E-01	2.47E+00	0.00E+00	5.90E-04	1.20E-02	4.33E-02	5.59E-02	5.42E-04	3.00E-03	1.52E-02	1.87E-02	8.36E+02	4.69E-01	1.70E-01	0.00%
T6TS	Gasoline	818409.04	6.83E-02	5.00E-01	1.77E+00	1.64E-02	1.04E-03	1.20E-02	4.36E-02	5.66E-02	9.54E-04	3.00E-03	1.53E-02	1.92E-02	1.66E+03	1.39E-02	2.44E-02	0.29%
T7 CAIRP Class 8	Diesel	1323608.70	1.27E-02	1.55E+00	7.56E-02	1.46E-02	2.70E-02	3.60E-02	8.01E-02	1.43E-01	2.58E-02	9.00E-03	2.81E-02	6.29E-02	1.54E+03	5.90E-04	2.43E-01	0.48%
T7 CAIRP Class 8	Electricity	1531.58	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.01E-02	7.61E-02	0.00E+00	9.00E-03	1.40E-02	2.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 CAIRP Class 8	Natural Gas	5633.68	1.40E-02	3.33E-01	6.46E+00	0.00E+00	1.70E-03	3.60E-02	8.01E-02	1.18E-01	1.56E-03	9.00E-03	2.81E-02	3.86E-02	1.19E+03	9.78E-01	2.43E-01	0.00%
T7 NNOOS Class 8	Diesel	1572770.61	1.17E-02	1.46E+00	6.53E-02	1.45E-02	2.52E-02	3.60E-02	8.01E-02	1.41E-01	2.41E-02	9.00E-03	2.81E-02	6.11E-02	1.53E+03	5.45E-04	2.42E-01	0.57%
T7 NOOS Class 8	Diesel	571074.62	1.30E-02	1.58E+00	7.63E-02	1.45E-02	2.75E-02	3.60E-02	8.01E-02	1.44E-01	2.63E-02	9.00E-03	2.81E-02	6.34E-02	1.53E+03	6.02E-04	2.42E-01	0.21%
T7 POAK Class 8	Diesel	108.54	9.01E-03	1.19E+00	4.63E-02	1.63E-02	1.89E-02	3.60E-02	8.14E-02	1.36E-01	1.81E-02	9.00E-03	2.85E-02	5.56E-02	1.72E+03	4.18E-04	2.71E-01	0.00%
T7 POLA Class 8	Diesel	1084548.74	1.13E-02	1.59E+00	9.17E-02	1.54E-02	2.29E-02	3.60E-02	8.14E-02	1.40E-01	2.19E-02	9.00E-03	2.85E-02	5.94E-02	1.63E+03	5.23E-04	2.57E-01	0.39%
T7 POLA Class 8	Electricity	170.80	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.07E-02	7.67E-02	0.00E+00	9.00E-03	1.42E-02	2.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 POLA Class 8	Natural Gas	13464.97	1.42E-02	4.06E-01	7.67E+00	0.00E+00	1.57E-03	3.60E-02	8.14E-02	1.19E-01	1.45E-03	9.00E-03	2.85E-02	3.89E-02	1.29E+03	9.94E-01	2.63E-01	0.00%
T7 Public Class 8	Diesel	149663.91	7.83E-02	1.02E+01	3.25E-01	1.61E-02	6.36E-02	3.60E-02	9.85E-02	1.98E-01	6.09E-02	9.00E-03	3.45E-02	1.04E-01	1.70E+03	3.64E-03	2.68E-01	0.05%
T7 Public Class 8	Electricity	47.87	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.06E-02	7.66E-02	0.00E+00	9.00E-03	1.42E-02	2.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 Public Class 8	Natural Gas	58685.39	1.43E-02	3.40E-01	6.60E+00	0.00E+00	1.73E-03	3.60E-02	8.20E-02	1.20E-01	1.59E-03	9.00E-03	2.87E-02	3.93E-02	1.23E+03	9.99E-01	2.51E-01	0.02%
T7 Single Concrete/Transit M	Diesel	48752.06	9.20E-03	1.01E+00	6.55E-02	1.54E-02	1.36E-02	3.60E-02	8.29E-02	1.32E-01	1.30E-02	9.00E-03	2.90E-02	5.10E-02	1.63E+03	4.27E-04	2.56E-01	0.02%
T7 Single Concrete/Transit M	Electricity	38.08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.14E-02	7.74E-02	0.00E+00	9.00E-03	1.45E-02	2.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 Single Concrete/Transit M	Natural Gas	4808.11	1.48E-02	2.53E-01	5.51E+00	0.00E+00	2.00E-03	3.60E-02	8.29E-02	1.21E-01	1.84E-03	9.00E-03	2.90E-02	3.98E-02	1.25E+03	1.04E+00	2.56E-01	0.00%
T7 Single Dump Class 8	Diesel	113250.69	1.76E-02	1.60E+00	1.07E-01	1.53E-02	1.66E-02	3.60E-02	8.29E-02	1.35E-01	1.59E-02	9.00E-03	2.90E-02	5.39E-02	1.62E+03	8.17E-04	2.55E-01	0.04%
T7 Single Dump Class 8	Electricity	9.34	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.14E-02	7.74E-02	0.00E+00	9.00E-03	1.45E-02	2.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 Single Dump Class 8	Natural Gas	7866.10	1.46E-02	4.16E-01	7.70E+00	0.00E+00	1.63E-03	3.60E-02	8.29E-02	1.20E-01	1.50E-03	9.00E-03	2.90E-02	3.95E-02	1.31E+03	1.02E+00	2.67E-01	0.00%
T7 Single Other Class 8	Diesel	333857.56	1.20E-02	1.16E+00	7.63E-02	1.53E-02	1.42E-02	3.60E-02	8.29E-02	1.33E-01	1.36E-02	9.00E-03	2.90E-02	5.16E-02	1.61E+03	5.56E-04	2.54E-01	0.12%
T7 Single Other Class 8	Electricity	198.47	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.14E-02	7.74E-02	0.00E+00	9.00E-03	1.45E-02	2.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 Single Other Class 8	Natural Gas	24928.84	1.47E-02	3.20E-01	6.36E+00	0.00E+00	1.86E-03	3.60E-02	8.29E-02	1.21E-01	1.71E-03	9.00E-03	2.90E-02	3.97E-02	1.25E+03	1.03E+00	2.55E-01	0.01%
T7 SWCV Class 8	Diesel	84243.13	1.53E-03	1.49E+01	1.21E-02	3.64E-02	1.49E-02	3.60E-02	2.10E-01	2.61E-01	1.42E-02	9.00E-03	7.35E-02	9.67E-02	3.84E+03	7.13E-05	6.05E-01	0.03%
T7 SWCV Class 8	Electricity	52.86	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	1.05E-01	1.41E-01	0.00E+00	9.00E-03	3.68E-02	4.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 SWCV Class 8	Natural Gas	198827.11	6.31E-02	1.39E+00	1.03E+01	0.00E+00	3.33E-03	3.60E-02	2.10E-01	2.49E-01	3.06E-03	9.00E-03	7.35E-02	8.56E-02	1.24E+03	1.88E+00	2.52E-01	0.07%
T7 Tractor Class 8	Diesel	1083164.64	1.45E-02	1.57E+00	8.18E-02	1.47E-02	2.24E-02	3.60E-02	8.02E-02	1.39E-01	2.14E-02	9.00E-03	2.81E-02	5.85E-02	1.56E+03	6.74E-04	2.45E-01	0.39%
T7 Tractor Class 8	Electricity	457.13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.01E-02	7.61E-02	0.00E+00	9.00E-03	1.40E-02	2.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7 Tractor Class 8	Natural Gas	36390.67	1.40E-02	3.11E-01	5.98E+00	0.00E+00	1.77E-03	3.60E-02	8.02E-02	1.18E-01	1.62E-03	9.00E-03	2.81E-02	3.87E-02	1.23E+03	9.82E-01	2.50E-01	0.01%
T7 Utility Class 8	Diesel	20667.97	9.57E-03	1.02E+00	6.91E-02	1.53E-02	1.15E-02	3.60E-02	8.13E-02	1.29E-01	1.10E-02	9.00E-03	2.84E-02	4.84E-02	1.61E+03	4.44E-04	2.54E-01	0.01%
T7 Utility Class 8	Electricity	3.57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.06E-02	7.66E-02	0.00E+00	9.00E-03	1.42E-02	2.32E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7IS	Gasoline	3231.28	9.66E-01	7.22E+00	5.04E+01	2.13E-02	1.94E-03	2.00E-02	9.86E-02	1.21E-01	1.78E-03	5.00E-03	3.45E-02	4.13E-02	2.16E+03	1.72E-01	2.04E-01	0.00%
UBUS	Gasoline	31153.41	1.68E-02	2.49E-01	4.19E-01	1.85E-02	1.26E-03	1.10E-02	1.05E-01	1.17E-01	1.16E-03	2.74E-03	3.68E-02	4.07E-02	1.87E+03	5.05E-03	2.10E-02	0.01%
UBUS	Diesel	1269.07	1.04E-01	8.52E-01	1.35E-01	1.64E-02	6.33E-03	3.50E-02	1.10E-01	1.51E-01	6.05E-03	8.75E-03	3.85E-02	5.33E-02	1.73E+03	4.84E-03	2.73E-01	0.00%
UBUS	Electricity	2415.77	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-02	5.45E-02	8.06E-02	0.00E+00	6.53E-03	1.91E-02	2.56E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
UBUS	Natural Gas	417623.32	3.78E-02	6.86E-01	3.89E+01	0.00E+00	3.89E-04	3.35E-02	1.10E-01	1.44E-01	3.72E-04	8.39E-03	3.85E-02	4.72E-02	2.58E+03	2.62E+00	5.25E-01	0.15%
	Total	**277,602,710**															Total	**100%**

Source: EMFAC2021 (v1.0.2) En

Region Type: Sub-Area
Region: Los Angeles
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day

1.000E-06

		lbs/Mile														
Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
All Other Buses	Diesel	2.208E-04	4.218E-03	7.331E-04	2.277E-05	1.140E-04	2.646E-05	9.705E-05	2.375E-04	1.090E-04	6.614E-06	3.397E-05	1.496E-04	2.405E+00	1.026E-05	3.789E-04
All Other Buses	Natural Gas	1.674E-05	3.453E-04	5.728E-03	0.000E+00	1.642E-06	2.646E-05	9.705E-05	1.251E-04	1.510E-06	6.614E-06	3.397E-05	4.209E-05	1.967E+00	1.172E-03	4.010E-04
LDA	Gasoline	2.751E-05	1.061E-04	1.931E-03	6.421E-06	3.510E-06	1.764E-05	1.939E-05	4.054E-05	3.227E-06	4.409E-06	6.787E-06	1.442E-05	6.495E-01	7.039E-06	1.123E-05
LDA	Diesel	1.101E-04	5.923E-04	1.060E-03	5.360E-06	7.154E-05	1.764E-05	1.971E-05	1.089E-04	6.845E-05	4.409E-06	6.898E-06	7.975E-05	5.657E-01	5.114E-06	8.912E-05
LDA	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.627E-06	2.726E-05	0.000E+00	4.409E-06	3.369E-06	7.779E-06	0.000E+00	0.000E+00	0.000E+00
LDA	Plug-in Hybrid	3.809E-06	7.731E-06	5.510E-04	3.331E-06	1.814E-06	1.764E-05	9.112E-06	2.856E-05	1.668E-06	4.409E-06	3.189E-06	9.266E-06	3.370E-01	1.216E-06	1.421E-06
LDT1	Gasoline	1.111E-04	4.381E-04	4.754E-03	7.663E-06	6.209E-06	1.764E-05	2.400E-05	4.785E-05	5.709E-06	4.409E-06	8.401E-06	1.852E-05	7.751E-01	2.458E-05	2.946E-05
LDT1	Diesel	7.277E-04	3.347E-03	3.959E-03	9.243E-06	5.929E-04	1.764E-05	2.748E-05	6.381E-04	5.673E-04	4.409E-06	9.619E-06	5.813E-04	9.754E-01	3.380E-05	1.537E-04
LDT1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.683E-06	2.732E-05	0.000E+00	4.409E-06	3.389E-06	7.798E-06	0.000E+00	0.000E+00	0.000E+00
LDT1	Plug-in Hybrid	3.476E-06	7.056E-06	5.045E-04	3.043E-06	1.096E-06	1.764E-05	9.130E-06	2.786E-05	1.008E-06	4.409E-06	3.195E-06	8.612E-06	3.078E-01	1.110E-06	1.299E-06
LDT2	Gasoline	3.688E-05	1.922E-04	2.293E-03	7.902E-06	3.651E-06	1.764E-05	2.287E-05	4.416E-05	3.357E-06	4.409E-06	8.006E-06	1.577E-05	7.993E-01	9.159E-06	1.539E-05
LDT2	Diesel	4.542E-05	1.237E-04	3.985E-04	6.908E-06	1.541E-05	1.764E-05	2.238E-05	5.542E-05	1.474E-05	4.409E-06	7.833E-06	2.698E-05	7.291E-01	2.110E-06	1.149E-04
LDT2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.601E-06	2.724E-05	0.000E+00	4.409E-06	3.360E-06	7.770E-06	0.000E+00	0.000E+00	0.000E+00
LDT2	Plug-in Hybrid	3.610E-06	7.328E-06	5.234E-04	3.160E-06	1.388E-06	1.764E-05	9.119E-06	2.814E-05	1.276E-06	4.409E-06	3.192E-06	8.877E-06	3.196E-01	1.154E-06	1.350E-06
LHD1	Gasoline	7.379E-05	4.130E-04	2.581E-03	1.400E-05	2.698E-06	1.764E-05	1.720E-04	1.923E-04	2.481E-06	4.409E-06	6.019E-05	6.708E-05	1.416E+00	1.465E-05	2.295E-05
LHD1	Diesel	2.184E-04	2.930E-03	6.058E-04	1.042E-05	5.039E-05	2.646E-05	1.720E-04	2.488E-04	4.821E-05	6.614E-06	6.019E-05	1.150E-04	1.100E+00	1.014E-05	1.732E-04
LHD2	Gasoline	4.910E-05	4.100E-04	1.950E-03	1.600E-05	2.402E-06	1.764E-05	2.006E-04	2.207E-04	2.209E-06	4.409E-06	7.022E-05	7.683E-05	1.619E+00	1.045E-05	2.440E-05
LHD2	Diesel	2.142E-04	2.561E-03	5.414E-04	1.237E-05	4.962E-05	2.646E-05	2.006E-04	2.767E-04	4.747E-05	6.614E-06	7.022E-05	1.243E-04	1.305E+00	9.949E-06	2.056E-04
MCY	Gasoline	2.626E-03	1.225E-03	2.861E-02	4.265E-06	5.032E-06	8.818E-06	2.646E-05	4.031E-05	4.707E-06	2.205E-06	9.259E-06	1.617E-05	4.314E-01	4.010E-04	8.583E-05
MDV	Gasoline	6.140E-05	3.190E-04	2.976E-03	9.679E-06	3.842E-06	1.764E-05	2.351E-05	4.499E-05	3.533E-06	4.409E-06	8.228E-06	1.617E-05	9.791E-01	1.416E-05	2.215E-05
MDV	Diesel	4.420E-05	2.442E-04	6.822E-04	9.201E-06	2.071E-05	1.764E-05	2.322E-05	6.156E-05	1.981E-05	4.409E-06	8.127E-06	3.235E-05	9.710E-01	2.053E-06	1.530E-04
MDV	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.598E-06	2.723E-05	0.000E+00	4.409E-06	3.359E-06	7.769E-06	0.000E+00	0.000E+00	0.000E+00
MDV	Plug-in Hybrid	3.715E-06	7.541E-06	5.380E-04	3.250E-06	1.737E-06	1.764E-05	9.117E-06	2.849E-05	1.597E-06	4.409E-06	3.191E-06	9.198E-06	3.288E-01	1.177E-06	1.366E-06
MH	Gasoline	1.617E-04	9.867E-04	4.894E-03	3.877E-05	3.376E-06	2.646E-05	9.611E-05	1.259E-04	3.104E-06	6.614E-06	3.364E-05	4.336E-05	3.922E+00	3.538E-05	5.816E-05
MH	Diesel	1.521E-04	7.990E-03	6.414E-04	2.131E-05	2.087E-04	3.527E-05	9.550E-05	3.395E-04	1.997E-04	8.818E-06	3.342E-05	2.419E-04	2.248E+00	7.064E-06	3.542E-04
Motor Coach	Diesel	3.217E-05	3.894E-03	2.524E-04	3.701E-05	4.184E-05	2.646E-05	1.952E-04	2.635E-04	4.003E-05	6.614E-06	6.833E-05	1.150E-04	3.908E+00	1.494E-06	6.157E-04
OBUS	Gasoline	1.367E-04	1.117E-03	3.492E-03	3.700E-05	1.876E-06	2.646E-05	9.705E-05	1.254E-04	1.725E-06	6.614E-06	3.397E-05	4.231E-05	3.743E+00	2.794E-05	5.286E-05
PTO	Diesel	5.246E-05	6.568E-03	5.774E-04	4.330E-05	1.084E-05	0.000E+00	0.000E+00	1.084E-05	1.037E-05	0.000E+00	0.000E+00	1.037E-05	4.573E+00	2.437E-06	7.204E-04
PTO	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SBUS	Gasoline	1.595E-04	1.153E-03	3.157E-03	1.965E-05	2.560E-06	1.764E-05	1.033E-04	1.235E-04	2.354E-06	4.409E-06	3.615E-05	4.291E-05	1.988E+00	3.196E-05	6.178E-05
SBUS	Diesel	3.623E-04	2.048E-02	8.551E-04	2.665E-05	1.205E-04	2.646E-05	1.033E-04	2.503E-04	1.153E-04	6.614E-06	3.615E-05	1.581E-04	2.814E+00	1.683E-05	4.434E-04
SBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	5.164E-05	7.809E-05	0.000E+00	6.614E-06	1.807E-05	2.469E-05	0.000E+00	0.000E+00	0.000E+00
SBUS	Natural Gas	1.494E-04	1.957E-03	3.633E-02	0.000E+00	9.883E-06	2.646E-05	1.033E-04	1.396E-04	9.087E-06	6.614E-06	3.615E-05	5.185E-05	3.793E+00	1.046E-02	7.733E-04
T6 CAIRP Class 4	Diesel	2.406E-05	1.036E-03	1.114E-04	2.309E-05	1.664E-05	2.646E-05	9.483E-05	1.379E-04	1.592E-05	6.614E-06	3.319E-05	5.572E-05	2.438E+00	1.117E-06	3.841E-04
T6 CAIRP Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.741E-05	7.387E-05	0.000E+00	6.614E-06	1.660E-05	2.321E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 5	Diesel	1.475E-05	9.165E-04	8.582E-05	2.306E-05	1.162E-05	2.646E-05	9.483E-05	1.329E-04	1.112E-05	6.614E-06	3.319E-05	5.092E-05	2.436E+00	6.850E-07	3.837E-04
T6 CAIRP Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.741E-05	7.387E-05	0.000E+00	6.614E-06	1.660E-05	2.321E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 6	Diesel	1.950E-05	8.903E-04	9.681E-05	2.269E-05	1.414E-05	2.646E-05	9.483E-05	1.354E-04	1.353E-05	6.614E-06	3.319E-05	5.333E-05	2.397E+00	9.055E-07	3.776E-04
T6 CAIRP Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.741E-05	7.387E-05	0.000E+00	6.614E-06	1.660E-05	2.321E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Diesel	1.277E-05	9.849E-04	8.517E-05	2.151E-05	1.132E-05	2.646E-05	9.483E-05	1.326E-04	1.083E-05	6.614E-06	3.319E-05	5.063E-05	2.272E+00	5.931E-07	3.579E-04
T6 CAIRP Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.741E-05	7.387E-05	0.000E+00	6.614E-06	1.660E-05	2.321E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Natural Gas	1.443E-05	3.018E-04	5.138E-03	0.000E+00	1.393E-06	2.646E-05	9.483E-05	1.227E-04	1.281E-06	6.614E-06	3.319E-05	4.108E-05	1.779E+00	1.010E-03	3.626E-04
T6 Instate Delivery Class 4	Diesel	1.316E-04	3.573E-03	4.651E-04	2.273E-05	6.788E-05	2.646E-05	9.662E-05	1.910E-04	6.494E-05	6.614E-06	3.382E-05	1.054E-04	2.400E+00	6.115E-06	3.782E-04
T6 Instate Delivery Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.831E-05	7.477E-05	0.000E+00	6.614E-06	1.691E-05	2.352E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 4	Natural Gas	1.716E-05	2.789E-04	5.489E-03	0.000E+00	1.951E-06	2.646E-05	9.662E-05	1.250E-04	1.793E-06	6.614E-06	3.382E-05	4.222E-05	1.937E+00	1.201E-03	3.949E-04
T6 Instate Delivery Class 5	Diesel	4.386E-05	1.690E-03	1.890E-04	2.290E-05	2.532E-05	2.646E-05	9.662E-05	1.484E-04	2.423E-05	6.614E-06	3.382E-05	6.466E-05	2.418E+00	2.037E-06	3.809E-04
T6 Instate Delivery Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.831E-05	7.477E-05	0.000E+00	6.614E-06	1.691E-05	2.352E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 5	Natural Gas	1.712E-05	2.819E-04	5.497E-03	0.000E+00	1.931E-06	2.646E-05	9.662E-05	1.250E-04	1.776E-06	6.614E-06	3.382E-05	4.221E-05	1.919E+00	1.198E-03	3.913E-04
T6 Instate Delivery Class 6	Diesel	5.518E-05	1.988E-03	2.250E-04	2.278E-05	3.083E-05	2.646E-05	9.662E-05	1.539E-04	2.950E-05	6.614E-06	3.382E-05	6.993E-05	2.406E+00	2.563E-06	3.791E-04
T6 Instate Delivery Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.831E-05	7.477E-05	0.000E+00	6.614E-06	1.691E-05	2.352E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 6	Natural Gas	1.695E-05	2.942E-04	5.530E-03	0.000E+00	1.854E-06	2.646E-05	9.662E-05	1.249E-04	1.705E-06	6.614E-06	3.382E-05	4.214E-05	1.924E+00	1.186E-03	3.923E-04
T6 Instate Delivery Class 7	Diesel	1.832E-05	1.633E-03	1.259E-04	2.265E-05	1.220E-05	2.646E-05	9.662E-05	1.353E-04	1.167E-05	6.614E-06	3.382E-05	5.210E-05	2.392E+00	8.509E-07	3.768E-04
T6 Instate Delivery Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.831E-05	7.477E-05	0.000E+00	6.614E-06	1.691E-05	2.352E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 7	Natural Gas	1.657E-05	3.272E-04	5.648E-03	0.000E+00	1.689E-06	2.646E-05	9.662E-05	1.248E-04	1.553E-06	6.614E-06	3.382E-05	4.198E-05	1.952E+00	1.160E-03	3.979E-04
T6 Instate Other Class 4	Diesel	1.127E-04	3.195E-03	3.941E-04	2.290E-05	6.262E-05	2.646E-05	9.633E-05	1.854E-04	5.991E-05	6.614E-06	3.372E-05	1.002E-04	2.418E+00	5.236E-06	3.810E-04
T6 Instate Other Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 4	Natural Gas	1.642E-05	3.071E-04	5.492E-03	0.000E+00	1.712E-06	2.646E-05	9.633E-05	1.245E-04	1.574E-06	6.614E-06	3.372E-05	4.190E-05	1.956E+00	1.149E-03	3.988E-04
T6 Instate Other Class 5	Diesel	2.819E-05	1.420E-03	1.396E-04	2.305E-05	1.708E-05	2.646E-05	9.633E-05	1.399E-04	1.634E-05	6.614E-06	3.372E-05	5.667E-05	2.434E+00	1.309E-06	3.835E-04
T6 Instate Other Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 5	Natural Gas	1.637E-05	3.104E-04	5.502E-03	0.000E+00	1.691E-06	2.646E-05	9.633E-05	1.245E-04	1.555E-06	6.614E-06	3.372E-05	4.189E-05	1.916E+00	1.146E-03	3.906E-04
T6 Instate Other Class 6	Diesel	5.976E-05	2.055E-03	2.364E-04	2.296E-05	3.473E-05	2.646E-05	9.633E-05	1.575E-04	3.323E-05	6.614E-06	3.372E-05	7.356E-05	2.425E+00	2.776E-06	3.821E-04
T6 Instate Other Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 6	Natural Gas	1.608E-05	3.312E-04	5.564E-03	0.000E+00	1.560E-06	2.646E-05	9.633E-05	1.243E-04	1.434E-06	6.614E-06	3.372E-05	4.176E-05	1.930E+00	1.125E-03	3.935E-04
T6 Instate Other Class 7	Diesel	1.995E-05	1.583E-03	1.246E-04	2.272E-05	1.322E-05	2.646E-05	9.633E-05	1.360E-04	1.265E-05	6.614E-06	3.372E-05	5.298E-05	2.399E+00	9.267E-07	3.780E-04
T6 Instate Other Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 7	Natural Gas	1.661E-05	2.992E-04	5.498E-03	0.000E+00	1.807E-06	2.646E-05	9.633E-05	1.246E-04	1.662E-06	6.614E-06	3.372E-05	4.199E-05	1.939E+00	1.163E-03	3.953E-04
T6 Instate Tractor Class 6	Diesel	2.599E-05	1.282E-03	1.308E-04	2.290E-05	1.683E-05	2.646E-05	9.633E-05	1.396E-04	1.610E-05	6.614E-06	3.372E-05	5.643E-05	2.418E+00	1.207E-06	3.809E-04
T6 Instate Tractor Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Class 6	Natural Gas	1.747E-05	2.320E-04	5.266E-03	0.000E+00	2.187E-06	2.646E-05	9.633E-05	1.250E-04	2.011E-06	6.614E-06	3.372E-05	4.234E-05	1.912E+00	1.223E-03	3.897E-04
T6 Instate Tractor Class 7	Diesel	1.997E-05	1.711E-03	1.277E-04	2.165E-05	1.332E-05	2.646E-05	9.633E-05	1.361E-04	1.275E-05	6.614E-06	3.372E-05	5.308E-05	2.287E+00	9.276E-07	3.603E-04
T6 Instate Tractor Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.817E-05	7.462E-05	0.000E+00	6.614E-06	1.686E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Class 7	Natural Gas	1.634E-05	3.182E-04	5.553E-03	0.000E+00	1.683E-06	2.646E-05	9.633E-05	1.245E-04	1.548E-06	6.614E-06	3.372E-05	4.188E-05	1.935E+00	1.144E-03	3.945E-04
T6 OOS Class 4	Diesel	3.106E-05	1.179E-03	1.314E-04	2.308E-05	2.036E-05	2.646E-05	9.483E-05	1.416E-04	1.948E-05	6.614E-06	3.319E-05	5.929E-05	2.437E+00	1.443E-06	3.840E-04
T6 OOS Class 5	Diesel	1.612E-05	9.472E-04	8.964E-05	2.306E-05	1.227E-05	2.646E-05	9.483E-05	1.336E-04	1.174E-05	6.614E-06	3.319E-05	5.154E-05	2.435E+00	7.489E-07	3.836E-04
T6 OOS Class 6	Diesel	2.465E-05	1.001E-03	1.117E-04	2.268E-05	1.689E-05	2.646E-05	9.483E-05	1.382E-04	1.616E-05	6.614E-06	3.319E-05	5.596E-05	2.395E+00	1.145E-06	3.773E-04
T6 OOS Class 7	Diesel	1.261E-05	9.912E-04	8.485E-05	2.141E-05	1.128E-05	2.646E-05	9.483E-05	1.326E-04	1.079E-05	6.614E-06	3.319E-05	5.060E-05	2.261E+00	5.855E-07	3.562E-04
T6 Public Class 4	Diesel	6.860E-05	7.877E-03	2.344E-04	2.291E-05	4.199E-05	2.646E-05	9.550E-05	1.639E-04	4.017E-05	6.614E-06	3.342E-05	8.021E-05	2.420E+00	3.186E-06	3.812E-04
T6 Public Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.775E-05	7.420E-05	0.000E+00	6.614E-06	1.671E-05	2.333E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 4	Natural Gas	1.633E-05	2.414E-04	5.035E-03	0.000E+00	1.975E-06	2.646E-05	9.550E-05	1.239E-04	1.816E-06	6.614E-06	3.342E-05	4.185E-05	1.848E+00	1.143E-03	3.768E-04
T6 Public Class 5	Diesel	6.947E-05	8.044E-03	2.324E-04	2.328E-05	4.110E-05	2.646E-05	9.550E-05	1.631E-04	3.932E-05	6.614E-06	3.342E-05	7.936E-05	2.458E+00	3.227E-06	3.873E-04
T6 Public Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.775E-05	7.420E-05	0.000E+00	6.614E-06	1.671E-05	2.333E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 5	Natural Gas	1.618E-05	2.561E-04	5.115E-03	0.000E+00	1.917E-06	2.646E-05	9.550E-05	1.239E-04	1.762E-06	6.614E-06	3.342E-05	4.180E-05	1.852E+00	1.133E-03	3.775E-04
T6 Public Class 6	Diesel	1.252E-04	1.333E-02	3.662E-04	2.347E-05	7.934E-05	2.646E-05	9.550E-05	2.013E-04	7.591E-05	6.614E-06	3.342E-05	1.159E-04	2.479E+00	5.815E-06	3.906E-04
T6 Public Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.775E-05	7.420E-05	0.000E+00	6.614E-06	1.671E-05	2.333E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 6	Natural Gas	1.673E-05	2.121E-04	4.900E-03	0.000E+00	2.144E-06	2.646E-05	9.550E-05	1.241E-04	1.971E-06	6.614E-06	3.342E-05	4.201E-05	1.860E+00	1.171E-03	3.791E-04
T6 Public Class 7	Diesel	1.008E-04	1.089E-02	3.086E-04	2.334E-05	6.743E-05	2.646E-05	9.550E-05	1.894E-04	6.451E-05	6.614E-06	3.342E-05	1.045E-04	2.464E+00	4.682E-06	3.883E-04
T6 Public Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.775E-05	7.420E-05	0.000E+00	6.614E-06	1.671E-05	2.333E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 7	Natural Gas	1.714E-05	1.869E-04	4.799E-03	0.000E+00	2.318E-06	2.646E-05	9.550E-05	1.243E-04	2.132E-06	6.614E-06	3.342E-05	4.217E-05	1.846E+00	1.199E-03	3.763E-04
T6 Utility Class 5	Diesel	1.394E-05	1.059E-03	8.328E-05	2.206E-05	9.498E-06	2.646E-05	9.550E-05	1.314E-04	9.087E-06	6.614E-06	3.342E-05	4.912E-05	2.330E+00	6.475E-07	3.671E-04
T6 Utility Class 5	Natural Gas	1.553E-05	2.899E-04	5.223E-03	0.000E+00	1.625E-06	2.646E-05	9.550E-05	1.236E-04	1.494E-06	6.614E-06	3.342E-05	4.153E-05	1.854E+00	1.087E-03	3.779E-04
T6 Utility Class 6	Diesel	1.224E-05	1.075E-03	8.277E-05	2.196E-05	9.069E-06	2.646E-05	9.550E-05	1.310E-04	8.676E-06	6.614E-06	3.342E-05	4.871E-05	2.319E+00	5.683E-07	3.654E-04
T6 Utility Class 6	Natural Gas	1.478E-05	3.400E-04	5.438E-03	0.000E+00	1.303E-06	2.646E-05	9.550E-05	1.233E-04	1.198E-06	6.614E-06	3.342E-05	4.124E-05	1.847E+00	1.035E-03	3.766E-04
T6 Utility Class 7	Diesel	9.716E-06	8.820E-04	7.477E-05	2.205E-05	8.028E-06	2.646E-05	9.550E-05	1.300E-04	7.681E-06	6.614E-06	3.342E-05	4.772E-05	2.329E+00	4.513E-07	3.669E-04
T6 Utility Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.775E-05	7.420E-05	0.000E+00	6.614E-06	1.671E-05	2.333E-05	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 7	Natural Gas	1.478E-05	3.404E-04	5.439E-03	0.000E+00	1.301E-06	2.646E-05	9.550E-05	1.233E-04	1.196E-06	6.614E-06	3.342E-05	4.123E-05	1.844E+00	1.034E-03	3.758E-04
T6TS	Gasoline	1.506E-04	1.102E-03	3.909E-03	3.621E-05	2.287E-06	2.646E-05	9.611E-05	1.249E-04	2.103E-06	6.614E-06	3.364E-05	4.236E-05	3.662E+00	3.057E-05	5.374E-05
T7 CAIRP Class 8	Diesel	2.800E-05	3.421E-03	1.666E-04	3.216E-05	5.948E-05	7.937E-05	1.767E-04	3.155E-04	5.691E-05	1.984E-05	6.184E-05	1.386E-04	3.396E+00	1.300E-06	5.351E-04
T7 CAIRP Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	8.834E-05	1.677E-04	0.000E+00	1.984E-05	3.092E-05	5.076E-05	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Natural Gas	3.080E-05	7.347E-04	1.424E-02	0.000E+00	3.738E-06	7.937E-05	1.767E-04	2.598E-04	3.437E-06	1.984E-05	6.184E-05	8.512E-05	2.631E+00	2.156E-03	5.364E-04
T7 NNOOS Class 8	Diesel	2.585E-05	3.224E-03	1.440E-04	3.200E-05	5.553E-05	7.937E-05	1.767E-04	3.116E-04	5.313E-05	1.984E-05	6.184E-05	1.348E-04	3.380E+00	1.201E-06	5.325E-04
T7 NOOS Class 8	Diesel	2.857E-05	3.486E-03	1.682E-04	3.204E-05	6.062E-05	7.937E-05	1.767E-04	3.167E-04	5.800E-05	1.984E-05	6.184E-05	1.397E-04	3.383E+00	1.327E-06	5.330E-04
T7 POAK Class 8	Diesel	1.986E-05	2.631E-03	1.021E-04	3.590E-05	4.166E-05	7.937E-05	1.795E-04	3.005E-04	3.986E-05	1.984E-05	6.282E-05	1.225E-04	3.791E+00	9.223E-07	5.973E-04
T7 POLA Class 8	Diesel	2.482E-05	3.516E-03	2.022E-04	3.405E-05	5.056E-05	7.937E-05	1.795E-04	3.094E-04	4.837E-05	1.984E-05	6.282E-05	1.310E-04	3.596E+00	1.153E-06	5.665E-04
T7 POLA Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	8.974E-05	1.691E-04	0.000E+00	1.984E-05	3.141E-05	5.125E-05	0.000E+00	0.000E+00	0.000E+00
T7 POLA Class 8	Natural Gas	3.131E-05	8.950E-04	1.691E-02	0.000E+00	3.466E-06	7.937E-05	1.795E-04	2.623E-04	3.186E-06	1.984E-05	6.282E-05	8.585E-05	2.846E+00	2.191E-03	5.801E-04
T7 Public Class 8	Diesel	1.725E-04	2.247E-02	7.166E-04	3.551E-05	1.403E-04	7.937E-05	2.172E-04	4.368E-04	1.342E-04	1.984E-05	7.602E-05	2.301E-04	3.750E+00	8.014E-06	5.908E-04
T7 Public Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	8.958E-05	1.689E-04	0.000E+00	1.984E-05	3.135E-05	5.119E-05	0.000E+00	0.000E+00	0.000E+00
T7 Public Class 8	Natural Gas	3.147E-05	7.498E-04	1.455E-02	0.000E+00	3.817E-06	7.937E-05	1.808E-04	2.640E-04	3.510E-06	1.984E-05	6.328E-05	8.663E-05	2.717E+00	2.203E-03	5.538E-04
T7 Single Concrete/Transit M	Diesel	2.028E-05	2.218E-03	1.444E-04	3.396E-05	2.996E-05	7.937E-05	1.827E-04	2.920E-04	2.867E-05	1.984E-05	6.394E-05	1.125E-04	3.587E+00	9.420E-07	5.651E-04
T7 Single Concrete/Transit M	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.134E-05	1.707E-04	0.000E+00	1.984E-05	3.197E-05	5.181E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Concrete/Transit M	Natural Gas	3.265E-05	5.584E-04	1.214E-02	0.000E+00	4.408E-06	7.937E-05	1.827E-04	2.664E-04	4.053E-06	1.984E-05	6.394E-05	8.783E-05	2.765E+00	2.285E-03	5.637E-04
T7 Single Dump Class 8	Diesel	3.876E-05	3.524E-03	2.369E-04	3.379E-05	3.661E-05	7.937E-05	1.827E-04	2.987E-04	3.503E-05	1.984E-05	6.396E-05	1.188E-04	3.568E+00	1.800E-06	5.621E-04
T7 Single Dump Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.134E-05	1.707E-04	0.000E+00	1.984E-05	3.197E-05	5.181E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Dump Class 8	Natural Gas	3.227E-05	9.171E-04	1.698E-02	0.000E+00	3.601E-06	7.937E-05	1.827E-04	2.656E-04	3.311E-06	1.984E-05	6.394E-05	8.709E-05	2.887E+00	2.259E-03	5.885E-04
T7 Single Other Class 8	Diesel	2.639E-05	2.560E-03	1.683E-04	3.362E-05	3.124E-05	7.937E-05	1.827E-04	2.933E-04	2.989E-05	1.984E-05	6.395E-05	1.137E-04	3.551E+00	1.226E-06	5.594E-04
T7 Single Other Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.134E-05	1.707E-04	0.000E+00	1.984E-05	3.197E-05	5.181E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Other Class 8	Natural Gas	3.251E-05	7.062E-04	1.402E-02	0.000E+00	4.091E-06	7.937E-05	1.827E-04	2.661E-04	3.761E-06	1.984E-05	6.394E-05	8.754E-05	2.755E+00	2.275E-03	5.616E-04
T7 SWCV Class 8	Diesel	3.383E-06	3.293E-02	2.666E-05	8.022E-05	3.275E-05	7.937E-05	4.630E-04	5.751E-04	3.134E-05	1.984E-05	1.620E-04	2.132E-04	8.472E+00	1.571E-07	1.335E-03
T7 SWCV Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	2.315E-04	3.108E-04	0.000E+00	1.984E-05	8.102E-05	1.009E-04	0.000E+00	0.000E+00	0.000E+00
T7 SWCV Class 8	Natural Gas	1.390E-04	3.068E-03	2.268E-02	0.000E+00	7.348E-06	7.937E-05	4.630E-04	5.497E-04	6.756E-06	1.984E-05	1.620E-04	1.886E-04	2.723E+00	4.140E-03	5.551E-04
T7 Tractor Class 8	Diesel	3.200E-05	3.463E-03	1.804E-04	3.247E-05	4.929E-05	7.937E-05	1.768E-04	3.055E-04	4.716E-05	1.984E-05	6.188E-05	1.289E-04	3.429E+00	1.486E-06	5.402E-04
T7 Tractor Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	8.840E-05	1.678E-04	0.000E+00	1.984E-05	3.094E-05	5.078E-05	0.000E+00	0.000E+00	0.000E+00
T7 Tractor Class 8	Natural Gas	3.092E-05	6.866E-04	1.318E-02	0.000E+00	3.892E-06	7.937E-05	1.768E-04	2.601E-04	3.578E-06	1.984E-05	6.188E-05	8.530E-05	2.706E+00	2.164E-03	5.516E-04
T7 Utility Class 8	Diesel	2.109E-05	2.255E-03	1.522E-04	3.369E-05	2.526E-05	7.937E-05	1.792E-04	2.838E-04	2.417E-05	1.984E-05	6.271E-05	1.067E-04	3.558E+00	9.798E-07	5.605E-04
T7 Utility Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	8.958E-05	1.689E-04	0.000E+00	1.984E-05	3.135E-05	5.119E-05	0.000E+00	0.000E+00	0.000E+00
T7IS	Gasoline	2.130E-03	1.592E-02	1.111E-01	4.706E-05	4.273E-06	4.409E-05	2.174E-04	2.657E-04	3.929E-06	1.102E-05	7.608E-05	9.103E-05	4.760E+00	3.785E-04	4.498E-04
UBUS	Gasoline	3.706E-05	5.496E-04	9.247E-04	4.084E-05	2.784E-06	2.416E-05	2.316E-04	2.586E-04	2.560E-06	6.040E-06	8.106E-05	8.966E-05	4.131E+00	1.114E-05	4.640E-05
UBUS	Diesel	2.295E-04	1.878E-03	2.966E-04	3.624E-05	1.395E-05	7.717E-05	2.425E-04	3.336E-04	1.334E-05	1.929E-05	8.488E-05	1.175E-04	3.825E+00	1.066E-05	6.026E-04
UBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.757E-05	1.202E-04	1.777E-04	0.000E+00	1.439E-05	4.206E-05	5.645E-05	0.000E+00	0.000E+00	0.000E+00
UBUS	Natural Gas	8.343E-05	1.512E-03	8.575E-02	0.000E+00	8.568E-07	7.395E-05	2.422E-04	3.170E-04	8.197E-07	1.849E-05	8.478E-05	1.041E-04	5.682E+00	5.781E-03	1.158E-03
	Total															

Source: EMFAC2021 (v1.0.2) Em

Region Type: Sub-Area
Region: Los Angeles
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day

		MTons/Mile														
Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
All Other Buses	Diesel	1.002E-07	1.913E-06	3.326E-07	1.033E-08	5.170E-08	1.200E-08	4.402E-08	1.077E-07	4.946E-08	3.000E-09	1.541E-08	6.787E-08	1.091E-03	4.653E-09	1.719E-07
All Other Buses	Natural Gas	7.593E-09	1.566E-07	2.598E-06	0.000E+00	7.447E-10	1.200E-08	4.402E-08	5.677E-08	6.847E-10	3.000E-09	1.541E-08	1.909E-08	8.924E-04	5.314E-07	1.819E-07
LDA	Gasoline	1.248E-08	4.813E-08	8.760E-07	2.912E-09	1.592E-09	8.000E-09	8.795E-09	1.839E-08	1.464E-09	2.000E-09	3.078E-09	6.542E-09	2.946E-04	3.193E-09	5.094E-09
LDA	Diesel	4.994E-08	2.687E-07	4.809E-07	2.431E-09	3.245E-08	8.000E-09	8.940E-09	4.939E-08	3.105E-08	2.000E-09	3.129E-09	3.618E-08	2.566E-04	2.320E-09	4.042E-08
LDA	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.367E-09	1.237E-08	0.000E+00	2.000E-09	1.528E-09	3.528E-09	0.000E+00	0.000E+00	0.000E+00
LDA	Plug-in Hybrid	1.728E-09	3.507E-09	2.499E-07	1.511E-09	8.228E-10	8.000E-09	4.133E-09	1.296E-08	7.566E-10	2.000E-09	1.447E-09	4.203E-09	1.528E-04	5.515E-10	6.448E-10
LDT1	Gasoline	5.040E-08	1.987E-07	2.156E-06	3.476E-09	2.816E-09	8.000E-09	1.089E-08	2.170E-08	2.590E-09	2.000E-09	3.811E-09	8.400E-09	3.516E-04	1.115E-08	1.336E-08
LDT1	Diesel	3.301E-07	1.518E-06	1.796E-06	4.192E-09	2.690E-07	8.000E-09	1.247E-08	2.894E-07	2.573E-07	2.000E-09	4.363E-09	2.637E-07	4.424E-04	1.533E-08	6.971E-08
LDT1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.392E-09	1.239E-08	0.000E+00	2.000E-09	1.537E-09	3.537E-09	0.000E+00	0.000E+00	0.000E+00
LDT1	Plug-in Hybrid	1.577E-09	3.201E-09	2.288E-07	1.380E-09	4.970E-10	8.000E-09	4.141E-09	1.264E-08	4.570E-10	2.000E-09	1.449E-09	3.906E-09	1.396E-04	5.036E-10	5.891E-10
LDT2	Gasoline	1.673E-08	8.719E-08	1.040E-06	3.584E-09	1.656E-09	8.000E-09	1.038E-08	2.003E-08	1.523E-09	2.000E-09	3.631E-09	7.154E-09	3.625E-04	4.155E-09	6.982E-09
LDT2	Diesel	2.060E-08	5.609E-08	1.808E-07	3.134E-09	6.988E-09	8.000E-09	1.015E-08	2.514E-08	6.686E-09	2.000E-09	3.553E-09	1.224E-08	3.307E-04	9.569E-10	5.210E-08
LDT2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.355E-09	1.236E-08	0.000E+00	2.000E-09	1.524E-09	3.524E-09	0.000E+00	0.000E+00	0.000E+00
LDT2	Plug-in Hybrid	1.637E-09	3.324E-09	2.374E-07	1.433E-09	6.297E-10	8.000E-09	4.136E-09	1.277E-08	5.790E-10	2.000E-09	1.448E-09	4.027E-09	1.450E-04	5.233E-10	6.124E-10
LHD1	Gasoline	3.347E-08	1.873E-07	1.171E-06	6.349E-09	1.224E-09	8.000E-09	7.800E-08	8.722E-08	1.125E-09	2.000E-09	2.730E-08	3.043E-08	6.422E-04	6.644E-09	1.041E-08
LHD1	Diesel	9.906E-08	1.329E-06	2.748E-07	4.726E-09	2.286E-08	1.200E-08	7.800E-08	1.129E-07	2.187E-08	3.000E-09	2.730E-08	5.217E-08	4.987E-04	4.601E-09	7.858E-08
LHD2	Gasoline	2.227E-08	1.860E-07	8.847E-07	7.258E-09	1.090E-09	8.000E-09	9.100E-08	1.001E-07	1.002E-09	2.000E-09	3.185E-08	3.485E-08	7.342E-04	4.740E-09	1.107E-08
LHD2	Diesel	9.716E-08	1.162E-06	2.456E-07	5.609E-09	2.251E-08	1.200E-08	9.100E-08	1.255E-07	2.153E-08	3.000E-09	3.185E-08	5.638E-08	5.920E-04	4.513E-09	9.327E-08
MCY	Gasoline	1.191E-06	5.556E-07	1.298E-05	1.935E-09	2.282E-09	4.000E-09	1.200E-08	1.828E-08	2.135E-09	1.000E-09	4.200E-09	7.335E-09	1.957E-04	1.819E-07	3.893E-08
MDV	Gasoline	2.785E-08	1.447E-07	1.350E-06	4.391E-09	1.743E-09	8.000E-09	1.066E-08	2.041E-08	1.603E-09	2.000E-09	3.732E-09	7.335E-09	4.441E-04	6.421E-09	1.005E-08
MDV	Diesel	2.005E-08	1.108E-07	3.094E-07	4.174E-09	9.392E-09	8.000E-09	1.053E-08	2.793E-08	8.986E-09	2.000E-09	3.687E-09	1.467E-08	4.405E-04	9.312E-10	6.939E-08
MDV	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.354E-09	1.235E-08	0.000E+00	2.000E-09	1.524E-09	3.524E-09	0.000E+00	0.000E+00	0.000E+00
MDV	Plug-in Hybrid	1.685E-09	3.421E-09	2.441E-07	1.474E-09	7.880E-10	8.000E-09	4.136E-09	1.292E-08	7.245E-10	2.000E-09	1.447E-09	4.172E-09	1.491E-04	5.337E-10	6.196E-10
MH	Gasoline	7.333E-08	4.476E-07	2.220E-06	1.759E-08	1.531E-09	1.200E-08	4.360E-08	5.713E-08	1.408E-09	3.000E-09	1.526E-08	1.967E-08	1.779E-03	1.605E-08	2.638E-08
MH	Diesel	6.898E-08	3.624E-06	2.909E-07	9.664E-09	9.467E-08	1.600E-08	4.332E-08	1.540E-07	9.058E-08	4.000E-09	1.516E-08	1.097E-07	1.020E-03	3.204E-09	1.607E-07
Motor Coach	Diesel	1.459E-08	1.766E-06	1.145E-07	1.679E-08	1.898E-08	1.200E-08	8.856E-08	1.195E-07	1.816E-08	3.000E-09	3.100E-08	5.215E-08	1.773E-03	6.779E-10	2.793E-07
OBUS	Gasoline	6.202E-08	5.067E-07	1.584E-06	1.678E-08	8.509E-10	1.200E-08	4.402E-08	5.687E-08	7.824E-10	3.000E-09	1.541E-08	1.919E-08	1.698E-03	1.267E-08	2.398E-08
PTO	Diesel	2.380E-08	2.979E-06	2.619E-07	1.964E-08	4.915E-09	0.000E+00	0.000E+00	4.915E-09	4.703E-09	0.000E+00	0.000E+00	4.703E-09	2.074E-03	1.105E-09	3.268E-07
PTO	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SBUS	Gasoline	7.236E-08	5.232E-07	1.432E-06	8.915E-09	1.161E-09	8.000E-09	4.685E-08	5.601E-08	1.068E-09	2.000E-09	1.640E-08	1.946E-08	9.018E-04	1.450E-08	2.802E-08
SBUS	Diesel	1.644E-07	9.289E-06	3.879E-07	1.209E-08	5.467E-08	1.200E-08	4.685E-08	1.135E-07	5.231E-08	3.000E-09	1.640E-08	7.170E-08	1.276E-03	7.634E-09	2.011E-07
SBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.342E-08	3.542E-08	0.000E+00	3.000E-09	8.198E-09	1.120E-08	0.000E+00	0.000E+00	0.000E+00
SBUS	Natural Gas	6.779E-08	8.875E-07	1.648E-05	0.000E+00	4.483E-09	1.200E-08	4.685E-08	6.333E-08	4.122E-09	3.000E-09	1.640E-08	2.352E-08	1.721E-03	4.744E-06	3.508E-07
T6 CAIRP Class 4	Diesel	1.091E-08	4.697E-07	5.055E-08	1.047E-08	7.548E-09	1.200E-08	4.301E-08	6.256E-08	7.222E-09	3.000E-09	1.506E-08	2.528E-08	1.106E-03	5.068E-10	1.742E-07
T6 CAIRP Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.151E-08	3.351E-08	0.000E+00	3.000E-09	7.528E-09	1.053E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 5	Diesel	6.690E-09	4.157E-07	3.893E-08	1.046E-08	5.272E-09	1.200E-08	4.301E-08	6.029E-08	5.044E-09	3.000E-09	1.506E-08	2.310E-08	1.105E-03	3.107E-10	1.741E-07
T6 CAIRP Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.151E-08	3.351E-08	0.000E+00	3.000E-09	7.528E-09	1.053E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 6	Diesel	8.843E-09	4.038E-07	4.391E-08	1.029E-08	6.412E-09	1.200E-08	4.301E-08	6.143E-08	6.135E-09	3.000E-09	1.506E-08	2.419E-08	1.087E-03	4.107E-10	1.713E-07
T6 CAIRP Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.151E-08	3.351E-08	0.000E+00	3.000E-09	7.528E-09	1.053E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Diesel	5.792E-09	4.467E-07	3.864E-08	9.759E-09	5.134E-09	1.200E-08	4.301E-08	6.015E-08	4.912E-09	3.000E-09	1.506E-08	2.297E-08	1.031E-03	2.690E-10	1.624E-07
T6 CAIRP Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.151E-08	3.351E-08	0.000E+00	3.000E-09	7.528E-09	1.053E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Natural Gas	6.547E-09	1.369E-07	2.331E-06	0.000E+00	6.318E-10	1.200E-08	4.301E-08	5.565E-08	5.809E-10	3.000E-09	1.506E-08	1.864E-08	8.069E-04	4.582E-07	1.645E-07
T6 Instate Delivery Class 4	Diesel	5.971E-08	1.621E-06	2.110E-07	1.031E-08	3.079E-08	1.200E-08	4.383E-08	8.662E-08	2.946E-08	3.000E-09	1.534E-08	4.780E-08	1.089E-03	2.774E-09	1.715E-07
T6 Instate Delivery Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.191E-08	3.391E-08	0.000E+00	3.000E-09	7.670E-09	1.067E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 4	Natural Gas	7.784E-09	1.265E-07	2.490E-06	0.000E+00	8.848E-10	1.200E-08	4.383E-08	5.671E-08	8.135E-10	3.000E-09	1.534E-08	1.915E-08	8.787E-04	5.448E-07	1.791E-07
T6 Instate Delivery Class 5	Diesel	1.989E-08	7.666E-07	8.572E-08	1.039E-08	1.149E-08	1.200E-08	4.383E-08	6.731E-08	1.099E-08	3.000E-09	1.534E-08	2.933E-08	1.097E-03	9.240E-10	1.728E-07
T6 Instate Delivery Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.191E-08	3.391E-08	0.000E+00	3.000E-09	7.670E-09	1.067E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 5	Natural Gas	7.765E-09	1.279E-07	2.493E-06	0.000E+00	8.761E-10	1.200E-08	4.383E-08	5.670E-08	8.055E-10	3.000E-09	1.534E-08	1.914E-08	8.707E-04	5.435E-07	1.775E-07
T6 Instate Delivery Class 6	Diesel	2.503E-08	9.016E-07	1.021E-07	1.033E-08	1.398E-08	1.200E-08	4.383E-08	6.981E-08	1.338E-08	3.000E-09	1.534E-08	3.172E-08	1.091E-03	1.163E-09	1.719E-07
T6 Instate Delivery Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.191E-08	3.391E-08	0.000E+00	3.000E-09	7.670E-09	1.067E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 6	Natural Gas	7.688E-09	1.334E-07	2.508E-06	0.000E+00	8.410E-10	1.200E-08	4.383E-08	5.667E-08	7.733E-10	3.000E-09	1.534E-08	1.911E-08	8.729E-04	5.381E-07	1.779E-07
T6 Instate Delivery Class 7	Diesel	8.310E-09	7.407E-07	5.710E-08	1.027E-08	5.532E-09	1.200E-08	4.383E-08	6.136E-08	5.293E-09	3.000E-09	1.534E-08	2.363E-08	1.085E-03	3.860E-10	1.709E-07
T6 Instate Delivery Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.191E-08	3.391E-08	0.000E+00	3.000E-09	7.670E-09	1.067E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Class 7	Natural Gas	7.517E-09	1.484E-07	2.562E-06	0.000E+00	7.662E-10	1.200E-08	4.383E-08	5.659E-08	7.045E-10	3.000E-09	1.534E-08	1.904E-08	8.854E-04	5.261E-07	1.805E-07
T6 Instate Other Class 4	Diesel	5.113E-08	1.449E-06	1.787E-07	1.039E-08	2.840E-08	1.200E-08	4.370E-08	8.410E-08	2.718E-08	3.000E-09	1.529E-08	4.547E-08	1.097E-03	2.375E-09	1.728E-07
T6 Instate Other Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 4	Natural Gas	7.447E-09	1.393E-07	2.491E-06	0.000E+00	7.763E-10	1.200E-08	4.370E-08	5.647E-08	7.138E-10	3.000E-09	1.529E-08	1.901E-08	8.873E-04	5.212E-07	1.809E-07
T6 Instate Other Class 5	Diesel	1.279E-08	6.441E-07	6.330E-08	1.046E-08	7.749E-09	1.200E-08	4.370E-08	6.345E-08	7.414E-09	3.000E-09	1.529E-08	2.571E-08	1.104E-03	5.939E-10	1.740E-07
T6 Instate Other Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 5	Natural Gas	7.426E-09	1.408E-07	2.496E-06	0.000E+00	7.670E-10	1.200E-08	4.370E-08	5.646E-08	7.052E-10	3.000E-09	1.529E-08	1.900E-08	8.691E-04	5.197E-07	1.772E-07
T6 Instate Other Class 6	Diesel	2.711E-08	9.321E-07	1.072E-07	1.042E-08	1.575E-08	1.200E-08	4.370E-08	7.145E-08	1.507E-08	3.000E-09	1.529E-08	3.337E-08	1.100E-03	1.259E-09	1.733E-07
T6 Instate Other Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 6	Natural Gas	7.293E-09	1.502E-07	2.524E-06	0.000E+00	7.075E-10	1.200E-08	4.370E-08	5.640E-08	6.505E-10	3.000E-09	1.529E-08	1.894E-08	8.756E-04	5.104E-07	1.785E-07
T6 Instate Other Class 7	Diesel	9.050E-09	7.179E-07	5.651E-08	1.031E-08	5.996E-09	1.200E-08	4.370E-08	6.169E-08	5.737E-09	3.000E-09	1.529E-08	2.403E-08	1.088E-03	4.203E-10	1.715E-07
T6 Instate Other Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Class 7	Natural Gas	7.535E-09	1.357E-07	2.494E-06	0.000E+00	8.198E-10	1.200E-08	4.370E-08	5.652E-08	7.537E-10	3.000E-09	1.529E-08	1.905E-08	8.796E-04	5.274E-07	1.793E-07
T6 Instate Tractor Class 6	Diesel	1.179E-08	5.815E-07	5.933E-08	1.039E-08	7.634E-09	1.200E-08	4.370E-08	6.333E-08	7.303E-09	3.000E-09	1.529E-08	2.560E-08	1.097E-03	5.476E-10	1.728E-07
T6 Instate Tractor Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Class 6	Natural Gas	7.926E-09	1.052E-07	2.389E-06	0.000E+00	9.919E-10	1.200E-08	4.370E-08	5.669E-08	9.120E-10	3.000E-09	1.529E-08	1.921E-08	8.672E-04	5.547E-07	1.768E-07
T6 Instate Tractor Class 7	Diesel	9.059E-09	7.760E-07	5.792E-08	9.823E-09	6.044E-09	1.200E-08	4.370E-08	6.174E-08	5.783E-09	3.000E-09	1.529E-08	2.408E-08	1.037E-03	4.208E-10	1.634E-07
T6 Instate Tractor Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.185E-08	3.385E-08	0.000E+00	3.000E-09	7.647E-09	1.065E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Class 7	Natural Gas	7.411E-09	1.443E-07	2.519E-06	0.000E+00	7.636E-10	1.200E-08	4.370E-08	5.646E-08	7.021E-10	3.000E-09	1.529E-08	1.900E-08	8.778E-04	5.187E-07	1.790E-07
T6 OOS Class 4	Diesel	1.409E-08	5.346E-07	5.960E-08	1.047E-08	9.237E-09	1.200E-08	4.301E-08	6.425E-08	8.837E-09	3.000E-09	1.506E-08	2.689E-08	1.106E-03	6.543E-10	1.742E-07
T6 OOS Class 5	Diesel	7.314E-09	4.297E-07	4.066E-08	1.046E-08	5.565E-09	1.200E-08	4.301E-08	6.058E-08	5.324E-09	3.000E-09	1.506E-08	2.338E-08	1.104E-03	3.397E-10	1.740E-07
T6 OOS Class 6	Diesel	1.118E-08	4.542E-07	5.067E-08	1.029E-08	7.660E-09	1.200E-08	4.301E-08	6.267E-08	7.328E-09	3.000E-09	1.506E-08	2.538E-08	1.086E-03	5.193E-10	1.711E-07
T6 OOS Class 7	Diesel	5.718E-09	4.496E-07	3.849E-08	9.710E-09	5.116E-09	1.200E-08	4.301E-08	6.013E-08	4.895E-09	3.000E-09	1.506E-08	2.295E-08	1.025E-03	2.656E-10	1.616E-07
T6 Public Class 4	Diesel	3.112E-08	3.573E-06	1.063E-07	1.039E-08	1.905E-08	1.200E-08	4.332E-08	7.436E-08	1.822E-08	3.000E-09	1.516E-08	3.638E-08	1.098E-03	1.445E-09	1.729E-07
T6 Public Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.166E-08	3.366E-08	0.000E+00	3.000E-09	7.580E-09	1.058E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 4	Natural Gas	7.409E-09	1.095E-07	2.284E-06	0.000E+00	8.958E-10	1.200E-08	4.332E-08	5.621E-08	8.237E-10	3.000E-09	1.516E-08	1.898E-08	8.384E-04	5.185E-07	1.709E-07
T6 Public Class 5	Diesel	3.151E-08	3.649E-06	1.054E-07	1.056E-08	1.864E-08	1.200E-08	4.332E-08	7.396E-08	1.784E-08	3.000E-09	1.516E-08	3.600E-08	1.115E-03	1.464E-09	1.757E-07
T6 Public Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.166E-08	3.366E-08	0.000E+00	3.000E-09	7.580E-09	1.058E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 5	Natural Gas	7.341E-09	1.162E-07	2.320E-06	0.000E+00	8.694E-10	1.200E-08	4.332E-08	5.619E-08	7.994E-10	3.000E-09	1.516E-08	1.896E-08	8.399E-04	5.138E-07	1.712E-07
T6 Public Class 6	Diesel	5.679E-08	6.045E-06	1.661E-07	1.065E-08	3.599E-08	1.200E-08	4.332E-08	9.131E-08	3.443E-08	3.000E-09	1.516E-08	5.259E-08	1.124E-03	2.638E-09	1.772E-07
T6 Public Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.166E-08	3.366E-08	0.000E+00	3.000E-09	7.580E-09	1.058E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 6	Natural Gas	7.590E-09	9.619E-08	2.223E-06	0.000E+00	9.724E-10	1.200E-08	4.332E-08	5.629E-08	8.940E-10	3.000E-09	1.516E-08	1.905E-08	8.436E-04	5.312E-07	1.720E-07
T6 Public Class 7	Diesel	4.572E-08	4.941E-06	1.400E-07	1.059E-08	3.058E-08	1.200E-08	4.332E-08	8.590E-08	2.926E-08	3.000E-09	1.516E-08	4.742E-08	1.118E-03	2.124E-09	1.761E-07
T6 Public Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.166E-08	3.366E-08	0.000E+00	3.000E-09	7.580E-09	1.058E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 7	Natural Gas	7.772E-09	8.480E-08	2.177E-06	0.000E+00	1.052E-09	1.200E-08	4.332E-08	5.637E-08	9.669E-10	3.000E-09	1.516E-08	1.913E-08	8.373E-04	5.440E-07	1.707E-07
T6 Utility Class 5	Diesel	6.323E-09	4.805E-07	3.778E-08	1.001E-08	4.308E-09	1.200E-08	4.332E-08	5.962E-08	4.122E-09	3.000E-09	1.516E-08	2.228E-08	1.057E-03	2.937E-10	1.665E-07
T6 Utility Class 5	Natural Gas	7.046E-09	1.315E-07	2.369E-06	0.000E+00	7.370E-10	1.200E-08	4.332E-08	5.605E-08	6.777E-10	3.000E-09	1.516E-08	1.884E-08	8.409E-04	4.931E-07	1.714E-07
T6 Utility Class 6	Diesel	5.550E-09	4.876E-07	3.754E-08	9.962E-09	4.114E-09	1.200E-08	4.332E-08	5.943E-08	3.936E-09	3.000E-09	1.516E-08	2.210E-08	1.052E-03	2.578E-10	1.657E-07
T6 Utility Class 6	Natural Gas	6.706E-09	1.542E-07	2.467E-06	0.000E+00	5.909E-10	1.200E-08	4.332E-08	5.591E-08	5.433E-10	3.000E-09	1.516E-08	1.870E-08	8.379E-04	4.693E-07	1.708E-07
T6 Utility Class 7	Diesel	4.407E-09	4.001E-07	3.391E-08	1.000E-08	3.642E-09	1.200E-08	4.332E-08	5.896E-08	3.484E-09	3.000E-09	1.516E-08	2.164E-08	1.056E-03	2.047E-10	1.664E-07
T6 Utility Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.166E-08	3.366E-08	0.000E+00	3.000E-09	7.580E-09	1.058E-08	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 7	Natural Gas	6.704E-09	1.544E-07	2.467E-06	0.000E+00	5.899E-10	1.200E-08	4.332E-08	5.591E-08	5.424E-10	3.000E-09	1.516E-08	1.870E-08	8.363E-04	4.692E-07	1.705E-07
T6TS	Gasoline	6.832E-08	4.997E-07	1.773E-06	1.642E-08	1.038E-09	1.200E-08	4.360E-08	5.663E-08	9.540E-10	3.000E-09	1.526E-08	1.921E-08	1.661E-03	1.387E-08	2.437E-08
T7 CAIRP Class 8	Diesel	1.270E-08	1.552E-06	7.556E-08	1.459E-08	2.698E-08	3.600E-08	8.014E-08	1.431E-07	2.581E-08	9.000E-09	2.805E-08	6.287E-08	1.541E-03	5.899E-10	2.427E-07
T7 CAIRP Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.007E-08	7.607E-08	0.000E+00	9.000E-09	1.403E-08	2.303E-08	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Natural Gas	1.397E-08	3.333E-07	6.458E-06	0.000E+00	1.696E-09	3.600E-08	8.014E-08	1.178E-07	1.559E-09	9.000E-09	2.805E-08	3.861E-08	1.194E-03	9.778E-07	2.433E-07
T7 NNOOS Class 8	Diesel	1.172E-08	1.463E-06	6.530E-08	1.452E-08	2.519E-08	3.600E-08	8.014E-08	1.413E-07	2.410E-08	9.000E-09	2.805E-08	6.115E-08	1.533E-03	5.446E-10	2.415E-07
T7 NOOS Class 8	Diesel	1.296E-08	1.581E-06	7.632E-08	1.453E-08	2.750E-08	3.600E-08	8.014E-08	1.436E-07	2.631E-08	9.000E-09	2.805E-08	6.336E-08	1.535E-03	6.018E-10	2.418E-07
T7 POAK Class 8	Diesel	9.007E-09	1.194E-06	4.633E-08	1.628E-08	1.890E-08	3.600E-08	8.141E-08	1.363E-07	1.808E-08	9.000E-09	2.849E-08	5.557E-08	1.720E-03	4.184E-10	2.709E-07
T7 POLA Class 8	Diesel	1.126E-08	1.595E-06	9.170E-08	1.544E-08	2.293E-08	3.600E-08	8.141E-08	1.403E-07	2.194E-08	9.000E-09	2.849E-08	5.943E-08	1.631E-03	5.230E-10	2.570E-07
T7 POLA Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.071E-08	7.671E-08	0.000E+00	9.000E-09	1.425E-08	2.325E-08	0.000E+00	0.000E+00	0.000E+00
T7 POLA Class 8	Natural Gas	1.420E-08	4.060E-07	7.671E-06	0.000E+00	1.572E-09	3.600E-08	8.141E-08	1.190E-07	1.445E-09	9.000E-09	2.849E-08	3.894E-08	1.291E-03	9.940E-07	2.631E-07
T7 Public Class 8	Diesel	7.827E-08	1.019E-05	3.251E-07	1.611E-08	6.362E-08	3.600E-08	9.852E-08	1.981E-07	6.087E-08	9.000E-09	3.448E-08	1.044E-07	1.701E-03	3.635E-09	2.680E-07
T7 Public Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.063E-08	7.663E-08	0.000E+00	9.000E-09	1.422E-08	2.322E-08	0.000E+00	0.000E+00	0.000E+00
T7 Public Class 8	Natural Gas	1.427E-08	3.401E-07	6.601E-06	0.000E+00	1.732E-09	3.600E-08	8.201E-08	1.197E-07	1.592E-09	9.000E-09	2.870E-08	3.930E-08	1.232E-03	9.991E-07	2.512E-07
T7 Single Concrete/Transit M	Diesel	9.199E-09	1.006E-06	6.549E-08	1.541E-08	1.359E-08	3.600E-08	8.287E-08	1.325E-07	1.300E-08	9.000E-09	2.900E-08	5.101E-08	1.627E-03	4.273E-10	2.563E-07
T7 Single Concrete/Transit M	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.143E-08	7.743E-08	0.000E+00	9.000E-09	1.450E-08	2.350E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Concrete/Transit M	Natural Gas	1.481E-08	2.533E-07	5.509E-06	0.000E+00	2.000E-09	3.600E-08	8.286E-08	1.209E-07	1.839E-09	9.000E-09	2.900E-08	3.984E-08	1.254E-03	1.037E-06	2.557E-07
T7 Single Dump Class 8	Diesel	1.758E-08	1.598E-06	1.075E-07	1.533E-08	1.661E-08	3.600E-08	8.289E-08	1.355E-07	1.589E-08	9.000E-09	2.901E-08	5.390E-08	1.618E-03	8.167E-10	2.550E-07
T7 Single Dump Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.143E-08	7.743E-08	0.000E+00	9.000E-09	1.450E-08	2.350E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Dump Class 8	Natural Gas	1.464E-08	4.160E-07	7.703E-06	0.000E+00	1.633E-09	3.600E-08	8.286E-08	1.205E-07	1.502E-09	9.000E-09	2.900E-08	3.950E-08	1.309E-03	1.025E-06	2.669E-07
T7 Single Other Class 8	Diesel	1.197E-08	1.161E-06	7.633E-08	1.525E-08	1.417E-08	3.600E-08	8.288E-08	1.330E-07	1.356E-08	9.000E-09	2.901E-08	5.156E-08	1.611E-03	5.559E-10	2.538E-07
T7 Single Other Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.143E-08	7.743E-08	0.000E+00	9.000E-09	1.450E-08	2.350E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Other Class 8	Natural Gas	1.475E-08	3.203E-07	6.361E-06	0.000E+00	1.855E-09	3.600E-08	8.286E-08	1.207E-07	1.706E-09	9.000E-09	2.900E-08	3.971E-08	1.250E-03	1.032E-06	2.547E-07
T7 SWCV Class 8	Diesel	1.535E-09	1.494E-05	1.209E-08	3.639E-08	1.486E-08	3.600E-08	2.100E-07	2.609E-07	1.421E-08	9.000E-09	7.350E-08	9.671E-08	3.843E-03	7.128E-11	6.054E-07
T7 SWCV Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	1.050E-07	1.410E-07	0.000E+00	9.000E-09	3.675E-08	4.575E-08	0.000E+00	0.000E+00	0.000E+00
T7 SWCV Class 8	Natural Gas	6.307E-08	1.391E-06	1.029E-05	0.000E+00	3.333E-09	3.600E-08	2.100E-07	2.493E-07	3.065E-09	9.000E-09	7.350E-08	8.556E-08	1.235E-03	1.878E-06	2.518E-07
T7 Tractor Class 8	Diesel	1.452E-08	1.571E-06	8.182E-08	1.473E-08	2.236E-08	3.600E-08	8.020E-08	1.386E-07	2.139E-08	9.000E-09	2.807E-08	5.846E-08	1.555E-03	6.742E-10	2.451E-07
T7 Tractor Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.010E-08	7.610E-08	0.000E+00	9.000E-09	1.403E-08	2.303E-08	0.000E+00	0.000E+00	0.000E+00
T7 Tractor Class 8	Natural Gas	1.402E-08	3.114E-07	5.976E-06	0.000E+00	1.765E-09	3.600E-08	8.019E-08	1.180E-07	1.623E-09	9.000E-09	2.807E-08	3.869E-08	1.227E-03	9.815E-07	2.502E-07
T7 Utility Class 8	Diesel	9.568E-09	1.023E-06	6.906E-08	1.528E-08	1.146E-08	3.600E-08	8.127E-08	1.287E-07	1.096E-08	9.000E-09	2.844E-08	4.841E-08	1.614E-03	4.444E-10	2.542E-07
T7 Utility Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.063E-08	7.663E-08	0.000E+00	9.000E-09	1.422E-08	2.322E-08	0.000E+00	0.000E+00	0.000E+00
T7IS	Gasoline	9.660E-07	7.221E-06	5.039E-05	2.134E-08	1.938E-09	2.000E-08	9.860E-08	1.205E-07	1.782E-09	5.000E-09	3.451E-08	4.129E-08	2.159E-03	1.717E-07	2.040E-07
UBUS	Gasoline	1.681E-08	2.493E-07	4.194E-07	1.853E-08	1.263E-09	1.096E-08	1.051E-07	1.173E-07	1.161E-09	2.740E-09	3.677E-08	4.067E-08	1.874E-03	5.053E-09	2.105E-08
UBUS	Diesel	1.041E-07	8.519E-07	1.345E-07	1.644E-08	6.326E-09	3.501E-08	1.100E-07	1.513E-07	6.052E-09	8.751E-09	3.850E-08	5.330E-08	1.735E-03	4.835E-09	2.733E-07
UBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.611E-08	5.451E-08	8.062E-08	0.000E+00	6.528E-09	1.908E-08	2.561E-08	0.000E+00	0.000E+00	0.000E+00
UBUS	Natural Gas	3.785E-08	6.859E-07	3.889E-05	0.000E+00	3.886E-10	3.354E-08	1.099E-07	1.438E-07	3.718E-10	8.385E-09	3.846E-08	4.721E-08	2.577E-03	2.622E-06	5.254E-07
	Total															

Year 2050 Current General Plan: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

Daily VMT	1,395,544					lbs/day			
Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.03%	0.02%	0.01	0.41	0.05	0.01	0.05	0.02
All Other Buses	Natural Gas	0.01%	0.01%	0.00	0.02	0.56	0.00	0.01	0.00
LDA	Gasoline	36.70%	37.13%	3.69	21.90	579.24	2.62	19.76	6.37
LDA	Diesel	0.02%	0.02%	0.00	0.01	0.12	0.00	0.01	0.00
LDA	Electricity	5.24%	5.30%	0.00	0.00	0.00	0.00	2.02	0.58
LDA	Plug-in Hybrid	1.75%	1.77%	0.08	0.15	10.94	0.07	0.68	0.20
LDT1	Gasoline	3.21%	3.25%	0.36	2.10	55.15	0.26	1.93	0.63
LDT1	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.10%	0.11%	0.00	0.00	0.00	0.00	0.04	0.01
LDT1	Plug-in Hybrid	0.08%	0.08%	0.00	0.01	0.50	0.00	0.03	0.01
LDT2	Gasoline	24.88%	25.17%	3.53	16.94	466.26	2.13	14.78	4.81
LDT2	Diesel	0.10%	0.10%	0.05	0.10	0.54	0.01	0.07	0.03
LDT2	Electricity	0.73%	0.74%	0.00	0.00	0.00	0.00	0.28	0.08
LDT2	Plug-in Hybrid	0.69%	0.70%	0.03	0.06	4.34	0.03	0.27	0.08
LHD1	Gasoline	0.96%	0.87%	0.04	0.39	13.86	0.13	2.34	0.81
LHD1	Diesel	0.73%	0.66%	0.90	2.94	1.73	0.09	2.05	0.83
LHD1	Electricity	1.67%	1.52%	0.00	0.00	0.00	0.00	2.19	0.73
LHD2	Gasoline	0.13%	0.12%	0.01	0.07	1.91	0.02	0.37	0.13
LHD2	Diesel	0.34%	0.31%	0.51	1.83	0.99	0.05	1.10	0.45
LHD2	Electricity	0.44%	0.40%	0.00	0.00	0.00	0.00	0.66	0.22
MCY	Gasoline	0.38%	0.39%	10.54	5.55	124.50	0.02	0.22	0.09
MDV	Gasoline	13.60%	13.76%	2.01	9.66	264.59	1.41	8.17	2.66
MDV	Diesel	0.15%	0.15%	0.03	0.05	0.90	0.01	0.09	0.03
MDV	Electricity	0.66%	0.67%	0.00	0.00	0.00	0.00	0.25	0.07
MDV	Plug-in Hybrid	0.42%	0.42%	0.02	0.04	2.61	0.02	0.16	0.05
MH	Gasoline	0.05%	0.04%	0.01	0.27	0.19	0.02	0.08	0.03
MH	Diesel	0.03%	0.02%	0.03	1.39	0.08	0.01	0.06	0.03
Motor Coach	Diesel	0.03%	0.03%	0.01	0.94	0.06	0.01	0.12	0.05
OBUS	Gasoline	0.01%	0.01%	0.00	0.09	0.06	0.01	0.02	0.01
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
PTO	Diesel	0.03%	0.03%	0.01	2.12	0.15	0.01	0.00	0.00
PTO	Electricity	0.04%	0.03%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.01%	0.00	0.03	0.06	0.00	0.02	0.01
SBUS	Diesel	0.00%	0.00%	0.00	0.03	0.01	0.00	0.01	0.00
SBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
SBUS	Natural Gas	0.01%	0.01%	0.01	0.05	1.95	0.00	0.01	0.01
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.02%	0.00	0.11	0.02	0.00	0.03	0.01
T6 CAIRP Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.03%	0.00	0.21	0.04	0.01	0.06	0.02
T6 Instate Delivery Class 4	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.03%	0.00	0.22	0.04	0.01	0.06	0.02
T6 Instate Delivery Class 5	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.05	0.01
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.11%	0.10%	0.01	0.68	0.11	0.03	0.19	0.07
T6 Instate Delivery Class 6	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00	0.14	0.04
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.06%	0.05%	0.01	0.55	0.07	0.02	0.10	0.04
T6 Instate Delivery Class 7	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.09	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	0.05%	0.05%	0.01	0.31	0.05	0.01	0.09	0.03
T6 Instate Other Class 4	Electricity	0.07%	0.07%	0.00	0.00	0.00	0.00	0.07	0.02

T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.12%	0.11%	0.02	0.71	0.12	0.03	0.20	0.07
T6 Instate Other Class 5	Electricity	0.17%	0.16%	0.00	0.00	0.00	0.00	0.16	0.05
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.11%	0.10%	0.01	0.64	0.11	0.03	0.18	0.07
T6 Instate Other Class 6	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00	0.14	0.04
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.06%	0.01	0.58	0.08	0.02	0.12	0.04
T6 Instate Other Class 7	Electricity	0.06%	0.06%	0.00	0.00	0.00	0.00	0.06	0.02
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.10	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.05%	0.05%	0.01	0.40	0.06	0.01	0.08	0.03
T6 Instate Tractor Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.02%	0.02%	0.00	0.12	0.02	0.00	0.03	0.01
T6 Public Class 4	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.02%	0.02%	0.00	0.13	0.02	0.01	0.03	0.01
T6 Public Class 7	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.01	0.22	0.00	0.01	0.00
T6 Utility Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.01	0.00
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.10%	0.09%	0.02	0.17	0.44	0.04	0.16	0.05
T6TS	Electricity	0.14%	0.12%	0.00	0.00	0.00	0.00	0.13	0.04
T7 CAIRP Class 8	Diesel	0.79%	0.71%	0.23	25.20	1.01	0.26	3.25	1.39
T7 CAIRP Class 8	Electricity	0.23%	0.21%	0.00	0.00	0.00	0.00	0.51	0.16
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.28	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	1.21%	1.10%	0.34	42.74	1.50	0.38	4.97	2.12
T7 NOOS Class 8	Diesel	0.44%	0.40%	0.13	15.97	0.56	0.14	1.82	0.79
T7 POLA Class 8	Diesel	0.50%	0.45%	0.13	15.86	0.64	0.18	2.02	0.84
T7 POLA Class 8	Electricity	0.10%	0.09%	0.00	0.00	0.00	0.00	0.22	0.07
T7 POLA Class 8	Natural Gas	0.02%	0.02%	0.01	0.09	2.09	0.00	0.07	0.02
T7 Public Class 8	Diesel	0.01%	0.01%	0.01	0.53	0.03	0.01	0.06	0.02
T7 Public Class 8	Electricity	0.03%	0.03%	0.00	0.00	0.00	0.00	0.07	0.02
T7 Public Class 8	Natural Gas	0.03%	0.02%	0.01	0.13	2.89	0.00	0.09	0.03
T7 Single Concrete/Transit Mi	Diesel	0.01%	0.01%	0.00	0.16	0.01	0.00	0.03	0.01
T7 Single Concrete/Transit Mi	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.03	0.01
T7 Single Concrete/Transit Mi	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.02%	0.02%	0.01	0.56	0.03	0.01	0.09	0.03
T7 Single Dump Class 8	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.20	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	0.12%	0.11%	0.03	2.75	0.14	0.04	0.46	0.18
T7 Single Other Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00	0.33	0.10
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	0.00	0.04	1.03	0.00	0.03	0.01
T7 SWCV Class 8	Diesel	0.00%	0.00%	0.00	0.08	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Electricity	0.04%	0.04%	0.00	0.00	0.00	0.00	0.18	0.06
T7 SWCV Class 8	Natural Gas	0.05%	0.05%	0.01	0.22	9.12	0.00	0.36	0.12
T7 Tractor Class 8	Diesel	0.69%	0.62%	0.19	21.29	0.81	0.23	2.78	1.15
T7 Tractor Class 8	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00	0.34	0.10
T7 Tractor Class 8	Natural Gas	0.02%	0.02%	0.01	0.08	1.89	0.00	0.07	0.02
T7 Utility Class 8	Diesel	0.00%	0.00%	0.00	0.08	0.00	0.00	0.01	0.01
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00

T7IS	Gasoline	0.00%	0.00%	0.00	0.02	0.26	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.00%	0.00%	0.00	0.00	0.06	0.00	0.01	0.00
UBUS	Electricity	0.26%	0.24%	0.00	0.00	0.00	0.00	0.65	0.20
UBUS	Natural Gas	0.00%	0.00%	0.00	0.01	0.00	0.00	0.01	0.00
	total	100%	100%	23.09	197.95	1555.99	8.43	78.73	27.33

Year 2050 Proposed General Plan: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

Daily VMT	1,664,444					lbs/day			
Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.03%	0.02%	0.01	0.47	0.06	0.01	0.05	0.02
All Other Buses	Natural Gas	0.01%	0.01%	0.00	0.02	0.64	0.00	0.02	0.01
LDA	Gasoline	36.70%	37.33%	4.43	26.26	694.60	3.14	23.69	7.63
LDA	Diesel	0.02%	0.02%	0.00	0.01	0.14	0.00	0.01	0.00
LDA	Electricity	5.24%	5.33%	0.00	0.00	0.00	0.00	2.42	0.69
LDA	Plug-in Hybrid	1.75%	1.78%	0.09	0.18	13.12	0.08	0.81	0.24
LDT1	Gasoline	3.21%	3.26%	0.43	2.52	66.14	0.32	2.31	0.75
LDT1	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.10%	0.11%	0.00	0.00	0.00	0.00	0.05	0.01
LDT1	Plug-in Hybrid	0.08%	0.08%	0.00	0.01	0.60	0.00	0.04	0.01
LDT2	Gasoline	24.88%	25.30%	4.23	20.31	559.11	2.55	17.73	5.77
LDT2	Diesel	0.10%	0.10%	0.06	0.11	0.65	0.01	0.08	0.04
LDT2	Electricity	0.73%	0.74%	0.00	0.00	0.00	0.00	0.34	0.10
LDT2	Plug-in Hybrid	0.69%	0.71%	0.04	0.07	5.20	0.03	0.32	0.10
LHD1	Gasoline	0.96%	0.83%	0.05	0.44	15.74	0.15	2.66	0.93
LHD1	Diesel	0.73%	0.63%	1.02	3.34	1.97	0.10	2.33	0.95
LHD1	Electricity	1.67%	1.44%	0.00	0.00	0.00	0.00	2.49	0.83
LHD2	Gasoline	0.13%	0.11%	0.01	0.08	2.17	0.02	0.42	0.14
LHD2	Diesel	0.34%	0.29%	0.57	2.08	1.12	0.06	1.25	0.52
LHD2	Electricity	0.44%	0.38%	0.00	0.00	0.00	0.00	0.75	0.25
MCY	Gasoline	0.38%	0.39%	12.63	6.65	149.29	0.03	0.27	0.11
MDV	Gasoline	13.60%	13.83%	2.41	11.59	317.28	1.69	9.79	3.19
MDV	Diesel	0.15%	0.15%	0.03	0.06	1.08	0.02	0.11	0.04
MDV	Electricity	0.66%	0.67%	0.00	0.00	0.00	0.00	0.30	0.09
MDV	Plug-in Hybrid	0.42%	0.42%	0.02	0.04	3.12	0.02	0.19	0.06
MH	Gasoline	0.05%	0.04%	0.01	0.31	0.21	0.03	0.09	0.03
MH	Diesel	0.03%	0.02%	0.03	1.58	0.09	0.01	0.06	0.03
Motor Coach	Diesel	0.03%	0.03%	0.01	1.07	0.07	0.02	0.13	0.05
OBUS	Gasoline	0.01%	0.01%	0.00	0.11	0.07	0.01	0.03	0.01
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
PTO	Diesel	0.03%	0.03%	0.01	2.40	0.17	0.02	0.00	0.00
PTO	Electricity	0.04%	0.03%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.01%	0.00	0.03	0.07	0.00	0.02	0.01
SBUS	Diesel	0.00%	0.00%	0.00	0.04	0.01	0.00	0.01	0.00
SBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.03	0.01
SBUS	Natural Gas	0.01%	0.01%	0.01	0.05	2.22	0.00	0.02	0.01
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.02%	0.00	0.12	0.02	0.01	0.04	0.01
T6 CAIRP Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.03%	0.01	0.24	0.04	0.01	0.07	0.02
T6 Instate Delivery Class 4	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.05	0.02
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.03%	0.01	0.25	0.04	0.01	0.07	0.03
T6 Instate Delivery Class 5	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.05	0.02
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.11%	0.10%	0.02	0.77	0.13	0.03	0.21	0.08
T6 Instate Delivery Class 6	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00	0.16	0.05
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.06%	0.05%	0.01	0.62	0.08	0.02	0.11	0.04
T6 Instate Delivery Class 7	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00	0.05	0.02
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.10	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	0.05%	0.05%	0.01	0.35	0.06	0.02	0.10	0.04
T6 Instate Other Class 4	Electricity	0.07%	0.06%	0.00	0.00	0.00	0.00	0.08	0.02

T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.12%	0.11%	0.02	0.81	0.14	0.04	0.23	0.08
T6 Instate Other Class 5	Electricity	0.17%	0.15%	0.00	0.00	0.00	0.00	0.18	0.06
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.11%	0.10%	0.02	0.73	0.12	0.03	0.21	0.07
T6 Instate Other Class 6	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00	0.16	0.05
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.06%	0.01	0.65	0.09	0.02	0.13	0.05
T6 Instate Other Class 7	Electricity	0.06%	0.06%	0.00	0.00	0.00	0.00	0.07	0.02
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.11	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.05%	0.04%	0.01	0.46	0.07	0.01	0.10	0.04
T6 Instate Tractor Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.08	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.02%	0.01%	0.00	0.13	0.02	0.00	0.03	0.01
T6 Public Class 4	Diesel	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.02%	0.02%	0.00	0.14	0.02	0.01	0.04	0.01
T6 Public Class 7	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.01	0.25	0.00	0.01	0.00
T6 Utility Class 5	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.10%	0.09%	0.03	0.19	0.50	0.04	0.18	0.06
T6TS	Electricity	0.14%	0.12%	0.00	0.00	0.00	0.00	0.14	0.05
T7 CAIRP Class 8	Diesel	0.79%	0.68%	0.26	28.62	1.15	0.30	3.69	1.58
T7 CAIRP Class 8	Electricity	0.23%	0.20%	0.00	0.00	0.00	0.00	0.58	0.18
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.32	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	1.21%	1.04%	0.39	48.56	1.71	0.44	5.65	2.41
T7 NOOS Class 8	Diesel	0.44%	0.38%	0.15	18.14	0.64	0.16	2.07	0.89
T7 POLA Class 8	Diesel	0.50%	0.43%	0.15	18.02	0.72	0.20	2.30	0.95
T7 POLA Class 8	Electricity	0.10%	0.09%	0.00	0.00	0.00	0.00	0.25	0.08
T7 POLA Class 8	Natural Gas	0.02%	0.02%	0.01	0.10	2.37	0.00	0.08	0.03
T7 Public Class 8	Diesel	0.01%	0.01%	0.01	0.61	0.03	0.01	0.06	0.03
T7 Public Class 8	Electricity	0.03%	0.03%	0.00	0.00	0.00	0.00	0.08	0.02
T7 Public Class 8	Natural Gas	0.03%	0.02%	0.01	0.15	3.29	0.00	0.10	0.03
T7 Single Concrete/Transit Mi	Diesel	0.01%	0.01%	0.00	0.18	0.01	0.00	0.04	0.01
T7 Single Concrete/Transit Mi	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.03	0.01
T7 Single Concrete/Transit Mi	Natural Gas	0.00%	0.00%	0.00	0.00	0.08	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.02%	0.02%	0.01	0.64	0.03	0.01	0.10	0.04
T7 Single Dump Class 8	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.23	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	0.12%	0.10%	0.03	3.12	0.16	0.05	0.52	0.20
T7 Single Other Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00	0.38	0.12
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	0.00	0.05	1.17	0.00	0.04	0.01
T7 SWCV Class 8	Diesel	0.00%	0.00%	0.00	0.09	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Electricity	0.04%	0.04%	0.00	0.00	0.00	0.00	0.20	0.06
T7 SWCV Class 8	Natural Gas	0.05%	0.05%	0.01	0.25	10.36	0.00	0.41	0.14
T7 Tractor Class 8	Diesel	0.69%	0.60%	0.21	24.19	0.92	0.26	3.15	1.31
T7 Tractor Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00	0.38	0.12
T7 Tractor Class 8	Natural Gas	0.02%	0.02%	0.01	0.10	2.15	0.00	0.08	0.02
T7 Utility Class 8	Diesel	0.00%	0.00%	0.00	0.09	0.01	0.00	0.02	0.01
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00

T7IS	Gasoline	0.00%	0.00%	0.00	0.03	0.29	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.00%	0.00%	0.00	0.00	0.07	0.00	0.02	0.01
UBUS	Electricity	0.26%	0.23%	0.00	0.00	0.00	0.00	0.74	0.23
UBUS	Natural Gas	0.00%	0.00%	0.00	0.01	0.00	0.00	0.01	0.00
	total	100%	100%	27.52	228.46	1862.95	9.99	92.53	32.04

Existing Year 2050: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	92%	8%
EMFAC Default	89%	11%

Daily VMT	1,398,064						lbs/day		
Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.03%	0.02%	0.01	0.30	0.04	0.01	0.03	0.01
All Other Buses	Natural Gas	0.01%	0.01%	0.00	0.01	0.41	0.00	0.01	0.00
LDA	Gasoline	36.70%	38.26%	3.81	22.60	597.94	2.70	20.40	6.57
LDA	Diesel	0.02%	0.02%	0.00	0.01	0.12	0.00	0.01	0.00
LDA	Electricity	5.24%	5.46%	0.00	0.00	0.00	0.00	2.09	0.60
LDA	Plug-in Hybrid	1.75%	1.82%	0.08	0.16	11.29	0.07	0.70	0.21
LDT1	Gasoline	3.21%	3.35%	0.37	2.17	56.93	0.27	1.99	0.65
LDT1	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.10%	0.11%	0.00	0.00	0.00	0.00	0.04	0.01
LDT1	Plug-in Hybrid	0.08%	0.08%	0.00	0.01	0.51	0.00	0.03	0.01
LDT2	Gasoline	24.88%	25.93%	3.64	17.48	481.31	2.20	15.26	4.96
LDT2	Diesel	0.10%	0.10%	0.05	0.10	0.56	0.01	0.07	0.03
LDT2	Electricity	0.73%	0.76%	0.00	0.00	0.00	0.00	0.29	0.08
LDT2	Plug-in Hybrid	0.69%	0.72%	0.03	0.06	4.48	0.03	0.28	0.08
LHD1	Gasoline	0.96%	0.64%	0.03	0.28	10.19	0.10	1.72	0.60
LHD1	Diesel	0.73%	0.48%	0.66	2.16	1.27	0.07	1.51	0.61
LHD1	Electricity	1.67%	1.11%	0.00	0.00	0.00	0.00	1.61	0.54
LHD2	Gasoline	0.13%	0.09%	0.00	0.05	1.40	0.02	0.27	0.09
LHD2	Diesel	0.34%	0.23%	0.37	1.34	0.73	0.04	0.81	0.33
LHD2	Electricity	0.44%	0.29%	0.00	0.00	0.00	0.00	0.48	0.16
MCY	Gasoline	0.38%	0.40%	10.88	5.72	128.52	0.02	0.23	0.09
MDV	Gasoline	13.60%	14.17%	2.07	9.98	273.13	1.45	8.43	2.75
MDV	Diesel	0.15%	0.15%	0.03	0.05	0.93	0.02	0.09	0.03
MDV	Electricity	0.66%	0.69%	0.00	0.00	0.00	0.00	0.26	0.07
MDV	Plug-in Hybrid	0.42%	0.43%	0.02	0.04	2.69	0.02	0.17	0.05
MH	Gasoline	0.05%	0.03%	0.01	0.20	0.14	0.02	0.06	0.02
MH	Diesel	0.03%	0.02%	0.02	1.02	0.06	0.01	0.04	0.02
Motor Coach	Diesel	0.03%	0.02%	0.01	0.69	0.05	0.01	0.09	0.04
OBUS	Gasoline	0.01%	0.01%	0.00	0.07	0.05	0.00	0.02	0.01
OBUS	Electricity	0.02%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
PTO	Diesel	0.03%	0.02%	0.01	1.56	0.11	0.01	0.00	0.00
PTO	Electricity	0.04%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.01%	0.00	0.02	0.04	0.00	0.01	0.00
SBUS	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
SBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
SBUS	Natural Gas	0.01%	0.01%	0.01	0.03	1.44	0.00	0.01	0.00
T6 CAIRP Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.01%	0.00	0.08	0.01	0.00	0.02	0.01
T6 CAIRP Class 7	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.02%	0.00	0.16	0.03	0.01	0.04	0.02
T6 Instate Delivery Class 4	Electricity	0.05%	0.03%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.02%	0.00	0.16	0.03	0.01	0.04	0.02
T6 Instate Delivery Class 5	Electricity	0.05%	0.03%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.11%	0.08%	0.01	0.50	0.08	0.02	0.14	0.05
T6 Instate Delivery Class 6	Electricity	0.15%	0.10%	0.00	0.00	0.00	0.00	0.10	0.03
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	0.06%	0.04%	0.01	0.40	0.05	0.01	0.07	0.03
T6 Instate Delivery Class 7	Electricity	0.05%	0.03%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	0.05%	0.04%	0.01	0.23	0.04	0.01	0.06	0.02
T6 Instate Other Class 4	Electricity	0.07%	0.05%	0.00	0.00	0.00	0.00	0.05	0.02

T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.12%	0.08%	0.01	0.52	0.09	0.02	0.15	0.05
T6 Instate Other Class 5	Electricity	0.17%	0.11%	0.00	0.00	0.00	0.00	0.12	0.04
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	0.11%	0.07%	0.01	0.47	0.08	0.02	0.13	0.05
T6 Instate Other Class 6	Electricity	0.15%	0.10%	0.00	0.00	0.00	0.00	0.11	0.03
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	0.07%	0.05%	0.01	0.42	0.06	0.01	0.09	0.03
T6 Instate Other Class 7	Electricity	0.06%	0.04%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.05%	0.03%	0.01	0.30	0.04	0.01	0.06	0.02
T6 Instate Tractor Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 OOS Class 4	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	0.02%	0.01%	0.00	0.09	0.01	0.00	0.02	0.01
T6 Public Class 4	Diesel	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Public Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 6	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Public Class 7	Diesel	0.02%	0.01%	0.00	0.09	0.01	0.00	0.02	0.01
T6 Public Class 7	Electricity	0.02%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.16	0.00	0.00	0.00
T6 Utility Class 5	Diesel	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.10%	0.07%	0.02	0.13	0.32	0.03	0.12	0.04
T6TS	Electricity	0.14%	0.09%	0.00	0.00	0.00	0.00	0.09	0.03
T7 CAIRP Class 8	Diesel	0.79%	0.52%	0.17	18.52	0.74	0.19	2.39	1.02
T7 CAIRP Class 8	Electricity	0.23%	0.15%	0.00	0.00	0.00	0.00	0.38	0.11
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.21	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	1.21%	0.80%	0.25	31.42	1.10	0.28	3.66	1.56
T7 NOOS Class 8	Diesel	0.44%	0.29%	0.09	11.74	0.41	0.10	1.34	0.58
T7 POLA Class 8	Diesel	0.50%	0.33%	0.10	11.66	0.47	0.13	1.49	0.62
T7 POLA Class 8	Electricity	0.10%	0.07%	0.00	0.00	0.00	0.00	0.16	0.05
T7 POLA Class 8	Natural Gas	0.02%	0.01%	0.01	0.07	1.54	0.00	0.05	0.02
T7 Public Class 8	Diesel	0.01%	0.01%	0.00	0.39	0.02	0.00	0.04	0.02
T7 Public Class 8	Electricity	0.03%	0.02%	0.00	0.00	0.00	0.00	0.05	0.02
T7 Public Class 8	Natural Gas	0.03%	0.02%	0.01	0.10	2.13	0.00	0.07	0.02
T7 Single Concrete/Transit Mi	Diesel	0.01%	0.01%	0.00	0.12	0.01	0.00	0.02	0.01
T7 Single Concrete/Transit Mi	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T7 Single Concrete/Transit Mi	Natural Gas	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	0.02%	0.01%	0.00	0.42	0.02	0.01	0.06	0.02
T7 Single Dump Class 8	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00	0.04	0.01
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	0.00	0.01	0.15	0.00	0.00	0.00
T7 Single Other Class 8	Diesel	0.12%	0.08%	0.02	2.02	0.10	0.03	0.34	0.13
T7 Single Other Class 8	Electricity	0.15%	0.10%	0.00	0.00	0.00	0.00	0.24	0.07
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	0.00	0.03	0.76	0.00	0.02	0.01
T7 SWCV Class 8	Diesel	0.00%	0.00%	0.00	0.06	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Electricity	0.04%	0.03%	0.00	0.00	0.00	0.00	0.13	0.04
T7 SWCV Class 8	Natural Gas	0.05%	0.04%	0.00	0.16	6.70	0.00	0.27	0.09
T7 Tractor Class 8	Diesel	0.69%	0.46%	0.14	15.65	0.60	0.17	2.04	0.85
T7 Tractor Class 8	Electricity	0.15%	0.10%	0.00	0.00	0.00	0.00	0.25	0.08
T7 Tractor Class 8	Natural Gas	0.02%	0.01%	0.01	0.06	1.39	0.00	0.05	0.02
T7 Utility Class 8	Diesel	0.00%	0.00%	0.00	0.06	0.00	0.00	0.01	0.00
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00

T7IS	Gasoline	0.00%	0.00%	0.00	0.02	0.19	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.00%	0.00%	0.00	0.00	0.05	0.00	0.01	0.00
UBUS	Electricity	0.26%	0.17%	0.00	0.00	0.00	0.00	0.48	0.15
UBUS	Natural Gas	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
	total	100%	100%	23.02	162.33	1592.47	8.15	72.37	24.75

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**484,253,936**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
All Other Buses	Diesel	0.03%	0.02%	114.40	0.00	0.02	119.17
All Other Buses	Natural Gas	0.01%	0.01%	28.54	0.02	0.01	30.71
LDA	Gasoline	36.70%	37.13%	41,684.69	0.20	0.57	41,840.66
LDA	Diesel	0.02%	0.02%	19.82	0.00	0.00	20.65
LDA	Electricity	5.24%	5.30%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.75%	1.77%	1,054.89	0.00	0.00	1,056.06
LDT1	Gasoline	3.21%	3.25%	4,213.27	0.02	0.05	4,227.70
LDT1	Diesel	0.00%	0.00%	0.07	0.00	0.00	0.07
LDT1	Electricity	0.10%	0.11%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.08%	0.08%	47.97	0.00	0.00	48.02
LDT2	Gasoline	24.88%	25.17%	33,868.31	0.18	0.41	33,983.03
LDT2	Diesel	0.10%	0.10%	123.26	0.00	0.02	128.41
LDT2	Electricity	0.73%	0.74%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.69%	0.70%	418.56	0.00	0.00	419.02
LHD1	Gasoline	0.96%	0.87%	2,136.31	0.00	0.01	2,138.02
LHD1	Diesel	0.73%	0.66%	1,491.29	0.01	0.23	1,553.74
LHD1	Electricity	1.67%	1.52%	0.00	0.00	0.00	0.00
LHD2	Gasoline	0.13%	0.12%	326.91	0.00	0.00	327.24
LHD2	Diesel	0.34%	0.31%	808.65	0.00	0.13	842.52
LHD2	Electricity	0.44%	0.40%	0.00	0.00	0.00	0.00
MCY	Gasoline	0.38%	0.39%	363.02	0.28	0.07	388.42
MDV	Gasoline	13.60%	13.76%	22,423.96	0.10	0.23	22,487.92
MDV	Diesel	0.15%	0.15%	245.86	0.00	0.04	256.13
MDV	Electricity	0.66%	0.67%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.42%	0.42%	251.27	0.00	0.00	251.54
MH	Gasoline	0.05%	0.04%	372.91	0.00	0.00	373.87
MH	Diesel	0.03%	0.02%	118.90	0.00	0.02	123.87
Motor Coach	Diesel	0.03%	0.03%	226.03	0.00	0.04	235.47
OBUS	Gasoline	0.01%	0.01%	88.03	0.00	0.00	88.26
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
PTO	Diesel	0.03%	0.03%	240.42	0.00	0.04	250.46
PTO	Electricity	0.04%	0.03%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.01%	38.43	0.00	0.00	38.54
SBUS	Diesel	0.00%	0.00%	14.91	0.00	0.00	15.53
SBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	0.01%	50.60	0.11	0.01	56.46
T6 CAIRP Class 4	Diesel	0.00%	0.00%	1.98	0.00	0.00	2.07
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	2.72	0.00	0.00	2.83
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	7.10	0.00	0.00	7.39
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.02%	75.30	0.00	0.01	78.44
T6 CAIRP Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.04	0.00	0.00	0.05
T6 Instate Delivery Class 4	Diesel	0.04%	0.03%	152.74	0.00	0.02	159.12
T6 Instate Delivery Class 4	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	1.00	0.00	0.00	1.08
T6 Instate Delivery Class 5	Diesel	0.04%	0.03%	158.26	0.00	0.02	164.87

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**484,253,936**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T6 Instate Delivery Class 5	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	1.03	0.00	0.00	1.11
T6 Instate Delivery Class 6	Diesel	0.11%	0.10%	484.22	0.00	0.08	504.44
T6 Instate Delivery Class 6	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	3.15	0.00	0.00	3.39
T6 Instate Delivery Class 7	Diesel	0.06%	0.05%	257.91	0.00	0.04	268.68
T6 Instate Delivery Class 7	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	5.26	0.00	0.00	5.65
T6 Instate Other Class 4	Diesel	0.05%	0.05%	227.63	0.00	0.04	237.13
T6 Instate Other Class 4	Electricity	0.07%	0.07%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	1.48	0.00	0.00	1.59
T6 Instate Other Class 5	Diesel	0.12%	0.11%	530.67	0.00	0.08	552.83
T6 Instate Other Class 5	Electricity	0.17%	0.16%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	3.44	0.00	0.00	3.70
T6 Instate Other Class 6	Diesel	0.11%	0.10%	470.57	0.00	0.07	490.22
T6 Instate Other Class 6	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	3.05	0.00	0.00	3.28
T6 Instate Other Class 7	Diesel	0.07%	0.06%	299.00	0.00	0.05	311.48
T6 Instate Other Class 7	Electricity	0.06%	0.06%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	5.94	0.00	0.00	6.38
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	7.78	0.00	0.00	8.10
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.05	0.00	0.00	0.05
T6 Instate Tractor Class 7	Diesel	0.05%	0.05%	195.40	0.00	0.03	203.56
T6 Instate Tractor Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	4.18	0.00	0.00	4.49
T6 OOS Class 4	Diesel	0.00%	0.00%	2.69	0.00	0.00	2.80
T6 OOS Class 5	Diesel	0.00%	0.00%	3.69	0.00	0.00	3.85
T6 OOS Class 6	Diesel	0.00%	0.00%	9.63	0.00	0.00	10.04
T6 OOS Class 7	Diesel	0.02%	0.02%	63.08	0.00	0.01	65.71
T6 Public Class 4	Diesel	0.00%	0.00%	17.13	0.00	0.00	17.84
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	2.64	0.00	0.00	2.84
T6 Public Class 5	Diesel	0.00%	0.00%	11.94	0.00	0.00	12.43
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	1.90	0.00	0.00	2.04
T6 Public Class 6	Diesel	0.00%	0.00%	14.27	0.00	0.00	14.87
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	2.24	0.00	0.00	2.40
T6 Public Class 7	Diesel	0.02%	0.02%	88.28	0.00	0.01	91.97
T6 Public Class 7	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.00%	13.98	0.01	0.00	15.02
T6 Utility Class 5	Diesel	0.00%	0.00%	15.14	0.00	0.00	15.78
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.07	0.00	0.00	0.08
T6 Utility Class 6	Diesel	0.00%	0.00%	2.86	0.00	0.00	2.98
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.01	0.00	0.00	0.01
T6 Utility Class 7	Diesel	0.00%	0.00%	3.95	0.00	0.00	4.11

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**484,253,936**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.02	0.00	0.00	0.02
T6TS	Gasoline	0.10%	0.09%	619.45	0.00	0.00	620.22
T6TS	Electricity	0.14%	0.12%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Diesel	0.79%	0.71%	4,357.51	0.00	0.69	4,539.48
T7 CAIRP Class 8	Electricity	0.23%	0.21%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	13.32	0.01	0.00	14.38
T7 NNOOS Class 8	Diesel	1.21%	1.10%	6,390.56	0.00	1.01	6,657.45
T7 NOOS Class 8	Diesel	0.44%	0.40%	2,319.91	0.00	0.37	2,416.79
T7 POLA Class 8	Diesel	0.50%	0.45%	2,933.97	0.00	0.46	3,056.49
T7 POLA Class 8	Electricity	0.10%	0.09%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.02%	0.02%	94.01	0.09	0.02	101.55
T7 Public Class 8	Diesel	0.01%	0.01%	94.50	0.00	0.01	98.45
T7 Public Class 8	Electricity	0.03%	0.03%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.03%	0.02%	124.24	0.11	0.03	134.06
T7 Single Concrete/Transit Mix	Diesel	0.01%	0.01%	51.61	0.00	0.01	53.76
T7 Single Concrete/Transit Mix	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00%	3.15	0.00	0.00	3.40
T7 Single Dump Class 8	Diesel	0.02%	0.02%	138.87	0.00	0.02	144.67
T7 Single Dump Class 8	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	8.44	0.01	0.00	9.11
T7 Single Other Class 8	Diesel	0.12%	0.11%	742.69	0.00	0.12	773.70
T7 Single Other Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	45.18	0.04	0.01	48.78
T7 SWCV Class 8	Diesel	0.00%	0.00%	7.40	0.00	0.00	7.71
T7 SWCV Class 8	Electricity	0.04%	0.04%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.05%	0.05%	227.44	0.06	0.05	241.50
T7 Tractor Class 8	Diesel	0.69%	0.62%	3,802.17	0.00	0.60	3,960.95
T7 Tractor Class 8	Electricity	0.15%	0.14%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.02%	0.02%	88.26	0.08	0.02	95.32
T7 Utility Class 8	Diesel	0.00%	0.00%	24.52	0.00	0.00	25.55
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	2.48	0.00	0.00	2.52
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.00%	0.00%	11.92	0.00	0.00	11.93
UBUS	Electricity	0.26%	0.24%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.00%	0.00%	4.11	0.00	0.00	4.34
	total	100%	100%	136,030.41	1.39	5.81	137,610.32

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

		CO_2	CH_4	N_2O	
		AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT	**577,562,001**	1	28	265	

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
All Other Buses	Diesel	0.03%	0.02%	129.97	0.00	0.02	135.39
All Other Buses	Natural Gas	0.01%	0.01%	32.43	0.03	0.01	34.89
LDA	Gasoline	36.70%	37.33%	49,986.29	0.24	0.68	50,173.32
LDA	Diesel	0.02%	0.02%	23.77	0.00	0.00	24.76
LDA	Electricity	5.24%	5.33%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.75%	1.78%	1,264.97	0.00	0.00	1,266.38
LDT1	Gasoline	3.21%	3.26%	5,052.35	0.02	0.06	5,069.66
LDT1	Diesel	0.00%	0.00%	0.08	0.00	0.00	0.08
LDT1	Electricity	0.10%	0.11%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.08%	0.08%	57.52	0.00	0.00	57.58
LDT2	Gasoline	24.88%	25.30%	40,613.26	0.22	0.50	40,750.83
LDT2	Diesel	0.10%	0.10%	147.80	0.00	0.02	153.99
LDT2	Electricity	0.73%	0.74%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.69%	0.71%	501.92	0.00	0.00	502.47
LHD1	Gasoline	0.96%	0.83%	2,427.07	0.00	0.01	2,429.01
LHD1	Diesel	0.73%	0.63%	1,694.27	0.01	0.27	1,765.21
LHD1	Electricity	1.67%	1.44%	0.00	0.00	0.00	0.00
LHD2	Gasoline	0.13%	0.11%	371.41	0.00	0.00	371.78
LHD2	Diesel	0.34%	0.29%	918.72	0.00	0.14	957.19
LHD2	Electricity	0.44%	0.38%	0.00	0.00	0.00	0.00
MCY	Gasoline	0.38%	0.39%	435.32	0.33	0.08	465.77
MDV	Gasoline	13.60%	13.83%	26,889.74	0.12	0.28	26,966.44
MDV	Diesel	0.15%	0.15%	294.82	0.00	0.05	307.14
MDV	Electricity	0.66%	0.67%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.42%	0.42%	301.31	0.00	0.00	301.64
MH	Gasoline	0.05%	0.04%	423.66	0.00	0.00	424.76
MH	Diesel	0.03%	0.02%	135.08	0.00	0.02	140.73
Motor Coach	Diesel	0.03%	0.03%	256.79	0.00	0.04	267.52
OBUS	Gasoline	0.01%	0.01%	100.01	0.00	0.00	100.27
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
OBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
PTO	Diesel	0.03%	0.03%	273.15	0.00	0.04	284.55
PTO	Electricity	0.04%	0.03%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.01%	43.66	0.00	0.00	43.79
SBUS	Diesel	0.00%	0.00%	16.94	0.00	0.00	17.65
SBUS	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	0.01%	57.49	0.13	0.01	64.14
T6 CAIRP Class 4	Diesel	0.00%	0.00%	2.25	0.00	0.00	2.35
T6 CAIRP Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00%	3.09	0.00	0.00	3.22
T6 CAIRP Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00%	8.06	0.00	0.00	8.40
T6 CAIRP Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.02%	85.55	0.00	0.01	89.12
T6 CAIRP Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00%	0.05	0.00	0.00	0.05
T6 Instate Delivery Class 4	Diesel	0.04%	0.03%	173.53	0.00	0.03	180.77
T6 Instate Delivery Class 4	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00%	1.14	0.00	0.00	1.22
T6 Instate Delivery Class 5	Diesel	0.04%	0.03%	179.80	0.00	0.03	187.30

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the 2008 Climate Change Scoping Plan Measure Documentation Supplement.

	Fleet Mix	
	Passenger Vehicles	Trucks
Fehr & Peers	90%	10%
EMFAC Default	89%	11%

		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**577,562,001**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T6 Instate Delivery Class 5	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00%	1.17	0.00	0.00	1.26
T6 Instate Delivery Class 6	Diesel	0.11%	0.10%	550.13	0.00	0.09	573.10
T6 Instate Delivery Class 6	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00%	3.58	0.00	0.00	3.85
T6 Instate Delivery Class 7	Diesel	0.06%	0.05%	293.01	0.00	0.05	305.25
T6 Instate Delivery Class 7	Electricity	0.05%	0.04%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00%	5.98	0.00	0.00	6.42
T6 Instate Other Class 4	Diesel	0.05%	0.05%	258.61	0.00	0.04	269.41
T6 Instate Other Class 4	Electricity	0.07%	0.06%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00%	1.68	0.00	0.00	1.81
T6 Instate Other Class 5	Diesel	0.12%	0.11%	602.89	0.00	0.09	628.07
T6 Instate Other Class 5	Electricity	0.17%	0.15%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	0.00%	3.91	0.00	0.00	4.20
T6 Instate Other Class 6	Diesel	0.11%	0.10%	534.62	0.00	0.08	556.94
T6 Instate Other Class 6	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	0.00%	3.47	0.00	0.00	3.73
T6 Instate Other Class 7	Diesel	0.07%	0.06%	339.69	0.00	0.05	353.88
T6 Instate Other Class 7	Electricity	0.06%	0.06%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	0.00%	6.75	0.00	0.00	7.25
T6 Instate Tractor Class 6	Diesel	0.00%	0.00%	8.84	0.00	0.00	9.20
T6 Instate Tractor Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00%	0.06	0.00	0.00	0.06
T6 Instate Tractor Class 7	Diesel	0.05%	0.04%	221.99	0.00	0.03	231.26
T6 Instate Tractor Class 7	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00%	4.74	0.00	0.00	5.10
T6 OOS Class 4	Diesel	0.00%	0.00%	3.06	0.00	0.00	3.18
T6 OOS Class 5	Diesel	0.00%	0.00%	4.19	0.00	0.00	4.37
T6 OOS Class 6	Diesel	0.00%	0.00%	10.95	0.00	0.00	11.40
T6 OOS Class 7	Diesel	0.02%	0.01%	71.67	0.00	0.01	74.66
T6 Public Class 4	Diesel	0.00%	0.00%	19.46	0.00	0.00	20.27
T6 Public Class 4	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00%	3.00	0.00	0.00	3.22
T6 Public Class 5	Diesel	0.00%	0.00%	13.56	0.00	0.00	14.13
T6 Public Class 5	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00%	2.16	0.00	0.00	2.32
T6 Public Class 6	Diesel	0.00%	0.00%	16.21	0.00	0.00	16.89
T6 Public Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00%	2.54	0.00	0.00	2.73
T6 Public Class 7	Diesel	0.02%	0.02%	100.30	0.00	0.02	104.49
T6 Public Class 7	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.00%	15.89	0.01	0.00	17.07
T6 Utility Class 5	Diesel	0.00%	0.00%	17.20	0.00	0.00	17.92
T6 Utility Class 5	Electricity	0.01%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00%	0.08	0.00	0.00	0.09
T6 Utility Class 6	Diesel	0.00%	0.00%	3.25	0.00	0.00	3.39
T6 Utility Class 6	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00%	0.02	0.00	0.00	0.02
T6 Utility Class 7	Diesel	0.00%	0.00%	4.48	0.00	0.00	4.67

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. Los Angeles County

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	Passenger Vehicles	Trucks
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		CO_2	CH_4	N_2O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	**577,562,001**	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	Adjusted Percent for Redondo Beach	CO_2	CH_4	N_2O	CO_2e
T6 Utility Class 7	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00%	0.02	0.00	0.00	0.02
T6TS	Gasoline	0.10%	0.09%	703.76	0.00	0.00	704.64
T6TS	Electricity	0.14%	0.12%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Diesel	0.79%	0.68%	4,950.58	0.00	0.78	5,157.33
T7 CAIRP Class 8	Electricity	0.23%	0.20%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	0.00%	15.13	0.01	0.00	16.34
T7 NNOOS Class 8	Diesel	1.21%	1.04%	7,260.35	0.00	1.14	7,563.55
T7 NOOS Class 8	Diesel	0.44%	0.38%	2,635.66	0.00	0.42	2,745.73
T7 POLA Class 8	Diesel	0.50%	0.43%	3,333.30	0.00	0.53	3,472.50
T7 POLA Class 8	Electricity	0.10%	0.09%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.02%	0.02%	106.81	0.10	0.02	115.37
T7 Public Class 8	Diesel	0.01%	0.01%	107.36	0.00	0.02	111.84
T7 Public Class 8	Electricity	0.03%	0.03%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.03%	0.02%	141.16	0.13	0.03	152.31
T7 Single Concrete/Transit Mix	Diesel	0.01%	0.01%	58.63	0.00	0.01	61.08
T7 Single Concrete/Transit Mix	Electricity	0.01%	0.01%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00%	3.58	0.00	0.00	3.86
T7 Single Dump Class 8	Diesel	0.02%	0.02%	157.77	0.00	0.02	164.36
T7 Single Dump Class 8	Electricity	0.02%	0.02%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	0.00%	9.59	0.01	0.00	10.35
T7 Single Other Class 8	Diesel	0.12%	0.10%	843.77	0.00	0.13	879.01
T7 Single Other Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.01%	0.01%	51.33	0.05	0.01	55.42
T7 SWCV Class 8	Diesel	0.00%	0.00%	8.41	0.00	0.00	8.76
T7 SWCV Class 8	Electricity	0.04%	0.04%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.05%	0.05%	258.40	0.07	0.05	274.37
T7 Tractor Class 8	Diesel	0.69%	0.60%	4,319.66	0.00	0.68	4,500.05
T7 Tractor Class 8	Electricity	0.15%	0.13%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.02%	0.02%	100.27	0.09	0.02	108.29
T7 Utility Class 8	Diesel	0.00%	0.00%	27.86	0.00	0.00	29.03
T7 Utility Class 8	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.00%	2.81	0.00	0.00	2.86
T7IS	Electricity	0.00%	0.00%	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.00%	0.00%	13.54	0.00	0.00	13.56
UBUS	Electricity	0.26%	0.23%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.00%	0.00%	4.67	0.00	0.00	4.93
	total	100%	100%	161,146.81	1.63	6.69	162,966.51

Source: EMFAC2021 (v1.0.2) Emission Rates

Region Type: Sub-Area

Region: Los Angeles

Calendar Year: 2050

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

g/mile 2.205E-03

Vehicle Category	Fuel	VMT Total	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_TOTAL	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	% of VMT
All Other Buses	Diesel	76662.8064	1.14E-02	5.42E-01	7.01E-02	9.11E-03	6.34E-03	1.20E-02	4.41E-02	6.24E-02	6.07E-03	3.00E-03	1.54E-02	2.45E-02	9.62E+02	5.30E-04	1.52E-01	0.03%
All Other Buses	Natural Gas	23518.7619	8.76E-03	7.61E-02	2.42E+00	0.00E+00	1.25E-03	1.20E-02	4.41E-02	5.73E-02	1.15E-03	3.00E-03	1.54E-02	1.96E-02	7.82E+02	6.13E-01	1.59E-01	0.01%
LDA	Gasoline	104008495	3.23E-03	1.92E-02	5.07E-01	2.29E-03	5.62E-04	8.00E-03	8.73E-03	1.73E-02	5.17E-04	2.00E-03	3.06E-03	5.57E-03	2.32E+02	1.12E-03	3.16E-03	36.70%
LDA	Diesel	60242.5084	5.53E-03	1.05E-02	1.78E-01	1.80E-03	9.09E-04	8.00E-03	8.74E-03	1.77E-02	8.70E-04	2.00E-03	3.06E-03	5.93E-03	1.90E+02	2.57E-04	3.00E-02	0.02%
LDA	Electricity	14854702.5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.39E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	5.24%
LDA	Plug-in Hybric	4949652.74	1.39E-03	2.83E-03	2.01E-01	1.22E-03	2.29E-04	8.00E-03	4.20E-03	1.24E-02	2.11E-04	2.00E-03	1.47E-03	3.68E-03	1.23E+02	4.23E-04	4.73E-04	1.75%
LDT1	Gasoline	9095512.82	3.60E-03	2.10E-02	5.52E-01	2.65E-03	6.06E-04	8.00E-03	1.07E-02	1.93E-02	5.57E-04	2.00E-03	3.74E-03	6.30E-03	2.68E+02	1.22E-03	3.33E-03	3.21%
LDT1	Diesel	108.138023	1.76E-02	3.22E-02	1.88E-01	3.38E-03	4.65E-03	8.00E-03	1.06E-02	2.33E-02	4.45E-03	2.00E-03	3.72E-03	1.02E-02	3.57E+02	8.16E-04	5.62E-02	0.00%
LDT1	Electricity	297361.714	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.40E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	0.10%
LDT1	Plug-in Hybric	225340.068	1.39E-03	2.82E-03	2.01E-01	1.22E-03	2.28E-04	8.00E-03	4.21E-03	1.24E-02	2.09E-04	2.00E-03	1.47E-03	3.68E-03	1.23E+02	4.20E-04	4.68E-04	0.08%
LDT2	Gasoline	70496461.9	4.55E-03	2.19E-02	6.02E-01	2.75E-03	5.76E-04	8.00E-03	1.05E-02	1.91E-02	5.29E-04	2.00E-03	3.68E-03	6.21E-03	2.78E+02	1.51E-03	3.39E-03	24.88%
LDT2	Diesel	270074.154	1.74E-02	3.22E-02	1.82E-01	2.50E-03	4.55E-03	8.00E-03	1.05E-02	2.31E-02	4.35E-03	2.00E-03	3.68E-03	1.00E-02	2.64E+02	8.09E-04	4.16E-02	0.10%
LDT2	Electricity	2059273.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.39E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	0.73%
LDT2	Plug-in Hybric	1964573.76	1.39E-03	2.83E-03	2.01E-01	1.22E-03	2.29E-04	8.00E-03	4.21E-03	1.24E-02	2.11E-04	2.00E-03	1.47E-03	3.68E-03	1.23E+02	4.21E-04	4.69E-04	0.69%
LHD1	Gasoline	2728819.03	1.55E-03	1.43E-02	5.15E-01	4.99E-03	1.07E-03	8.00E-03	7.80E-02	8.71E-02	9.87E-04	2.00E-03	2.73E-02	3.03E-02	5.05E+02	4.79E-04	1.47E-03	0.96%
LHD1	Diesel	2057479.09	4.42E-02	1.45E-01	8.55E-02	4.43E-03	1.12E-02	1.20E-02	7.80E-02	1.01E-01	1.08E-02	3.00E-03	2.73E-02	4.11E-02	4.67E+02	2.05E-03	7.36E-02	0.73%
LHD1	Electricity	4733034.15	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	3.90E-02	4.70E-02	0.00E+00	2.00E-03	1.37E-02	1.57E-02	0.00E+00	0.00E+00	0.00E+00	1.67%
LHD2	Gasoline	370486.547	1.38E-03	1.96E-02	5.22E-01	5.62E-03	1.07E-03	8.00E-03	9.10E-02	1.00E-01	9.88E-04	2.00E-03	3.19E-02	3.48E-02	5.69E+02	4.35E-04	2.12E-03	0.13%
LHD2	Diesel	957881.781	5.35E-02	1.94E-01	1.05E-01	5.16E-03	1.38E-02	1.20E-02	9.10E-02	1.17E-01	1.32E-02	3.00E-03	3.19E-02	4.81E-02	5.44E+02	2.48E-03	8.57E-02	0.34%
LHD2	Electricity	1249736.01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.55E-02	5.35E-02	0.00E+00	2.00E-03	1.59E-02	1.79E-02	0.00E+00	0.00E+00	0.00E+00	0.44%
MCY	Gasoline	1090739.18	8.79E-01	4.63E-01	1.04E+01	1.90E-03	2.53E-03	4.00E-03	1.20E-02	1.85E-02	2.36E-03	1.00E-03	4.20E-03	7.56E-03	1.93E+02	1.48E-01	3.52E-02	0.38%
MDV	Gasoline	38531531.6	4.74E-03	2.28E-02	6.25E-01	3.33E-03	5.80E-04	8.00E-03	1.07E-02	1.93E-02	5.33E-04	2.00E-03	3.75E-03	6.28E-03	3.37E+02	1.56E-03	3.46E-03	13.60%
MDV	Diesel	415776.682	6.02E-03	1.12E-02	1.97E-01	3.24E-03	9.54E-04	8.00E-03	1.07E-02	1.97E-02	9.12E-04	2.00E-03	3.75E-03	6.67E-03	3.42E+02	2.80E-04	5.39E-02	0.15%
MDV	Electricity	1866962.63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.40E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00	0.66%
MDV	Plug-in Hybric	1179011.97	1.39E-03	2.83E-03	2.01E-01	1.22E-03	2.31E-04	8.00E-03	4.21E-03	1.24E-02	2.13E-04	2.00E-03	1.47E-03	3.69E-03	1.23E+02	4.18E-04	4.62E-04	0.42%
MH	Gasoline	135257.64	6.15E-03	2.04E-01	1.40E-01	1.76E-02	1.14E-03	1.20E-02	4.35E-02	5.66E-02	1.04E-03	3.00E-03	1.52E-02	1.93E-02	1.78E+03	2.26E-03	1.71E-02	0.05%
MH	Diesel	74971.7278	3.66E-02	1.88E+00	1.05E-01	9.69E-03	1.55E-02	1.60E-02	4.32E-02	7.47E-02	1.49E-02	4.00E-03	1.51E-02	3.40E-02	1.02E+03	1.70E-03	1.61E-01	0.03%
Motor Coach	Diesel	97037.1007	9.45E-03	9.85E-01	6.69E-02	1.42E-02	1.39E-02	1.20E-02	9.81E-02	1.24E-01	1.33E-02	3.00E-03	3.43E-02	5.06E-02	1.50E+03	4.39E-04	2.37E-01	0.03%
OBUS	Gasoline	39449.5082	5.42E-03	2.44E-01	1.60E-01	1.42E-02	1.12E-03	1.20E-02	4.41E-02	5.72E-02	1.03E-03	3.00E-03	1.54E-02	1.95E-02	1.44E+03	1.45E-03	1.41E-02	0.01%
OBUS	Electricity	52659.4788	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.20E-02	3.40E-02	0.00E+00	3.00E-03	7.72E-03	1.07E-02	0.00E+00	0.00E+00	0.00E+00	0.02%
PTO	Diesel	90414.6754	1.37E-02	2.37E+00	1.70E-01	1.62E-02	3.78E-03	0.00E+00	0.00E+00	3.78E-03	3.62E-03	0.00E+00	0.00E+00	3.62E-03	1.71E+03	6.35E-04	2.70E-01	0.03%
PTO	Electricity	104014.482	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.04%
SBUS	Gasoline	32143.9887	1.05E-02	8.51E-02	1.92E-01	7.62E-03	1.70E-03	8.00E-03	4.68E-02	5.65E-02	1.56E-03	2.00E-03	1.64E-02	2.00E-02	7.71E+02	2.39E-03	8.09E-03	0.01%
SBUS	Diesel	8698.05737	9.52E-03	3.71E-01	6.34E-02	1.05E-02	3.27E-03	1.20E-02	4.68E-02	6.21E-02	3.13E-03	3.00E-03	1.64E-02	2.25E-02	1.10E+03	4.42E-04	1.74E-01	0.00%
SBUS	Electricity	67966.5895	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-02	2.34E-02	3.36E-02	0.00E+00	2.56E-03	8.20E-03	1.08E-02	0.00E+00	0.00E+00	0.00E+00	0.02%
SBUS	Natural Gas	22945.6196	4.48E-02	2.03E-01	8.64E+00	0.00E+00	4.48E-03	1.20E-02	4.68E-02	6.33E-02	4.12E-03	3.00E-03	1.64E-02	2.35E-02	1.42E+03	3.14E+00	2.90E-01	0.01%
T6 CAIRP Class 4	Diesel	1302.78652	4.55E-03	1.79E-01	3.06E-02	9.29E-03	3.88E-03	1.20E-02	4.29E-02	5.88E-02	3.71E-03	3.00E-03	1.50E-02	2.17E-02	9.81E+02	2.11E-04	1.55E-01	0.00%
T6 CAIRP Class 4	Electricity	2001.52511	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.51E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 5	Diesel	1788.13485	4.55E-03	1.80E-01	3.06E-02	9.29E-03	3.88E-03	1.20E-02	4.29E-02	5.88E-02	3.71E-03	3.00E-03	1.50E-02	2.17E-02	9.81E+02	2.12E-04	1.55E-01	0.00%
T6 CAIRP Class 5	Electricity	2744.78652	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.51E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 6	Diesel	4666.64212	4.55E-03	1.82E-01	3.06E-02	9.28E-03	3.91E-03	1.20E-02	4.29E-02	5.88E-02	3.74E-03	3.00E-03	1.50E-02	2.18E-02	9.80E+02	2.11E-04	1.54E-01	0.00%
T6 CAIRP Class 6	Electricity	7178.01111	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.51E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 CAIRP Class 7	Diesel	55971.6732	4.94E-03	1.99E-01	3.32E-02	8.21E-03	4.16E-03	1.20E-02	4.29E-02	5.91E-02	3.98E-03	3.00E-03	1.50E-02	2.20E-02	8.67E+02	2.29E-04	1.37E-01	0.02%
T6 CAIRP Class 7	Electricity	18287.2062	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.15E-02	3.35E-02	0.00E+00	3.00E-03	7.51E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00	0.01%
T6 CAIRP Class 7	Natural Gas	36.7725361	7.85E-03	4.53E-02	1.76E+00	0.00E+00	1.20E-03	1.20E-02	4.29E-02	5.61E-02	1.10E-03	3.00E-03	1.50E-02	1.91E-02	7.50E+02	5.49E-01	1.53E-01	0.00%
T6 Instate Delivery Cl	Diesel	101057.761	4.68E-03	2.12E-01	3.63E-02	9.23E-03	3.28E-03	1.20E-02	4.37E-02	5.90E-02	3.14E-03	3.00E-03	1.53E-02	2.14E-02	9.74E+02	2.17E-04	1.53E-01	0.04%
T6 Instate Delivery Cl	Electricity	134637.062	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.64E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.05%
T6 Instate Delivery Cl	Natural Gas	791.11877	8.67E-03	4.83E-02	2.18E+00	0.00E+00	1.34E-03	1.20E-02	4.37E-02	5.70E-02	1.23E-03	3.00E-03	1.53E-02	1.95E-02	8.16E+02	6.07E-01	1.66E-01	0.00%
T6 Instate Delivery Cl	Diesel	104661.144	4.68E-03	2.11E-01	3.62E-02	9.23E-03	3.27E-03	1.20E-02	4.37E-02	5.90E-02	3.13E-03	3.00E-03	1.53E-02	2.14E-02	9.75E+02	2.17E-04	1.54E-01	0.04%
T6 Instate Delivery Cl	Electricity	139811.112	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.64E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.05%
T6 Instate Delivery Cl	Natural Gas	813.023502	8.67E-03	4.81E-02	2.18E+00	0.00E+00	1.34E-03	1.20E-02	4.37E-02	5.70E-02	1.23E-03	3.00E-03	1.53E-02	1.95E-02	8.15E+02	6.07E-01	1.66E-01	0.00%
T6 Instate Delivery Cl	Diesel	320287.355	4.68E-03	2.14E-01	3.63E-02	9.23E-03	3.30E-03	1.20E-02	4.37E-02	5.90E-02	3.15E-03	3.00E-03	1.53E-02	2.14E-02	9.75E+02	2.17E-04	1.54E-01	0.11%
T6 Instate Delivery Cl	Electricity	427525.495	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.64E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.15%
T6 Instate Delivery Cl	Natural Gas	2491.02109	8.67E-03	4.82E-02	2.18E+00	0.00E+00	1.34E-03	1.20E-02	4.37E-02	5.70E-02	1.23E-03	3.00E-03	1.53E-02	1.95E-02	8.15E+02	6.07E-01	1.66E-01	0.00%
T6 Instate Delivery Cl	Diesel	168712.287	5.81E-03	3.31E-01	4.41E-02	9.33E-03	4.04E-03	1.20E-02	4.37E-02	5.97E-02	3.87E-03	3.00E-03	1.53E-02	2.22E-02	9.85E+02	2.70E-04	1.55E-01	0.06%
T6 Instate Delivery Cl	Electricity	134688.398	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.64E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.05%
T6 Instate Delivery Cl	Natural Gas	4087.42599	8.37E-03	7.02E-02	2.25E+00	0.00E+00	1.21E-03	1.20E-02	4.37E-02	5.69E-02	1.11E-03	3.00E-03	1.53E-02	1.94E-02	8.30E+02	5.86E-01	1.69E-01	0.00%
T6 Instate Other Clas	Diesel	150745.889	4.66E-03	2.06E-01	3.54E-02	9.22E-03	3.37E-03	1.20E-02	4.35E-02	5.89E-02	3.22E-03	3.00E-03	1.52E-02	2.15E-02	9.73E+02	2.16E-04	1.53E-01	0.05%
T6 Instate Other Clas	Electricity	207598.799	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.07%
T6 Instate Other Clas	Natural Gas	1182.3515	8.53E-03	4.77E-02	2.11E+00	0.00E+00	1.32E-03	1.20E-02	4.35E-02	5.69E-02	1.21E-03	3.00E-03	1.52E-02	1.94E-02	8.08E+02	5.97E-01	1.65E-01	0.00%
T6 Instate Other Clas	Diesel	351351.441	4.66E-03	2.06E-01	3.54E-02	9.22E-03	3.37E-03	1.20E-02	4.35E-02	5.89E-02	3.22E-03	3.00E-03	1.52E-02	2.15E-02	9.74E+02	2.17E-04	1.53E-01	0.12%
T6 Instate Other Clas	Electricity	484107.62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.17%
T6 Instate Other Clas	Natural Gas	2744.21085	8.53E-03	4.76E-02	2.11E+00	0.00E+00	1.32E-03	1.20E-02	4.35E-02	5.69E-02	1.21E-03	3.00E-03	1.52E-02	1.94E-02	8.08E+02	5.97E-01	1.65E-01	0.00%
T6 Instate Other Clas	Diesel	311588.117	4.66E-03	2.09E-01	3.54E-02	9.22E-03	3.39E-03	1.20E-02	4.35E-02	5.89E-02	3.25E-03	3.00E-03	1.52E-02	2.15E-02	9.73E+02	2.16E-04	1.53E-01	0.11%
T6 Instate Other Clas	Electricity	429159.018	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.15%
T6 Instate Other Clas	Natural Gas	2434.77847	8.53E-03	4.77E-02	2.11E+00	0.00E+00	1.32E-03	1.20E-02	4.35E-02	5.69E-02	1.21E-03	3.00E-03	1.52E-02	1.94E-02	8.08E+02	5.97E-01	1.65E-01	0.00%
T6 Instate Other Clas	Diesel	197108.586	5.56E-03	2.97E-01	4.10E-02	9.26E-03	3.99E-03	1.20E-02	4.35E-02	5.95E-02	3.82E-03	3.00E-03	1.52E-02	2.21E-02	9.78E+02	2.58E-04	1.54E-01	0.07%
T6 Instate Other Clas	Electricity	180365.215	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.06%

T6 Instate Other Clas	Natural Gas	4682.28347	8.33E-03	6.22E-02	2.17E+00	0.00E+00	1.23E-03	1.20E-02	4.35E-02	5.68E-02	1.13E-03	3.00E-03	1.52E-02	1.94E-02	8.18E+02	5.83E-01	1.67E-01	0.00%
T6 Instate Tractor Clc	Diesel	5146.23943	4.59E-03	2.05E-01	3.49E-02	9.22E-03	3.36E-03	1.20E-02	4.35E-02	5.89E-02	3.21E-03	3.00E-03	1.52E-02	2.15E-02	9.74E+02	2.13E-04	1.53E-01	0.00%
T6 Instate Tractor Clc	Electricity	7217.20915	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Instate Tractor Clc	Natural Gas	40.2014373	8.53E-03	4.75E-02	2.11E+00	0.00E+00	1.32E-03	1.20E-02	4.35E-02	5.69E-02	1.21E-03	3.00E-03	1.52E-02	1.94E-02	8.08E+02	5.97E-01	1.65E-01	0.00%
T6 Instate Tractor Clc	Diesel	143018.377	5.48E-03	2.86E-01	4.06E-02	8.34E-03	3.93E-03	1.20E-02	4.35E-02	5.95E-02	3.76E-03	3.00E-03	1.52E-02	2.20E-02	8.81E+02	2.54E-04	1.39E-01	0.05%
T6 Instate Tractor Clc	Electricity	38433.1551	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.18E-02	3.38E-02	0.00E+00	3.00E-03	7.62E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.01%
T6 Instate Tractor Clc	Natural Gas	3373.6862	8.35E-03	6.11E-02	2.16E+00	0.00E+00	1.23E-03	1.20E-02	4.35E-02	5.68E-02	1.13E-03	3.00E-03	1.52E-02	1.94E-02	7.98E+02	5.84E-01	1.63E-01	0.00%
T6 OOS Class 4	Diesel	1880.98546	4.50E-03	2.28E-01	3.03E-02	8.73E-03	4.05E-03	1.20E-02	4.29E-02	5.90E-02	3.88E-03	3.00E-03	1.50E-02	2.19E-02	9.22E+02	2.09E-04	1.45E-01	0.00%
T6 OOS Class 5	Diesel	2580.3738	4.51E-03	2.28E-01	3.03E-02	8.73E-03	4.06E-03	1.20E-02	4.29E-02	5.90E-02	3.89E-03	3.00E-03	1.50E-02	2.19E-02	9.22E+02	2.10E-04	1.45E-01	0.00%
T6 OOS Class 6	Diesel	6742.59057	4.49E-03	2.26E-01	3.02E-02	8.72E-03	4.05E-03	1.20E-02	4.29E-02	5.90E-02	3.87E-03	3.00E-03	1.50E-02	2.19E-02	9.21E+02	2.09E-04	1.45E-01	0.00%
T6 OOS Class 7	Diesel	49027.0178	4.84E-03	2.39E-01	3.25E-02	7.85E-03	4.28E-03	1.20E-02	4.29E-02	5.92E-02	4.10E-03	3.00E-03	1.50E-02	2.21E-02	8.29E+02	2.25E-04	1.31E-01	0.02%
T6 Public Class 4	Diesel	11162.1128	5.31E-03	2.61E-01	3.32E-02	9.37E-03	3.95E-03	1.20E-02	4.32E-02	5.92E-02	3.78E-03	3.00E-03	1.51E-02	2.19E-02	9.89E+02	2.47E-04	1.56E-01	0.00%
T6 Public Class 4	Electricity	14017.0113	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 4	Natural Gas	2149.14716	8.10E-03	5.12E-02	1.95E+00	0.00E+00	1.23E-03	1.20E-02	4.32E-02	5.64E-02	1.13E-03	3.00E-03	1.51E-02	1.92E-02	7.92E+02	5.67E-01	1.61E-01	0.00%
T6 Public Class 5	Diesel	7765.06813	5.24E-03	2.43E-01	3.26E-02	9.38E-03	3.82E-03	1.20E-02	4.32E-02	5.90E-02	3.65E-03	3.00E-03	1.51E-02	2.18E-02	9.91E+02	2.43E-04	1.56E-01	0.00%
T6 Public Class 5	Electricity	9841.96538	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 5	Natural Gas	1544.66413	8.07E-03	5.36E-02	1.96E+00	0.00E+00	1.21E-03	1.20E-02	4.32E-02	5.64E-02	1.11E-03	3.00E-03	1.51E-02	1.92E-02	7.93E+02	5.65E-01	1.62E-01	0.00%
T6 Public Class 6	Diesel	9305.32807	5.01E-03	2.22E-01	3.19E-02	9.36E-03	3.63E-03	1.20E-02	4.32E-02	5.88E-02	3.47E-03	3.00E-03	1.51E-02	2.16E-02	9.89E+02	2.33E-04	1.56E-01	0.00%
T6 Public Class 6	Electricity	11619.072	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Public Class 6	Natural Gas	1818.64353	8.13E-03	4.91E-02	1.94E+00	0.00E+00	1.24E-03	1.20E-02	4.32E-02	5.64E-02	1.14E-03	3.00E-03	1.51E-02	1.93E-02	7.92E+02	5.69E-01	1.62E-01	0.00%
T6 Public Class 7	Diesel	58285.2814	4.75E-03	2.21E-01	3.12E-02	9.25E-03	3.63E-03	1.20E-02	4.32E-02	5.88E-02	3.47E-03	3.00E-03	1.51E-02	2.16E-02	9.76E+02	2.21E-04	1.54E-01	0.02%
T6 Public Class 7	Electricity	57042.051	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.02%
T6 Public Class 7	Natural Gas	11380.8409	8.13E-03	4.93E-02	1.94E+00	0.00E+00	1.24E-03	1.20E-02	4.32E-02	5.64E-02	1.14E-03	3.00E-03	1.51E-02	1.93E-02	7.92E+02	5.69E-01	1.61E-01	0.00%
T6 Utility Class 5	Diesel	10027.8676	3.64E-03	1.40E-01	2.61E-02	9.22E-03	3.13E-03	1.20E-02	4.32E-02	5.83E-02	2.99E-03	3.00E-03	1.51E-02	2.11E-02	9.73E+02	1.69E-04	1.53E-01	0.00%
T6 Utility Class 5	Electricity	15559.3622	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.01%
T6 Utility Class 5	Natural Gas	57.6429543	8.17E-03	4.60E-02	1.92E+00	0.00E+00	1.26E-03	1.20E-02	4.32E-02	5.65E-02	1.16E-03	3.00E-03	1.51E-02	1.93E-02	7.88E+02	5.72E-01	1.61E-01	0.00%
T6 Utility Class 6	Diesel	1895.08982	3.64E-03	1.37E-01	2.61E-02	9.22E-03	3.11E-03	1.20E-02	4.32E-02	5.83E-02	2.98E-03	3.00E-03	1.51E-02	2.11E-02	9.73E+02	1.69E-04	1.53E-01	0.00%
T6 Utility Class 6	Electricity	2940.3785	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Utility Class 6	Natural Gas	10.8935001	8.17E-03	4.60E-02	1.92E+00	0.00E+00	1.26E-03	1.20E-02	4.32E-02	5.65E-02	1.16E-03	3.00E-03	1.51E-02	1.93E-02	7.88E+02	5.72E-01	1.61E-01	0.00%
T6 Utility Class 7	Diesel	2610.05144	3.61E-03	1.34E-01	2.58E-02	9.23E-03	3.10E-03	1.20E-02	4.32E-02	5.83E-02	2.96E-03	3.00E-03	1.51E-02	2.11E-02	9.74E+02	1.68E-04	1.54E-01	0.00%
T6 Utility Class 7	Electricity	4117.84441	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.16E-02	3.36E-02	0.00E+00	3.00E-03	7.56E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T6 Utility Class 7	Natural Gas	15.0032971	8.17E-03	4.60E-02	1.92E+00	0.00E+00	1.26E-03	1.20E-02	4.32E-02	5.65E-02	1.16E-03	3.00E-03	1.51E-02	1.93E-02	7.88E+02	5.72E-01	1.61E-01	0.00%
T6TS	Gasoline	285814.488	8.06E-03	6.04E-02	1.55E-01	1.38E-02	1.14E-03	1.20E-02	4.35E-02	5.66E-02	1.05E-03	3.00E-03	1.52E-02	1.93E-02	1.40E+03	2.17E-03	6.36E-03	0.10%
T6TS	Electricity	382793.847	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.17E-02	3.37E-02	0.00E+00	3.00E-03	7.61E-03	1.06E-02	0.00E+00	0.00E+00	0.00E+00	0.14%
T7 CAIRP Class 8	Diesel	2231195.16	1.04E-02	1.15E+00	4.58E-02	1.19E-02	2.48E-02	3.60E-02	8.70E-02	1.48E-01	2.37E-02	9.00E-03	3.05E-02	6.32E-02	1.26E+03	4.83E-04	1.98E-01	0.79%
T7 CAIRP Class 8	Electricity	654175.252	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.35E-02	7.95E-02	0.00E+00	9.00E-03	1.52E-02	2.42E-02	0.00E+00	0.00E+00	0.00E+00	0.23%
T7 CAIRP Class 8	Natural Gas	8162.49528	1.39E-02	1.57E-01	3.53E+00	0.00E+00	2.06E-03	3.60E-02	8.70E-02	1.25E-01	1.89E-03	9.00E-03	3.05E-02	4.14E-02	1.05E+03	9.75E-01	2.14E-01	0.00%
T7 NNOOS Class 8	Diesel	3419711.86	1.01E-02	1.27E+00	4.46E-02	1.14E-02	2.45E-02	3.60E-02	8.70E-02	1.48E-01	2.34E-02	9.00E-03	3.05E-02	6.29E-02	1.20E+03	4.70E-04	1.90E-01	1.21%
T7 NOOS Class 8	Diesel	1241700.89	1.04E-02	1.30E+00	4.60E-02	1.14E-02	2.59E-02	3.60E-02	8.70E-02	1.49E-01	2.48E-02	9.00E-03	3.05E-02	6.43E-02	1.20E+03	4.85E-04	1.90E-01	0.44%
T7 POLA Class 8	Diesel	1410184.44	9.68E-03	1.14E+00	4.59E-02	1.27E-02	2.15E-02	3.60E-02	8.80E-02	1.45E-01	2.06E-02	9.00E-03	3.08E-02	6.04E-02	1.34E+03	4.49E-04	2.11E-01	0.50%
T7 POLA Class 8	Electricity	282689.154	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.41E-02	8.01E-02	0.00E+00	9.00E-03	1.54E-02	2.44E-02	0.00E+00	0.00E+00	0.00E+00	0.10%
T7 POLA Class 8	Natural Gas	57000.036	1.42E-02	1.58E-01	3.72E+00	0.00E+00	2.10E-03	3.60E-02	8.81E-02	1.26E-01	1.93E-03	9.00E-03	3.08E-02	4.18E-02	1.06E+03	9.94E-01	2.17E-01	0.02%
T7 Public Class 8	Diesel	40720.8416	1.55E-02	1.33E+00	6.44E-02	1.42E-02	1.63E-02	3.60E-02	8.65E-02	1.39E-01	1.56E-02	9.00E-03	3.03E-02	5.49E-02	1.50E+03	7.20E-04	2.36E-01	0.01%
T7 Public Class 8	Electricity	91072.3002	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.40E-02	8.00E-02	0.00E+00	9.00E-03	1.54E-02	2.44E-02	0.00E+00	0.00E+00	0.00E+00	0.03%
T7 Public Class 8	Natural Gas	72349.3454	1.41E-02	1.82E-01	4.06E+00	0.00E+00	2.03E-03	3.60E-02	8.65E-02	1.25E-01	1.87E-03	9.00E-03	3.03E-02	4.11E-02	1.11E+03	9.87E-01	2.26E-01	0.03%
T7 Single Concrete/T	Diesel	23565.4443	7.55E-03	6.98E-01	3.90E-02	1.34E-02	1.22E-02	3.60E-02	8.94E-02	1.38E-01	1.17E-02	9.00E-03	3.13E-02	5.20E-02	1.41E+03	3.51E-04	2.22E-01	0.01%
T7 Single Concrete/T	Electricity	35527.9326	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.47E-02	8.07E-02	0.00E+00	9.00E-03	1.57E-02	2.47E-02	0.00E+00	0.00E+00	0.00E+00	0.01%
T7 Single Concrete/T	Natural Gas	1839.64092	1.45E-02	1.60E-01	3.92E+00	0.00E+00	2.14E-03	3.60E-02	8.94E-02	1.28E-01	1.97E-03	9.00E-03	3.13E-02	4.23E-02	1.10E+03	1.01E+00	2.25E-01	0.00%
T7 Single Dump Class	Diesel	62476.7304	8.92E-03	9.17E-01	4.73E-02	1.36E-02	1.53E-02	3.60E-02	8.84E-02	1.40E-01	1.46E-02	9.00E-03	3.10E-02	5.46E-02	1.43E+03	4.14E-04	2.26E-01	0.02%
T7 Single Dump Class	Electricity	70352.4807	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.47E-02	8.07E-02	0.00E+00	9.00E-03	1.56E-02	2.46E-02	0.00E+00	0.00E+00	0.00E+00	0.02%
T7 Single Dump Class	Natural Gas	4872.68544	1.44E-02	1.75E-01	4.14E+00	0.00E+00	2.10E-03	3.60E-02	8.84E-02	1.27E-01	1.93E-03	9.00E-03	3.10E-02	4.19E-02	1.12E+03	1.01E+00	2.28E-01	0.00%
T7 Single Other Class	Diesel	336314.853	8.20E-03	8.29E-01	4.29E-02	1.35E-02	1.43E-02	3.60E-02	8.87E-02	1.39E-01	1.37E-02	9.00E-03	3.11E-02	5.37E-02	1.42E+03	3.81E-04	2.24E-01	0.12%
T7 Single Other Class	Electricity	417957.307	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.47E-02	8.07E-02	0.00E+00	9.00E-03	1.56E-02	2.46E-02	0.00E+00	0.00E+00	0.00E+00	0.15%
T7 Single Other Class	Natural Gas	26277.0236	1.45E-02	1.65E-01	3.99E+00	0.00E+00	2.13E-03	3.60E-02	8.87E-02	1.27E-01	1.96E-03	9.00E-03	3.11E-02	4.20E-02	1.11E+03	1.01E+00	2.26E-01	0.01%
T7 SWCV Class 8	Diesel	1345.08719	1.10E-02	6.23E+00	2.27E-02	3.36E-02	2.08E-02	3.60E-02	2.10E-01	2.67E-01	1.99E-02	9.00E-03	7.35E-02	1.02E-01	3.55E+03	5.12E-04	5.59E-01	0.00%
T7 SWCV Class 8	Electricity	126189.843	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	1.05E-01	1.41E-01	0.00E+00	9.00E-03	3.68E-02	4.58E-02	0.00E+00	0.00E+00	0.00E+00	0.04%
T7 SWCV Class 8	Natural Gas	149807.866	4.23E-03	1.52E-01	6.18E+00	0.00E+00	7.35E-04	3.60E-02	2.10E-01	2.47E-01	6.76E-04	9.00E-03	7.35E-02	8.32E-02	9.79E+02	2.73E-01	1.99E-01	0.05%
T7 Tractor Class 8	Diesel	1950477.34	9.67E-03	1.11E+00	4.23E-02	1.19E-02	2.16E-02	3.60E-02	8.68E-02	1.44E-01	2.07E-02	9.00E-03	3.04E-02	6.01E-02	1.26E+03	4.49E-04	1.98E-01	0.69%
T7 Tractor Class 8	Electricity	430867.648	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.35E-02	7.95E-02	0.00E+00	9.00E-03	1.52E-02	2.42E-02	0.00E+00	0.00E+00	0.00E+00	0.15%
T7 Tractor Class 8	Natural Gas	53924.2025	1.39E-02	1.58E-01	3.56E+00	0.00E+00	2.05E-03	3.60E-02	8.67E-02	1.25E-01	1.89E-03	9.00E-03	3.04E-02	4.12E-02	1.06E+03	9.75E-01	2.15E-01	0.02%
T7 Utility Class 8	Diesel	10797.1811	8.29E-03	7.66E-01	4.42E-02	1.39E-02	1.29E-02	3.60E-02	8.59E-02	1.35E-01	1.24E-02	9.00E-03	3.01E-02	5.14E-02	1.46E+03	3.85E-04	2.31E-01	0.00%
T7 Utility Class 8	Electricity	9452.3275	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.40E-02	8.00E-02	0.00E+00	9.00E-03	1.54E-02	2.44E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
T7IS	Gasoline	993.130935	2.94E-01	2.26E+00	2.64E+01	1.59E-02	1.06E-03	2.00E-02	9.03E-02	1.11E-01	9.72E-04	5.00E-03	3.16E-02	3.76E-02	1.61E+03	6.68E-02	9.70E-02	0.00%
T7IS	Electricity	1230.23763	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.00E-02	4.52E-02	6.52E-02	0.00E+00	5.00E-03	1.58E-02	2.08E-02	0.00E+00	0.00E+00	0.00E+00	0.00%
UBUS	Gasoline	13625.4608	1.35E-03	1.79E-02	4.76E-01	5.57E-03	1.07E-03	8.00E-03	9.10E-02	1.00E-01	9.83E-04	2.00E-03	3.19E-02	3.48E-02	5.64E+02	5.25E-04	2.98E-03	0.00%
UBUS	Electricity	742666.945	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.34E-02	5.50E-02	8.84E-02	0.00E+00	8.36E-03	1.93E-02	2.76E-02	0.00E+00	0.00E+00	0.00E+00	0.26%
UBUS	Natural Gas	4664.99779	5.56E-02	1.33E-01	9.03E-02	0.00E+00	1.08E-02	1.20E-02	9.10E-02	1.14E-01	1.04E-02	3.00E-03	3.19E-02	4.52E-02	5.68E+02	2.58E-03	1.16E-01	0.00%
	total	**283,389,028**															total	**100.00%**

Source: EMFAC2021 (v1.
Region Type: Sub-Area
Region: Los Angeles
Calendar Year: 2050
Season: Annual
Vehicle Classification: EMFAC202x
Units: miles/day for CVMT and EVM

		lbs/Mile														
Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+ACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
All Other Buses	Diesel	2.517E-05	1.196E-03	1.545E-04	2.008E-05	1.398E-05	2.646E-05	9.722E-05	1.377E-04	1.338E-05	6.614E-06	3.403E-05	5.402E-05	2.120E+00	1.169E-06	3.341E-04
All Other Buses	Natural Gas	1.931E-05	1.678E-04	5.343E-03	0.000E+00	2.759E-06	2.646E-05	9.722E-05	1.264E-04	2.537E-06	6.614E-06	3.403E-05	4.318E-05	1.725E+00	1.352E-03	3.516E-04
LDA	Gasoline	7.127E-06	4.225E-05	1.118E-03	5.052E-06	1.240E-06	1.764E-05	1.925E-05	3.813E-05	1.140E-06	4.409E-06	6.738E-06	1.229E-05	5.111E-01	2.462E-06	6.956E-06
LDA	Diesel	1.218E-05	2.318E-05	3.921E-04	3.976E-06	2.004E-06	1.764E-05	1.928E-05	3.892E-05	1.918E-06	4.409E-06	6.747E-06	1.307E-05	4.196E-01	5.659E-07	6.611E-05
LDA	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.679E-06	2.732E-05	0.000E+00	4.409E-06	3.388E-06	7.797E-06	0.000E+00	0.000E+00	0.000E+00
LDA	Plug-in Hybric	3.064E-06	6.232E-06	4.437E-04	2.687E-06	5.058E-07	1.764E-05	9.261E-06	2.740E-05	4.651E-07	4.409E-06	3.241E-06	8.116E-06	2.718E-01	9.315E-07	1.042E-06
LDT1	Gasoline	7.938E-06	4.629E-05	1.217E-03	5.840E-06	1.336E-06	1.764E-05	2.355E-05	4.252E-05	1.229E-06	4.409E-06	8.242E-06	1.388E-05	5.907E-01	2.699E-06	7.350E-06
LDT1	Diesel	3.873E-05	7.105E-05	4.154E-04	7.452E-06	1.026E-05	1.764E-05	2.342E-05	5.132E-05	9.817E-06	4.409E-06	8.197E-06	2.242E-05	7.864E-01	1.799E-06	1.239E-04
LDT1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.695E-06	2.733E-05	0.000E+00	4.409E-06	3.393E-06	7.802E-06	0.000E+00	0.000E+00	0.000E+00
LDT1	Plug-in Hybric	3.061E-06	6.226E-06	4.430E-04	2.683E-06	5.019E-07	1.764E-05	9.279E-06	2.742E-05	4.615E-07	4.409E-06	3.248E-06	8.118E-06	2.714E-01	9.267E-07	1.033E-06
LDT2	Gasoline	1.004E-05	4.822E-05	1.327E-03	6.056E-06	1.269E-06	1.764E-05	2.318E-05	4.209E-05	1.167E-06	4.409E-06	8.113E-06	1.369E-05	6.126E-01	3.323E-06	7.479E-06
LDT2	Diesel	3.838E-05	7.110E-05	4.023E-04	5.514E-06	1.002E-05	1.764E-05	2.317E-05	5.083E-05	9.590E-06	4.409E-06	8.109E-06	2.211E-05	5.820E-01	1.783E-06	9.169E-05
LDT2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.689E-06	2.733E-05	0.000E+00	4.409E-06	3.391E-06	7.800E-06	0.000E+00	0.000E+00	0.000E+00
LDT2	Plug-in Hybric	3.063E-06	6.231E-06	4.434E-04	2.686E-06	5.050E-07	1.764E-05	9.273E-06	2.741E-05	4.643E-07	4.409E-06	3.245E-06	8.119E-06	2.717E-01	9.280E-07	1.035E-06
LHD1	Gasoline	3.413E-06	3.160E-05	1.136E-03	1.100E-05	2.366E-06	1.764E-05	1.720E-04	1.920E-04	2.175E-06	4.409E-06	6.019E-05	6.677E-05	1.113E+00	1.057E-06	3.247E-06
LHD1	Diesel	9.741E-05	3.192E-04	1.885E-04	9.760E-06	2.478E-05	2.646E-05	1.720E-04	2.232E-04	2.370E-05	6.614E-06	6.019E-05	9.050E-05	1.030E+00	4.525E-06	1.623E-04
LHD1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	8.598E-05	1.036E-04	0.000E+00	4.409E-06	3.009E-05	3.450E-05	0.000E+00	0.000E+00	0.000E+00
LHD2	Gasoline	3.049E-06	4.315E-05	1.152E-03	1.240E-05	2.369E-06	1.764E-05	2.006E-04	2.206E-04	2.179E-06	4.409E-06	7.022E-05	7.680E-05	1.254E+00	9.587E-07	4.666E-06
LHD2	Diesel	1.179E-04	4.269E-04	2.312E-04	1.137E-05	3.047E-05	2.646E-05	2.006E-04	2.575E-04	2.915E-05	6.614E-06	7.022E-05	1.060E-04	1.200E+00	5.478E-06	1.890E-04
LHD2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	1.003E-04	1.179E-04	0.000E+00	4.409E-06	3.511E-05	3.952E-05	0.000E+00	0.000E+00	0.000E+00
MCY	Gasoline	1.939E-03	1.020E-03	2.291E-02	4.196E-06	5.581E-06	8.818E-06	2.646E-05	4.085E-05	5.202E-06	2.205E-06	9.259E-06	1.667E-05	4.244E-01	3.254E-04	7.765E-05
MDV	Gasoline	1.046E-05	5.034E-05	1.378E-03	7.337E-06	1.279E-06	1.764E-05	2.363E-05	4.254E-05	1.176E-06	4.409E-06	8.269E-06	1.385E-05	7.421E-01	3.430E-06	7.625E-06
MDV	Diesel	1.328E-05	2.478E-05	4.348E-04	7.145E-06	2.103E-06	1.764E-05	2.365E-05	4.338E-05	2.012E-06	4.409E-06	8.276E-06	1.470E-05	7.540E-01	6.169E-07	1.188E-04
MDV	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.764E-05	9.700E-06	2.734E-05	0.000E+00	4.409E-06	3.395E-06	7.804E-06	0.000E+00	0.000E+00	0.000E+00
MDV	Plug-in Hybric	3.064E-06	6.233E-06	4.435E-04	2.687E-06	5.101E-07	1.764E-05	9.286E-06	2.743E-05	4.690E-07	4.409E-06	3.250E-06	8.128E-06	2.718E-01	9.209E-07	1.019E-06
MH	Gasoline	1.357E-05	4.486E-04	3.090E-04	3.873E-05	2.504E-06	2.646E-05	9.584E-05	1.248E-04	2.302E-06	6.614E-06	3.354E-05	4.246E-05	3.918E+00	4.975E-06	3.761E-05
MH	Diesel	8.060E-05	4.141E-03	2.307E-04	2.135E-05	3.422E-05	3.527E-05	9.526E-05	1.648E-04	3.274E-05	8.818E-06	3.334E-05	7.490E-05	2.254E+00	3.744E-06	3.551E-04
Motor Coach	Diesel	2.083E-05	2.172E-03	1.475E-04	3.134E-05	3.056E-05	2.646E-05	2.162E-04	2.732E-04	2.923E-05	6.614E-06	7.568E-05	1.115E-04	3.310E+00	9.675E-07	5.215E-04
OBUS	Gasoline	1.194E-05	5.371E-04	3.525E-04	3.135E-05	2.460E-06	2.646E-05	9.722E-05	1.261E-04	2.262E-06	6.614E-06	3.403E-05	4.290E-05	3.171E+00	3.203E-06	3.117E-05
OBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.861E-05	7.506E-05	0.000E+00	6.614E-06	1.701E-05	2.363E-05	0.000E+00	0.000E+00	0.000E+00
PTO	Diesel	3.015E-05	5.233E-03	3.758E-04	3.578E-05	8.343E-06	0.000E+00	0.000E+00	8.343E-06	7.983E-06	0.000E+00	0.000E+00	7.983E-06	3.779E+00	1.400E-06	5.953E-04
PTO	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SBUS	Gasoline	2.313E-05	1.876E-04	4.241E-04	1.680E-05	3.747E-06	1.764E-05	1.033E-04	1.247E-04	3.445E-06	4.409E-06	3.615E-05	4.400E-05	1.699E+00	5.277E-06	1.784E-05
SBUS	Diesel	2.099E-05	8.186E-04	1.397E-04	2.307E-05	7.208E-06	2.646E-05	1.033E-04	1.369E-04	6.896E-06	6.614E-06	3.615E-05	4.966E-05	2.436E+00	9.748E-07	3.838E-04
SBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.253E-05	5.164E-05	7.417E-05	0.000E+00	5.633E-06	1.807E-05	2.371E-05	0.000E+00	0.000E+00	0.000E+00
SBUS	Natural Gas	9.879E-05	4.465E-04	1.904E-02	0.000E+00	9.883E-06	2.646E-05	1.033E-04	1.396E-04	9.087E-06	6.614E-06	3.615E-05	5.185E-05	3.134E+00	6.914E-03	6.388E-04
T6 CAIRP Class 4	Diesel	1.003E-05	3.953E-04	6.745E-05	2.048E-05	8.554E-06	2.646E-05	9.462E-05	1.296E-04	8.184E-06	6.614E-06	3.312E-05	4.791E-05	2.162E+00	4.660E-07	3.407E-04
T6 CAIRP Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.731E-05	7.377E-05	0.000E+00	6.614E-06	1.656E-05	2.317E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 5	Diesel	1.004E-05	3.961E-04	6.748E-05	2.048E-05	8.559E-06	2.646E-05	9.462E-05	1.296E-04	8.189E-06	6.614E-06	3.312E-05	4.792E-05	2.163E+00	4.663E-07	3.407E-04
T6 CAIRP Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.731E-05	7.377E-05	0.000E+00	6.614E-06	1.656E-05	2.317E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 6	Diesel	1.003E-05	4.008E-04	6.742E-05	2.047E-05	8.617E-06	2.646E-05	9.462E-05	1.297E-04	8.244E-06	6.614E-06	3.312E-05	4.797E-05	2.162E+00	4.657E-07	3.406E-04
T6 CAIRP Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.731E-05	7.377E-05	0.000E+00	6.614E-06	1.656E-05	2.317E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Diesel	1.089E-05	4.396E-04	7.323E-05	1.810E-05	9.174E-06	2.646E-05	9.462E-05	1.302E-04	8.777E-06	6.614E-06	3.312E-05	4.851E-05	1.912E+00	5.059E-07	3.012E-04
T6 CAIRP Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.731E-05	7.377E-05	0.000E+00	6.614E-06	1.656E-05	2.317E-05	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Natural Gas	1.730E-05	9.996E-05	3.879E-03	0.000E+00	2.646E-06	2.646E-05	9.462E-05	1.237E-04	2.433E-06	6.614E-06	3.312E-05	4.216E-05	1.653E+00	1.211E-03	3.370E-04
T6 Instate Delivery Cl	Diesel	1.032E-05	4.670E-04	7.997E-05	2.034E-05	7.225E-06	2.646E-05	9.629E-05	1.300E-04	6.913E-06	6.614E-06	3.370E-05	4.723E-05	2.148E+00	4.792E-07	3.384E-04
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.815E-05	7.460E-05	0.000E+00	6.614E-06	1.685E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	1.912E-05	1.064E-04	4.806E-03	0.000E+00	2.951E-06	2.646E-05	9.629E-05	1.257E-04	2.714E-06	6.614E-06	3.370E-05	4.303E-05	1.798E+00	1.338E-03	3.666E-04
T6 Instate Delivery Cl	Diesel	1.032E-05	4.650E-04	7.988E-05	2.035E-05	7.217E-06	2.646E-05	9.629E-05	1.300E-04	6.905E-06	6.614E-06	3.370E-05	4.722E-05	2.149E+00	4.792E-07	3.385E-04
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.815E-05	7.460E-05	0.000E+00	6.614E-06	1.685E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	1.912E-05	1.062E-04	4.805E-03	0.000E+00	2.953E-06	2.646E-05	9.629E-05	1.257E-04	2.715E-06	6.614E-06	3.370E-05	4.303E-05	1.797E+00	1.338E-03	3.664E-04
T6 Instate Delivery Cl	Diesel	1.032E-05	4.721E-04	7.994E-05	2.034E-05	7.266E-06	2.646E-05	9.629E-05	1.300E-04	6.952E-06	6.614E-06	3.370E-05	4.727E-05	2.148E+00	4.795E-07	3.385E-04
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.815E-05	7.460E-05	0.000E+00	6.614E-06	1.685E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	1.912E-05	1.063E-04	4.805E-03	0.000E+00	2.952E-06	2.646E-05	9.629E-05	1.257E-04	2.714E-06	6.614E-06	3.370E-05	4.303E-05	1.797E+00	1.338E-03	3.664E-04
T6 Instate Delivery Cl	Diesel	1.281E-05	7.289E-04	9.717E-05	2.057E-05	8.916E-06	2.646E-05	9.629E-05	1.317E-04	8.530E-06	6.614E-06	3.370E-05	4.885E-05	2.172E+00	5.951E-07	3.423E-04
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.815E-05	7.460E-05	0.000E+00	6.614E-06	1.685E-05	2.347E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	1.846E-05	1.547E-04	4.970E-03	0.000E+00	2.659E-06	2.646E-05	9.629E-05	1.254E-04	2.445E-06	6.614E-06	3.370E-05	4.276E-05	1.829E+00	1.292E-03	3.729E-04
T6 Instate Other Clas	Diesel	1.027E-05	4.545E-04	7.802E-05	2.032E-05	7.431E-06	2.646E-05	9.598E-05	1.299E-04	7.109E-06	6.614E-06	3.359E-05	4.732E-05	2.146E+00	4.769E-07	3.381E-04
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	1.881E-05	1.051E-04	4.652E-03	0.000E+00	2.899E-06	2.646E-05	9.598E-05	1.253E-04	2.666E-06	6.614E-06	3.359E-05	4.287E-05	1.782E+00	1.316E-03	3.632E-04
T6 Instate Other Clas	Diesel	1.028E-05	4.531E-04	7.798E-05	2.032E-05	7.429E-06	2.646E-05	9.598E-05	1.299E-04	7.107E-06	6.614E-06	3.359E-05	4.731E-05	2.146E+00	4.775E-07	3.382E-04
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	1.881E-05	1.050E-04	4.652E-03	0.000E+00	2.900E-06	2.646E-05	9.598E-05	1.253E-04	2.667E-06	6.614E-06	3.359E-05	4.287E-05	1.781E+00	1.317E-03	3.630E-04
T6 Instate Other Clas	Diesel	1.027E-05	4.597E-04	7.800E-05	2.032E-05	7.478E-06	2.646E-05	9.598E-05	1.299E-04	7.155E-06	6.614E-06	3.359E-05	4.736E-05	2.146E+00	4.771E-07	3.381E-04
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	1.881E-05	1.051E-04	4.652E-03	0.000E+00	2.899E-06	2.646E-05	9.598E-05	1.253E-04	2.666E-06	6.614E-06	3.359E-05	4.287E-05	1.781E+00	1.316E-03	3.630E-04
T6 Instate Other Clas	Diesel	1.226E-05	6.541E-04	9.044E-05	2.041E-05	8.799E-06	2.646E-05	9.598E-05	1.312E-04	8.418E-06	6.614E-06	3.359E-05	4.863E-05	2.156E+00	5.693E-07	3.396E-04
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00

T6 Instate Other Clas	Natural Gas	1.837E-05	1.371E-04	4.773E-03	0.000E+00	2.706E-06	2.646E-05	9.598E-05	1.251E-04	2.488E-06	6.614E-06	3.359E-05	4.270E-05	1.804E+00	1.285E-03	3.677E-04
T6 Instate Tractor Clc	Diesel	1.012E-05	4.527E-04	7.683E-05	2.034E-05	7.404E-06	2.646E-05	9.598E-05	1.298E-04	7.084E-06	6.614E-06	3.359E-05	4.729E-05	2.148E+00	4.702E-07	3.383E-04
T6 Instate Tractor Clc	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Clc	Natural Gas	1.881E-05	1.048E-04	4.651E-03	0.000E+00	2.901E-06	2.646E-05	9.598E-05	1.253E-04	2.668E-06	6.614E-06	3.359E-05	4.288E-05	1.781E+00	1.317E-03	3.631E-04
T6 Instate Tractor Clc	Diesel	1.207E-05	6.311E-04	8.954E-05	1.838E-05	8.670E-06	2.646E-05	9.598E-05	1.311E-04	8.295E-06	6.614E-06	3.359E-05	4.850E-05	1.942E+00	5.608E-07	3.059E-04
T6 Instate Tractor Clc	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.799E-05	7.445E-05	0.000E+00	6.614E-06	1.680E-05	2.341E-05	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Clc	Natural Gas	1.840E-05	1.346E-04	4.763E-03	0.000E+00	2.720E-06	2.646E-05	9.598E-05	1.252E-04	2.501E-06	6.614E-06	3.359E-05	4.271E-05	1.759E+00	1.288E-03	3.586E-04
T6 OOS Class 4	Diesel	9.930E-06	5.016E-04	6.672E-05	1.925E-05	8.938E-06	2.646E-05	9.462E-05	1.300E-04	8.551E-06	6.614E-06	3.312E-05	4.828E-05	2.032E+00	4.612E-07	3.202E-04
T6 OOS Class 5	Diesel	9.951E-06	5.037E-04	6.681E-05	1.925E-05	8.952E-06	2.646E-05	9.462E-05	1.300E-04	8.565E-06	6.614E-06	3.312E-05	4.830E-05	2.033E+00	4.622E-07	3.203E-04
T6 OOS Class 6	Diesel	9.907E-06	4.992E-04	6.660E-05	1.923E-05	8.921E-06	2.646E-05	9.462E-05	1.300E-04	8.535E-06	6.614E-06	3.312E-05	4.827E-05	2.030E+00	4.602E-07	3.199E-04
T6 OOS Class 7	Diesel	1.067E-05	5.278E-04	7.175E-05	1.731E-05	9.441E-06	2.646E-05	9.462E-05	1.305E-04	9.033E-06	6.614E-06	3.312E-05	4.876E-05	1.828E+00	4.957E-07	2.881E-04
T6 Public Class 4	Diesel	1.170E-05	5.748E-04	7.324E-05	2.065E-05	8.703E-06	2.646E-05	9.526E-05	1.304E-04	8.326E-06	6.614E-06	3.334E-05	4.828E-05	2.181E+00	5.435E-07	3.436E-04
T6 Public Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 4	Natural Gas	1.785E-05	1.128E-04	4.296E-03	0.000E+00	2.701E-06	2.646E-05	9.526E-05	1.244E-04	2.483E-06	6.614E-06	3.334E-05	4.244E-05	1.746E+00	1.249E-03	3.559E-04
T6 Public Class 5	Diesel	1.155E-05	5.356E-04	7.184E-05	2.068E-05	8.412E-06	2.646E-05	9.526E-05	1.301E-04	8.048E-06	6.614E-06	3.334E-05	4.800E-05	2.184E+00	5.367E-07	3.442E-04
T6 Public Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 5	Natural Gas	1.778E-05	1.181E-04	4.323E-03	0.000E+00	2.673E-06	2.646E-05	9.526E-05	1.244E-04	2.458E-06	6.614E-06	3.334E-05	4.241E-05	1.749E+00	1.245E-03	3.565E-04
T6 Public Class 6	Diesel	1.105E-05	4.902E-04	7.036E-05	2.064E-05	8.003E-06	2.646E-05	9.526E-05	1.297E-04	7.657E-06	6.614E-06	3.334E-05	4.761E-05	2.179E+00	5.135E-07	3.434E-04
T6 Public Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 6	Natural Gas	1.792E-05	1.082E-04	4.272E-03	0.000E+00	2.729E-06	2.646E-05	9.526E-05	1.244E-04	2.509E-06	6.614E-06	3.334E-05	4.246E-05	1.747E+00	1.254E-03	3.561E-04
T6 Public Class 7	Diesel	1.048E-05	4.870E-04	6.872E-05	2.038E-05	8.001E-06	2.646E-05	9.526E-05	1.297E-04	7.655E-06	6.614E-06	3.334E-05	4.761E-05	2.152E+00	4.867E-07	3.391E-04
T6 Public Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 7	Natural Gas	1.791E-05	1.086E-04	4.275E-03	0.000E+00	2.727E-06	2.646E-05	9.526E-05	1.244E-04	2.508E-06	6.614E-06	3.334E-05	4.246E-05	1.746E+00	1.254E-03	3.560E-04
T6 Utility Class 5	Diesel	8.026E-06	3.083E-04	5.749E-05	2.032E-05	6.897E-06	2.646E-05	9.526E-05	1.286E-04	6.598E-06	6.614E-06	3.334E-05	4.655E-05	2.146E+00	3.728E-07	3.381E-04
T6 Utility Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 5	Natural Gas	1.802E-05	1.015E-04	4.239E-03	0.000E+00	2.770E-06	2.646E-05	9.526E-05	1.245E-04	2.547E-06	6.614E-06	3.334E-05	4.250E-05	1.737E+00	1.261E-03	3.540E-04
T6 Utility Class 6	Diesel	8.026E-06	3.026E-04	5.749E-05	2.032E-05	6.862E-06	2.646E-05	9.526E-05	1.286E-04	6.565E-06	6.614E-06	3.334E-05	4.652E-05	2.146E+00	3.728E-07	3.381E-04
T6 Utility Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 6	Natural Gas	1.802E-05	1.015E-04	4.239E-03	0.000E+00	2.770E-06	2.646E-05	9.526E-05	1.245E-04	2.547E-06	6.614E-06	3.334E-05	4.250E-05	1.737E+00	1.261E-03	3.540E-04
T6 Utility Class 7	Diesel	7.951E-06	2.944E-04	5.695E-05	2.034E-05	6.825E-06	2.646E-05	9.526E-05	1.285E-04	6.530E-06	6.614E-06	3.334E-05	4.648E-05	2.148E+00	3.693E-07	3.384E-04
T6 Utility Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.763E-05	7.409E-05	0.000E+00	6.614E-06	1.667E-05	2.328E-05	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 7	Natural Gas	1.802E-05	1.015E-04	4.239E-03	0.000E+00	2.770E-06	2.646E-05	9.526E-05	1.245E-04	2.547E-06	6.614E-06	3.334E-05	4.246E-05	1.737E+00	1.261E-03	3.540E-04
T6TS	Gasoline	1.777E-05	1.331E-04	3.421E-04	3.045E-05	2.506E-06	2.646E-05	9.584E-05	1.248E-04	2.304E-06	6.614E-06	3.354E-05	4.246E-05	3.080E+00	4.783E-06	1.402E-05
T6TS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.646E-05	4.792E-05	7.437E-05	0.000E+00	6.614E-06	1.677E-05	2.338E-05	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Diesel	2.293E-05	2.526E-03	1.011E-04	2.628E-05	5.466E-05	7.937E-05	1.919E-04	3.259E-04	5.230E-05	1.984E-05	6.716E-05	1.393E-04	2.775E+00	1.065E-06	4.373E-04
T7 CAIRP Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.595E-05	1.753E-04	0.000E+00	1.984E-05	3.358E-05	5.343E-05	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Natural Gas	3.072E-05	3.453E-04	7.785E-03	0.000E+00	4.533E-06	7.937E-05	1.919E-04	2.758E-04	4.168E-06	1.984E-05	6.716E-05	9.117E-05	2.318E+00	2.150E-03	4.726E-04
T7 NNOOS Class 8	Diesel	2.229E-05	2.796E-03	9.826E-05	2.515E-05	5.401E-05	7.937E-05	1.919E-04	3.253E-04	5.168E-05	1.984E-05	6.715E-05	1.387E-04	2.656E+00	1.035E-06	4.184E-04
T7 NOOS Class 8	Diesel	2.300E-05	2.876E-03	1.014E-04	2.514E-05	5.719E-05	7.937E-05	1.919E-04	3.284E-04	5.471E-05	1.984E-05	6.716E-05	1.417E-04	2.655E+00	1.068E-06	4.183E-04
T7 POLA Class 8	Diesel	2.133E-05	2.516E-03	1.012E-04	2.800E-05	4.738E-05	7.937E-05	1.940E-04	3.207E-04	4.533E-05	1.984E-05	6.790E-05	1.331E-04	2.957E+00	9.909E-07	4.658E-04
T7 POLA Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.725E-05	1.766E-04	0.000E+00	1.984E-05	3.404E-05	5.388E-05	0.000E+00	0.000E+00	0.000E+00
T7 POLA Class 8	Natural Gas	3.130E-05	3.483E-04	8.202E-03	0.000E+00	4.624E-06	7.937E-05	1.942E-04	2.782E-04	4.252E-06	1.984E-05	6.796E-05	9.205E-05	2.344E+00	2.191E-03	4.778E-04
T7 Public Class 8	Diesel	3.419E-05	2.933E-03	1.419E-04	3.123E-05	3.604E-05	7.937E-05	1.907E-04	3.061E-04	3.448E-05	1.984E-05	6.674E-05	1.211E-04	3.298E+00	1.588E-06	5.196E-04
T7 Public Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.694E-05	1.763E-04	0.000E+00	1.984E-05	3.393E-05	5.377E-05	0.000E+00	0.000E+00	0.000E+00
T7 Public Class 8	Natural Gas	3.110E-05	4.007E-04	8.943E-03	0.000E+00	4.480E-06	7.937E-05	1.907E-04	2.745E-04	4.119E-06	1.984E-05	6.673E-05	9.069E-05	2.440E+00	2.176E-03	4.975E-04
T7 Single Concrete/T	Diesel	1.665E-05	1.539E-03	8.606E-05	2.947E-05	2.697E-05	7.937E-05	1.971E-04	3.035E-04	2.581E-05	1.984E-05	6.899E-05	1.146E-04	3.112E+00	7.735E-07	4.903E-04
T7 Single Concrete/T	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.859E-05	1.780E-04	0.000E+00	1.984E-05	3.451E-05	5.435E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Concrete/T	Natural Gas	3.190E-05	3.519E-04	8.640E-03	0.000E+00	4.714E-06	7.937E-05	1.971E-04	2.812E-04	4.335E-06	1.984E-05	6.899E-05	9.317E-05	2.432E+00	2.232E-03	4.957E-04
T7 Single Dump Class	Diesel	1.966E-05	2.021E-03	1.044E-04	2.991E-05	3.376E-05	7.937E-05	1.950E-04	3.081E-04	3.230E-05	1.984E-05	6.824E-05	1.204E-04	3.159E+00	9.131E-07	4.976E-04
T7 Single Dump Class	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.856E-05	1.779E-04	0.000E+00	1.984E-05	3.450E-05	5.434E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Dump Class	Natural Gas	3.185E-05	3.854E-04	9.123E-03	0.000E+00	4.638E-06	7.937E-05	1.950E-04	2.790E-04	4.265E-06	1.984E-05	6.825E-05	9.235E-05	2.462E+00	2.229E-03	5.018E-04
T7 Single Other Class	Diesel	1.809E-05	1.828E-03	9.458E-05	2.972E-05	3.151E-05	7.937E-05	1.957E-04	3.065E-04	3.014E-05	1.984E-05	6.848E-05	1.185E-04	3.138E+00	8.402E-07	4.944E-04
T7 Single Other Class	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.858E-05	1.779E-04	0.000E+00	1.984E-05	3.450E-05	5.434E-05	0.000E+00	0.000E+00	0.000E+00
T7 Single Other Class	Natural Gas	3.188E-05	3.635E-04	8.803E-03	0.000E+00	4.689E-06	7.937E-05	1.956E-04	2.797E-04	4.311E-06	1.984E-05	6.847E-05	9.262E-05	2.444E+00	2.231E-03	4.981E-04
T7 SWCV Class 8	Diesel	2.431E-05	1.373E-02	5.008E-05	7.402E-05	4.579E-05	7.937E-05	4.630E-04	5.881E-04	4.381E-05	1.984E-05	1.620E-04	2.257E-04	7.817E+00	1.129E-06	1.232E-03
T7 SWCV Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	2.315E-04	3.108E-04	0.000E+00	1.984E-05	8.102E-05	1.009E-04	0.000E+00	0.000E+00	0.000E+00
T7 SWCV Class 8	Natural Gas	9.327E-06	3.347E-04	1.362E-02	0.000E+00	1.621E-06	7.937E-05	4.630E-04	5.440E-04	1.491E-06	1.984E-05	1.620E-04	1.834E-04	2.157E+00	6.008E-04	4.398E-04
T7 Tractor Class 8	Diesel	2.131E-05	2.441E-03	9.334E-05	2.623E-05	4.770E-05	7.937E-05	1.913E-04	3.184E-04	4.564E-05	1.984E-05	6.697E-05	1.324E-04	2.770E+00	9.898E-07	4.364E-04
T7 Tractor Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.598E-05	1.753E-04	0.000E+00	1.984E-05	3.359E-05	5.343E-05	0.000E+00	0.000E+00	0.000E+00
T7 Tractor Class 8	Natural Gas	3.073E-05	3.489E-04	7.847E-03	0.000E+00	4.527E-06	7.937E-05	1.912E-04	2.751E-04	4.162E-06	1.984E-05	6.693E-05	9.094E-05	2.326E+00	2.151E-03	4.742E-04
T7 Utility Class 8	Diesel	1.829E-05	1.689E-03	9.743E-05	3.057E-05	2.851E-05	7.937E-05	1.894E-04	2.973E-04	2.727E-05	1.984E-05	6.630E-05	1.134E-04	3.228E+00	8.493E-07	5.085E-04
T7 Utility Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.937E-05	9.696E-05	1.763E-04	0.000E+00	1.984E-05	3.394E-05	5.378E-05	0.000E+00	0.000E+00	0.000E+00
T7IS	Gasoline	6.492E-04	4.987E-03	5.818E-02	3.502E-05	2.329E-06	4.409E-05	1.990E-04	2.454E-04	2.142E-06	1.102E-05	6.964E-05	8.281E-05	3.543E+00	1.472E-04	2.140E-04
T7IS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.409E-05	9.964E-05	1.437E-04	0.000E+00	1.102E-05	3.487E-05	4.590E-05	0.000E+00	0.000E+00	0.000E+00
UBUS	Gasoline	2.986E-06	3.949E-05	1.049E-03	1.229E-05	2.357E-06	1.764E-05	2.006E-04	2.206E-04	2.168E-06	4.409E-06	7.022E-05	7.679E-05	1.243E+00	1.158E-06	6.571E-06
UBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.370E-05	1.213E-04	1.950E-04	0.000E+00	1.842E-05	4.244E-05	6.086E-05	0.000E+00	0.000E+00	0.000E+00
UBUS	Natural Gas	1.227E-04	2.940E-04	1.991E-04	0.000E+00	2.385E-05	2.646E-05	2.006E-04	2.509E-04	2.282E-05	6.614E-06	7.022E-05	9.965E-05	1.253E+00	5.697E-06	2.554E-04
	total															

Source: EMFAC2021 (v1.
Region Type: Sub-Area
Region: Los Angeles
Calendar Year: 2050
Season: Annual
Vehicle Classification: EMFAC202x
Units: miles/day for CVMT and EVM

1.0E-06 | MTens/Mile

Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2(Pavley+ACC)_RUNEX	CH4_RUNEX	N2O_RUNEX
All Other Buses	Diesel	1.142E-08	5.423E-07	7.008E-08	9.108E-09	6.342E-09	1.200E-08	4.410E-08	6.244E-08	6.067E-09	3.000E-09	1.543E-08	2.450E-08	9.618E-04	5.303E-10	1.515E-07
All Other Buses	Natural Gas	8.761E-09	7.613E-08	2.424E-06	0.000E+00	1.251E-09	1.200E-08	4.410E-08	5.735E-08	1.151E-09	3.000E-09	1.543E-08	1.958E-08	7.823E-04	6.131E-07	1.595E-07
LDA	Gasoline	3.233E-09	1.917E-08	5.070E-07	2.292E-09	5.622E-10	8.000E-09	8.732E-09	1.729E-08	5.170E-10	2.000E-09	3.056E-09	5.573E-09	2.318E-04	1.117E-09	3.155E-09
LDA	Diesel	5.526E-09	1.052E-08	1.778E-07	1.803E-09	9.092E-10	8.000E-09	8.744E-09	1.765E-08	8.698E-10	2.000E-09	3.060E-09	5.930E-09	1.903E-04	2.567E-10	2.999E-08
LDA	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.390E-09	1.239E-08	0.000E+00	2.000E-09	1.537E-09	3.537E-09	0.000E+00	0.000E+00	0.000E+00
LDA	Plug-in Hybric	1.390E-09	2.827E-09	2.013E-07	1.219E-09	2.294E-10	8.000E-09	4.201E-09	1.243E-08	2.110E-10	2.000E-09	1.470E-09	3.681E-09	1.233E-04	4.225E-10	4.729E-10
LDT1	Gasoline	3.601E-09	2.100E-08	5.521E-07	2.649E-09	6.061E-10	8.000E-09	1.068E-08	1.929E-08	5.573E-10	2.000E-09	3.739E-09	6.296E-09	2.679E-04	1.224E-09	3.334E-09
LDT1	Diesel	1.757E-08	3.223E-08	1.884E-07	3.380E-09	4.654E-09	8.000E-09	1.062E-08	2.328E-08	4.453E-09	2.000E-09	3.718E-09	1.017E-08	3.567E-04	8.159E-10	5.620E-08
LDT1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.397E-09	1.240E-08	0.000E+00	2.000E-09	1.539E-09	3.539E-09	0.000E+00	0.000E+00	0.000E+00
LDT1	Plug-in Hybric	1.388E-09	2.824E-09	2.009E-07	1.217E-09	2.277E-10	8.000E-09	4.209E-09	1.244E-08	2.093E-10	2.000E-09	1.473E-09	3.682E-09	1.231E-04	4.204E-10	4.685E-10
LDT2	Gasoline	4.553E-09	2.187E-08	6.021E-07	2.747E-09	5.758E-10	8.000E-09	1.051E-08	1.909E-08	5.294E-10	2.000E-09	3.680E-09	6.210E-09	2.779E-04	1.508E-09	3.393E-09
LDT2	Diesel	1.741E-08	3.225E-08	1.825E-07	2.501E-09	4.547E-09	8.000E-09	1.051E-08	2.306E-08	4.350E-09	2.000E-09	3.678E-09	1.003E-08	2.640E-04	8.087E-10	4.159E-08
LDT2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.395E-09	1.239E-08	0.000E+00	2.000E-09	1.538E-09	3.538E-09	0.000E+00	0.000E+00	0.000E+00
LDT2	Plug-in Hybric	1.389E-09	2.826E-09	2.011E-07	1.218E-09	2.290E-10	8.000E-09	4.206E-09	1.244E-08	2.106E-10	2.000E-09	1.472E-09	3.683E-09	1.232E-04	4.209E-10	4.694E-10
LHD1	Gasoline	1.548E-09	1.433E-08	5.151E-07	4.989E-09	1.073E-09	8.000E-09	7.800E-08	8.707E-08	9.868E-10	2.000E-09	2.730E-08	3.029E-08	5.046E-04	4.793E-10	1.473E-09
LHD1	Diesel	4.419E-08	1.448E-07	8.549E-08	4.427E-09	1.124E-08	1.200E-08	7.800E-08	1.012E-07	1.075E-08	3.000E-09	2.730E-08	4.105E-08	4.672E-04	2.052E-09	7.361E-08
LHD1	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	3.900E-08	4.700E-08	0.000E+00	2.000E-09	1.365E-08	1.565E-08	0.000E+00	0.000E+00	0.000E+00
LHD2	Gasoline	1.383E-09	1.957E-08	5.225E-07	5.623E-09	1.075E-09	8.000E-09	9.100E-08	1.001E-07	9.882E-10	2.000E-09	3.185E-08	3.484E-08	5.688E-04	4.349E-10	2.117E-09
LHD2	Diesel	5.350E-08	1.936E-07	1.049E-07	5.156E-09	1.382E-08	1.200E-08	9.100E-08	1.168E-07	1.322E-08	3.000E-09	3.185E-08	4.807E-08	5.442E-04	2.485E-09	8.573E-08
LHD2	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.550E-08	5.350E-08	0.000E+00	2.000E-09	1.593E-08	1.793E-08	0.000E+00	0.000E+00	0.000E+00
MCY	Gasoline	8.793E-07	4.629E-07	1.039E-05	1.903E-09	2.531E-09	4.000E-09	1.200E-08	1.853E-08	2.360E-09	1.000E-09	4.200E-09	7.560E-09	1.925E-04	1.476E-07	3.522E-08
MDV	Gasoline	4.745E-09	2.283E-08	6.252E-07	3.328E-09	5.802E-10	8.000E-09	1.072E-08	1.930E-08	5.335E-10	2.000E-09	3.751E-09	6.284E-09	3.366E-04	1.556E-09	3.459E-09
MDV	Diesel	6.025E-09	1.124E-08	1.972E-07	3.241E-09	9.537E-10	8.000E-09	1.073E-08	1.968E-08	9.125E-10	2.000E-09	3.754E-09	6.666E-09	3.420E-04	2.798E-10	5.389E-08
MDV	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.000E-09	4.400E-09	1.240E-08	0.000E+00	2.000E-09	1.540E-09	3.540E-09	0.000E+00	0.000E+00	0.000E+00
MDV	Plug-in Hybric	1.390E-09	2.827E-09	2.012E-07	1.219E-09	2.314E-10	8.000E-09	4.212E-09	1.244E-08	2.127E-10	2.000E-09	1.474E-09	3.687E-09	1.233E-04	4.177E-10	4.621E-10
MH	Gasoline	6.154E-09	2.035E-07	1.402E-07	1.757E-08	1.136E-09	1.200E-08	4.347E-08	5.661E-08	1.044E-09	3.000E-09	1.521E-08	1.926E-08	1.777E-03	2.257E-09	1.706E-08
MH	Diesel	3.656E-08	1.879E-06	1.047E-07	9.686E-09	1.552E-08	1.600E-08	4.321E-08	7.473E-08	1.485E-08	4.000E-09	1.512E-08	3.397E-08	1.022E-03	1.698E-09	1.611E-07
Motor Coach	Diesel	9.449E-09	9.852E-07	6.689E-08	1.422E-08	1.386E-08	1.200E-08	9.808E-08	1.239E-07	1.326E-08	3.000E-09	3.433E-08	5.059E-08	1.501E-03	4.389E-10	2.366E-07
OBUS	Gasoline	5.417E-09	2.436E-07	1.599E-07	1.422E-08	1.116E-09	1.200E-08	4.410E-08	5.721E-08	1.026E-09	3.000E-09	1.543E-08	1.946E-08	1.438E-03	1.453E-09	1.414E-08
OBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.205E-08	3.405E-08	0.000E+00	3.000E-09	7.717E-09	1.072E-08	0.000E+00	0.000E+00	0.000E+00
PTO	Diesel	1.367E-08	2.374E-06	1.705E-07	1.623E-08	3.785E-09	0.000E+00	0.000E+00	3.785E-09	3.621E-09	0.000E+00	0.000E+00	3.621E-09	1.714E-03	6.352E-10	2.700E-07
PTO	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SBUS	Gasoline	1.049E-08	8.509E-08	1.924E-07	7.618E-09	1.699E-09	8.000E-09	4.685E-08	5.654E-08	1.563E-09	2.000E-09	1.640E-08	1.996E-08	7.706E-04	2.394E-09	8.090E-09
SBUS	Diesel	9.520E-09	3.713E-07	6.336E-08	1.046E-08	3.269E-09	1.200E-08	4.685E-08	6.211E-08	3.128E-09	3.000E-09	1.640E-08	2.252E-08	1.105E-03	4.422E-10	1.741E-07
SBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.022E-08	2.342E-08	3.364E-08	0.000E+00	2.555E-09	8.198E-09	1.075E-08	0.000E+00	0.000E+00	0.000E+00
SBUS	Natural Gas	4.481E-08	2.026E-07	8.637E-06	0.000E+00	4.483E-09	1.200E-08	4.685E-08	6.333E-08	4.122E-09	3.000E-09	1.640E-08	2.352E-08	1.421E-03	3.136E-06	2.898E-07
T6 CAIRP Class 4	Diesel	4.551E-09	1.793E-07	3.059E-08	9.288E-09	3.880E-09	1.200E-08	4.292E-08	5.880E-08	3.712E-09	3.000E-09	1.502E-08	2.173E-08	9.808E-04	2.114E-10	1.545E-07
T6 CAIRP Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.146E-08	3.346E-08	0.000E+00	3.000E-09	7.511E-09	1.051E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 5	Diesel	4.554E-09	1.797E-07	3.061E-08	9.289E-09	3.882E-09	1.200E-08	4.292E-08	5.880E-08	3.714E-09	3.000E-09	1.502E-08	2.174E-08	9.809E-04	2.115E-10	1.545E-07
T6 CAIRP Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.146E-08	3.346E-08	0.000E+00	3.000E-09	7.511E-09	1.051E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 6	Diesel	4.548E-09	1.818E-07	3.058E-08	9.285E-09	3.909E-09	1.200E-08	4.292E-08	5.883E-08	3.740E-09	3.000E-09	1.502E-08	2.176E-08	9.805E-04	2.113E-10	1.545E-07
T6 CAIRP Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.146E-08	3.346E-08	0.000E+00	3.000E-09	7.511E-09	1.051E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Diesel	4.941E-09	1.994E-07	3.322E-08	8.211E-09	4.161E-09	1.200E-08	4.292E-08	5.908E-08	3.981E-09	3.000E-09	1.502E-08	2.200E-08	8.672E-04	2.295E-10	1.366E-07
T6 CAIRP Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.146E-08	3.346E-08	0.000E+00	3.000E-09	7.511E-09	1.051E-08	0.000E+00	0.000E+00	0.000E+00
T6 CAIRP Class 7	Natural Gas	7.846E-09	4.534E-08	1.759E-06	0.000E+00	1.200E-09	1.200E-08	4.292E-08	5.612E-08	1.104E-09	3.000E-09	1.502E-08	1.913E-08	7.498E-04	5.491E-07	1.529E-07
T6 Instate Delivery Cl	Diesel	4.680E-09	2.118E-07	3.627E-08	9.225E-09	3.277E-09	1.200E-08	4.368E-08	5.896E-08	3.136E-09	3.000E-09	1.529E-08	2.142E-08	9.742E-04	2.174E-10	1.535E-07
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.184E-08	3.384E-08	0.000E+00	3.000E-09	7.644E-09	1.064E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	8.671E-09	4.827E-08	2.180E-06	0.000E+00	1.339E-09	1.200E-08	4.368E-08	5.702E-08	1.231E-09	3.000E-09	1.529E-08	1.952E-08	8.157E-04	6.069E-07	1.663E-07
T6 Instate Delivery Cl	Diesel	4.680E-09	2.109E-07	3.623E-08	9.230E-09	3.274E-09	1.200E-08	4.368E-08	5.895E-08	3.132E-09	3.000E-09	1.529E-08	2.142E-08	9.747E-04	2.174E-10	1.536E-07
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.184E-08	3.384E-08	0.000E+00	3.000E-09	7.644E-09	1.064E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	8.672E-09	4.815E-08	2.179E-06	0.000E+00	1.340E-09	1.200E-08	4.368E-08	5.702E-08	1.232E-09	3.000E-09	1.529E-08	1.952E-08	8.153E-04	6.070E-07	1.662E-07
T6 Instate Delivery Cl	Diesel	4.682E-09	2.141E-07	3.626E-08	9.228E-09	3.296E-09	1.200E-08	4.368E-08	5.897E-08	3.153E-09	3.000E-09	1.529E-08	2.144E-08	9.745E-04	2.175E-10	1.535E-07
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.184E-08	3.384E-08	0.000E+00	3.000E-09	7.644E-09	1.064E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	8.671E-09	4.822E-08	2.180E-06	0.000E+00	1.339E-09	1.200E-08	4.368E-08	5.702E-08	1.231E-09	3.000E-09	1.529E-08	1.952E-08	8.153E-04	6.069E-07	1.662E-07
T6 Instate Delivery Cl	Diesel	5.812E-09	3.306E-07	4.408E-08	9.331E-09	4.044E-09	1.200E-08	4.368E-08	5.972E-08	3.869E-09	3.000E-09	1.529E-08	2.216E-08	9.854E-04	2.699E-10	1.552E-07
T6 Instate Delivery Cl	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.184E-08	3.384E-08	0.000E+00	3.000E-09	7.644E-09	1.064E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Delivery Cl	Natural Gas	8.372E-09	7.019E-08	2.254E-06	0.000E+00	1.206E-09	1.200E-08	4.368E-08	5.688E-08	1.109E-09	3.000E-09	1.529E-08	1.940E-08	8.296E-04	5.860E-07	1.691E-07
T6 Instate Other Clas	Diesel	4.658E-09	2.062E-07	3.539E-08	9.217E-09	3.371E-09	1.200E-08	4.354E-08	5.891E-08	3.225E-09	3.000E-09	1.524E-08	2.146E-08	9.733E-04	2.163E-10	1.533E-07
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	8.531E-09	4.769E-08	2.110E-06	0.000E+00	1.315E-09	1.200E-08	4.354E-08	5.685E-08	1.209E-09	3.000E-09	1.524E-08	1.945E-08	8.081E-04	5.971E-07	1.647E-07
T6 Instate Other Clas	Diesel	4.663E-09	2.055E-07	3.537E-08	9.219E-09	3.370E-09	1.200E-08	4.354E-08	5.891E-08	3.224E-09	3.000E-09	1.524E-08	2.146E-08	9.736E-04	2.166E-10	1.534E-07
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	8.532E-09	4.763E-08	2.110E-06	0.000E+00	1.316E-09	1.200E-08	4.354E-08	5.685E-08	1.210E-09	3.000E-09	1.524E-08	1.945E-08	8.077E-04	5.972E-07	1.647E-07
T6 Instate Other Clas	Diesel	4.659E-09	2.085E-07	3.538E-08	9.218E-09	3.392E-09	1.200E-08	4.354E-08	5.893E-08	3.245E-09	3.000E-09	1.524E-08	2.148E-08	9.735E-04	2.164E-10	1.534E-07
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Other Clas	Natural Gas	8.531E-09	4.769E-08	2.110E-06	0.000E+00	1.315E-09	1.200E-08	4.354E-08	5.685E-08	1.209E-09	3.000E-09	1.524E-08	1.945E-08	8.078E-04	5.971E-07	1.647E-07
T6 Instate Other Clas	Diesel	5.559E-09	2.967E-07	4.102E-08	9.259E-09	3.991E-09	1.200E-08	4.354E-08	5.953E-08	3.818E-09	3.000E-09	1.524E-08	2.206E-08	9.778E-04	2.582E-10	1.541E-07
T6 Instate Other Clas	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00

T6 Instate Other Clas	Natural Gas	8.331E-09	6.217E-08	2.165E-06	0.000E+00	1.227E-09	1.200E-08	4.354E-08	5.676E-08	1.128E-09	3.000E-09	1.524E-08	1.937E-08	8.182E-04	5.830E-07	1.668E-07
T6 Instate Tractor Clc	Diesel	4.592E-09	2.054E-07	3.485E-08	9.224E-09	3.359E-09	1.200E-08	4.354E-08	5.890E-08	3.213E-09	3.000E-09	1.524E-08	2.145E-08	9.741E-04	2.133E-10	1.535E-07
T6 Instate Tractor Clc	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Clc	Natural Gas	8.534E-09	4.754E-08	2.110E-06	0.000E+00	1.316E-09	1.200E-08	4.354E-08	5.685E-08	1.210E-09	3.000E-09	1.524E-08	1.945E-08	8.079E-04	5.973E-07	1.647E-07
T6 Instate Tractor Clc	Diesel	5.477E-09	2.862E-07	4.061E-08	8.339E-09	3.933E-09	1.200E-08	4.354E-08	5.947E-08	3.762E-09	3.000E-09	1.524E-08	2.200E-08	8.807E-04	2.544E-10	1.387E-07
T6 Instate Tractor Clc	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.177E-08	3.377E-08	0.000E+00	3.000E-09	7.619E-09	1.062E-08	0.000E+00	0.000E+00	0.000E+00
T6 Instate Tractor Clc	Natural Gas	8.345E-09	6.106E-08	2.161E-06	0.000E+00	1.234E-09	1.200E-08	4.354E-08	5.677E-08	1.134E-09	3.000E-09	1.524E-08	1.937E-08	7.979E-04	5.841E-07	1.627E-07
T6 OOS Class 4	Diesel	4.504E-09	2.275E-07	3.026E-08	8.730E-09	4.054E-09	1.200E-08	4.292E-08	5.897E-08	3.879E-09	3.000E-09	1.502E-08	2.190E-08	9.219E-04	2.092E-10	1.452E-07
T6 OOS Class 5	Diesel	4.514E-09	2.285E-07	3.031E-08	8.733E-09	4.061E-09	1.200E-08	4.292E-08	5.898E-08	3.885E-09	3.000E-09	1.502E-08	2.191E-08	9.222E-04	2.096E-10	1.453E-07
T6 OOS Class 6	Diesel	4.494E-09	2.265E-07	3.021E-08	8.722E-09	4.047E-09	1.200E-08	4.292E-08	5.897E-08	3.872E-09	3.000E-09	1.502E-08	2.189E-08	9.210E-04	2.087E-10	1.451E-07
T6 OOS Class 7	Diesel	4.840E-09	2.394E-07	3.254E-08	7.853E-09	4.283E-09	1.200E-08	4.292E-08	5.920E-08	4.097E-09	3.000E-09	1.502E-08	2.212E-08	8.293E-04	2.248E-10	1.307E-07
T6 Public Class 4	Diesel	5.308E-09	2.607E-07	3.322E-08	9.367E-09	3.947E-09	1.200E-08	4.321E-08	5.916E-08	3.777E-09	3.000E-09	1.512E-08	2.190E-08	9.891E-04	2.465E-10	1.558E-07
T6 Public Class 4	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 4	Natural Gas	8.097E-09	5.118E-08	1.949E-06	0.000E+00	1.225E-09	1.200E-08	4.321E-08	5.643E-08	1.126E-09	3.000E-09	1.512E-08	1.925E-08	7.920E-04	5.667E-07	1.615E-07
T6 Public Class 5	Diesel	5.241E-09	2.430E-07	3.259E-08	9.383E-09	3.816E-09	1.200E-08	4.321E-08	5.903E-08	3.650E-09	3.000E-09	1.512E-08	2.177E-08	9.908E-04	2.434E-10	1.561E-07
T6 Public Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 5	Natural Gas	8.066E-09	5.356E-08	1.961E-06	0.000E+00	1.212E-09	1.200E-08	4.321E-08	5.642E-08	1.115E-09	3.000E-09	1.512E-08	1.924E-08	7.932E-04	5.646E-07	1.617E-07
T6 Public Class 6	Diesel	5.014E-09	2.224E-07	3.192E-08	9.361E-09	3.630E-09	1.200E-08	4.321E-08	5.884E-08	3.473E-09	3.000E-09	1.512E-08	2.160E-08	9.885E-04	2.329E-10	1.557E-07
T6 Public Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 6	Natural Gas	8.128E-09	4.906E-08	1.938E-06	0.000E+00	1.238E-09	1.200E-08	4.321E-08	5.645E-08	1.138E-09	3.000E-09	1.512E-08	1.926E-08	7.923E-04	5.688E-07	1.615E-07
T6 Public Class 7	Diesel	4.753E-09	2.209E-07	3.117E-08	9.245E-09	3.629E-09	1.200E-08	4.321E-08	5.884E-08	3.472E-09	3.000E-09	1.512E-08	2.160E-08	9.763E-04	2.208E-10	1.538E-07
T6 Public Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Public Class 7	Natural Gas	8.126E-09	4.926E-08	1.939E-06	0.000E+00	1.237E-09	1.200E-08	4.321E-08	5.645E-08	1.138E-09	3.000E-09	1.512E-08	1.926E-08	7.921E-04	5.687E-07	1.615E-07
T6 Utility Class 5	Diesel	3.641E-09	1.398E-07	2.608E-08	9.218E-09	3.128E-09	1.200E-08	4.321E-08	5.834E-08	2.993E-09	3.000E-09	1.512E-08	2.112E-08	9.734E-04	1.691E-10	1.534E-07
T6 Utility Class 5	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 5	Natural Gas	8.172E-09	4.604E-08	1.923E-06	0.000E+00	1.256E-09	1.200E-08	4.321E-08	5.647E-08	1.155E-09	3.000E-09	1.512E-08	1.928E-08	7.878E-04	5.719E-07	1.606E-07
T6 Utility Class 6	Diesel	3.641E-09	1.372E-07	2.608E-08	9.218E-09	3.113E-09	1.200E-08	4.321E-08	5.832E-08	2.978E-09	3.000E-09	1.512E-08	2.110E-08	9.734E-04	1.691E-10	1.534E-07
T6 Utility Class 6	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 6	Natural Gas	8.172E-09	4.604E-08	1.923E-06	0.000E+00	1.256E-09	1.200E-08	4.321E-08	5.647E-08	1.155E-09	3.000E-09	1.512E-08	1.928E-08	7.878E-04	5.719E-07	1.606E-07
T6 Utility Class 7	Diesel	3.606E-09	1.336E-07	2.583E-08	9.227E-09	3.096E-09	1.200E-08	4.321E-08	5.831E-08	2.962E-09	3.000E-09	1.512E-08	2.109E-08	9.744E-04	1.675E-10	1.535E-07
T6 Utility Class 7	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.160E-08	3.360E-08	0.000E+00	3.000E-09	7.562E-09	1.056E-08	0.000E+00	0.000E+00	0.000E+00
T6 Utility Class 7	Natural Gas	8.172E-09	4.604E-08	1.923E-06	0.000E+00	1.256E-09	1.200E-08	4.321E-08	5.647E-08	1.155E-09	3.000E-09	1.512E-08	1.928E-08	7.878E-04	5.719E-07	1.606E-07
T6TS	Gasoline	8.058E-09	6.038E-08	1.552E-07	1.381E-08	1.137E-09	1.200E-08	4.347E-08	5.661E-08	1.045E-09	3.000E-09	1.521E-08	1.926E-08	1.397E-03	2.170E-09	6.359E-09
T6TS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.200E-08	2.174E-08	3.374E-08	0.000E+00	3.000E-09	7.607E-09	1.061E-08	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Diesel	1.040E-08	1.146E-06	4.584E-08	1.192E-08	2.480E-08	3.600E-08	8.704E-08	1.478E-07	2.372E-08	9.000E-09	3.046E-08	6.319E-08	1.259E-03	4.832E-10	1.983E-07
T7 CAIRP Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.352E-08	7.952E-08	0.000E+00	9.000E-09	1.523E-08	2.423E-08	0.000E+00	0.000E+00	0.000E+00
T7 CAIRP Class 8	Natural Gas	1.393E-08	1.566E-07	3.531E-06	0.000E+00	2.056E-09	3.600E-08	8.704E-08	1.251E-07	1.891E-09	9.000E-09	3.046E-08	4.135E-08	1.052E-03	9.752E-07	2.144E-07
T7 NNOOS Class 8	Diesel	1.011E-08	1.268E-06	4.457E-08	1.141E-08	2.450E-08	3.600E-08	8.703E-08	1.475E-07	2.344E-08	9.000E-09	3.046E-08	6.290E-08	1.205E-03	4.697E-10	1.898E-07
T7 NOOS Class 8	Diesel	1.043E-08	1.305E-06	4.598E-08	1.140E-08	2.594E-08	3.600E-08	8.704E-08	1.490E-07	2.482E-08	9.000E-09	3.046E-08	6.428E-08	1.204E-03	4.846E-10	1.897E-07
T7 POLA Class 8	Diesel	9.677E-09	1.141E-06	4.591E-08	1.270E-08	2.149E-08	3.600E-08	8.799E-08	1.455E-07	2.056E-08	9.000E-09	3.080E-08	6.036E-08	1.341E-03	4.495E-10	2.113E-07
T7 POLA Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.411E-08	8.011E-08	0.000E+00	9.000E-09	1.544E-08	2.444E-08	0.000E+00	0.000E+00	0.000E+00
T7 POLA Class 8	Natural Gas	1.420E-08	1.580E-07	3.720E-06	0.000E+00	2.098E-09	3.600E-08	8.808E-08	1.262E-07	1.929E-09	9.000E-09	3.083E-08	4.176E-08	1.063E-03	9.936E-07	2.167E-07
T7 Public Class 8	Diesel	1.551E-08	1.330E-06	6.436E-08	1.416E-08	1.635E-08	3.600E-08	8.649E-08	1.388E-07	1.564E-08	9.000E-09	3.027E-08	5.491E-08	1.496E-03	7.203E-10	2.357E-07
T7 Public Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.397E-08	7.997E-08	0.000E+00	9.000E-09	1.539E-08	2.439E-08	0.000E+00	0.000E+00	0.000E+00
T7 Public Class 8	Natural Gas	1.411E-08	1.818E-07	4.057E-06	0.000E+00	2.032E-09	3.600E-08	8.649E-08	1.245E-07	1.868E-09	9.000E-09	3.027E-08	4.114E-08	1.107E-03	9.872E-07	2.257E-07
T7 Single Concrete/T	Diesel	7.554E-09	6.981E-07	3.903E-08	1.337E-08	1.223E-08	3.600E-08	8.942E-08	1.376E-07	1.171E-08	9.000E-09	3.130E-08	5.200E-08	1.412E-03	3.508E-10	2.224E-07
T7 Single Concrete/T	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.472E-08	8.072E-08	0.000E+00	9.000E-09	1.565E-08	2.465E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Concrete/T	Natural Gas	1.447E-08	1.596E-07	3.919E-06	0.000E+00	2.138E-09	3.600E-08	8.941E-08	1.276E-07	1.966E-09	9.000E-09	3.129E-08	4.226E-08	1.103E-03	1.013E-06	2.248E-07
T7 Single Dump Class	Diesel	8.917E-09	9.167E-07	4.734E-08	1.357E-08	1.531E-08	3.600E-08	8.844E-08	1.398E-07	1.465E-08	9.000E-09	3.096E-08	5.461E-08	1.433E-03	4.142E-10	2.257E-07
T7 Single Dump Class	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.471E-08	8.071E-08	0.000E+00	9.000E-09	1.565E-08	2.465E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Dump Class	Natural Gas	1.445E-08	1.748E-07	4.138E-06	0.000E+00	2.104E-09	3.600E-08	8.845E-08	1.266E-07	1.935E-09	9.000E-09	3.096E-08	4.189E-08	1.117E-03	1.011E-06	2.276E-07
T7 Single Other Class	Diesel	8.205E-09	8.292E-07	4.290E-08	1.348E-08	1.429E-08	3.600E-08	8.875E-08	1.390E-07	1.367E-08	9.000E-09	3.106E-08	5.373E-08	1.423E-03	3.811E-10	2.243E-07
T7 Single Other Class	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.471E-08	8.071E-08	0.000E+00	9.000E-09	1.565E-08	2.465E-08	0.000E+00	0.000E+00	0.000E+00
T7 Single Other Class	Natural Gas	1.446E-08	1.649E-07	3.993E-06	0.000E+00	2.127E-09	3.600E-08	8.874E-08	1.269E-07	1.955E-09	9.000E-09	3.106E-08	4.201E-08	1.108E-03	1.012E-06	2.260E-07
T7 SWCV Class 8	Diesel	1.103E-08	6.227E-06	2.272E-08	3.358E-08	2.077E-08	3.600E-08	2.100E-07	2.668E-07	1.987E-08	9.000E-09	7.350E-08	1.024E-07	3.546E-03	5.123E-10	5.586E-07
T7 SWCV Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	1.050E-07	1.410E-07	0.000E+00	9.000E-09	3.675E-08	4.575E-08	0.000E+00	0.000E+00	0.000E+00
T7 SWCV Class 8	Natural Gas	4.231E-09	1.518E-07	6.176E-06	0.000E+00	7.354E-10	3.600E-08	2.100E-07	2.467E-07	6.761E-10	9.000E-09	7.350E-08	8.318E-08	9.786E-04	2.725E-07	1.995E-07
T7 Tractor Class 8	Diesel	9.666E-09	1.107E-06	4.234E-08	1.190E-08	2.164E-08	3.600E-08	8.679E-08	1.444E-07	2.070E-08	9.000E-09	3.038E-08	6.008E-08	1.257E-03	4.490E-10	1.980E-07
T7 Tractor Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.354E-08	7.954E-08	0.000E+00	9.000E-09	1.524E-08	2.424E-08	0.000E+00	0.000E+00	0.000E+00
T7 Tractor Class 8	Natural Gas	1.394E-08	1.583E-07	3.559E-06	0.000E+00	2.053E-09	3.600E-08	8.674E-08	1.248E-07	1.888E-09	9.000E-09	3.036E-08	4.125E-08	1.055E-03	9.755E-07	2.151E-07
T7 Utility Class 8	Diesel	8.295E-09	7.663E-07	4.419E-08	1.386E-08	1.293E-08	3.600E-08	8.592E-08	1.349E-07	1.237E-08	9.000E-09	3.007E-08	5.144E-08	1.464E-03	3.853E-10	2.307E-07
T7 Utility Class 8	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.600E-08	4.398E-08	7.998E-08	0.000E+00	9.000E-09	1.539E-08	2.439E-08	0.000E+00	0.000E+00	0.000E+00
T7IS	Gasoline	2.945E-07	2.262E-06	2.639E-05	1.589E-08	1.057E-09	2.000E-08	9.026E-08	1.113E-07	9.715E-10	5.000E-09	3.159E-08	3.756E-08	1.607E-03	6.677E-08	9.705E-08
T7IS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.000E-08	4.520E-08	6.520E-08	0.000E+00	5.000E-09	1.582E-08	2.082E-08	0.000E+00	0.000E+00	0.000E+00
UBUS	Gasoline	1.354E-09	1.791E-08	4.760E-07	5.574E-09	1.069E-09	8.000E-09	9.100E-08	1.001E-07	9.832E-10	2.000E-09	3.185E-08	3.483E-08	5.638E-04	5.254E-10	2.981E-09
UBUS	Electricity	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.343E-08	5.500E-08	8.843E-08	0.000E+00	8.357E-09	1.925E-08	2.761E-08	0.000E+00	0.000E+00	0.000E+00
UBUS	Natural Gas	5.564E-08	1.334E-07	9.033E-08	0.000E+00	1.082E-08	1.200E-08	9.100E-08	1.138E-07	1.035E-08	3.000E-09	3.185E-08	4.520E-08	5.683E-04	2.584E-09	1.159E-07
	total															

Operation-Related Annual Vehicle Fuel/Energy Usage Summary

Existing - Baseline Year 2023

Year	Gas			Diesel			CNG			Electricity		
	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	kWh	Miles/kWh
Existing Baseline	441,763,277	18,431,052	23.97	24,385,615	2,903,860	8.40	1,576,556	386,486	4.08	17,402,729	6,379,060	2.73

Existing - Year 2050

Year	Gas			Diesel			CNG			Electricity		
	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	kWh	Miles/kWh
Existing Year 2050	399,911,915	12,982,178	30.80	25,320,719	2,723,246	9.30	699,521	101,348	6.90	59,196,022	15,419,534	3.84

Proposed Project (GP 2050)

Year	Gas			Diesel			CNG			Electricity		
	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	kWh	Miles/kWh
Proposed Project	476,109,071	15,455,736	30.80	30,145,199	3,242,120	9.30	832,804	120,659	6.90	70,474,928	18,357,492	3.84

Net Change

Year	Gas			Diesel			CNG			Electricity		
	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	Gallons	Miles/Gal	VMT	kWh	Miles/kWh
From Existing Baseline	34,345,794	-2,975,316	6.84	5,759,584	338,260	0.90	-743,752	-265,828	2.82	53,072,198	11,978,432	1.11
From Existing 2050	76,197,157	2,473,557	0.00	4,824,479	518,873	0.00	133,283	19,310	0.00	11,278,905	2,937,959	0.00

Notes

** VMT based on VMT data provided by Fehr & Peers.*

*** Fuel consumption rates based on data obtained from EMFAC2021 Web Database, Version 1.0.2. https://arb.ca.gov/emfac/emissions-inventory/f7df17ce2153322cf12c7ff31f52997af7bf7717*

*****VMT per year based on a conversion of VMT x 347 days per year to account for less travel on weekend, consistent with CARB statewide GHG emissions inventory methodology. California Air Resources Board. 2008, October. Climate Change Proposed Scoping Plan: A Framework for Change.*

Existing Baseline Year 2023: VMT

Vehicle type	Fleet percent	VMT
LDA	51.87%	251,621,925
LDT1	4.15%	20,121,567
LDT2	23.08%	111,968,846
MDV	13.04%	63,248,615
LHD1	2.67%	12,976,355
LHD2	0.64%	3,114,306
MHD	1.24%	6,034,812
HHD	2.51%	12,175,475
OBUS	0.06%	276,667
UBUS	0.17%	817,100
MCY	0.34%	1,642,746
SBUS	0.05%	231,837
MH	0.08%	370,355
All Other Buses	0.04%	184,688
Motor Coach	0.03%	151,504
PTO	0.04%	191,379
	100%	485,128,177

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent	
LDA	93.61%	0.19%	0.00%	6.20%	
LDT1	99.67%	0.02%	0.00%	0.31%	
LDT2	98.80%	0.32%	0.00%	0.88%	
MDV	97.65%	1.15%	0.00%	1.20%	
LHD1	67.85%	32.15%	0.00%	0.00%	
LHD2	41.02%	58.98%	0.00%	0.00%	
MHD	24.49%	74.29%	1.21%	0.02%	<< Equal to T6 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
HHD	0.05%	94.71%	5.20%	0.04%	<< Equal to T7 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
OBUS	45.14%	49.10%	5.76%	0.00%	<< OBUS (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
UBUS	6.89%	0.28%	92.30%	0.53%	
MCY	100.00%	0.00%	0.00%	0.00%	
SBUS	45.96%	25.87%	28.15%	0.01%	
MH	73.61%	26.39%	0.00%	0.00%	
All Other Buses	0.00%	80.89%	19.11%	0.00%	
Motor Coach	0.00%	100.00%	0.00%	0.00%	
PTO	0.00%	99.95%	0.00%	0.05%	

Vehicle type	Gasoline			Diesel			CNG			Electricity		
	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	m/kWh	kWh
LDA	235,546,200	28.38	8,299,115	487,347	39.58	12,313	0	0	0	15,588,377	2.72	5,728,946
LDT1	20,054,938	23.74	844,803	4,619	22.95	201	0	0	0	62,010	2.73	22,691
LDT2	110,630,274	23.10	4,788,702	355,401	30.71	11,574	0	0	0	983,171	2.92	336,772
MDV	61,762,509	18.83	3,279,580	727,011	23.06	31,531	0	0	0	759,095	2.79	272,142
LHD1	8,804,935	13.13	670,411	4,171,420	20.24	206,081	0	0	0	0	0.00	0
LHD2	1,277,537	11.50	111,108	1,836,769	17.02	107,937	0	0	0	0	0.00	0
MHD	1,477,964	5.09	290,092	4,483,060	8.87	505,519	72,730	8.09	8,989	1,059	0.96	1,107
HHD	5,835	3.95	1,477	11,531,951	5.98	1,927,449	633,157	5.75	110,069	4,532	0.57	8,021
OBUS	124,897	4.99	25,011	135,839	0.00	0	15,931	0	0	0	0.00	0
UBUS	56,260	4.58	12,289	2,292	5.85	392	754,186	3.05	247,644	4,363	0.48	9,157
MCY	1,642,746	40.95	40,118	0	0.00	0	0	0	0	0	0.00	0
SBUS	106,564	8.90	11,967	59,975	7.30	8,218	65,264	4.16	15,684	34	0.86	40
MH	272,617	4.84	56,378	97,738	9.96	9,815	0	0	0	0	0.00	0
All Other Buses	0	0	0	149,399	9.21	16,214	35,289	8.61	4,101	0	0.00	0
Motor Coach	0	0	0	151,504	5.50	27,546	0	0	0	0	0.00	0
PTO	0	0	0	191,291	4.90	39,070	0	0	0	88	0.48	183
	441,763,277		**18,431,052**	**24,385,615**		**2,903,860**	**1,576,556**		**386,486**	**17,402,729**		**6,379,060**

Existing Year 2050: VMT

Vehicle type	Fleet percent	VMT
LDA	44.46%	215,708,071
LDT1	3.45%	16,748,995
LDT2	26.85%	130,237,236
MDV	15.07%	73,125,566
LHD1	2.90%	14,092,948
LHD2	0.79%	3,816,769
MHD	1.56%	7,573,777
HHD	4.04%	19,576,405
OBUS	0.03%	136,363
UBUS	0.23%	1,126,564
MCY	0.39%	1,899,373
SBUS	0.04%	195,056
MH	0.06%	311,235
All Other Buses	0.03%	148,314
Motor Coach	0.03%	143,659
PTO	0.06%	287,844
	100%	485,128,177

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent	
LDA	85.59%	0.05%	0.00%	14.36%	
LDT1	95.52%	0.00%	0.00%	4.48%	
LDT2	95.33%	0.36%	0.00%	4.31%	
MDV	92.90%	0.99%	0.00%	6.11%	
LHD1	28.67%	21.61%	0.00%	49.72%	
LHD2	14.37%	37.15%	0.00%	48.47%	
MHD	5.59%	40.63%	0.78%	53.01%	<< Equal to T6 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
HHD	0.01%	81.13%	2.83%	16.03%	<< Equal to T7 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
OBUS	13.63%	60.04%	8.13%	18.20%	<<OBUS (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
UBUS	1.79%	0.00%	0.61%	97.60%	
MCY	100.00%	0.00%	0.00%	0.00%	
SBUS	24.40%	6.60%	17.42%	51.59%	
MH	64.34%	35.66%	0.00%	0.00%	
All Other Buses	0.00%	76.52%	23.48%	0.00%	
Motor Coach	0.00%	100.00%	0.00%	0.00%	
PTO	0.00%	46.50%	0.00%	53.50%	

Vehicle type	Gasoline			Diesel			CNG			Electricity		
	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	m/kWh	kWh
LDA	184,627,648	35.85	5,150,157	104,904	53.36	1,966	0	0.00	0	30,975,519	2.69	11,529,758
LDT1	15,998,268	31.14	513,786	188	28.47	7	0	0.00	0	750,539	2.78	270,209
LDT2	124,153,220	30.03	4,133,639	470,297	38.47	12,225	0	0.00	0	5,613,719	2.81	1,996,919
MDV	67,933,819	24.81	2,738,536	724,018	29.69	24,384	0	0.00	0	4,467,729	2.75	1,622,648
LHD1	4,039,895	16.62	243,028	3,046,006	21.58	141,145	0	0.00	0	7,007,047	1.78	0
LHD2	548,489	14.76	37,156	1,418,101	18.47	76,785	0	0.00	0	1,850,179	1.78	0
MHD	423,136	6.05	69,925	3,077,405	10.09	305,113	58,706	8.38	7,009	4,014,531	0.95	0
HHD	1,470	5.33	276	15,883,052	7.59	2,093,309	554,036	6.66	83,231	3,137,847	0.56	0
OBUS	18,593	5.86	3,174	81,867	0.00	0	11,085	0.00	0	24,819	0.95	0
UBUS	20,172	15.20	1,327	0	0.00	0	6,906	13.81	500	1,099,485	0.48	0
MCY	1,899,373	42.02	45,205	0	0.00	0	0	0.00	0	0	0.00	0
SBUS	47,588	10.35	4,597	12,877	8.53	1,510	33,970	4.83	7,037	100,622	0.86	0
MH	200,243	4.84	41,371	110,992	9.93	11,172	0	0.00	0	0	0.00	0
All Other Buses	0	0	0	113,496	10.44	10,869	34,818	10	3,571	0	0.00	0
Motor Coach	0	0	0	143,659	6.48	22,169	0	0	0	0	0.00	0
PTO	0	0	0	133,855	5.92	22,592	0	0	0	153,989	0.48	0
	399,911,915		**12,982,178**	**25,320,719**		**2,723,246**	**699,521**		**101,348**	**59,196,022**		**15,419,534**

Proposed Project Year 2050 (General Plan 2050): VMT

Vehicle type	Fleet percent	VMT
LDA	44.46%	256,807,976
LDT1	3.45%	19,940,263
LDT2	26.85%	155,051,968
MDV	15.07%	87,058,535
LHD1	2.90%	16,778,146
LHD2	0.79%	4,543,996
MHD	1.56%	9,016,846
HHD	4.04%	23,306,393
OBUS	0.03%	162,345
UBUS	0.23%	1,341,213
MCY	0.39%	2,261,270
SBUS	0.04%	232,221
MH	0.06%	370,536
All Other Buses	0.03%	176,573
Motor Coach	0.03%	171,031
PTO	0.06%	342,688
	100%	577,562,001

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent	
LDA	85.59%	0.05%	0.00%	14.36%	
LDT1	95.52%	0.00%	0.00%	4.48%	
LDT2	95.33%	0.36%	0.00%	4.31%	
MDV	92.90%	0.99%	0.00%	6.11%	
LHD1	28.67%	21.61%	0.00%	49.72%	
LHD2	14.37%	37.15%	0.00%	48.47%	
MHD	5.59%	40.63%	0.78%	53.01%	<< Equal to T6 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
HHD	0.01%	81.13%	2.83%	16.03%	<< Equal to T7 (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
OBUS	13.63%	60.04%	8.13%	18.20%	<< OBUS (https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf)
UBUS	1.79%	0.00%	0.61%	97.60%	
MCY	100.00%	0.00%	0.00%	0.00%	
SBUS	24.40%	6.60%	17.42%	51.59%	
MH	64.34%	35.66%	0.00%	0.00%	
All Other Buses	0.00%	76.52%	23.48%	0.00%	
Motor Coach	0.00%	100.00%	0.00%	0.00%	
PTO	0.00%	46.50%	0.00%	53.50%	

Vehicle type	Gasoline			Diesel			CNG			Electricity		
	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	m/kWh	kWh
LDA	219,805,649	35.85	6,131,442	124,892	53.36	2,341	0	0	0	36,877,434	2.69	13,726,579
LDT1	19,046,496	31.14	611,681	224	28.47	8	0	0	0	893,542	2.78	321,693
LDT2	147,808,735	30.03	4,921,242	559,905	38.47	14,554	0	0	0	6,683,328	2.81	2,377,401
MDV	80,877,579	24.81	3,260,322	861,969	29.69	29,031	0	0	0	5,318,987	2.75	1,931,819
LHD1	4,809,636	16.62	289,334	3,626,377	21.58	168,038	0	0	0	8,342,133	1.78	0
LHD2	652,995	14.76	44,235	1,688,299	18.47	91,416	0	0	0	2,202,702	1.78	0
MHD	503,758	6.05	83,248	3,663,758	10.09	363,248	69,891	8.38	8,345	4,779,439	0.95	0
HHD	1,750	5.33	328	18,909,327	7.59	2,492,157	659,599	6.66	99,089	3,735,716	0.56	0
OBUS	22,136	5.86	3,778	97,465	0.00	0	13,197	0	0	29,548	0.95	0
UBUS	24,015	15.20	1,580	0	0.00	0	8,222	13.81	595	1,308,976	0.48	0
MCY	2,261,270	42.02	53,819	0	0.00	0	0	0	0	0	0.00	0
SBUS	56,655	10.35	5,473	15,331	8.53	1,798	40,442	4.83	8,378	119,793	0.86	0
MH	238,396	4.84	49,253	132,140	9.93	13,301	0	0	0	0	0.00	0
All Other Buses	0	0	0	135,121	10.44	12,940	41,453	9.75	4,252	0	0.00	0
Motor Coach	0	0	0	171,031	6.48	26,393	0	0	0	0	0.00	0
PTO	0	0	0	159,359	5.92	26,896	0	0	0	183,329	0.48	0
	476,109,071		**15,455,736**	**30,145,199**		**3,242,120**	**832,804**		**120,659**	**70,474,928**		**18,357,492**

EMFAC Fuel Usage: Year 2023

Vehicle type	GAS			DSL			NG			ELEC		
	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallo	VMT/day	kWh/day	Miles/kWh
All other buses	0	0	0.00	82,728	8,978	9.21	19,541	2,271	8.61	0	0	0.00
LDA	135,140,035	4,761,455	28.38	279,606	7,064	39.58	0	0	0.00	8,943,527	3,286,871	2.72
LDT1	11,506,129	484,689	23.74	2,650	115	22.95	0	0	0.00	35,577	13,019	2.73
LDT2	63,471,961	2,747,424	23.10	203,904	6,640	30.71	0	0	0.00	564,075	193,216	2.92
LHD1	4,875,651	371,234	13.13	2,309,885	114,116	20.24	0	0	0.00	0	0	0.00
LHD2	707,424	61,525	11.50	1,017,094	59,769	17.02	0	0	0.00	0	0	0.00
MCY	942,493	23,017	40.95	0	0	0.00	0	0	0.00	0	0	0.00
MDV	35,435,034	1,881,595	18.83	417,109	18,090	23.06	0	0	0.00	435,516	156,136	2.79
MH	150,959	31,219	4.84	54,121	5,435	9.96	0	0	0.00	0	0	0.00
Motor coach	0	0	0.00	83,894	15,253	5.50	0	0	0.00	0	0	0.00
OBUS	153,202	30,680	4.99	0	0	0.00	0	0	0.00	0	0	0.00
PTO	0	0	0.00	105,926	21,634	4.90	0	0	0.00	49	101	0.48
SBUS	59,009	6,627	8.90	33,210	4,551	7.30	36,139	8,685	4.16	19	22	0.86
T6	818,409	160,636	5.09	2,482,453	279,926	8.87	40,273	4,978	8.09	586	613	0.96
T7	3,231	818	3.95	6,385,711	1,067,307	5.98	350,605	60,950	5.75	2,510	4,442	0.57
UBUS	31,153	6,805	4.58	1,269	217	5.85	417,623	137,130	3.05	2,416	5,071	0.48
Total	**253,294,692**	**10,567,724**	**23.97**	**13,459,561**	**1,609,097**	**8.36**	**864,182**	**214,013**	**4.04**	**9,984,275**	**3,659,491**	**2.73**

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Los Angeles (SC)
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Fuel Consumption	Energy Consumption
Los Angeles (SC)	2023	All Other Buses	Aggregate	Aggregate	Diesel	1475.194739	82728.49796	82728.49796	0	13129.2332	8.978276931	0
Los Angeles (SC)	2023	All Other Buses	Aggregate	Aggregate	Natural Gas	319.8885181	19541.02621	19541.02621	0	2847.00781	2.270823151	0
Los Angeles (SC)	2023	LDA	Aggregate	Aggregate	Gasoline	3363325.814	133132108	133132108	0	15650234.8	4688.007701	0
Los Angeles (SC)	2023	LDA	Aggregate	Aggregate	Diesel	9465.936918	279606.0153	279606.0153	0	38923.8152	7.064261604	0
Los Angeles (SC)	2023	LDA	Aggregate	Aggregate	Electricity	149786.3595	6967760.765	0	6967761	750975.114	0	2690130.736
Los Angeles (SC)	2023	LDA	Aggregate	Aggregate	Plug-in Hybrid	84855.73206	3983693.819	2007927.363	1975766	350878.452	73.44775691	596740.3568
Los Angeles (SC)	2023	LDT1	Aggregate	Aggregate	Gasoline	316618.4734	11498860.94	11498860.94	0	1394223.8	484.4224711	0
Los Angeles (SC)	2023	LDT1	Aggregate	Aggregate	Diesel	130.6972397	2649.862279	2649.862279	0	380.526712	0.115446626	0
Los Angeles (SC)	2023	LDT1	Aggregate	Aggregate	Electricity	737.9430578	27045.91094	0	27045.91	3402.44021	0	10441.95384
Los Angeles (SC)	2023	LDT1	Aggregate	Aggregate	Plug-in Hybrid	305.3619056	15799.36792	7268.198583	8531.169	1262.67148	0.266803592	2576.66741
Los Angeles (SC)	2023	LDT2	Aggregate	Aggregate	Gasoline	1534013.272	63204640.7	63204640.7	0	7216719.72	2737.584197	0
Los Angeles (SC)	2023	LDT2	Aggregate	Aggregate	Diesel	4672.025415	203904.1794	203904.1794	0	22591.3919	6.6400753	0
Los Angeles (SC)	2023	LDT2	Aggregate	Aggregate	Electricity	7316.504913	271839.3938	0	271839.4	37572.1356	0	104952.4421
Los Angeles (SC)	2023	LDT2	Aggregate	Aggregate	Plug-in Hybrid	11176.08817	559555.6037	267320.0773	292235.5	46213.1246	9.840078762	88263.83897
Los Angeles (SC)	2023	LHD1	Aggregate	Aggregate	Gasoline	123582.2629	4875651.462	4875651.462	0	1841191.58	371.233764	0
Los Angeles (SC)	2023	LHD1	Aggregate	Aggregate	Diesel	52370.85258	2309885.271	2309885.271	0	658759.443	114.1155095	0
Los Angeles (SC)	2023	LHD2	Aggregate	Aggregate	Gasoline	18992.20879	707424.2091	707424.2091	0	282955.613	61.52516871	0
Los Angeles (SC)	2023	LHD2	Aggregate	Aggregate	Diesel	23383.97043	1017094.138	1017094.138	0	294140.931	59.76930672	0
Los Angeles (SC)	2023	MCY	Aggregate	Aggregate	Gasoline	143314.4155	942493.4885	942493.4885	0	286628.831	23.0171675	0
Los Angeles (SC)	2023	MDV	Aggregate	Aggregate	Gasoline	930000.0312	35296866.04	35296866.04	0	4305992.45	1876.436347	0
Los Angeles (SC)	2023	MDV	Aggregate	Aggregate	Diesel	10587.09868	417108.5847	417108.5847	0	50133.2065	18.09042921	0
Los Angeles (SC)	2023	MDV	Aggregate	Aggregate	Electricity	7870.579333	292645.8028	0	292645.8	40427.0527	0	112985.4333
Los Angeles (SC)	2023	MDV	Aggregate	Aggregate	Plug-in Hybrid	6232.488765	281038.1518	138168.2151	142869.9	25771.341	5.15879783	43150.9791
Los Angeles (SC)	2023	MH	Aggregate	Aggregate	Gasoline	15543.05122	150959.242	150959.242	0	1554.92684	31.21883005	0
Los Angeles (SC)	2023	MH	Aggregate	Aggregate	Diesel	5175.528798	54121.46359	54121.46359	0	517.55288	5.43523898	0
Los Angeles (SC)	2023	Motor Coach	Aggregate	Aggregate	Diesel	588.8354422	83893.72533	83893.72533	0	13531.4385	15.25330866	0
Los Angeles (SC)	2023	OBUS	Aggregate	Aggregate	Gasoline	3808.788003	153201.689	153201.689	0	76206.2304	30.6795829	0
Los Angeles (SC)	2023	PTO	Aggregate	Aggregate	Diesel	0	105925.7735	105925.7735	0	0	21.63440519	0
Los Angeles (SC)	2023	PTO	Aggregate	Aggregate	Electricity	0	48.8251688	0	48.82517	0	0	101.1422535
Los Angeles (SC)	2023	SBUS	Aggregate	Aggregate	Gasoline	1333.830023	59008.65529	59008.65529	0	5335.32009	6.626552175	0
Los Angeles (SC)	2023	SBUS	Aggregate	Aggregate	Diesel	1641.865076	33210.41415	33210.41415	0	23774.2063	4.550703273	0
Los Angeles (SC)	2023	SBUS	Aggregate	Aggregate	Electricity	1.644084418	19.09632517	0	19.09633	23.8063424	0	22.08110642
Los Angeles (SC)	2023	SBUS	Aggregate	Aggregate	Natural Gas	1447.068317	36139.19841	36139.19841	0	20953.5492	8.685035105	0
Los Angeles (SC)	2023	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	26.65154111	1790.703118	1790.703118	0	612.452415	0.196586528	0
Los Angeles (SC)	2023	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0.033161573	1.223583518	0	1.223584	0.76205295	0	1.282388103
Los Angeles (SC)	2023	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	35.75830225	2456.776702	2456.776702	0	821.725786	0.269374438	0
Los Angeles (SC)	2023	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0.037301746	1.424502151	0	1.424502	0.85719412	0	1.492962747
Los Angeles (SC)	2023	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	112.9342461	6415.644096	6415.644096	0	2595.22898	0.693277012	0
Los Angeles (SC)	2023	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0.261949426	7.705978424	0	7.705978	6.0195978	0	8.07632246
Los Angeles (SC)	2023	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	194.6886565	40229.91644	40229.91644	0	4473.94533	4.09381301	0
Los Angeles (SC)	2023	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0.215824961	22.56156156	0	22.56156	4.95965761	0	23.64585473
Los Angeles (SC)	2023	T6 CAIRP Class 7	Aggregate	Aggregate	Natural Gas	0.191111078	38.02037272	38.02037272	0	4.39173257	0.003937761	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	3774.976897	127730.108	127730.108	0	53868.9203	14.4699939	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	2.446208079	44.76302906	0	44.76303	34.9073893	0	46.76886219
Los Angeles (SC)	2023	T6 Instate Delivery Class 4	Aggregate	Aggregate	Natural Gas	13.27297117	471.347353	471.347353	0	189.405299	0.05990266	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	3826.469277	132608.0345	132608.0345	0	54603.7166	15.09669253	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	1.865894219	34.01962767	0	34.01963	26.6263105	0	35.54404855
Los Angeles (SC)	2023	T6 Instate Delivery Class 5	Aggregate	Aggregate	Natural Gas	10.58451437	376.0415507	376.0415507	0	151.04102	0.04734435	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	11772.40959	405510.7394	405510.7394	0	167992.285	45.97419937	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	7.51666475	137.1273199	0	137.1273	107.262806	0	143.2720006
Los Angeles (SC)	2023	T6 Instate Delivery Class 6	Aggregate	Aggregate	Natural Gas	35.36133975	1241.582046	1241.582046	0	504.606318	0.156845307	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	2931.591762	161949.4146	161949.4146	0	41833.8144	17.9017285	0
Los Angeles (SC)	2023	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	0.93840441	20.21344545	0	20.21345	13.3910309	0	21.11921075
Los Angeles (SC)	2023	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	86.03903782	4781.035313	4781.035313	0	1227.77707	0.584200298	0
Los Angeles (SC)	2023	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	4707.887806	194317.3213	194317.3213	0	54423.183	22.03580312	0
Los Angeles (SC)	2023	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	0.739722177	15.39192516	0	15.39193	8.55118837	0	16.0837245
Los Angeles (SC)	2023	T6 Instate Other Class 4	Aggregate	Aggregate	Natural Gas	14.4899031	638.637223	638.637223	0	167.50328	0.080622677	0
Los Angeles (SC)	2023	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	10314.00608	453243.291	453243.291	0	119229.91	51.54124645	0
Los Angeles (SC)	2023	T6 Instate Other Class 5	Aggregate	Aggregate	Electricity	5.565438602	115.8638402	0	115.8638	64.3364702	0	121.0714102
Los Angeles (SC)	2023	T6 Instate Other Class 5	Aggregate	Aggregate	Natural Gas	27.16879291	1198.098792	1198.098792	0	314.071246	0.148126174	0
Los Angeles (SC)	2023	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	9328.84955	401790.5002	401790.5002	0	107841.501	45.57773495	0
Los Angeles (SC)	2023	T6 Instate Other Class 6	Aggregate	Aggregate	Electricity	4.853467761	101.2613359	0	101.2613	56.1060873	0	105.8125876
Los Angeles (SC)	2023	T6 Instate Other Class 6	Aggregate	Aggregate	Natural Gas	25.95511978	1135.452813	1135.452813	0	300.041185	0.141422152	0
Los Angeles (SC)	2023	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	4117.528532	201239.8476	201239.8476	0	47598.6298	22.48097088	0
Los Angeles (SC)	2023	T6 Instate Other Class 7	Aggregate	Aggregate	Electricity	1.496559908	46.77540481	0	46.7754	17.3002325	0	48.87775353
Los Angeles (SC)	2023	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	118.6563362	5956.448287	5956.448287	0	1371.66725	0.734481819	0
Los Angeles (SC)	2023	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	127.4290108	6703.456591	6703.456591	0	1473.07937	0.751691625	0
Los Angeles (SC)	2023	T6 Instate Tractor Class 6	Aggregate	Aggregate	Electricity	0.106383948	2.894903141	0	2.894903	1.22979844	0	3.025016305
Los Angeles (SC)	2023	T6 Instate Tractor Class 6	Aggregate	Aggregate	Natural Gas	0.374526998	20.1422852	20.1422852	0	4.3295321	0.002443924	0
Los Angeles (SC)	2023	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	1580.36537	97335.93	97335.93	0	18269.0237	10.29375987	0
Los Angeles (SC)	2023	T6 Instate Tractor Class 7	Aggregate	Aggregate	Electricity	0.379991844	13.93398198	0	13.93398	4.39270572	0	14.56025319
Los Angeles (SC)	2023	T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	45.94560097	2880.768181	2880.768181	0	531.131147	0.347952612	0
Los Angeles (SC)	2023	T6 OOS Class 4	Aggregate	Aggregate	Diesel	15.31650101	1020.05756	1020.05756	0	351.973193	0.111946277	0
Los Angeles (SC)	2023	T6 OOS Class 5	Aggregate	Aggregate	Diesel	20.46322336	1399.335542	1399.335542	0	470.244873	0.153391857	0

Los Angeles (SC)	2023 T6 OOS Class 6	Aggregate	Aggregate	Diesel	64.83612449	3656.503807	3656.503807	0	1489.93414	0.394861345	0
Los Angeles (SC)	2023 T6 OOS Class 7	Aggregate	Aggregate	Diesel	105.28737	26587.3295	26587.3295	0	2419.50376	2.690655852	0
Los Angeles (SC)	2023 T6 Public Class 4	Aggregate	Aggregate	Diesel	714.1898549	25127.74955	25127.74955	0	3663.79396	2.959703332	0
Los Angeles (SC)	2023 T6 Public Class 4	Aggregate	Aggregate	Electricity	0.013317837	0.241432377	0	0.241432	0.0683205	0	0.252689464
Los Angeles (SC)	2023 T6 Public Class 4	Aggregate	Aggregate	Natural Gas	67.37917516	2769.848435	2769.848435	0	345.655169	0.351006565	0
Los Angeles (SC)	2023 T6 Public Class 5	Aggregate	Aggregate	Diesel	484.5433605	17013.89641	17013.89641	0	2485.70744	2.03538049	0
Los Angeles (SC)	2023 T6 Public Class 5	Aggregate	Aggregate	Electricity	0.017611541	0.319291732	0	0.319292	0.0903472	0	0.334179108
Los Angeles (SC)	2023 T6 Public Class 5	Aggregate	Aggregate	Natural Gas	62.16815122	2536.636205	2536.636205	0	318.922616	0.321224291	0
Los Angeles (SC)	2023 T6 Public Class 6	Aggregate	Aggregate	Diesel	619.6155192	20835.20168	20835.20168	0	3178.62761	2.511273923	0
Los Angeles (SC)	2023 T6 Public Class 6	Aggregate	Aggregate	Electricity	0.197962805	3.593247893	0	3.593248	1.01554919	0	3.760787566
Los Angeles (SC)	2023 T6 Public Class 6	Aggregate	Aggregate	Natural Gas	59.50831005	2378.252735	2378.252735	0	305.277631	0.305638862	0
Los Angeles (SC)	2023 T6 Public Class 7	Aggregate	Aggregate	Diesel	2664.995907	115788.2596	115788.2596	0	13671.429	13.62422605	0
Los Angeles (SC)	2023 T6 Public Class 7	Aggregate	Aggregate	Electricity	0.378782471	10.85441335	0	10.85441	1.94315408	0	11.36051393
Los Angeles (SC)	2023 T6 Public Class 7	Aggregate	Aggregate	Natural Gas	253.1373471	13549.87518	13549.87518	0	1298.59459	1.657089615	0
Los Angeles (SC)	2023 T6 Utility Class 5	Aggregate	Aggregate	Diesel	640.1812675	26023.60966	26023.60966	0	8194.32022	2.813014437	0
Los Angeles (SC)	2023 T6 Utility Class 5	Aggregate	Aggregate	Natural Gas	3.880549317	155.7462229	155.7462229	0	49.6710313	0.018355797	0
Los Angeles (SC)	2023 T6 Utility Class 6	Aggregate	Aggregate	Diesel	121.1336603	4889.490714	4889.490714	0	1550.51085	0.52626879	0
Los Angeles (SC)	2023 T6 Utility Class 6	Aggregate	Aggregate	Natural Gas	1.46334689	57.87760757	57.87760757	0	18.7308402	0.00679256	0
Los Angeles (SC)	2023 T6 Utility Class 7	Aggregate	Aggregate	Diesel	138.1520634	6789.727125	6789.727125	0	1768.34641	0.728764721	0
Los Angeles (SC)	2023 T6 Utility Class 7	Aggregate	Aggregate	Electricity	0.217899452	6.218835044	0	6.218835	2.78911299	0	6.508795997
Los Angeles (SC)	2023 T6 Utility Class 7	Aggregate	Aggregate	Natural Gas	1.966822801	87.48677629	87.48677629	0	25.1753318	0.010141222	0
Los Angeles (SC)	2023 T6TS	Aggregate	Aggregate	Gasoline	15094.86549	818409.0416	818409.0416	0	302018.069	160.6355235	0
Los Angeles (SC)	2023 T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	6435.828117	1323608.7	1323608.7	0	147895.33	216.3914574	0
Los Angeles (SC)	2023 T7 CAIRP Class 8	Aggregate	Aggregate	Electricity	14.53463948	1531.582599	0	1531.583	334.006015	0	2712.073822
Los Angeles (SC)	2023 T7 CAIRP Class 8	Aggregate	Aggregate	Natural Gas	27.63052145	5633.680626	5633.680626	0	634.949383	1.03243525	0
Los Angeles (SC)	2023 T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	5773.529562	1572770.608	1572770.608	0	132675.709	254.4510404	0
Los Angeles (SC)	2023 T7 NOOS Class 8	Aggregate	Aggregate	Diesel	2417.432288	571074.6236	571074.6236	0	55552.594	93.53136811	0
Los Angeles (SC)	2023 T7 POAK Class 8	Aggregate	Aggregate	Diesel	1.163143668	108.5424559	108.5424559	0	19.0290304	0.019311768	0
Los Angeles (SC)	2023 T7 POLA Class 8	Aggregate	Aggregate	Diesel	8313.558238	1084548.738	1084548.738	0	136009.813	181.1303929	0
Los Angeles (SC)	2023 T7 POLA Class 8	Aggregate	Aggregate	Electricity	3.127934898	170.7967038	0	170.7967	51.1730149	0	302.0216528
Los Angeles (SC)	2023 T7 POLA Class 8	Aggregate	Aggregate	Natural Gas	104.2847166	13464.97476	13464.97476	0	1706.09796	2.441309708	0
Los Angeles (SC)	2023 T7 Public Class 8	Aggregate	Aggregate	Diesel	3741.056562	149663.9061	149663.9061	0	19191.6202	26.30419602	0
Los Angeles (SC)	2023 T7 Public Class 8	Aggregate	Aggregate	Electricity	1.668389431	47.86777059	0	47.86777	8.55883778	0	84.637816
Los Angeles (SC)	2023 T7 Public Class 8	Aggregate	Aggregate	Natural Gas	1171.95601	58685.39317	58685.39317	0	6012.13433	10.09490464	0
Los Angeles (SC)	2023 T7 Single Concrete/Transit	Aggregate	Aggregate	Diesel	704.453817	48752.06151	48752.06151	0	6635.95496	8.120377548	0
Los Angeles (SC)	2023 T7 Single Concrete/Transit	Aggregate	Aggregate	Electricity	1.001087833	38.08470649	0	38.08471	9.43024739	0	67.21755441
Los Angeles (SC)	2023 T7 Single Concrete/Transit	Aggregate	Aggregate	Natural Gas	65.8062684	4808.107512	4808.107512	0	619.895048	0.847905659	0
Los Angeles (SC)	2023 T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	1911.450598	113250.6944	113250.6944	0	18005.8646	18.94944797	0
Los Angeles (SC)	2023 T7 Single Dump Class 8	Aggregate	Aggregate	Electricity	0.247062018	9.340586715	0	9.340587	2.32732421	0	16.48565667
Los Angeles (SC)	2023 T7 Single Dump Class 8	Aggregate	Aggregate	Natural Gas	122.3673668	7866.104109	7866.104109	0	1152.7006	1.456328892	0
Los Angeles (SC)	2023 T7 Single Other Class 8	Aggregate	Aggregate	Diesel	5784.088097	333857.5575	333857.5575	0	54486.1099	55.53194181	0
Los Angeles (SC)	2023 T7 Single Other Class 8	Aggregate	Aggregate	Electricity	6.077680923	198.4680162	0	198.468	57.2517543	0	350.2858734
Los Angeles (SC)	2023 T7 Single Other Class 8	Aggregate	Aggregate	Natural Gas	407.8227126	24928.84292	24928.84292	0	3841.68995	4.443684618	0
Los Angeles (SC)	2023 T7 SWCV Class 8	Aggregate	Aggregate	Diesel	1297.387966	84243.13249	84243.13249	0	5967.98465	32.37980749	0
Los Angeles (SC)	2023 T7 SWCV Class 8	Aggregate	Aggregate	Electricity	1.953624666	52.85602879	0	52.85603	8.98667347	0	93.16567108
Los Angeles (SC)	2023 T7 SWCV Class 8	Aggregate	Aggregate	Natural Gas	3075.004889	198827.1073	198827.1073	0	14145.0225	33.98816564	0
Los Angeles (SC)	2023 T7 Tractor Class 8	Aggregate	Aggregate	Diesel	13527.62233	1083164.637	1083164.637	0	196556.352	177.142381	0
Los Angeles (SC)	2023 T7 Tractor Class 8	Aggregate	Aggregate	Electricity	10.90088667	457.1278569	0	457.1279	158.389883	0	809.5023946
Los Angeles (SC)	2023 T7 Tractor Class 8	Aggregate	Aggregate	Natural Gas	440.9972137	36390.67059	36390.67059	0	6407.68952	6.644899225	0
Los Angeles (SC)	2023 T7 Utility Class 8	Aggregate	Aggregate	Diesel	449.6908764	20667.97054	20667.97054	0	5756.04322	3.355504004	0
Los Angeles (SC)	2023 T7 Utility Class 8	Aggregate	Aggregate	Electricity	0.125388186	3.572630519	0	3.572631	1.60496878	0	6.316977807
Los Angeles (SC)	2023 T7IS	Aggregate	Aggregate	Gasoline	52.44057302	3231.284725	3231.284725	0	1049.23098	0.817685124	0
Los Angeles (SC)	2023 UBUS	Aggregate	Aggregate	Gasoline	438.7257597	31153.4128	31153.4128	0	1754.90304	6.805144169	0
Los Angeles (SC)	2023 UBUS	Aggregate	Aggregate	Diesel	9.742965344	1269.074735	1269.074735	0	38.9718614	0.216797099	0
Los Angeles (SC)	2023 UBUS	Aggregate	Aggregate	Electricity	53.5307883	2415.769471	0	2415.769	214.123153	0	5070.782408
Los Angeles (SC)	2023 UBUS	Aggregate	Aggregate	Natural Gas	3880.598718	417623.3217	417623.3217	0	15522.3949	137.1303086	0

EMFAC Fuel Usage: Year 2050

Vehicle type	GAS			DSL			NG			ELEC		
	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallon	VMT/day	kWh/day	Miles/kWh
All other buses	0	0	0.00	76,663	7,342	10.44	23,519	2,412	9.75	0	0	0.00
LDA	106,024,766	2,957,543	35.85	60,243	1,129	53.36	0	0	0.00	17,788,084	6,621,110	2.69
LDT1	9,187,208	295,048	31.14	108	4	28.47	0	0	0.00	431,006	155,171	2.78
LDT2	71,296,560	2,373,795	30.03	270,074	7,020	38.47	0	0	0.00	3,223,749	1,146,756	2.81
LHD1	2,728,819	164,158	16.62	2,057,479	95,339	21.58	0	0	0.00	4,733,034	2,654,836	1.78
LHD2	370,487	25,097	14.76	957,882	51,866	18.47	0	0	0.00	1,249,736	701,369	1.78
MCY	1,090,739	25,960	42.02	0	0	0.00	0	0	0.00	0	0	0.00
MDV	39,011,856	1,572,639	24.81	415,777	14,003	29.69	0	0	0.00	2,565,650	931,826	2.75
MH	135,258	27,945	4.84	74,972	7,547	9.93	0	0	0.00	0	0	0.00
Motor coach	0	0	0.00	97,037	14,974	6.48	0	0	0.00	0	0	0.00
OBUS	39,450	6,734	5.86	0	0	0.00	0	0	0.00	52,659	55,431	0.95
PTO	0	0	0.00	90,415	15,260	5.92	0	0	0.00	104,014	215,468	0.48
SBUS	32,144	3,105	10.35	8,698	1,020	8.53	22,946	4,753	4.83	67,967	78,590	0.86
T6	285,814	47,232	6.05	2,078,688	206,094	10.09	39,654	4,735	8.38	2,711,686	2,844,505	0.95
T7	993	186	5.33	10,728,490	1,413,963	7.59	374,233	56,220	6.66	2,119,514	3,767,265	0.56
UBUS	13,625	897	15.20	0	0	0.00	4,665	338	13.81	742,667	1,560,784	0.48
Total	**230,217,719**	**7,500,339**	**30.69**	**16,916,525**	**1,835,561**	**9.22**	**465,016**	**68,458**	**6.79**	**35,789,768**	**20,733,110**	**1.73**

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Los Angeles (SC)
Calendar Year: 2050
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Fuel Consumption	Energy Consumption
Los Angeles (SC)	2050	All Other Buses	Aggregate	Aggregate	Diesel	1535.99622	76662.80641	76662.80641	0	13670.3664	7.34181733	0
Los Angeles (SC)	2050	All Other Buses	Aggregate	Aggregate	Natural Gas	462.6026461	23518.76187	23518.76187	0	4117.16355	2.412203323	0
Los Angeles (SC)	2050	LDA	Aggregate	Aggregate	Gasoline	2791705.317	104008494.8	104008494.8	0	13046536.7	2883.126406	0
Los Angeles (SC)	2050	LDA	Aggregate	Aggregate	Diesel	1705.366561	60242.50841	60242.50841	0	7780.27256	1.129056773	0
Los Angeles (SC)	2050	LDA	Aggregate	Aggregate	Electricity	388137.8708	14854702.46	0	14854702.46	1826786.99	0	5735141.176
Los Angeles (SC)	2050	LDA	Aggregate	Aggregate	Plug-in Hybrid	131601.907	4949652.738	2016271.245	2933381.493	544173.885	74.41667202	885968.6396
Los Angeles (SC)	2050	LDT1	Aggregate	Aggregate	Gasoline	257677.7091	9095512.819	9095512.819	0	1165593.22	291.6367077	0
Los Angeles (SC)	2050	LDT1	Aggregate	Aggregate	Diesel	2.990084566	108.1380231	108.1380231	0	13.7624533	0.003798467	0
Los Angeles (SC)	2050	LDT1	Aggregate	Aggregate	Electricity	8050.96012	297361.7144	0	297361.7144	37455.7829	0	114806.1643
Los Angeles (SC)	2050	LDT1	Aggregate	Aggregate	Plug-in Hybrid	6126.728584	225340.0677	91695.49731	133644.5704	25334.0227	3.411629969	40364.64351
Los Angeles (SC)	2050	LDT2	Aggregate	Aggregate	Gasoline	1909056.362	70496461.88	70496461.88	0	8858901.78	2343.953421	0
Los Angeles (SC)	2050	LDT2	Aggregate	Aggregate	Diesel	7301.688637	270074.1544	270074.1544	0	33932.8969	7.020170431	0
Los Angeles (SC)	2050	LDT2	Aggregate	Aggregate	Electricity	78442.89641	2059273.028	0	2059273.028	368340.234	0	795049.3499
Los Angeles (SC)	2050	LDT2	Aggregate	Aggregate	Plug-in Hybrid	53148.95754	1964573.761	800097.6758	1164476.086	219770.939	29.84124774	351706.4848
Los Angeles (SC)	2050	LHD1	Aggregate	Aggregate	Gasoline	77862.85822	2728819.03	2728819.03	0	1160040.57	164.157761	0
Los Angeles (SC)	2050	LHD1	Aggregate	Aggregate	Diesel	61183.6605	2057479.093	2057479.093	0	769613.48	95.33887362	0
Los Angeles (SC)	2050	LHD1	Aggregate	Aggregate	Electricity	118780.889	4733034.146	0	4733034.146	1652867.33	0	2654836.222
Los Angeles (SC)	2050	LHD2	Aggregate	Aggregate	Gasoline	11213.67796	370486.5465	370486.5465	0	167067.093	25.09737842	0
Los Angeles (SC)	2050	LHD2	Aggregate	Aggregate	Diesel	29661.37473	957881.7812	957881.7812	0	373102.78	51.86612559	0
Los Angeles (SC)	2050	LHD2	Aggregate	Aggregate	Electricity	32748.55229	1249736.006	0	1249736.006	433246.405	0	701368.8455
Los Angeles (SC)	2050	MCY	Aggregate	Aggregate	Gasoline	199576.3893	1090739.181	1090739.181	0	399152.779	25.95977363	0
Los Angeles (SC)	2050	MDV	Aggregate	Aggregate	Gasoline	1106051.265	38531531.55	38531531.55	0	5100841.06	1554.423979	0
Los Angeles (SC)	2050	MDV	Aggregate	Aggregate	Diesel	11986.41891	415776.6825	415776.6825	0	55134.5911	14.0030942	0
Los Angeles (SC)	2050	MDV	Aggregate	Aggregate	Electricity	72219.58254	1866962.628	0	1866962.628	337193.988	0	720801.6631
Los Angeles (SC)	2050	MDV	Aggregate	Aggregate	Plug-in Hybrid	33944.2419	1179011.971	480324.7061	698687.265	140359.44	18.21493816	211024.3783
Los Angeles (SC)	2050	MH	Aggregate	Aggregate	Gasoline	13071.26618	135257.6398	135257.6398	0	1307.64947	27.94465184	0
Los Angeles (SC)	2050	MH	Aggregate	Aggregate	Diesel	8080.796114	74971.72781	74971.72781	0	808.079611	7.546608734	0
Los Angeles (SC)	2050	Motor Coach	Aggregate	Aggregate	Diesel	770.4139793	97037.10071	97037.10071	0	17704.1132	14.97429644	0
Los Angeles (SC)	2050	OBUS	Aggregate	Aggregate	Gasoline	1390.57198	39449.50819	39449.50819	0	27822.5642	6.733937066	0
Los Angeles (SC)	2050	OBUS	Aggregate	Aggregate	Electricity	1066.496715	52659.47881	0	52659.47881	21338.4663	0	55431.06188
Los Angeles (SC)	2050	PTO	Aggregate	Aggregate	Diesel	0	90414.67539	90414.67539	0	0	15.26012493	0
Los Angeles (SC)	2050	PTO	Aggregate	Aggregate	Electricity	0	104014.4816	0	104014.4816	0	0	215467.9508
Los Angeles (SC)	2050	SBUS	Aggregate	Aggregate	Gasoline	792.1607246	32143.98866	32143.98866	0	3168.6429	3.105393422	0
Los Angeles (SC)	2050	SBUS	Aggregate	Aggregate	Diesel	414.0301415	8698.057369	8698.057369	0	5995.15645	1.019840483	0
Los Angeles (SC)	2050	SBUS	Aggregate	Aggregate	Electricity	2316.795707	67966.58954	0	67966.58954	25736.8798	0	78589.85873
Los Angeles (SC)	2050	SBUS	Aggregate	Aggregate	Natural Gas	1092.509818	22945.61958	22945.61958	0	15819.5422	4.753439935	0
Los Angeles (SC)	2050	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	17.80294022	1302.786524	1302.786524	0	409.111566	0.126716501	0
Los Angeles (SC)	2050	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	26.43096346	2001.525113	0	2001.525113	607.38354	0	2103.509855
Los Angeles (SC)	2050	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	21.84389777	1788.134849	1788.134849	0	501.972771	0.173815159	0
Los Angeles (SC)	2050	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	32.39026395	2744.786523	0	2744.786523	744.328266	0	2884.643047
Los Angeles (SC)	2050	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	99.65953915	4666.642124	4666.642124	0	2290.17621	0.455557509	0
Los Angeles (SC)	2050	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	148.3153137	7178.01111	0	7178.01111	3408.28591	0	7543.756012
Los Angeles (SC)	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	275.2166493	55971.67324	55971.67324	0	6324.4786	4.792858199	0
Los Angeles (SC)	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	87.14419922	18287.20624	0	18287.20624	2002.5737	0	19219.00369
Los Angeles (SC)	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Natural Gas	0.180837447	36.77253609	36.77253609	0	4.15564454	0.003541556	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	3024.539168	101057.7606	101057.7606	0	43160.1739	10.21059005	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	3865.728185	134637.0615	0	134637.0615	55163.9412	0	141224.3566
Los Angeles (SC)	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Natural Gas	23.63008768	791.1187701	791.1187701	0	337.201351	0.095073644	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	3130.743775	104661.1437	104661.1437	0	44675.7137	10.57909608	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	4013.1713	139811.1121	0	139811.1121	57267.9544	0	146651.5545
Los Angeles (SC)	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Natural Gas	24.23909581	813.023502	813.023502	0	345.891897	0.097639278	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	9584.089779	320287.3552	320287.3552	0	136764.961	32.36974631	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	12282.11799	427525.4946	0	427525.4946	175265.824	0	448442.7411
Los Angeles (SC)	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Natural Gas	74.30849117	2491.021094	2491.021094	0	1060.38217	0.299191289	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	3307.147937	168712.2873	168712.2873	0	47193.0011	16.95040933	0
Los Angeles (SC)	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	2541.030526	134688.3982	0	134688.3982	36260.5056	0	141278.205
Los Angeles (SC)	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	80.58273041	4087.425988	4087.425988	0	1149.91556	0.475424003	0
Los Angeles (SC)	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	3797.309189	150745.8894	150745.8894	0	43896.8942	15.14433978	0
Los Angeles (SC)	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	4848.208085	207598.7987	0	207598.7987	56045.2855	0	217700.1545
Los Angeles (SC)	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Natural Gas	29.620227	1182.351497	1182.351497	0	342.409824	0.139068719	0
Los Angeles (SC)	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	8847.840472	351351.4408	351351.4408	0	102281.036	35.30529587	0
Los Angeles (SC)	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Electricity	11301.54884	484107.6195	0	484107.6195	130645.905	0	507663.3593
Los Angeles (SC)	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Natural Gas	68.56318121	2744.210852	2744.210852	0	792.590375	0.322506966	0
Los Angeles (SC)	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	7848.518119	311588.1166	311588.1166	0	90728.8695	31.30749897	0
Los Angeles (SC)	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Electricity	10024.82195	429159.0181	0	429159.0181	115886.942	0	450041.0653
Los Angeles (SC)	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Natural Gas	60.86459784	2434.778469	2434.778469	0	703.594751	0.286183357	0
Los Angeles (SC)	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	4808.746106	197108.5859	197108.5859	0	55589.105	19.88586258	0
Los Angeles (SC)	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Electricity	3546.8062	180365.2153	0	180365.2153	41001.0797	0	189141.4376
Los Angeles (SC)	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	116.881852	4682.283469	4682.283469	0	1351.15421	0.555886076	0
Los Angeles (SC)	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	104.9310424	5146.23943	5146.23943	0	1213.00285	0.512879508	0
Los Angeles (SC)	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Electricity	133.8151915	7217.209155	0	7217.209155	1546.90361	0	7568.384583
Los Angeles (SC)	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Natural Gas	0.812546866	40.20143732	40.20143732	0	9.39304177	0.004613401	0
Los Angeles (SC)	2050	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	2438.470084	143018.3773	143018.3773	0	28188.7142	12.85353032	0
Los Angeles (SC)	2050	T6 Instate Tractor Class 7	Aggregate	Aggregate	Electricity	573.1236126	38433.15506	0	38433.15506	6625.30896	0	40303.238

Los Angeles (SC)	2050	T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	58.24994792	3373.6862	3373.6862	0	673.369398	0.376025095	0
Los Angeles (SC)	2050	T6 OOS Class 4	Aggregate	Aggregate	Diesel	25.59387438	1880.985458	1880.985458	0	588.147233	0.171965579	0
Los Angeles (SC)	2050	T6 OOS Class 5	Aggregate	Aggregate	Diesel	31.42519848	2580.373802	2580.373802	0	722.151061	0.235818214	0
Los Angeles (SC)	2050	T6 OOS Class 6	Aggregate	Aggregate	Diesel	143.0572479	6742.59057	6742.59057	0	3287.45556	0.618267677	0
Los Angeles (SC)	2050	T6 OOS Class 7	Aggregate	Aggregate	Diesel	175.8120129	49027.01778	49027.01778	0	4040.16006	4.012082051	0
Los Angeles (SC)	2050	T6 Public Class 4	Aggregate	Aggregate	Diesel	325.8983827	11162.11285	11162.11285	0	1671.8587	1.175395091	0
Los Angeles (SC)	2050	T6 Public Class 4	Aggregate	Aggregate	Electricity	369.2411867	14017.01132	0	14017.01132	1894.20729	0	14718.69116
Los Angeles (SC)	2050	T6 Public Class 4	Aggregate	Aggregate	Natural Gas	62.6401016	2149.147156	2149.147156	0	321.343721	0.26951202	0
Los Angeles (SC)	2050	T6 Public Class 5	Aggregate	Aggregate	Diesel	226.1790401	7765.06813	7765.06813	0	1160.29848	0.818733932	0
Los Angeles (SC)	2050	T6 Public Class 5	Aggregate	Aggregate	Electricity	259.1281408	9841.965381	0	9841.965381	1329.32736	0	10334.64592
Los Angeles (SC)	2050	T6 Public Class 5	Aggregate	Aggregate	Natural Gas	45.2253611	1544.664134	1544.664134	0	232.006102	0.193954329	0
Los Angeles (SC)	2050	T6 Public Class 6	Aggregate	Aggregate	Diesel	271.8414681	9305.32807	9305.32807	0	1394.54673	0.978844663	0
Los Angeles (SC)	2050	T6 Public Class 6	Aggregate	Aggregate	Electricity	306.248544	11619.07198	0	11619.07198	1571.05503	0	12200.71298
Los Angeles (SC)	2050	T6 Public Class 6	Aggregate	Aggregate	Natural Gas	53.20459181	1818.643534	1818.643534	0	272.939556	0.228488124	0
Los Angeles (SC)	2050	T6 Public Class 7	Aggregate	Aggregate	Diesel	1393.576434	58285.28143	58285.28143	0	7149.04711	5.972947771	0
Los Angeles (SC)	2050	T6 Public Class 7	Aggregate	Aggregate	Electricity	1231.751197	57042.05101	0	57042.05101	6318.88364	0	59897.52827
Los Angeles (SC)	2050	T6 Public Class 7	Aggregate	Aggregate	Natural Gas	272.403851	11380.8409	11380.8409	0	1397.43176	1.37813501	0
Los Angeles (SC)	2050	T6 Utility Class 5	Aggregate	Aggregate	Diesel	250.5922597	10027.86755	10027.86755	0	3207.58092	0.995778512	0
Los Angeles (SC)	2050	T6 Utility Class 5	Aggregate	Aggregate	Electricity	382.2529272	15559.36219	0	15559.36219	4892.83747	0	16338.25082
Los Angeles (SC)	2050	T6 Utility Class 5	Aggregate	Aggregate	Natural Gas	1.440473571	57.64295435	57.64295435	0	18.4380617	0.006424047	0
Los Angeles (SC)	2050	T6 Utility Class 6	Aggregate	Aggregate	Diesel	47.35633079	1895.089824	1895.089824	0	606.161034	0.188184662	0
Los Angeles (SC)	2050	T6 Utility Class 6	Aggregate	Aggregate	Electricity	72.23479492	2940.378497	0	2940.378497	924.605375	0	3087.57138
Los Angeles (SC)	2050	T6 Utility Class 6	Aggregate	Aggregate	Natural Gas	0.272217278	10.8935001	10.8935001	0	3.48438116	0.001214028	0
Los Angeles (SC)	2050	T6 Utility Class 7	Aggregate	Aggregate	Diesel	52.82973089	2610.051437	2610.051437	0	676.220555	0.257714469	0
Los Angeles (SC)	2050	T6 Utility Class 7	Aggregate	Aggregate	Electricity	80.60202834	4117.844406	0	4117.844406	1031.70596	0	4323.980246
Los Angeles (SC)	2050	T6 Utility Class 7	Aggregate	Aggregate	Natural Gas	0.303679895	15.00329707	15.00329707	0	3.88710266	0.001640478	0
Los Angeles (SC)	2050	T6TS	Aggregate	Aggregate	Gasoline	5956.885207	285814.4879	285814.4879	0	119185.359	47.2320816	0
Los Angeles (SC)	2050	T6TS	Aggregate	Aggregate	Electricity	6214.083643	382793.8472	0	382793.8472	124331.386	0	401838.0805
Los Angeles (SC)	2050	T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	10627.94696	2231195.16	2231195.16	0	244230.221	297.5829488	0
Los Angeles (SC)	2050	T7 CAIRP Class 8	Aggregate	Aggregate	Electricity	3013.189824	654175.2522	0	654175.2522	69243.1022	0	1163634.63
Los Angeles (SC)	2050	T7 CAIRP Class 8	Aggregate	Aggregate	Natural Gas	38.88099903	8162.495277	8162.495277	0	893.485358	1.331152076	0
Los Angeles (SC)	2050	T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	11796.10305	3419711.864	3419711.864	0	271074.448	433.3455969	0
Los Angeles (SC)	2050	T7 NOOS Class 8	Aggregate	Aggregate	Diesel	5088.193644	1241700.891	1241700.891	0	116926.69	159.2051908	0
Los Angeles (SC)	2050	T7 POLA Class 8	Aggregate	Aggregate	Diesel	8790.6051	1410184.438	1410184.438	0	143814.299	191.8768748	0
Los Angeles (SC)	2050	T7 POLA Class 8	Aggregate	Aggregate	Electricity	1780.160419	282689.1536	0	282689.1536	29123.4244	0	502533.5971
Los Angeles (SC)	2050	T7 POLA Class 8	Aggregate	Aggregate	Natural Gas	355.338239	57000.03604	57000.03604	0	5813.33359	8.43297695	0
Los Angeles (SC)	2050	T7 Public Class 8	Aggregate	Aggregate	Diesel	1068.613982	40720.84158	40720.84158	0	5481.98973	6.273616959	0
Los Angeles (SC)	2050	T7 Public Class 8	Aggregate	Aggregate	Electricity	2025.503673	91072.30017	0	91072.30017	10390.8338	0	161839.9591
Los Angeles (SC)	2050	T7 Public Class 8	Aggregate	Aggregate	Natural Gas	1757.045443	72349.34537	72349.34537	0	9013.64312	11.48832802	0
Los Angeles (SC)	2050	T7 Single Concrete/Transit M	Aggregate	Aggregate	Diesel	350.4333488	23565.44427	23565.44427	0	3301.08215	3.401455006	0
Los Angeles (SC)	2050	T7 Single Concrete/Transit M	Aggregate	Aggregate	Electricity	506.740159	35527.93264	0	35527.93264	4773.4923	0	63074.26934
Los Angeles (SC)	2050	T7 Single Concrete/Transit M	Aggregate	Aggregate	Natural Gas	27.36442956	1839.640916	1839.640916	0	257.772926	0.289199247	0
Los Angeles (SC)	2050	T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	1244.127263	62476.73038	62476.73038	0	11719.6788	9.279822356	0
Los Angeles (SC)	2050	T7 Single Dump Class 8	Aggregate	Aggregate	Electricity	1173.723493	70352.48071	0	70352.48071	11056.4753	0	124899.7898
Los Angeles (SC)	2050	T7 Single Dump Class 8	Aggregate	Aggregate	Natural Gas	96.99436777	4872.685442	4872.685442	0	913.686944	0.802721131	0
Los Angeles (SC)	2050	T7 Single Other Class 8	Aggregate	Aggregate	Diesel	7595.747947	336314.8531	336314.8531	0	71551.9457	49.92545139	0
Los Angeles (SC)	2050	T7 Single Other Class 8	Aggregate	Aggregate	Electricity	8166.978765	417957.3068	0	417957.3068	76932.94	0	742017.6122
Los Angeles (SC)	2050	T7 Single Other Class 8	Aggregate	Aggregate	Natural Gas	593.8626164	26277.02356	26277.02356	0	5594.18585	4.379174844	0
Los Angeles (SC)	2050	T7 SWCV Class 8	Aggregate	Aggregate	Diesel	24.35340615	1345.087186	1345.087186	0	112.025668	0.478425765	0
Los Angeles (SC)	2050	T7 SWCV Class 8	Aggregate	Aggregate	Electricity	1951.48837	126189.8429	0	126189.8429	8976.8465	0	223798.0315
Los Angeles (SC)	2050	T7 SWCV Class 8	Aggregate	Aggregate	Natural Gas	2307.846381	149807.8657	149807.8657	0	10616.0934	20.55204403	0
Los Angeles (SC)	2050	T7 Tractor Class 8	Aggregate	Aggregate	Diesel	30157.73487	1950477.345	1950477.345	0	438191.888	261.0020673	0
Los Angeles (SC)	2050	T7 Tractor Class 8	Aggregate	Aggregate	Electricity	6167.226087	430867.6479	0	430867.6479	89609.795	0	766486.9041
Los Angeles (SC)	2050	T7 Tractor Class 8	Aggregate	Aggregate	Natural Gas	835.2081519	53924.20252	53924.20252	0	12135.5744	8.943998592	0
Los Angeles (SC)	2050	T7 Utility Class 8	Aggregate	Aggregate	Diesel	264.8158114	10797.18114	10797.18114	0	3389.64239	1.591371031	0
Los Angeles (SC)	2050	T7 Utility Class 8	Aggregate	Aggregate	Electricity	207.8964589	9452.327501	0	9452.327501	2661.07467	0	16797.25112
Los Angeles (SC)	2050	T7IS	Aggregate	Aggregate	Gasoline	8.382095263	993.1309355	993.1309355	0	167.708962	0.186328228	0
Los Angeles (SC)	2050	T7IS	Aggregate	Aggregate	Electricity	8.505068163	1230.23763	0	1230.23763	170.169404	0	2182.738061
Los Angeles (SC)	2050	UBUS	Aggregate	Aggregate	Gasoline	234.6635533	13625.46081	13625.46081	0	938.654213	0.896619664	0
Los Angeles (SC)	2050	UBUS	Aggregate	Aggregate	Electricity	7069.046364	742666.9453	0	742666.9453	28276.1855	0	1560784.075
Los Angeles (SC)	2050	UBUS	Aggregate	Aggregate	Natural Gas	66.99559823	4664.997785	4664.997785	0	267.982393	0.337807479	0

We Can Model Regional Emissions, But Are the Results Meaningful for CEQA?

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On December 24, 2018, the California Supreme Court, *Sierra Club v. County of Fresno (Friant Ranch, L.P.] (2018) 6 Cal.5th 502, Case No. S219783 (Friant Ranch*), held that simply identifying that a project exceeds an emissions threshold is not sufficient to identify a project's significant effect on the environment relative to the health effects of project emissions. The Court found that an EIR should make a reasonable effort to substantively connect a project's criteria pollutant emissions to likely health consequences, or explain why it is not currently feasible to provide such an analysis. In 2019, there were several CEQA documents that included health effects modeling to provide additional analysis for projects with criteria air pollutant emissions that exceed a significance threshold. While it is technically possible to conduct this modeling, we argue that this additional layer of quantitative analysis may not always provide decision-makers and the public with additional meaningful information. It is the air districts that are best suited to provide frameworks for how to identify health effects of regional criteria pollutant emissions under CEQA.

Introduction

Significance thresholds for regional criteria pollutants used by California air districts and lead agencies represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable national or state ambient air quality standard (AAQS). By analyzing the project's emissions against these thresholds, the CEQA document assesses whether these emissions directly contribute to any regional or local exceedances of the applicable AAQS and exposure levels. The basis of the ruling in Friant Ranch was that the EIR did not provide a meaningful analysis of the adverse health effects that would be associated with the project's criteria pollutant emissions, which were identified as being far above the relevant thresholds. The discussion of the adverse health effects in the EIR was general in nature and did not connect the levels of the pollutants that would be emitted by the project to adverse health effects.

The process of correlating project-related criteria pollutant emissions to health-based consequences is called a health impact assessment (HIA). An HIA involves two steps: 1) running a regional photochemical grid model (PGM) to estimate the small increases in concentrations of ozone and particulate matter (PM) in the region as a result of a project's emissions of criteria and precursor pollutants; and 2) running the U.S. EPA Benefits Mapping and Analysis Program (BenMAP) to estimate the resulting health impacts from these increases in concentrations of ozone and PM.

Limitations of Regional-Scale Dispersion Models

It is technically feasible to conduct regional-scale criteria pollutant modeling for a development project. Particulate matter (PM) can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur oxides (SO_x) and NO_x, Ozone (O_3) is a secondary pollutant formed from the oxidation of reactive organic gases (ROGs) and nitrogen oxides (NOx) in the presence of sunlight. Rates of ozone formation are a function of a variety of complex physical factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns.. Secondary formation of PM and ozone can occur far from the original emissions source from regional transport due to wind and topography (e.g. low-level jet stream). As such, modeling concentrations of secondary PM and ozone require photochemical grid models (PGMs), such as CMAQ and CAMx. These models have a much larger "grid" system and much lower resolution than localized dispersion modeling (e.g., AERMOD). For example, common grid cells in PGMs are 4x4 kilometers, while AERMOD can identify concentrations at the meter-level.

Photochemical modeling also depends on all emission sources in the entire domain. Low resolution and spatial averaging produces "noise" and model uncertainty that can exceed a project's specific emissions. Additionally, regional-scale models are highly contingent upon background concentrations. Factors such as meteorology and topography greatly affect the certainty levels of predicted concentrations at receptor points. As a result, there are statistical ranges of uncertainty through all the modeling steps. Due to these factors, it is difficult to predict ground-level secondary PM and ozone concentrations associated with relatively small emission sources with a high degree of certainty. While it is possible to use a regional-scale model to predict these regional concentrations, when a project's emissions are less than the regional model's resolution, the resultant ambient air quality concentrations will be within the margin of uncertainty. In CEQA terms, this would fit the definition of "speculative". Only when the scale of emissions would result in changes in ambient air quality beyond the model margin of uncertainty would the results not be "speculative" as defined by CEQA.

Identifying Health Effects due to Ambient Air Quality Changes

BenMap is a model developed by the USEPA to understand the health effects from changes in ozone and PM concentrations. If there is an acceptable level of confidence that the results provided by the regional dispersion modeling are valid, then these concentrations can be translated into health outcomes using BenMap. The health outcomes in BenMap are based on changes in ambient air concentrations and the population exposed to these changes. Data provided by this analysis may indicate increased number of workdays lost to illness, hospital admissions (respiratory), emergency room visits (asthma), or mortality, among other health effects. These are called "health incidences."

Translating the incremental increase in PM and ozone concentrations to specific health effects is also subject to uncertainty. For example, regional models assign the same toxicity to PM regardless of the source of PM (such as road dust as exhaust), and thus potentially overpredict adverse health effects of PM. BenMap also assumes that health effects can occur at any concentration, including small incremental concentrations, and assumes that impacts seen at large concentration differences can be linearly scaled down to small increases in concentration, with no consideration of potential thresholds below which health impacts may not occur. Additionally, BenMap is used for assessing impacts over large areas and populations and was not intended to be used for individual projects. For health incidences, the number of hospitalizations or increase in morbidity predicted by BenMap is greatly affected by the population characteristics.[1] Small increases in emissions in an area with a high population have a much greater affect than large increases in emissions over an area with a small population. As a result, the same amount of emissions generated in an urban area could result in greater health consequences than if the same emissions occurred on the urban periphery, where fewer people may be affected. This will also depend on other factors including meteorology and photochemistry, as discussed above. Emissions in areas with conditions that favor high air dispersion or unfavorable ozone formation will likely have relatively lower effects on ambient air quality and health outcomes.

While BenMap provides additional statistical information about health consequences requested by the Court in the Friant Ranch decision, this information is only meaningful when presented with the full health context of the region or locality at hand. For example, if the BenMap analysis says that the project would result in two additional hospital admissions, this result alone is not useful unless one identifies how many hospital admissions are caused by poor air quality now (without the project) and how many hospital admissions occur

[1] BenMap assigns prevalence rate for asthma and other health effects based on indicators such as gender, race, age, ethnicity, etc. The BenMap user manual specifically states that there are a wide range of variables that can be included in the health effect function. The health effect function was developed based on epidemiological studies, and specifically states that "there are a number of issues that arise when deriving and choosing between health effect functions that go well beyond this user manual. Hence, it is important to have a trained health researcher assist in developing the impact function data file."

overall (due to air quality and other causes). Because health is not solely influenced by ambient air quality, and has many factors that are highly variable across geographies and populations, there is an added level of uncertainty in using a generalized identification of health effects due to air quality conditions overlaid onto a specific diverse set of health conditions and other factors. Regardless of the uncertainty levels, if regional health effects are identified for a project, then the CEQA analysis needs to provide a full health baseline for decision-makers and the public to be able to understand the marginal change due to project criteria pollutant emissions. Given the margin of uncertainty at each step in the process (regional scale modeling, existing ambient air quality effects on health, population health conditions vulnerability, and marginal health effects of air pollution), the identification of marginal health effects due to individual projects using regional air quality modelling and tools such as BenMap are likely to be within the level of uncertainty and thus defined as "speculative" per CEQA.

The Role of Air Districts

Regional, community, multiscale air quality modeling conducted by the air districts for each individual air basin or locality within the air basin would be the most appropriate indictor of health effects for projects. The AQMPs provide a forecast of regional emissions based on regional dispersion modeling for all sources within the air basin. Regional-scale models attempt to account for all emissions sources within an air basin.

The regional scale model requires inputs such as existing and future regional sources of pollutants and global meteorological data, which are generally not accessible by CEQA practitioners. Modeling of future years should consider future concentrations of air pollutants based on regional growth projections and existing programs, rules, and regulations adopted by Federal, State, and local air districts. In general, air pollution in California is decreasing as a result of Federal and State laws. Based on the air quality management plans (AQMPs) required for air districts in a nonattainment area, air quality in the air basins are anticipated to improve despite an increase in population and employment growth. Air districts are charged with assessing programs, rules, and regulations so that the increase in population and employment does not conflict with the mandate to achieve the AAQS. Because emissions forecasting and health outcomes based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should also fall on the air districts to identify the potential health outcomes associated with individual project's criteria pollutant emissions.

The South Coast Air Quality Management District (South Coast AQMD) and the Sacramento Metropolitan Air Quality Management District (Sacramento Metropolitan AQMD) are exploring concepts for project-level analysis in light of Friant Ranch to assist local lead agencies.

» South Coast AQMD is looking at the largest land use development project they have had in the air basin and doing a sensitivity analysis (using CAMx for photochemical grid modeling and BenMap for health outcomes) to see how locating a very large project in different parts of the air basin (Los Angeles, Inland Empire, v. Orange County) would affect the health incidence.

» Sacramento Metropolitan AQMD is also looking at a screening process. Rather than looking at the upper end (i.e., largest project in the air basin), Sacramento Metropolitan AQMD is starting at the smallest project that exceeds the regional significance threshold and running CAMx and BenMap at different locations in the air basin to see how it affects regional health incidences.

Guidance from Air Districts would be the most effective way to incorporate meaningful information concerning regional health effects of project criteria pollutants in CEQA analyses, including guidance as to when modelling is and is not useful and meaningful, how modelling should be conducted, and how to best present additional information to inform decision-makers and the public about a project's impacts.

So…until air districts do their part, what should we do?

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS BELOW AIR DISTRICT THRESHOLDS

The Friant Ranch ruling was about providing disclosure of health effects of project emissions that were well over the significance thresholds. Since the air district thresholds are tied to a level the air districts find to not have a significant effect on ambient air quality, there should be no need to discuss the health effects of criteria pollutant emissions that are less than the significance thresholds.

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS ABOVE AIR DISTRICT THRESHOLDS

Pursuant to Section 15125 of the CEQA Guidelines, the environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. For CEQA, the health effects associated with buildout of a project would occur at the project's horizon year. Because CEQA requires an analysis of the change from existing conditions, the change in effects would be associated with changes in ambient air quality and associated health outcomes between existing conditions and the project's horizon year. Therefore, in order to show how a project affects health outcomes in an air basin, the CEQA documents will need to qualitatively or quantitatively address: (1) existing ambient criteria pollutant concentrations, health incidences due to existing air quality, and health incidences overall; 2) future (without project) ambient criteria pollutant concentrations and health incidences, and 3) future (with project) ambient criteria pollutant concentrations and health incidences.

Projects with significant criteria pollutant emissions could use regional modelling and BenMap to identify health effects of project emissions, but it is likely that many (or most) projects that are not regionally substantial in scale will be shown to have minimal regional changes in PM and ozone concentrations and therefore minimal changes in associated health effects. In addition, many projects may have emissions that are less than the uncertainty level of regional air quality models and BenMap health effects modeling; in these cases, quantitative results will not be meaningful. Thus, absent better direction from air districts, CEQA lead agencies will have to determine on a case by case basis whether a qualitative discussion of health effects will suffice, or whether regional modeling, despite its limitations, should be conducted for the project.

Where a project has substantial criteria pollutant emissions when considered on a regional scale, and there is reason to believe that the modeling of ambient air quality and regional health effects would produce non-speculative results when considering modeling uncertainties, then CEQA lead agencies should use regional modelling.

Conclusion

The purpose of CEQA is to inform the public as to the potential for a project to result in one or more significant adverse effects on the environment (including health effects). A CEQA document must provide an understandable and clear environmental analysis and provide an adequate basis for decision making and public disclosure. Regional dispersion modeling of criteria pollutants and secondary pollutants like PM and ozone can provide additional information, but that information may be within the margin of modelling uncertainty and/or may not be meaningful for the public and decision-makers unless a full health context is presented in the CEQA document. Simply providing health outcomes based on use of a regional-scale model and BenMap may not satisfy the goal to provide decision-makers and the public with information that would assist in weighting the environmental consequences of a project. A CEQA document must provide an analysis that is understandable for decision making and public disclosure. Regional scale modeling may provide a technical method for this type of analysis, but it does not necessarily provide a meaningful way to connect the magnitude of a project's criteria pollutant emissions to health effects without speculation.

In order to accurately connect the dots, we urge California air districts to provide more guidance on how to identify and describe the health effects of exceeding regional criteria pollutant thresholds. The air districts are the primary agency responsible for ensuring that the air basins attain the AAQS and ensure the health and welfare of its residents relative to air quality. Because emissions forecasting and health outcomes are based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should fall on the air districts to identify the potential health outcomes associated with exceeding the CEQA thresholds for projects. The air districts should provide lead agencies with a consistent, reliable, and meaningful analytical approach to correlate specific health effects that may result from a project's criteria pollutant emissions.

Glossary

AAQS – Ambient Air Quality Standards

BenMap – Benefits Mapping and Analysis Program

CAMx – Comprehensive Air Quality Model with extensions

CMAQ – Community Multiscale Air Quality

NOx – Nitrogen Oxides

PM – Particulate Matter

SOx – Sulfur Oxides

State – California

USEPA – United States Environmental Protection Agency

S219783

IN THE SUPREME COURT OF C ALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,

Plaintiffs and Appellants,

v.

COUNTY OF FRESNO,

Defendant and Respondent,

and,

FRIANT RANCH, L.P.,

Real Party in Interest and Respondent.

After a Published Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726
Honorable Rosendo A. Pena, Jr.

APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*

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TO THE HONORABLE CHIEF JUSTICE AND JUSTICES OF THE SUPREME COURT:

APPLICATION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF

Pursuant to Rule 8.520(f) of the California Rules of Court, the South Coast Air Quality Management District (SCAQMD) respectfully requests leave to file the attached *amicus curiae* brief. Because SCAQMD's position differs from that of either party, we request leave to submit this amicus brief in support of neither party.

HOW THIS BRIEF WILL ASSIST THE COURT

SCAQMD's proposed amicus brief takes a position on two of the issues in this case. In both instances, its position differs from that of either party. The issues are:

1) Does the California Environmental Quality Act (CEQA) require an environmental impact report (EIR) to correlate a project's air pollution emissions with specific levels of health impacts?
2) What is the proper standard of review for determining whether an EIR provides sufficient information on the health impacts caused by a project's emission of air pollutants?

This brief will assist the Court by discussing the practical realities of correlating identified air quality impacts with specific health outcomes. In short, CEQA requires agencies to provide detailed information about a project's air quality impacts that is sufficient for the public and decisionmakers to adequately evaluate the project and meaningfully understand its impacts. However, the level of analysis is governed by a rule of reason; CEQA only requires agencies to conduct analysis if it is reasonably feasible to do so.

With regard to health-related air quality impacts, an analysis that correlates a project's air pollution emissions with specific levels of health impacts will be feasible in some cases but not others. Whether it is feasible depends on a variety of factors, including the nature of the project and the nature of the analysis under consideration. The feasibility of analysis may also change over time as air districts and others develop new tools for measuring projects' air quality related health impacts. Because SCAQMD has among the most sophisticated air quality modeling and health impact evaluation capability of any of the air districts in the State, it is uniquely situated to express an opinion on the extent to which the Court should hold that CEQA requires lead agencies to correlate air quality impacts with specific health outcomes.

SCAQMD can also offer a unique perspective on the question of the appropriate standard of review. SCAQMD submits that the proper standard of review for determining whether an EIR is sufficient as an informational document is more nuanced than argued by either party. In our view, this is a mixed question of fact and law. It includes determining whether additional analysis is feasible, which is primarily a factual question that should be reviewed under the substantial evidence standard. However, it also involves determining whether the omission of a particular analysis renders an EIR insufficient to serve CEQA's purpose as a meaningful, informational document. If a lead agency has not determined that a requested analysis is infeasible, it is the court's role to determine whether the EIR nevertheless meets CEQA's purposes, and courts should not defer to the lead agency's conclusions regarding the legal sufficiency of an EIR's analysis. The ultimate question of whether an EIR's analysis is "sufficient" to serve CEQA's informational purposes is predominately a question of law that courts should review de novo.

This brief will explain the rationale for these arguments and may assist the Court in reaching a conclusion that accords proper respect to a lead agency's factual conclusions while maintaining judicial authority over the ultimate question of what level of analysis CEQA requires.

STATEMENT OF INTEREST OF *AMICUS CURIAE*

The SCAQMD is the regional agency primarily responsible for air pollution control in the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of the Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410; Cal. Code Regs., tit. 17, § 60104.) The SCAQMD participates in the CEQA process in several ways. Sometimes it acts as a lead agency that prepares CEQA documents for projects. Other times it acts as a responsible agency when it has permit authority over some part of a project that is undergoing CEQA review by a different lead agency. Finally, SCAQMD also acts as a commenting agency for CEQA documents that it receives because it is a public agency with jurisdiction by law over natural resources affected by the project.

In all of these capacities, SCAQMD will be affected by the decision in this case. SCAQMD sometimes submits comments requesting that a lead agency perform an additional type of air quality or health impacts analysis. On the other hand, SCAQMD sometimes determines that a particular type of health impact analysis is not feasible or would not produce reliable and informative results. Thus, SCAQMD will be affected by the Court's resolution of the extent to which CEQA requires EIRs to correlate emissions and health impacts, and its resolution of the proper standard of review.

CERTIFICATION REGARDING AUTHORSHIP AND FUNDING

No party or counsel in the pending case authored the proposed amicus curiae brief in whole or in part, or made any monetary contribution intended to fund the preparation or submission of the brief. No person or entity other than the proposed *Amicus Curiae* made any monetary contribution intended to fund the preparation or submission of the brief.

Respectfully submitted,

DATED: April 3, 2015

SOUTH COAST AIR QUALITY
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BRIEF OF AMICUS CURIAE

SUMMARY OF ARGUMENT

The South Coast Air Quality Management District (SCAQMD) submits that this Court should not try to establish a hard-and-fast rule concerning whether lead agencies are required to correlate emissions of air pollutants with specific health consequences in their environmental impact reports (EIR). The level of detail required in EIRs is governed by a few, core CEQA (California Environmental Quality Act) principles. As this Court has stated, "[a]n EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project." (*Laurel Heights Improvement Assn. v. Regents of the Univ of Cal.* (1988) 47 Cal.3d 376, 405 ["*Laurel Heights I*"]) Accordingly, "an agency must use its best efforts to find out and disclose all that it reasonably can." (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 (quoting CEQA Guidelines § 15144)[1].). However, "[a]nalysis of environmental effects need not be exhaustive, but will be judged in light of what is reasonably feasible." (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1390; CEQA Guidelines §§ 15151, 15204(a).)

With regard to analysis of air quality related health impacts, EIRs must generally quantify a project's pollutant emissions, but in some cases it is not feasible to correlate these emissions to specific, quantifiable health impacts (e.g., premature mortality; hospital admissions). In such cases, a general description of the adverse health impacts resulting from the pollutants at issue may be sufficient. In other cases, due to the magnitude

[1] The CEQA Guidelines are found at Cal. Code Regs., tit. 14 §§ 15000, *et seq.*

or nature of the pollution emissions, as well as the specificity of the project involved, it may be feasible to quantify health impacts. Or there may be a less exacting, but still meaningful analysis of health impacts that can feasibly be performed. In these instances, agencies should disclose those impacts.

SCAQMD also submits that whether or not an EIR complies with CEQA's informational mandates by providing sufficient, feasible analysis is a mixed question of fact and law. Pertinent here, the question of whether an EIR's discussion of health impacts from air pollution is sufficient to allow the public to understand and consider meaningfully the issues involves two inquiries: (1) Is it feasible to provide the information or analysis that a commenter is requesting or a petitioner is arguing should be required?; and (2) Even if it is feasible, is the agency relying on other policy or legal considerations to justify not preparing the requested analysis? The first question of whether an analysis is feasible is primarily a question of fact that should be judged by the substantial evidence standard. The second inquiry involves evaluating CEQA's information disclosure purposes against the asserted reasons to not perform the requested analysis. For example, an agency might believe that its EIR meets CEQA's informational disclosure standards even without a particular analysis, and therefore choose not to conduct that analysis. SCAQMD submits that this is more of a legal question, which should be reviewed de novo as a question of law.

ARGUMENT

I. RELEVANT FACTUAL AND LEGAL FRAMEWORK.

A. Air Quality Regulatory Background

The South Coast Air Quality Management District (SCAQMD) is one of the local and regional air pollution control districts and air quality

management districts in California. The SCAQMD is the regional air pollution agency for the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410, 17 Cal. Code Reg. § 60104.) The SCAQMD also includes the Coachella Valley in Riverside County (Palm Springs area to the Salton Sea). (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "chapter 7" hyperlink; pp 7-1, 7-3 (last visited Apr. 1, 2015).) The SCAQMD's jurisdiction includes over 16 million residents and has the worst or nearly the worst air pollution levels in the country for ozone and fine particulate matter. (SCAQMD, *Final 2012 AQMP (Feb. 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Executive Summary" hyperlink p. ES-1 (last visited Apr. 1, 2015).)

Under California law, the local and regional districts are primarily responsible for controlling air pollution from all sources except motor vehicles. (Health & Saf. Code § 40000.) The California Air Resources Board (CARB), part of the California Environmental Protection Agency, is primarily responsible for controlling pollution from motor vehicles. (*Id.*) The air districts must adopt rules to achieve and maintain the state and federal ambient air quality standards within their jurisdictions. (Health & Saf. Code § 40001.)

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to identify pollutants that are widely distributed and pose a threat to human health, developing a so-called "criteria" document. (42 U.S.C. § 7408; CAA § 108.) These pollutants are frequently called "criteria pollutants." EPA must then establish "national ambient air quality standards" at levels "requisite to protect public health",

allowing "an adequate margin of safety." (42 U.S.C. § 7409; CAA § 109.) EPA has set standards for six identified pollutants: ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter (PM), and lead. (U.S. EPA, National Ambient Air Quality Standards (NAAQS), http://www.epa.gov/air/criteria.html (last updated Oct. 21, 2014).)[2]

Under the Clean Air Act, EPA sets emission standards for motor vehicles and "nonroad engines" (mobile farm and construction equipment, marine vessels, locomotives, aircraft, etc.). (42 U.S.C. §§ 7521, 7547; CAA §§ 202, 213.) California is the only state allowed to establish emission standards for motor vehicles and most nonroad sources; however, it may only do so with EPA's approval. (42 U.S.C. §§ 7543(b), 7543(e); CAA §§ 209(b), 209(c).) Sources such as manufacturing facilities, power plants and refineries that are not mobile are often referred to as "stationary sources." The Clean Air Act charges state and local agencies with the primary responsibility to attain the national ambient air quality standards. (42 U.S.C. § 7401(a)(3); CAA § 101(a)(3).) Each state must adopt and implement a plan including enforceable measures to achieve and maintain the national ambient air quality standards. (42 U.S.C. § 7410; CAA § 110.) The SCAQMD and CARB jointly prepare portion of the plan for the South Coast Air Basin and submit it for approval by EPA. (Health & Saf. Code §§ 40460, et seq.)

The Clean Air Act also requires state and local agencies to adopt a permit program requiring, among other things, that new or modified "major" stationary sources use technology to achieve the "lowest achievable emission rate," and to control minor stationary sources as

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[2] Particulate matter (PM) is further divided into two categories: fine particulate or $PM_{2.5}$ (particles with a diameter of less than or equal to 2.5 microns) and coarse particulate (PM_{10}) (particles with a diameter of 10 microns or less). (U.S. EPA, Particulate Matter (PM), http://www.epa.gov/airquality/particlepollution/ (last visited Apr. 1, 2015).)

needed to help attain the standards. (42 U.S.C. §§ 7502(c)(5), 7503(a)(2), 7410(a)(2)(C); CAA §§ 172(c)(5), 173(a)(2), 110(a)(2)(C).) The air districts implement these permit programs in California. (Health & Saf. Code §§ 42300, et seq.)

The Clean Air Act also sets out a regulatory structure for over 100 so-called "hazardous air pollutants" calling for EPA to establish "maximum achievable control technology" (MACT) for sources of these pollutants. (42 U.S.C. § 7412(d)(2); CAA § 112(d)(2).) California refers to these pollutants as "toxic air contaminants" (TACs) which are subject to two state-required programs. The first program requires "air toxics control measures" for specific categories of sources. (Health & Saf. Code § 39666.) The other program requires larger stationary sources and sources identified by air districts to prepare "health risk assessments" for impacts of toxic air contaminants. (Health & Saf. Code §§ 44320(b), 44322, 44360.) If the health risk exceeds levels identified by the district as "significant," the facility must implement a "risk reduction plan" to bring its risk levels below "significant" levels. Air districts may adopt additional more stringent requirements than those required by state law, including requirements for toxic air contaminants. (Health & Saf. Code § 41508; *Western Oil & Gas Assn. v. Monterey Bay Unified APCD* (1989) 49 Cal.3d 408, 414.) For example, SCAQMD has adopted a rule requiring new or modified sources to keep their risks below specified levels and use best available control technology (BACT) for toxics. (SCAQMD, *Rule 1401-New Source Review of Toxic Air Contaminants*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiv; then follow "Rule 1401" hyperlink (last visited Apr. 1, 2015).)

B. The SCAQMD's Role Under CEQA

The California Environmental Quality Act (CEQA) requires public agencies to perform an environmental review and appropriate analysis for projects that they implement or approve. (Pub. Resources Code § 21080(a).) The agency with primary approval authority for a particular project is generally the "lead agency" that prepares the appropriate CEQA document. (CEQA Guidelines §§ 15050, 15051.) Other agencies having a subsequent approval authority over all or part of a project are called "responsible" agencies that must determine whether the CEQA document is adequate for their use. (CEQA Guidelines §§ 15096(c), 15381.) Lead agencies must also consult with and circulate their environmental impact reports to "trustee agencies" and agencies "with jurisdiction by law" including "authority over resources which may be affected by the project." (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines §§ 15086(a)(3), 15073(c).) The SCAQMD has a role in all these aspects of CEQA.

Fulfilling its responsibilities to implement its air quality plan and adopt rules to attain the national ambient air quality standards, SCAQMD adopts a dozen or more rules each year to require pollution reductions from a wide variety of sources. The SCAQMD staff evaluates each rule for any adverse environmental impact and prepares the appropriate CEQA document. Although most rules reduce air emissions, they may have secondary environmental impacts such as use of water or energy or disposal of waste—e.g., spent catalyst from control equipment.[3]

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[3] The SCAQMD's CEQA program for its rules is a "Certified Regulatory Program" under which it prepares a "functionally equivalent" document in lieu of a negative declaration or EIR. (Pub. Resources Code § 21080.5, CEQA Guidelines § 15251(l).)

The SCAQMD also approves a large number of permits every year to construct new, modified, or replacement facilities that emit regulated air pollutants. The majority of these air pollutant sources have already been included in an earlier CEQA evaluation for a larger project, are currently being evaluated by a local government as lead agency, or qualify for an exemption. However, the SCAQMD sometimes acts as lead agency for major projects where the local government does not have a discretionary approval. In such cases, SCAQMD prepares and certifies a negative declaration or environmental impact report (EIR) as appropriate.[4] SCAQMD evaluates perhaps a dozen such permit projects under CEQA each year. SCAQMD is often also a "responsible agency" for many projects since it must issue a permit for part of the projects (e.g., a boiler used to provide heat in a commercial building). For permit projects evaluated by another lead agency under CEQA, SCAQMD has the right to determine that the CEQA document is inadequate for its purposes as a responsible agency, but it may not do so because its permit program already requires all permitted sources to use the best available air pollution control technology. (SCAQMD, *Rule 1303(a)(1) – Requirements*, http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiii; then follow "Rule 1303" hyperlink (last visited Apr. 1, 2015).)

Finally, SCAQMD receives as many as 60 or more CEQA documents each month (around 500 per year) in its role as commenting agency or an agency with "jurisdiction by law" over air quality—a natural resource affected by the project. (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines § 15366(a)(3).) The SCAQMD staff provides comments on as many as 25 or 30 such documents each month.

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[4] The SCAQMD's permit projects are not included in its Certified Regulatory Program, and are evaluated under the traditional local government CEQA analysis. (Pub. Resources Code §§ 21150-21154.)

(SCAQMD Governing Board Agenda, Apr. 3, 2015, Agenda Item 16, Attachment A, http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-april-3-2015; then follow "16. Lead Agency Projects and Environmental Documents Received by SCAQMD" hyperlink (last visited Apr. 1, 2015).) Of course, SCAQMD focuses its commenting efforts on the more significant projects.

Typically, SCAQMD comments on the adequacy of air quality analysis, appropriateness of assumptions and methodology, and completeness of the recommended air quality mitigation measures. Staff may comment on the need to prepare a health risk assessment detailing the projected cancer and noncancer risks from toxic air contaminants resulting from the project, particularly the impacts of diesel particulate matter, which CARB has identified as a toxic air contaminant based on its carcinogenic effects. (California Air Resources Board, Resolution 98-35, Aug. 27, 1998, http://www.arb.ca.gov/regact/diesltac/diesltac.htm; then follow Resolution 98-35 hyperlink (last visited Apr. 1, 2015).) Because SCAQMD already requires new or modified stationary sources of toxic air contaminants to use the best available control technology for toxics and to keep their risks below specified levels, (SCAQMD Rule 1401, supra, note 15), the greatest opportunity to further mitigate toxic impacts through the CEQA process is by reducing emissions—particularly diesel emissions—from vehicles.

II. THIS COURT SHOULD NOT SET A HARD-AND-FAST RULE CONCERNING THE EXTENT TO WHICH AN EIR MUST CORRELATE A PROJECT'S EMISSION OF POLLUTANTS WITH RESULTING HEALTH IMPACTS.

Numerous cases hold that courts do not review the correctness of an EIR's conclusions but rather its sufficiency as an informative document. (*Laurel Heights 1, supra*, 47 Cal.3d at p. 392; *Citizens of Goleta Valley v.*

Bd. of Supervisors (1990) 52 Cal.3d 553, 569; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197.)

As stated by the Court of Appeal in this case, where an EIR has addressed a topic, but the petitioner claims that the information provided about that topic is insufficient, courts must "draw[] a line that divides *sufficient* discussions from those that are *insufficient*." (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) The Court of Appeal readily admitted that "[t]he terms themselves – sufficient and insufficient – provide little, if any, guidance as to where the line should be drawn. They are simply labels applied once the court has completed its analysis." (*Id.*)

The CEQA Guidelines, however, provide guidance regarding what constitutes a sufficient discussion of impacts. Section 15151 states that "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." Case law reflects this: "Analysis of environmental effects need not be exhaustive, but will be judged in light of what was reasonably feasible." (*Association of Irritated Residents v. County of Madera, supra,* 107 Cal.App.4th at p. 1390; see also CEQA Guidelines § 15204(a).)

Applying this test, this Court cannot realistically establish a hard-and-fast rule that an analysis correlating air pollution impacts of a project to quantified resulting health impacts is always required, or indeed that it is never required. Simply put, in some cases such an analysis will be "feasible"; in some cases it will not.

For example, air pollution control districts often require a proposed new source of toxic air contaminants to prepare a "health risk assessment" before issuing a permit to construct. District rules often limit the allowable cancer risk the new source may cause to the "maximally exposed individual" (worker and residence exposures). (*See, e.g.*, SCAQMD Rule 1401(c)(8); 1401(d)(1), *supra* note 15.) In order to perform this analysis, it

is necessary to have data regarding the sources and types of air toxic contaminants, location of emission points, velocity of emissions, the meteorology and topography of the area, and the location of receptors (worker and residence). (SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588), pp. 11-16*; (last visited Apr. 1, 2015) http://www.aqmd.gov/home/library/documents-support-material; "Guidelines" hyperlink; AB2588; then follow AB2588 Risk Assessment Guidelines hyperlink.)

Thus, it is feasible to determine the health risk posed by a new gas station locating at an intersection in a mixed use area, where receptor locations are known. On the other hand, it may not be feasible to perform a health risk assessment for airborne toxics that will be emitted by a generic industrial building that was built on "speculation" (i.e., without knowing the future tenant(s)). Even where a health risk assessment can be prepared, however, the resulting maximum health risk value is only a calculation of risk—it does not necessarily mean anyone will contract cancer as a result of the project.

In order to find the "cancer burden" or expected additional cases of cancer resulting from the project, it is also necessary to know the numbers and location of individuals living within the "zone of impact" of the project: i.e., those living in areas where the projected cancer risk from the project exceeds one in a million. (SCAQMD, Health Risk Assessment Summary form, http://www.aqmd.gov/home/forms ; filter by "AB2588" category; then "Health Risk Assessment" hyperlink (last visited Apr. 1, 2015).) The affected population is divided into bands of those exposed to at least 1 in a million risk, those exposed to at least 10 in a million risk, etc. up to those exposed at the highest levels. (*Id.*) This data allows agencies to calculate an approximate number of additional cancer cases expected from

the project. However, it is not possible to predict which particular individuals will be affected.

For the so-called criteria pollutants[5], such as ozone, it may be more difficult to quantify health impacts. Ozone is formed in the atmosphere from the chemical reaction of the nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. (U.S. EPA, Ground Level Ozone, http://www.epa.gov/airquality/ozonepollution/ (last updated Mar. 25, 2015).) It takes time and the influence of meteorological conditions for these reactions to occur, so ozone may be formed at a distance downwind from the sources. (U.S. EPA, *Guideline on Ozone Monitoring Site Selection* (Aug. 1998) EPA-454/R-98-002 § 5.1.2, http://www.epa.gov/ttnamti1/archive/cpreldoc.html (last visited Apr. 1, 2015).) NO_x and VOC are known as "precursors" of ozone.

Scientifically, health effects from ozone are correlated with increases in the ambient level of ozone in the air a person breathes. (U.S. EPA, *Health Effects of Ozone in the General Population,* Figure 9, http://www.epa.gov/apti/ozonehealth/population.html#levels (last visited Apr. 1, 2015).) However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire region. For example, the SCAQMD's 2012 AQMP showed that reducing NO_x by 432 tons per day (157,680 tons/year) and reducing VOC by 187 tons per day (68,255 tons/year) would reduce ozone levels at the SCAQMD's monitor site with the highest levels by only 9 parts per billion. (South Coast Air Quality Management District, *Final 2012 AQMP (February 2013)*, http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan; then follow "Appendix V: Modeling & Attainment Demonstrations" hyperlink,

[5] See discussion of types of pollutants, supra, Part I.A.

pp. v-4-2, v-7-4, v-7-24.) SCAQMD staff does not currently know of a way to accurately quantify ozone-related health impacts caused by NO_x or VOC emissions from relatively small projects.

On the other hand, this type of analysis may be feasible for projects on a regional scale with very high emissions of NO_x and VOCs, where impacts are regional. For example, in 2011 the SCAQMD performed a health impact analysis in its CEQA document for proposed Rule 1315, which authorized various newly-permitted sources to use offsets from the districts "internal bank" of emission reductions. This CEQA analysis accounted for essentially *all* the increases in emissions due to new or modified sources in the District between 2010 and 2030.[6] The SCAQMD was able to correlate this very large emissions increase (e.g., 6,620 pounds per day NO_x (1,208 tons per year), 89,180 pounds per day VOC (16,275 tons per year)) to expected health outcomes from ozone and particulate matter (e.g., 20 premature deaths per year and 89,947 school absences in the year 2030 due to ozone).[7] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System* (see hyperlink in fn 6*)* at p. 4.1-35, Table 4.1-29.)

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[6] (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, Attachment G, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System, Vol. 1, p.4.0-6,* http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-february-4-2011; the follow "26. Adopt Proposed Rule 1315 – Federal New Source Review Tracking System" (last visited April 1, 2015).)

[7] The SCAQMD was able to establish the location of future NO_x and VOC emissions by assuming that new projects would be built in the same locations and proportions as existing stationary sources. This CEQA document was upheld by the Los Angeles County Superior Court in *Natural Res. Def. Council v SCAQMD*, Los Angeles Superior Court No. BS110792).

However, a project emitting only 10 tons per year of NO_x or VOC is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. Thus, in this case it would not be feasible to directly correlate project emissions of VOC or NO_x with specific health impacts from ozone. This is in part because ozone formation is not linearly related to emissions. Ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology and seasonal impacts, and because ozone is formed some time later and downwind from the actual emission. (EPA Guideline on Ozone Monitoring Site Selection (Aug. 1998) EPA-454/R-98-002, § 5.1.2; https://www.epa.gov/ttnamti1/archive/cpreldoc.html; then search "Guideline on Ozone Monitoring Site Selection" click on pdf) (last viewed Apr. 1, 2015).)

SCAQMD has set its CEQA "significance" threshold for NO_x and VOC at 10 tons per year (expressed as 55 lb/day). (SCAQMD, *Air Quality Analysis Handbook*, http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook; then follow "SCAQMD Air Quality Significance Thresholds" hyperlink (last visited Apr. 1, 2015).) This is because the federal Clean Air Act defines a "major" stationary source for "extreme" ozone nonattainment areas such as SCAQMD as one emitting 10 tons/year. (42 U.S.C. §§ 7511a(e), 7511a(f); CAA §§ 182(e), 182(f).) Under the Clean Air Act, such sources are subject to enhanced control requirements (42 U.S.C. §§ 7502(c)(5), 7503; CAA §§ 172(c)(5), 173), so SCAQMD decided this was an appropriate threshold for making a CEQA "significance" finding and requiring feasible mitigation. Essentially, SCAQMD takes the position that a source that emits 10 tons/year of NO_x or VOC would contribute cumulatively to ozone formation. Therefore, lead agencies that use SCAQMD's thresholds of significance may determine

that many projects have "significant" air quality impacts and must apply all feasible mitigation measures, yet will not be able to precisely correlate the project to quantifiable health impacts, unless the emissions are sufficiently high to use a regional modeling program.

In the case of particulate matter ($PM_{2.5}$)[8], another "criteria" pollutant, SCAQMD staff is aware of two possible methods of analysis. SCAQMD used regional modeling to predict expected health impacts from its proposed Rule 1315, as mentioned above. Also, the California Air Resources Board (CARB) has developed a methodology that can predict expected mortality (premature deaths) from large amounts of $PM_{2.5}$. (California Air Resources Board, *Health Impacts Analysis: PM Premature Death Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort_arch.htm (last reviewed Jan. 19, 2012).) SCAQMD used the CARB methodology to predict impacts from three very large power plants (e.g., 731-1837 lbs/day). (Final Environmental Assessment for Rule 1315, *supra*, pp 4.0-12, 4.1-13, 4.1-37 (e.g., 125 premature deaths in the entire SCAQMD in 2030), 4.1-39 (0.05 to 1.77 annual premature deaths from power plants.) Again, this project involved large amounts of additional $PM_{2.5}$ in the District, up to 2.82 tons/day (5,650 lbs/day of $PM_{2.5}$, or, or 1029 tons/year. (*Id.* at table 4.1-4, p. 4.1-10.)

However, the primary author of the CARB methodology has reported that this $PM_{2.5}$ health impact methodology is not suited for small projects and may yield unreliable results due to various uncertainties. [9] (SCAQMD, *Final Subsequent Mitigated Negative Declaration for: Warren*

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[8] SCAQMD has not attained the latest annual or 24-hour national ambient air quality standards for "$PM_{2.5}$" or particulate matter less than 2.5 microns in diameter.

[9] Among these uncertainties are the representativeness of the population used in the methodology, and the specific source of PM and the corresponding health impacts. (*Id.* at p. 2-24.)

E&P, Inc. WTU Central Facility, New Equipment Project (certified July 19, 2011), http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2011; then follow "Final Subsequent Mitigated Negative Declaration for Warren E&P Inc. WTU Central Facility, New Equipment Project" hyperlink, pp. 2-22, 2-23 (last visited Apr. 1, 2015).) Therefore, when SCAQMD prepared a CEQA document for the expansion of an existing oil production facility, with very small $PM_{2.5}$ increases (3.8 lb/day) and a very small affected population, staff elected not to use the CARB methodology for using estimated $PM_{2.5}$ emissions to derive a projected premature mortality number and explained why it would be inappropriate to do so. (*Id.* at pp 2-22 to 2-24.) SCAQMD staff concluded that use of this methodology for such a small source could result in unreliable findings and would not provide meaningful information. (*Id.* at pp. 2-23, 2-25.) This CEQA document was not challenged in court.

In the above case, while it may have been technically possible to plug the data into the methodology, the results would not have been reliable or meaningful. SCAQMD believes that an agency should not be required to perform analyses that do not produce reliable or meaningful results. This Court has already held that an agency may decline to use even the "normal" "existing conditions" CEQA baseline where to do so would be misleading or without informational value. (*Neighbors for Smart Rail v. Exposition Metro Line* (2013) 57 Cal.4th 439, 448, 457.) The same should be true for a decision that a particular study or analysis would not provide reliable or meaningful results.[10]

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[10] Whether a particular study would result in "informational value" is a part of deciding whether it is "feasible." CEQA defines "feasible" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and

Therefore, it is not possible to set a hard-and-fast rule on whether a correlation of air quality impacts with specific quantifiable health impacts is required in all cases. Instead, the result turns on whether such an analysis is reasonably feasible in the particular case.[11] Moreover, what is reasonably feasible may change over time as scientists and regulatory agencies continually seek to improve their ability to predict health impacts. For example, CARB staff has been directed by its Governing Board to reassess and improve the methodology for estimating premature deaths. (California Air Resources Board, *Health Impacts Analysis: PM Mortality Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm (last reviewed Dec. 29, 2010).) This factor also counsels against setting any hard-and-fast rule in this case.

III. THE QUESTION OF WHETHER AN EIR CONTAINS SUFFICIENT ANALYSIS TO MEET CEQA'S REQUIREMENTS IS A MIXED QUESTION OF FACT AND LAW GOVERNED BY TWO DIFFERENT STANDARDS OF REVIEW.

A. Standard of Review for Feasibility Determination and Sufficiency as an Informative Document

A second issue in this case is whether courts should review an EIR's informational sufficiency under the "substantial evidence" test as argued by Friant Ranch or the "independent judgment" test as argued by Sierra Club.

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technological factors." (Pub. Resources Code § 21061.1.) A study cannot be "accomplished in a *successful* manner" if it produces unreliable or misleading results.

[11] In this case, the lead agency did not have an opportunity to determine whether the requested analysis was feasible because the comment was non-specific. Therefore, SCAQMD suggests that this Court, after resolving the legal issues in the case, direct the Court of Appeal to remand the case to the lead agency for a determination of whether the requested analysis is feasible. Because Fresno County, the lead agency, did not seek review in this Court, it seems likely that the County has concluded that at least some level of correlation of air pollution with health impacts is feasible.

As this Court has explained, "a reviewing court must adjust its scrutiny to the nature of the alleged defect, depending on whether the claim is predominantly one of improper procedure or a dispute over the facts." (*Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 435.) For questions regarding compliance with proper procedure or other legal questions, courts review an agency's action de novo under the "independent judgment" test. (*Id.*) On the other hand, courts review factual disputes only for substantial evidence, thereby "accord[ing] greater deference to the agency's substantive factual conclusions." (*Id.*)

Here, Friant Ranch and Sierra Club agree that the case involves the question of whether an EIR includes sufficient information regarding a project's impacts. However, they disagree on the proper standard of review for answering this question: Sierra Club contends that courts use the independent judgment standard to determine whether an EIR's analysis is sufficient to meet CEQA's informational purposes,[12] while Friant Ranch contends that the substantial evidence standard applies to this question.

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[12] Sierra Club acknowledges that courts use the substantial evidence standard when reviewing predicate factual issues, but argues that courts ultimately decide as a matter of law what CEQA requires. (Answering Brief, pp. 14, 23.)

SCAQMD submits that the issue is more nuanced than either party contends. We submit that, whether a CEQA document includes sufficient analysis to satisfy CEQA's informational mandates is a mixed question of fact and law,[13] containing two levels of inquiry that should be judged by different standards.[14]

The state CEQA Guidelines set forth standards for the adequacy of environmental analysis. Guidelines Section 15151 states:

> 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 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.

In this case, the basic question is whether the underlying analysis of air quality impacts made the EIR "sufficient" as an informative document. However, whether the EIR's analysis was sufficient is judged in light of what was reasonably feasible. This represents a mixed question of fact and law that is governed by two different standards of review.

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[13] Friant Ranch actually states that the claim that an EIR lacks sufficient relevant information is, "most properly thought of as raising mixed questions of fact and law." (Opening Brief, p. 27.) However, the remainder of its argument claims that the court should apply the substantial evidence standard of review to all aspects of the issue.

[14] Mixed questions of fact and law issues may implicate predominantly factual subordinate questions that are reviewed under the substantial evidence test even though the ultimate question may be reviewed by the independent judgment test. *Crocker National Bank v. City and County of San Francisco* (1989) 49 Cal.3d 881, 888-889.

SCAQMD submits that an EIR's sufficiency as an informational document is ultimately a legal question that courts should determine using their independent judgment. This Court's language in *Laurel Heights I* supports this position. As this Court explained: "The court does not pass upon the correctness of the EIR's environmental conclusions, but only upon its *sufficiency as an informative document.*" (*Laurel Heights I, supra,* 47 Cal.3d at 392-393) (emphasis added.) As described above, the Court in *Vineyard Area Citizens v. City of Rancho Cordova, supra,* 40 Cal.4th at 431, also used its independent judgment to determine what level of analysis CEQA requires for water supply impacts. The Court did not defer to the lead agency's opinion regarding the law's requirements; rather, it determined for itself what level of analysis was necessary to meet "[t]he law's informational demands." (*Id.* at p. 432.) Further, existing case law also holds that where an agency fails to comply with CEQA's information disclosure requirements, the agency has "failed to proceed in the manner required by law." (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 118.)

However, whether an EIR satisfies CEQA's requirements depends in part on whether it was reasonably feasible for an agency to conduct additional or more thorough analysis. EIRs must contain "a detailed statement" of a project's impacts (Pub. Res. Code § 21061), and an agency must "use its best efforts to find out and disclose all that it reasonably can." (CEQA Guidelines § 15144.) Nevertheless, "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." (CEQA Guidelines § 15151.)

SCAQMD submits that the question of whether additional analysis or a particular study suggested by a commenter is "feasible" is generally a question of fact. Courts have already held that whether a particular alternative is "feasible" is reviewed by the substantial evidence test.

(*Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 598-99; *Center for Biological Diversity v. County of San Bernardino* (2010) 185 Cal.App.4th 866, 883.) Thus, if a lead agency determines that a particular study or analysis is infeasible, that decision should generally be judged by the substantial evidence standard. However, SCAQMD urges this Court to hold that lead agencies must explain the basis of any determination that a particular analysis is infeasible in the EIR itself. An EIR must discuss information, including issues related to the feasibility of particular analyses "in sufficient detail to enable meaningful participation and criticism by the public. '[W]hatever is required to be considered in an EIR must be in that formal report; what any official might have known from other writings or oral presentations cannot supply what is lacking in the report.'" (*Laurel Heights I, supra*, 47 Cal.3d at p. 405 (quoting *Santiago County Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831) (discussing analysis of alternatives).) The evidence on which the determination is based should also be summarized in the EIR itself, with appropriate citations to reference materials if necessary. Otherwise commenting agencies such as SCAQMD would be forced to guess where the lead agency's evidence might be located, thus thwarting effective public participation.

Moreover, if a lead agency determines that a particular study or analysis would not result in reliable or useful information and for that reason is not feasible, that determination should be judged by the substantial evidence test. (See *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, supra*, 57 Cal.4th 439, 448, 457:

whether "existing conditions" baseline would be misleading or uninformative judged by substantial evidence standard.[15])

If the lead agency's determination that a particular analysis or study is not feasible is supported by substantial evidence, then the agency has not violated CEQA's information disclosure provisions, since it would be infeasible to provide additional information. This Court's decisions provide precedent for such a result. For example, this Court determined that the issue of whether the EIR should have included a more detailed discussion of future herbicide use was resolved because substantial evidence supported the agency's finding that "the precise parameters of future herbicide use could not be predicted." *Ebbetts Pass Forest Watch v. California Dept. of Forestry & Fire Protection* (2008) 43 Cal.4th 936, 955.

Of course, SCAQMD expects that courts will continue to hold lead agencies to their obligations to consult with, and not to ignore or misrepresent, the views of sister agencies having special expertise in the area of air quality. (*Berkeley Keep Jets Over the Bay v. Board of Port Commissioners* (2007) 91 Cal.App.4th 1344, 1364 n.11.) In some cases, information provided by such expert agencies may establish that the purported evidence relied on by the lead agency is not in fact "substantial". (*Id.* at pp. 1369-1371.)

In sum, courts retain ultimate responsibility to determine what CEQA requires. However, the law does not require exhaustive analysis, but only what is reasonably feasible. Agencies deserve deference for their factual determinations regarding what type of analysis is reasonably feasible. On the other hand, if a commenter requests more information, and the lead agency declines to provide it but does *not* determine that the

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[15] The substantial evidence standard recognizes that the courts "have neither the resources nor the scientific expertise" to weigh conflicting evidence on technical issues. (*Laurel Heights I, supra,* 47 Cal.3d 376, 393.)

requested study or analysis would be infeasible, misleading or uninformative, the question becomes whether the omission of that analysis renders the EIR inadequate to satisfy CEQA's informational purposes. (*Id.* at pp. 1370-71.) Again, this is predominantly a question of law and should be judged by the de novo or independent judgment standard of review. Of course, this Court has recognized that a "project opponent or reviewing court can always imagine some additional study or analysis that might provide helpful information. It is not for them to design the EIR. That further study...might be helpful does not make it necessary." (*Laurel Heights I, supra,* 47 Cal.3d 376, 415 – see also CEQA Guidelines § 15204(a) [CEQA "does not require a lead agency to conduct every test. . . recommended or demanded by commenters."].) Courts, then, must adjudicate whether an omission of particular information renders an EIR inadequate to serve CEQA's informational purposes.[16]

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[16] We recognize that there is case law stating that the substantial evidence standard applies to "challenges to the scope of an EIR's analysis of a topic" as well as the methodology used and the accuracy of the data relied on in the document "because these types of challenges involve factual questions." (*Bakersfield Citizens for Local Control v. City of Bakersfield, supra,* 124 Cal.App.4th 1184, 1198, and cases relied on therein.) However, we interpret this language to refer to situations where the question of the scope of the analysis really is factual—that is, where it involves whether further analysis is feasible, as discussed above. This interpretation is supported by the fact that the *Bakersfield* court expressly rejected an argument that a claimed "omission of information from the EIR should be treated as inquiries whether there is substantial evidence supporting the decision approving the project. " *Bakersfield, supra,* 124 Cal.App.4th at p. 1208. And the *Bakersfield* court ultimately decided that the lead agency must analyze the connection between the identified air pollution impacts and resulting health impacts, even though the EIR already included some discussion of air-pollution-related respiratory illnesses. *Bakersfield, supra,* 124 Cal.App.4th at p. 1220. Therefore, the court must not have interpreted this question as one of the "scope of the analysis" to be judged by the substantial evidence standard.

B. Friant Ranch's Rationale for Rejecting the Independent Judgment Standard of Review is Unsupported by Case Law.

In its brief, Friant Ranch makes a distinction between cases where a required CEQA topic is not discussed at all (to be reviewed by independent judgment as a failure to proceed in the manner required by law) and cases where a topic is discussed, but the commenter claims the information provided is insufficient (to be judged by the substantial evidence test). (Opening Brief, pp. 13-17.) The Court of Appeal recognized these two types of cases, but concluded that both raised questions of law. (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) We believe the distinction drawn by Friant Ranch is unduly narrow, and inconsistent with cases which have concluded that CEQA documents are insufficient. In many instances, CEQA's requirements are stated broadly, and the courts must interpret the law to determine what level of analysis satisfies CEQA's mandate for providing meaningful information, even though the EIR discusses the issue to some extent.

For example, the CEQA Guidelines require discussion of the existing environmental baseline. In *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 954-955, the lead agency had discussed the environmental baseline by describing historic month-end water levels in the affected lakes. However, the court held that this was not an adequate baseline discussion because it failed to discuss the timing and amounts of past actual water releases, to allow comparison with the proposed project. The court evidently applied the independent judgment test to its decision, even though the agency discussed the issue to some extent.

Likewise, in *Vineyard Area Citizens* (2007) 40 Cal.4th 412, this Court addressed the question of whether an EIR's analysis of water supply impacts complied with CEQA. The parties agreed that the EIR was required to analyze the effects of providing water to the development project, "and that in order to do so the EIR had, in some manner, to identify the planned sources of that water." (*Vineyard Area Citizens, supra,* at p. 428.) However, the parties disagreed as to the level of detail required for this analysis and "what level of uncertainty regarding the availability of water supplies can be tolerated in an EIR . . . ." (*Id.*) In other words, the EIR had analyzed water supply impacts for the project, but the petitioner claimed that the analysis was insufficient.

This Court noted that neither CEQA's statutory language or the CEQA Guidelines specifically addressed the question of how precisely an EIR must discuss water supply impacts. (*Id.*) However, it explained that CEQA "states that '[w]hile foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.'" (*Id.*, [Guidelines § 15144].) The Court used this general principle, along with prior precedent, to elucidate four "principles for analytical adequacy" that are necessary in order to satisfy "CEQA's informational purposes." (*Vineyard Area Citizens, supra,* at p. 430.) The Court did not defer to the agency's determination that the EIR's analysis of water supply impacts was sufficient. Rather, this Court used its independent judgment to determine for itself the level of analysis required to satisfy CEQA's fundamental purposes. (*Vineyard Area Citizens, supra*, at p. 441: an EIR does not serve its purposes where it neglects to explain likely sources of water and "... leaves long term water supply considerations to later stages of the project.")

Similarly, the CEQA Guidelines require an analysis of noise impacts of the project. (Appendix G, "Environmental Checklist Form."[17]) In *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1123, the court held that the lead agency's noise impact analysis was inadequate even though it had addressed the issue and concluded that the increase would not be noticeable. If the court had been using the substantial evidence standard, it likely would have upheld this discussion.

Therefore, we do not agree that the issue can be resolved on the basis suggested by Friant Ranch, which would apply the substantial evidence standard to *every* challenge to an analysis that addresses a required CEQA topic. This interpretation would subvert the courts' proper role in interpreting CEQA and determining what the law requires.

Nor do we agree that the Court of Appeal in this case violated CEQA's prohibition on courts interpreting its provisions "in a manner which imposes procedural or substantive requirements beyond those explicitly stated in this division or in the state guidelines." (Pub. Resources Code § 21083.1.) CEQA requires an EIR to describe *all* significant impacts of the project on the environment. (Pub. Resources Code § 21100(b)(2); *Vineyard Area Citizens, supra,* at p. 428.) Human beings are part of the environment, so CEQA requires EIRs to discuss a project's significant impacts on human health. However, except in certain particular circumstances,[18] neither the CEQA statute nor Guidelines specify the precise level of analysis that agencies must undertake to satisfy the law's requirements. (see, e.g., CEQA Guidelines § 15126.2(a) [EIRs must describe "health and safety problems caused by {a project's} physical changes"].) Accordingly, courts must interpret CEQA as a whole to

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[17] Association of Environmental Professionals, 2015 CEQA Statute and Guidelines (2015) p.287.

[18] E.g., Pub. Resources Code § 21151.8(C)(3)(B)(iii) (requiring specific type of health risk analysis for siting schools).

determine whether a particular EIR is sufficient as an informational document. A court determining whether an EIR's discussion of human health impacts is legally sufficient does not constitute imposing a new substantive requirement.[19] Under Friant Ranch's theory, the above-referenced cases holding a CEQA analysis inadequate would have violated the law. This is not a reasonable interpretation.

IV. COURTS MUST SCRUPULOUSLY ENFORCE THE REQUIREMENTS THAT LEAD AGENCIES CONSULT WITH AND OBTAIN COMMENTS FROM AIR DISTRICTS

Courts must "scrupulously enforce" CEQA's legislatively mandated requirements. (*Vineyard Area Citizens, supra*, 40 Cal.4th 412, 435.) Case law has firmly established that lead agencies must consult with the relevant air pollution control district before conducting an initial study, and must provide the districts with notice of the intention to adopt a negative declaration (or EIR). (*Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 958.) As *Schenck* held, neither publishing the notice nor providing it to the State Clearinghouse was a sufficient substitute for sending notice directly to the air district. (*Id.*) Rather, courts "must be satisfied that [administrative] agencies have fully complied with the procedural requirements of CEQA, since only in this way can the important public purposes of CEQA be protected from subversion." *Schenck,* 198 Cal.App.4th at p. 959 (citations omitted).[20]

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[19] We submit that Public Resources Code Section 21083.1 was intended to prevent courts from, for example, holding that an agency must analyze economic impacts of a project where there are no resulting environmental impacts (see CEQA Guidelines § 15131) , or imposing new procedural requirements, such as imposing additional public notice requirements not set forth in CEQA or the Guidelines.

[20] Lead agencies must consult air districts, as public agencies with jurisdiction by law over resources affected by the project, *before* releasing an EIR. (Pub. Resources Code §§ 21104(a); 21153.) Moreover, air

Lead agencies should be aware, therefore, that failure to properly seek and consider input from the relevant air district constitutes legal error which may jeopardize their project approvals. For example, the court in *Fall River Wild Trout Foundation v. County of Shasta,* (1999) 70 Cal.App.4th 482, 492 held that the failure to give notice to a trustee agency (Department of Fish and Game) was prejudicial error requiring reversal. The court explained that the lack of notice prevented the Department from providing any response to the CEQA document. (*Id.* at p. 492.) It therefore prevented relevant information from being presented to the lead agency, which was prejudicial error because it precluded informed decision-making. (*Id.*)[21]

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districts should be considered "state agencies" for purposes of the requirement to consult with "trustee agencies" as set forth in Public Resources Code § 20180.3(a). This Court has long ago held that the districts are not mere "local agencies" whose regulations are superseded by those of a state agency regarding matters of statewide concern, but rather have concurrent jurisdiction over such issues. (*Orange County Air Pollution Control District v. Public Util. Com.* (1971) 4 Cal.3d 945, 951, 954.) Since air pollution is a matter of statewide concern, *Id* at 952, air districts should be entitled to trustee agency status in order to ensure that this vital concern is adequately protected during the CEQA process.

[21] In *Schenck,* the court concluded that failure to give notice to the air district was not prejudicial, but this was partly because the trial court had already corrected the error before the case arrived at the Court of Appeal. The trial court issued a writ of mandate requiring the lead agency to give notice to the air district. The air district responded by concurring with the lead agency that air impacts were not significant. (*Schenck,* 198 Cal.App.4th 949, 960.) We disagree with the *Schenck* court that the failure to give notice to the air district would not have been prejudicial (even in the absence of the trial court writ) merely because the lead agency purported to follow the air district's published CEQA guidelines for significance. (*Id.*, 198 Cal.App.4th at p. 960.) In the first place, absent notice to the air district, it is uncertain whether the lead agency properly followed those guidelines. Moreover, it is not realistic to expect that an air district's published guidelines would necessarily fully address all possible air-quality related issues that can arise with a CEQA project, or that those

Similarly, lead agencies must obtain additional information requested by expert agencies, including those with jurisdiction by law, if that information is necessary to determine a project's impacts. (*Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236-37.) Approving a project without obtaining that information constitutes a failure to proceed in the manner prescribed by CEQA. (*Id.* at p. 1236.)

Moreover, a lead agency can save significant time and money by consulting with the air district early in the process. For example, the lead agency can learn what the air district recommends as an appropriate analysis on the facts of its case, including what kinds of health impacts analysis may be available, and what models are appropriate for use. This saves the lead agency from the need to do its analysis all over again and possibly needing to recirculate the document after errors are corrected, if new significant impacts are identified. (CEQA Guidelines § 15088.5(a).) At the same time, the air district's expert input can help the lead agency properly determine whether another commenter's request for additional analysis or studies is reasonable or feasible. Finally, the air district can provide input on what mitigation measures would be feasible and effective.

Therefore, we suggest that this Court provide guidance to lead agencies reminding them of the importance of consulting with the relevant air districts regarding these issues. Otherwise, their feasibility decisions may be vulnerable to air district evidence that establishes that there is no substantial evidence to support the lead agency decision not to provide specific analysis. (*See Berkeley Keep Jets Over the Bay, supra,* 91 Cal.App.4th 1344, 1369-1371.)

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guidelines would necessarily be continually modified to reflect new developments. Therefore we believe that, had the trial court not already ordered the lead agency to obtain the air district's views, the failure to give notice would have been prejudicial, as in *Fall River, supra,* 70 Cal.App.4th 482, 492.

CONCLUSION

The SCAQMD respectfully requests this Court *not* to establish a hard-and-fast rule concerning whether CEQA requires a lead agency to correlate identified air quality impacts of a project with resulting health outcomes. Moreover, the question of whether an EIR is "sufficient as an informational document" is a mixed question of fact and law containing two levels of inquiry. Whether a particular proposed analysis is feasible is predominantly a question of fact to be judged by the substantial evidence standard of review. Where the requested analysis is feasible, but the lead agency relies on legal or policy reasons not to provide it, the question of whether the EIR is nevertheless sufficient as an informational document is predominantly a question of law to be judged by the independent judgment standard of review.

Respectfully submitted,

DATED: April 3, 2015

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
KURT R. WIESE, GENERAL COUNSEL
BARBARA BAIRD, CHIEF DEPUTY COUNSEL

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SOUTH COAST AIR QUALITY MANAGEMENT DISTICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.520(c)(1) of the California Rules of Court, I hereby certify that this brief contains 8,476 words, including footnotes, but excluding the Application, Table of Contents, Table of Authorities, Certificate of Service, this Certificate of Word Count, and signature blocks. I have relied on the word count of the Microsoft Word Vista program used to prepare this Certificate.

DATED: April 3, 2015 Respectfully submitted,

Barbara Baird

Barbara Baird

PROOF OF SERVICE

I am employed in the County of Los Angeles, California. I am over the age of 18 years and not a party to the within action. My business address is 21865 Copley Drive, Diamond Bar, California 91765.

On April 3, 2015 I served true copies of the following document(s) described as **APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND *[PROPOSED]* BRIEF OF *AMICUS CURIAE*** by placing a true copy of the foregoing document(s) in a sealed envelope addressed as set forth on the attached service list as follows:

BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing following our ordinary business practices. I am readily familiar with this District's practice for collection and processing of correspondence for mailing. Under that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid at Diamond Bar, California, in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on April 3, 2015 at Diamond Bar, California.

Patricia Anderson

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CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.

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APPLICATION

Pursuant to California Rules of Court 8.520(f)(1), proposed Amicus Curiae San Joaquin Valley Unified Air Pollution Control District hereby requests permission from the Chief Justice to file an amicus brief in support of Defendant and Respondent, County of Fresno, and Defendant and Real Parties in Interest Friant Ranch, L.P. Pursuant to Rule 8.520(f)(5) of the California Rules of Court, the proposed amicus curiae brief is combined with this Application. The brief addresses the following issue certified by this Court for review:

> Is an EIR adequate when it identifies the health impacts of air pollution and quantifies a project's expected emissions, or does CEQA further require the EIR to *correlate* a project's air quality emissions to specific health impacts?

As of the date of this filing, the deadline for the final reply brief on the merits was March 5, 2015. Accordingly, under Rule 8.520(f)(2), this application and brief are timely.

1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District

The San Joaquin Valley Unified Air Pollution Control District ("Air District") regulates air quality in the eight counties comprising the San Joaquin Valley ("Central Valley"): Kern, Tulare, Madera, Fresno, Merced, San Joaquin, Stanislaus, and Kings, and is primarily responsible for attaining air quality standards within its jurisdiction. After billions of dollars of investment by Central Valley businesses, pioneering air quality regulations, and consistent efforts by residents, the Central Valley air basin has made historic improvements in air quality.

The Central Valley's geographical, topographical and meteorological features create exceptionally challenging air quality

conditions. For example, it receives air pollution transported from the San Francisco Bay Area and northern Central Valley communities, and the southern portion of the Central Valley includes three mountain ranges (Sierra, Tehachapi, and Coastal) that, under some meteorological conditions, effectively trap air pollution. Central Valley air pollution is only a fraction of what the Bay Area and Los Angeles produce, but these natural conditions result in air quality conditions that are only marginally better than Los Angeles, even though about ten times more pollution is emitted in the Los Angeles region. Bay Area air quality is much better than the Central Valley's, even though the Bay Area produces about six times more pollution. The Central Valley also receives air pollution transported from the Bay Area and northern counties in the Central Valley, including Sacramento, and transboundary anthropogenic ozone from as far away as China.

Notwithstanding these challenges, the Central Valley has reduced emissions at the same or better rate than other areas in California and has achieved unparalleled milestones in protecting public health and the environment:

- In the last decade, the Central Valley became the first air basin classified by the federal government under the Clean Air Act as a "serious nonattainment" area to come into attainment of health-based National Ambient Air Quality Standard ("NAAQS") for coarse particulate matter (PM10), an achievement made even more notable given the Valley's extensive agricultural sector. Unhealthy levels of particulate matter can cause and exacerbate a range of chronic and acute illnesses.
- In 2013, the Central Valley became the first air basin in the country to improve from a federal designation of "extreme" nonattainment to

actually attain (and quality for an attainment designation) of the 1-hour ozone NAAQS; ozone creates "smog" and, like PM10, causes adverse health impacts.

- The Central Valley also is in full attainment of federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide.
- The Central Valley continues to make progress toward compliance with its last two attainment standards, with the number of exceedences for the 8-hour ozone NAAQS reduced by 74% (for the 1997 standard) and 38% (for the 2008 standard) since 1991, and for the small particulate matter (PM2.5) NAAQS reduced by 85% (for the 1997 standard) and 61% (for the 2006 standard).

Sustained improvement in Central Valley air quality requires a rigorous and comprehensive regulatory framework that includes prohibitions (e.g., on wood-burning fireplaces in new residences), mandates (e.g., requiring the installation of best available pollution reduction technologies on new and modified equipment and industrial operations), innovations (e.g., fees assessed against residential development to fund pollution reduction actions to "offset" vehicular emissions associated with new residences), incentive programs (e.g., funding replacements of older, more polluting heavy duty trucks and school buses)[1], ongoing planning for continued air quality improvements, and enforcement of Air District permits and regulations.

The Air District is also an expert air quality agency for the eight counties and cities in the San Joaquin Valley. In that capacity, the Air District has developed air quality emission guidelines for use by the Central

[1] San Joaquin's incentive program has been so successful that through 2012, it has awarded over $ 432 million in incentive funds and has achieved 93,349 tons of lifetime emissions reductions. *See* SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 2012 PM2.5 PLAN, 6-6 (2012) *available at* http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/06%20Chapter%206%20Incentives.pdf.

Valley counties and cities that implement the California Environment Quality Act (CEQA).[2] In its guidance, the Air District has distinguished between toxic air contaminants and criteria air pollutants.[3] Recognizing this distinction, the Air District's CEQA Guidance has adopted distinct thresholds of significance for *criteria* pollutants (i.e., ozone, PM2.5 and their respective precursor pollutants) based upon scientific and factual data which demonstrates the level that can be accommodated on a cumulative basis in the San Joaquin Valley without affecting the attainment of the applicable NAAQS.[4] For *toxic air* pollutants, the District has adopted different thresholds of significance which scientific and factual data demonstrates has the potential to expose sensitive receptors (i.e., children, the elderly) to levels which may result in localized health impacts.[5]

The Air District's CEQA Guidance was followed by the County of Fresno in its environment review of the Friant Ranch project, for which the Air District also served as a commenting agency. The Court of Appeal's holding, however, requiring correlation between the project's criteria

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[2] *See, e.g.*, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, PLANNING DIVISION, GUIDE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2015), *available at* http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf ("CEQA Guidance").

[3] Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from toxic air contaminants and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of toxic air contaminants occurs solely under section 112 of the Act. Compare 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 with 42 U.S.C. § 7411.

[4] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 64-66, 80.

[5] See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 66, 99-101.

pollutants and local health impacts, departs from the Air District's Guidance and approved methodology for assessing criteria pollutants. A close reading of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants (for which a local health risk assessment is feasible and routinely performed) and criteria air pollutants (for which a local health risk assessment is not feasible and would result in speculative results).[6] The Air District has a direct interest in ensuring the lawfulness and consistent application of its CEQA Guidance, and will explain how the Court of Appeal departed from the Air District's long-standing CEQA Guidance in addressing criteria pollutants and toxic air contaminants in this amicus brief.

2. How the Proposed Amicus Curiae Brief Will Assist the Court

As counsel for the proposed amicus curiae, we have reviewed the briefs filed in this action. In addition to serving as a "commentary agency" for CEQA purposes over the Friant Ranch project, the Air District has a strong interest in assuring that CEQA is used for its intended purpose, and believes that this Court would benefit from additional briefing explaining the distinction between criteria pollutants and toxic air contaminants and the different methodologies employed by local air pollution control agencies such as the Air District to analyze these two categories of air pollutants under CEQA. The Air District will also explain how the Court of Appeal's opinion is based upon a fundamental misunderstanding of these two different approaches by requiring the County of Fresno to correlate the project's *criteria* pollution emissions with *local* health impacts. In doing

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[6] CEQA does not require speculation. *See, e.g., Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.*, 6 Cal. 4th 1112, 1137 (1993) (upholding EIR that failed to evaluate cumulative toxic air emission increases given absence of any acceptable means for doing so).

so, the Air District will provide helpful analysis to support its position that at least insofar as criteria pollutants are concerned, CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible.

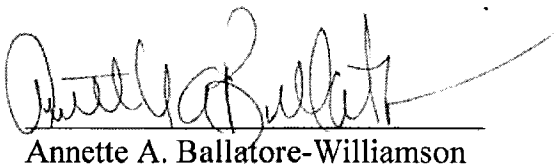
Rule 8.520 Disclosure

Pursuant to Cal. R. 8.520(f)(4), neither the Plaintiffs nor the Defendant or Real Party In Interest or their respective counsel authored this brief in whole or in part. Neither the Plaintiffs nor the Defendant or Real Party in Interest or their respective counsel made any monetary contribution towards or in support of the preparation of this brief.

CONCLUSION

On behalf of the San Joaquin Valley Unified Air Pollution Control District, we respectfully request that this Court accept the filing of the attached brief.

Dated: April 2, 2015



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SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL
DISTRICT

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I. INTRODUCTION.

The San Joaquin Valley Unified Air Pollution Control District ("Air District") respectfully submits that the Court of Appeal erred when it held that the air quality analysis contained in the Environmental Impact Report ("EIR") for the Friant Ranch development project was inadequate under the California Environmental Quality Act ("CEQA") because it did not include an analysis of the correlation between the project's criteria air pollutants and the potential adverse human health impacts. A close reading of the portion of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants and criteria air pollutants.

Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants (hereinafter referred to as "TACs") regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health,

they are distinguishable from TACs and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of TACs occurs solely under section 112 of the Act. *Compare* 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 *with* 42 U.S.C. § 7411.

The most relevant difference between criteria pollutants and TACs for purposes of this case is the manner in which human health impacts are accounted for. While it is common practice to analyze the correlation between an individual facility's TAC emissions and the expected localized human health impacts, such is not the case for criteria pollutants. Instead, the human health impacts associated with criteria air pollutants are analyzed and taken into consideration when EPA sets the national ambient air quality standard ("NAAQS") for each criteria pollutant. 42 U.S.C. § 7409(b)(1). The health impact of a particular criteria pollutant is analyzed on a regional and not a facility level based on how close the area is to complying with (attaining) the NAAQS. Accordingly, while the type of individual facility / health impact analysis that the Court of Appeal has required is a customary practice for TACs, it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.

It is clear from a reading of both the administrative record and the Court of Appeal's decision that the Court did not have the expertise to fully

appreciate the difference between TACs and criteria air pollutants. As a result, the Court has ordered the County of Fresno to conduct an analysis that is not practicable and not likely yield valid information. The Air District respectfully requests that this portion of the Court of Appeal's decision be reversed.

II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.

Although the Air District does not take lightly the amount of air emissions at issue in this case, it submits that the Court of Appeal got it wrong when it required Fresno County to revise the Friant Ranch EIR to include an analysis correlating the criteria air pollutant emissions associated with the project with specific, localized health-impacts. The type of analysis the Court of Appeal has required will not yield reliable information because currently available modeling tools are not well suited for this task. Further, in reviewing this issue de novo, the Court of Appeal failed to appreciate that it lacked the scientific expertise to appreciate the significant differences between a health risk assessment commonly performed for toxic air contaminants and a similar type of analysis it felt should have been conducted for criteria air pollutants.

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A. Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project's Air Emissions and Specific Human Health Impacts.

In order to appreciate the problematic nature of the Court of Appeals' decision requiring a health risk type analysis for criteria air pollutants, it is important to understand how the relevant criteria pollutants (ozone and particulate matter) are formed, dispersed and regulated.

Ground level ozone (smog) is not directly emitted into the air, but is formed when precursor pollutants such as oxides of nitrogen (NOx) and volatile organic compounds (VOCs) are emitted into the atmosphere and undergo complex chemical reactions in the process of sunlight.[1] Once formed, ozone can be transported long distances by wind.[2] Because of the complexity of ozone formation, a specific tonnage amount of NOx or VOCs emitted in a particular area does not equate to a particular concentration of ozone in that area. In fact, even rural areas that have relatively low tonnages of emissions of NOx or VOCs can have high levels of ozone concentration simply due to wind transport.[3] Conversely, the San Francisco Bay Area has six times more NOx and VOC emissions per square mile than the San Joaquin Valley, but experiences lower

[1] *See* United States Environmental Protection Agency, *Ground-level Ozone: Basic Information*, available at: http://www.epa.gov/airquality/ozonepollution/basic.html (visited March 10, 2015).
[2] *Id.*
[3] *Id.*

concentrations of ozone (and better air quality) simply because sea breezes disperse the emissions.[4]

Particulate matter ("PM") can be divided into two categories: directly emitted PM and secondary PM.[5] While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to the local PM concentration because it can be transported long distances by wind.[6] Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur dioxides (SOx) and NOx.[7] Because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area.

The disconnect between the *tonnage* of precursor pollutants (NOx, SOx and VOCs) and the *concentration* of ozone or PM formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects, but the concentration of resulting ozone or PM. Indeed, the national ambient air quality standards ("NAAQS"), which are statutorily required to be set by the United States Environmental Protection

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[4] *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, Executive Summary p. ES-6, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).

[5] United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at: http://www.epa.gov/airquality/particlepollution/basic.html (visited March 10, 2015).

[6] *Id.*

[7] *Id.*

Agency ("EPA") at levels that are "requisite to protect the public health," 42 U.S.C. § 7409(b)(1), are established as concentrations of ozone or particulate matter and not as tonnages of their precursor pollutants.[8]

Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period.[9] Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District's tools and plans for attaining the NAAQS are regional in nature.

For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NOx, SOx and VOCs) and the atmospheric chemistry and meteorology of the Valley.[10] At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor

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[8] See, e.g., United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at: http://www.epa.gov/air/criteria.html#3 (visited March 10, 2015).

[9] *San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard*, Ch. 2 p. 2-16, available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).

[10] *Id.* at Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM2.5 Plan*, Appendix F, pp. F-2 – F-5, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_Adopted_PM2.5/20%20Appendix%20F.pdf (visited March 19, 2015).

emissions Valley wide.[11] Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which *all* of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.[12]

Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the Valley can accommodate without affecting the attainment date for the NAAQS.[13] The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources permitted by the Air District must "offset" their emissions.[14] This "offset"

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[11] *Id.*

[12] Although the Air District does have a dispersion modeling tool used during its air permitting process that is used to predict whether a particular project's directly emitted PM will either cause an exceedance of the PM NAAQS or contribute to an existing exceedance, this model bases the prediction on a worst case scenario of emissions and meteorology and has no provision for predicting any associated human health impacts. Further, this analysis is only performed for stationary sources (factories, oil refineries, etc.) that are required to obtain a New Source Review permit from the Air District and not for development projects such as Friant Ranch over which the Air District has no preconstruction permitting authority. *See* San Joaquin Valley Unified Air Pollution Control District Rule 2201 §§ 2.0; 3.3.9; 4.14.1, available at: http://www.valleyair.org/rules/currntrules/Rule2201041l.pdf (visited March 19, 2015).

[13] *San Joaquin Valley Unified Air Pollution Control District Guide to Assessing and Mitigating Air Quality Impacts*, (March 19, 2015) p. 22, available at: http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf (visited March 30, 2015).

[14] *Id.* at pp. 22, 25.

level allows for growth while keeping the cumulative effects of all new sources at a level that will not impede attainment of the NAAQS.[15] In the Valley, these thresholds are 15 tons per year of PM, and 10 tons of NOx or VOC per year. *Sierra Club*, *supra*, 172 Cal.Rptr.3d at 303; AR 4554. Thus, the CEQA air quality analysis for criteria pollutants is not really a localized, project-level impact analysis but one of regional, "cumulative impacts."

Accordingly, the significance thresholds applied in the Friant Ranch EIR (15 tons per year of PM and 10 tons of NOx or VOCs) are not intended to be indicative of any localized human health impact that the project may have. While the health effects of air pollution are of primary concern to the Air District (indeed, the NAAQS are established to protect human health), the Air District is simply not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual CEQA project directly impact human health in a particular area. This is true even for projects with relatively high levels of emissions of criteria pollutant precursor emissions.

For instance, according to the EIR, the Friant Ranch project is estimated to emit 109.52 tons per year of ROG (VOC), 102.19 tons per year of NOx, and 117.38 tons per year of PM. Although these levels well

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[15] [15] *San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines* (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).

exceed the Air District's CEQA significance thresholds, this does not mean that one can easily determine the concentration of ozone or PM that will be created at or near the Friant Ranch site on a particular day or month of the year, or what specific health impacts will occur. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. This is especially true for a project like Friant Ranch where most of the criteria pollutant emissions derive not from a single "point source," but from area wide sources (consumer products, paint, etc.) or mobile sources (cars and trucks) driving to, from and around the site.

In addition, it would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have. As discussed above, the currently available modeling tools are equipped to model the impact of *all* emission sources in the Valley on attainment. According to the most recent EPA-approved emission inventory, the NOx inventory for the Valley is for the year 2014 is 458.2 tons per day, or 167,243 tons per year and the VOC (or ROG) inventory is 361.7 tons per day, or 132,020.5 tons per year.[16] Running the photochemical grid model used for predicting ozone attainment with the

[16] *San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan*, Appendix B pp. B-6, B-9,
available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).

emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information given the relative scale involved.

Finally, even once a model is developed to accurately ascertain local increases in concentrations of photochemical pollutants like ozone and some particulates, it remains impossible, using today's models, to correlate that increase in concentration to a specific health impact. The reason is the same: such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level.

For these reasons, it is not the norm for CEQA practitioners, including the Air District, to conduct an analysis of the localized health impacts associated with a project's criteria air pollutant emissions as part of the EIR process. When the accepted scientific method precludes a certain type of analysis, "the court cannot impose a legal standard to the contrary." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 717 n. 8. However, that is exactly what the Court of Appeal has done in this case. Its decision upends the way CEQA air quality analysis of criteria pollutants occurs and should be reversed.

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B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants.

The Court of Appeal's error in requiring the new health impact analysis for criteria air pollutants clearly stems from a misunderstanding of terms of art commonly used in the air pollution field. More specifically, the Court of Appeal (and Appellants Sierra Club et al.) appear to have confused the health risk analysis ("HRA") performed to determine the health impacts associated with a project's toxic air contaminants ("TACs"), with an analysis correlating a project's criteria air pollutants (ozone, PM and the like) with specific localized health impacts.

The first type of analysis, the HRA, is commonly performed during the Air District's stationary source permitting process for projects that emit TACs and is, thus, incorporated into the CEQA review process. An HRA is a comprehensive analysis to evaluate and predict the dispersion of TACs emitted by a project and the potential for exposure of human populations. It also assesses and quantifies both the individual and population-wide health risks associated with those levels of exposure. There is no similar analysis conducted for criteria air pollutants. Thus, the second type of analysis (required by the Court of Appeal), is not currently part of the Air District's process because, as outlined above, the health risks associated

with exposure to criteria pollutants are evaluated on a regional level based on the region's attainment of the NAAQS.

The root of this confusion between the types of analyses conducted for TACs versus criteria air pollutants appears to stem from a comment that was presented to Fresno County by the City of Fresno during the administrative process.

In its comments on the draft EIR, the City of Fresno (the only party to raise this issue) stated:

> [t]he EIR must disclose the human health related effects of the Project's air pollution impacts. (CEQA Guidelines section 15126.2(a).) The EIR fails completely in this area. The EIR should be revised to disclose and determine the significance of TAC impacts, and of human health risks due to exposure to Project-related air emissions.

(AR 4602.)

In determining that the issue regarding the correlation between the Friant Ranch project's criteria air pollutants and adverse health impacts was adequately exhausted at the administrative level, the Court of Appeal improperly read the first two sentences of the City of Fresno's comment in isolation rather than in the context of the entire comment. *See Sierra Club v. County of Fresno* (2014) 172 Cal.Rptr.3d 271, 306. Although the comment first speaks generally in terms of "human health related effects" and "air pollution," it requests only that the EIR be revised to disclose "the significance of TACs" and the "human health risks due to exposure."

The language of this request in the third sentence of the comment is significant because, to an air pollution practitioner, the language would only have indicated only that a HRA for TACs was requested, and not a separate analysis of the health impacts associated with the project's criteria air pollutants. Fresno County clearly read the comment as a request to perform an HRA for TACs and limited its response accordingly. (AR 4602.)[17] The Air District submits that it would have read the City's comment in the same manner as the County because the City's use of the terms "human health risks" and "TACs" signal that an HRA for TACs is being requested. Indeed, the Air District was also concerned that an HRA be conducted, but understood that it was not possible to conduct such an analysis until the project entered the phase where detailed site specific information, such as the types of emission sources and the proximity of the sources to sensitive receptors became available. (AR 4553.)[18] The City of Fresno was apparently satisfied with the County's discussion of human health risks, as it did not raise the issue again when it commented on the final EIR. (AR 8944 – 8960.)

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[17] Appellants do not challenge the manner in which the County addressed TACs in the EIR. (Appellants' Answer Brief p. 28 fn. 7.)

[18] Appellants rely on the testimony of Air District employee, Dan Barber, as support for their position that the County should have conducted an analysis correlating the project's criteria air pollutant emissions with localized health impacts. (Appellants Answer Brief pp. 10-11; 28.) However, Mr. Barber's testimony simply reinforces the Air District's concern that a risk assessment (HRA) be conducted once the actual details of the project become available. (AR 8863.) As to criteria air pollutants, Mr. Barber's comments are aimed at the Air District's concern about the amount of emissions and the fact that the emissions will make it "more difficult for Fresno County and the Valley to reach attainment which means that the health of Valley residents maybe [sic] adversely impacted." Mr. Barber says nothing about conducting a separate analysis of the localized health impacts the project's emissions may have.

The Court of Appeal's holding, which incorrectly extrapolates a request for an HRA for TACs into a new analysis of the localized health impacts of the project's criteria air pollutants, highlights two additional errors in the Court's decision.

First, the Court of Appeal's holding illustrates why the Court should have applied the deferential substantial evidence standard of review to the issue of whether the EIR's air quality analysis was sufficient. The regulation of air pollution is a technical and complex field and the Court of Appeal lacked the expertise to fully appreciate the difference between TACs and criteria air pollutants and tools available for analyzing each type of pollutant.

Second, it illustrates that the Court likely got it wrong when it held that the issue regarding the criteria pollutant / localized health impact analysis was properly exhausted during the administrative process. In order to preserve an issue for the court, '[t]he "exact issue" must have been presented to the administrative agency....' [Citation.] *Citizens for Responsible Equitable Environmental Development v. City of San Diego*, (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 535, 78 Cal.Rptr.3d 1, 13. "'[T]he objections must be sufficiently specific so that the agency has the

opportunity to evaluate and respond to them.' [Citation.]" *Sierra Club v. City of Orange*,163 Cal.App.4th at 536.[19]

As discussed above, the City's comment, while specific enough to request a commonly performed HRA for TACs, provided the County with no notice that it should perform a new type of analysis correlating criteria pollutant tonnages to specific human health effects. Although the parties have not directly addressed the issue of failure to exhaust administrative remedies in their briefs, the Air District submits that the Court should consider how it affects the issues briefed by the parties since "[e]xhaustion of administrative remedies is a jurisdictional prerequisite to maintenance of a CEQA action." *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203.

III. CONCLUSION

For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal's decision requiring an analysis correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

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[19] *Sierra Club v. City of Orange*, is illustrative here. In that case, the plaintiffs challenged an EIR approved for a large planned community on the basis that the EIR improperly broke up the various environmental impacts by separate project components or "piecemealed" the analysis in violation of CEQA. In evaluating the defense that the plaintiffs had failed to adequately raise the issue at the administrative level, the Court held that comments such as *"the use of a single document for both a project-level and a program-level EIR [is] 'confusing',"* and *"[t]he lead agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project,"* were too vague to fairly raise the argument of piecemealing before the agency. *Sierra Club v. City of Orange*, 163 Cal.App.4th at 537.

correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

Respectfully submitted,

Dated: April 2, 2015

Catherine T. Redmond
Attorney for Proposed Amicus Curiae

SAN JOAQUIN VALLEY
UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.204 of the California Rules of Court, I hereby certify that this document, based on the Word County feature of the Microsoft Word software program used to compose and print this document, contains, exclusive of caption, tables, certificate of word count, signature block and certificate of service, 3806 words.

Dated: April 2, 2015

Annette A. Ballatore-Williamson
District Counsel (SBN 192176)

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

PROOF OF SERVICE

I am over the age of 18 years and not a p[arty to the above-captioned action; that my business address is San Joaquin Valley Unified Air Pollution Control District located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

On April 2, 2015, I served the document described below:

APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO

On all parties to this action at the following addresses and in the following manner:

PLEASE SEE ATTACHED SERVICE LIST

(XX) **(BY MAIL)** I caused a true copy of each document(s) to be laced in a sealed envelope with first-class postage affixed and placed the envelope for collection. Mail is collected daily at my office and placed in a United State Postal Service collection box for pick-up and delivery that same day.

( ) **(BY ELECTRONIC MAIL)** I caused a true and correct scanned image (.PDF file) copy to be transmitted via electronic mail transfer system in place at the San Joaquin Valley Unified Air Pollution Control District ("District"), originating from the undersigned at 1990 E. Gettysburg Avenue, Fresno, CA, to the address(es) indicated below.

( ) **(BY OVERNIGHT MAIL)** I caused a true and correct copy to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I executed this document on April 2, 2015, at Fresno, California.

Esthela Soto

SERVICE LIST

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

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Appendix D Cultural and Paleontological Resources Assessment

Appendices

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

CULTURAL AND PALEONTOLOGICAL RESOURCES ASSESSMENT FOR THE CITY OF REDONDO BEACH GENERAL PLAN UPDATE, ZONING CODE UPDATE AND LOCAL COASTAL PROGRAM AMENDMENT PROJECT, CITY OF REDONDO BEACH, LOS ANGELES COUNTY, CALIFORNIA

Prepared for:
Placeworks

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John Gust, Ph.D.
Kim Scott, M.S.

Revised June 2024

Cogstone Project Number: 3929
Type of Study: Cultural and Paleontological Resources Assessment
Archaeological Sites: P-19-000100 (CA-LAN-000100), P-19-000127 (CA-LAN-000127), P-19-000137 (CA-LAN-000137), P-19-000383 (CA-LAN-000383)
Historic Built Environment Resources: P-19-150257, P-19-177518 (HRI# 028196), P-19-177541, 19-177599, P-19-177600, P-19-177601, P-19-177668, P-19-177669, P-19-186114 (CHL 373), P-19-187150, P-19-187260, P-19-187274, P-19-187275, P-19-187276, P-19-187277, P-19-187979, P-19-188839, P-19-188900, P-19-189406, P-19-189423, P-19-189474, P-19-189746, P-19-189813, P-19-190110, P-19-190298, P-19-190323, P-19-190326, P-19-190801, P-19-193056, P-19-193058
Multi-Component Sites: P-19-001872 (G&A-1, CA-LAN-001872/H)
USGS Quadrangle: Venice (1981), Inglewood (1981), Redondo Beach (1996) and Torrance (1981)
Area: 6.25 square miles
Key Words: Key Words: Cultural and Paleontological Resources Assessment, City of Redondo Beach, Los Angeles County; Gabrielino/Gabrieleño/Tongva territory, Pleistocene sedimentary deposits, middle to late Pleistocene old eolian deposits and old alluvium, late Holocene unconsolidated shelf sediments, eolian deposits, beach deposits, artificial fill, General Plan Update

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Federal Certifications WOSB, EDWOSB, SDB
State Certifications DBE, WBE, UDBE

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SUMMARY OF FINDINGS

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the City of Redondo Beach General Plan update, Zoning Code Update and Local Coastal Program Amendment (Project). The City of Redondo Beach is the lead agency under the California Environmental Quality Act (CEQA).

The Land Use, Open Space and Conservation, Noise, and Safety elements have been revised as part of the updated General Plan. These will be accompanied by associated revisions to the Zoning Code and Local Coastal Program.

Cogstone requested a search of the California Historical Resources Information System (CHRIS) from the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton on August 18, 2023 which included the entire proposed Project Area. Results of the record search indicate that 71 previous studies have been completed within the Project Area. Thirty-six cultural resources have been recorded within the Project Area.

PALEONTOLOGICAL RESOURCES SENSITIVITY

The Project is mapped as Pleistocene and Holocene sediments of varying lithologies, as well as artificial fill. A records search revealed that all records of previously identified fossils from within a 10-mile radius were a minimum of five feet deep in deposits mapped as Pleistocene at the surface. Sediments less than five feet below the modern surface are therefore assigned a low sensitivity for fossils due to the unlikelihood of fossils in a reliable stratigraphic context in these deposits. Sediments mapped at the surface as Pleistocene that are deeper than five feet below the modern surface are assigned a moderate potential for fossils due to similar deposits producing fossils at that depth near to the study area. In areas mapped as Holocene at the surface, Pleistocene sediments may be present at undetermined depths; wherever these sediments are encountered in an otherwise undisturbed state, they have moderate potential for fossils.

CULTURAL RESOURCES SENSITIVITY

ARCHAEOLOGICAL SENSITIVITY

The underlaying geology of most of the City dates to the Holocene and has the capability of preserving archaeological sites. All but one of the prehistoric archaeological sites and multi-component archaeological sites are located in the southern portion of the City near the beach. Historic-aged archaeological sites are found in most of the City but are also concentrated in the southern portion. The area in the southern half of the City within one-half mile of the beach is considered highly sensitive for buried historic-aged and prehistoric archaeological deposits. All other areas of the City except the northeast corner are considered to have low to moderate sensitivity for buried historic-aged and prehistoric archaeological deposits. The sediments in the northeast corner of the City are Pleistocene-age alluvium that predate human occupation of the area and have a very low sensitivity for cultural resources.

HISTORIC BUILT ENVIRONMENT SENSITIVITY

The vast majority of the developed land in Redondo Beach was first developed prior to 1983 meaning it may contain buildings or structures that are 50 years of age or older. There are currently three sources of data that include buildings, structures, or object that are considered significant at the local, state, or federal level in addition to the SCCIC record search results. These are the Built Environment Resource Directory entries for the City, the City of Redondo Beach Historic Resources Register, and the buildings that received an A or B grade in historic resource inventories conducted by the City in 1986, 1996, and 2003.

RECOMMENDATIONS

PALEONTOLOGICAL RESOURCES

Based upon recorded fossil locality data within and near the City, Pleistocene sediments of varying lithologies, both at the surface and at depth, have potential to yield significant paleontological resources. Sediments mapped at the surface as Pleistocene that are less than five feet below the modern surface are interpreted to have low potential for fossils, while Pleistocene deposits deeper than five feet have moderate potential for fossils. Pleistocene fossiliferous sediments may also be present at depth. A qualified paleontologist should be retained to develop and implement a Paleontological Resources Impact Mitigation Plan, which may include development of a paleontology Worker Environmental Awareness Program (WEAP) and full-time paleontological monitoring.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified paleontologist can evaluate the find and make recommendations.

ARCHAEOLOGICAL RESOURCES

The southern half of the City within one-half mile of the beach is considered highly sensitive for buried archaeological deposits and we recommend cultural resources monitoring during all ground-disturbing activities in native soil or artificial fill in excess of 50 years old. We recommend WEAP training for construction personnel conducting ground-disturbing work and their direct supervisors for the remainder of the City except the far northeast corner where the sediments are too old to contain buried archaeological sites.

HISTORIC BUILT ENVIRONMENT

As a large majority of the City was developed by 1973, most areas have buildings, structures, or objects that may be greater than 50 years in age. Thus far, most of the significant buildings have been recorded in the southern half of the City within approximately one mile of the beach. Cogstone recommends that the City develop a plan to conduct historic inventories in various part so the City can sample the variety of building, structure, and object types within the City. The evaluator should be tasked with investigating whether land adjacent to resources being recorded and evaluated may have potential for buried remains including trash pits and foundations, where possible.

INTRODUCTION

PURPOSE OF STUDY

The objective of this study is to review and summarize available information regarding known paleontological, archaeological, and historical resources within the City of Redondo Beach (City) to support the Redondo Beach General Plan Update Project (Project; Figure 1). The City of Redondo Beach is the lead agency under the California Environmental Quality Act (CEQA).

PROJECT DESCRIPTION

The Project includes focused updates to the City's General Plan, including revisions to the Land Use, Open Space and Conservation, Noise, and Safety elements. The Project also includes updates to the City's Zoning Ordinance, Zoning Ordinance for the Coastal Zone, and the Land Use Plan and Implementation Plan components of the City's Local Coastal Program , which includes modifications for consistency with the proposed General Plan Update.

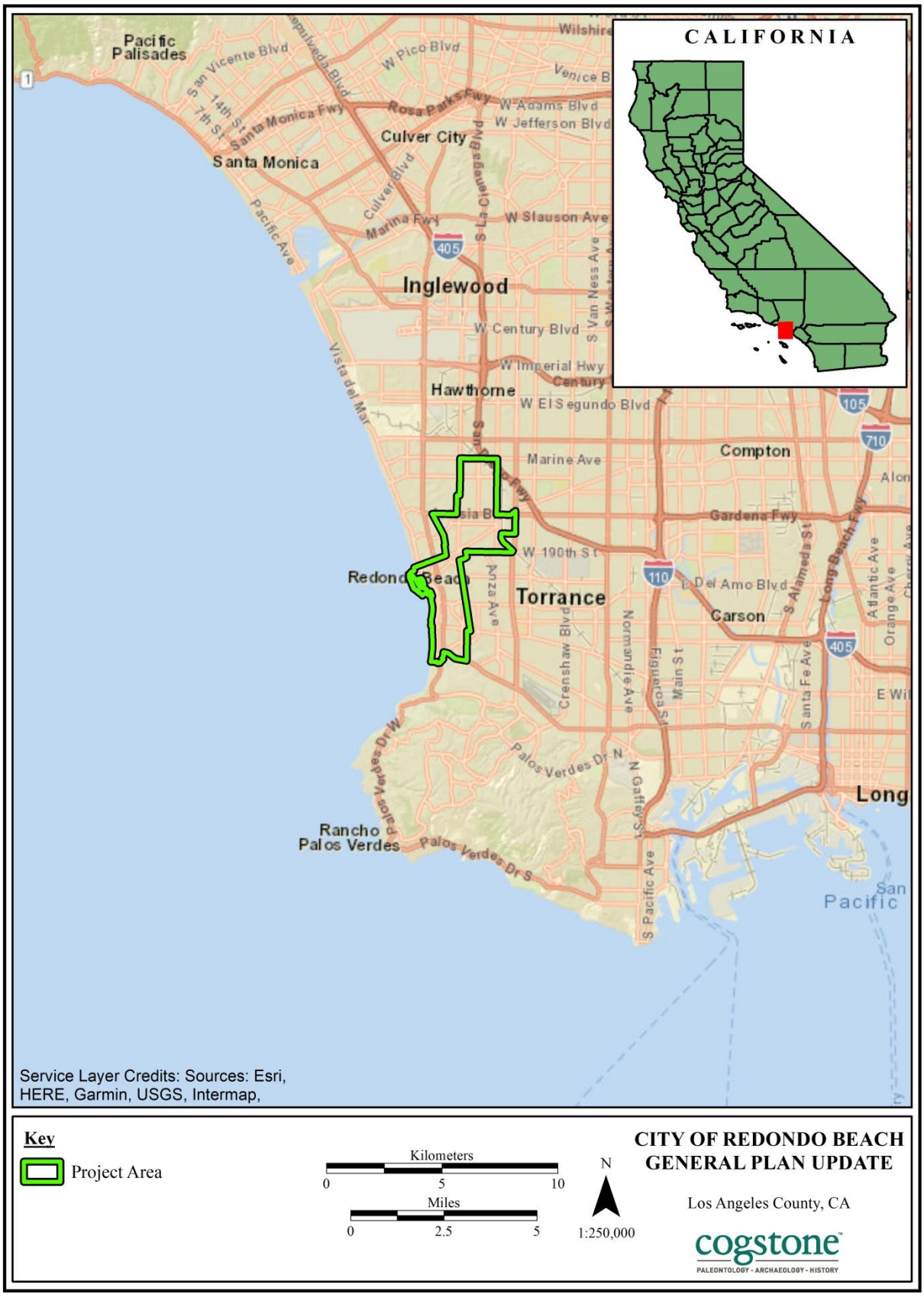
PROJECT LOCATION

Located in the South Bay region of Los Angeles County, 16 miles south-southwest of downtown Los Angeles, Redondo Beach is an urban beach community encompassing 6.25 square miles. Redondo Beach is situated on the coast between Hermosa Beach to the north and Torrance Beach to the south (Figures 2, 3, and Appendix A, Figure A-1).

Redondo Beach is within the United States Geological Survey (USGS) 7.5-minute Venice, Inglewood, Redondo Beach, and Torrance topographic quadrangle maps. Table 1 summarizes the cadastral information for the City.

Table 1. City of Redondo Beach Cadastral Information

USGS 7.5-minute Topographic Quad(s)	Township	Range	Section(s)
Venice	3 South	15 West	24, 25
	3 South	14 West	19, 20, 29, 30
Inglewood	3 South	14 west	20, 21, 28, 29
Redondo Beach	4 South	15 West	1
	3 South	14 West	31, 32
	4 South	14 West	5, 6, 7, 8, 17, 18, 19, 20
Torrance	3 South	14 West	32, 33
	4 South	14 West	4, 5, 8, 17, 20


CALIFORNIA
Pacific Palisades
Santa Monica
Culver City
Inglewood
Hawthorne
Torrance
Redondo Beach
Compton
Carson
Long
Rancho Palos Verdes
Pacific
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap,
Key
Project Area
Kilometers
0 5 10
Miles
0 2.5 5
N
1:250,000
CITY OF REDONDO BEACH
GENERAL PLAN UPDATE
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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

Figure 1**. Project vicinity map**

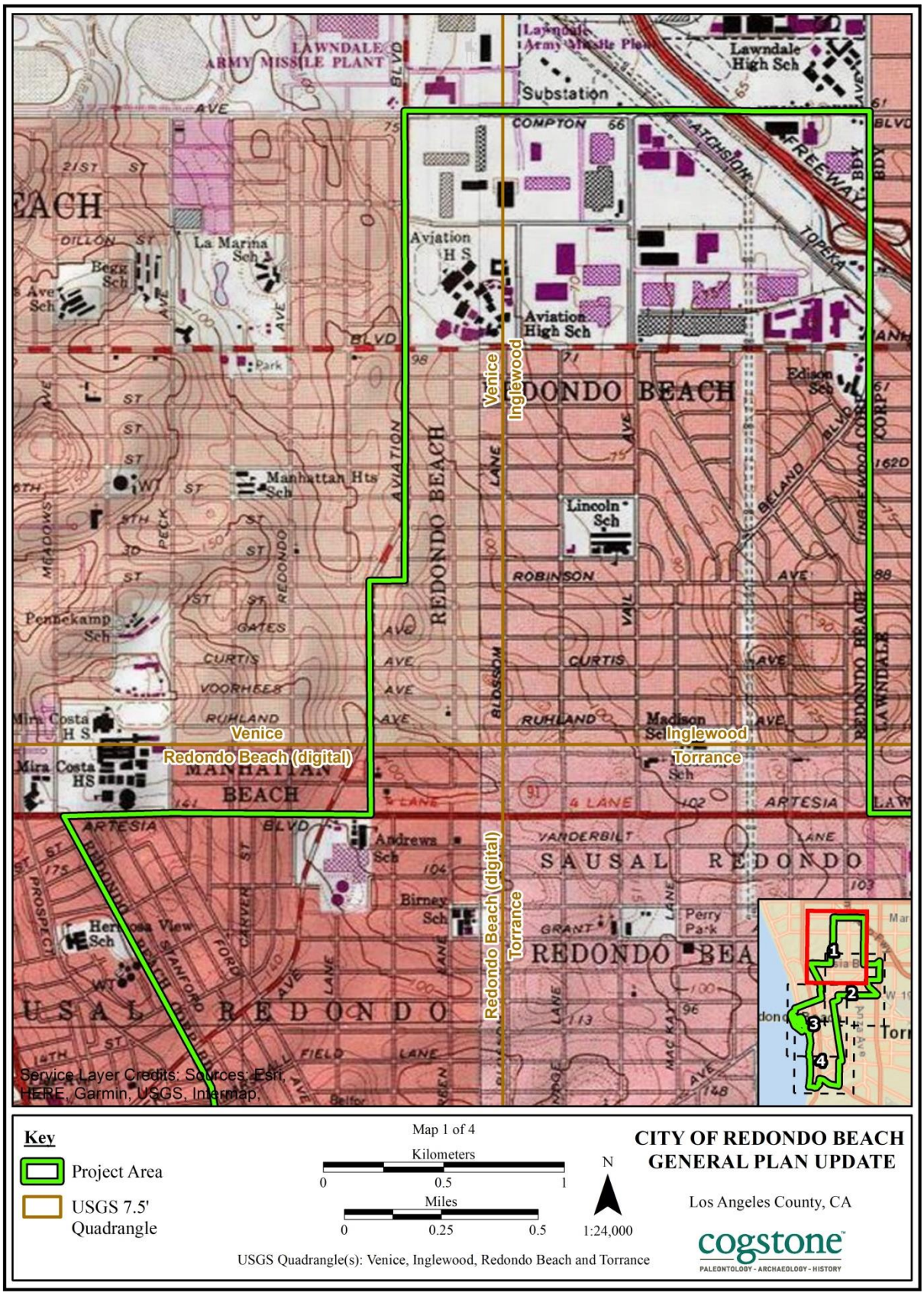

Figure 2a. Location map (1 of 4)

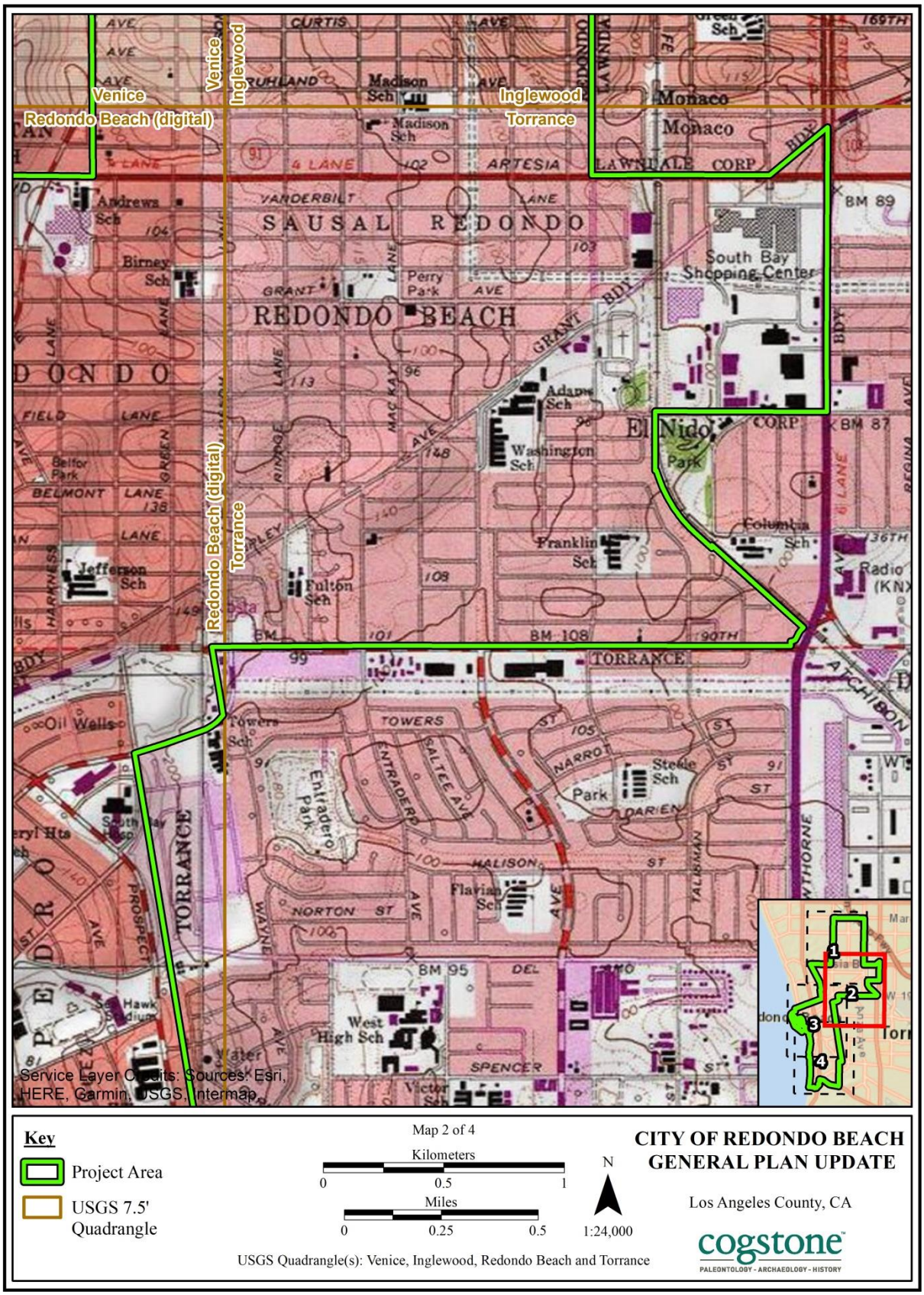

Figure 2b. Location map (2 of 4)

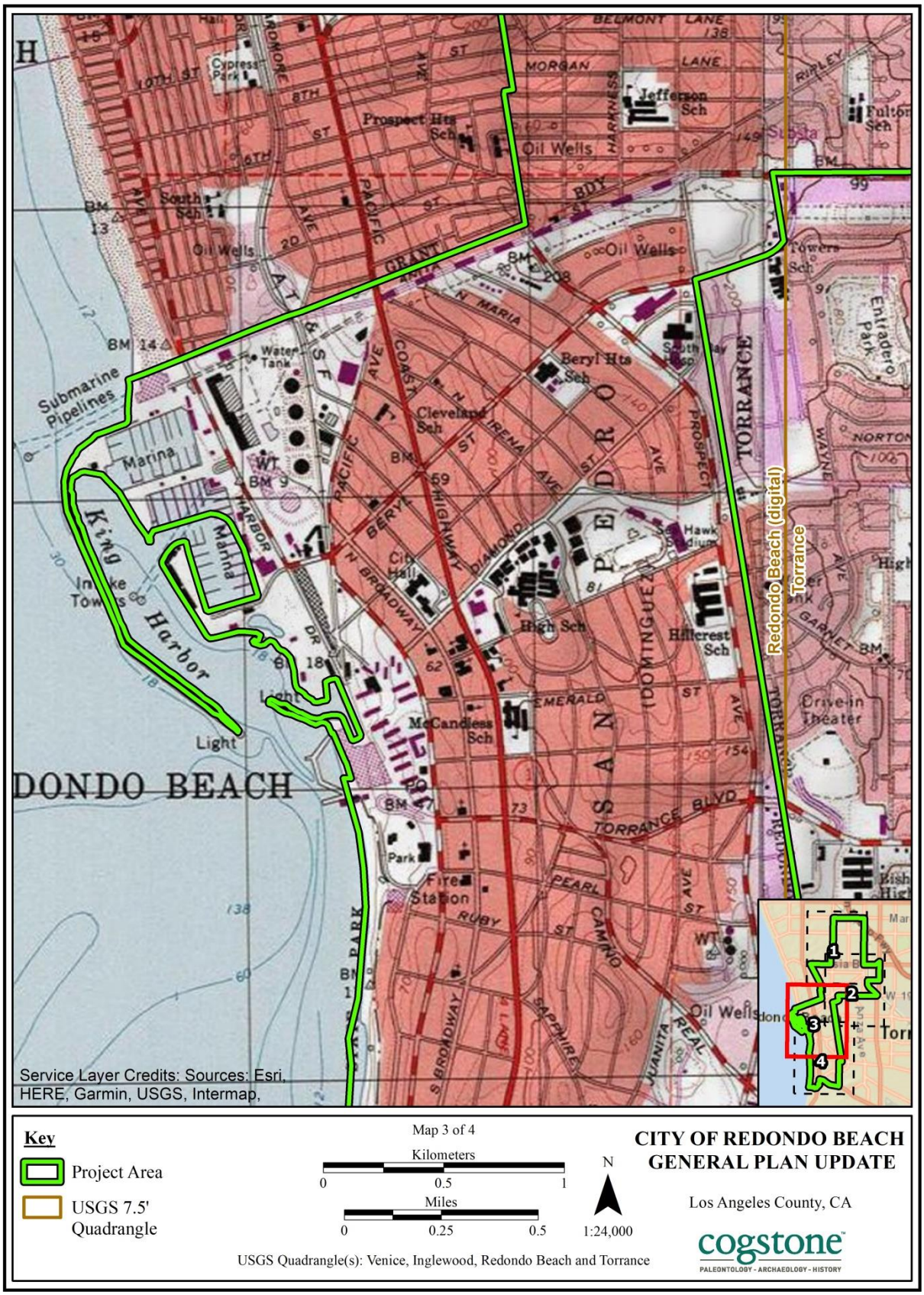

Figure 2c. Location map (3 of 4)

Figure 2d. Location map (4 of 4)

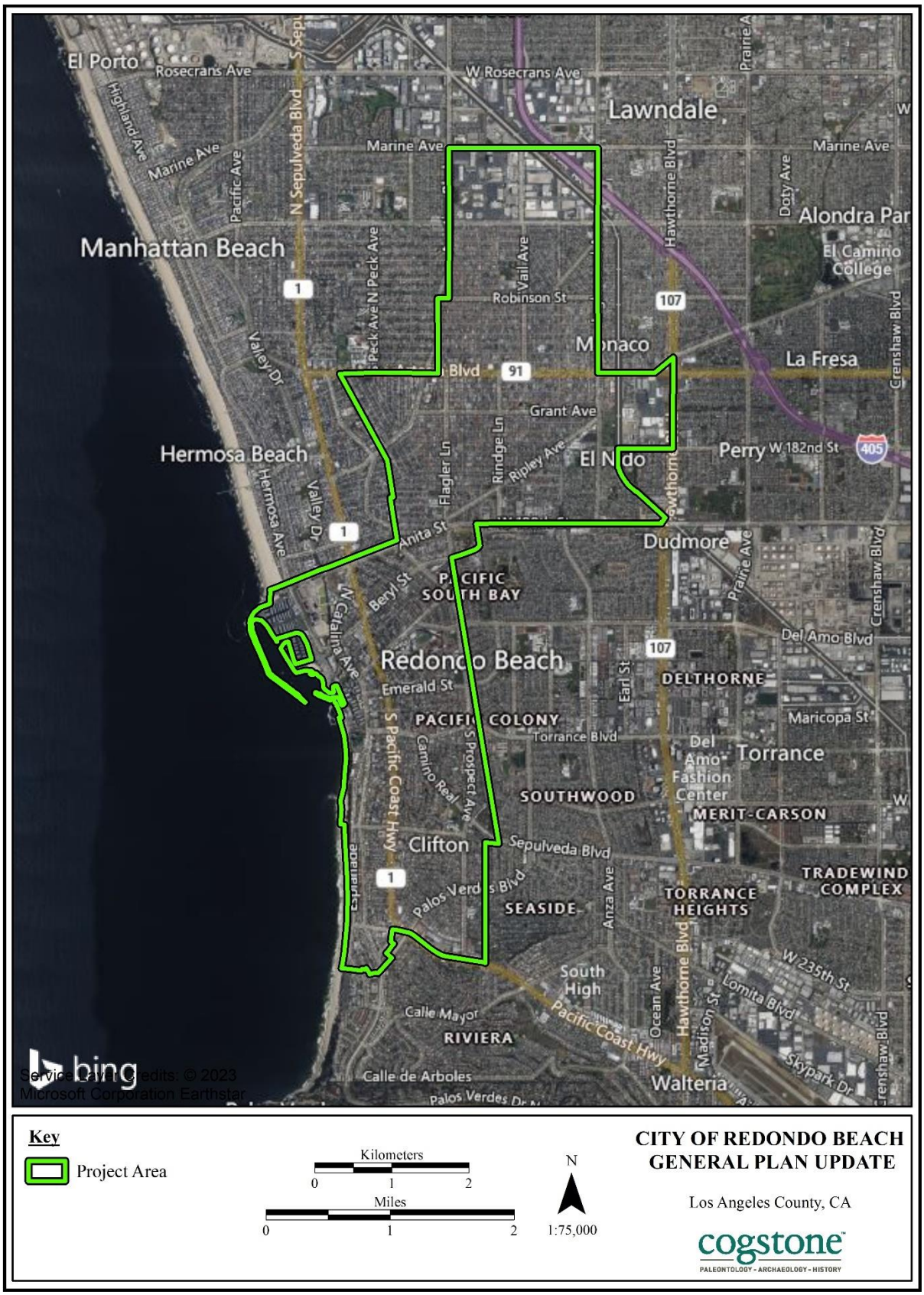

Figure 3. Project aerial map

PROJECT PERSONNEL

Cogstone Resource Management (Cogstone) conducted the cultural and paleontological resources study. Resumes of key personnel are provided in Appendix B.

- Molly Valasik was Task Manager for the Project and provided overall QA/QC. Ms. Valasik has an M.A. in Anthropology from Kent State University in Ohio and over 15 years of experience in southern California archaeology.

- Eric Scott provided QA/QC for the paleontology and geology sections of this report. Mr. Scott has an M.A. in Anthropology, with an emphasis in biological paleoanthropology, from UCLA, and more than 39 years of experience in California paleontology.

- John Gust, RPA, served as the Principal Investigator for Archaeology, and co-authored this report. Dr. Gust has a Ph.D. in Anthropology from the University of California (UC), Riverside and more than 11 years of experience in archaeology.

- Kim Scott served as the Principal Investigator for Paleontology for the Project and wrote the geology, paleontology, environmental, and geoarchaeological sections of this report. Ms. Scott holds an M.S. in Biology with an emphasis in paleontology from California State University (CSU), San Bernardino and a B.S. in Geology from University of California, Los Angeles (UCLA). She is a qualified vertebrate paleontologist and sedimentary geologist with more than 28 years of experience in California paleontology and sedimentary geology.

- Sandy Duarte completed the additional sources consulted section and co-authored this report. Mrs. Duarte holds a B.A. in Anthropology from UC Santa Barbara, and has more than 18 years of experience in California archaeology.

- Kelly Vreeland co-authored the geological and paleontological portions of this report. Ms. Vreeland has an M.S. and a B.S. in Geology, with an emphasis in paleontology, from CSU Fullerton as well as 12 years of experience in California paleontology and geology.

- Shannon Lopez conducted historic society consultation and drafted portions of this report. Ms. Lopez holds an M.A. in History from CSU Fullerton and has more than five years of experience as an architectural historian.

- Logan Freeberg conducted the archaeological and paleontological record searches and prepared the maps for the report. He has a certificate in Geographic Information Systems

(GIS) from CSU Fullerton and a B.A. in Anthropology from UC Santa Barbara and has more than 20 years of experience in southern California archaeology.

- Debbie Webster provided technical editing. Ms. Webster has more than 23 years of experience in technical writing.

REGULATORY ENVIRONMENT

STATE LAWS AND REGULATIONS

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA states that: It is the policy of the state that public agencies 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, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed project and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

CEQA declares that it is state policy to: "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered.

TRIBAL CULTURAL RESOURCES

As of 2015, CEQA established that "[a] project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment" (Public Resources Code, § 21084.2). In order to be considered a "tribal cultural resource," a resource must be either:

(1) listed, or determined to be eligible for listing, on the national, state, or local register of historic resources, or
(2) a resource that the lead agency chooses, in its discretion, to treat as a tribal cultural resource.

To help determine whether a project may have such an effect, the lead agency must consult with any California Native American tribe that requests consultation and is traditionally and culturally affiliated with the geographic area of a proposed project. If a lead agency determines that a project may cause a substantial adverse change to tribal cultural resources, the lead agency must consider measures to mitigate that impact. Public Resources Code §20184.3 (b)(2) provides examples of mitigation measures that lead agencies may consider to avoid or minimize impacts to tribal cultural resources.

PUBLIC RESOURCES CODE

Section 5097.5: No person shall knowingly and willfully excavate upon, or remove, destroy,

injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands (lands under state, county, city, district or public authority jurisdiction, or the jurisdiction of a public corporation), except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register of Historical Resources (CRHR) is a listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks No. 770 and above. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic resources or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historical integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2) It is associated with the lives of persons important to local, California, or national history;
3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance.

Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or

appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

NATIVE AMERICAN HUMAN REMAINS

Sites that may contain human remains important to Native Americans must be identified and treated in a sensitive manner, consistent with state law (i.e., Health and Safety Code §7050.5 and Public Resources Code §5097.98), as reviewed below:

In the event that human remains are encountered during project development and in accordance with the Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods.

CALIFORNIA ADMINISTRATIVE CODE, TITLE 14, SECTION 4307

This section states that "No person shall remove, injure, deface or destroy any object of paleontological, archeological or historical interest or value."

CITY OF REDONDO BEACH MUNICIPAL CODE

The following sections are excerpted from Chapter 4: Historic Resources Preservation of Redondo Beach, California Municipal Code.

ARTICLE 2. LANDMARK AND HISTORIC DISTRICT DESIGNATION CRITERIA

10-4.201 Designation criteria.

For the purpose of this chapter, a historic resource may be designated a landmark, and an area may be designated a historic district pursuant to Article 3 of this chapter, if it meets one or more of the following criteria:

a) It exemplifies or reflects special elements of the City's cultural, social, economic, political, aesthetic, engineering, or architectural history; or
b) It is identified with persons or events significant in local, state or national history; or
c) It embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or
d) It is representative of the notable work of a builder, designer, or architect; or
e) Its unique location or singular physical characteristic(s) represents an established and familiar visual feature or landmarks of a neighborhood, community, or the City.

(§ 2, Ord. 2554 c.s., eff. August 31, 1989)

ARTICLE 3. DESIGNATION OF LANDMARKS AND HISTORIC DISTRICTS

10-4.302 Minimum eligibility requirements, landmark.

In order to be eligible for consideration as a landmark, a historic resource must be at least fifty (50) years old; with the exception that a historic resource of at least thirty (30) years of age may be eligible if the Preservation Commission determines that the resource is very exceptional, or that it is threatened by demolition, removal, or relocation, inappropriate alteration.

(§ 2, Ord. 2554 c.s., eff. August 31, 1989)

10-4.304 Minimum eligibility requirements, historic district.

In order to be eligible for considerations as a historic district, at least seventy-five (75%) percent of the building in the proposed district (excluding accessory building) must be at least fifty (50) years old or otherwise meet the requirement of Section 10-4.302. In addition, no more than twenty-five (25%) percent of the buildings in the proposed district (excluding accessory buildings) may be noncontributing. Preservation Commission determines them to be essential to the geographic integrity of the district. The Preservation Commission shall make determinations identifying any noncontributing buildings within a historic district as part of the review process.

(§ 2, Ord. 2554 c.s., eff. August 31, 1989)

10-4.312 Use of California Historical Building Code.

All repairs, alterations, restorations, or changes in use of existing buildings and structures designated as landmarks or included as part of a historic district, or otherwise considered a historic resource under state law, may confirm to the standards of the California Historical Building Code as an alternative to complying with building standards as set forth in Title 9 of this Code, notwithstanding the fact that such buildings may ne nonconforming.

(§ 2, Ord. 2554 c.s., eff. August 31, 1989, as amended by §§ 6, 7, Ord. 2933 c.s., eff. June 3, 2004)

10-4.314 Adaptive reuse.

A Historic Overlay Zone (H) may be created pursuant to Section 10-2.1400-1420 of the Zoning Ordinance and Section 5.1400-1420 of the Coastal Plan Implementing Ordinance. An H zone may contain development standards, uses (including adaptive re-uses), and other provisions that are unique to the zone.

(§ 8, Ord. 2933 c.s., eff. June 3, 2004

ARTICLE 4. CERTIFICATE OF APPROPRIATENESS REQUIRED

10-4.401 Actions requiring certificate of appropriateness.

a) For landmarks or properties within a historic district, no person shall alter, restore, demolish, remove, or relocate an exterior improvement or architectural feature that is either a contributing characteristic of the resource or visible from any public right-of-way; or alter, restore, place, erect, remove, or relocate any permanent sign visible from a public right-of-way; or alter, restore, place, erect, remove, or relocate any interior characteristic that was identified as contributing during the designation without being granted a certificate of appropriateness, except as provided under Article 7 of this chapter. Approval of such work shall be required even if no other permits or entitlements are required by the City.

b) For potential historic resources, no person shall demolish, remove, or relocate any exterior improvement or architectural feature that is either a contributing characteristic of the resource or visible from any public right-of-way without being granted a certificate of appropriateness, except as provided under Article 7 of this chapter. Approval of such wok shall be required even if no other permits or entitlements are required by the City.

c) **Minor alterations**. The Commission may, by resolution, adopt a list of those types of alterations that are subject to approval of a certificate of appropriateness that are deemed to be "minor" in nature. The Commission may modify the list of minor alterations from time to time by resolution as circumstances warrant. Applications for certificates of appropriateness involving only minor alterations shall be reviewed pursuant to procedures in Section 10-4.402(e).

(§ 2, Ord. 2554 c.s., eff. August 31, 1989, as amended by § 3, Ord. 2740 c.s., eff. March 23, 1995, and § 9, Ord. 2933 c.s., eff. June 3, 2004).

10-4.403 Criteria for approval of certificates of appropriateness for other than demolition or removal.

The Minor Alterations Subcommittee, Commission, or the City Council upon appeal, shall issue certificate appropriateness only when it determines the following conditions to exist as applicable in each case:

a) In the case of a landmark, the proposed work (other than demolition or removal):
    1) Conforms to the prescriptive standards adopted by the Commission; and
    2) Will not detrimentally alter, destroy or adversely affect any exterior improvement or exterior architectural feature; and
    3) Will retain the essential elements that make the resource significant.

b) In the case of all properties located within a historic district, the proposed work (other than demolition or removal):
    1) Conforms to the prescriptive standards adopted by the Commission; and
    2) Will not adversely affect the character of the district.

c) In the case of properties supporting contributing buildings within a historic district, the proposed work (other than demolition or removal):
    1) Will not detrimentally alter, destroy, or adversely affect any exterior improvement or exterior architectural feature; and
    2) Will retain the essential elements that make the resource significant.
d) In the case of construction of a new building, structure, or improvement on a site where a landmark is located or on a property within a historic district:
    1) The exterior of such improvements will not adversely affect and will be compatible with the external appearance of the existing designated improvements, buildings and structures on such site or within such district.
e) In the case where the applicant has requested consideration for approval on the basis of economic hardship:
    1) It is not feasible to remove the resource to another site or otherwise preserve it; and
    2) The denial of the proposed work will work an immediate and substantial hardship on the applicant because of condition peculiar to the particular improvement; and
    3) The property cannot be put to a reasonable use or the owner cannot obtain a reasonable economic return therefrom without approval of the proposed work.

(§ 2, Ord. 2554 c.s., eff. August 31, 1989, as amended by § 5, Ord. 2740 c.s., eff. March 23, 1995, and §§ 12, 13, Ord. 2933 c.s., eff. June 3, 2004)

10-4.404 Certificate of appropriateness for removal or demolition.

a) **Discretionary review of demolition permits.** The demolition of a historic landmark, buildings in a historic district, or potential historic resource as described by this chapter is considered to be a discretionary permit and subject to the California Environmental Quality Act (CEQA) and Permit Streamlining Act. Therefore, a demolition permit shall not be issued pursuant to Title 9, Chapter 17, until the requirements of Article 4 herein have been met.
b) D**emolition review and conditions.**
    1) The demolition of a landmark, structure located within a historic district, or potential historic resource shall be referred to the Preservation Commission for review and conditions.
    2) Where appropriate, the Commission may require that a memorial of the resources be incorporated into the proposed redevelopment of the site. Some examples are a photographic display, a book or pamphlet, and exhibit, re-use of original fixtures, and other methods deemed appropriate by the Commission.
c) Concurrent processing of demolition permits and replacement plans.
    1) No permit to wholly or partially demolish, remove or relocate a historic landmark, building in a historic district, or potential historic resource shall be considered

unless accompanied by complete application for approvals necessary for the proposed new construction on the site.

2) A demolition permit may not be issued until the building permit for the replacement structure is issued.
3) Staff may refer the request for the replacement structure to the Preservation Commission for advisory direction.
4) Exceptions may be granted to this section when compelled by public safety due to eminent hazard as determined by the Chief Building Official.

d) Criteria for approval of certificates of appropriateness. The Commission, or the City Council upon appeal, shall issue a certificate of appropriateness only when it determines the following conditions to exist as applicable in each case:
    1) In the case of the whole or partial demolition or removal of a landmark or structure located within a historic district:
        a) The structure and/or site is a hazard to public health or safety and repairs or stabilization are not physically possible; or
        b) The site is required for a public use which will be of more benefit to the public than the historic resource, and there is no feasible alternative location for the public use; or
        c) Removal of the resource to another site is not feasible or practical; or
        d) For the building in a historic district, the proposed replacement structure will not detract from or adversely affect the character of the historic district; or
        e) For a partial demolition or removal, such action will not result in the loss of the essential elements that make the resource significant.
    2) In the case where the applicant has requested consideration for approval of whole or partial demolition or removal on the basis of economic hardship: It is not feasible to remove the resource to another site or otherwise preserve it; and
        a) It is not feasible to remove the resource to another site or otherwise preserve it; and
        b) The denial of the proposed work will work an immediate and substantial hardship on the applicant because of condition peculiar to the particular improvement; and
        c) The property cannot be put to a reasonable use or the owner cannot obtain a reasonable economic return therefrom without approval of the proposed work.

(§ 14, Ord. 2933 c.s., eff, June 3, 2004, as amended by § 1, Ord. 3102 c.s., eff. February 8, 2013)

REDONDO BEACH CITY CHARTER ARTICLE XXVII

Article XXVII requires for a public vote whenever a major change in allowable land use is proposed. Article XXVII requires that the areas of major changes in allowable land uses under

the proposed General Plan be studied relative to both the as-built conditions and the current General Plan.

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;
5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003; Scott et al. 2004).

BACKGROUND

GEOLOGICAL SETTING

The Project lies within the Los Angeles Basin, a sedimentary basin that includes the coastal plains of Los Angeles and Orange Counties and extends westwards to Catalina Island, California. This region is bounded by the Santa Ana Mountains to the east, the Santa Monica Mountains to the north, and the San Joaquin Hills to the south. The marine Los Angeles Basin began to develop in the early Miocene, about 23 million years ago. Through time the basin transitioned to terrestrial deposition by the middle Pleistocene, about 1 million years ago.

The area is part of the coastal section of the northernmost Peninsular Range Geomorphic Province and is characterized by elongated northwest-trending mountain ridges separated by sediment-floored valleys (Figure 4). Subparallel faults branching off from the San Andreas Fault to the east create the local mountains and hills. The Peninsular Ranges Geomorphic Province is located in the southwestern corner of California and is bounded by the Transverse Ranges Geomorphic Province to the north and the Colorado Desert Geomorphic Province to the east (Wagner 2002).

STRATIGRAPHY

The Project is mapped as Pleistocene (2.58 million years ago – 11,700 years ago) sedimentary deposits; middle to late Pleistocene (774,000 – 11,700 years ago) old eolian deposits and old alluvium, undivided; and late Holocene (less than 4,200 years ago) unconsolidated shelf sediments, eolian deposits, beach deposits, and artificial fill (Saucedo et al. 2016).

Pleistocene sedimentary deposits, Pleistocene
Primarily deposits of unconsolidated sand near to the shore along the continental shelf (Saucedo et al. 2016).

Old eolian deposits, middle to late Pleistocene
The old eolian deposits consist of well sorted fine to coarse grained silty sand. These deposits are very dense but are poorly consolidated (Saucedo et al. 2016).

Old alluvium, undivided; middle to late Pleistocene
These fluvial and flood plain deposits consist of layered poorly sorted, moderately well-indurated, slightly dissected, gravels to clays. The sediments were deposited by streams and rivers on canyon floors and in the flat flood plains of the area (Saucedo et al. 2016).

Unconsolidated shelf sediments, late Holocene
These unconsolidated shelf sediments originate on the continental shelf sediments consist of primarily loose silt and sand (Saucedo et al. 2016).

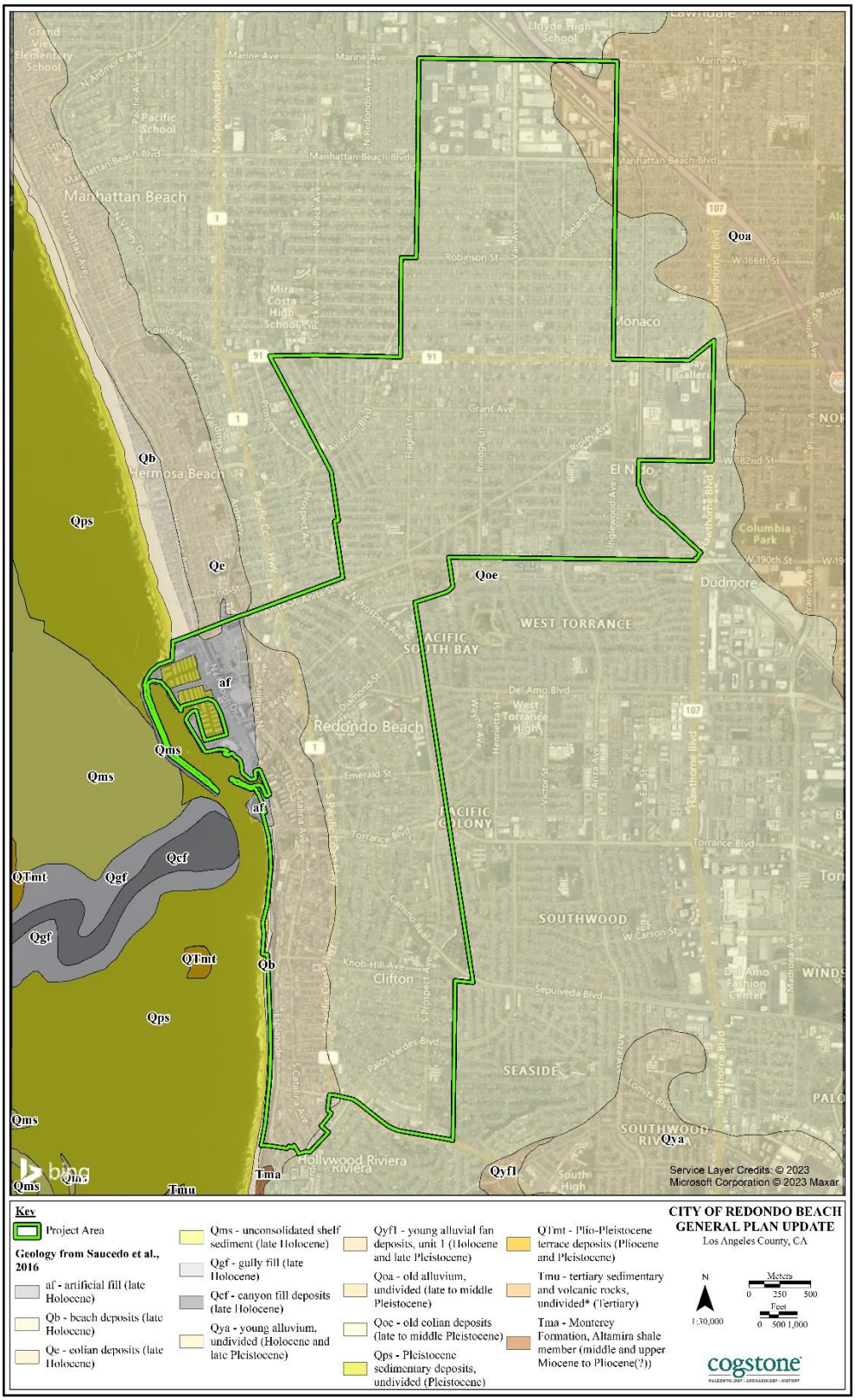

Figure 4. Project geology map

Eolian deposits, late Holocene
The eolian deposits consist primarily of unconsolidated sand. Sand is fine to medium grained and very well sorted. Grades into older deposits (Saucedo et al. 2016).

Beach deposits, late Holocene
Beach deposits consist of unconsolidated sand. These deposits are well sorted and fine to coarse grained. Some areas may contain talus (Saucedo et al. 2016).

Artificial fill, late Holocene
The artificial fill deposits result from human construction activities, quarrying, or mining. These deposits included non-compacted and compacted engineered fill and non-engineered fill. Only large deposits are mapped, but in other areas artificial fill may not be shown but may still be present (Saucedo et al. 2016).

PALEONTOLOGICAL SETTING

During the past 100,000 years or so, southern California's climate has shifted from the cooler and damper conditions of the last glacial period to the warmer and dryer conditions of the Holocene interglacial. While continental ice sheets covered the interior of northern North America, southern California was ice free.

Fossils of Monterey cypress (*Hesperocyparis macrocarpa*), Monterey pine (*Pinus radiata*), and Torrey pine (*Pinus* sp. cf. *P. torreyana*) have been found in middle to late Pleistocene deposits in the Wilshire District of Los Angeles (Scott et al. 2014). Fossils of Monterey cypress are also known from middle to late Pleistocene deposits in Costa Mesa, California and the late Pleistocene Rancho la Brea asphalt seeps of the Wilshire District of Los Angeles (Axelrod and Govean 1996; Stock and Harris 1992). Today the most restricted conifers (Monterey cypress and Torrey pine) only inhabit locations on the coasts with cool, moist summers characterized by abundant sea fog. These locations experience a mean summer high temperature of 70ºF - 83ºF (21.1C - 28.3C). Winters are cool and damp with average precipitation of 10.59" - 32.41" (26.90cm - 82.32cm). Cold water upwellings due to submarine canyons adjacent to the shore near the relict populations create these conditions (Intellicast 2014; Weather Channel 2014).

ENVIRONMENTAL SETTING

Located in Los Angeles County, the City is situated approximately 16 miles south-southwest of downtown Los Angeles. The Los Angeles River lays approximately 11.5 miles to the east, and the City has over a mile and a half of beach front.

The current Mediterranean-like climate is characterized by warm, dry summers and cool, moist winters, with rainfall predominantly falling between November and May. Mild breezes reach the area from the Pacific Ocean, located west of the Project Area.

Prior to development, the native vegetation of the Project Area consisted of California coastal sage scrub. Typical species include California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis* var. *consanguinea*), California buckwheat (*Eriogonum fasciculatum*), lemonade berry (*Rhus integrifolia*), poison oak (*Toxicodendron diversiloba*), purple sage (*Salvia leucophylla*), and black sage (*Salvia mellifera*; Ornduff et al. 2003). Additional common species include brittlebush (*Encelia californica*), chamise (*Adenostoma fasciculatum*), white sage (*Salvia apiana*), Our Lord's candle (*Hesperoyucca whipplei*), and prickly pear cactus (*Opuntia*; Hall 2007).

Large native land mammals of the region included mule deer (*Odocoileus hemionus*), bighorn sheep ([1]‡*Ovis canadensis*), tule elk (‡*Cervus canadensis nannodes*), pronghorn (‡*Antilocapra americana*), bison (‡*Bison bison*), bobcat (‡*Lynx rufus*), mountain lion (‡*Felis concolor*), jaguar (‡*Panthera onca*), coyote (*Canis latrans*), grey wolf (‡*Canis lupus*), black and grizzly bears (‡*Ursus americanus,* ‡*Ursus arctos*). Smaller native fauna included rabbits (‡Lepus californicus, Sylvilagus audubonii, ‡Sylvilagus bachmani), desert tortoise (‡*Gopherus agassizii*), and numerous other species (California Department of Fish and Game 2020).

Today, after approximately a century of urban and suburban development, the vegetation of the area is instead typified by imported species. Grasses such as slender wild oat (*Avena barbata*), ripgut brome (*Bromus diandrus*), and giant reed (*Arundo donax*); shrubs and trees including blackwood acacia (*Acacia melanoxylon*), saltcedar (*Tamarix ramosissima*), eucalyptus (*Eucalyptus* spp.), and Brazilian pepper (*Schinus terebinthifolius*) are common (Cal-IPC 2006). In recent history, urban development has driven most animals from the area, although mule deer, bobcat, and coyotes still occur in the surrounding hills.

PREHISTORIC SETTING

Approaches to prehistoric frameworks have changed over the past half century from being based on material attributes to radiocarbon chronologies to association with cultural traditions. Archaeologists defined a material complex consisting of an abundance of milling stones (for grinding food items) with few projectile points or vertebrate faunal remains dating from about 7 to 3 thousand years before the present as the "Millingstone Horizon" (Wallace 1955). Later, the "Millingstone Horizon" was redefined as a cultural tradition named the Encinitas Tradition (Warren 1968) with various regional expressions including Topanga and La Jolla. Use by archaeologists varied as some adopted a generalized Encinitas Tradition without regional variations, some continued to use "Millingstone Horizon" and some used Middle Holocene (the time period) to indicate this observed pattern (Sutton and Gardner 2010:1-2).

Recently, it was recognized that generalized terminology is suppressing the identification of

[1] ‡ - indicates that the species has been extirpated from Southern California.

cultural, spatial, and temporal variation and the movement of peoples throughout space and time. These factors are critical to understanding adaptation and change (Sutton and Gardner 2010:1-2). The Encinitas Tradition characteristics are abundant metates and manos, crudely made core and flake tools, bone tools, shell ornaments, very few projectile points with subsistence focusing on collecting (plants, shellfish, etc.; Sutton and Gardner 2010:7). Faunal remains vary by location but include shellfish, land animals, marine mammals, and fish.

The Encinitas Tradition is currently redefined as comprising four geographical patterns (Sutton and Gardner 2010:8-25). These are (1) Topanga in coastal Los Angeles and Orange counties, (2) La Jolla in coastal San Diego County, (3) Greven Knoll in inland San Bernardino, Riverside, Orange, and Los Angeles counties, and (4) Pauma in inland San Diego County.

About 3,500 years before present the Encinitas Tradition was replaced in the greater Los Angeles Basin by the Del Rey Tradition (Sutton 2010). This tradition has been generally assigned to the Intermediate and Late Prehistoric periods. The changes that initiated the beginning of the Intermediate Period include new settlement patterns, economic foci, and artifact types that coincided with the arrival of a biologically distinctive population. The Intermediate and Late Prehistoric periods have not been well-defined. Many archaeologists have proposed, however, that the beginning of the Intermediate marked the arrival of Takic-speaking groups (from the Mojave Desert, southern Sierra Nevada, and San Joaquin Valley) and that the Late Prehistoric Period reflected Shoshonean groups (from the Great Basin). Related cultural and biological changes occurred on the southern Channel Islands about 300 years later.

As defined by Sutton (2010), the Del Rey Tradition replaces usage of the Intermediate and Late Prehistoric designations for both the southern California mainland and the southern Channel Islands. Within the Del Rey Tradition are two regional patterns named Angeles and Island. The Del Rey Tradition represents the arrival, divergence, and development of the Gabrielino in southern California.

PREHISTORIC CHRONOLOGY

The latest cultural revisions for the Project Area define traits for time phases of the Topanga pattern of the Encinitas Tradition applicable to coastal Los Angeles and Orange counties (Sutton and Gardner 2010; Table 2). This pattern is replaced in the Project Area by the Angeles pattern of the Del Rey Tradition later in time (Sutton 2010).

Table 2. Cultural Patterns and Phases

Phase	Dates BP	Material Culture	Other Traits
Topanga I	8,500 to 5,000	Abundant manos and metates, many core tools and scrapers, few but large points, charmstones, cogged stones, early discoidals, faunal remains rare	Shellfish and hunting important, secondary burials under metate cairns (some with long bones only), some extended inhumations, no cremations
Topanga II	5,000 to 3,500	Abundant but decreasing manos and metates, adoption of mortars and pestles, smaller points, cogged stones, late discoidals, fewer scraper planes and core tools, some stone balls and charmstones	Shellfish important, addition of acorns, reburial of long bones only, addition of flexed inhumations (some beneath metate cairns), cremations rare
Topanga III	3,500 to 1,000	Abundant but decreasing manos and metates, increasing use of mortars and pestles, wider variety of small projectile points, stone-lined ovens	Hunting and gathering important, flexed inhumations (some under rock cairns), cremations rare, possible subsistence focus on yucca/agave
Angeles IV	1,000 to 800	Cottonwood arrow points for arrows appear, Olivella cupped beads and Mytilus shell disks appear, some imported pottery appears, possible appearance of ceramic pipes	Changes in settlement pattern to fewer but larger permanent villages, flexed primary inhumations, cremations uncommon
Angeles V	800 to 450	Artifact abundance and size increases, steatite trade from islands increases, larger and more elaborate effigies	Development of mainland dialect of Gabrielino, settlement in open grasslands, exploitation of marine resources declined and use of small seeds increased, flexed primary inhumations, cremations uncommon
Angeles VI	450 to 150	Addition of locally made pottery, metal needle-drilled Olivella beads, addition of Euro-American material culture (glass beads and metal tools)	Use of domesticated animals, flexed primary inhumations continue, some cremations

Topanga Pattern groups were relatively small and highly mobile. Sites known are temporary campsites, not villages and tend to be along the coast in wetlands, bays, coastal plains, near-coastal valleys, marine terraces, and mountains. The Topanga toolkit is dominated by manos and metates with projectile points scarce (Sutton and Gardner 2010:9).

In Topanga Phase I other typical characteristics were a few mortars and pestles, abundant core tools (scraper planes, choppers, and hammerstones), relatively few large, leaf-shaped projectile points, cogged stones, and early discoidals. Secondary inhumation under cairns was the common mortuary practice. In Orange County as many as 600 flexed burials were present at one site and dated 6,435 radiocarbon years before present (Sutton and Gardner 2010:9, 13).

In Topanga Phase II, flexed burials and secondary burial under cairns continued. Adoption of the mortar and pestle is a marker of this phase. Other typical artifacts include manos, metates, scrapers, core tools, discoidals, charmstones, cogged stones and an increase in the number of projectile points. In Orange County stabilization of sea level during this time period resulted in increased use of estuary, near shore, and local terrestrial food sources (Sutton and Gardner 2010:14-16).

In Topanga Phase III, there was continuing abundance of metates, manos, and core tools plus increasing amounts of mortars and pestles. More numerous and varied types of projectile points are observed along with the introduction of stone-line earthen ovens. Cooking features such as these were possibly used to bake yucca or agave. Both flexed and extended burials are known (Sutton and Gardner 2010:17).

The Angeles pattern generally is restricted to the mainland and appears to have been less technologically conservative and more ecologically diverse, with a largely terrestrial focus and greater emphases on hunting and nearshore fishing (Sutton 2010).

The Angeles IV phase is marked by new material items including Cottonwood points for arrows, Olivella cupped beads, Mytilus shell disks, birdstones (zoomorphic effigies with magico-religious properties), and trade items from the Southwest including pottery. It appears that populations increased and that there was a change in the settlement pattern to fewer but larger, permanent villages. Presence and utility of steatite vessels may have impeded the diffusion of pottery into the Los Angeles Basin. The settlement pattern altered to one of fewer and larger permanent villages. Smaller special-purpose sites continued to be used (Sutton 2010).

Angeles V components contain more and larger steatite artifacts, including larger vessels, more elaborate effigies, and comals. Settlement locations shifted from woodland to open grasslands. The exploitation of marine resources seems to have declined and use of small seeds increased. Many Gabrielino inhumations contained grave goods while cremations did not (Sutton 2010).

The Angeles VI phase reflects the ethnographic mainland Gabrielino of the post-contact period (i.e., after A.D. 1542; Sutton 2010). One of the first changes in Gabrielino culture after contact was undoubtedly population loss due to disease, coupled with resulting social and political disruption. Angeles VI material culture is essentially Angeles V augmented by a number of Euro-American tools and materials, including glass beads and metal tools such as knives and

needles (used in bead manufacture). The frequency of Euro-American material culture increased through time until it constituted the vast majority of materials used. Locally produced brownware pottery appears along with metal needle-drilled Olivella disk beads.

The ethnographic mainland Gabrielino subsistence system was based primarily on terrestrial hunting and gathering, although nearshore fish and shellfish played important roles. Sea mammals, especially whales (likely from beached carcasses), were prized. In addition, a number of European plant and animal domesticates were obtained and exploited. Ethnographically, the mainland Gabrielino practiced interment and some cremation.

ETHNOGRAPHY

The Gabrielino are considered to have been one of the wealthiest tribes and to have greatly influenced tribes they traded with (Kroeber 1976:621; Figure 5). Houses were domed, circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The best known artifacts were made of steatite and were highly prized. Many common everyday items were decorated with inlaid shell or carvings reflecting an elaborately developed artisanship (Bean and Smith 1978:542).

The main food zones utilized were marine, woodland and grassland (Bean and Smith 1978). Plant foods were, by far, the greatest part of the traditional diet at contact. Acorns were the most important single food source. Villages were located near water sources necessary for the leaching of acorns, which was a daily occurrence. Grass seeds were the next most abundant plant food used along with chia. Seeds were parched, ground, and cooked as mush in various combinations according to taste and availability. Greens and fruits were eaten raw or cooked or sometimes dried for storage. Bulbs, roots, and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were made from flowers, fruits, stems, and roots for medicinal cures as well as beverages (Bean and Smith 1978:538-540).

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks, and other birds. Most predators were avoided as food, as were tree squirrels and most reptiles. Trout and other fish were caught in the streams, while salmon were available when they ran in the larger creeks. Marine foods were extensively utilized. Sea mammals, fish, and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes. Shellfish were the most common resource, including abalone, turbans, mussels, clams, scallops, bubble shells, and others (Bean and Smith 1978:538-540).

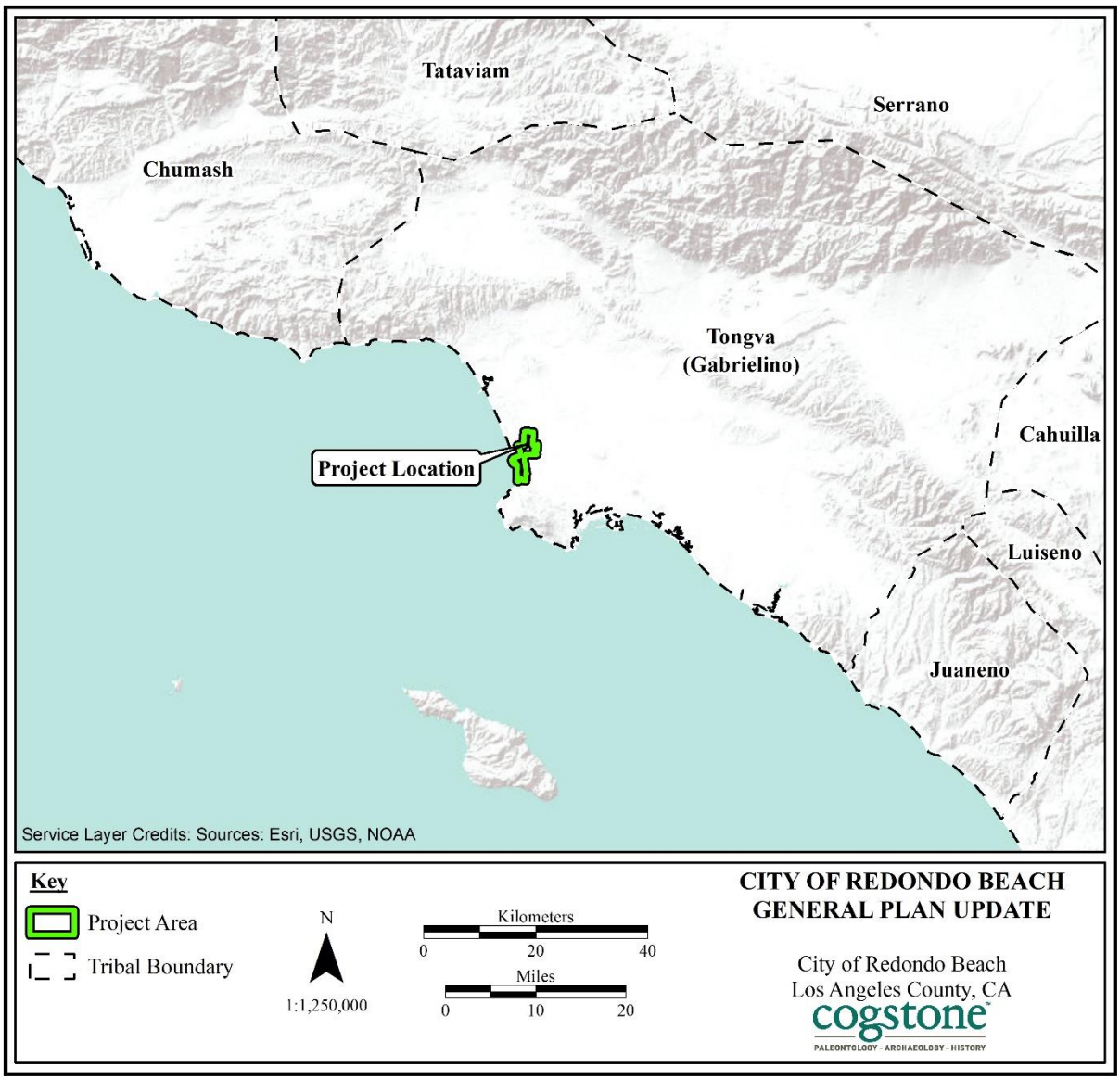

Figure 5. Tribal boundary map

The Project Area was not home to any known major villages. The closest known named villages are Tevaaxa'anga 5.9 miles east-southeast of the City and Saa'anga located 6.65 miles northwest of the City. However, smaller villages and seasonal camps may have been present closer to the Project Area.

HISTORIC SETTING

DOMINGUEZ FAMILY AND RANCHO SAN PEDRO

In 1784, then Spanish King Carlos III issued the Rancho San Pedro to Juan Jose Dominquez. As the first Spanish land grant in California, the rancho consisted of 75,000 acres as well as the entirety of Los Angeles harbor, including what is now Redondo Beach. A retired Spanish

soldier, Juan Jose Dominguez owned the Rancho until his death in 1809. The Rancho passed to Cristobal Dominguez, Juan Jose's nephew and fellow soldier within the Spanish army. In 1817, Cristobal requested the Rancho be re-granted to his name resulting the first official survey of the land. In 1825, Cristobal Dominguez died, leaving the Rancho to his 22 year old son Manuel Dominguez (the eldest son of Cristobal's eight children). After Cristobal's death, Manuel, his siblings, and their mother moved to Los Angeles and built homes on the Rancho. In 1827, Manuel married Maria Engracia de Cota, the daughter of a Los Angeles Commissioner for the Mexican government (Friends of Rancho San Pedro 2020).

After the war of Mexican Independence from Spain, the Rancho was recognized by the Mexican government as the property of the Dominguez family. In 1828, Manuel Dominguez was elected as a member of the Los Angeles City Council and then Mayor of Los Angeles in 1832. Following the signing of the treaty of Guadalupe-Hidalgo in 1848 and subsequent annexation of California to the United States, Manuel sought a United States land patent for his Rancho; the patent would not be confirmed until 1858.

In 1854, the Dominguez family sold the Old Salt Lake (approximately 215 acres) to business partners William Johnson and Henry Allanson. Johnson and Allanson then established the Pacific Salt Works as the first industry in the area (Redondo Beach Historical Museum n.d.). While traditionally used by Tongva tribes to harvest salt, the natives were forcefully moved to neighboring missions following the sale of the land. Johnson and Allanson then transformed the Old Salt Lake into a modern enterprise with the construction of boiling houses and a evaporation pond; the salt produced by these methods was exported through the Port of San Pedro. The company continued under various owners until its eventual closure in 1881.

CITY OF REDONDO BEACH

While the area's first industry ultimately failed in the early 1880s, the arrival of the Santa Fe Railroad would drastically shape the fortunes of Redondo Beach with an influx of people and capital. In 1887, Los Angeles developers Judge Charles Silent and Nathan Vail purchased 1,214 acres which would become the City's original townsite. Judge Silent and his fellow business partners Vail and Dan McFarland founded the Redondo Beach Company.

To design their new townsite, the Redondo Beach Company hired the renowned civil engineer William Hammond Hall. Most famously known as the first State Engineer of California, Hall organized the town into a grid street plan while integrating a tiered system into the coastline's geography. To invoke an aura of romanticism, Hall named streets after precious stones and Spanish words/phrases. Included in his plans was a train yard, railroad depot, lush gardens and a hotel (built in 1890 as the Hotel Redondo, demolished in 1925), a promenade along the beach, a "Y" shaped pier for boat landings, and an assembly complex known as a Chautauqua.

In 1888, the Redondo Beach Company was purchased by sea captains R.R. Thompson and J.C.

Ainsworth. Managers of a fleet of steam ships, the captains were impressed with the townsite's potential as a deep-water port (Creason 2014). The following year Thompson and Ainsworth oversaw the opening of Redondo Beach's first wharf, "Wharf No. 1." The first ship to land at the wharf was the steamer Eureka, captained by L.J. Perry who also served as one of the first superintendents of Los Angeles and Redondo Company (*The Los Angeles Times* 1911). In 1895 and 1903 Wharf No. 2 and Wharf No. 3 were constructed to support the thriving shipping trade. The large capacity and early success of the shipping industry resulted in the Santa Fe Railroad choosing Redondo Beach as its primary Los Angeles port until the early 1910s, when it was replaced by the Port of San Pedro as the official site of Los Angeles Harbor (Tearnen 1998).

In addition to its success as a trading hub, Redondo Beach was a beloved tourist destination. With Captains Ainsworth and Thompson's financial backing, the Redondo Railway Company and the Redondo Hotel Company incorporated in 1889. The railroad brought in visitors by land who could then stay at the luxurious Hotel Redondo. With a stunning view of the ocean and celebrated for its modern amenities including electricity, steam heating, elevators, large dining room, billiard room, bowling alley, and gardens, the Hotel Redondo became the summer destination for members of California's high society (Gnerre 2017).

In 1892, with a permanent population of 1,000 residents, the City of Redondo Beach was officially incorporated. In 1905, railroad investor and real estate developer Henry Huntington purchased interest in the Redondo Beach Improvement Company and also purchased the Pacific Electric Railway and Redondo Railway. The Pacific Electric Railway "Red Car" line (established by Huntington in 1901) connected Redondo Beach with the counties of Los Angeles, Orange, Riverside, and San Bernardino. Huntington also served as one of the founding partners of the Pacific Light and Electric Company which oversaw the construction of the Redondo Beach Steam Plant (Tearnen 1998).

Following years of financial trouble and multiple failed ownerships, Hotel Redondo was officially closed in 1920 and by 1926 the hotel and its ancillary building were demolished. The land was then transformed into a City Park, now Veterans Park which opened in 1930 (Gnerre 2017).

Since the construction of the city's wharfs in the late 19th and early 20th century, storms and violent waves would often damage or destroy these structures. In response, engineers constructed a breakwater in 1938-1939. However, this effort was not enough to protect the city's shoreline and in the mid-1950s the breakwater was expanded resulting in the creation of King Harbor (Krintz 2011).

In an effort to provide Redondo Beach with a more reliable source of electricity, in 1948 a new Southern California Edison steam-driven generating plant was opened. The Redondo Beach

Plant was constructed as a reaction to the state's power shortages caused by drought (*Santa Barbara News-Press* 1948). Using nearby ocean water to cool the facility's motors, excess power generated by the plant could be sold to Pacific Gas & Electric who also struggled with drought induced power shortages (Webb 1950). Cost of the new facility was estimated at $38,000,000.

In the 1950s and 1960s, industry and the city's overall population continued to grow. As part of this expansion, Redondo Beach soon attracted various aerospace companies. In the early 1960s, 70 acres were developed as the site of the new Space Technology Laboratories, Inc.; the name was later changed to TRW Systems Group of Thompson Ramo Wooldridge, Inc. (*Sioux City Journal* 1965). Designed by Albert C. Martin & Associates, this massive facility included multiple research and development laboratories, auditorium, library, administration building, and cafeteria (*The Los Angeles Times* 1961).

RECORDS SEARCHES

PALEONTOLOGICAL RECORD SEARCH

A record search of the Project was obtained from the Natural History Museum of Los Angeles County (Bell 2023; Appendix C). Additional records from the University of California Museum of Paleontology database (UCMP 2023), the PaleoBiology Database (PBDB 2023), and print sources were searched for records of fossils from the region.

No recorded paleontological localities producing vertebrate fossils were found within 1 mile of the Project Area. Fourteen localities are known from Pleistocene deposits between 6 and 10 miles and another six localities were found between 10 and 15 miles from the Project. Extinct megafaunal taxa from these sites include ground sloth (†*Megalonyx* sp.), mastodon (†*Mammut* sp.) mammoth (†*Mammuthus* sp.), dire wolf (†*Aenocyon dirus*), horse (†*Equus* sp.), dwarf pronghorn (†*Capromeryx* sp.), camel (†Camelidae), and bison (†*Bison* sp.) (Table 3). All fossils were discovered from a minimum of 5 feet deep in deposits mapped as late Pleistocene at the surface; sediments with a Holocene component at the surface produced fossils starting at 11 feet deep.

Table 3. Pleistocene vertebrate fossil localities from near to the Project Area

Common Name	Taxon	Depth below original surface	Formation mapped at surface	Age/ dates	Locality	Location	Reference
mastodon	†*Mammut* sp.	unknown	unknown	Pleistocene	LACM 3249	Lomita, general locality number for specimens without locality data within the area	Bell 2023
bison	†*Bison* sp.						
camel	†*Camelops* sp.						
llama	†*Tanupolama* sp.						
sea lion	*Eumetopias*						
ground sloth	†*Megalonyx*						
horse	†*Equus*						
tapir	†*Tapirus*						
loon	*Gavia*						
grebe	*Aechmophorus*						
Flightless sea duck	*Chendytes*						
teleost fish	*Teleostei*						
mammoth	†*Mammuthus* sp.	15 to 20 feet	older alluvium (Qoa)	late Pleistocene	LACM 1344, 3266, 3365	South Los Angeles: near I-110 and Athens on the Hill	Bell 2023, McLeod 2019, 2020
squirrel	Sciuridae						
horse	†*Equus* sp.						
pronghorn	†*Capromeryx* sp.						
western pond turtle	*Actinemys* sp.	unknown but shallow	older alluvium (Qoa)	late Pleistocene	LACM 1295, 4206	South Los Angeles: near I-110 between 112th and 113th Streets and along Imperial Hwy near Main St	Bell 2023, McLeod 2019, 2020
puffin	*Mancalla* sp.						
turkey	*Parapavo* sp.						
ground sloth	†*Paramylodon* sp.						
mammoth	†*Mammuthus* sp.						
dire wolf	†*Aenocyon dirus*						
rabbit	*Sylvilagus* sp.						
squirrel	Sciuridae						
deer mouse	*Microtus* sp.						
pocket gopher	*Thomomys* sp.						
horse	†*Equus* sp.						
elk	‡*Cervus* sp.						
diminutive pronghorn	†*Capromeryx* sp.						
bison	†*Bison* sp.						

Common Name	Taxon	Depth below original surface	Formation mapped at surface	Age/ dates	Locality	Location	Reference
mammoth	*†Mammuthus sp.*	unknown	older alluvium (Qoa)	Pleistocene	LACM 1021	Long Beach: south of I-405; near the Spring St or Cherry Ave intersection	Jefferson 1991, McLeod 2017a
bird	*Aves*						
mammoth	†*Mammuthus* sp.	10 feet	older alluvium (Qoa)	Pleistocene	LACM 1919	Dominguez Hills: west of Wilmington Ave., south of 223rd St	McLeod 2017b
sea lion	*Zalophus* sp.	less than 48 feet	young alluvium (Qya2) over older marine (Qom)	Pleistocene	LACM 1144	Long Beach: south of Anaheim St; near the Loma Vista Dr or Crystal Court intersection	McLeod 2017b
camel	†Camelidae						
bison	†*Bison* sp.						
bison	†*Bison* sp.	5 feet	older alluvium (Qoa)	Pleistocene	LACM 1163	Wilmington: west of SR 103, near the Anaheim St or Henry Ford Ave	McLeod 2017b, 2020
mammoth	†*Mammuthus* sp.	30 feet	younger alluvium (Qya2)	Pleistocene	LACM 1165	Carson: Alameda St or Sepulveda Blvd	Jefferson 1991
mammoth	†*Mammuthus* sp.	unknown	older alluvium (Qoa)	Pleistocene	LACM 1932	Long Beach: near the Spring St or Cherry Ave intersection	Jefferson 1991, McLeod 2017b
hare	*Lepus* sp.	13-16 feet deep	older alluvium (Qoa)	Pleistocene	LACM 1180, LACM 4942	Los Angeles: Manchester and Airport Blvds	McLeod 2015a, 2000
mastodon	†*Mammut* sp.						
mammoth	†*Mammuthus* sp.						
horse	†*Equus* sp.						
bison	†*Bison* sp.						
elephant relative	†Proboscidea	30 feet	older alluvium (Qoa)	Pleistocene	LACM 3319	Long Beach: east of Wilmington Ave north of Artesia Blvd	Jefferson 1991, McLeod 2000
bison	†*Bison* sp.	unknown					
mammoth	†*Mammuthus* sp.	5 feet	older alluvium (Qoa)	Pleistocene	LACM 3382	Compton: west of the I-710, east of Wilmington Ave., north of Artesia Blvd.	Jefferson 1991, McLeod 2000
mammoth	†*Mammuthus* sp.	19 feet	older marine (Qom)	Pleistocene	LACM 3660	Lakewood: south of Carson St; along Cover St between Pixie Ave or Paramount Blvd	McLeod 2017b
camel	†Camelidae	24 feet	younger alluvial fan (Qya)	Pleistocene	LACM 4129	Carson: Alameda or 223rd Streets	McLeod 2017b
indeterminate vertebrates	Vertebrata	unknown	older marine (Qom)	Pleistocene	LACM 6802	Lakewood: near Bixby Rd between Atlantic Ave or Orange Ave	McLeod 2017b
three-spine stickleback	*Gasterosteus aculeatus*	11 to 34 feet	young alluvium (Qya2)	Holocene or late Pleistocene	LACM 7701, 7702	Bell Gardens: Near the intersection of Atlantic Ave and I-710 north of the Los Angeles River	McLeod 2019
salamander	*Batrachoseps* sp.						
lizard	Lacertilia						

Common Name	Taxon	Depth below original surface	Formation mapped at surface	Age/ dates	Locality	Location	Reference
constrictor snake	Colubridae						
rabbit	*Sylvilagus* sp.						
pocket mouse	*Microtus* sp.						
harvest mouse	*Reithrodontomys* sp.						
pocket gopher	*Thomomys* sp.						
horse	†*Equus sp.*	unknown	older alluvium (Qoa)	Pleistocene	UCMP V65109	Long Beach: Signal Hill	UCMP 2023

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

Cogstone requested a search of the California Historical Resources Information System (CHRIS) from the South Central Coastal Information Center (SCCIC) located at California State University, Fullerton on August 18, 2023 which included the entire City. Results of the record search indicate that 71 previous studies have been completed within the City (Appendix D, Table D-1). Thirty-six cultural resources have been recorded within the City (Table 4, Appendix E, Table E-1).

Table 4. Redondo Beach previously recorded resources by type

Resource Type	Number
Prehistoric Archaeological Site	4
Historic Archaeological Site	1
Historic Built Environment	30
Multi-Component Site	1
Total	36

REDONDO BEACH RESOURCES LISTED IN THE NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

Redondo Beach Public Library (NRHP ID: 81000158; P-19-177601)
Location: 309 Esplanade Street.
Description: This one-story library was built in 1930 and is an exemplary representation of the Spanish Colonial Revival style with Dutch Colonial Revival features. One of the unique aspects of the library is its location within a park overlooking the Pacific Ocean. The library is one of the last remaining significant public/commercial buildings still remaining from its period of construction. This historic resource was entered into the National Register in 1981 under Criterion C (Architectural significance; Strojny 1980).

Woman's Club of Redondo Beach (NRHP ID: 84000900; P-19-177600)
Location: 400 S. Broadway
Description: Built in 1922, this one-story wood framed building is considered an excellent example of a Vernacular style bungalow. The history of the building is significant for its continuous association with the welfare and development of the community of Redondo Beach. This historic resource was added in the National Register in 1984 under Criterion A (Event-Social History) and Criterion C (Architectural significance; Loranger 1983).

Sweetser Residence[2] (NRHP ID: 85001984; P-19-177599)
Location: 417 E. Beryl Street

[2] This resource is called the "Sweetser House" in City records including the Redondo Beach Historic Resources Register (see Appendix G).

Description: Built in 1921, the two-story, single family residence is an excellent example of the American Colonial Revival style, a type of architecture which is uncommon in this area of Southern California. During the early years of Redondo Beach's development, fine homes such as the Sweetser Residence boosted the town's appearance, encouraging residential and commercial growth. This historic resource was added in the National Register in 1985 under Criterion A (Event- Community Planning and Development) and Criterion C (Architecture; McAvoy and Johnson Research Associates 1984).

Redondo Beach Original Townsite Historic District (NRHP ID: 88000970; P-19-177669)
Location: North Gertruda Avenue, Carnelian Street, North Guadalupe Avenue, and Diamond Street.
Description: The Redondo Beach Original Townsite Historic District consists of one- and two-story residential building (both single family and multi-family residences) and associated ancillary buildings (garages and sheds). Architectural styles include a variety of Craftsman bungalows, Spanish Mission revival, and Neo-Classical/Colonial Revival styles. The integrity of the district, per the 1988 NRHP District record, is moderately high. Within the boundaries of the historic district are 49 contributing buildings and 19 non-contributing buildings. The majority of homes were built within 1906-1924 in close proximity to the Pacific Electric rail lines in what is now downtown Redondo Beach. The district represents the highest concentration of intact historic buildings within the city. This historic district was added in the National Register in 1988 under Criterion A (Event-Exploration/Settlement) and Criterion C (Architectural significance; Dyan 1987).

Diamond Apartments (NRHP ID: 92000260; P-19-177541)
Location: 321 Diamond Street.
Description: This two-story Classical Revival style multi-family residence was built in 1913. While the Diamond Apartments are not an exemplary representation of an architectural style, it is considered a rare surviving example of the early commercial life of Redondo Beach. It is the second oldest commercial building in the city and retains the highest level of integrity of its contemporaries. This historic resource was entered into the National Register in 1992 under Criterion A (Event-Commerce; Dyan 1991).

CALIFORNIA HISTORIC LANDMARKS (CHL)
Old Salt Lake (Reference No. 373; P-19-186114)
Location: Historical Marker is located at the East corner of Harbor Drive and Yacht Club Way.
Description: The Old Salt Lake was used by the local Native American Tribes and early California settlers to harvest salt, an extremely important and valuable commodity. This site was designated on September 6, 1941.

OTHER SOURCES

In addition to the SCCIC records search, a variety of sources were consulted in September 2023

to obtain information regarding the cultural context of the City (Table 5). Sources included the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), Built Environment Resource Directory (BERD), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI).

Table 5. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP)	Positive (discussed above in SCCIC record search results): • Redondo Beach Public Library (NRHP ID: 81000158) • Woman's Club of Redondo Beach (NRHP ID: 84000900) • Sweetser Residence (NRHP ID: 85001984) • Redondo Beach Original Townsite Historic District (NRHP ID: 88000970) • Diamond Apartments (NRHP ID: 92000260)
California Register of Historical Resources (CRHR)	Negative
Built Environment Resource Directory (BERD)	Positive; See Appendix F
California Historical Landmarks (CHL)	Positive (discussed above in SCCIC record search results): • Old Salt Lake (Reference No. 373)
California Points of Historical Interest (CPHI)	Negative
Caltrans Historic Bridge Inventory (2016)	Negative
Bureau of Land Management (BLM) General Land Office Records	Positive; See below Table 6 below
Local Registers	City of Redondo Beach Historic Register List: Positive; see Appendix G; City of Redondo Beach Historic Inventories: Positive; see Appendix H
Historical Societies/Archives	The Redondo Beach Historical Museum was contacted on September 8, 2023 regarding information about the history of the City (Appendix I),. No response was received

Table 6. BLM General Land Office Records Results

Name(s)	Year	Accession Number	Type	T; R; Section
Antonio Ygnacio Abila	1875	CACAAA 084983 CACAAA 084983	Grant-Spanish/Mexican	T3S; R14W; Sec 20, 21, 28, 29, 31-33 T4S; R14W; Sec 6, 17 T4S; R15W; Sec 1
Jose Aquina	1858	CACAAA 084909	Grant-Spanish/Mexican	T3S; R14W; Sec 28,

Name(s)	Year	Accession Number	Type	T; R; Section
Andres Dominguez Esteban Dominguez Feliciana Dominguez Jose Dominguez Madalina Dominguez Manuel Dominguez Maria Dominguez Maria Jesus Dominguez Pedro Dominguez		CACAAA 084909		32, 33 T4S; R14W; Sec 4-8, 17, 18 T4S; R15W; Sec 1
Jose Lorebo Sepulveda	1880	CACAAA 084938	Grant-Spanish/Mexican	T4S; R14W; Sec 17-20

OTHER LISTS OF LOCALLY SIGNIFICANT PROPERTIES

In addition to the SCCIC (Appendix E) and BERD (Appendix F) record search results, locally significant properties are found on the City of Redondo Beach Historic Resources Register (Appendix G). The City also conducted historic resources inventories in 1986, 1996, and 2003. Properties rated A or B in these inventories are considered locally significant and are listed in Appendix H.

SACRED LANDS FILE SEARCH

Cogstone archaeologist Logan Freeberg submitted a Sacred Lands File (SLF) search request to the Native American Heritage Commission (NAHC) on August 18, 2022. The NAHC responded on October 3, 2023 and indicated that the search was negative for sacred lands or resources known within the same USGS Quadrangle, Township, Range, and Section as the Project Area (Appendix J).

STUDY FINDINGS AND CONCLUSIONS

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM 2016; Appendix K) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a Project Area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the study area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria

All alluvial deposits may increase or decrease in fossiliferous potential depending on how coarse the sediments are. Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm or less in diameter. Moreover, fossil preservation also greatly increases with rapid burial in flood-plains, rivers, lakes, oceans, etc. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. So the sands, silts, and clays of flood-plains, rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

The Project is mapped as Pleistocene (2.58 million years ago – 11,700 years ago) sedimentary deposits; middle to late Pleistocene (774,000 – 11,700 years ago) undivided old eolian deposits and old alluvium, undivided; and late Holocene (less than 4,200 years ago) unconsolidated shelf sediments, eolian deposits, beach deposits, and artificial fill (Saucedo et al. 2016). A records search revealed that all records of previously identified fossils from within a 10-mile radius were a minimum of five feet deep in deposits mapped as Pleistocene at the surface. Given this, sediments less than five feet below the modern surface are assigned a low potential for fossils (PFYC 2) due to the unlikelihood of fossils in a reliable stratigraphic context in these deposits. Sediments mapped at the surface as Pleistocene that are deeper than five feet below the modern surface are assigned a moderate potential for fossils (PFYC 3) due to similar deposits producing fossils at that depth near to the study area (Table 7). In those areas mapped as Holocene at the surface, Pleistocene sediments may be present at undetermined depths; wherever these sediments are encountered in an otherwise undisturbed state, they have moderate potential for fossils (PFYC 7).

Table 7. Paleontological Sensitivity Rankings

Rock Unit	PFYC rankings				
	5 very high	4 high	3 moderate	2 low	1 very low
Pleistocene sedimentary deposits, Pleistocene			Below 5 feet	Above 5 feet	
old eolian deposits, middle to late Pleistocene			Below 5 feet	Above 5 feet	
old alluvium, undivided; middle to			Below 5 feet	Above 5 feet	

late Pleistocene					
unconsolidated shelf sediments, late Holocene					X
eolian deposits, late Holocene					X
beach deposits, late Holocene					X
artificial fill, modern					X

CULTURAL RESOURCES SENSITIVITY

ARCHAEOLOGICAL SENSITIVITY

Cogstone reviewed the SCCIC record search results, the negative sacred lands file search result, and the geological formations within the City. The underlaying geology of most of the City dates to the Holocene and has the capability of preserving archaeological sites. The Late to Middle Pleistocene sediments found in the far northeast corner of the City pre-date documented human populations in the area and are considered to have low sensitivity for archaeological sites. All but one of the prehistoric archaeological sites and multi-component archaeological sites are located in the southern portion of the City near the beach. Historic-aged archaeological sites are found in most of the City but are concentrated in the southern portion. The area in the southern half of the City within one-half mile of the beach is considered highly sensitive for buried historic-aged and prehistoric archaeological deposits. All other areas of the City except the northeast corner are considered to have low to moderate sensitivity for buried historic-aged and prehistoric archaeological deposits. The sediments in the northeast corner of the City are Pleistocene-age alluvium that predate human occupation of the area and have a very low sensitivity for cultural resources.

HISTORIC BUILT ENVIRONMENT SENSITIVITY

The vast majority of the developed land in Redondo Beach was first developed prior to 1983, meaning it may contain buildings or structures that are 50 years of age or older.

There are currently three sources of data that include buildings, structures, or objects that are considered significant at the local, state, or federal level in addition to the SCCIC record search results. These are the Built Environment Resource Database entries for the City (Appendix F), the City of Redondo Beach Historic Resources Register (Appendix G), and the buildings that received and A or B grade in historic resource inventories conducted by the City in 1986, 1996, and 2003 (Appendix H).

There are five NRHP-listed historic bult environment resources and one California Historic Landmark that should be considered during planning future development. The four individually listed buildings consist of the Redondo Beach Public Library (NRHP ID: 81000158; P-19-177601; built in 1930), the Woman's Club of Redondo Beach (NRHP ID: 84000900; P-19-177600; built in 1922), Sweetser Residence (NRHP ID: 85001984; P-19-177599; built in 1921), and the Diamond Apartments (NRHP ID: 92000260; P-19-177541; built in 1913). The fifth

NHRP-listed resource is the Redondo Beach Original Townsite Historic District (NRHP ID: 88000970; P-19-177669; most elements built 1906-1924). The historic landmark is the Old Salt Lake (CHL Reference No. 373; P-19-186114; designated in 1941).

Maps showing the location and density of significant historic built environment resources (national, state, or local level) are found in Appendix J.

RECOMMENDATIONS

PALEONTOLOGICAL RESOURCES RECOMMENDATIONS

Based upon recorded fossil locality data within and near the City, Pleistocene sediments of varying lithologies, both at the surface and at depth, have potential to yield significant paleontological resources. Sediments mapped at the surface as Pleistocene that are less than five feet below the modern surface are interpreted to have low potential for fossils (PFYC 2), while Pleistocene deposits deeper than five feet have moderate potential for fossils (PFYC 3). Pleistocene fossiliferous sediments may also be present at depth. A qualified paleontologist should be retained to develop and implement a Paleontological Resources Impact Mitigation Plan, which may include development of a paleontology Worker Environmental Awareness Program (WEAP) and full-time paleontological monitoring.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified paleontologist can evaluate the find and make recommendations.

CULTURAL RESOURCES RECOMMENDATIONS

ARCHAEOLOGICAL RESOURCES

The majority of the City sits on Holocene age sediments that have the capability to preserve archaeological sites. The southern portion of the City within approximately one-half mile of the beach contains almost all of the prehistoric archaeological sites previously identified within the City and a large share of the historic and archaeological sites as well. This area is considered highly sensitive for buried archaeological deposits Cogstone recommends that City staff require applicants for future proposed ground disturbing projects in this area to either (1) provide a technical cultural resources assessment consisting of a record search, survey, background context and project specific recommendations performed by a qualified archaeologist meeting Secretary of the Interior Standards or (2) agree to full-time monitoring by an archaeologist and a Native American. If resources are known or reasonably anticipated the recommendations shall provide a detailed mitigation plan which shall require monitoring during grading and other earthmoving activities in undisturbed sediments, provide a treatment plan for potential resources that includes data to be co collected, requires professional identification, other special studies as appropriate,

requires curation at a repository for artifacts meeting significance criteria, requires a comprehensive final mitigation compliance report including a catalog of specimens with museum numbers and an appendix containing a letter from the museum stating that they are in possession of the materials.

We recommend worker environmental awareness program (WEAP) training for construction personnel conducting ground-disturbing work and their direct supervisors for the remainder of the City except the far northeast corner where the sediments are pre-date documented human populations in the area and are considered to have very low sensitivity for archaeological sites (see Figure 4).

HISTORIC BUILT ENVIRONMENT

As a large majority of the City was developed by 1973, most areas have buildings, structures, or objects that may be greater than 50 years in age. The City should take special note of the location of the four individually NRHP listed buildings, the contributing elements of NRHP listed Redondo Beach Original Townsite Historic District, and the California Historic Landmark Old Salt Lake (Appendix L, Figure L-1). Thus far, most of the other significant buildings have been recorded in the southern half of the City within approximately one mile of the beach (Appendix L, Figure L-2). Cogstone recommends that the City develop a plan to conduct historic inventories in various parts so the City can sample the variety of building, structure, and object types within the City. The evaluator should be tasked with investigating whether land adjacent to resources being recorded and evaluated may have potential for buried remains including trash pits and foundations, where possible.

Cogstone also recommends that City staff require applicants for future proposed projects with intact extant building(s) more than 45 years old to provide a historic resource technical study evaluating the significance and data potential of the resource. If significance criteria are met, detailed mitigation recommendations are required as part of the technical study. All work shall be performed by a qualified architectural historian meeting Secretary of the Interior Standards.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it. In the unlikely event that human remains are encountered during project development, all work must cease near the find immediately.

In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property

owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the vicinity of the find until all requirements of the health and safety code have been met.

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APPENDIX A. PROJECT AERIAL MAPS

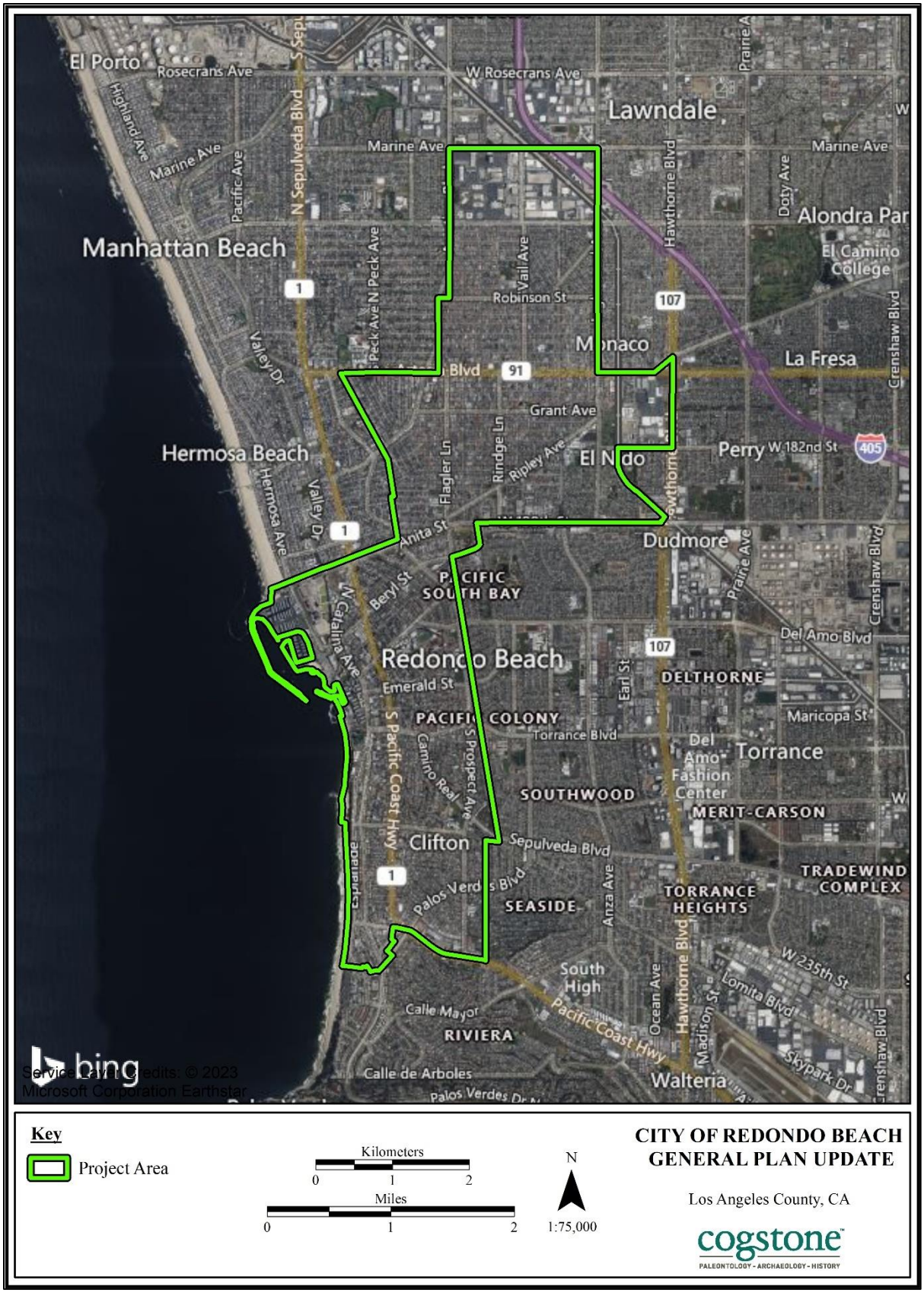


Figure A-1. Project aerial overview map

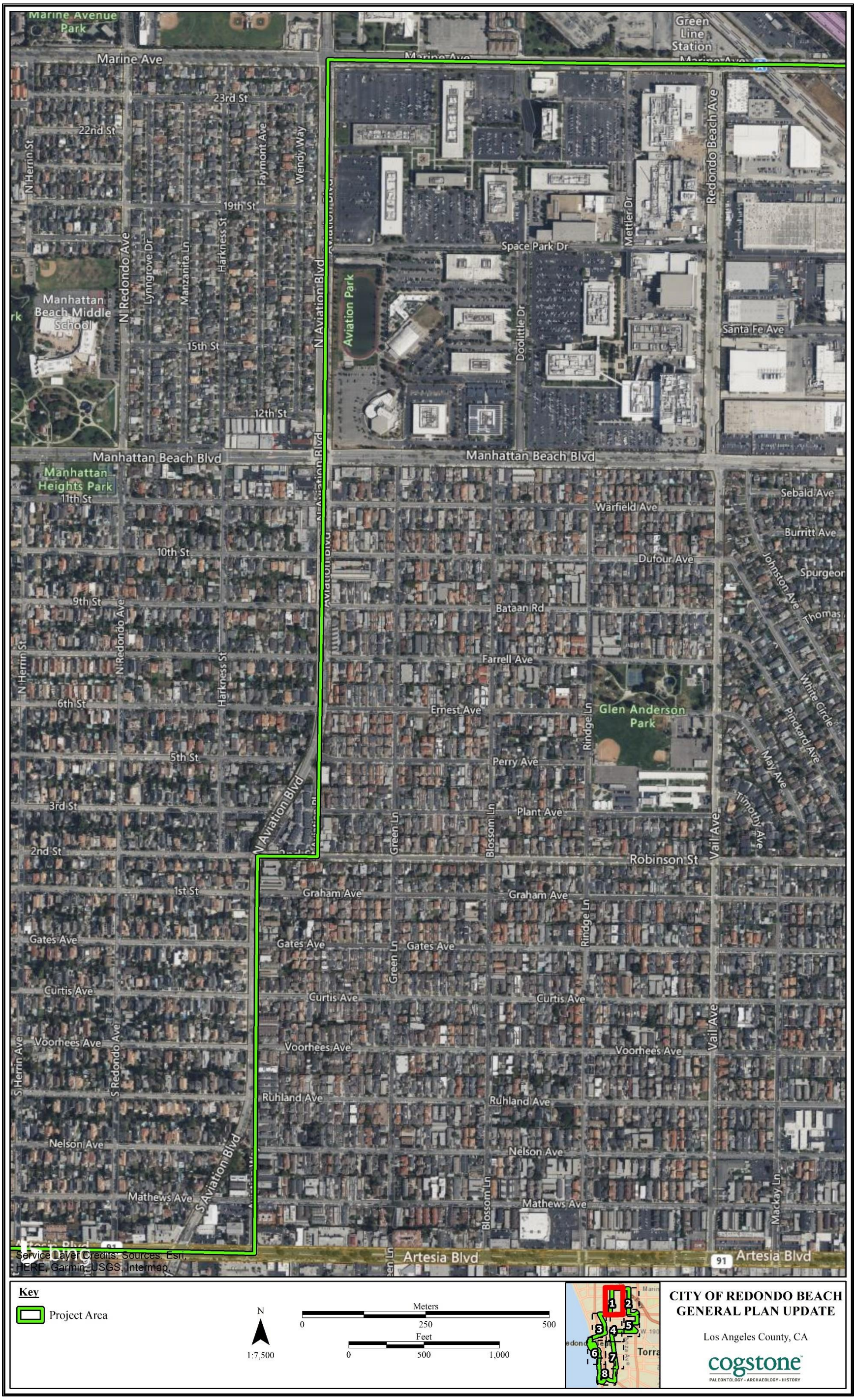
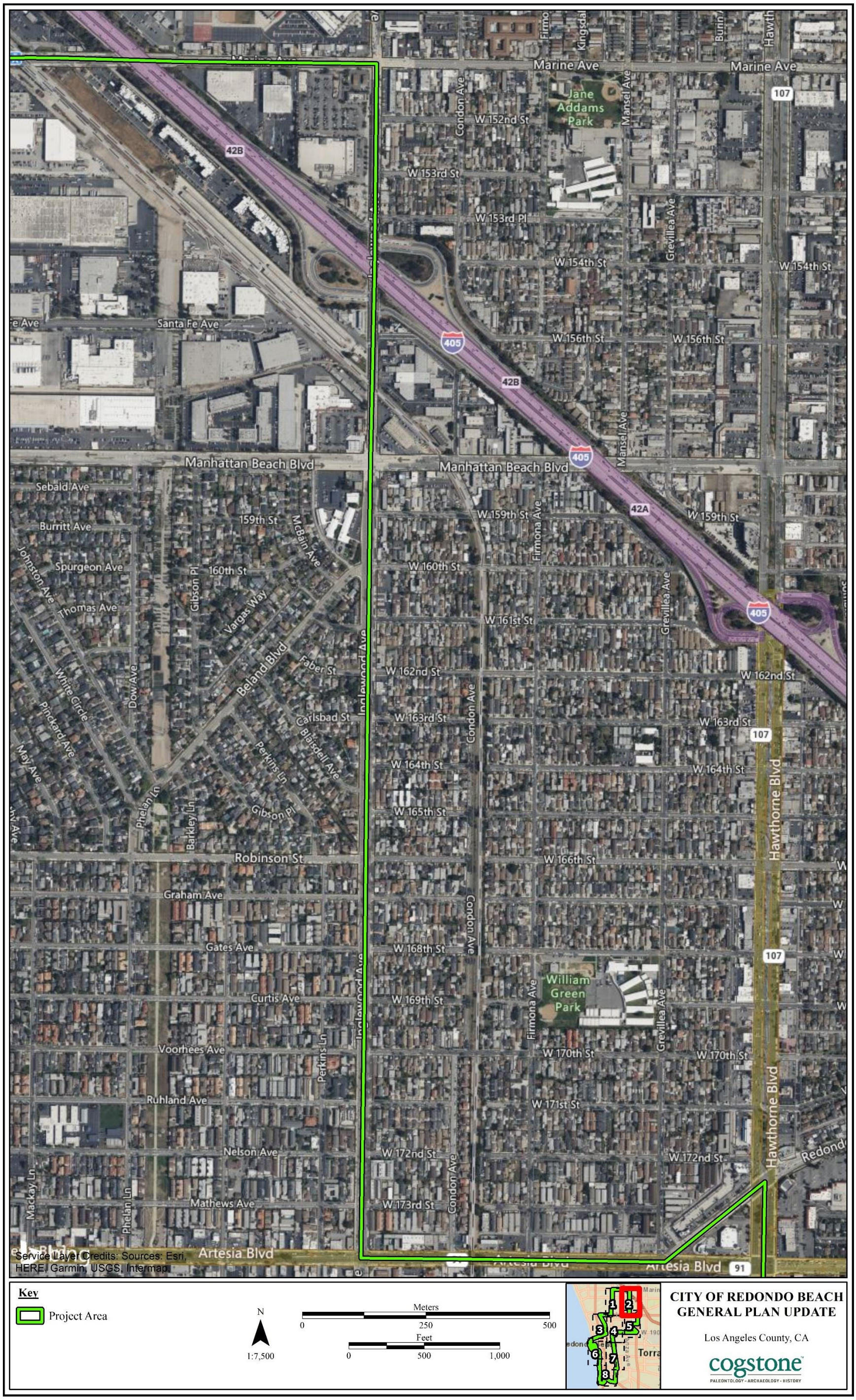


Figure A-2a. Project aerial map (1 of 8)



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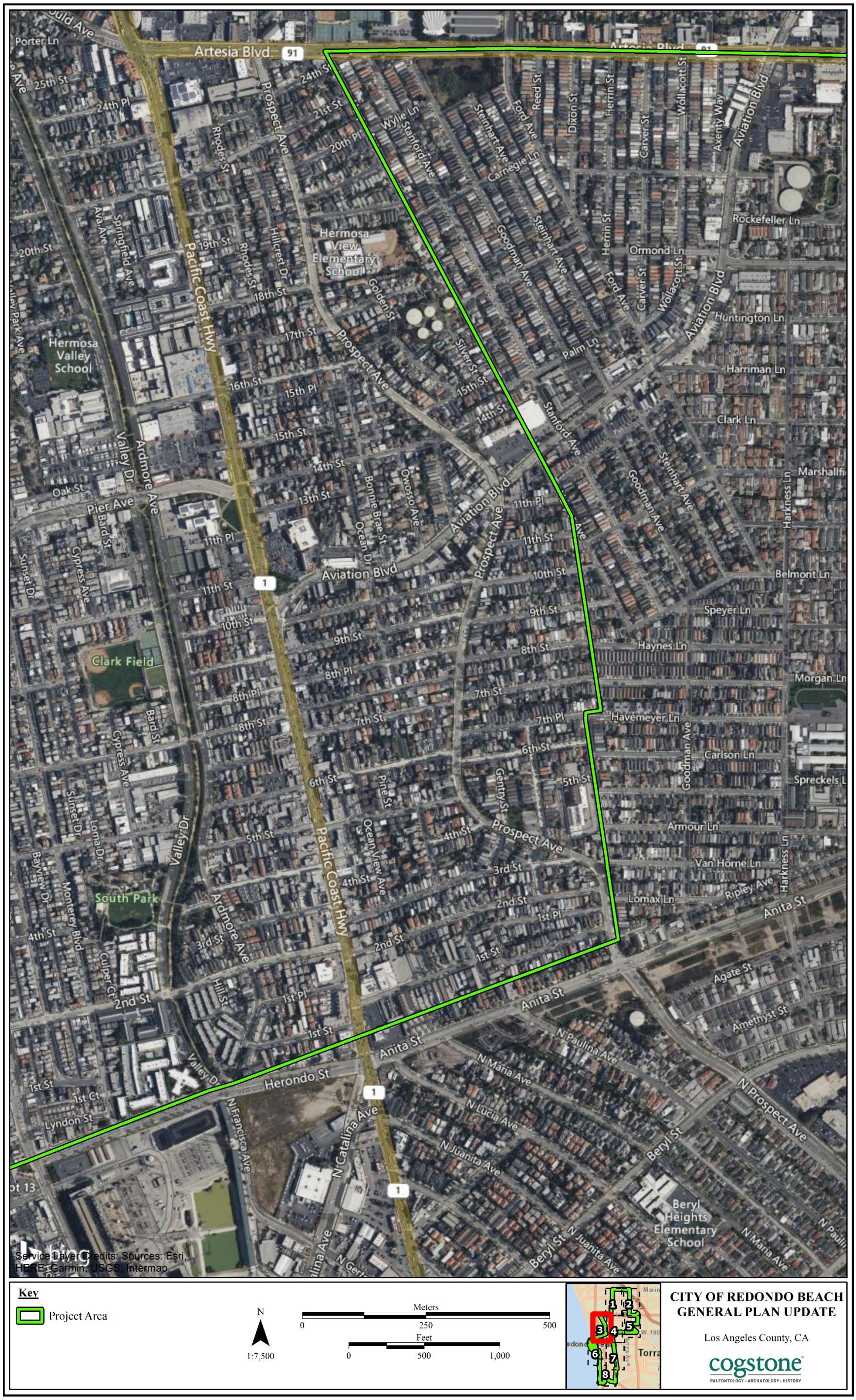

Figure A-2c. Project aerial map (3 of 8)

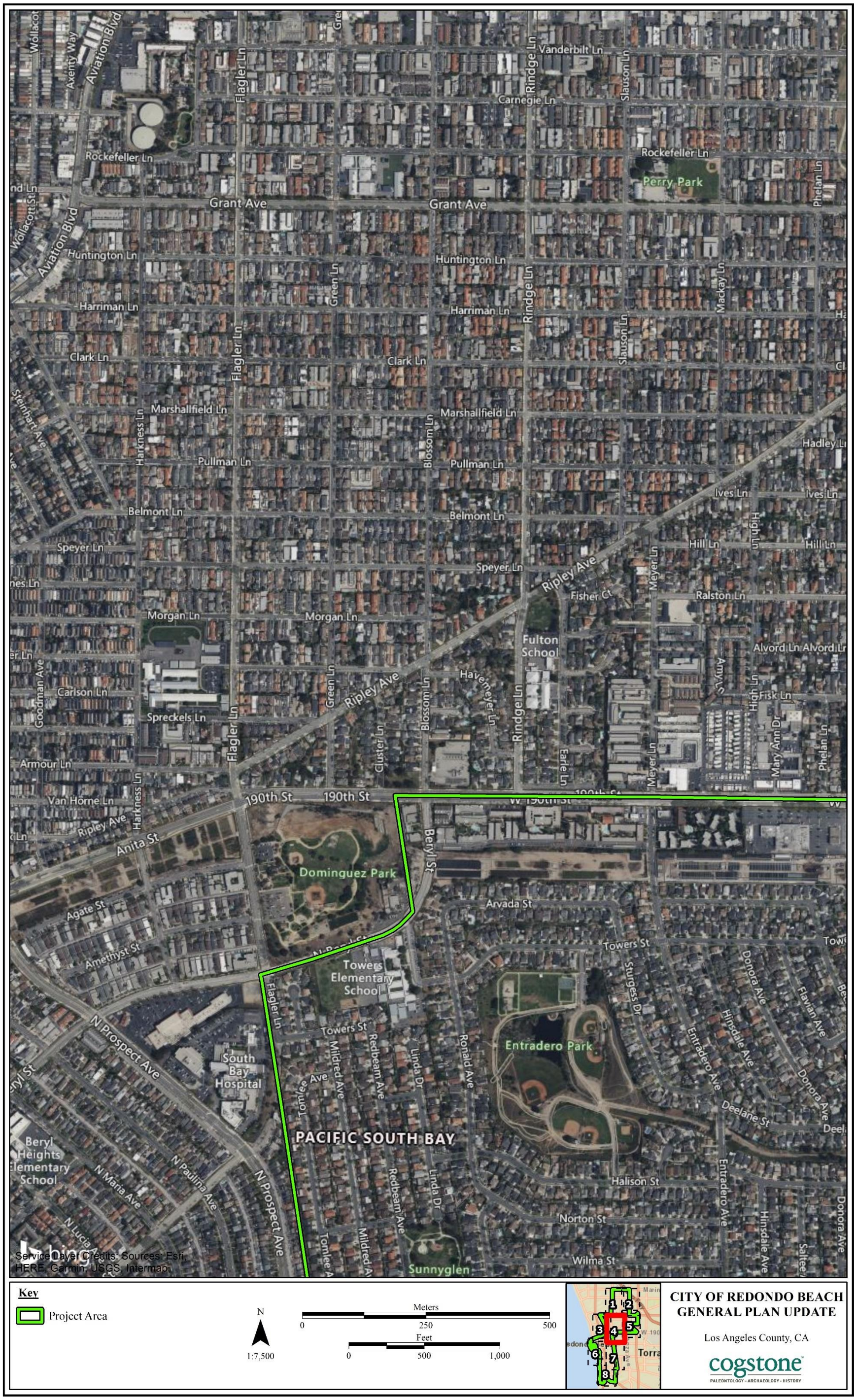

Figure A-2d. Project aerial map (4 of 8)

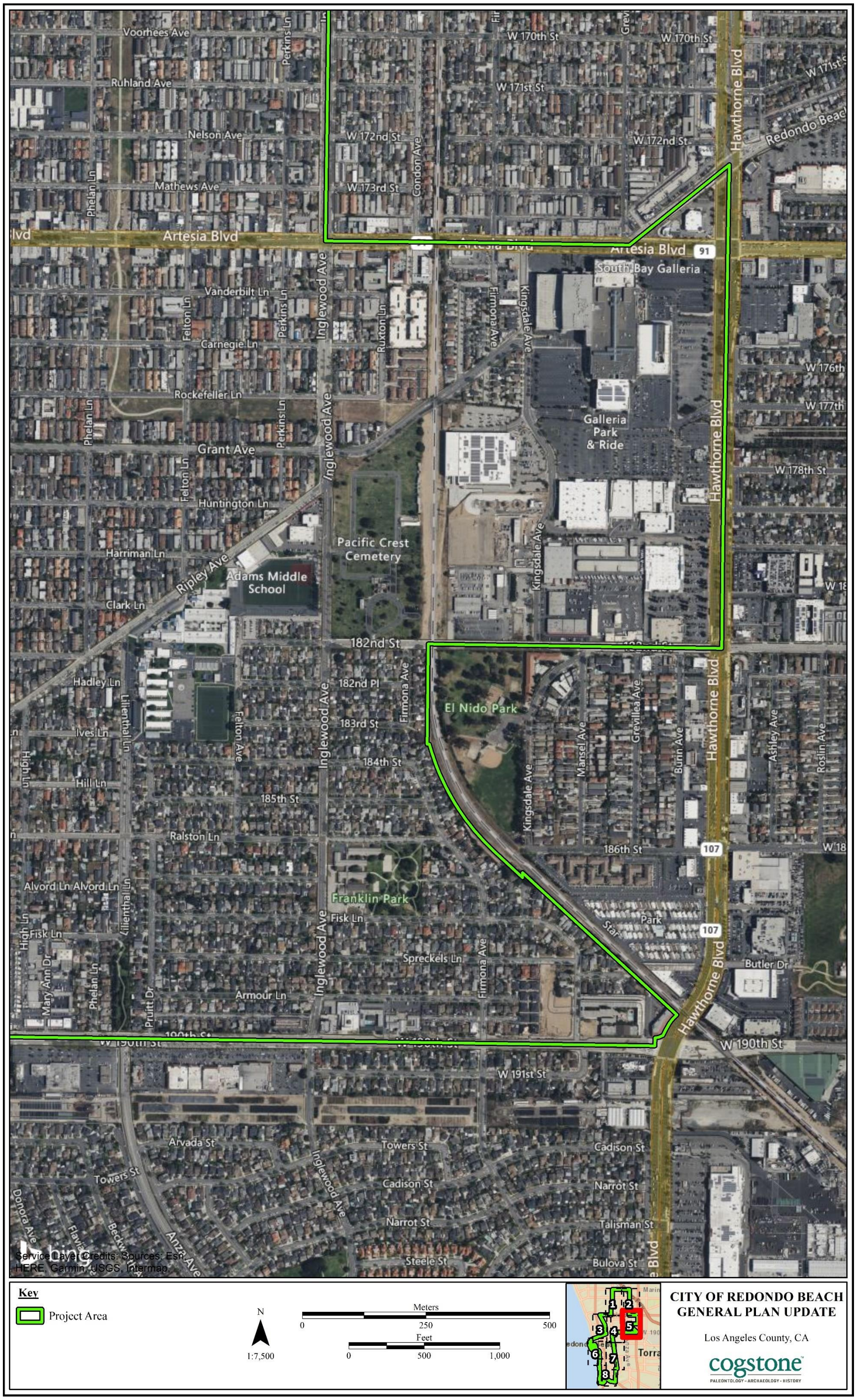

Figure A-2e. Project aerial map (5 of 8)

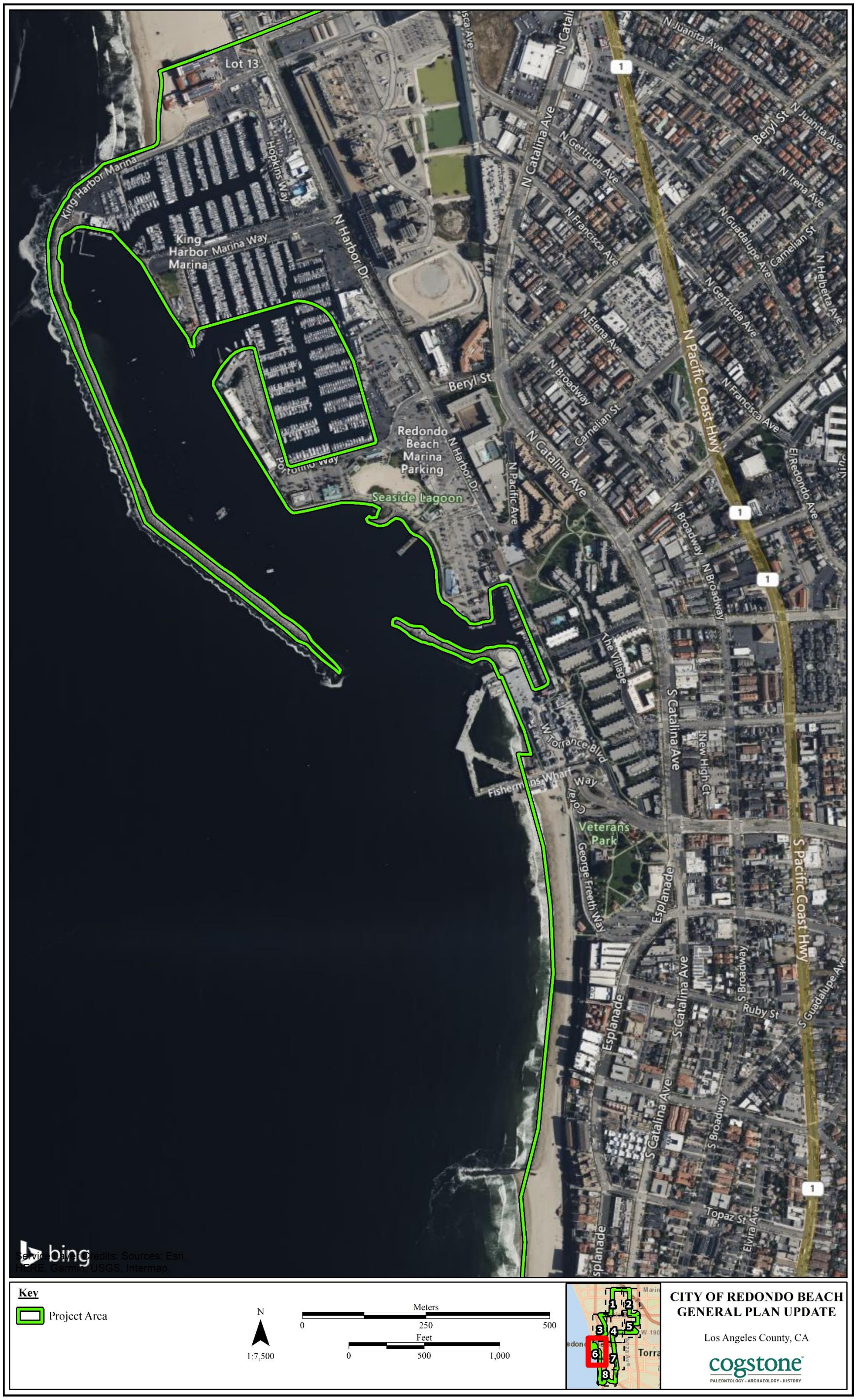

Figure A-2f. Project aerial map (6 of 8)

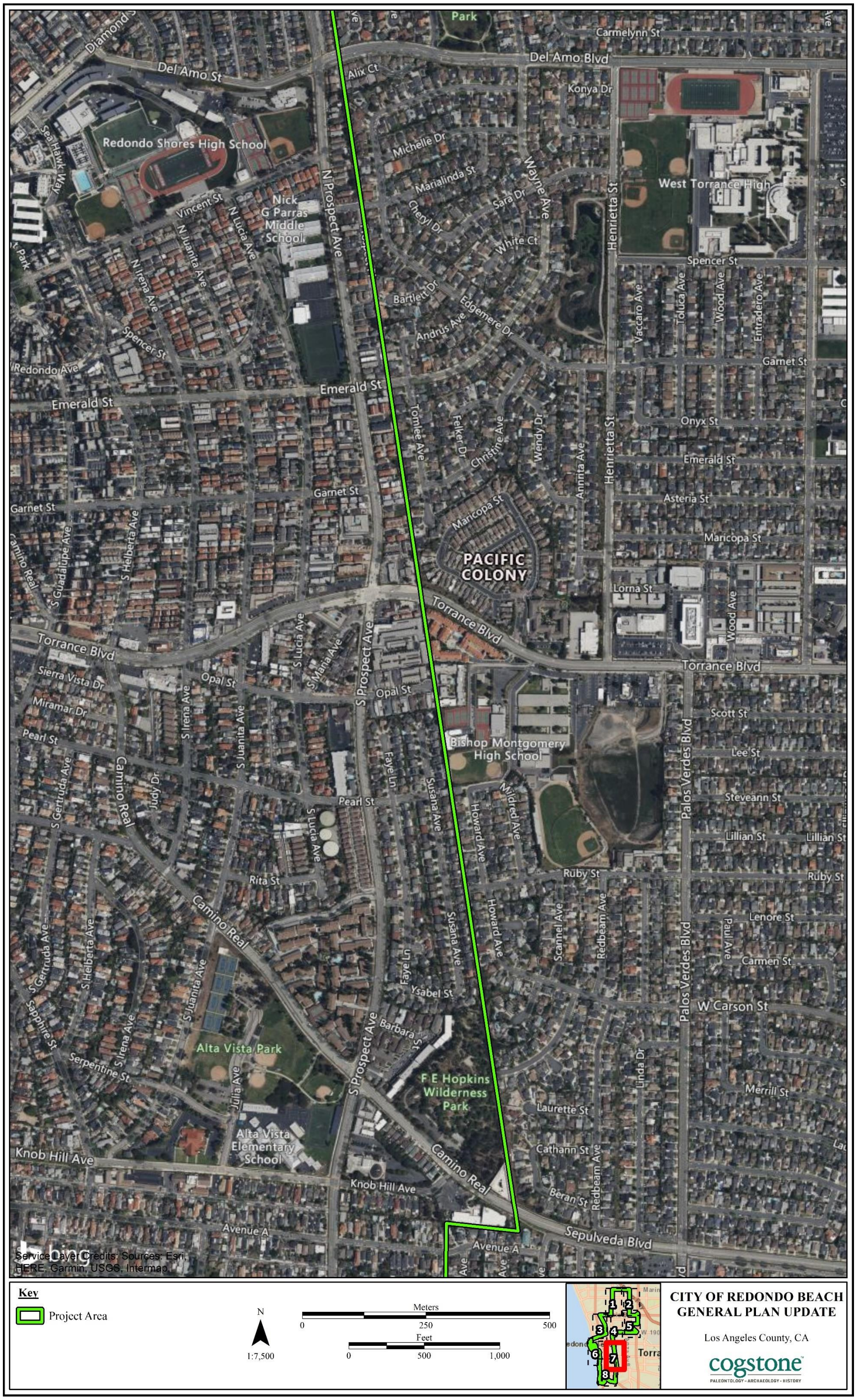

Figure A-2g. Project aerial map (7 of 8)

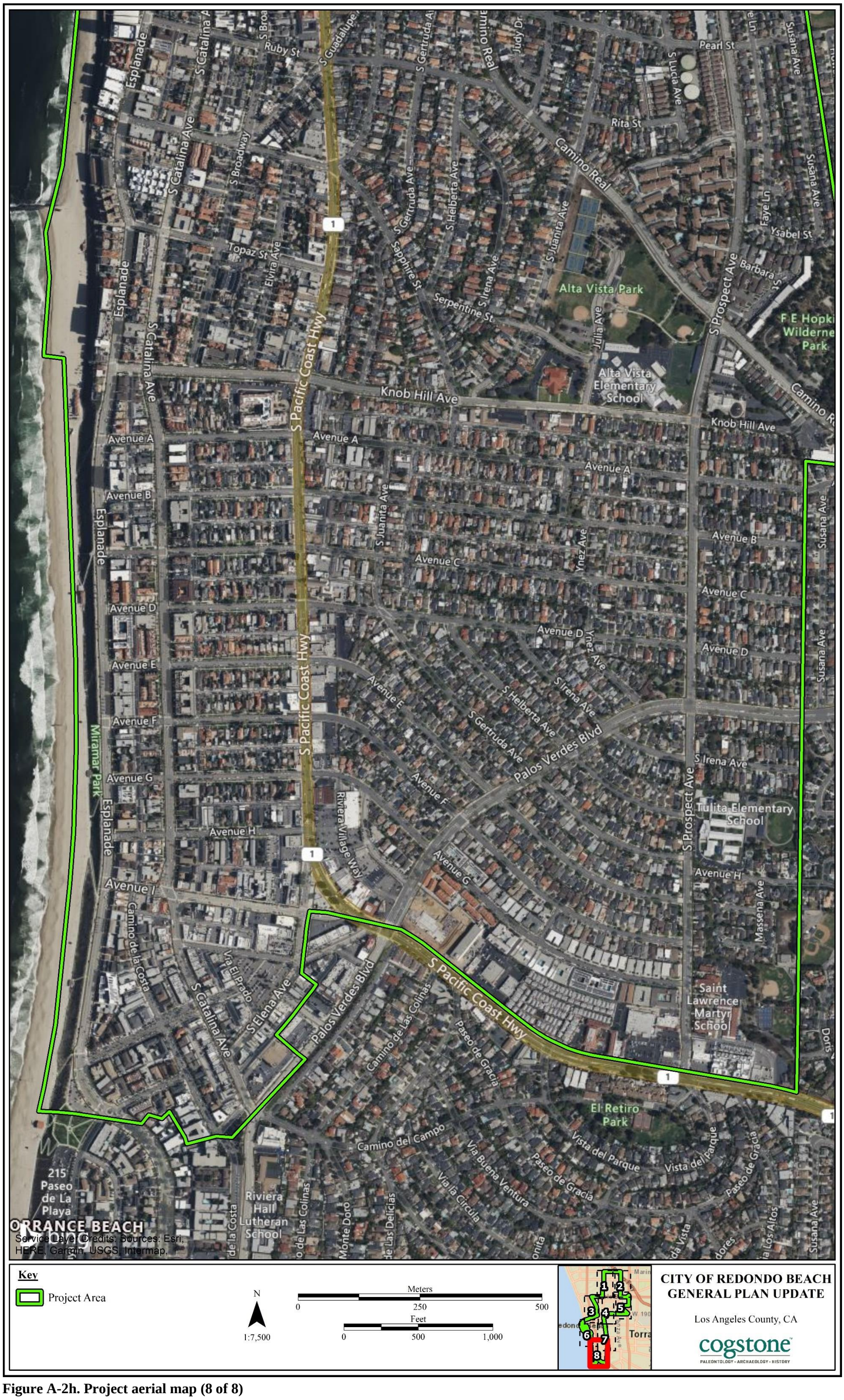

Figure A-2h. Project aerial map (8 of 8)

APPENDIX B. QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MOLLY VALASIK
QA/QC

EDUCATION

2009 M.A., Anthropology, Kent State University, Kent, Ohio
2006 B.A., Anthropology, Ohio State University, Columbus, Ohio

SUMMARY QUALIFICATIONS

Ms. Valasik is a Registered Professional Archaeologist (RPA) with more than 14 years of experience. She is a skilled professional who is well-versed in the compliance procedures of the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA) and regularly prepares cultural resources assessment reports for many federal, state, and local agencies throughout California. Ms. Valasik has managed a variety of projects at Cogstone in the water, transportation, energy, development, and federal sectors. She meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation*. She is accepted as a principal investigator for prehistoric archaeology by the State Office of Historic Preservation's Information Centers.

SELECTED EXPERIENCE

Brea 265 Specific Plan, City of Brea, Orange County, CA. The objective of this study was to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the proposed Specific Plan. This study provided environmental documentation as required by CEQA. A Paleontological Resource Impact Mitigation Program and full-time monitoring was recommended. Due to the high sensitivity for subsurface archaeological resources, a cultural resources mitigation plan and monitoring was also recommended. Sub to PlaceWorks. Project Manager and Principal Investigator for Archaeology. 2018-2019

La Verne General Plan Update, City of La Verne, Los Angeles County, CA. Cogstone reviewed and summarized available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of La Verne to support an update of the City's General Plan. Cogstone conducted archaeological and paleontological record searches, extensive historical research at City Hall, a Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC), and a general analysis of impacts of future projects within the city that may adversely affect paleontological, archaeological, or historic resources was provided along with mitigation recommendations. Sub to De Novo. Principal Investigator for Archaeology. 2018

River Street Marketplace, City of San Juan Capistrano, Orange County, CA. Cogstone conducted record searches, literature studies, and intensive archaeological and paleontological surveys to determine the potential effects to cultural and paleontological resources resulting from the construction of 64,900 square feet of proposed commercial and office space, along with associated improvements. The proposed project consisted of five buildings and was located on a 5.6-acre property occupied by the Ito Nursery which has been in operation since 1970. Sub to PlaceWorks. Principal Investigator for Archaeology. 2018

Whittier Boulevard/Three Intersection Improvements, City of Whittier, Los Angeles County, CA. Cogstone conducted intensive-level cultural resources surveys and prepared technical studies for improvements proposed for three intersections at Colima Road, Santa Fe Springs Road and Painter Avenue in a disturbed urban environment. Managed records search, Sacred Lands search, NAHC consultation, and APE mapping. Sub to Michael Baker. Principal Investigator for Archaeology. 2016-2018

Irvine General Plan Update – Phase II, City of Irvine, Orange County, CA. Cogstone conducted a study to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Irvine to support the Phase II update of the City's General Plan. A general analysis of impacts of future projects within the City of Irvine that may adversely affect paleontological, archaeological, or historic resources was provided along with mitigation recommendations. Sub to Placeworks. Principal Investigator for Archaeology. 2018-2019

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

ERIC SCOTT
Paleontology QA/QC

EDUCATION

1990 M.A., Anthropology (Biological), University of California, Los Angeles
1985 B.A., Anthropology (Physical), California State University, Northridge

SUMMARY OF QUALIFICATIONS

Mr. Scott is a professional vertebrate paleontologist with over four decades of experience in paleontological mitigation, fieldwork, curation, and research. He is an emeritus paleontology curator at the San Bernardino County Museum, an adjunct instructor at California State University, San Bernardino, and a research associate of the Natural History Museum of Los Angeles County and the La Brea Tar Pits and Museum. He is a 30+ year member of the Society of Vertebrate Paleontology, an international society of professional scientists where he currently serves on the Government Affairs Committee and also holds membership in the Geological Society of America and other professional societies. Mr. Scott has published over 40 research articles in professional scientific journals.

SELECTED EXPERIENCE

Purple Line Extension (Westside Subway), Sections 1 and 2, Metropolitan Transit Authority (METRO), Los Angeles, CA. The project involves construction of seven stations from the existing Purple Line at Wilshire/Western Avenue along Wilshire Boulevard to the Veterans Administration Hospital in Westwood for 8.6 miles. Cogstone supervises paleontological monitoring, fossil recovery, and fossil preparation in the lab. Sub to JV West (Section 1) and AECOM (Section 2). Principal Paleontologist. 2017-ongoing

Deep Soil Mixing Pilot Project, Community of Pacific Palisades, Los Angeles County, CA. As part of an on-call contract with the Los Angeles Bureau of Engineering (LABOE), Cogstone provided cultural and paleontological resources monitoring as well as managed Native American monitoring during ground-disturbing activities. The City of Los Angeles was the lead agency under the California Environmental Quality Act (CEQA). Monitoring for the Project was conducted in compliance with the Contingency Plan conditions for the Coastal Development Permit (CDP) from the California Coastal Commission (CCC). No cultural or paleontological resources were identified. No further work was necessary. Sub to ICF. Principal Investigator for Paleontology. 2020

Gates Canyon Stormwater Capture Project, unincorporated area of Calabasas, Los Angeles County, CA. Cogstone conducted cultural and paleontological resources monitoring for 31 days during proposed improvements to Gates Canyon Park that would allow the capture and storage of stormwater runoff from an adjacent 105-acre residential area. Monitoring complied with program mitigation measures and as defined by the County of Los Angeles, Department of Public Works (LACDPW). LACDPW was the project proponent and acted as the lead agency under CEQA. Sub to Aspen Environmental. Task Manager. 2019

Irvine General Plan Update – Phase II, City of Irvine, Orange County, CA. Cogstone conducted a study to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Irvine to support the Phase II update of the City's General Plan. A general analysis of impacts of future projects within the City of Irvine that may adversely affect paleontological, archaeological, or historic resources was provided along with mitigation recommendations. Sub to PlaceWorks. Paleontology QA/QC. 2018-2019

Camino de la Cumbre Project, City of Sherman Oaks, Los Angeles County, CA. Cogstone conducted a paleontological resources assessment to determine the potential for impacting fossil resources during excavations of the Camino de la Cumbre residential development project. Services included a records search, background research, pedestrian survey, and report preparation. Sub to Ridge, Inc. Task Manager. 2018

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

JOHN GUST
Principal Investigator for Archaeology

EDUCATION

2016 Ph.D., Department of Anthropology, University of California, Riverside (UCR)
2011 M.A., Department of Anthropology, UCR
2007 M.A., Applied Geography, University of Colorado, Colorado Springs (UCCS)
2002 B.A., Department of Anthropology, minor in Geography/Environmental Studies, UCCS

SUMMARY QUALIFICATIONS

Dr. Gust is a Registered Professional Archaeologist (RPA) with over 11 years of experience in field archaeology. He meets the qualifications required by the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* and his field expertise includes pedestrian surveys, excavation monitoring, resource recording, and historic artifact analysis. Dr. Gust has managed cultural assessments for over 20 cellular tower projects and multiple assessments for construction of commercial and residential structures. He has also managed cultural resources monitoring projects for both public and private sector clients. Dr. Gust is a member of the Society for California Archaeology, Society for American Archaeology, and the American Anthropological Association.

SELECTED EXPERIENCE

Dogwood Road Project, City of El Centro, Imperial County, CA. Cogstone conducted a cultural resources assessment to determine the potential effects to cultural resources resulting from the construction of United States Department of Agriculture (USDA) Part 70-B RD Funding assisted housing on a 2.2-acre parcel. Cogstone conducted a record search, pedestrian survey, and determined that no further cultural resources work was necessary. The assessment provided environmental documentation as required by Section 106 of the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA). The City of El Centro acted as the lead agency. Sub to Partner Science & Engineering, Inc. Principal Investigator for Archaeology. 2019-2020

Euclid Fueling Station Project, City of Santa Ana, Orange County, CA. Cogstone conducted a cultural resources assessment to determine the potential impacts to cultural and paleontological resources during the construction of a convenience store, associated parking, gas station, and underground fuel storage tank. The assessment was conducted to meet the requirements of CEQA with the City of Santa Ana acting as lead agency. Cogstone conducted record searches, a Sacred Lands File Search, an intensive pedestrian survey, gave mitigation recommendations, and produced a report. Sub to Sagecrest Planning + Environmental. Principal Investigator for Archaeology. 2019

Jackson St HUD 58 EA Project, City of Riverside, Riverside County, CA. Cogstone conducted a cultural resources assessment to determine the potential effects to cultural resources resulting from the construction of United States Department of Housing and Urban Development (HUD) assisted housing on a 3.58-acre parcel. This assessment provided environmental documentation as required by Section 106 of the NHPA. The City of Riverside was the lead agency. Cogstone conducted a records search, a Sacred Lands File Search, a pedestrian survey, and produced a report. Sub to Partner Science & Engineering. Principal Investigator for Archaeology and Report Author. 2019

Heathercliff Malibu Development Project, City of Malibu, Los Angeles County, CA. Cogstone conducted a study to determine the potential impacts to cultural resources resulting from the construction of a single residence bounded by Heathercliff Road to the southeast and the Pacific Coast Highway to the northwest. This study included all information required by the City of Malibu Archaeology Guidelines. Cogstone conducted a record search, Sacred Lands File Search, pedestrian survey, and produced an assessment. Sub to ACS Construction. Principal Investigator for Archaeology and Report Author. 2019

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

KIM SCOTT
Principal Investigator for Paleontology

EDUCATION

2013 M.S., Biology, with paleontology emphasis, California State University, San Bernardino
2000 B.S., Geology, with paleontology emphasis, University of California, Los Angeles

SUMMARY QUALIFICATIONS

Ms. Scott has over 28 years of experience in California as a paleontologist and sedimentary geologist. She has worked extensively in the field surveying, monitoring, and salvaging fossils on over 100 projects. In addition, she has special skills in fossil preparation (cleaning and stabilization) and in the preparation of stratigraphic sections and other documentation for fossil localities. She has written over 100 assessments and monitoring compliance reports to all agency requirements. Ms. Scott serves as company safety officer and is the author of the company safety and paleontology manuals. She is a Member of the Society of Vertebrate Paleontology and the Geological Society of America.

SELECTED PROJECTS

Irvine General Plan Update – Phase II, City of Irvine, Orange County, CA. Cogstone conducted a study to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Irvine to support the Phase II update of the City's General Plan. A general analysis of impacts of future projects within the City of Irvine that may adversely affect paleontological, archaeological, or historic resources was provided along with mitigation recommendations. Sub to Placeworks. Principal Paleontologist. 2018-2019

City of La Verne General Plan, Los Angeles County, CA. The Project was for an update to the City's General Plan, a 5,446-acre area. Provided a Paleontological and Cultural Assessment Report for the City. Sub to De Novo Planning Group. Principal Paleontologist. 2018.

Interstate 405 Paleontological Resources Mitigation Plan, Los Angeles and Orange Counties, CA. Improvements to a 6-miles of Interstate 405 (I-405) between State Route 73 and Interstate 605. Provided a Paleontological Mitigation and Monitoring Plan. Sub to OC 405 Partners. Principal Paleontologist. 2018.

Park Place Extension Project, City of El Segundo, Los Angeles County, CA. The City proposed to extend Park Place from Allied Way to Nash Street with a railroad grade separation to implement a critical Project improving traffic and circulation in the Project Area. Provided a combined Paleontological Identification and Evaluation Report. Sub to Michael Baker International. Principal Paleontologist. 2017

Lakeview Senior Housing Development, City of Anaheim, Orange County, CA. Project included the development of 149 senior apartment units: 139 market-rate units and 10 affordable units. Paleontological Assessment Report. Under contract to Placeworks. Principal Paleontologist and Report Author. 2017

State Route 57 Northbound Widening Project, Caltrans District 12/ Orange County Transportation Authority (OCTA), City of Anaheim, Orange County, CA. Caltrans widened State Route 57 between Orangewood and Katella Avenues. Paleontological Identification Report (PM 11.5/12.5; EA 0M9700). Under contract to WSP. Principal Paleontologist and Report Author. 2017

Interstate 605 and Katella Interchange Improvement Project, Caltrans District 12/ Orange County Transportation Authority (OCTA), City of Anaheim, Orange County, CA. Caltrans updated the southbound onramp to the interchange at Katella Avenue. Combined Paleontological Identification and Evaluation Report (PM 1.1/1.6; EA 0K8700). Under contract to Michael Baker International. Principal Paleontologist and Report Author. 2017

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

SHANNON LOPEZ
Architectural Historian and Co-Author

EDUCATION

2018 M.A., History (with an emphasis in architecture), California State University, Fullerton
2012 B.A., History, Minor in Asian-Pacific Studies, California State University, Dominguez Hills

SUMMARY OF QUALIFICATIONS

Ms. Lopez is a qualified historian and she meets the Secretary of the Interior's *Standards and Guidelines for Architectural History.* She is experienced in architectural history research and surveys along with photo documentation and recording of built environment resources for local and federal projects. Ms. Lopez is acknowledged as an approved Architectural Historian by Caltrans. She has extensive knowledge with Native American consultation, consultation with city and county historical societies, and analysis of primary and secondary sources. Additionally, she is an approved Reader at the Huntington Library by the Los Angeles Office of Historic Resources.

SELECTED EXPERIENCE

Los Angeles Harbor College, City of Los Angeles, Los Angeles County, CA. Cogstone conducted a study to determine the potential impacts to cultural resources for the proposed demolition, renovation, and construction at the college. Three of the buildings scheduled for demolition were considered historic in age and required evaluation under the California Environmental Quality Act (CEQA). Cogstone conducted a records search, historical society outreach, a pedestrian survey, and produced a Historic Resources Evaluation Report. Sub to PlaceWorks. Architectural Historian. 2020

Long Beach Municipal Urban Stormwater Treatment (MUST) Project, Los Angeles County, CA. In 2017, Cogstone prepared a cultural and paleontological resources assessment for the proposed construction of a stormwater facility. The project intended to improve the water quality of existing urban runoff to the Los Angeles River, and ultimately to the Long Beach Harbor. Services included pedestrian surveys, records searches, background research, built environment assessment, Native American consultation, and reporting. In 2020, Cogstone produced a Paleontological Resources Management Plan to propose effective mitigation of potential impacts to paleontological resources resulting from proposed construction of MUST and its associated Wetlands project. Sub to Michael Baker. Architectural Historian. 2020

Fresno West Area Specific Plan, City of Fresno, Fresno County, CA. Cogstone conducted a study to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the city in order to guide future growth and development. Cogstone conducted a records search and in-depth background research. Of the 82 previously recorded cultural resources, 78 were built environment. Three mitigation measures were recommended for future development. The City of Fresno acted as the lead agency under CEQA. Sub to De Novo. Architectural Historian. 2019

Purple Line Extension (Westside Subway) Crack Propagation Reassessment, City of Beverly Hills, Los Angeles County, CA. On behalf of METRO, Cogstone was approved to reassess the exterior façade of the old Porsche building located on Wilshire Boulevard. The purpose of this reassessment was to document and compare the cracks of the current building during construction of the underground subway with those recorded in a pre-construction survey. Architectural Monitor. 2018

3800 W. 6th Street Mixed-Used Development, Koreatown, Los Angeles County, CA. Cogstone conducted a paleontological and cultural resources assessment for proposed construction of a 21-story mixed-use development with two levels of underground parking. Services included records search, built environment survey, resource recording and technical report. Architectural Historian. 2018

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

SANDY DUARTE
Archaeologist and Co-Author

EDUCATION

2002 B.A., Cultural Anthropology, University of California, Santa Barbara

TRAINING AND CERTIFICATIONS

HAZWOPER Certified – Certified American Red Cross CPR; Certified American Red Cross Standard First Aid
Applied Archaeology of Southern California, USDA Forest Service, San Bernardino National Forest
Railroad Security Certified

SUMMARY OF QUALIFICATIONS

Mrs. Duarte is a skilled archaeologist with 18 years of experience in monitoring, surveying, and excavation in California. She has experience with Native American consultation as required by Section 106 of the National Historic Preservation Act (NHPA) and under Senate Bill 18 for the protection and management of cultural resources. Beginning in 2006, Mrs. Duarte worked for the U.S. Forest Service in the Biology, Timber, and Geology Department as an archaeologist, including serving as a trained wild-land firefighter to preserve archaeological sites in forest fires. Additional skills include paleontological identification, fossil preparation, artifact identification and preparation, and final report preparation.

SELECTED EXPERIENCE

Newport Village Project, City of Newport Beach, Orange County, CA. Cogstone conducted a cultural and paleontological resources assessment to determine the potential impacts to cultural and paleontological resources during proposed construction of 14 residential condominium units, 108 apartment units, and 121,370 square feet of mixed-use development. The project would also have publicly accessible waterfront promenade with 844 parking spaces in surface-level and subterranean parking. Services included records searches, pedestrian survey, Sacred Lands File search from the Native American Heritage Commission (NAHC), background research, and reporting. The City of Newport Beach acted as the lead agency under the California Environmental Quality Act (CEQA). Sub to Cox, Castle & Nicholson LLP. Archaeologist. 2019-2020

Prologis Vermont Avenue and Redondo Beach Industrial Project, City of Los Angeles, Los Angeles County, CA. Cogstone conducted a cultural and paleontological resources assessment to determine the potential impacts to cultural and paleontological resources during proposed construction of an industrial center, 223 automobile parking spaces, 32 bicycle parking spaces, 36 high truck loading positions, and parking stalls for truck trailers. Services included records searches, pedestrian survey, Sacred Lands File search from the NAHC, background research, and reporting. The City of Los Angeles acted as the lead agency under CEQA. Sub to PlaceWorks. Archaeologist. 2019-2020

Bell Gardens Water Reservoir Project, City of Bell Gardens, Los Angeles County, CA. Cogstone conducted a cultural and paleontological resources assessment to determine the potential impacts to cultural and paleontological resources during improvements which included a new two-million-gallon reservoir, booster pump station, well to be drilled, and other components. Services included record searches, Sacred Lands File search from the NAHC, and an intensive-pedestrian survey of the 1.7-acre project area. Sub to Infrastructure Engineers. Archaeologist/Co-Author. 2019-2020

Firestone Phoenix, City of Los Angeles, Los Angeles County, CA. Cogstone provided cultural resources monitoring during ground-disturbing construction activities. Excavation activities included grubbing, mechanical excavation, and grading. Cogstone also conducted Worker Environmental Awareness Program (WEAP) training for construction personnel. Two artifacts were collected during monitoring and returned to the property owner. All work was completed in compliance with NEPA, CEQA, PRC, and project specific requirements from the Los Angeles County Development Authority (LACDA). A cultural resources monitoring compliance report was submitted upon completion of monitoring. Sub to A Community of Friends. Archaeologist. 2019-2020

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

LOGAN FREEBERG
GIS Supervisor

EDUCATION

2018 Geographic Information Systems (GIS) Certificate, California State University, Fullerton
2003 B.A., Anthropology, University of California, Santa Barbara

SUMMARY QUALIFICATIONS

Mr. Freeberg has over 20 years of experience in cultural resource management and has extensive experience in field surveying, data recovery, monitoring, and excavation of archaeological and paleontological resources associated with land development projects in the private and public sectors. He has conducted all phases of archaeological work, including fieldwork, laboratory analysis, research, and reporting. Mr. Freeberg also has a strong grounding in conventional field and laboratory methods and is skilled in the use of ArcGIS.

SELECTED PROJECTS

Euclid Fueling Station Project, City of Santa Ana, Riverside County, CA. Cogstone conducted a cultural resources assessment to determine the potential impacts to cultural and paleontological resources during the construction of a convenience store, associated parking, gas station, and underground fuel storage tank. The assessment was conducted to meet the requirements of the California Environmental Quality Act (CEQA) with the City of Santa Ana acting as lead agency. Cogstone conducted record searches, a Sacred Lands File Search, an intensive pedestrian survey, gave mitigation recommendations, and produced a report. Sub to Sagecrest Planning + Environmental. GIS Supervisor. 2019

Laguna Creek Trail and Bruceville Road Project, Caltrans District 3, City of Elk Grove, Sacramento County, CA. The City of Elk Grove, in cooperation with Caltrans, proposed multiple trail extensions and gap closures in effort to provide connecting links that would ultimately provide trail users with access to a vast system of trails, with connections to parks, schools, community centers, commercial retail and office areas, and transit facilities. Cogstone conducted pedestrian surveys, records search, and prepared an Archaeological Survey Report and a Historic Property Survey Report. Sub to Helix Environmental. GIS Technician. 2019

Roosevelt Park Regional Stormwater Capture Project, unincorporated area of Florence-Firestone, Los Angeles County, CA. Conducted cultural and paleontological monitoring during all ground disturbing activities in native sediments. This project included the construction of three diversion structures and pipelines. Sub to Environmental Advisors. GIS Technician. 2019

Goddard School Project, City of Chino Hills, San Bernardino County, CA. Cogstone produced a paleontological resources mitigation and monitoring program for a proposed 59,129 square foot development consisting of a one-story, 10,587-square foot pre-school/daycare with nine classrooms, fenced play yards and play structures, and a parking lot with 40 stalls. Cogstone put forward mitigation measures that included monitoring for all ground-breaking activities, paleontological resource awareness training for construction personnel, and the completion of a final mitigation report. GIS Technician. 2019

Euclid Fueling Station Project, City of Santa Ana, Orange County, CA. This study was conducted to determine the potential impacts to archaeological and paleontological resources during construction activities for a proposed 7-Eleven gas station and convenience store. The proposed project entailed the construction of the convenience store, associated parking, gas station, and underground fuel storage tank. Planned vertical impacts included approximately three to four feet of fill removal over at least some of the site, a trench approximately eight feet deep for utilities, and approximately 12 feet for the new fuel storage tanks. Sub to Sagecrest Environmental. GIS Technician. 2019

Fresno West Area Specific Plan, City of Fresno, Fresno County, CA. The objective of this study was to review and summarize available information regarding known paleontological, archaeological, and historical resources within the boundaries of the City of Fresno's West Area Specific Plan. Cogstone's services included record searches, mapping, and extensive background research. Sub to De Novo Planning. GIS Technician. 2019

APPENDIX C. PALEONTOLOGICAL RECORD SEARCH

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

August 20, 2023

Cogstone Resource Management
Attn: Logan Freeberg

re: Paleontological resources for the Redondo Beach General Plan Update EIR Project (Cogstone 3909)

Dear Logan:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Redondo Beach General Plan Update EIR project area as outlined on the portion of the Redondo Beach, Venice, Inglewood and Torrance USGS topographic quadrangles map that you sent to me via e-mail on August 18, 2023. The collections of the Natural History Museum of Los Angeles County (NHMLA) include fossil localities that have been recorded or georeferenced within the bounds of the project area, as shown in the table below:

Locality Number	Location	Formation	Taxa	Depth
LACM IP 14	Redondo Beach, Beryl St and Hwy 1	Quaternary terrace deposits	Invertebrates: ship worms (Teredinidae), sand dollar (*Dendraster*), moon snails (Naticidae), horn snails (*Bittium*), bubble snails (*Acteocina*), true welks (*Neptunea*), cone snail (*Crockerella, Conus*), worm shells (*Serpulorbis*), turrid (*Antiplanes*), murex snails (*Boreotrophon*), tower shell (*Turritella*), oyster (*Ostrea*), venus clams (*Petricola, Chione, Amiantis, Tivela*), dimplodon (*Diplodonta*), cardita (*Cyclocardia*), scallop (*Chlamys*), bean clam (*Donax*), dwarf olive (*Callianax*), Washington clams (*Saxidomus*),yellow cockle (*Dallocardia*), paddock (*Penitella*)	Unknown
LACM IP 5096	4848 W. 190th Street, Torrance	Timms Point Silt	Invertebrates: lobster/crab family (Decapoda), Washington clams (*Saxidomus*), gastropods (*Kurtzella, Ithycythara*), barnacle (*Megabalanus*), limpet (*Fissurelidea, Lottia*), top snails (*Calliostoma*), lucinids (*Lucinisca*), wentletrap (*Epitonium*), pyramidellid snails (*Odostomia*), dwarf olive (*Callianax*), slipper snail (*Crepidula*), cerith (*Lirobittium*), bubble snail (*Acteocina*), tusk shell (*Dentalium*), moon snail (*Glossaulax*), pyrams (*Turbonilla*), scallop (*Leptopecten*), cone snails (*Californiconus*), falsejingle (*Pododesmus*)	Unknown

IP, Invertebrate Paleontology; bgs, below ground surface

Additionally, we have other localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth, as shown in the table below:

Locality Number	Location	Formation	Taxa	Depth
LACM VP 6630	Cliffs above Torrance Beach	Found in Pleistocene deposits and presumably reworked from the Monterey Formation (Altamira Shale)	Marine mammal (Cetacea)	Exposed about half-way up the sea cliff
LACM VP 3265	Gravel pit located in Torrance south of Winlock; west of Crenshaw & east of Hawthorne Blvd.	Palos Verdes Sandm San Pedro Sand (terrace deposits)	Vertebrata: marine & terrestrial animals, more specific identifications not available	Unknown
LACM VP 3249	Lomita, general locality number for specimens without locality data from the area	Unknown formation (Pleistocene)	Mastodon (*Mammut*), Bison (*Bison*), Camel (*Camelops, Tanupolama*), sea lion (*Eumetopias*), ground sloth (*Megalonyx*), horse (*Equus*), tapir (Tapirus); Loon (*Gavia*), grebe (*Achmophorous*), sea duck (*Chendytes*), teleost fish, and other unspecified vertebrates; invertebrate rich sand lenses common	Unknown (many collected from sand pit operations)
LACM VP 1295, 1344, 4206	Harbor Freeway excavations between 112 St & 113 St.*	Unknown formation (Pleistocene)	Horse (*Equus*), Bison (*Bison*), canine (*Canis*), birds (*Mancalla, Parapavo*, Aves), rabbit (*Sylvilagus,* Leporidae), mammoth (*Mammuthus*), rodent (*Thomomys, Microtus,* Sciuridae, Rodentia), ground sloth (*Paramylodon*), antelope (*Breameryx*), artiodactyl (*Pecora*), turtle (*Clemmys*)	Unknown
LACM IP 237	near Crenshaw Blvd and 190th Street	Unknown formation (Pleistocene)	Invertebrates (unspecified)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

*Published in Miller, 1971.

This records search covers only the records of the NHMLA. It is not intended as a paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Bureau of Land Management or Society of Vertebrate Paleontology standards.

Sincerely,

Alyssa Bell

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice

APPENDIX D. PREVIOUS CULTURAL RESOURCES STUDIES COMPLETED WITHIN THE CITY

Table D-1. Previous cultural resources studies completed within the Project Area

Report No. (LA-)	Author(s)	Title	Year
00206	Hector, Susan M.	Engineer Report for South Bay Cities Main Extension No. 3 Relief Trunk Sewer (#2)	1976
00858	Dillon, Brian D.	Archaeological Resource Survey and Impact Assessment of Torrance Blvd. Between Lucia and Francisca Streets, City of Redondo Beach	1980
01624	Woodward, Jim	Archaeological Survey of Redondo State Beach Los Angeles County, California	1987
02101	Wallace, William J.	Prehistoric Cultural Development in the South Bay District, Los Angeles County, California	1984
02189	Demcak, Carol R.	Archaeological Assessment of the Property Located at 811 North Catalina Avenue, Redondo Beach, County of Los Angeles, California	1990
02190	Van Wormer, Stephen R.	Historical Assessment of the Property Located at 811 North Catalina Avenue, Redondo Beach, County of Los Angeles, California	1990
02197	Romani, Gwendolyn R.	Archaeological Investigations at 811 North Catalina Avenue for The Proposed Commercial/Industrial Mini-Storage Located in Redondo Beach, Los Angeles County, California	1990
02201	Lee, Portia	Historical and Architectural Evaluation, 811-819 North Catalina Avenue, Redondo Beach	1990
02499	McKenna, Jeanette A.	Results of a Standard Prehistoric Archaeological Records Check, City of Redondo Beach, Los Angeles County, California - General Plan EIR	1991
02904	Stickel, Gary E.	Draft Report a Phase I Cultural Resources Literature Search for the West Basin Water Reclamation Project	1993
03544	McManus, Jim	Results of Phase II Testing: CA-LAN-1872-H, 811 Catalina Avenue Redondo Beach, Los Angeles County, California	1996
04171	Maxwell, Pamela	Redondo Beach Breakwater Repair: Cultural Resources	1991
04188	McLean, Deborah K.	Archaeological Assessment for Pacific Bell Mobile Services Telecommunications Facility La 860-03, 2100 190th Street, City of Torrance, County of Los Angeles, California	1998
04747	Duke, Curt	Cultural Resource Assessment for Pacific Bell Mobile Services Facility La 597-03, County of Los Angeles, California	1999
04757	Duke, Curt	Cultural Resource Assessment for Pacific Bell Mobile Services Facility La 466-04, County of Los Angeles, California	1999
05166	Sturm, Bradley L.	Cultural History Appendix 1: Redondo Beach Breakwater Emergency Repair History of Redondo Beach King Harbor	1983
05167	Sturm, Bradley L.	Redondo Beach Harbor Feasibility Study - Cultural Resources Analysis	1987
05250	Dillon, Brian D.	An Archaeological Resource Survey and Impact Assessment of Torrance Blvd. Between Lucia and Francisca Streets, City of Redondo Beach, California	1985
05251	Romani, Gwendolyn R.	Archaeological Investigations at 811 North Catalina Avenue for the Proposed Commercial/Industrial Mini-storage Located in Redondo Beach, Los Angeles County, California	1990
05251	Lee, Portia	Historical and Architectural Evaluation, 811-819 North Catalina Avenue, Redondo Beach	1990
05499	Smith, Philomena C.	Negative Archaeological Survey Report: to Cold Plane the Existing Pavement on Route 405 and Overlay With 30mm of Rubberized Asphalt Concrete at Selected On/off-ramps From Vermont Ave. to Manchester Blvd.	2000

Report No. (LA-)	Author(s)	Title	Year
05582	Duke, Curt	Cultural Resource Assessment: Cingular Wireless Facility No. Sm 075-02 Los Angeles County, California	2001
05915	Mason, Roger D.	Cultural Resources Records Search and Literature Review Report for an American Tower Corporation Telecommunications Facility: Number La_990_n1 Anita Prospect in the City of Redondo Beach, Los Angeles County, California	2001
05917	Duke, Curt	Cultural Resource Assessment AT&T Wireless Services Facility No. 05163a Los Angeles County, California	2002
05918	Duke, Curt	Cultural Resource Assessment AT&T Wireless Services Facility No. 05016a Los Angeles County, California	2002
05983	Mason, Roger D.	Cultural Resources Records Search and Literature Review Report for an American Tower Corporation Telecommunications Facility: Number La_464_n1 Hawthorne Boulevard in the City of Redondo Beach, Los Angeles County, California	2001
05990	Mason, Roger D.	Cultural Resources Records Search and Literature Review Report for American Tower Corporation Telecommunications Facility: Number La_694_n1 Artesia in the City of Redondo Beach, Los Angeles County, California	2001
06206	McKenna, Jeanette A.	An Evaluation of the Residential Structure Located at 625 Diamond Street, Redondo Beach, Los Angeles County, California	2003
06208	Bonner, Wayne H.	Cultural Resources Monitoring Tyco Global Network (TGN) Transpacific Fiber Optic Cable and Hermosa Beach Landing Project, City of Hermosa Beach, Los Angeles County, California	2002
06819	Harper, Caprice D.	Cultural Resource Assessment Cingular Wireless Facility No. Sm 241-01 Redondo Beach, Los Angeles County, California	2003
06989	McKenna, Jeanette A.	An Evaluation of Residential Structures: 615 Through 621 S. Pacific Coast Highway, Redondo Beach, Los Angeles County, California	2003
06990	McKenna, Jeanette A.	An Evaluation of the Residential Structure Located at 291 S. Francisca Avenue, City of Redondo Beach, Los Angeles County, California	2002
07690	Bonner, Wayne H.	Cultural Resource Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate El-0009-02 (SCE Gibson), Manhattan Beach Boulevard Near Gibson Place, Redondo Beach, Los Angeles County, California	2005
08154	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for Nextel Communications Candidate Ca6340c Freeman Avenue, SCE Tower M4-t7, Phelan Lane and Curtis Avenue, Redondo Beach, Los Angeles County, California	2005
08799	Bonner, Wayne H.	Cultural Resources Records Search and Site Visit Results for Royal Street Communications, LLC Candidate La2619a (Redondo Beach SCE), 834 North Lucia Avenue, Redondo Beach, Los Angeles County, California	2007
08931	McKenna, Jeanette A.	Historic Property Survey Report: Re-evaluation of the Residence at 920 Ynez Avenue in Redondo Beach, Los Angeles County, California	2007
09157	Bonner, Wayne H.	Cultural Resources Records Search and Site Visit Results for T-Mobile Candidate LA03370E (Beach Cities Medical), 514 North Prospect Avenue, Redondo Beach, Los Angeles County, California	2007
09158	Bonner, Wayne H.	Cultural Resources Records Search and Site Visit Results for Sprint Nextel Candidate LA73XC324 (Wilderness Park), 1102 Camino Real, Redondo Beach, Los Angeles County, California	2007

Report No. (LA-)	Author(s)	Title	Year
09875	Wayne Bonner	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA03370G (Redondo Beach Lattice Tower), 896 North Prospect Avenue, Redondo Beach, Los Angeles County, CA.	2009
10069	Wlodarski, Robert J.	Records Search and Pedestrian Survey for Cingular Wireless Telecommunication Site El-0131-02 (SCE - 190th & Paulina) Located at 895 E. Paulina Avenue, City of Redondo Beach, Los Angeles County, California	2005
10132	Johnson, Ken	Fun, Frustration and Fulfillment, An Historical Study of the City of Redondo Beach	1965
10160	Harper, Caprice D. and Francesca Smith	Preliminary Cultural Resources Survey for the Formation of the Wiseburn Unified School District Project, Cities of El Segundo and Hawthorne, and Unincorporated Los Angeles County, CA	2008
10301	Bonner, Wayne H. and Kathleen Crawford	Cultural Resources Records Search and Site Visit for T-Mobile USA Candidate LA33673B (Manor Property), 512 Avenue G, Redondo Beach, Los Angeles County, California	2009
10317	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate LA03363D (Redondo Beach Apartments), 1930 Manhattan Beach Boulevard, Redondo Beach, Los Angeles County, California	2009
10333	McKenna, Jeanette M.	A Brief Historic Context Statement Prepared for the General Plan Update: The City of Torrance, Los Angeles County, California	2009
10652	Wallace, William J., Georgie Waugh, Mark E. Basgall, R.L. Bettinger, M.G. Dekacrte, T.L. Jones, M.A. Giambastiani, S. Griset, H. McCarthy, C.W. Meighan, W.J. Nelson, W.L. Norton, B.A. Ramos, E.W. Ritter, H.L. Crew, D.H. Thomas, C.N. Warren, and G.J. West	Avocados to Millingstones: Papers in Honor of D.L. True - Grave Goods vs. Midden Artifacts: the Case of Palmer-Redondo	2008
10714	Bonner, Wayne and Kathleen Crawford	Cultural Resources Records Search, Site Visit Results, and Direct APE Historic Architectural Assessment for Clearwire Candidate CA-LOS2061/CA5604, 1611 South Pacific Coast Highway, Redondo Beach, Los Angeles County, California	2010
10788	Billat, Lorna	SCE El Nido - La Fresa #4, CA-LOS4340C - Collocation Submission Packet	2010
10852	Dreizler, Patricia, Gloria Snyder, Harry Johnson, and Pat Botsai	Historic Resources Survey - City of Redondo Beach	1986

Report No. (LA-)	Author(s)	Title	Year
10932	Bonner, Wayne	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Facility LA02669-A (SCE Performance Nursery), 2600 Beland Boulevard, Redondo Beach, Los Angeles County, California	2011
11023	Linn, Robert	61081411 / LAC376 PCH Redondo, 1650 S. Pacific Coast Highway, Redondo Beach, CA 90277	2008
11136	Pecora, Meredith	Cultural Resource Survey Reports for FEMA Project: LA County Beach Repairs, Various Location Project	2011
11138	Pierson, Larry, Shiner, Gerald, and Slater, Richard	California Outer Continental Shelf, Archaeological Resource Study: Morro Bay to Mexican Border, Final Report.	1987
11150	Maxwell, Pamela	West Basin Municipal Water District Harbor/ South Bay Water Recycling Project	2003
11237	Loftus, Shannon	Cultural Resources Records Search and Site Survey and Historic Architectural Resource-Inventory and Assessment. NextG Palos Verdes Das Node Site: VZ1018CA-HAW18 Pole#781617E. Row Adjacent to 1799 Camino De La Costa Redondo Beach, CA	2010
11296	Wlodarski, Robert J. and Diane F. Bonner	Cultural Resources Records Search and Archaeological Survey Results for the proposed Clear Wireless, LLC, Site CA-LOS5458A (SCE El Nido-La Fresa M5-T5) located at 1701 Inglewood Avenue, Redondo Beach, Los Angeles County, California, 90278	2010
11399	Loftus, Shannon L.	Cultural Resource Records Search and Site Survey, AT&T Site LAD155, Redondo Villa Apartments, 1910-1930 Manhattan Beach Boulevard, Redondo Beach, Los Angeles County, California 90278 CASPR# 3551278793	2011
11403	Loftus, Shannon L.	Cultural Resource Records Search and Site Survey, AT&T Site EL0129 LTE Riviera Center 1815 Via El Prado, Redondo Beach, Los Angeles County, California 90277 CASPR# 3551278655	2011
11421	Loftus, Shannon L.	Historic Architectural Resource Inventory and Assessment, AT&T Site EL0129 LTE, Riviera Center 1815 Via El Prado, Redondo Beach, Los Angeles County, California 90277 CASPR# 3551278655	2011
11425	Loftus, Shannon L.	Historic Architectural Resource Inventory and Assessment, AT&T Site LAD155 Redondo Villa Apartments, 1910-1930 Manhattan Beach Boulevard, Redondo Beach, Los Angeles County, California 90278 CASPR# 3551278793	2011
11482	Racer, F.H.	Camp Sites in Harbor District - F.H. Racer	1939
12266	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA03363D (Redondo Beach Apartments) 1930 Manhattan Beach Boulevard, #P, Redondo Beach, California	2013
12288	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA03370G (SCE Redondo Beach Tower) 896 North Prospect Avenue, Redondo Beach, Los Angeles County, California	2013
12311	Bonner, Wayne and Crawford, Kathleen	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA02459A (SM075 SCE Tower M5/T4) Inglewood Avenue & Rockefeller Lane, Redondo Beach, California	2012

Report No. (LA-)	Author(s)	Title	Year
12314	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA02860A (LA860 Ripley & Meyer JPA) 2109 190th Street, Redondo Beach, Los Angeles County, California	2013
12361	Bonner, Wayne H and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T-Mobile West, LLC Candidate LA02669A (SM241 SCE / Performance Nursery), 2600 Beland Boulevard, Redondo Beach, Los Angeles County, California	2013
12509	Johnson, Brent	Cultural Resources Records Search and Site Visit, AT&T Mobility, LLC Site: LA0558/Blossom ROW, 1587 1/2 Blossom Lane, Redondo Beach, California 90278, Los Angeles County	2012
12571	O'Neil, Stephen and Megan Black	Archaeology Survey Report in Support of the Huitt-Zollars Inglewood Avenue Corridor Widening Project, City Lawndale, Los Angeles County, California	2014
12595	Smallwood, Josh	Historical Resource Evaluation of the Redondo Beach Generating Station and SEA Lab, 1021 and 100 North Harbor Drive, Redondo Beach, Los Angeles County, California	2014
13024	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resources Records Search and Site Visit Results for T Mobile West, LLC Candidate LA02471A (Redondo Beach), 220 South Pacific Coast Highway, Redondo Beach, Los Angeles County, California.	2013
13416	Grady, Amber and Robin Hoffman	South Bay Galleria Improvement Project, Redondo Beach, Los Angeles County, Historic Resources Evaluation Report	2016

APPENDIX E. PREVIOUSLY RECORDED CULTURAL RESOURCES WITHIN THE CITY

Table E-1. Previously Recorded Cultural Resources within the Project Area

Primary No. (P-19-)	Trinomial No. (CA-LAN-)	Resource Type	Resource Description	Year Recorded	NRHP/CRHR Status
000100	000100	Prehistoric Archaeological Site	Groundstone metate and mano	1939	Unevaluated
000127	000127	Prehistoric Archaeological Site	Shell midden deposit with pottery, bone, asphaltum, projectile points, lithic scrapers, groundstone metates, manos and pestles	1951, 2008	Unevaluated
000137	000137	Prehistoric Archaeological Site	Shell midden deposit with obsidian and quartz artifacts.	Unknown	Unevaluated
000383	000383	Prehistoric Archaeological Site	Shell midden deposit with lithic flakes, groundstone mano, small bowl and lithic cores	1969, 1970	Unevaluated
001872	001872/H	Multi-Component Site	Prehistoric shell scatter deposit with lithic flakes and lithic core. Historic 1880s commercial structures associated with the Atchison, Topeka and Santa Fe Railroad right-of-way with narrow gauge tracks.	1990	Unevaluated
150257		Historic Built Environment	Manor Property/Mirada Apartments, 512 Avenue G. Multifamily residence, Modern architectural style. 1964	2009	NR – 6Y CR - Unevaluated
177518		Historic Built Environment	Weddle Woodcraft/Redondo Planning Mill, 811-819 Catalina Avenue. Vernacular/Mission Revival architectural style. 1905-1938	1990	Unevaluated
177541		Historic Built Environment	Diamond Apartments, 321 Diamond Street. Multifamily residence, Classical Revival architectural style. 1913	1991	NR - Listed
177599		Historic Built Environment	Sweetser Residence, 417 East Beryl Street. Single family residence, American Colonial Revival architectural style. 1921	1984	NR - Listed
177600		Historic Built Environment	Woman's Club of Redondo Beach, 400 South Broadway. Vernacular Bungalow architectural style. 1922	1983	NR - Listed
177601		Historic Built Environment	Redondo Beach Public Library, 309 Esplanade. Spanish Colonial Revival/Dutch Colonial architectural style. 1930	1980	NR - Listed
177668		Historic Built Environment	Cheetham House, 625 Diamond Street. Single family residence, Vernacular Cottage architectural style. 1912	2003	NR – 7Y

Primary No. (P-19-)	Trinomial No. (CA-LAN-)	Resource Type	Resource Description	Year Recorded	NRHP/CRHR Status
177669		Historic Built Environment	Redondo Beach Original Townsite Historic District, North Gertruda Avenue, Carnelian Street, North Guadalupe Avenue and Diamond Street. Single family and multifamily residences, Bungalow/Craftsman, Mission/Spanish and Neo-Classical Revival/Colonial Revival architectural styles. 1906-1925	1987	NR - Listed
186114		Historic Archaeological Site	"Old Salt Lake" with locational plaque marker. Naturally occurring, inland saltwater lake. Salt has been extracted from lake by manufacturing activity.	1980	CR – California Registered Historical Landmark
187150		Historic Built Environment	Single family residence, 2638 Beland Boulevard. Vernacular architectural style. 1948	1999	NR - Ineligible
187260		Historic Built Environment	Single family residence, 225 Avenue D. Cottage Eclectic architectural style. 1917	2001	NR – Eligible CR - Listed
187274		Historic Built Environment	Single family residence, 2210 Robinson Street. Vernacular architectural style. 1947	1999	NR - Ineligible
187275		Historic Built Environment	Single family residence, 2306 Clark Lane. Minimal Traditional architectural style. 1947	1999	NR - Ineligible
187276		Historic Built Environment	Single family residence, 1816 Belmont Lane. Minimal Traditional architectural style. 1948	1999	NR - Ineligible
187277		Historic Built Environment	Single family residence, 2919 Blaisdell Avenue. Modern architectural style. 1948	1999	NR - Ineligible
187979		Historic Built Environment	Cingular CA-6340-C/Freeman, Curtis Avenue and Phelan Lane. Steel lattice frame transmission tower with concrete base. 1954	2005	NR – 6Y CR - Unevaluated
188839		Historic Built Environment	M.J. Building, 1611 South Pacific Coast Highway. Commercial building. Modern architectural style. 1957	2010	NR – 6Z CR - Unevaluated
188900		Historic Built Environment	SCE El Nido - La Fresa #4, 2504 Manhattan Beach. Steel lattice frame transmission tower with concrete base. 1963	2010	NR - Ineligible
189406		Historic Built Environment	The Riviera, 1650 South Coast Pacific Highway. Commercial building. Mediterranean architectural style. 1962	2008	NR – 6Y2

Primary No. (P-19-)	Trinomial No. (CA-LAN-)	Resource Type	Resource Description	Year Recorded	NRHP/CRHR Status
189423		Historic Built Environment	Redondo Beach Apartments, 1930 Manhattan Beach Boulevard. Modern architectural style. 1964	2009, 2011	NR – 6Y CR - Unevaluated
189474		Historic Built Environment	SCE utility pole HAW 18, 1799 Camino de la Costa. Wood utility pole for power, cable tv and telephone transmission lines.1962	2010	NR – 6Y
189746		Historic Built Environment	SCE El Nido - La Fresa M5-T5, 1701 Inglewood Avenue. Steel lattice frame transmission tower with concrete base. 1963	2010	NR – 6Y
189813		Historic Built Environment	Riviera Center, 1815 Via El Prado. Commercial building. Contemporary/International architectural style. 1960	2011	NR – 6Y
190110		Historic Built Environment	Michael Tumanjan Property, 219 South Francisca Avenue. Single family residence. California Bungalow architectural style. 1913	2002	Unevaluated
190298		Historic Built Environment	SCE Tower M0-T8 La Fresa-Redondo Beach 220kV, 896 North Prospect Avenue. Steel lattice frame transmission tower with concrete base. 1966	2012	NR – Ineligible CR - Unevaluated
190323		Historic Built Environment	T-Mobile West LLC LA02860A/LA860 Ripley & Meyer JPA, 2109 190th Street. Class 5 Douglas fir wood utility pole	2013	NR – Ineligible CR - Unevaluated
190326		Historic Built Environment	SCE Tower M5 T4, Inglewood Avenue and Rockefeller Lane. Steel lattice frame transmission tower with concrete base. 1967	2012	NR – Ineligible CR - Unevaluated
190801		Historic Built Environment	Redondo Beach Generating Station and SEA Lab, 1021-1100 North Harbor Drive. Commercial utility building compound. Art Modern and Vernacular architectural styles. 19	2013	NR – 3CS CR - Eligible
193055		Historic Built Environment	Pacific Crest Cemetery, 2701 182nd Street. Tudor architectural style chapel and mortuary with associated offices. Gothic-Renaissance architectural style mausoleum and lawn style cemetery. 1902	2020	NR – Ineligible CR - Ineligible

Primary No. (P-19-)	Trinomial No. (CA-LAN-)	Resource Type	Resource Description	Year Recorded	NRHP/CRHR Status
193056		Historic Built Environment	City of Redondo Beach Maintenance Facility, 1521 Kingsdale Avenue. Commercial building. Utilitarian architectural style. 1969	2020	NR – Ineligible CR - Ineligible
193058		Historic Built Environment	Single family residence, 1306 Firmona Avenue. Minimal Traditional architectural style. 1955	2020	NR – Ineligible CR - Ineligible

APPENDIX F. BUILT ENVIRONMENT RESOURCE DIRECTORY (BERD)

STATUS CODES

1D Contributor to a district or multiple resource property listed in NR (National Register) by the Keeper. Listed in the CR (California Register)
1S Individual Property listed in NR by the Keeper. Listed in the CR.
2D2 Contributor to a district determined eligible for NR by consensus through Section 106 process. Listed in the CR.
2S2 Individual property determined eligible for NR by a consensus through Section 106 process. Listed in the CR.
3D Appears eligible for NR as a contributor to a NR eligible district through survey evaluation.
3S Appears eligible for NR as an individual property through survey evaluation.
5S2 Individual property that is eligible for local listing or designation.

Table F-1. BERD Results for the City of Redondo Beach

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
177480	430717	28158		554	Ave A	3S, 0277-0002-0000 | 7R, 11/29/2001, 0277-2270-0000			11/2/7509	1937
	478830	79867		225	Ave D	2D2, 02/01/1993, DOE-19-93-0003-0000 | 2D2, 02/01/1993, HUD921113H | 7R, 11/29/2001, 0277-2260-0000			7509-008-033	1920
177486	430723	28164		211	Ave E	2S2, 04/02/1987, HUD870316C | 3S, , 0277-0008-0000			3/23/7511	1930
177487	430724	28165		233	Ave E	3S, 0277-0009-0000			7511-3-34	1923
177491	430728	28169		125	Beryl St	3D, 0277-0013-0001		430732		1926
177492	430729	28170		125	Beryl St	3D, 0277-0013-0002		430732		1926
177493	430730	28171		125	Beryl St	3D, 0277-0013-0003		430732		1926
177494	430731	28172	Salvation Army Church	125	Beryl St	3D, 0277-0013-0004		430732		1926
177495	430732	28173	Salvation Army	125	Beryl St	3D, 0277-0013-9999	430, 728, 430, 729, 430, 000, 000, 000		7503-13-3	1926-1926
177584	430821	28262		820	Beryl St	3S, 0277-0106-0000 | 7R, 11/29/2001, 0277-1725-0000			7502-26-15	1923
177630	430867	28308		512	Carnelian St	1D, 06/30/1988, NPS-88000970-0029 | 7R, 11/29/2001, 0277-1905-0000		430906	7503-027-016	1910
177656	430893	28334		610	Carnelian St	1D, 06/30/1988, NPS-88000970-0055 | 7R, 11/29/2001, 0277-1879-0000		430906	7503-026-013	1909
177657	430894	28335	Garage	610	Carnelian St	1D, 06/30/1988, NPS-88000970-0056		430906		1910
177658	430895	28336		612	Carnelian St	1D, 06/30/1988, NPS-88000970-0057 | 7R, 11/29/2001, 0277-1877-0000		430906	7503-026-013	1922
177659	430896	28337		614	Carnelian St	1D, 06/30/1988, NPS-88000970-0058		430906	7503-26-13	1922
1177660	430897	28338		614	Carnelian St	1D, 06/30/1988, NPS-88000970-0059		430906		1922
1177541	430778	28219	Diamond Apartments	321	Diamond St	1S, 03/26/1992, 0277-0060-0000 | 1S, 03/26/1992, 19-0059 | 1S, 03/26/1992, NPS-92000260-0000 | 2S2, 07/24/1990, DOE-19-90-0058-0000 | 2S2, 07/24/1990, HUD900621A | 2S3, 06/18/1991, 537.9-19-0104 | 7R, 11/29/2001, 0277-1925-0000			7505-301-1	1913
177599	430836	28277	Sweetser Residence	417	E Beryl St	1S, 01/01/1985, 0277-0121-0000 | 1S, 09/05/1985, NPS-85001984-0000 | 7R, 05/01/1996, 0277-				1921

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
						0260-0000				
1177548	430785	28226	Frank Perry House	616	Elvira Ave	3S, 0277-0067-0000 | 7R, 11/29/2001, 0277-2091-0000			7508-17-21	1905
177553	430790	28231		411	Emerald St	3S, 0277-0072-0000			7/22/7505	1911
177554	430791	28232		413	Emerald St	3S, 0277-0073-0000			7/27/7505	1910
177555	430792	28233		415	Emerald St	3S, 0277-0074-0000			7/29/7505	1910
177556	430793	28234		417	Emerald St	2S2, 03/20/1997, DOE-19-97-0003-0000 | 2S2, 03/20/1997, HUD970225C | 3S, , 0277-0075-0000			7/3/7505	1911
177562	430799	28240		1600	Esplanade St	5S2, 0277-0081-0000			8/21/7511	1920
177601	430838	28279	Redondo Beach Public Library	309	Esplanade St	1S, 01/01/1981, 0277-0123-0000 | 1S, 03/12/1981, NPS-81000158-0000				1930
177561	430798	28239		818	Esplanade St	3S, 0277-0080-0000			1/12/7509	1922
177515	430752	28193	Morrell House	298	Flagler Ln	3S, 0277-0034-0000 | 3S, 12/21/1988, 619.0-HP-88-19-050 | 7W, 10/23/2002, 19-0418			7503-31-29	1906
177572	430809	28250		605	Garnet St	3S, 0277-0091-0000			5/28/7506	1912
177497	430734	28175		102	N Broadway	3S, 0277-0015-0000			-7535	1925
177499	430736	28177	Vincent Apartments	133	N Broadway	3S, 0277-0017-0000			6/8/7505	1913
177514	430751	28192	Venable House	200	N Catalina Ave	3S, 0277-0033-0000			7503-31-30	1905
177516	430753	28194	Catalina Court	214	N Catalina Ave	3S, 0277-0035-0000 | 7R, 11/29/2001, 0277-1924-0000			7503-31-25	1922
177518	430755	28196	Weddle Woodcraft	811	N Catalina Ave	5S2, 0277-0037-0000			7503-21-26	1944
177669	430906	28347	Redondo Beach Original Townsite Historic District		N Gertruda Ave	1S, 06/30/1988, NPS-88000970-9999	430839, 430840, 430841, 430842, 430843, 430844, 430845, 430846, 430847, 430848, 430849, 430850, 430851, 430852, 430853, 430854, 430855, 430856, 430857, 430858, 430859, 430860, 430861, 430862, 430863, 430864, 430865, 430866, 430867, 430868, 430869, 430870, 430871, 430872, 430873, 430874, 430875, 430876, 430877, 430878, 430879, 430880, 430882, 430883, 430884, 430885, 430886, 430887, 430888, 430889, 430890, 430891, 430892, 430893, 430894, 430895, 430896, 430897, 430898, 430899, 430900, 430901, 430902, 430903, 430904, 430905			1906-1925
177602	430839	28280		303	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0001		430906		1907
177633	430870	28311		304	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0032 | 7R, 11/29/2001, 0277-1891-0000		430906	7503-026-026	1907

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
177634	430871	28312	Garage	304	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0033		430906		1911
177603	430840	28281		305	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0002 | 7R, 11/29/2001, 0277-1894-0000		430906	7503-027-003	1912
177604	430841	28282	Garage	305	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0003		430906		1920
177635	430872	28313		306	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0034 | 7K, 11/13/1992, HUD921019A | 7R, 11/29/2001, 0277-1890-0000		430906	7503-026-025	1922
177605	430842	28283		307	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0004 | 7R, 11/29/2001, 0277-1895-0000		430906	7503-027-004	1907
177636	430873	28314		308	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0035 | 7R, 11/29/2001, 0277-1889-0000		430906	7503-026-024	1907
177637	430874	28315	Garage	308	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0036		430906		1923
177606	430843	28284		309	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0005		430906		1907
177638	430875	28316		310	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0037 | 7R, 11/29/2001, 0277-1888-0000		430906	7503-026-023	1911
177608	430845	28286		311	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0007 | 7R, 11/29/2001, 0277-1896-0000		430906	7503-027-006	1911
177610	430847	28288	Garage	311	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0009		430906		1913
177611	430848	28289		313	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0010 | 7R, 11/29/2001, 0277-1897-0000		430906	7503-027-007	1911
177612	430849	28290	Garage	313	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0011		430906		1914
177641	430878	28319		314	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0040 | 7R, 11/29/2001, 0277-1887-0000		430906	7503-026-021	1913
177613	430850	28291		315	N Gertruda Ave	1D, 05/14/1992, NPS-88000970-0012 | 7R, 11/29/2001, 0277-1898-0000		430906	7503-027-008	1912
19-177642	430879	28320		316	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0041 | 7R, 11/29/2001, 0277-1886-0000		430906	7503-026-020	1905
177616	430853	28294		317	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0015 | 7R, 11/29/2001, 0277-1899-0000		430906	7503-027-009	1923
177617	430854	28295	Rear House	317	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0016		430906		1922
177644	430881	28322		318	N Gertruda Ave	1D, 06/30/1988, NPS-88000790-0043 | 7R, 11/29/2001, 0277-1885-0000			7503-026-019	1908
177618	430855	28296		319	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0017 | 7R, 11/29/2001, 0277-1900-0000		430906	7053-27-10	1912

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
177646	430883	28324		320	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0045 | 7R, 11/29/2001, 0277-1884-0000		430906	7503-026-018	1908
177620	430857	28298		321	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0019 | 7R, 11/29/2001, 0277-1901-0000		430906	7503-027-011	1905
177648	430885	28326		322	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0047 | 7R, 11/29/2001, 0277-1883-0000		430906	7503-026-017	1923
177649	430886	28327	Garage	322	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0048		430906		1924
177650	430887	28328		324	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0049		430906	7503-26-16	1910
177651	430888	28329		324	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0050		430906		1910
177624	430861	28302		325	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0023 | 7R, 11/29/2001, 0277-1902-0000		430906	7503-027-013	1912
177625	430862	28303	Rear House	325	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0024		430906	7503-27-13	1906
177626	430863	28304		327	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0025 | 7R, 11/29/2001, 0277-1903-0000		430906	7503-027-014	1906
177654	430891	28332		328	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0053 | 7R, 11/29/2001, 0277-1880-0000		430906	7503-026-014	1912
177655	430892	28333	Garage	328	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0054		430906		1910
177628	430865	28306		329	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0027 | 7R, 11/29/2001, 0277-1904-0000		430906	7503-027-015	1907
177629	430866	28307	Garage	329	N Gertruda Ave	1D, 06/30/1988, NPS-88000970-0028		430906		1920
177666	430903	28344		505	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0065		430906		1907
177667	430904	28345		505	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0066		430906		1907
177664	430901	28342		507	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0063 | 7R, 11/29/2001, 0277-1871-0000		430906	7503-026-003	1922
177665	430902	28343	Garage	507	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0064		430906		1922
177663	430900	28341		509	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0062 | 7R, 11/29/2001, 0277-1872-0000		430906	7503-026-004	1905
177661	430898	28339		511	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0060 | 7R, 11/29/2001, 0277-1873-0000		430906	7503-026-005	1927
177662	430899	28340	Garage	511	N Guadalupe Ave	1D, 06/30/1988, NPS-88000970-0061		430906		1921
177674	430911	28352		508	N Irena Ave	5S2, 0277-0129-0000				1921
177592	430829	28270	John Clark House	106	Pearl St	3S, 0277-0114-0000			11/11/7508	1922
177593	430830	28271		108	Pearl St	3S, 0277-0115-0000			11/13/7508	1917

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
177500	430737	28178	De Simone House	145	S Broadway	3S, 0277-0018-0000			7505-14-30	1910
177501	430738	28179	H & M Court	207	S Broadway	3S, 0277-0019-0000			7505-18-8	1923
177502	430739	28180		220	S Broadway	3S, 0277-0020-0000			7505-19-22	1912
177504	430741	28182		313	S Broadway	3S, 0277-0022-0000			7505-23-5	1921
2S217760 0	430837	28278	Woman's Club Of Redondo Beach	400	S Broadway	1S, 01/01/1984, 0277-0122-0000 | 1S, 04/19/1984, NPS-84000900-0000 | 7R, 11/29/2001, 0277-2032-0000			7508-012-017	1922
177506	430743	28184	Christchurch Episcopal Church	408	S Broadway	3S, 0277-0024-0000 | 7R, 11/29/2001, 0277-2035-0000			12/20/7508	1892
177507	430744	28185		412	S Broadway	3S, 0277-0025-0000 | 7R, 11/29/2001, 0277-2036-0000			12/21/7508	1917
177508	430745	28186		414	S Broadway	3S, 0277-0026-0000 | 7R, 11/29/2001, 0277-2037-0000			12/22/7508	1911
177509	430746	28187		420	S Broadway	3S, 0277-0027-0000			12/25/7508	1922
177510	430747	28188		707	S Broadway	3S, 0277-0028-0000 | 7R, 11/29/2001, 0277-2002-0000			8/20/7508	1911
177538	430775	28216		1111	S Catalina Ave	5S2, 0277-0057-0000			6/17/7509	1920
177519	430756	28197		116	S Catalina Ave	5S2, 0277-0038-0000			7505-14-24	1905
177539	430776	28217		1501	S Catalina Ave	5S2, 0277-0058-0000			7511-8-(1 & 2)	1925
177540	430777	28218		1601	S Catalina Ave	5S2, 0277-0059-0000			8/13/7511	1923
177521	430758	28199	Mclaughlin BUILDING, AMBLENTI	308	S Catalina Ave	5S2, 0277-0040-0000			7505-23-13	1925
177522	430759	28200	Vail Apartments	408	S Catalina Ave	3S, 0277-0041-0000 | 7R, 11/29/2001, 0277-2029-0000			11/14/7508	1904
177523	430760	28201	Redondo Beach Masonic Temple	501	S Catalina Ave	3S, 0277-0042-0000 | 7R, 11/29/2001, 0277-1978-0000			7508-5-(12-15)	1927
177524	430761	28202		519	S Catalina Ave	3S, 0277-0043-0000 | 7R, 11/29/2001, 0277-1977-0000			5/6/7508	1912
177526	430763	28204		528	S Catalina Ave	3S, 0277-0045-0000 | 7R, 11/29/2001, 0277-2024-0000			10/25/7508	1923
177527	430764	28205	Banal Court	605	S Catalina Ave	3S, 0277-0046-0000 | 7R, 11/29/2001, 0277-1981-0000			6/10/7508	1925
177528	430765	28206		620	S Catalina Ave	3S, 0277-0047-0000			9/30/7508	1909
177529	430766	28207		708	S Catalina Ave	5S2, 0277-0048-0000 | 7R, 11/29/2001, 0277-1998-0000			8/13/7508	1910
177530	430767	28208		712	S Catalina Ave	3S, 0277-0049-0000 | 7R, 11/29/2001, 0277-1997-0000			8/11/7508	1926
177531	430768	28209		720	S Catalina Ave	3S, 0277-0050-0000			8/7/7508	1912
177532	430769	28210		724	S Catalina Ave	5S2, 0277-0051-0000 | 7R, 11/29/2001, 0277-1996-0000			8/5/7508	1910
177533	430770	28211		726	S Catalina Ave	3S, 0277-0052-0000			8/4/7508	1923
177534	430771	28212	Casa Catalina Apartments	810	S Catalina Ave	3S, 0277-0053-0000			2/10/7509	1941

Primary Number (P-19-)	OTIS ID	Property Number	Name	St Number	St Name	Evaluation Info	District Elements	Parent District	Parcel Number	Build Year
177574	430811	28252		119	S Guadalupe Ave	3S, 0277-0096-0000			6/12/7508	1910
177577	430814	28255		526	S Guadalupe Ave	3S, 0277-0099-0000 | 7R, 11/29/2001, 0277-2102-0000			7508-18-13	1895
177596	430833	28274		112	Sapphire St	3S, 0277-0118-0000			6/14/7508	1908
177597	430834	28275		124	Sapphire St	3S, 0277-0119-0000 | 7R, 11/29/2001, 0277-1983-0000			6/12/7508	1920

APPENDIX G. CITY OF REDONDO BEACH HISTORIC RESOURCES REGISTER

NOTES

MA Properties with Mills Act agreements
NR Properties on the National Register
CR Properties on the California Register
LHD Local Historic District, designated as contributors to a historic district under local ordinance
NRHD Listed in the National Register as a contributor to a National Register Historic District
HOZ Historic Overlay Zone

Table G-1. Redondo Beach Historic Resources Register

Address	Common Name	Notes	Built	Designated
321 Diamond St	Redondo Van and Storage/ Diamond Apartment	NR	1913	7/5/1990
417 Beryl St	Sweetser House	NR, HOZ	1921	9/5/1990
507 N. Gertruda Ave	Sweetser Guest House		1909	9/5/1990
298 Flagler Lane	Morrell House at Dominguez Park		1906	2/6/1991
302 Flagler Lane	Queen Anne House at Dominguez		1904	2/6/1991
328 N. Gertruda Ave	Hibbard House/ Original Townsite Historic District	NR, NRHD, MA	1910	1/6/1993
227 Avenue C	Griffey House	MA	1930	4/7/1993
626 Elvira Ave	Sale House	MA	1922	4/7/1993
213 Avenue C	Allingham House	MA	1931	9/1/1993
616 S. Gertruda Av	Waller House	MA	1937	10/28/1993
702 Elvira Ave	Thurber House	MA	1923	10/28/1993
309 Esplanade	Old Main Library	NR	1930	1/27/1994
309 Esplanade	Moreton Bay Fig Tree		----	1/27/1994
2604 Fisk Lane	Bissen House	MA	1905	1/27/1994
605 Garnet St	Pfeifer/Dodge House	MA	1912	1/27/1994
717-719 Esplanade	Blauveldt House	MA	1934	1/27/1994
125 S. Irena Ave	Montague House	MA	1909	2/2/1994
108 N. Broadway	Dorrington Apartments	MA	1907	2/24/1994
519 S. Catalina Ave	Gephart House		1913	5/4/1994
510 Garnet St	Lowe House		1910	5/4/1994
417 Miramar Dr	Crisler House	MA	1928	6/1/1994
513 Garnet St	Martin House	MA	1912	3/1/1995
209 Avenue C	Humer House	MA	1921	3/1/1995
2500 Graham Ave	Manny House	MA	1934	5/3/1995
501 Avenue B	Davis House	MA	1930	10/4/1995
509 Garnet St	Cholvin House	MA	1913	10/4/1995
607 Esplanade	Albee House	MA	Pre-1906	1/3/1996
323 S. Francisca	Thomas House	MA	1892	2/7/1996
512 Garnet St	Hussong House	MA	1910	2/7/1996
422 S. Guadalupe	Murray House	MA	1936	7/3/1996
216 Avenue C	Harvey House	MA	1919	10/1/1997
108 Beryl St	A.S. Day House	MA	1920	2/3/1999

Address	Common Name	Notes	Built	Designated
305 Emerald St	Oklahoma Apartments	MA	1905	7/7/1999
324 N Gertruda Ave	Shinn House [in Original Townsite Historic District]	NRHD, MA	1910	10/6/1999
208 Avenue B	Sarah Forbes House	MA	1910	11/3/1999
559 Avenue A	Monstad House	MA	1911	5/3/2000
426 N Gertruda Ave	Brandt House	MA	1921	9/6/2000
412 S Camino Real	American Legion Clubhouse	MA	1927	11/1/2000
511 Garnet Street	Wolfsberg House	MA	1913	4/4/2001
208 S Guadalupe Ave	Langworthy House	MA	1911	11/7/2001
629 S Broadway	Ebnet House	MA	1922	11/7/2001
412 Pearl Street	Newlywed House	MA	1923	12/5/2001
216 N. Catalina Ave	North Catalina Historic District	LHD	Pre-1895/1913	9/6/1995
218 N. Catalina Ave	North Catalina Historic District	LHD	Pre-1895	9/6/1995
303 N. Gertruda Ave	Original Townsite Historic District	NRHD	1907	--
304 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1911	8/6/1991
305 N. Gertruda Ave	Original Townsite Historic District	NRHD	1911/1920	--
306 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1921	8/6/1991
307 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1907	8/6/1991
308 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD, MA	1911	8/6/1991
309 N. Gertruda Ave	Gertruda Avenue Historic District (non-contributing)/ Original Townsite Historic District	LHD NRHD	1993	8/6/1991
310 N. Gertruda Ave	Original Townsite Historic District	NRHD	1911	--
311 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1913	8/6/1991
312 N. Gertruda Ave	Gertruda Avenue Historic District (non-contributing)	LHD	1980	8/6/1991
313 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1914	8/6/1991
314 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	c. 1917	8/6/1991
315 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD, HOZ	1913	8/6/1991
316 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1913	5/4/1994
317 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1922	8/6/1991

Address	Common Name	Notes	Built	Designated
318 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	c. 1907	8/6/1991
319 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1911	8/6/1991
320 N. Gertruda Ave	Original Townsite Historic District	NRHD	1907	--
321 N. Gertruda Ave	Original Townsite Historic District	NRHD	1910	--
322 N. Gertruda Ave	Original Townsite Historic District	NRHD	1922/1924	--
325 N. Gertruda Ave	Original Townsite Historic District	NRHD	1906/1912	--
327 N. Gertruda Ave	Original Townsite Historic District	NRHD	1906	--
329 N. Gertruda Ave	Original Townsite Historic District	NRHD	1908/1920	--
505 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1907	--
507 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1922	--
509 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1907	--
511 N. Guadalupe Ave	Original Townsite Historic District	LHD, NRHD	1921	12/5/2001
512 Carnelian St	Original Townsite Historic District	NRHD	1907	--
610-614 Carnelian St	Original Townsite Historic District	NRHD	1910/1922	--
400 S. Broadway	Woman's Club of Redondo Beach	NR	1922	--
225 Avenue D		CR	1917	---
211 Avenue E	Hogue House	CR	1930	---
417 Emerald Street	Johnson House	CR	1911	---
229 Avenue E	Haylor House	MA	1921	2/6/2002
Harbor Drive and Herondo Ave	Old Salt Lake	CHLP	NA	1941

APPENDIX H. A AND B RATED PROPERTIES FROM 1986, 1996, AND 2003 HSTORIC RESOURCE INVENTORIES

Table H-1. Properties rated A or B in 1986, 1996, or 2003 Historic Resources Inventories

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
4153-005-003		2420 ARTESIA BLVD	CRAFTSMAN COTTAGE	1923	B	---	1986/1996
4157-001-003		2518 ARTESIA BLVD	CRAFTSMAN COTTAGE	1928	B	---	1986/1996
4157-001-002		2520 ARTESIA BLVD	CRAFTSMAN COTTAGE	1924	B	---	1986/1996
7509-004-001		104 AVENUE A/901 S. CATALINA	SPANISH COLONIAL	1930	B/C+	45052	1986/1996
7509-011-002		554 AVENUE A	CRAFTSMAN	1924	B	3	1986/1996
7509-012-031	MONSTAD HOUSE LM# 5/1/2000	559 AVENUE A	PERIOD REVIVAL	1929	B	4B	1986/1996
7509-003-036		205 AVENUE B	CRAFTSMAN	1906	B	4B	1986/1996
7509-030-037	SARAH FORBES HOUSE LM#35 11/99	208 AVENUE B	CRAFTSMAN	1910	B	4B	1986/1996
7509-006-001		104 AVENUE B/1001 S. CATALINA	SPANISH COLONIAL	1924/1922	C/B	3	1986/1996
7509-007-022	LANDMARK 3/5/08	207 AVENUE C	CRAFTSMAN	1914	B	3	1986/1996
7511-003-022		209 AVENUE E	PERIOD REVIVAL	1925	B	3	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7511-003-023	LISTED ON CAL REGISTER/LANDMARK 5/7/14	211 AVENUE E	SPANISH COLONIAL	1930	B	3S/2	1986/1996
7511-003-027		219 AVENUE E	SPANISH COLONIAL	1935	B	5	1986/1996
7511-003-034		233 AVENUE E	MISSION REVIVAL	1923	B	3	1986/1996
7511-004-024	LANDMARK 1/6/10	207 AVENUE F	CRAFTSMAN	1914	B	4B	1986/1996
7511-005-013		210 AVENUE F	SPANISH COLONIAL	1925	B	4B	1986/1996
7511-004-029		217 AVENUE F	SPANISH COLONIAL	1929	B	3	1986/1996
7511-005-006		224 AVENUE F	MODERNE	1940	B-	5	1986/1996
7511-005-005		226 AVENUE F	PERIOD REVIVAL	1929	B	5	1986/1996
4155-028-018		2100 AVIATION WAY	VICTORIAN	1910	B	---	1986/1996
4159-009-004	LANDMARK 7/6/16	2222 BELMONT LANE	VERNACULAR	1926	A	---	1986/1996
7503-015-018		106 E. BERYL STREET	CRAFTSMAN	1924	B	---	1986/1996
7503-015-017	A.S. DAY HOUSE LM#32 2/99	108 E. BERYL STREET	CRAFTSMAN	1924	B	---	1986/1996
7503-016-017	LANDMARK 4/4/18	216 E. BERYL STREET	COL. REV. W/CRAFTSM.	1924	B	---	1986/1996
7503-010-001	SWEETSER HOUSE LM#2 9/1/1990	417 E. BERYL STREET	PER. REV.-COLONIAL	1921	A	1S	1986/1996
7503-006-001		523 E. BERYL STREET	VERNACULAR	1910	B	4B	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7503-020-003	VINCENT APARTMENTS/12/1/2002	612 E. BERYL STREET	CRAFTSMAN	1920	B	"---"	1986/1996
7503-020-002		614 E. BERYL STREET	CRAFTSMAN	1920	B	---	1986/1996
7503-005-027		615 E. BERYL STREET	CRAFTSMAN	1920	B	---	1986/1996
7502-003-003		809 E. BERYL STREET	CRAFSTMAN COTTAGE	1926	B	---	1986/1996
7502-026-015		820 BERYL STREET/629 N. LUCIA AVENUE	CRAFTSMAN	1923	A/B+	3	1986/1996
7505-007-023	BUNGALOW COURT	100-106 N. BROADWAY	SPANISH COLONIAL	1925	A	3/3D	1986/1996
7505-007-021	DORRINGTON APARTMENTS LM#18 2/94	108 N. BROADWAY	COLONIAL REVIVAL	1907	B	4B	1986/1996
7505-006-008	VINCENT APARTMENTS/LANDMARK 9/7/05	133 N. BROADWAY	ITALIANATE	1913	A	3	1986/1996
7505-018-008	BUNGALOW COURT	207-211 S. BROADWAY	CRAFTSMAN	1923	B	3/3D	1986/1996
7505-019-020		214-216 S. BROADWAY	SPANISH COLONIAL	1921	B	5	1986/1996
7505-019-022	LANDMARK 2/6/08	220 S. BROADWAY	COLONIAL REVIVAL	1912	B	3	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7505-018-024	1ST METHODIST CHURCH	243 S. BROADWAY	PERIOD REVIVAL	1927	B	4A	1986/1996
7505-023-005	LANDMARK 6/4/08	313 S. BROADWAY	CRAFTSMAN BUNGALOW & SPANISH COLONIAL	1921/ 1924	B		1986/1996
7508-012-017	REDONDO BEACH WOMEN'S CLUB	400 S. BROADWAY	CRAFTSMAN	1922	A	1	1986/1996
7508-012-018		402 S. BROADWAY	EASTLAKE VICTORIAN	1923	B	6	1986/1996
7508-012-020	CHRIST CHURCH EPISCOPAL	408 S. BROADWAY	GOTHIC REVIVAL	1900	A	3	1986/1996
7508-012-021		412 S. BROADWAY	CRAFTSMAN	1912	A	3	1986/1996
7508-012-022		414 S. BROADWAY	CRAFTSMAN	1920	B	3	1986/1996
7508-008-020		707 S. BROADWAY	CRAFTSMAN	1911	A	3	1986/1996
7508-008-021	LM 9/2/2020	709 S. BROADWAY	CRAFTSMAN	1923	B	3	1986/1996
7508-008-022		711 S. BROADWAY	CRAFTSMAN	1923	B	5	1986/1996
7506-008-027		212 S. CAMINO REAL	QUEEN ANNE	1911	B	6	1986/1996
7506-009-005		233 S. CAMINO REAL	CRAFTSMAN/QUEEN ANNE	1911	B-	4A	1986/1996
7506-027-033	AMERICAN LEGION CLUBHOUSE LM#38 11/2000	412 S. CAMINO REAL	SPANISH COLONIAL	1927	B	4A	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7507-003-009		509 S. CAMINO REAL	ITALIANATE	1918	B+	6	1986/1996
7503-015-001		221 CARNELIAN STREET	CRAFTSMAN	1924	B	5	1986/1996
7503-026-013	ORIGINAL TOWNSITE HD	610-614 CARNELIAN STREET	CRAFTSMAN	1910	B	3/1D	1986/1996
7503-031-025	BUNGALOW COURT	214 N. CATALINA AVENUE	SPANISH COLONIAL	1921	B	4B3D	1986/1996
7503-031-024	MULTI-UNIT - N. CATALINA HD	216 N. CATALINA AVENUE	CRAFTSMAN	PRE-1895, 1913	A	4B	1986/1996
7503-015-031	LM 3/3/2021	308 N. CATALINA AVENUE	ALT. COL. REVIVAL	1921	B	6	1986/1996
7505-014-024		116 S. CATALINA AVENUE	BRICK COMMERCIAL	1919	A	4A/3	1986/1996
7505-014-029	EAGLES LODGE	128 S. CATALINA AVENUE	MODERNE	1937	B	4D	1986/1996
7505-023-013	COMMERCIAL	308 S. CATALINA AVENUE	PERIOD REVIVAL	1925	A	4B	1986/1996
7508-011-014	MULTI-UNIT (VAIL APTS.)/LANDMARK 11/2/11	408 S. CATALINA AVENUE	CRAFTSMAN/CHARLES LINDBER	1911	B	3	1986/1996
7508-005-014	S. BAY MASONIC LODGE	501-505 S. CATALINA AVENUE	PER. REV. COMMERCIAL	1927	A	3	1986/1996
7508-005-006	GEPHART HOUSE LM#19 5/1/1994	519 S. CATALINA AVENUE	CRAFTSMAN	1913	B	3	1986/1996
7508-005-005	LANDMARK 11/5/08	521 S. CATALINA AVENUE	CRAFTSMAN	1909			1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7508-005-004		523 S. CATALINA AVENUE	CRAFTSMAN	PRE-1917	B	4A	1986/1996
7508-010-025	DUPLEX	528C-530C S. CATALINA AVENUE	COLONIAL REVIVAL	1923	B	3	1986/1996
7508-006-010	BUNGALOW COURT	605 S. CATALINA AVENUE	SPANISH COLONIAL	1925	B	3/3D	1986/1996
7508-008-013		708 S. CATALINA AVENUE		1910	B	3	1986/1996
7508-008-012		710 S. CATALINA AVENUE		1923	B	3	1986/1996
7508-008-011		712 S. CATALINA AVENUE	SPANISH COLONIAL	1923	B	3	1986/1996
7508-008-007		720 S. CATALINA AVENUE	CRAFTSMAN	1910	B	3	1986/1996
7508-008-005		724 S. CATALINA AVENUE	CRAFTSMAN	1913	A	4B/3	1986/1996
7508-008-004		726 S. CATALINA AVENUE	SPANISH COLONIAL	1923	B	3	1986/1996
7509-002-010	BUNGALOW COURT/REMOVED 5/7/14	810-814 S. CATALINA	MODERBW	1930'S	B	4B3D	1986/1996
7509-004-001		901 S. CATALINA/ 104 AVENUE A	SPANISH COLONIAL	1930	B/C+	45052	1986/1996
7509-003-020		906 S. CATALINA AVENUE	SPANISH COLONIAL	1926	B	4	1986/1996
7509-006-001	REMOVED 9/1/04	1001 S. CATALINA AVENUE	SPANISH COLONIAL	SPANISH COLONIAL	B/C	3	1986/1996
7509-006-001	REMOVED 9/1/04	104 S AVENUE B	SPANISH COLONIAL	SPANISH COLONIAL	B/C	3	1986/1996
7509-007-019		1008 S. CATALINA AVENUE	PERIOD REVIVAL	1926	B	4A	1986/1996
7511-008-001	COMMERCIAL	1501 S. CATALINA AVENUE	SPANISH COLONIAL	1934	B	4B	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
4161-011-028		1721 CLARK LANE	CRAFTSMAN	1915	B	---	1986/1996
4161-001-017		1811 CLARK LANE	CRAFTSMAN COTTAGE	1929	A	---	1986/1996
4157-027-020		2315 CLARK LANE	CRAFTSMAN BUNGALOW	1914	B	---	1986/1996
4157-026-021	REMOVED 9/1/04	2417 CLARK LANE	CRAFTSMAN	1948	B	---	1986/1996
4155-012-026		1911 CURTIS AVENUE	MODERN	1947	A	---	1986/1996
4153-015-010		2501 CURTIS AVENUE	CRAFTSMAN	1934	B	---	1986/1996
7503-031-001	COMMERCIAL LM#1 7/90	321 DIAMOND STREET	CLASSICAL REVIVAL	1913	A	1S	1986/1996
7504-009-037		806 EL REDONDO	CRAFTSMAN	1911	B	3	1986/1996
7504-009-040		812 EL REDONDO	VERNACULAR	1905	B	4AB	1986/1996
7505-010-009		813 EL REDONDO	CRAFTSMAN	1924	B	3	1986/1996
7508-017-025	SALE HOUSE LM#8 4/93	626 ELVIRA AVENUE	CRAFTSMAN	1922	A	3	1986/1996
7508-015-026	LANDMARK 11/7/07	717 ELVIRA AVENUE	PERIOD REVIVAL	1923	B-	4A/B	1986/1996
7508-015-027	LANDMARK 11/3/2021	719 ELVIRA AVENUE	CRAFTSMAN	1924	B	3	1986/1996
7505-005-013	OKLAHOMA APARTMENTS LM#33 7/99	305 EMERALD STREET	FOLK VICTORIAN	1905	B	4A	1986/1996
7505-007-022	LANDMARK 11/7/12	411 EMERALD STREET	COLONIAL REVIVAL	1911	B+	3/3D	1986/1996
7505-007-027	LANDMARK 8/1/12	413 EMERALD STREET	COLONIAL REVIVAL	1911	B+	3/3D	1986/1996
7505-007-029	LANDMARK 11/3/10	415 EMERALD STREET	TRANSITIONAL	1911	B+	3/3D	1986/1996
7505-007-030	LISTED ON CAL REGISTER	417 EMERALD STREET	COLONIAL REVIVAL	1911	B+	3S/3D/2S2	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7506-004-018	LANDMARK 11/5/08	816 EMERALD STREET	QUEEN ANNE	1895	A	4A	1986/1996
7506-004-017	TINGLEY HOUSE LM#49 5/1/2003	824 EMERALD STREET	QUEEN ANNE	1909	A	4A	1986/1996
7505-001-912	OLD MAIN LIBRARY LM#12 MORETON BAY FIG TREE LM #13 1/94	309 ESPLANADE	SPANISH COLONIAL	1930	A	1S	1986/1996
7509-006-009		1002 ESPLANADE	SPANISH COLONIAL REVIVAL	1921	B	6	1986/1996
4150-013-020		1919 FARRELL AVENUE	CRAFTSMAN	1916	A	---	1986/1996
4157-008-021		1801 FELTON LANE	CRAFTSMAN BUNGALOW	1915	B	---	1986/1996
7505-021-005	THOMAS HOUSE LM#28 2/1/1996	323 S. FRANCISCA AVENUE	QUEEN ANNE	1892	A	3	1986/1996
7508-023-022		530 S. FRANCISCA AVENUE	VERNACULAR	1914	B	5	1986/1996
7506-005-027	LANDMARK 2/6/19	601-603 GARNET STREET	SPANISH COLONIAL	1926	B	4B	1986/1996
7506-005-028	PFEIFER/DODGE HOUSE LM#15 1/94	605 GARNET STREET	CRAFTSMAN	1912	B	3	1986/1996
4155-011-012		2000 GATES AVENUE	CRAFTSMAN BUNGALOW	1924	B	---	1986/1996
4153-015-006		2510 GATES AVENUE	CRAFTSMAN COTTAGE	1937	B	---	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7503-027-013	ORIGINAL TOWNSITE HD	325 N. GERTRUDA AVENUE	CRAFTSMAN	1906/ 1912	B	3/1D	1986/1996
7503-010-004		511 N. GERTRUDA AVENUE	CRAFTSMAN	1908	B	5	1986/1996
4153-014-007	MANNY HOUSE LM#24 5/95	2500 GRAHAM AVENUE	CRAFTSMAN	1934	B	---	1986/1996
4162-003-031		1725 GRANT AVENUE	CRAFTSMAN BUNGALOW	1925	B	---	1986/1996
4156-013-018		1803 GRANT AVENUE	COLONIAL REVIVAL	1925	B	---	1986/1996
4156-020-010		1804 GRANT AVENUE	ART DECO	1937	B	---	1986/1996
4156-014-023	REMOVED 9/7/11	1921 GRANT AVENUE	VICTORIAN CRAFTSMAN	1916	B	---	1986/1996
7503-020-007		620 N. GUADALUPE AVENUE	COLONIAL REVIVAL	1921	B	4B	1986/1996
7503-006-002		705 N. GUADALUPE AVENUE	BOARD AND BATTEN	1910	B	5	1986/1996
7506-006-012	LANDMARK 1/6/10	119 S. GUADALUPE AVENUE	COLONIAL REVIVAL	1910	B	3	1986/1996
7506-005-026	LANDMARK 3/2/16	124 S. GUADALUPE AVENUE	COLONIAL REVIVAL	1923	A	4B	1986/1996
7508-020-008		400 S. GUADALUPE AVENUE	LATE PERIOD REVIVAL	1937	B	6	1986/1996
7508-020-017	MURRAY HOUSE LM#30 7/1/1996	422 S. GUADALUPE AVENUE	SPANISH COLONIAL	1937	B	6	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7508-018-013		526 S. GUADALUPE AVENUE	QUEEN ANNE	1895	B	4B	1986/1996
4161-011-002	LANDMARK 2/6/08	1307 HARKNESS LANE	COLONIAL REVIVAL	1930	B	---	1986/1996
4161-014-020		1218 HARPER AVENUE	CRAFTSMAN BUNGALOW	1915	B	---	1986/1996
4161-014-022		1224 HARPER AVENUE	CRAFTSMAN	1914	B	---	1986/1996
4157-021-019		2217 HARRIMAN LANE	SPAN. COL. REV.	1927	A	---	1986/1996
4157-025-003		2518 HARRIMAN LANE	CRAFTSMAN	1912	A	---	1986/1996
7506-011-001		221-1/2 S. HELBERTA AVENUE	VERNACULAR	1918	B	4A	1986/1996
4158-008-007		2310 HILL LANE	CRAFTSMAN BUNGALOW	1935	B	---	1986/1996
4158-006-013		2401 HILL LANE	MODERN	1949	A	---	1986/1996
4162-004-015		1705 HUNTINGTON LANE	CRAFSTMAN COTTAGE	1924	B	---	1986/1996
7503-004-021	LANDMARK 3/6/2019	724 N. IRENA AVENUE	COLONIAL REVIVAL	1907	B	4A	1986/1996
7506-004-005	MONTAGUE HOUSE LM#17	125 S. IRENA AVENUE	COLONIAL REVIVAL	1908	B	4A	1986/1996
	34366						
7504-017-003	REMOVED 1/6/16	110 N. JUANITA AVENUE	MODERNE	1925	B	6	1986/1996
7502-027-013	REMOVED 5/3/06	523 N. LUCIA AVENUE	FOLK ART	1924	B	3	1986/1996
7506-018-016		203 S. LUCIA AVENUE	SPANISH COLONIAL	1925	B	3	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7506-019-019	REMOVED 2009	206 S. LUCIA AVENUE	SPANISH COLONIAL	1913	B	4A/B	1986/1996
4153-001-003		2607 MACKAY LANE	CRAFTSMAN BUNGALOW	1932	B	---	1986/1996
7506-022-054	LANDMARK 12/6/06	317 S. MARIA AVENUE	CRAFTSMAN	1920	B	---	1986/1996
4161-018-024		1604 MARSHALLFIELD LANE	CRAFTSMAN BUNGALOW	1922	B	---	1986/1996
4161-003-013		1800 MARSHALLFIELD LANE	CRAFTSMAN COTTAGE	1927	B	---	1986/1996
4155-026-014		2101 MATHEWS AVENUE	MISSION	1930	B	---	1986/1996
7506-029-019		413 MIRAMAR DRIVE	SPANISH COLONIAL	1928	B-	3D	1986/1996
7506-029-018		415 MIRAMAR DRIVE	SPANISH COLONIAL	1928	B-	3D	1986/1996
	CRISLER HOUSE LM#21 6/1/1994	417 MIRAMAR DRIVE	SPANISH COLONIAL	1928	B-	3D	1986/1996
7506-029-016		419 MIRAMAR DRIVE	SPANISH COLONIAL	1928	B	3D	1986/1996
7505-010-024	CHURCH	100 N. PACIFIC CST HWY	MISSION REVIVAL	1929	B	4A	1986/1996
7508-018-017		501					
7508-018-017		501 S. PACIFIC CST HWY	CRAFTSMAN	1921	A	3	1986/1996
7508-018-017		500 S. 500 S. GUADALUPE AVENUE	CRAFTSMAN	1921	A	3	1986/1996
7508-011-011		104-106 PEARL STREET	SPANISH COLONIAL	1922	B-	3	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7508-011-013		108 PEARL STREET	CRAFTSMAN	1908	B	3	1986/1996
7506-028-034		413 PEARL STREET	PERIOD REVIVAL	1927	B	5	1986/1996
7507-004-019	LANDMARK 4/4/18	610 PEARL STREET	PER. REV. CHALET	1926	B	3	1986/1996
7506-001-013	REMOVED 5/4/11	105 S. PROSPECT AVENUE	CRAFTSMAN	1923	B	---	1986/1996
7506-001-012		107 S. PROSPECT AVENUE	CRAFTSMAN	1923	B	---	1986/1996
4161-008-003		1704 PULLMAN LANE	COLONIAL REVIVAL	1941	B	---	1986/1996
4155-004-001		1934 ROBINSON STREET	CRAFTSMAN BUNGALOW	1934	B	---	1986/1996
4156-016-033		1800 ROCKEFELLER LANE	CRAFTSMAN	1927	B	---	1986/1996
7508-013-016	DUPLEX	318-322 RUBY STREET	SPANISH COLONIAL	1927	B	3	1986/1996
4153-003-026	REMOVED 12/5/07	2303 RUHLAND AVENUE	CRAFTSMAN	1934	B	---	1986/1996
7508-006-014		114 SAPPHIRE AVENUE	CRAFTSMAN	1908	B	3	1986/1996
7508-006-012		124 SAPPHIRE AVENUE	MISSION REVIVAL	1912	B	3	1986/1996
7507-011-004		729 SAPPHIRE AVENUE	SPANISH COLONIAL	PRE-1925	B	3	1986/1996
4160-003-004		1816 SPRECKELS LANE	TUDOR REVIVAL	1926	A	---	1986/1996
4161-017-005		1208 STEINHART AVENUE	CRAFTSMAN COTTAGE	1937	A	---	1986/1996
7504-001-902	R. U. HIGH SCHOOL	631 VINCENT PARK	WPA MODERNE	1930'S	B	*	1986/1996

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
4155-019-005		2014 VORHEES AVENUE	CRAFTSMAN BUNGALOW	1935	B	---	1986/1996
7509-015-021	REMOVED 11/7/07	920 YNEZ AVENUE	CRAFTSMAN	1920	B	---	1986/1996
APN		NO STREET DIR STREET NAM	ARCITECTURAL STYLE	2003	2003	2003	2003
4157-002-003		2420 ARTESIA BLVD	CRAFTSMAN COTTAGE	1923	B		2003
4157-001-003		2518 ARTESIA BLVD	CRAFTSMAN COTTAGE	1928	B		2003
4157-001-002		2520 ARTESIA BLVD	CRAFTSMAN COTTAGE	1937	B		2003
7509-012-031		559 AVE A	SPANISH PERIOD REVIVAL	1929	B	4B	2003
7503-016-017		216 BERYL ST	COLONIAL REVIVAL	1924	B		2003
7503-010-001		417 BERYL ST	COLONIAL REVIVAL	1921	A	1S	2003
7503-006-001		523 BERYL ST	COTTAGE/ECLCTIC	1910	B		2003
7503-015-018		106 E BERYL ST	CRAFTSMAN COTTAGE	1924	B		2003
7503-015-017		108 E BERYL ST	COTTAGE	1920	B	X	2003
4155-028-018		2100 AVIATION WAY	VICTORAN	1910	B		2003
4159-009-004		2222 BELMONT LANE	VERNACULAR	1926	A		2003
7509-003-033		501 AVE B	SPANISH ECLECTIC	1930	X	TBD	2003
7509-007-023		209 AVE C	CRAFTSMAN	1921	X	TBD	2003
7509-007-025		213 AVE C	COTTAGE ECLECTIC	1932	X	TBD	2003

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7509-008-010		216 AVE C	CRAFTSMAN ECLECTIC	1925	X	TBD	2003
7509-007-032		227 AVE C	SPANISH	1930	X	TBD	2003
75009-008-033		225 AVE D	COTTAGE ECLECTIC	1920	X	TBD	2003
7511-003-023		211 AVE E	SPANISH ECLECTIC	1930	X	TBD	2003
7503-020-002		614 BERYL ST	CRAFTSMAN ECLECTIC	1920	TBD	NE	2003
7503-005-027		615 BERYL ST	CRAFTSMAN ECLECTIC	1920	X	NE	2003
7503-019-030		512 CARNELIAN ST	COTTAGE	1910	X	X	2003
7503-026-013		610 CARNELIAN ST	CRAFTSMAN ECLECTIC	1909	X	X	2003
7503-019-011		611 CARNELIAN ST		1923	X	TBD	2003
7503-031-001		321 DIAMND	COMERCIAL	1912	X	1S	2003
7506-008-022		510 GARNET		1908	X	X	2003
7506-007-015		511 GARNET		1913	X	X	2003
7506-008-021		512 GARNET		1908	X	X	2003
7506-007-014		513 GARNET		1912	X	X	2003
7506-005-028		605 GARNET		1912	X	X	2003
7506-029-017		417 MIRAMAR		1928	X	X	2003
7505-007-021		108 N BROADWAY		1906	X	X	2003
7503-031-024		216 N CATALINA	SPANISH ECLECIC	1913	X	TBD	2003
7503-026-026		304 N GERTRUDA	COTTAGE BUNGALOW	1907	X	1S	2003
7503-027-003		305 N GERTRUDA	CRAFTSMAN ECLECTIC	1912	X	1D	2003
7503-026-025		306 N GERTRUDA	CRAFTSMAN ECLECTIC	1922	X	1D	2003

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7503-027-004		307 N GERTRUDA	CRAFTSMAN ECLECTIC	1907	X	1D	2003
7503-026-024		308 N GERTRUDA	CRAFTSMAN ECLECTIC	1907	X	1D	2003
7503-026-023		310 N GERTRUDA	CRAFTSMAN ECLECTIC	1911	X	1D	2003
7503-027-006		311 N GERTRUDA	CRAFTSMAN ECLECTIC	1911	X	1D	2003
7503-027-007		313 N GERTRUDA	CRAFTSMAN	1911	X	1D	2003
7503-026-021		314 N GERTRUDA	CRAFTSMAN ECLECTIC	1913	X	1D	2003
7503-027-008		315 N GERTRUDA	CRAFTSMAN ECLECTIC	1912	X	1D	2003
7503-026-020		316 N GERTRUDA	CRAFTSMAN ECLECTIC	1905	X	1D	2003
7503-027-009		317 N GERTRUDA	CRAFTSMAN ECLECTIC	1923	X	1D	2003
7503-026-019		318 N GERTRUDA	CRAFTSMAN ECLECTIC	1908	X	1D	2003
7503-027-010		319 N GERTRUDA	CRAFTSMAN	1912	X	1D	2003
7503-026-018		320 N GERTRUDA	COTTAGE BUNGALOW	1908	X	1D	2003
7503-027-011		321 N GERTRUDA	CRAFTSMAN COTTAGE	1905	X	1D	2003
7503-026-017		322 N GERTRUDA	CRAFTSMAN COTTAGE	1923	X	1D	2003
7503-026-016		324 N GERTRUDA		1911	X	1D	2003
7503-027-013		325 N GERTRUDA	CRAFTSMAN ECLECTIC	1912	X	1D	2003
7503-026-015		326 N GERTRUDA	CRAFTSMAN ECLECTIC	1906	X		2003
7503-027-014		327 N GERTRUDA	VICTORIAN ECLCTIC	1906	X	1D	2003

PARCEL #	NAME OR USE	ADDRESS	STYLE	DATE	LOCAL RATING	NRHP RATING	INVENTORY
7503-026-014		328 N GERTRUDA	COTTAGE BUNGALOW	1912	X	1D	2003
7503-027-015		329 N GERTRUDA	CRAFTSMAN COTTAGE ECLECTIC	1907	X	1D	2003
7503-019-016		426 N GERTRUDA	CRAFTSMANBUNGALOW	1921	X	X	2003
7508-012-017		400 S BROADWAY	CRAFTSMAN	1922	X	X	2003
7508-010-021		519 S CATALINA AVE	CRAFTSMAN	1912	X	TBD	2003
7508-026-008		616 S GERTRUDA S GERTRUDA	SPANISH ECLECTIC	1937	X	TBD	2003
7508-020-017		509 S GUADALUPE	SPANISH ECLECTIC	1937	X	TBD	2003
7506-004-005		125 S IRENA		1910	X	TBD	2003

APPENDIX I. HISTORIC ARCHIVES/SOCIETIES CONSULTATION

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

September 8, 2023

Attn: Redondo Beach Historical Society
Redondo Beach Historical Museum
302 Flagler Lane
Redondo Beach, CA 90277

RE: Request for Information regarding the Cultural and Paleontological Resources Assessment for the City of Redondo Beach General Plan Update, City of Redondo Beach, Los Angeles County, CA

To Whom It May Concern:

As a sub-consultant to PlaceWorks, Cogstone Resource Management (Cogstone) is conducting a cultural and paleontological resources assessment for the City of Redondo Beach General Plan Update Project (Project) located in the City of Redondo Beach (City), Los Angeles County, California.

The Project involves updating the City's 2016 General Plan to add Safety Element and Zoning updates. To assist in this Project, Cogstone is compiling and reviewing all relevant archival records, historic maps, aerial photographs, and other sources to ascertain the status of the City of Redondo Beach's historic resources.

We are contacting you because we would like to invite members of the Redondo Beach Historical Museum to provide input regarding the City's General Plan update. We have attached a list of historic resources we have gathered from national, state, and local inventories. We would appreciate any questions, comments, corrections, or recommendations to these lists as we work to compile the most up to date information regarding historic resources within the City. Please contact me at slopez@cogstone.com. Thank you for your attention to this matter.

Sincerely,

Shannon Lopez

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Architectural Historian
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Federal Certifications EDWOSB, SDB
State Certifications DBE, WBE, UDBE

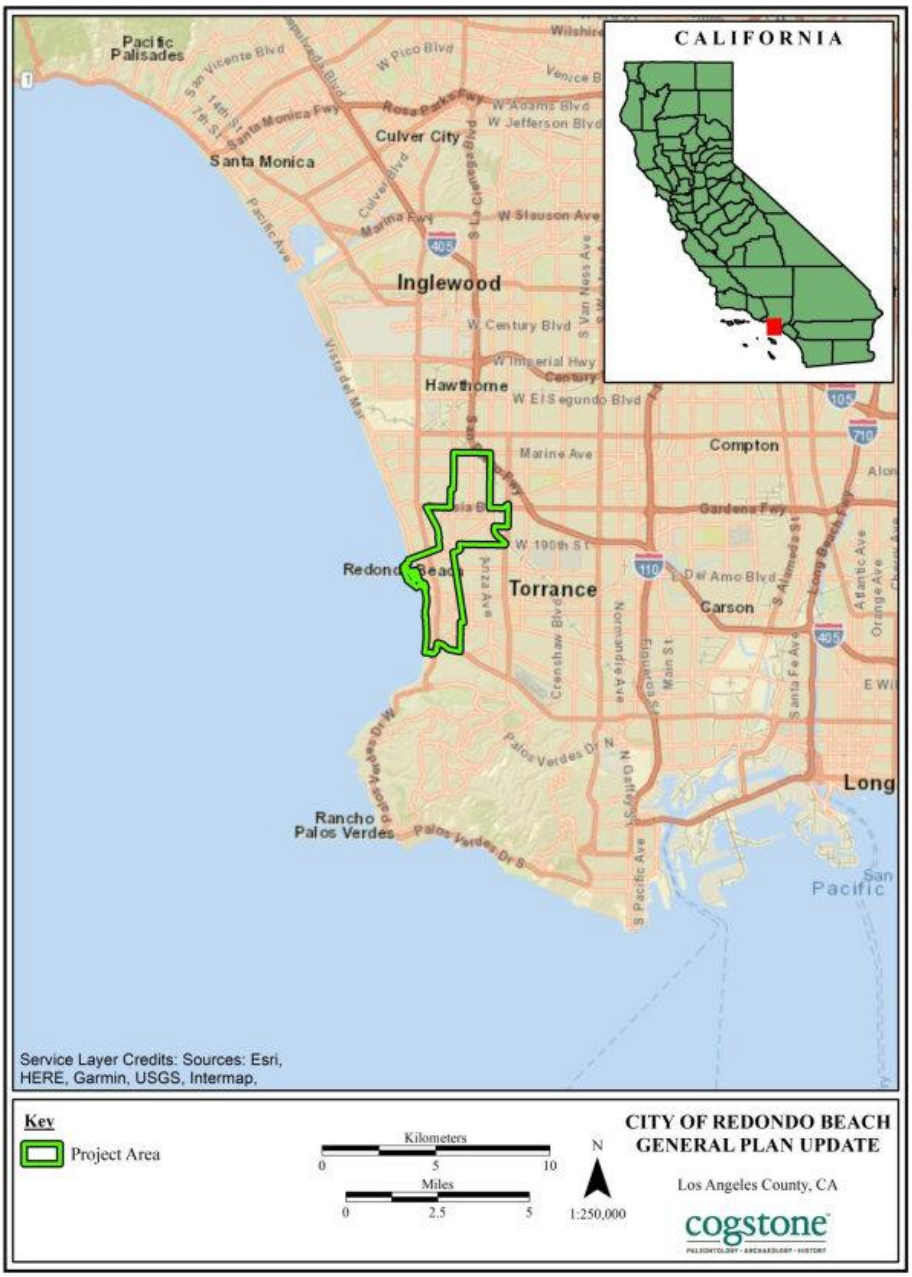


Figure 1. Project Vicinity Map

cogstone.com

NATIONAL REGISTER OF HISTORIC PLACES (NRHP)

Redondo Beach Public Library (NRHP ID: 81000158)
Location: 309 Esplanade Street.
Description: This 1-story library was built in 1930 and is an exemplary representation of the Spanish Colonial Revival style with Dutch Colonial Revival features. One of the unique aspects of the library is it location within a park overlooking the Pacific Ocean. The library is one of the last remaining significant public/commercial buildings still remaining from its period of construction. This historic resource was entered into the National Register in 1982 under Criterion C (Architectural significance).

Woman's Club of Redondo Beach (NRHP ID: 84000900)
Location: 400 S. Broadway
Description: Built in 1922, this 1-story wood framed building is considered an excellent example of a Vernacular style bungalow. The history of the building is significant for its continuous associated with the welfare and development of the community of Redondo Beach. This historic resource was added in the National Register in 1984 under Criterion A (Event-Social History) and Criterion C (Architectural significance).

Sweetser Residence (NRHP ID: 85001984)
Location: 417 E. Beryl Street
Description: Built in 1921, the 2-story, single family residence is an excellent example of the American Colonial Revival style, a type of architecture which is uncommon in this area of Southern California. During the early years of Redondo Beach's development, fine homes such as the Sweetser Residence boosted the town's appearance, encouraging residential and commercial growth. This historic resource was added in the National Register in 1985 under Criterion A (Event-Community Planning and Development) and Criterion C (Architecture).

Redondo Beach Original Townsite Historic District (NRHP ID: 88000970)
Location: North Gertruda Avenue, Carnelian Street, North Guadalupe Avenue and Diamond Street.
Description: The Redondo Beach Original Townsite Historic District consists of 1-story and 2-story residential building (both single family and multi-family residences) and associated ancillary buildings (garages and sheds). Architectural styles include a variety of Craftsman bungalows, Spanish Mission revival, and Neo-Classical/Colonial Revival styles. The integrity of the district, per the 1988 NRHP District record, is moderately high. Within the boundaries of the historic district are 49 contributing buildings and 19 non-contributors. Most homes were built within 1906-1914 near the Pacific Electric rail lines in what is now downtown Redondo Beach. The district represents the highest concentration of intact historic buildings within the city. This historic district was added in the National Register in 1988 under Criterion A (Event-Exploration/Settlement) and Criterion C (Architectural significance).

Diamond Apartments (NRHP ID: 92000260)
Location: 321 Diamond Street.
Description: This two-story Classical Revival style multi-family residence was built in 1913. While the Diamond Apartments are not an exemplary representation of an architectural style, it

is considered a rare surviving example of the early commercial life of Redondo Beach. It is the second oldest commercial building in the city and retains the highest level of integrity of its contemporaries. This historic resource was entered into the National Register in 1992 under Criterion A (Event-Commerce).

CALIFORNIA HISTORIC LANDMARKS (CHL)

Old Salt Lake (Reference No. 373)
Location: Historical Marker is located at the East corner of Harbor Drive and Yacht Club Way.
Description: The Old Salt Lake was used by the local Native American Tribes and early California settlers to harvest salt, an extremely important and valuable commodity. This site was designated on September 6, 1941.

CITY OF REDONDO BEACH HISTORIC RESOURCES REGISTER

NOTES
MA Properties with Mills Act agreements
NR Properties on the National Register
CR Properties on the California Register
LHD Local Historic District, designated as contributors to a historic district under local ordinance
NRHD Listed in the National Register as a contributor to a National Register Historic District
HOZ Historic Overlay Zone

Address	Common Name	Notes	Built	Designated
321 Diamond St	Redondo Van and Storage/ Diamond Apartment	NR	1913	7/5/1990
417 Beryl St	Sweetser House	NR, HOZ	1921	9/5/1990
507 N. Gertruda Ave	Sweetser Guest House		1909	9/5/1990
298 Flagler Lane	Morrell House at Dominguez Park		1906	2/6/1991
302 Flagler Lane	Queen Anne House at Dominguez		1904	2/6/1991
328 N. Gertruda Ave	Hibbard House/ Original Townsite Historic District	NR, NRHD, MA	1910	1/6/1993
227 Avenue C	Griffey House	MA	1930	4/7/1993
626 Elvira Ave	Sale House	MA	1922	4/7/1993
213 Avenue C	Allingham House	MA	1931	9/1/1993
616 S. Gertruda Av	Waller House	MA	1937	10/28/1993
702 Elvira Ave	Thurber House	MA	1923	10/28/1993
309 Esplanade	Old Main Library	NR	1930	1/27/1994
309 Esplanade	Moreton Bay Fig Tree		----	1/27/1994
2604 Fisk Lane	Bissen House	MA	1905	1/27/1994
605 Garnet St	Pfeifer/Dodge House	MA	1912	1/27/1994
717-719 Esplanade	Blauveldt House	MA	1934	1/27/1994
125 S. Irena Ave	Montague House	MA	1909	2/2/1994

Address	Common Name	Notes	Built	Designated
108 N. Broadway	Dorrington Apartments	MA	1907	2/24/1994
519 S. Catalina Ave	Gephart House		1913	5/4/1994
510 Garnet St	Lowe House		1910	5/4/1994
417 Miramar Dr	Crisler House	MA	1928	6/1/1994
513 Garnet St	Martin House	MA	1912	3/1/1995
209 Avenue C	Hurner House	MA	1921	3/1/1995
2500 Graham Ave	Manny House	MA	1934	5/3/1995
501 Avenue B	Davis House	MA	1930	10/4/1995
509 Garnet St	Cholvin House	MA	1913	10/4/1995
607 Esplanade	Albee House	MA	Pre-1906	1/3/1996
323 S. Francisca	Thomas House	MA	1892	2/7/1996
512 Garnet St	Hussong House	MA	1910	2/7/1996
422 S. Guadalupe	Murray House	MA	1936	7/3/1996
216 Avenue C	Harvey House	MA	1919	10/1/1997
108 Beryl St	A.S. Day House	MA	1920	2/3/1999
305 Emerald St	Oklahoma Apartments	MA	1905	7/7/1999
324 N Gertruda Ave	Shinn House [in Original Townsite Historic District]	NRHD, MA	1910	10/6/1999
208 Avenue B	Sarah Forbes House	MA	1910	11/3/1999
559 Avenue A	Monstad House	MA	1911	5/3/2000
426 N Gertruda Ave	Brandt House	MA	1921	9/6/2000
412 S Camino Real	American Legion Clubhouse	MA	1927	11/1/2000
511 Garnet Street	Wolfsberg House	MA	1913	4/4/2001
208 S Guadalupe Ave	Langworthy House	MA	1911	11/7/2001
629 S Broadway	Ebnet House	MA	1922	11/7/2001
412 Pearl Street	Newlywed House	MA	1923	12/5/2001
216 N. Catalina Ave	North Catalina Historic District	LHD	Pre-1895/1913	9/6/1995
218 N. Catalina Ave	North Catalina Historic District	LHD	Pre-1895	9/6/1995
303 N. Gertruda Ave	Original Townsite Historic District	NRHD	1907	--
304 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1911	8/6/1991
305 N. Gertruda Ave	Original Townsite Historic District	NRHD	1911/1920	--
306 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1921	8/6/1991
307 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1907	8/6/1991
308 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD, MA	1911	8/6/1991
309 N. Gertruda Ave	Gertruda Avenue Historic District (non-contributing)/ Original Townsite Historic District	LHD NRHD	1993	8/6/1991
310 N. Gertruda Ave	Original Townsite Historic District	NRHD	1911	--

Address	Common Name	Notes	Built	Designated
311 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1913	8/6/1991
312 N. Gertruda Ave	Gertruda Avenue Historic District (non-contributing)	LHD	1980	8/6/1991
313 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1914	8/6/1991
314 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	c. 1917	8/6/1991
315 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD, HOZ	1913	8/6/1991
316 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD NRHD	1913	5/4/1994
317 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1922	8/6/1991
318 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	c. 1907	8/6/1991
319 N. Gertruda Ave	Gertruda Avenue Historic District/ Original Townsite Historic District	LHD, NRHD	1911	8/6/1991
320 N. Gertruda Ave	Original Townsite Historic District	NRHD	1907	--
321 N. Gertruda Ave	Original Townsite Historic District	NRHD	1910	--
322 N. Gertruda Ave	Original Townsite Historic District	NRHD	1922/1924	--
325 N. Gertruda Ave	Original Townsite Historic District	NRHD	1906/1912	--
327 N. Gertruda Ave	Original Townsite Historic District	NRHD	1906	--
329 N. Gertruda Ave	Original Townsite Historic District	NRHD	1908/1920	--
505 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1907	--
507 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1922	--
509 N. Guadalupe Ave	Original Townsite Historic District	NRHD	1907	--
511 N. Guadalupe Ave	Original Townsite Historic District	LHD, NRHD	1921	12/5/2001
512 Carnelian St	Original Townsite Historic District	NRHD	1907	--
610-614 Carnelian St	Original Townsite Historic District	NRHD	1910/1922	--
400 S. Broadway	Women's Club of Redondo Beach	NR	1922	--
225 Avenue D		CR	1917	---
211 Avenue E	Hogue House	CR	1930	---
417 Emerald Street	Johnson House	CR	1911	---
229 Avenue E	Haylor House	MA	1921	2/6/2002
Harbor Drive and Herondo Ave	Old Salt Lake	CHLP	NA	1941

APPENDIX J. SACRED LANDS FILE SEARCH

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: Redondo Beach General Plan Update
County: Los Angeles

USGS Quadrangle
Name: Torrance, Inglewood, Venice and Redondo Beach
Township: See Below Range: _____ Section(s): _____

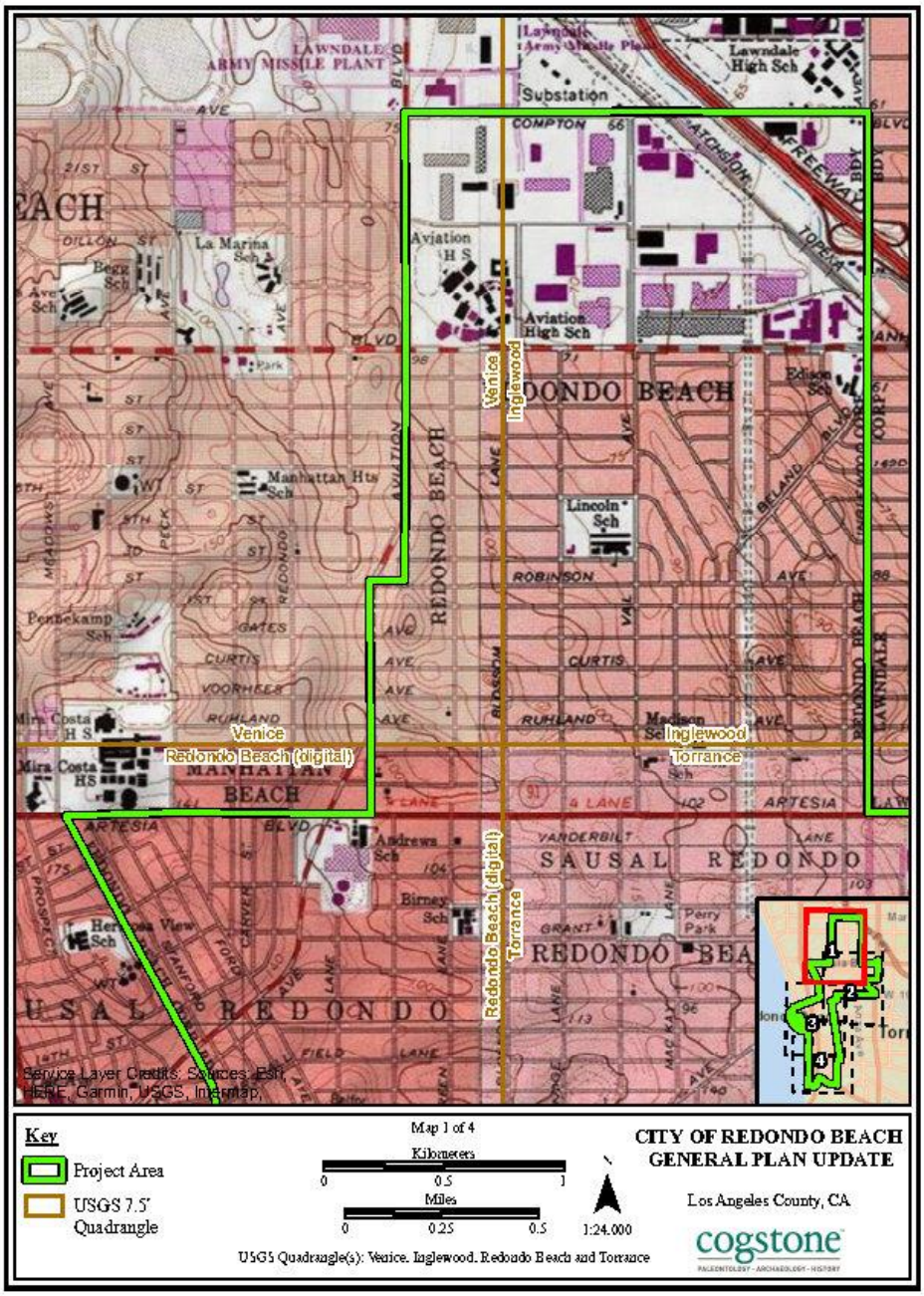
Company/Firm/Agency:
Cogstone Resource Management
Contact Person: _____
Street Address: 1518 W. Taft Avenue
City: Orange Zip: 92865
Phone: (714) 974-8300 Extension: _____
Fax: (714) 974-8303
Email: cogstoneconsult@cogstone.com

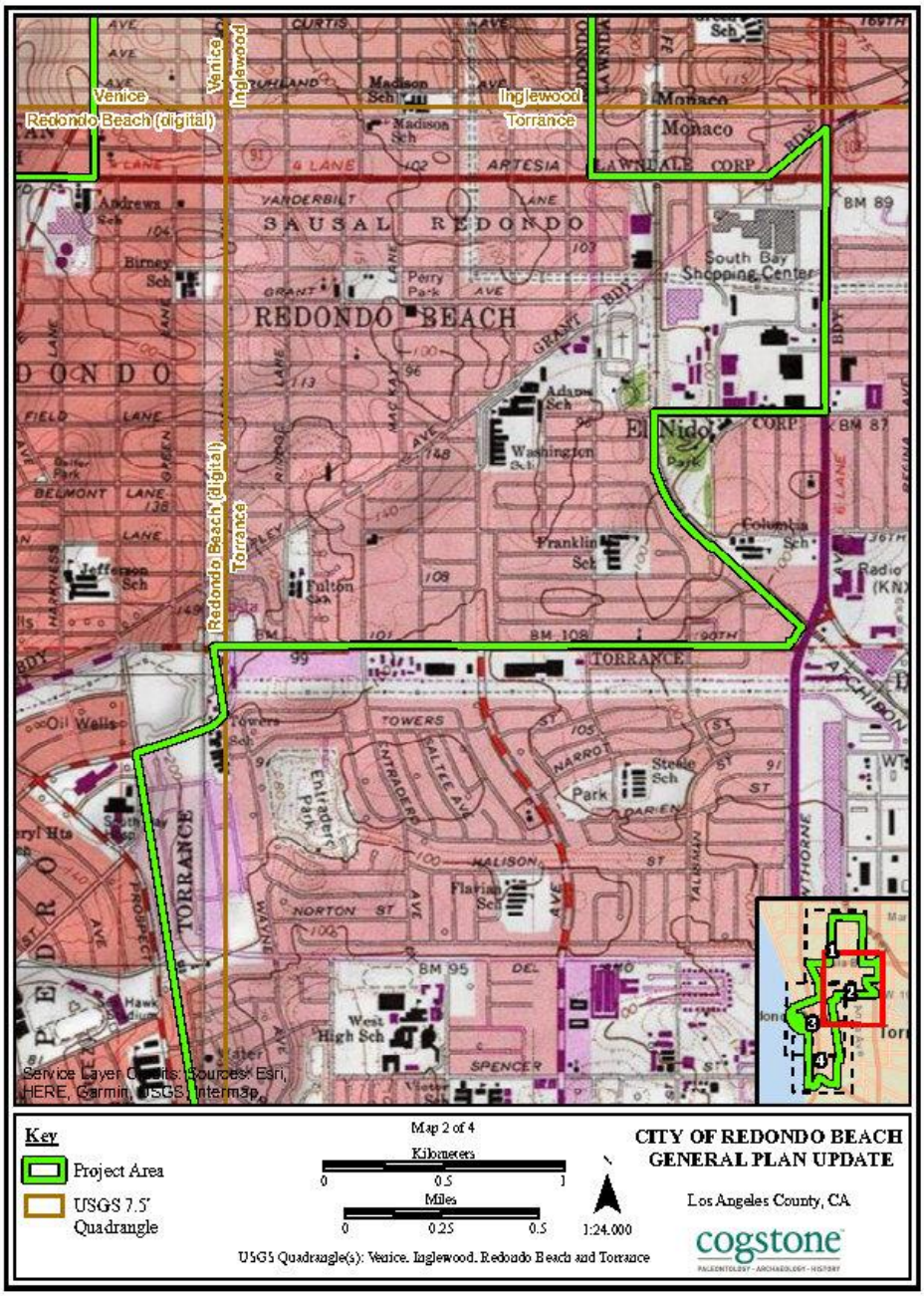
Project Description:
Location: T3S R14W S20, S21, S28, S29, S31, S32, S33;
T4S, R14W, S4, S5, S6, S7, S8, S17, S18, S19, S20
T4S, R15W, S1

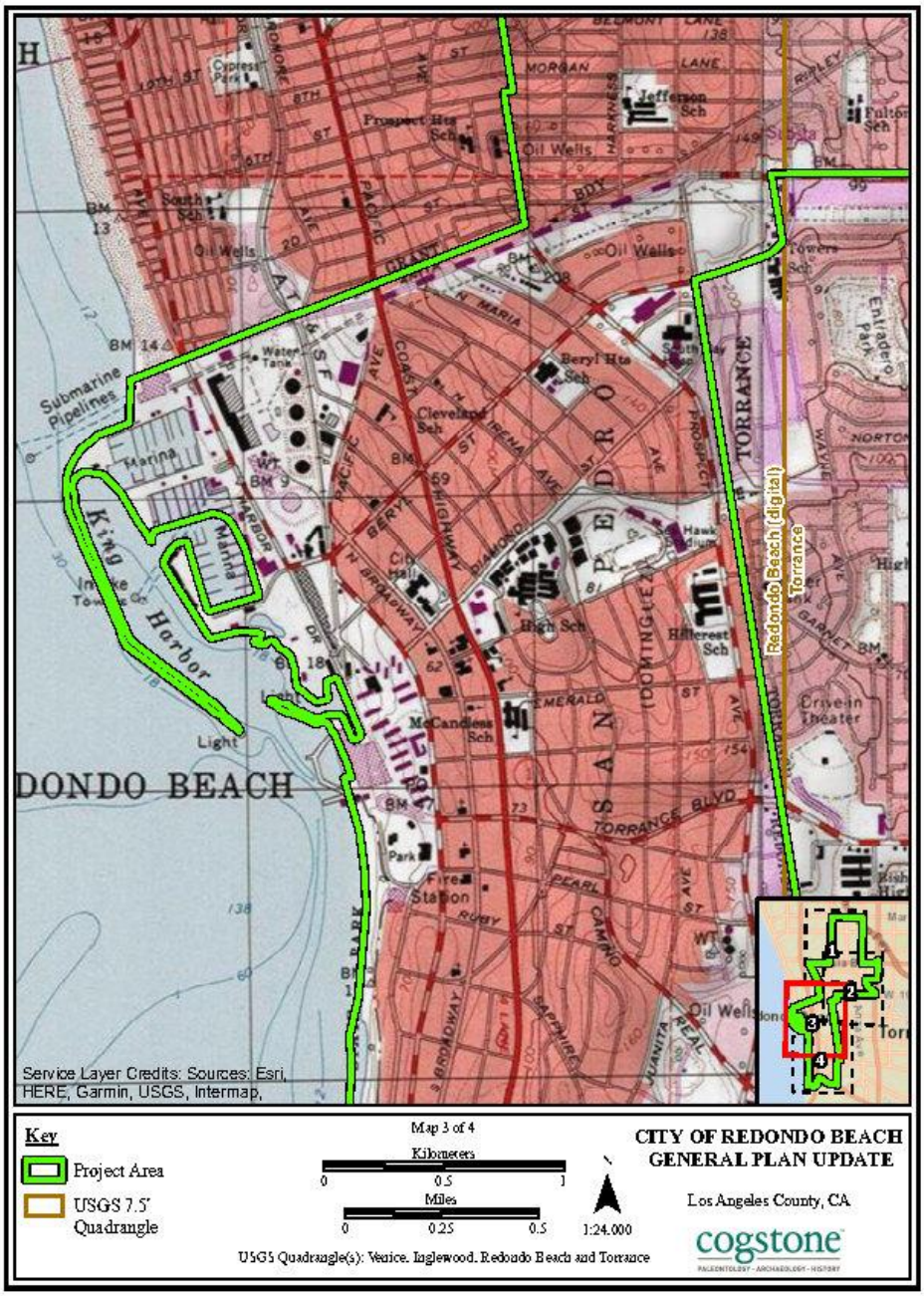
The Project involves updating the City's 2016 General Plan to add Safety Element and Zoning updates.

☑ Project Location Map is attached

SLF&Contactsform: rev: 05/07/14


LAWNDALE ARMY MISSILE PLANT
Substation
Lawndale High Sch
COMPTON
HAWTHORNE
FREEWAY
TOPEKA
Aviation H S
Aviation High Sch
La Marina Sch
Begg Sch
Park
Venice
Inglewood
REDONDO BEACH
Edison Sch
Manhattan Hts Sch
Lincoln Sch
ROBINSON
Penbekamp Sch
GATES
CURTIS
VOORHEES
RUHLAND
Mira Costa H S
Redondo Beach (digital)
Madison Sch
Torrance
MANHATTAN BEACH
ARTESIA
Andrews Sch
YANDERBILT
SAUSAL REDONDO
Birney Sch
Perry Park
GRANT
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap,
Key
Project Area
USGS 7.5' Quadrangle
Map 1 of 4
Kilometers
0 0.5 1
Miles
0 0.25 0.5
1:24,000
USGS Quadrangle(s): Venice, Inglewood, Redondo Beach and Torrance
CITY OF REDONDO BEACH
GENERAL PLAN UPDATE
Los Angeles County, CA
cogstone


Venice
Inglewood
Redondo Beach (digital)
Torrance
Monaco
SAUSAL REDONDO
REDONDO BEACH
TORRANCE
Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap
Key
Project Area
USGS 7.5' Quadrangle
Map 2 of 4
Kilometers
0 0.5 1
Miles
0 0.25 0.5
1:24,000
USGS Quadrangle(s): Venice, Inglewood, Redondo Beach and Torrance
CITY OF REDONDO BEACH
GENERAL PLAN UPDATE
Los Angeles County, CA
cogstone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Key
Project Area
USGS 7.5' Quadrangle
Map 3 of 4
Kilometers
0 0.5 1
Miles
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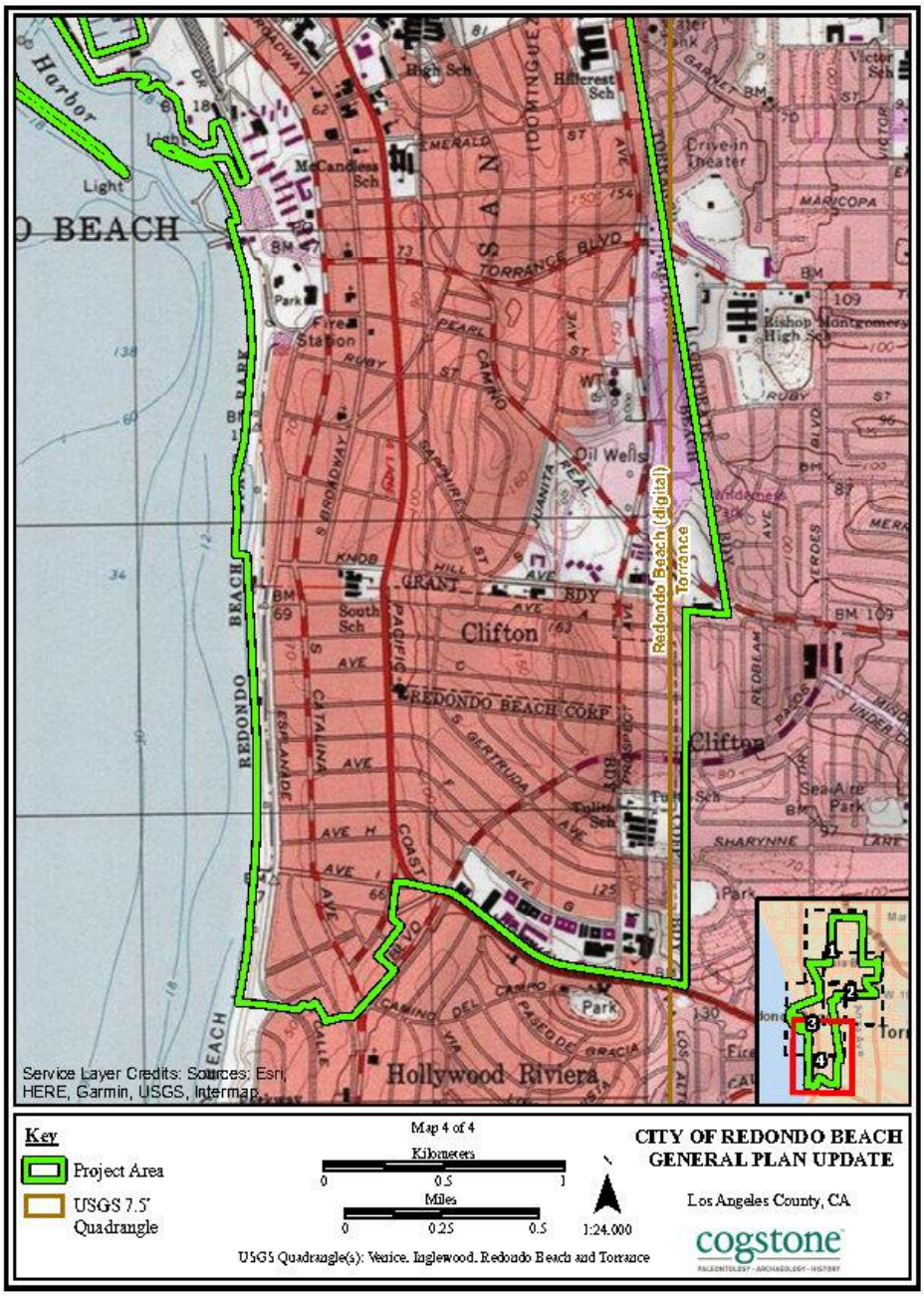
1:24,000
USGS Quadrangle(s): Venice, Inglewood, Redondo Beach and Torrance
CITY OF REDONDO BEACH
GENERAL PLAN UPDATE
Los Angeles County, CA
cogstone
Redondo Beach (digital)
Torrance
King Harbor
DONDO BEACH
SAN PEDRO
TORRANCE
Submarine Pipelines


Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap,
Key
Project Area
USGS 7.5' Quadrangle
Map 4 of 4
Kilometers
0 0.5 1
Miles
0 0.25 0.5
1:24,000
USGS Quadrangle(s): Venice, Inglewood, Redondo Beach and Torrance
CITY OF REDONDO BEACH
GENERAL PLAN UPDATE
Los Angeles County, CA
cogstone
Clifton
Hollywood Riviera
Redondo Beach (digital)
Torrance

STATE OF CALIFORNIA — Gavin Newsom, Governor

NATIVE AMERICAN HERITAGE COMMISSION

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

October 3, 2023

Cogstone Resource Management

Via Email to: cogstoneconsult@cogstone.com

Re: Redondo Beach General Plan Update Project, Los Angeles County

To Whom It May Concern:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Page 1 of 1

Native American Heritage Commission[3]
Native American Contact List
Los Angeles County
10/3/2023

Tribe Name	Cultural Affiliation	Counties	Last Updated
Gabrieleño Band of Mission Indians - Kizh Nation	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	8/18/2023
Gabrielino Band of Mission Indians - Kizh Nation	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	8/18/2023
Gabrieleño/Tongva San Gabriel Band of Mission Indians	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	
Gabrielino /Tongva Nation	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	3/28/2023
Gabrielino Tongva Indians of California Tribal Council	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	3/16/2023
Gabrielino Tongva Indians of California Tribal Council	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Santa Barbara, Ventura	3/16/2023
Gabrielino-Tongva Tribe	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Ventura	5/30/2023
Gabrielino-Tongva Tribe	Gabrielino	Los Angeles, Orange, Riverside, San Bernardino, Ventura	5/30/2023
Santa Rosa Band of Cahuilla Indians	Cahuilla	Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego	
Soboba Band of Luiseno Indians	Cahuilla Luiseno	Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego	7/14/2023
Soboba Band of Luiseno Indians	Cahuilla Luiseno	Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego	7/14/2023

[3] This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Redondo Beach General Plan Update Project, Los Angeles County.

Record: PROJ-2023-004707; Report Type: List of Tribes; Counties: Los Angeles; NAHC Group: All

APPENDIX K. PALEONTOLOGICAL SENSITIVITY RANKING CRITERIA

PFYC Description Summary (BLM 2016)	PFYC Rank
Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous (excluding air-fall and reworked volcanic ash units), metamorphic, or Precambrian rocks. Assessment or mitigation of paleontological resources is usually unnecessary except in very rare or isolated circumstances that result in the unanticipated presence of fossils.	**1**
Low. Sedimentary geologic units that are unlikely to contain vertebrate or scientifically significant nonvertebrate fossils. Includes rock units less than 10,000 years old and sediments with significant physical and chemical changes (e.g., diagenetic alteration) which decrease the potential for fossil preservation. Assessment or mitigation of paleontological resources is not likely to be necessary.	**2**
Moderate. Units are known to contain vertebrate or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and/or of low abundance. Common invertebrate or plant fossils may be found and opportunities may exist for casual collecting. Paleontological mitigation strategies will be based on the nature of the proposed activity. Management considerations cover a broad range of options that may include record searches, pre-disturbance surveys, monitoring, mitigation, or avoidance. Surface-disturbing activities may require assessment by a qualified paleontologist to determine whether significant paleontological resources occur in the area of a proposed action, and whether the action could affect the paleontological resources.	**3**
High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrates or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. Mitigation plans must consider the nature of the proposed disturbance, such as removal or penetration of protective surface alluvium or soils, potential for future accelerated erosion, or increased ease of access that could result in looting. Detailed field assessment is normally required and on-site monitoring or spot-checking may be necessary during land disturbing activities. In some cases avoidance of known paleontological resources may be necessary.	**4**
Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. Paleontological resources are highly susceptible to adverse impacts from surface disturbing activities. Paleontological mitigation may be necessary before or during surface disturbing activities. The area should be assessed prior to land tenure adjustments. Pre-work surveys are usually needed and on-site monitoring may be necessary during land use activities. Avoidance or resource preservation through controlled access, designation of areas of avoidance, or special management designations should be considered.	**5**
Unknown. An assignment of "Unknown" may indicate the unit or area is poorly studied and field studies are needed to verify the presence or absence of paleontological resources. The unit may exhibit features or preservational conditions that suggest significant fossils could be present, but little information about the actual unit or area is known. Literature searches or consultation with professional colleagues may allow an unknown unit to be provisionally assigned to another Class, but the geological unit should be formally assigned to a Class after adequate survey and research is performed to make an informed determination.	**U**
Water or Ice. Typically used only for areas which have been covered thus preventing an examination of the underlying geology.	**W, I**

APPENDIX L. HISTORIC BUILT ENVIRONMENT LOCATION MAPS

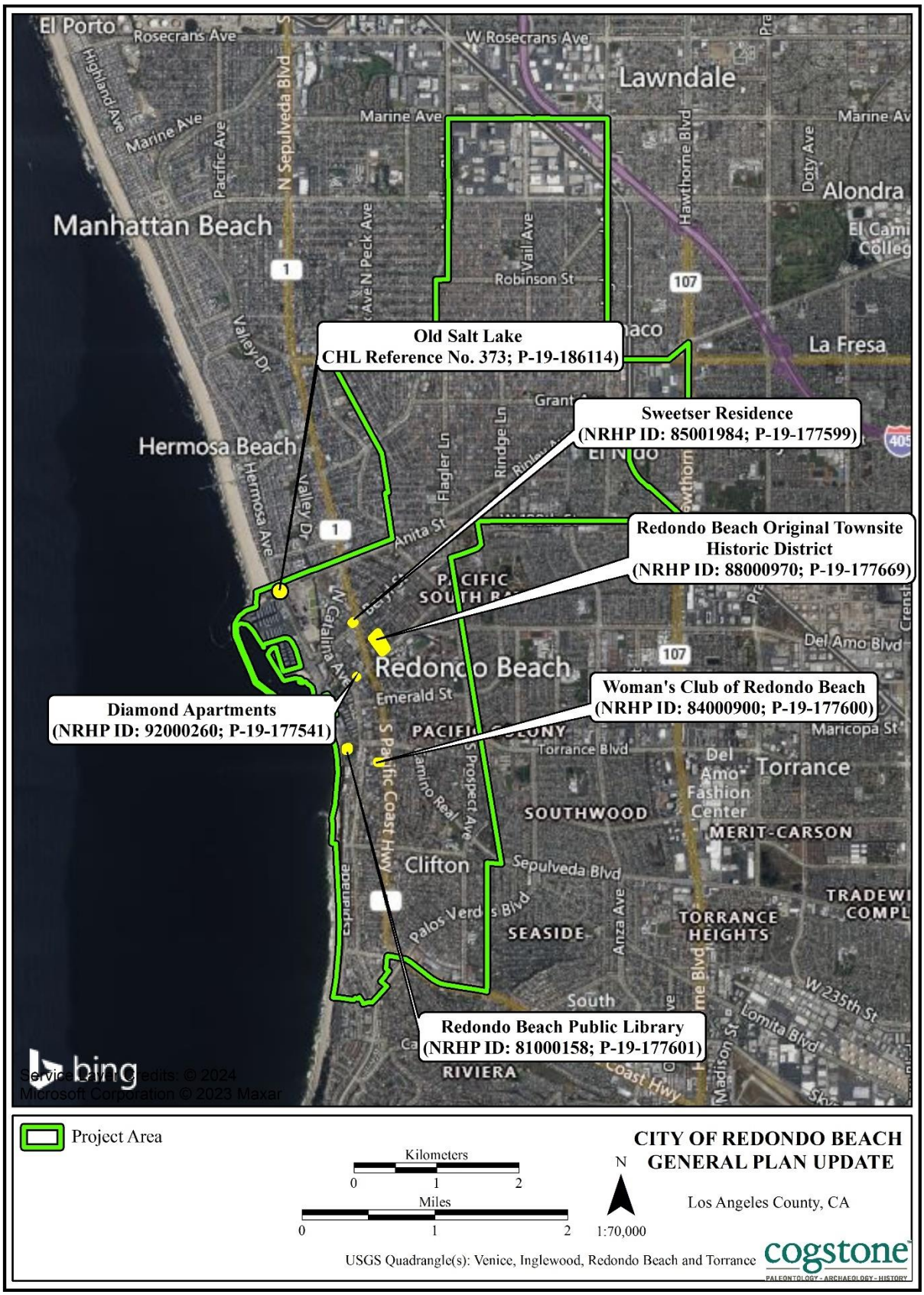


Figure L-1. Redondo Beach NRHP-listed and California Historic Landmarks map

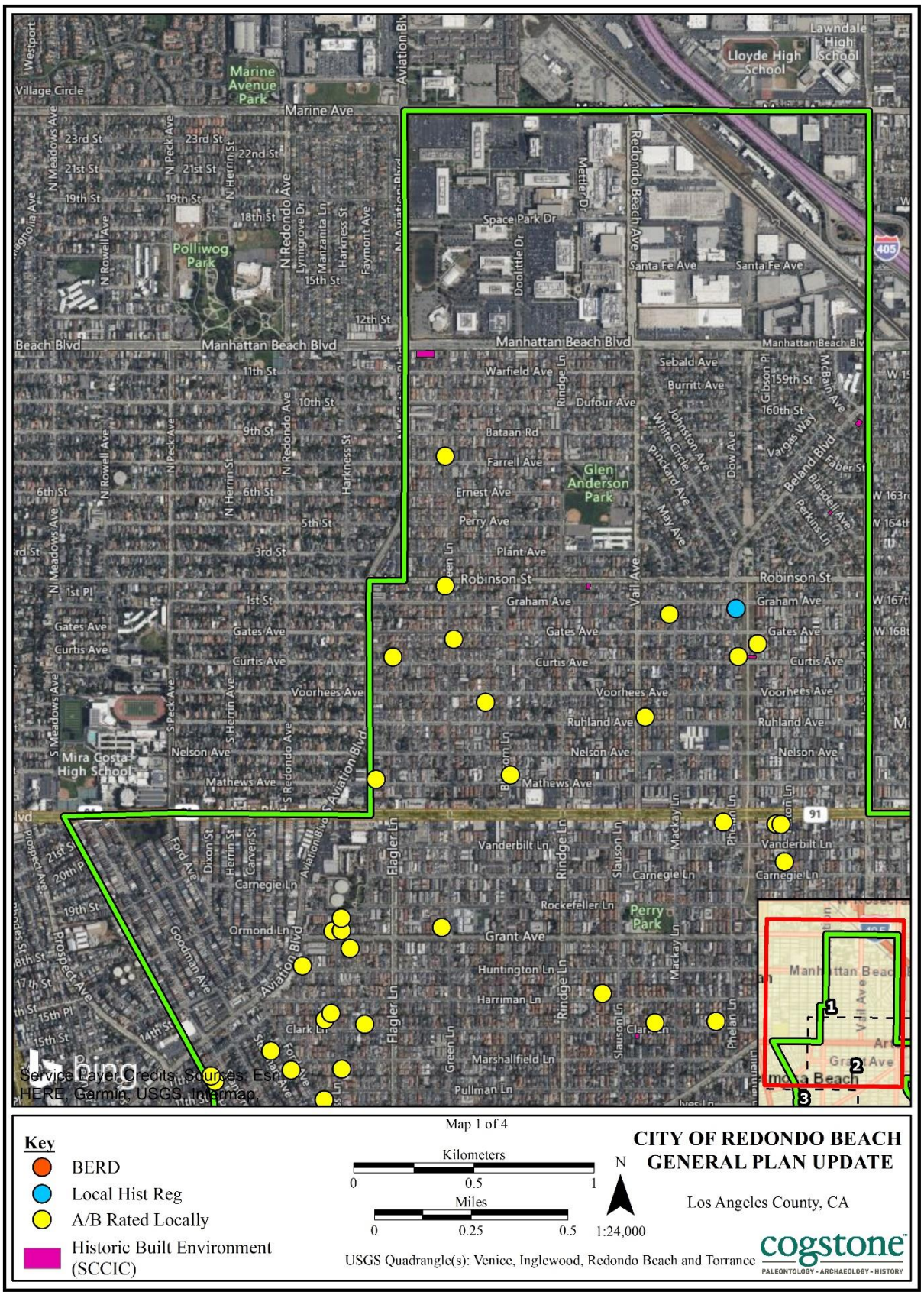


Figure L-2a. Historic built environment location map (1 of 4)

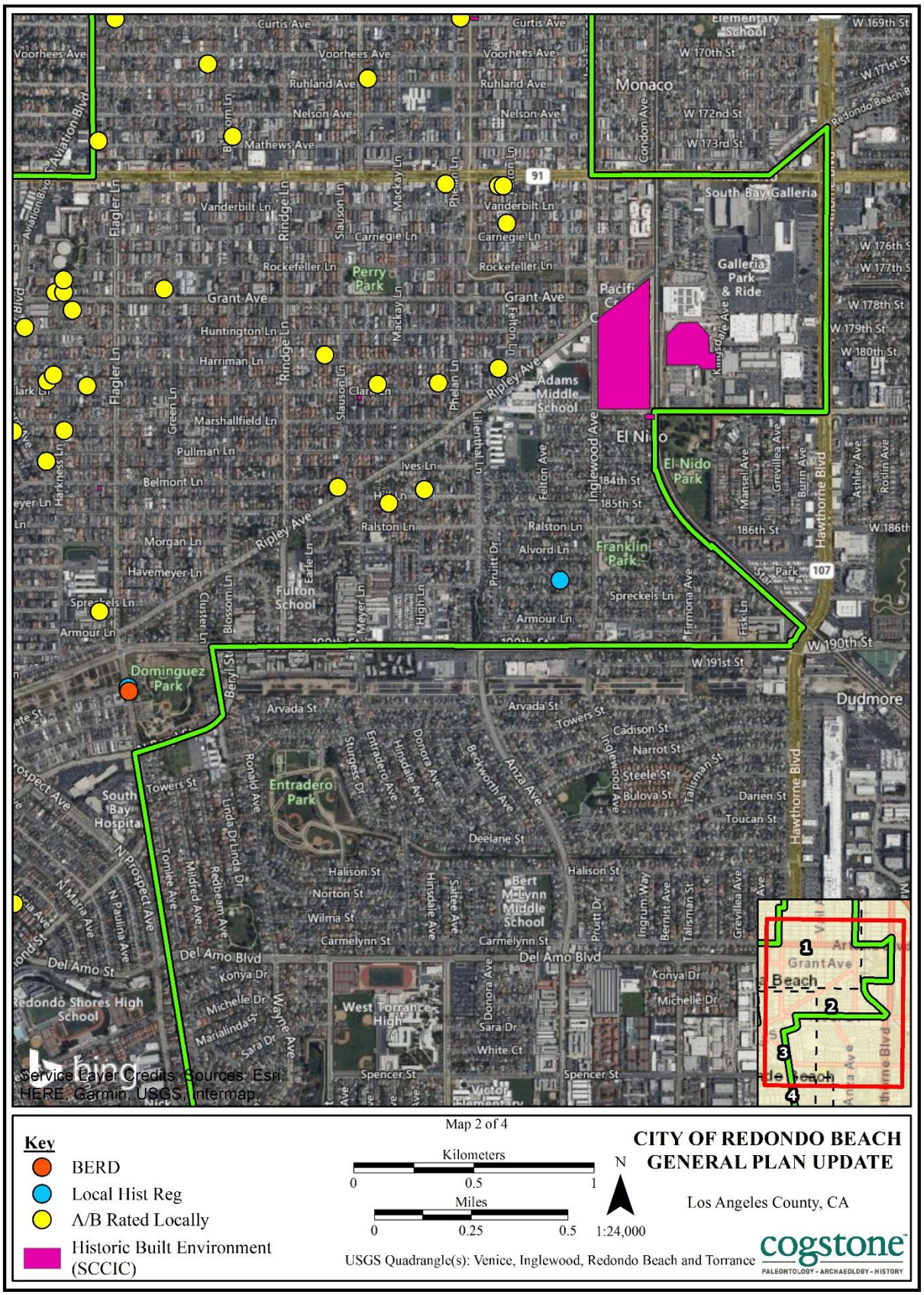


Figure L-2b. Historic built environment sensitivity location (2 of 4)

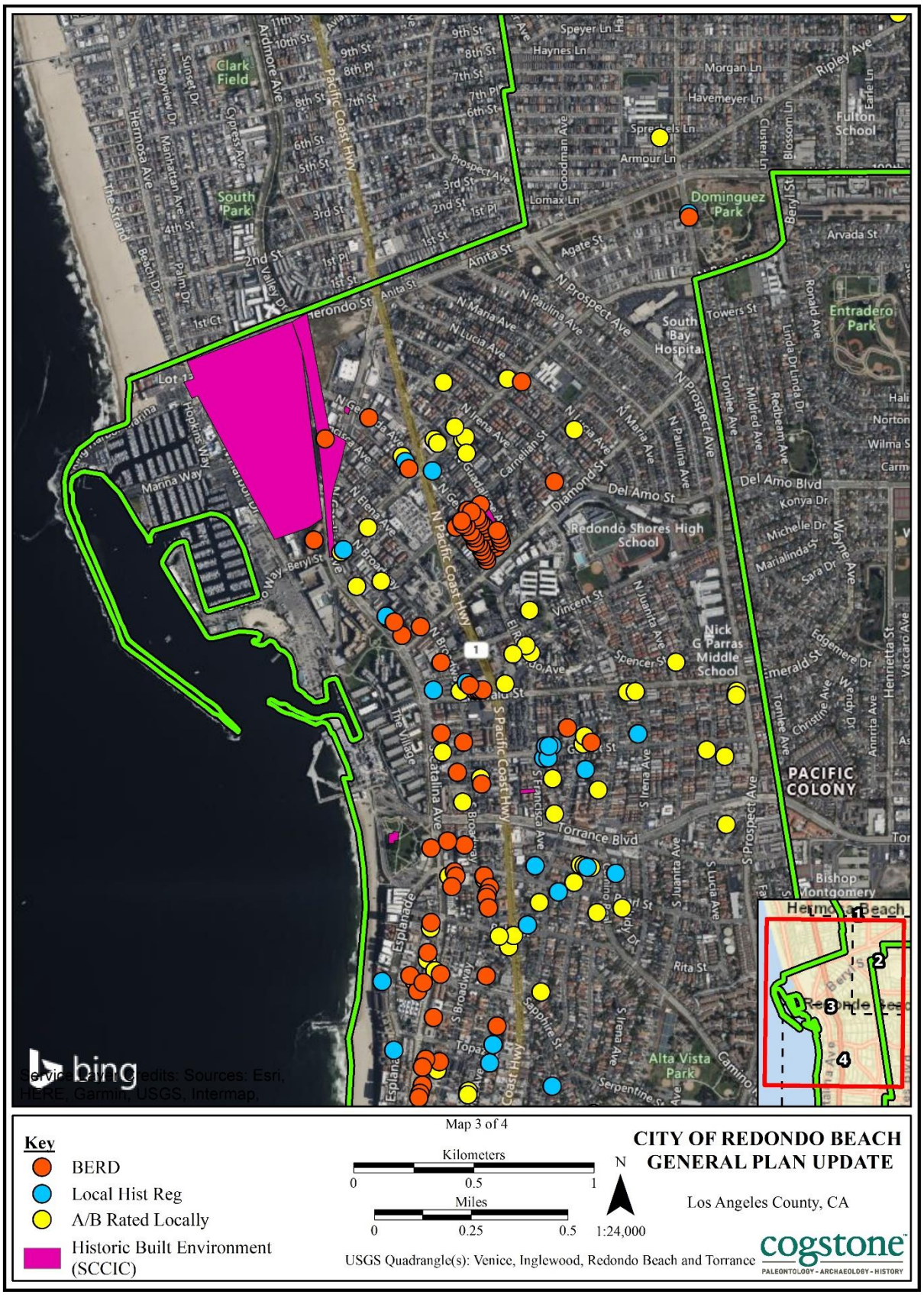


Figure L-2c. Historic built environment location map (3 of 4)

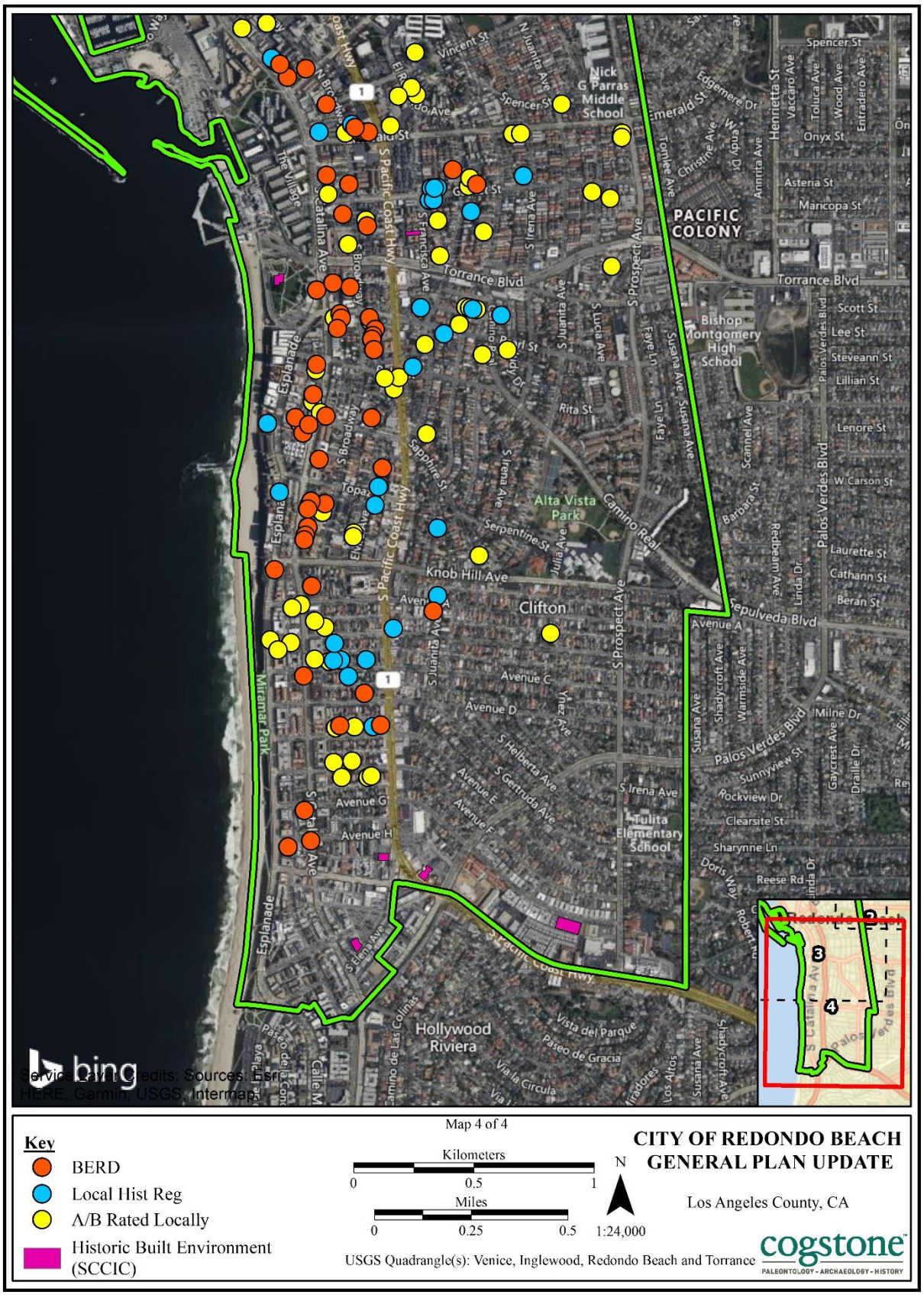


Figure L-2d. Historic built environment location map (4 of 4)

Appendix E Service Provider Questionnaires

Appendices

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PLACEWORKS

September 11, 2023

Brian Regan, Deputy Fire Marshal
City of Redondo Beach
Redondo Beach Fire Department
401 S. Broadway
Redondo Beach, CA 90277

Subject: Request for Service Provider Information for the Draft Environmental Impact Report for Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

Dear Deputy Fire Marshal Brian Regan:

On behalf of the City of Redondo Beach (City), PlaceWorks is preparing a Draft Environmental Impact Report (Draft EIR) for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program (proposed project). This letter is to request your assistance in updating information regarding existing fire-related services in Redondo Beach and assessing potential impacts of the proposed project. Please respond to the enclosed questionnaire, using additional sheets if necessary. Note that your responses will become a part of the administrative record for this project and will be included as an appendix to the Draft EIR.

Project Location

Redondo Beach is in the South Bay region of Los Angeles County. It is bordered to the north by Hermosa Beach, Manhattan Beach, Hawthorne, and El Segundo; to the east by Torrance and Lawndale; to the south by the Palos Verde Peninsula; and to the west by the Pacific Ocean. For purposes of the General Plan Update, the project planning area includes the entire geographic area of the City, which has a total land area of approximately 3,970 acres (6.2 square miles). As depicted in Figure 1, *Project Area*, the City is developed with a variety of land uses, such as established residential neighborhoods, commercial corridors, industrial complexes, public facilities, and parks.

Project Description

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

A General Plan establishes long-term goals and policies to guide a community in realizing a vision into the future. The State of California requires each city to adopt a comprehensive, long-term general plan for the physical development of a community and provides a list of topics that must be addressed. Local decision makers use the goals and policies of a general plan to make decisions regarding land use, housing, mobility, infrastructure, open spaces, and recreation.

The City has selected the year 2050 as its planning horizon for updating the existing General Plan. The City is updating four of the State-required elements that make up the General Plan: the Land Use, Open Space and Conservation, Safety, and Noise elements. Updates to these elements will be accompanied by associated revisions to the City's Zoning Code and Local Coastal Program needed to make consistent and implement the updated goals and policies. In addition, updates to the General Plan Land Use designations will be reviewed pursuant to the City Chart, Article XXVII, Area of Major Changes in Allowable Land Use. The General Plan is the principal policy document for guiding community growth and the provision of public services and is defined by specific community priorities and values that were identified during the public outreach process. Once adopted, the General Plan provides high-level guidance that sets the goals and priorities for related efforts, including the zoning code, specific plans, subdivision ordinances, and other planning projects.

PLACEWORKS

Public Agency Approvals

The proposed project will require adoption by the Redondo Beach City Council. The Planning Commission, General Plan Advisory Committee, and other decision-making and advisory bodies will review the proposed project and make recommendations to City Council. Though other agencies may be consulted during the project process, their approval is not required for adoption of the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment. However, subsequent development under the proposed project may require approval of state or federal responsible or trustee agencies that may rely on the EIR for decisions in their areas of expertise.

Please respond to PlaceWorks no later than **Wednesday, October 11, 2023**. If you need additional time to respond, please let me know as soon as possible. You can email your responses to me at ehaines@placeworks.com. If you prefer, mail the completed questionnaire to my attention at 700 S. Flower St., Suite 600, Los Angeles, California, 90017. Feel free to contact me at 213.623.1443 ext. 2132 or via the aforementioned email. Thank you for your prompt attention to this request.

Sincerely,

PLACEWORKS

Emma Haines
Associate

Enclosures:
Questionnaire
Figure 1: Project Area
Figure 2: Existing Land Uses
Figure 3: Current Land Use Plan Map
Figure 4: Proposed Land Use Plan Map

Performance Standard

b. Please provide Redondo Beach Fire Department's response time goals in the following table. Please feel free to revises the activity/incident types as necessary.

Redondo Beach Fire Department Performance Standards

Activity / Incident Type	Overall Time in Minutes/Seconds (from receipt of call to arrival onsite)
First-in Response Unit	NFPA Standard 1710 establishes an 80-second "turnout time" and 240-second "travel time" (together, **320 seconds or 5 minutes and 20 seconds** "response time") benchmark time goal for not less than 90% of dispatched incidents
First-in Engine Truck	All trucks, rescues and engines are ALS units or ALS assessment units.
First-in Basic Life Support Response Unit	BLS Response units are provided by McCormicks Ambulance
First-in Advanced Life Support Response Unit	All trucks, rescues and engines are ALS units or ALS assessment units.
First-in Paramedic Assessment	All trucks, rescues and engines are ALS units or ALS assessment units.

c. What was the average response time (if available) for the first-in response unit for the latest year for which data is available?

N/A

d. Are there any service agreements with other local or regional fire agencies (other than Redondo Beach Fire Department) for additional support?

The Redondo Beach Fire Department has automatic and mutual aid agreements with the cities of Manhattan Beach, Torrance, El Segundo, and the Los Angeles County Fire Department.

Funding

f. Please describe the funding sources/mechanisms (e.g., City development impacts fees, secured fire protection agreements, City general funds) that are used to provide fire protection services to the City?

Refer to Finance Department

3. Are there any existing deficiencies (personnel, equipment) in the fire protection service currently provided to the City of Redondo Beach?

N/A

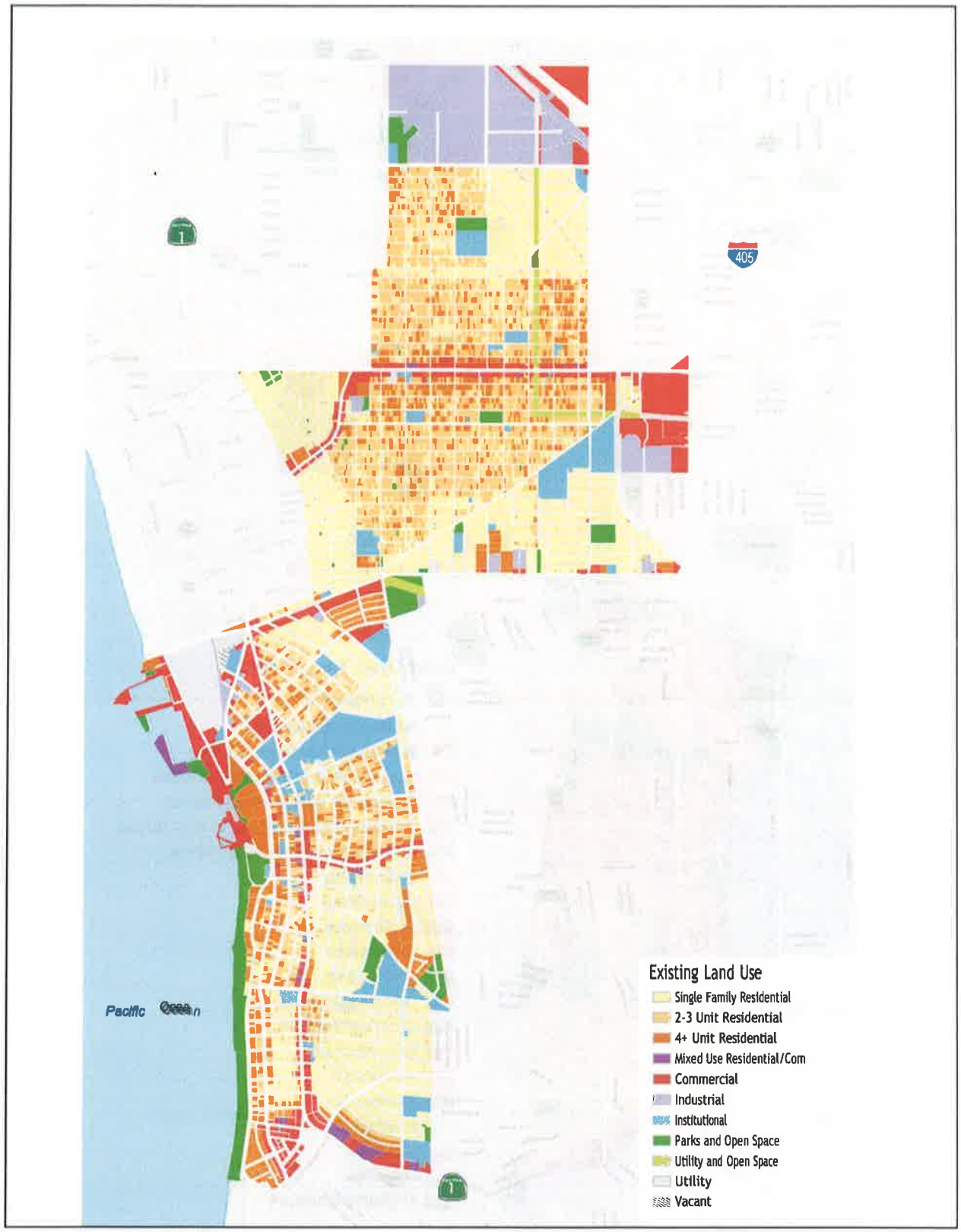
4. Please summarize any plans for fire service improvements plans or expanded capacity (personnel, equipment), if any, that would serve the City of Redondo Beach.

N/A

a. What are the funding sources for the planned improvements?

Agency **Date**

Figure 2 - Existing Land Uses



Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

Figure 4 - Proposed Land Use Plan

0 3,750
Scale (Feet)

Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

September 11, 2023

Mario Fizulich, Captain
City of Redondo Beach
Redondo Beach Police Department
415 Diamond Street
Redondo Beach, CA 90277

Subject: Request for Service Provider Information for the Draft Environmental Impact Report for Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

Dear Captain Mario Fizulich:

On behalf of the City of Redondo Beach (City), PlaceWorks is preparing a Draft Environmental Impact Report (Draft EIR) for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program (proposed project). This letter is to request your assistance in updating information regarding existing police-related services in Redondo Beach and assessing potential impacts of the proposed project. Please respond to the enclosed questionnaire, using additional sheets if necessary. Note that your responses will become a part of the administrative record for this project and will be included as an appendix to the Draft EIR.

Project Location

Redondo Beach is in the South Bay region of Los Angeles County. It is bordered to the north by Hermosa Beach, Manhattan Beach, Hawthorne, and El Segundo; to the east by Torrance and Lawndale; to the south by the Palos Verde Peninsula; and to the west by the Pacific Ocean. For purposes of the General Plan Update, the project planning area includes the entire geographic area of the City, which has a total land area of approximately 3,970 acres (6.2 square miles). As depicted in Figure 1, *Project Area*, the City is developed with a variety of land uses, such as established residential neighborhoods, commercial corridors, industrial complexes, public facilities, and parks.

Project Description

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

A General Plan establishes long-term goals and policies to guide a community in realizing a vision into the future. The State of California requires each city to adopt a comprehensive, long-term general plan for the physical development of a community and provides a list of topics that must be addressed. Local decision makers use the goals and policies of a general plan to make decisions regarding land use, housing, mobility, infrastructure, open spaces, and recreation.

The City has selected the year 2050 as its planning horizon for updating the existing General Plan. The City is updating four of the State-required elements that make up the General Plan: the Land Use, Open Space and Conservation, Safety, and Noise elements. Updates to these elements will be accompanied by associated revisions to the City's Zoning Code and Local Coastal Program needed to make consistent and implement the updated goals and policies. In addition, updates to the General Plan Land Use designations will be reviewed pursuant to the City Chart, Article XXVII, Area of Major Changes in Allowable Land Use. The General Plan is the principal policy document for guiding community growth and the provision of public services and is defined by specific community priorities and values that were identified during the public outreach process. Once adopted, the General Plan provides high-level guidance that sets the goals and priorities for related efforts, including the zoning code, specific plans, subdivision ordinances, and other planning projects.

The following elements will be updated as part of the Redondo Beach General Plan, Zoning Update and Local Coastal Program Amendment:

» The **Land Use Element** establishes how land is developed, used, and arranged to ensure compatibility and add value to the community in terms of function, design, and fiscal return.

» The **Open Space Element** coordinates the circulation system with future land use patterns and buildout to satisfy local and subregional mobility needs, as well as access and connectivity between various neighborhoods and districts. This element also defines goals and policies for the provision of public infrastructure to support the uses accommodated by the Land Use Element.

» The **Conservation Element** addresses how resources are managed comprehensively using systems that are environmentally and economically sustainable and meet growth demand in Redondo Beach.

» The **Safety Element** addresses how the City protects life, property, and commerce from impacts associated with human-made and natural hazards, disasters, and other threats to public safety. It also identifies ways the City can establish strategies to adapt to increased hazard risks and strategies to become more resilient.

» The **Noise Element** provides a basis for comprehensive local programs to control and abate environmental noise and to protect residents from excessive exposure.

The General Plan will also include an Implementation Plan that identifies responsible parties and the actions needed to carry out General Plan policies.

Table 1, *Buildout Statistical Summary*, provides a statistical summary of the buildout potential associated with the updated Land Use Plan compared to existing conditions. Figure 3, *Current Land Use Plan*, shows the existing land use plan for the city. Figure 4, *Proposed Land Use Plan*, shows the proposed General Plan Land Use Map.

Table 1 Buildout Statistical Summary

Scenario	Acres	Number of Housing Units	Total Population	Nonresidential Square Feet	Employment (Number of Jobs)
Existing Conditions	3,973	30,431[1]	70,311[2]	11,826,277[3]	28,638
Proposed General Plan (2050)	3,973	35,387[1]	78,978[2]	17,508,276[3]	36,627
Potential Growth	--	4,956	8,667	5,681,999	7,989

Notes:

1. Includes accessory dwelling units (ADUs) and assisted living units.
2. Includes people living in dwelling units, ADUs, assisted living units, and group quarters.
3. Includes square-footage of commercial uses with group quarters (such as memory care facilities).

Public Agency Approvals

The proposed project will require adoption by the Redondo Beach City Council. The Planning Commission, General Plan Advisory Committee, and other decision-making and advisory bodies will review the proposed project and make recommendations to City Council. Though other agencies may be consulted during the project process, their approval is not required for adoption of the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment. However, subsequent development under the proposed project may require approval of state or federal responsible or trustee agencies that may rely on the EIR for decisions in their areas of expertise.

Please respond to PlaceWorks no later than **Wednesday, October 11, 2023.** If you need additional time to respond, please let me know as soon as possible. You can email your responses to me at ehaines@placeworks.com. If you prefer, mail the completed questionnaire to my attention at 700 S. Flower St., Suite 600, Los Angeles, California, 90017. Feel free to contact me at 213.623.1443 ext. 2132 or via the aforementioned email. Thank you for your prompt attention to this request.

Sincerely,

PLACEWORKS

Emma Haines
Associate

Enclosures:
Questionnaire
Figure 1: Project Area
Figure 2: Existing Land Uses
Figure 3: Current Land Use Plan Map
Figure 4: Proposed Land Use Plan Map

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment
Redondo Beach Police Department

1. Please **confirm or update** the following information for the Redondo Beach Police Department:

Stations and Staff

a. Please provide the equipment and staffing information for the station in the following table.

Redondo Beach Police Department Stations

Station/Substation	Location	Equipment (Number of Police Vehicles)	Daily Staffing (Number and Type of Personnel)
Redondo Beach Police Main Station	401 Diamond Street Redondo Beach, CA 90277	30	16 - Police Patrol 9 - Detectives 5 - Records 4 - Dispatchers
Redondo Beach Police Pier Sub-Station	133 West Torrance Boulevard Redondo Beach, CA 90277	None assigned	3 - 3 days a week
Redondo Beach North Redondo Sub-Station	1922 Artesia Boulevard Redondo Beach, CA 90278	0	0

Performance Standards

b. Please provide the Department's response time goals in the following table. Please feel free to revises the activity/incident types as necessary.

Redondo Beach Police Department Performance Standards

Call Type	Overall Time in Minutes/Seconds (from receipt of call to arrival onsite)
Priority One Calls	30 seconds from time of call to dispatch, for all calls
Priority Two Calls	30 seconds from time of call to dispatch, if the incident is in-progress
Other call types?	30 seconds from time of call to dispatch, if the area unit is available.

c. What was the average response time (if available) for the latest year for which data is available for each call type?

i. Priority one calls:

Stolen vehicle - 2:22
Hit and run injury - 3:17
Robbery - 2:22
Domestic Violence - 4:57
Burglary - 2:30
Traffic Collision - 3:15
Mandown - 2:58
Unknown Trouble - 2:13
Aussult with a deadly weapon - 2:12

ii. Priority two calls:

Hit and run - 5:59
DUI - 3:42
Battery - 4:40
Disturbance Call - 3:57
5150 - 4:33
Drunk in public - 4:17

d. What is the goal for ratio of police to population for City of Redondo Beach ? Do you currently meet that goal?

Goal for Police Officer to population is 1 - 700.

Currently we are at full staffing of 99 but deployable is 73.

e. Does the Redondo Beach Police Department have any design guidelines or programs pertaining to reducing and/or preventing crimes through environmental design? If yes, please provide the guidelines and/or program procedure.

The Redondo Beach Police Department has a full time Community Base Police Officer (CBO) who meets regularly with community watch groups and business owners. The Officer makes suggestions for design that may make them less of a crime target.

Funding

f. Please describe the funding sources/mechanisms (e.g., city development impacts fees, city general funds) that are used to provide police protection services to the City of Redondo Beach and County?

The costs associated with the Redondo Beach Police Department operations are supported. by the General Fund and supplemented by State and Federal grant programs.

2. Are there any existing deficiencies (staff, equipment) in the police protection currently provided to the City of Redondo Beach?

None.

3. Please summarize any plans for police service improvements plans or expanded capacity (personnel, equipment), if any, that would serve the City of Redondo Beach.

Proposed expansion of the traffic unit with additional motorcycle officers and the addition of commercial enforcement detail.

a. What are the funding sources for the planned improvements?

General Fund budget through the appropriation budget cycle.

4. Would the General Plan Update affect the Redondo Beach Police Department´s Office's ability to provide services? Please comment on any area of specific concern.

No.

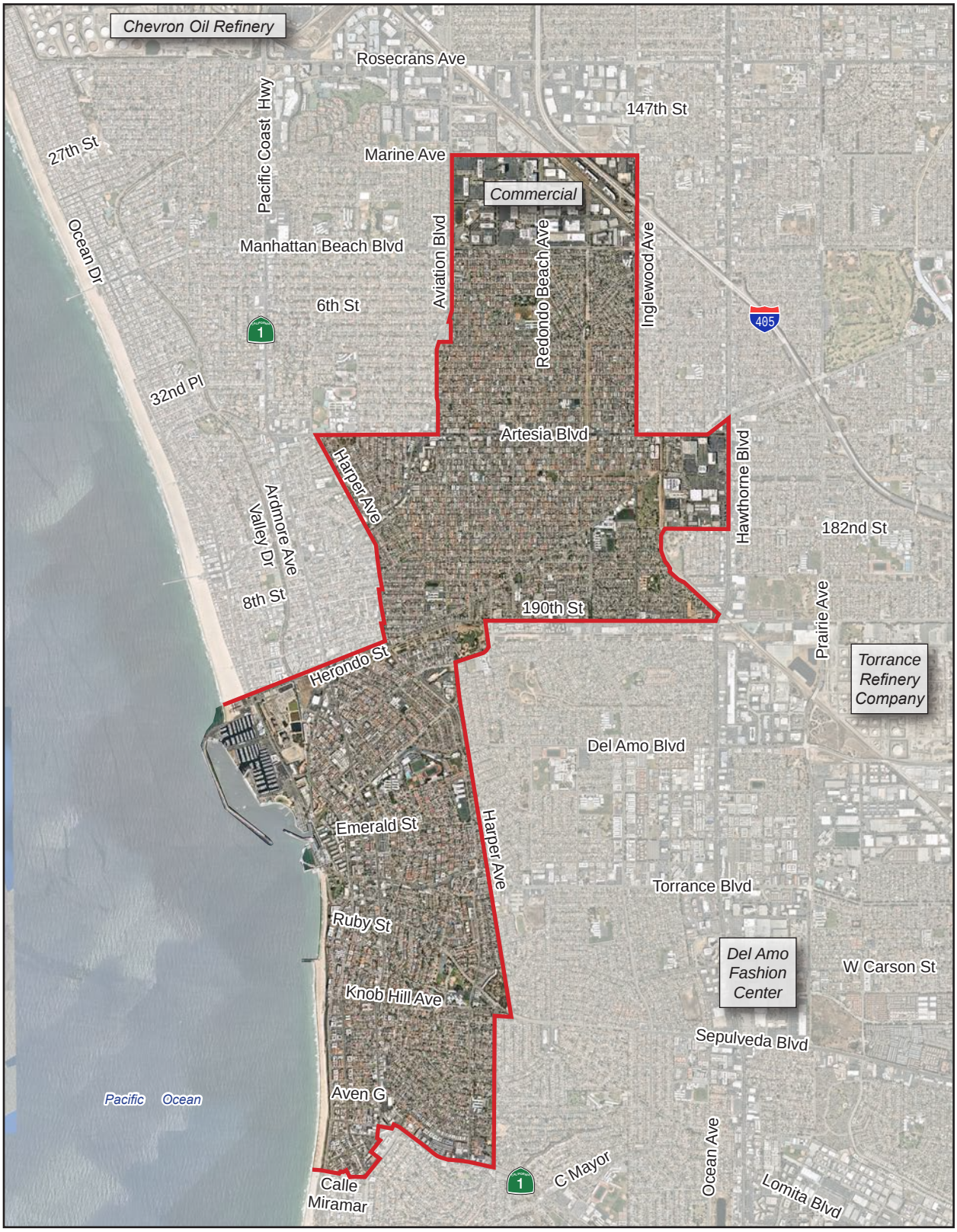
5. Please provide any additional comments and/or information regarding police service provision in the City of Redondo Beach related to the General Plan Update, Zoning Code Update and Local Coastal Program Amendment.

No.

Response Prepared By:

Stephen Sprengel	Police Captain
Name	**Title**
Redondo Beach Police Department	3-26-2024
Agency	**Date**

Figure 1 - Project Area Map



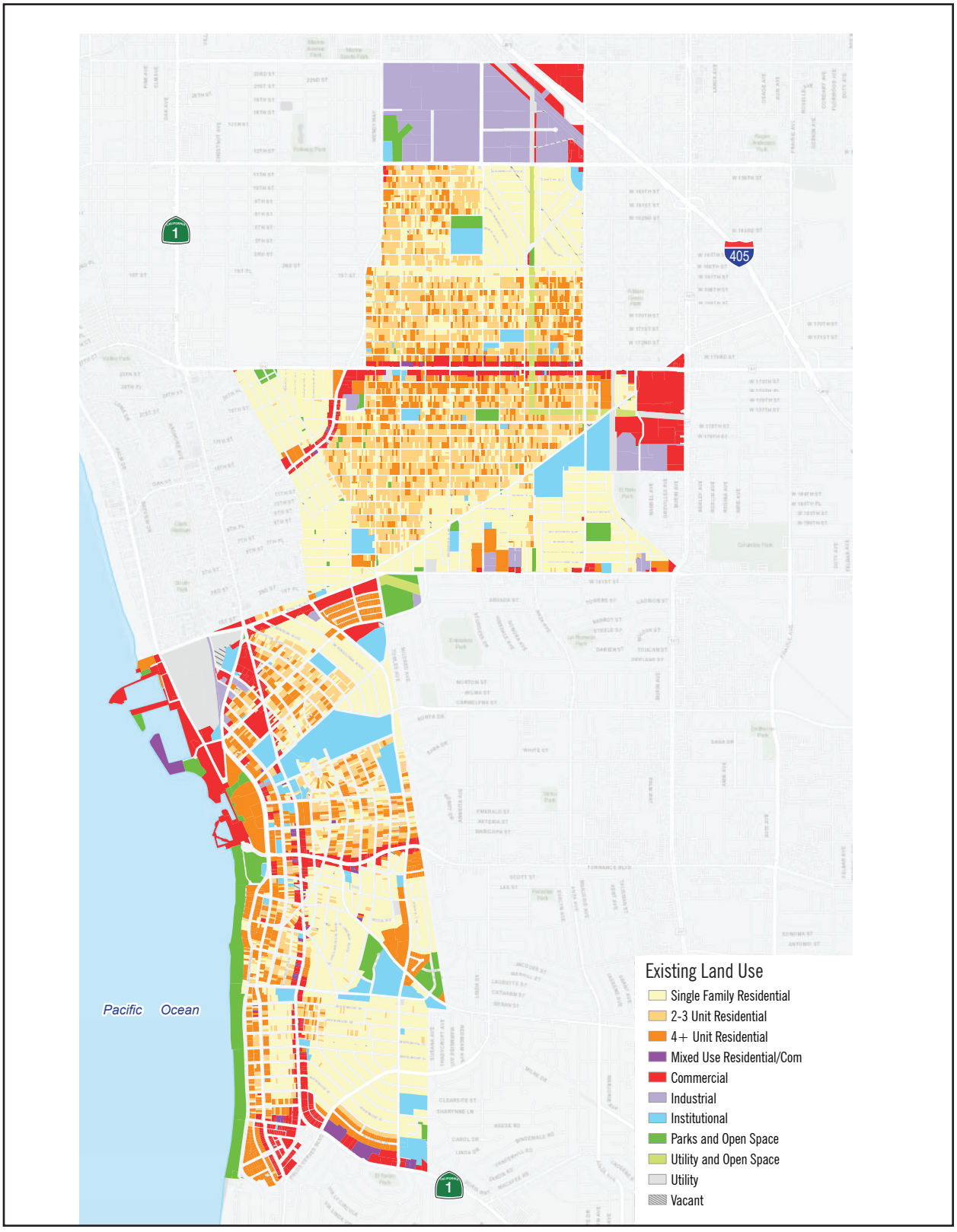
City of Redondo Beach

Note: The City boundary extends 3 miles into the Pacific Ocean, which is not shown on this exhibit.

Source: City of Redondo Beach, 2023.

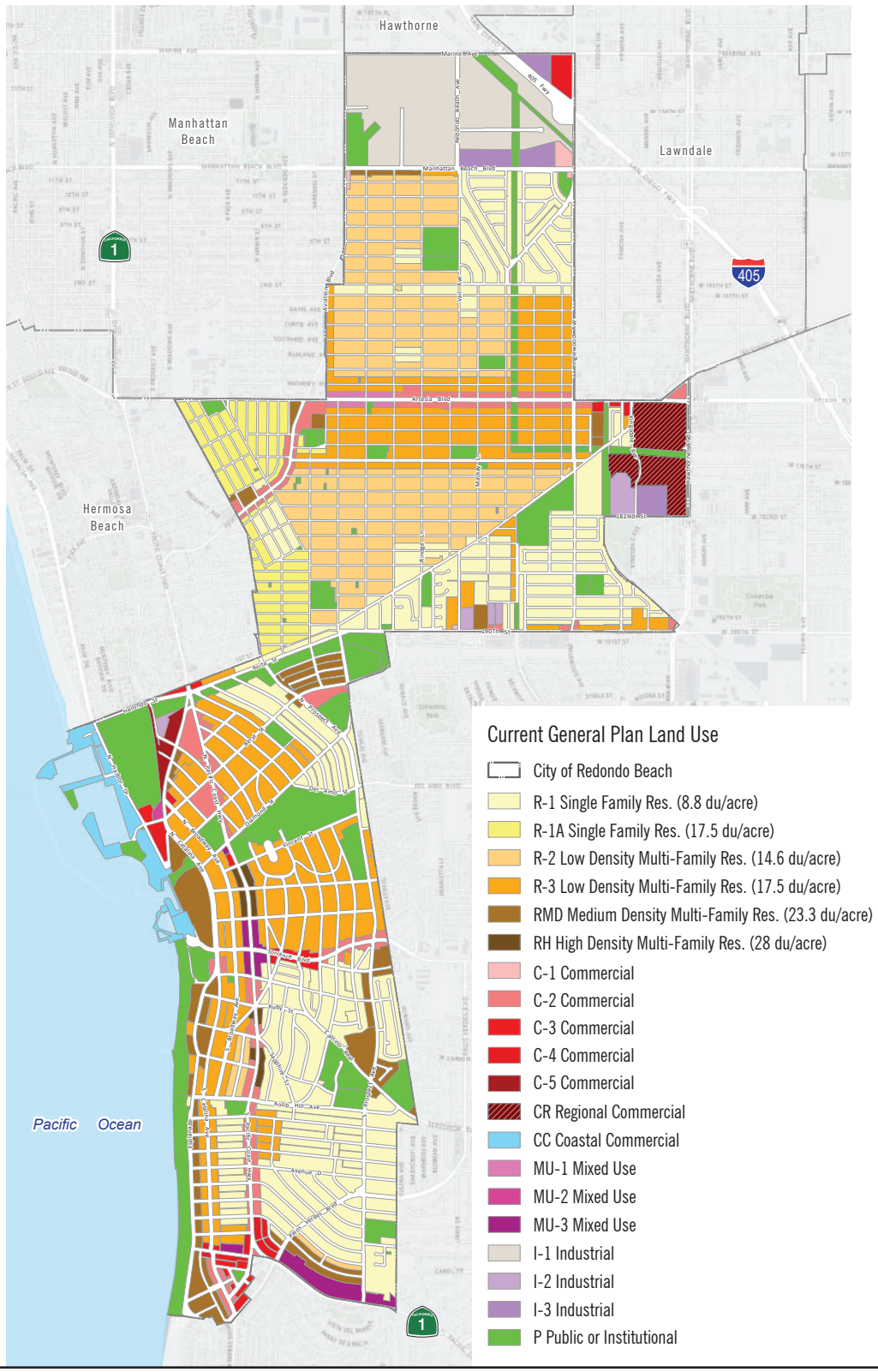
0 4,000
Scale (Miles)

Figure 2 - Existing Land Uses



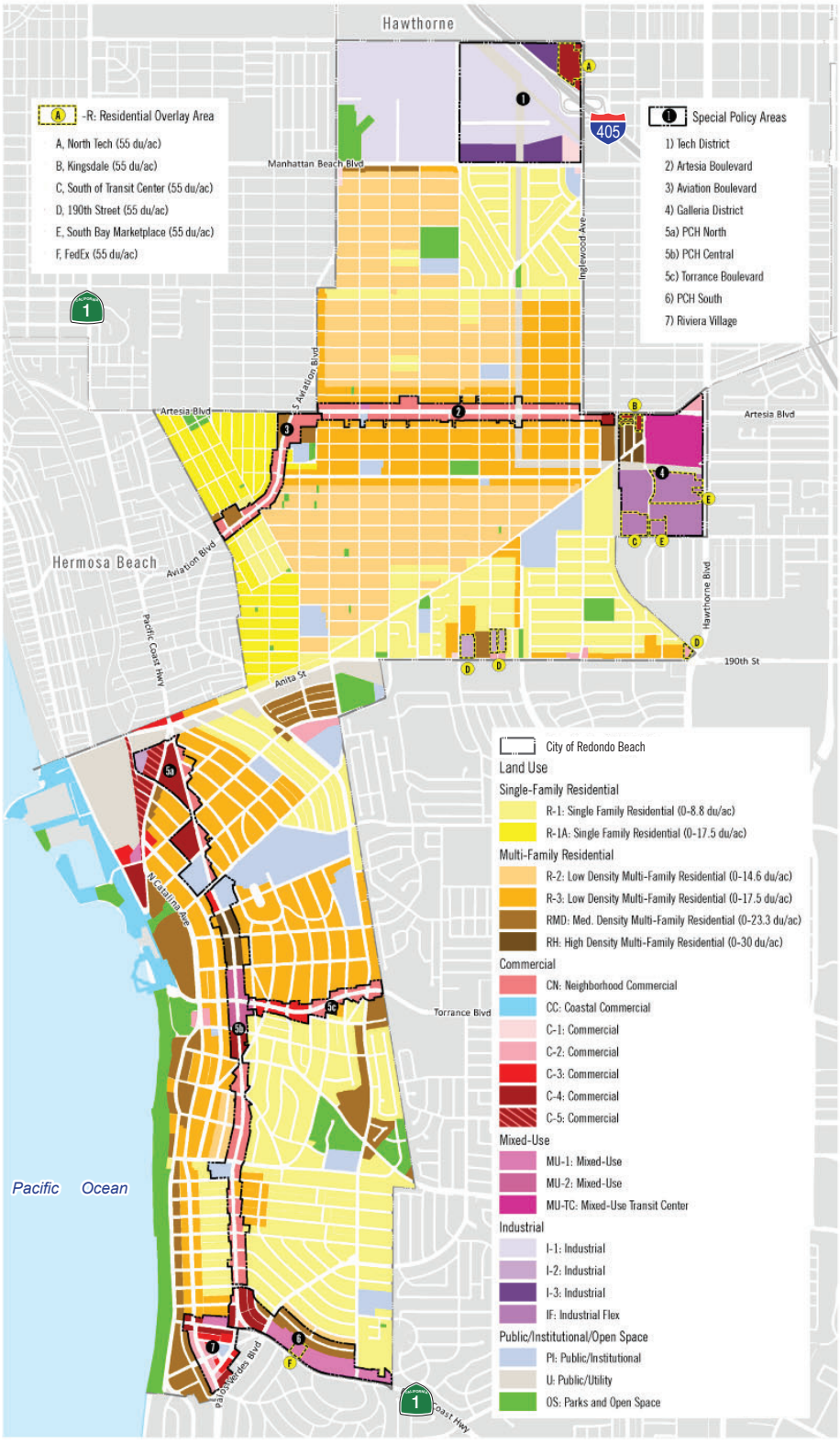
Source: City of Redondo Beach and PlaceWorks, 2023.

Figure 3 - Current Land Use Plan



Source: City of Redondo Beach, 2023.

Figure 4 - Proposed Land Use Plan



0 3,750
Scale (Feet)

Source: City of Redondo Beach and PlaceWorks, 2023.

PLACEWORKS

September 11, 2023

Fred Naile
Director of Facilities, Maintenance and Operations
Redondo Beach Unified School District
1401 Inglewood Ave.
Redondo Beach, CA 90278

Subject: Request for Service Provider Information for the Draft Environmental Impact Report for Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

Dear Mr. Fred Naile:

On behalf of the City of Redondo Beach (City), PlaceWorks is preparing a Draft Environmental Impact Report (Draft EIR) for the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program (proposed project). This letter is to request your assistance in updating information regarding existing school-related services in Redondo Beach and assessing potential impacts of the proposed project. Please respond to the enclosed questionnaire, using additional sheets if necessary. Note that your responses will become a part of the administrative record for this project and will be included as an appendix to the Draft EIR.

Project Location

Redondo Beach is in the South Bay region of Los Angeles County. It is bordered to the north by Hermosa Beach, Manhattan Beach, Hawthorne, and El Segundo; to the east by Torrance and Lawndale; to the south by the Palos Verde Peninsula; and to the west by the Pacific Ocean. For purposes of the General Plan Update, the project planning area includes the entire geographic area of the City, which has a total land area of approximately 3,970 acres (6.2 square miles). As depicted in Figure 1, *Project Area*, the City is developed with a variety of land uses, such as established residential neighborhoods, commercial corridors, industrial complexes, public facilities, and parks.

Project Description

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program

A General Plan establishes long-term goals and policies to guide a community in realizing a vision into the future. The State of California requires each city to adopt a comprehensive, long-term general plan for the physical development of a community and provides a list of topics that must be addressed. Local decision makers use the goals and policies of a general plan to make decisions regarding land use, housing, mobility, infrastructure, open spaces, and recreation.

The City has selected the year 2050 as its planning horizon for updating the existing General Plan. The City is updating four of the State-required elements that make up the General Plan: the Land Use, Open Space and Conservation, Safety, and Noise elements. Updates to these elements will be accompanied by associated revisions to the City's Zoning Code and Local Coastal Program needed to make consistent and implement the updated goals and policies. In addition, updates to the General Plan Land Use designations will be reviewed pursuant to the City Chart, Article XXVII, Area of Major Changes in Allowable Land Use. The General Plan is the principal policy document for guiding community growth and the provision of public services and is defined by specific community priorities and values that were identified during the public outreach process. Once adopted, the General Plan provides high-level guidance that sets the goals and priorities for related efforts, including the zoning code, specific plans, subdivision ordinances, and other planning projects.

1

The following elements will be updated as part of the Redondo Beach General Plan, Zoning Update and Local Coastal Program Amendment:

» The **Land Use Element** establishes how land is developed, used, and arranged to ensure compatibility and add value to the community in terms of function, design, and fiscal return.

» The **Open Space Element** coordinates the circulation system with future land use patterns and buildout to satisfy local and subregional mobility needs, as well as access and connectivity between various neighborhoods and districts. This element also defines goals and policies for the provision of public infrastructure to support the uses accommodated by the Land Use Element.

» The **Conservation Element** addresses how resources are managed comprehensively using systems that are environmentally and economically sustainable and meet growth demand in Redondo Beach.

» The **Safety Element** addresses how the City protects life, property, and commerce from impacts associated with human-made and natural hazards, disasters, and other threats to public safety. It also identifies ways the City can establish strategies to adapt to increased hazard risks and strategies to become more resilient.

» The **Noise Element** provides a basis for comprehensive local programs to control and abate environmental noise and to protect residents from excessive exposure.

The General Plan will also include an Implementation Plan that identifies responsible parties and the actions needed to carry out General Plan policies.

Table 1, *Buildout Statistical Summary*, provides a statistical summary of the buildout potential associated with the updated Land Use Plan compared to existing conditions. Figure 3, *Current Land Use Plan*, shows the existing land use plan for the city. Figure 4, *Proposed Land Use Plan*, shows the proposed General Plan Land Use Map.

Table 1 Buildout Statistical Summary

Scenario	Acres	Number of Housing Units	Total Population	Nonresidential Square Feet	Employment (Number of Jobs)
Existing Conditions	3,973	30,431[1]	70,311[2]	11,826,277[3]	28,638
Proposed General Plan (2050)	3,973	35,387[1]	78,978[2]	17,508,276[3]	36,627
Potential Growth	--	4,956	8,667	5,681,999	7,989

Notes:

1. Includes accessory dwelling units (ADUs) and assisted living units.
2. Includes people living in dwelling units, ADUs, assisted living units, and group quarters.
3. Includes square-footage of commercial uses with group quarters (such as memory care facilities).

Public Agency Approvals

The proposed project will require adoption by the Redondo Beach City Council. The Planning Commission, General Plan Advisory Committee, and other decision-making and advisory bodies will review the proposed project and make recommendations to City Council. Though other agencies may be consulted during the project process, their approval is not required for adoption of the Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment. However, subsequent development under the proposed project may require approval of state or federal responsible or trustee agencies that may rely on the EIR for decisions in their areas of expertise.

Please respond to PlaceWorks no later than **Wednesday, October 11, 2023.** If you need additional time to respond, please let me know as soon as possible. You can email your responses to me at ehaines@placeworks.com. If you prefer, mail the completed questionnaire to my attention at 700 S. Flower St., Suite 600, Los Angeles, California, 90017. Feel free to contact me at 213.623.1443 ext. 2132 or via the aforementioned email. Thank you for your prompt attention to this request.

Sincerely,

PLACEWORKS

Emma Haines
Associate

Enclosures:
Questionnaire
Figure 1: Project Area
Figure 2: Existing Land Uses
Figure 3: Current Land Use Plan Map
Figure 4: Proposed Land Use Plan Map

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment

Redondo Beach Unified School District

1. Please provide RBUSD current student generation rates and development impact fees? If possible, please provide the Developer Fee Justification Study for RBUSD?

RBUSD Developer Fee Justification Study 2020 attached under separate cover.

2. Are there any existing plans to expand school facilities with RBUSD? If so, please describe these planned expansions.

RBUSD may increase classrooms at a few of the elementary school sites in the next 1-5 years in order to accomodate students in a full day kindergarten program (currently ½day kindergarten shares classrooms with a.m. & p.m. programs) as well as implement CA's new Universal TK program.

3. Is there any existing Safe Routes to School program in place? If yes, please indicate how or where we can obtain a copy.

NO.

4. Please provide any additional comments you wish to make regarding the proposed project.

* page 9 of 9

I marked up the document attached. The City's Proposed Land Use Plan takes property owned by the school district (should be shaded light blue for Public/Institutional) and marks it up on the map as green for parks/open space. While these areas are currently in use as parks/open space, the school district has the authority to use or convert district property for any educational use it may deem appropriate.

Response Prepared By:

Annette V. Alpern — Deputy Superintendent

Name **Title**

Redondo Beach Unified School District — 09/29/23

Agency **Date**

Figure 1 - Project Area Map

Note: The City boundary extends 3 miles into the Pacific Ocean, which is not shown on this exhibit.

Source: City of Redondo Beach, 2023.

PlaceWorks

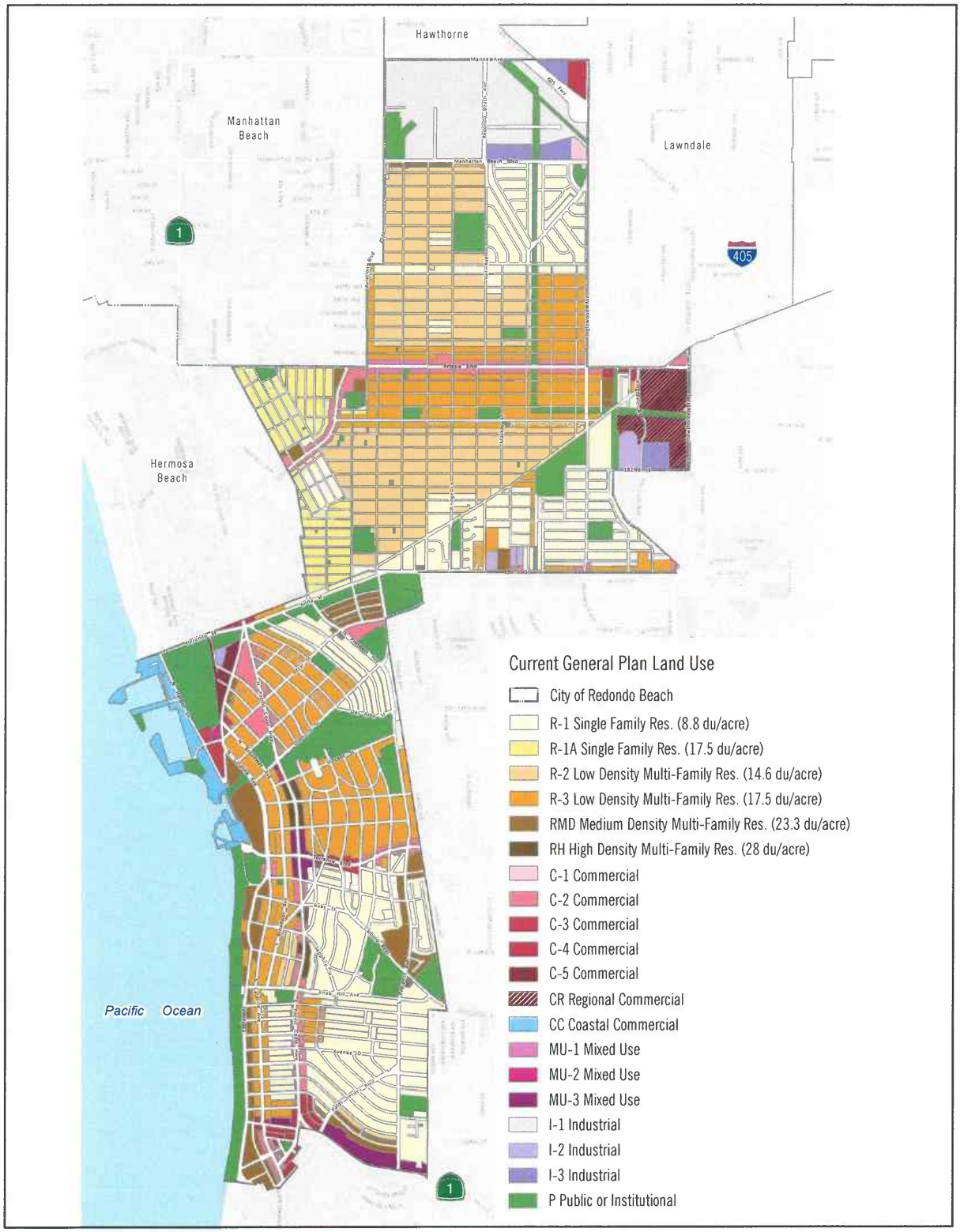
Figure 2 - Existing Land Uses

Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

7

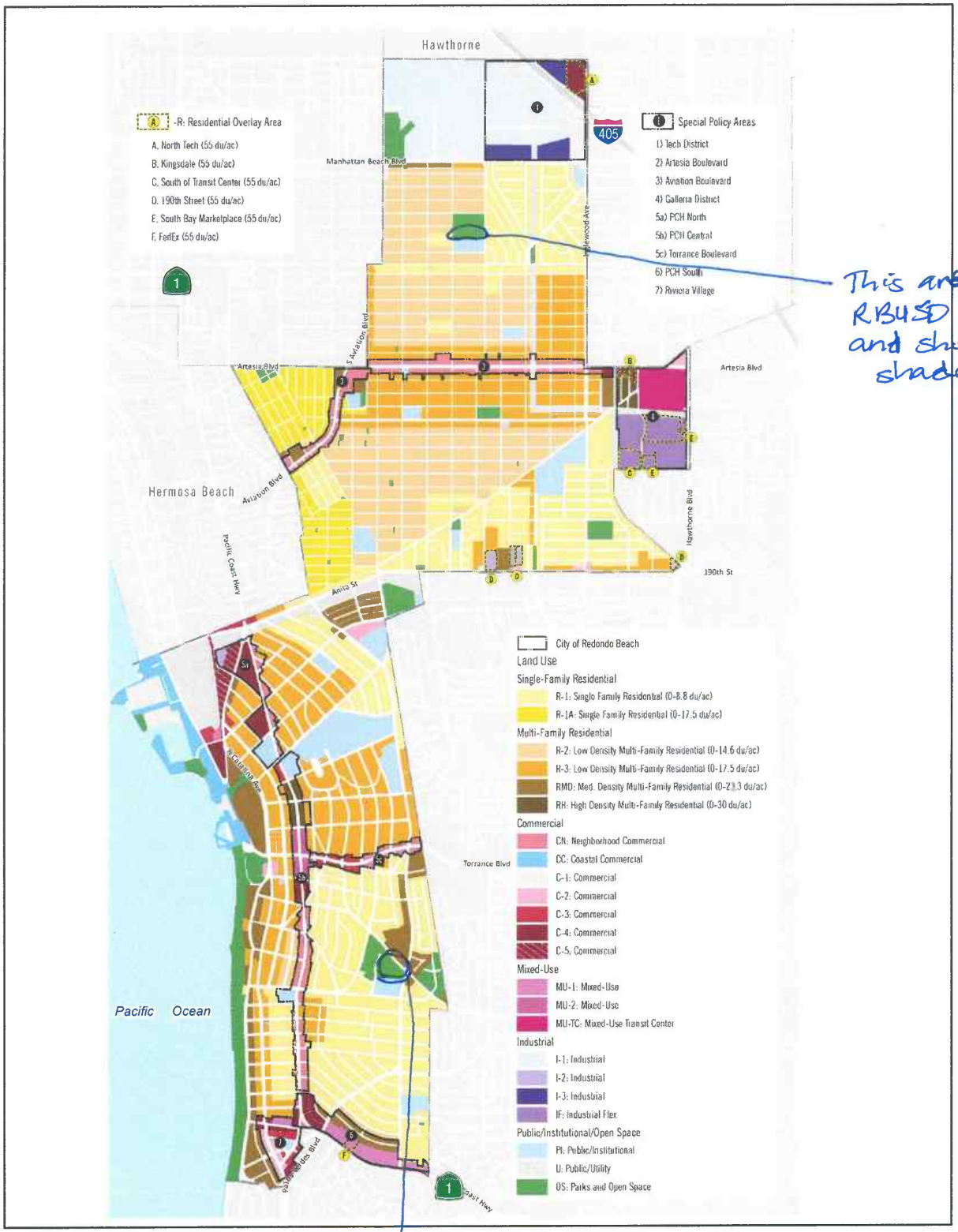
Figure 3 - Current Land Use Plan



Source: City of Redondo Beach, 2023.

PlaceWorks

Figure 4 - Proposed Land Use Plan



This area is RBUSD property and should be shaded blue

This area is RBUSD + should be shaded light blue

Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

RESIDENTIAL AND COMMERCIAL/INDUSTRIAL DEVELOPMENT SCHOOL FEE JUSTIFICATION STUDY

REDONDO BEACH UNIFIED SCHOOL DISTRICT

OCTOBER 29, 2020

Prepared For:
Redondo Beach Unified
School District
1401 Inglewood Avenue
Redondo Beach, CA 90278
310.379.5449

Prepared By:
Cooperative Strategies
8955 Research Drive
Irvine, CA 92618
844.654.2421

COOPERATIVE STRATEGIES

ASSESS • PLAN • FUND • BUILD

▸ TABLE OF CONTENTS

EXHIBITS

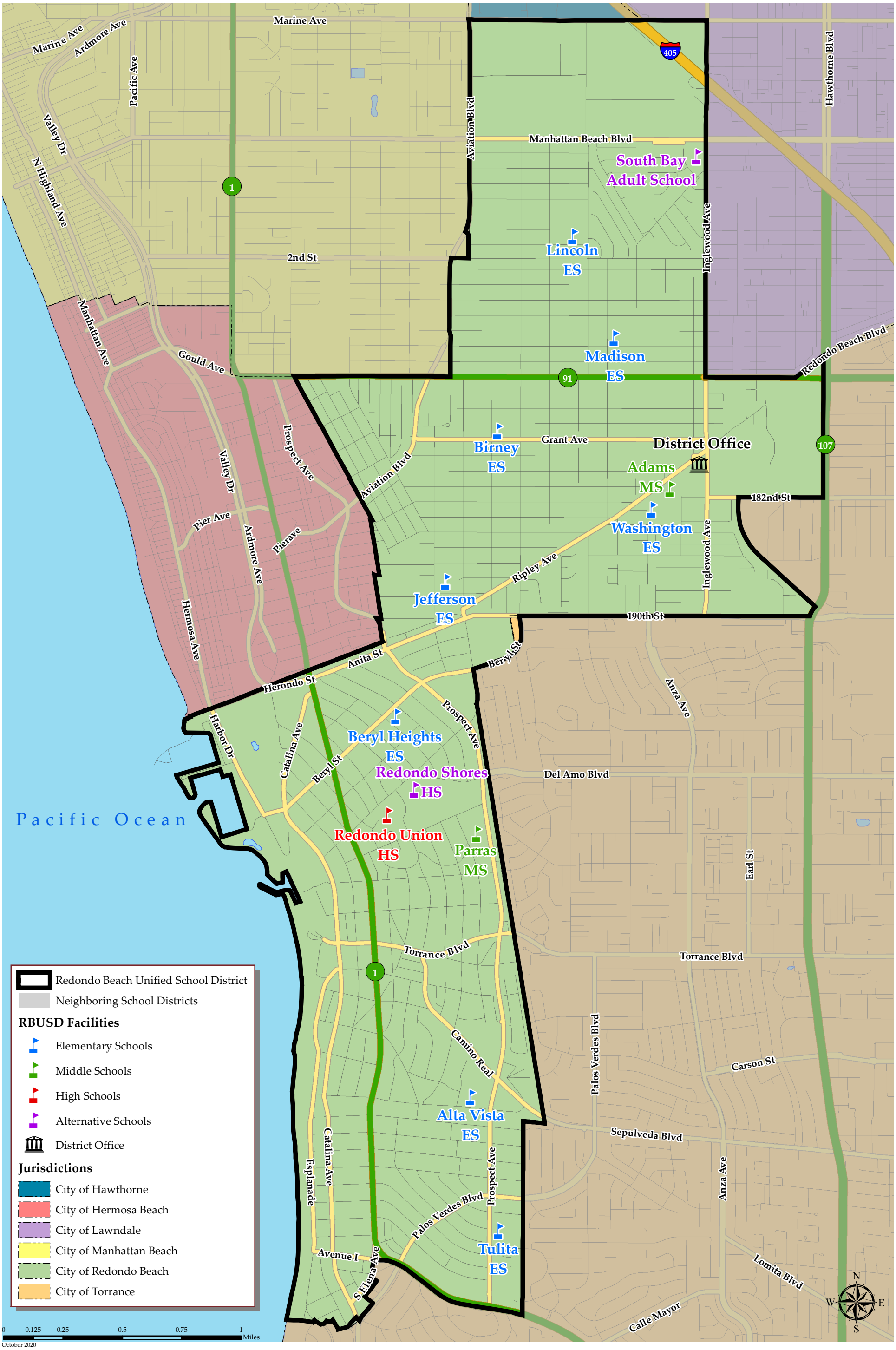
EXECUTIVE SUMMARY

This Residential and Commercial/Industrial Development School Fee Justification Study ("Study") is intended to determine the extent to which a nexus can be established in the Redondo Beach Unified School District ("School District") between residential and commercial/industrial development ("CID") and (i) the need for school facilities, (ii) the cost of school facilities, and (iii) the amount of statutory school fees ("School Fees") per residential and CID building square foot that may be levied for schools pursuant to the provisions of Section 17620 of the Education Code, as well as Sections 65995 and 66001 of the Government Code, Assembly Bill ("AB") 181, and subdivision (e) of Section 17621 of the Education Code.

The School District provides education to students in grades transitional kindergarten ("TK") through 12 residing within the City of Redondo Beach ("City") (please see map on following page for a geographic profile of the School District). Collectively, the School District's school facilities in school year 2019/2020 have a capacity of 10,384 students based on information provided by the School District. Of these 10,384 seats, 4,446 are at the elementary school level (i.e., grades TK through 5), 2,656 are at the middle school level (i.e., grades 6 through 8), and 3,282 are at the high school level (i.e., grades 9 through 12) (see Exhibit A for the school facilities capacity calculation). Based on data provided by the School District, student enrollment is 10,123 in school year 2019/2020. Comparing student enrollment to facilities capacity reveals that student enrollment exceeds facilities capacity at the elementary school level while facilities capacity exceeds student enrollment at the middle school and high school level in school year 2019/2020 (please see Section IV for more information on student enrollment and facilities capacity).

To establish a nexus and a justifiable residential School Fee level, the Study evaluated the number and cost of new facilities required to house students generated from future residential development within the School District. Based on data provided by the Southern California Association of Governments ("SCAG") approximately 1,246 additional residential units are expected be constructed within the School District's boundaries through calendar year 2035 ("Future Units"). Of these 1,246 Future Units, 374 are expected to be single family detached ("SFD") and 872 are expected to be multi-family attached ("MFA") units.

REDONDO BEACH UNIFIED SCHOOL DISTRICT
GEOGRAPHIC PROFILE



October 2020

To determine the impact on the School District from Future Units, the Study first multiplied the number of Future Units by the student generation factors ("SGFs") calculated by Cooperative Strategies, to determine the projected student enrollment from Future Units. The results were that 156 unhoused elementary school students and 138 unhoused high school students are anticipated to be generated from Future Units. These numbers include a reduction of the number of students projected to be housed by existing excess seats ("Projected Unhoused Students").

To adequately house the Projected Unhoused Students, the School District will need to expand existing elementary school and high school facilities. Using design capacities of 25 students per classroom at the elementary school level and 27 students per classroom at the high school level, the School District will need to construct seven (7) new elementary school classrooms and six (6) new high school classrooms to accommodate the Projected Unhoused Students from the Future Units projected to be constructed at this time. Based on school facility costs experienced by the School District as well as other school districts within the State, an elementary school classroom is projected to cost $1,000,000 and a high school classroom is projected to cost $1,000,000.

In addition to the school facilities cost impacts, the School District will experience Central Administrative and Support Facilities cost impacts. In January 1994, the State Allocation Board ("SAB") approved a policy of four (4) square feet of Central Administrative and Support Facilities per student, which based on School District cost estimates equates to a per-student cost of $800. Multiplying these costs by the facilities needed and the students generated yielded the total school facilities cost impacts shown in Table ES-1.

TABLE ES-1

TOTAL SCHOOL FACILITIES COST IMPACTS FROM FUTURE UNITS (2020$)

School Levels	Cost Per Teaching Station/ Student	Teaching Stations Required/Students Generated	Total School Facilities Cost Impacts
Elementary School	$1,000,000	6.2400	$6,240,000
Middle School	N/A	0.0000	$0
High School	$1,000,000	5.1111	$5,111,100
Central Admin Impacts	$800	294	$235,200
Total	N/A	N/A	$11,586,300

The amounts listed in Table ES-1 were apportioned to each land use class based on the number of students generated from such residential land use. Thereafter, the school facilities cost impacts for each land use class were divided by the number of Future Units to calculate the school facilities cost impacts per residential unit. Table ES-2 below lists the school facilities cost impacts per residential unit.

TABLE ES-2

SCHOOL FACILITIES COST IMPACTS PER RESIDENTIAL UNIT (2020$)

Land Use	Total School Facilities Cost Impacts	Future Units	School Facilities Cost Impacts per Residential Unit
Single Family Detached	$4,252,322	374	$11,370
Multi-Family Attached	$7,333,978	872	$8,411

To determine the school facilities cost impacts per square foot of residential construction, the school facilities cost impacts per unit were divided by the average square footage of a residential unit in each land use class. Table ES-3 below lists the school facilities cost impacts per average residential square foot.

TABLE ES-3

SCHOOL FACILITIES COST IMPACTS PER RESIDENTIAL SQUARE FOOT (2020$)

Land Use	School Facilities Cost Impacts per Future Units	Average Square Footage	School Facilities Cost Impacts per Residential Square Foot
Single Family Detached	$11,370	2,700	$4.21
Multi-Family Attached	$8,411	1,200	$7.01

To determine the commercial/industrial School Fee levels that satisfy the rigorous nexus requirements of AB 181, the Study divides CID into seven (7) land use categories: retail and services, office, research and development, industrial/warehouse/ manufacturing, hospital, hotel/motel, and self-storage. The employment impacts of each of these land uses, in terms of the number of employees per 1,000 square feet of building space, are based on information from the San Diego Association of Governments ("SANDAG") pursuant to Section 17621 (e)(1)(B) of the Education Code. These employee impacts are shown in Table ES-4 on the following page.

TABLE ES-4

EMPLOYMENT IMPACTS PER 1,000 SQUARE FEET CID

CID Land Use Category	Square Feet per Employee	Employees per 1,000 Square Feet
Retail and Service	447	2.2371
Office	286	3.4965
Research and Development	329	3.0395
Industrial/Warehouse/Manufacturing	371	2.6954
Hospital	360	2.7778
Hotel/Motel	883	1.1325
Self-Storage	15,552	0.0643

Additional data from SCAG, the U.S. Bureau of Census ("Census"), and CoreLogic provide a basis for estimating net school district household impacts. This number includes only those households occupying new housing units within the School District, as opposed to existing units whose previous occupants may have included school-aged children. Multiplying net school district households by (i) the number of students per household and (ii) total school facilities costs per student, results in estimates of school facilities cost impacts. Collectively, this calculation represents the total school facilities cost impacts per 1,000 square feet of commercial/industrial floor space, expressed in 2020 dollars. These results are summarized in Table ES-5.

TABLE ES-5

GROSS SCHOOL FACILITIES COSTS IMPACTS PER HOUSEHOLD (2020$)

School Level	Total Student Generation Impacts	Cost per Student	Gross School Facilities Costs Impacts per Unit
Elementary School	0.0093	$30,600.00	$284.58
Middle School	0.0090	$0.00	$0.00
High School	0.0102	$37,837.00	$385.94
Impact per Household	N/A	N/A	$670.52

The revenue component of the Study estimates the potential fee revenues generated by CID, including residential fees paid by CID related households, as well as CID School Fees. CID related residential revenues are calculated based on the proposed residential School Fee of $4.08 per square foot, justified in this Study. The residential revenues per household are then subtracted from the impact per household listed above. This results in net impact per household, as summarized in Table ES-6.

TABLE ES-6

NET SCHOOL FACILITIES COST IMPACTS PER HOUSEHOLD (2020$)

Item	Amount
Impact per Household	$670.52
Residential Revenue Per Household	$67.99
Net School Facilities Cost Impacts Per Household	$602.53

The net impact per household is then divided by the appropriate square feet per employee for each of the seven (7) CID land use categories to determine the cost impact per square foot of CID for each CID category, as shown in Table ES-7.

TABLE ES-7

SCHOOL FACILITIES COST IMPACTS PER SQUARE FOOT (2020$)

School Level	Net Impact per Household	Square Feet per Employee	Cost Impact per Square Foot Of CID
Retail and Services	$602.53	447	$1.348
Office	$602.53	286	$2.107
Research and Development	$602.53	329	$1.831
Industrial/Warehouse/Manufacturing	$602.53	371	$1.624
Hospital	$602.53	360	$1.674
Hotel/Motel	$602.53	883	$0.682
Self-Storage	$602.53	15,552	$0.039

On January 22, 2020, the SAB increased the maximum Residential and CID School Fees authorized by Section 17620 of the Education Code from $3.79 to $4.08 per residential building square foot, and from $0.61 to $0.66 per CID square foot for unified school districts. As shown in Table ES-3, the impact per residential square foot exceeds the maximum residential School Fee per square foot and, therefore, School Fees would provide for less than 100 percent of the school facilities cost impacts. The Study concludes that the School District is fully justified in levying the maximum residential School Fee of $4.08 per square foot for all new residential development within its boundaries subject to the limitations under the law.

Justification of the CID School Fee is based on a comparison of cost impacts per CID square foot, as shown in Table ES-7, against the maximum CID Fee per square foot as noted above. As shown in Table ES-8, the School District is justified in levying:

TABLE ES-8

MAXIMUM SCHOOL FEE PER SQUARE FOOT OF CID

CID Land Use Category	Maximum School Fee
Retail and Service	$0.66
Office	$0.66
Research and Development	$0.66
Industrial/Warehouse/Manufacturing	$0.66
Hospitals	$0.66
Hotel/Motel	$0.66
Self-Storage	$0.039

I. INTRODUCTION

Senate Bill ("SB") 50, which Governor Wilson signed on August 27, 1998, was enacted on November 4, 1998, following the approval of Proposition 1A by the voters of the State in the general election on November 3, 1998. SB 50 includes provisions for the following:

1. Issuance of State general obligation bonds in an amount not to exceed $9.2 billion;
2. Reformation of the State School Building Program; and
3. Reformation of the School Fee mitigation payment collection procedure.

Additionally, Assembly Bill ("AB") 16, which Governor Davis signed on April 26, 2002, was enacted following the approval of Proposition 47 ("Prop 47") by the voters of the State in the general election on November 5, 2002. Prop 47 includes the authorization for issuance of State general obligation bonds in the amount of $13.05 billion, and AB 16 provides for additional reformation of the State School Building Program into the School Facilities Program. On March 2, 2004, the voters of the State approved Proposition 55 ("Prop 55"). Prop 55 includes the authorization for the additional issuance of State general obligation bonds in the amount of $12.3 billion. Finally AB 127, which Governor Schwarzenegger signed on May 20, 2006, was enacted following the approval of Proposition 1D ("Prop 1D") by the voters of the State in the general election of November 7, 2006. Prop 1D includes the authorization for the issuance of State general obligation bonds in the amount of $10.4 billion. On November 8, 2016, the voters of the State approved Proposition 51 ("Prop 51"). Prop 51 includes the authorization for the issuance of State general obligation bonds in the amount of $9 billion.

The Mira-Hart-Murrieta Decisions, which formerly permitted school districts to collect mitigation payments in excess of School Fees under certain circumstances, are suspended by AB 127. In lieu of the powers granted by the Mira-Hart-Murrieta Decisions, SB 50 and subsequent legislation provide school districts with a reformed School Fee collection procedure that, subject to certain conditions, authorizes school districts to collect Alternative Fees on residential developments. However, not all school districts will qualify to charge Alternative Fees, and Alternative Fees are generally not imposed upon residential units that have existing agreements with a school district.

Therefore, school districts must still rely on School Fees as a funding source for school facilities required by new development. However, before a school district can levy School Fees on new development, State law requires that certain nexus findings must be made and documented. The objective of this Study is to provide a rigorous basis for such findings.

II. LEGISLATION

State legislation, specifically AB 2926 and AB 1600, provides guidelines, procedures, and restrictions on the levy of School Fees for school facilities. Certain provisions of this legislation are summarized below:

A. AB 2926

AB 2926 was enacted by the State in 1986. Among other things, AB 2926 added various sections to the Government Code which authorize school districts to levy School Fees on new residential and commercial/industrial developments in order to pay for school facilities. In addition, AB 2926 provides for the following:

1. No city or county can issue a building permit for a development project unless such School Fees have been paid.
2. School Fees for commercial/industrial development must be supported by the finding that such School Fees "are reasonably related and limited to the needs for schools caused by the development."
3. School Fees for 1987 were limited to $1.50 per square foot on new residential construction and $0.25 per square foot for new commercial/industrial construction.
4. Every year, School Fees are subject to annual increases based on the Statewide cost index for Class B construction, as determined by the SAB at its January meeting (This provision was changed to every other year by AB181).

The provisions of AB 2926 have since been expanded and revised by AB 1600.

B. AB 1600

AB 1600, which created Sections 66000 et seq. of the Government Code, was enacted by the State in 1987. AB 1600 requires that all public agencies satisfy the following requirements when establishing, increasing or imposing a fee as a condition of approval for a development project.

1. Determine the purpose of the fee.
2. Identify the facilities to which the fee will be put.
3. Determine that there is a reasonable relationship between the need for public facilities and the type of development on which a fee is imposed.

4. Determine that there is a reasonable relationship between the amount of the fee and the public facility or portion of the public facility attributable to the development on which the fee is imposed.

5. Provide an annual accounting of any portion of the fee remaining unexpended, whether committed or uncommitted, in the School District's accounts five or more years after it was collected.

In other words, AB 1600 limits the ability of a school district to levy School Fees unless (i) there is a need for the School Fee revenues generated and (ii) there is a nexus or relationship between the need for School Fee revenues and the type of development project on which the School Fee is imposed. (The requirements of AB 1600 were clarified with the passage in 2006 of AB 2751, which codifies the findings of Shapell Industries vs. Milpitas Unified School District.) The Study will provide information necessary to establish such a nexus between School Fees and residential development.

C. AB 181

AB 181, enacted by the State in 1989, made significant changes in several State Codes, including Sections 53080 et seq. of the Government Code which was re-codified as Sections 17620 et seq. of the Education Code on January 1, 1998. Changes in Section 53080 included additional requirements and procedures for imposing School Fees and other conditions on new development. Specifically, AB 181 imposes more stringent nexus requirements on school districts that wish to levy School Fees on CID, as follows:

1. In order to levy a School Fee on CID, a formal study must be conducted to determine the impact of "the increased number of employees anticipated to result" from new CID on the "cost of providing school facilities within the School District".

2. Only that portion of the School Fee justified by the "nexus findings" contained in this study may be levied. Nexus findings must be made on an individual project basis or on the basis of categories of CID and must "utilize employee generation estimates that are based on commercial/industrial factors within the school district." Categories to be evaluated may include, but are not limited to, office, retail, transportation, communications and utilities, light industrial, heavy industrial, research and development, and warehouse uses.

3. Starting in 1990, maximum School Fees for residential and CID will be subject to increases every two (2) years rather than annually.

4. An appeals procedure shall be established whereby the levy of School Fees on a commercial/industrial project may be appealed to the governing board of a school district. Grounds for an appeal must include, but are not limited to, improper project classification by commercial/industrial category, or the application of improper or inaccurate employee or student generation factors to the project.

In summary, AB 181 establishes additional requirements which must be satisfied by school districts prior to their levying School Fees on CID.

III. METHODOLOGY OF STUDY

The School District is projecting an increase in student enrollment attributable to new development in future years. This projected growth will create a demand for new school facilities to be constructed within the School District and the need to incur significant school facilities costs to meet that demand. As a result, the School District has determined that School Fees should be levied on new development projects. The objective of the Study is to provide a basis for such findings consistent with the requirements of AB 2926, AB 1600, AB 181, and the provisions of Section 66001 of the Government Code.

A. RESIDENTIAL METHODOLOGY

The School District has determined that School Fees must be levied on new residential projects, if findings can be made that such projects will lead to higher student enrollment and increased facilities costs. In order to evaluate the existence of a nexus, the Study identifies and analyzes the various connections or linkages between residential development and (i) the need for school facilities, (ii) the cost of school facilities, and (iii) the amount of School Fees that can justifiably be levied. The primary linkages identified include the following:

1. Housing projections - The number of future residential units to be constructed within the boundaries of the School District.
2. Student generation - The number of students generated from a residential unit within the School District.
3. Facility requirements - The number of new school facilities required to house students generated from new residential units
4. School facilities cost impacts - The costs to the School District associated with the construction of new school facilities.
5. School Fee requirements – The School District's need to levy School Fees to cover the cost of new school facilities.

The above linkages result in a series of impacts which (i) connect new residential development with increased school facilities costs and (ii) connect School Fees per residential building square foot with increased facilities costs.

B. COMMERCIAL/INDUSTRIAL METHODOLOGY

The School District has also determined that School Fees must be levied on new CID projects. In order to determine the nexus relationships identified in AB 181, the Study analyzes the various linkages between CID and (i) the need for school facilities, (ii) the cost of school facilities, and (iii) the amount of the School Fee that can justifiably be levied. The primary connections or linkages include the following:

1. Job creation (i.e., new CID within the School District creates new jobs);
2. Household formation (i.e., job creation within the School District leads to the formation of new households in the School District);
3. Student generation (i.e., household formation within the School District generates new students);
4. Facilities requirements (i.e., student generation within the School District leads to the need to incur additional costs for new school facilities); and
5. School Fee requirements (i.e., additional costs for new school facilities within the School District leads to the need to levy School Fees for new development).

The above linkages result in a series of impacts which (i) connect new CID with increased school facilities costs and (ii) connect increased school facilities costs with School Fees on CID buildings. These impacts are identified for different CID land use categories, based on a "prototypical unit" of 1,000 square feet of new commercial or industrial floor space for each category. These "linkage impacts" include five (5) major types:

1. Employment Impacts
2. Household Impacts
3. Student Generation Impacts
4. School Facilities Cost Impacts
5. Fee Revenues

The nature and components of these impacts are summarized in Section III.C, along with the key assumptions and data sources used in estimating their magnitude.

Analysis of the first four (4) linkage impacts provides an estimate of the gross school facilities cost impacts per 1,000 square feet of floor space for each CID category. Analysis and comparison of all five (5) impacts provide an estimate of

(i) net school facilities cost impacts (i.e., gross school facilities cost impacts minus residential revenues) per 1,000 square feet of CID floor space and (ii) the maximum commercial/industrial School Fee that can be justified.

C. COMMERCIAL/INDUSTRIAL LAND USE CATEGORIES

Linkage impacts are analyzed for the following CID land use categories:

1. Retail and Services
2. Office
3. Research and Development
4. Industrial/Warehouse/Manufacturing
5. Hospital
6. Hotel/Motel
7. Self-Storage

RETAIL AND SERVICES

The retail and services category includes commercial establishments which sell general merchandise, building materials, hard goods, apparel, and other items and services to consumers. Additional establishments in the retail and services category include nurseries, discount stores, restaurants, entertainment theme parks, new/used car sales facilities, service stations, supermarkets, banks, real estate sales offices, and similar uses.

OFFICE

A general office building houses one (1) or more tenants and is the location where affairs of a business, commercial or industrial organization, professional person or firm are conducted. The building or buildings may be limited to one (1) tenant, either the owner or lessee, or contain a mixture of tenants including professional services, insurance companies, investment brokers, company headquarters, and services for the tenants such as a bank or savings and loan, a restaurant or cafeteria, and service retail and services facilities. There may be large amounts of space used for file storage or data processing.

The office category may also include medical offices that provide diagnoses and outpatient care on a routine basis, but which are unable to provide prolonged in-house medical/surgical care. A medical office is generally operated by either a single private physician or a group of doctors.

RESEARCH AND DEVELOPMENT

Research and development facilities are those primarily associated with the application of scientific research to the development of high technology products. Areas of concentration include materials, science, computer, electronic, and telecommunications products. Facilities may also contain offices and fabrication areas. Activities performed range from pure research to product development, testing, assembly, and distribution.

INDUSTRIAL/WAREHOUSE/MANUFACTURING

Warehouses are facilities that are primarily devoted to the storage of materials. They may also include office and maintenance areas. This category also includes buildings in which a storage unit or vault is rented for the storage of goods.

Manufacturing facilities are building structures where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to actual production of goods, manufacturing facilities generally have office, warehouse, research and associated functions. This category includes light industrial facilities such as printing plants, material testing laboratories, assemblers of data processing equipment, and power stations.

HOSPITAL

Hospital refers to any institution where medical or surgical care is given to non-ambulatory and ambulatory patients. The term does not however, refer to medical clinics (facilities that provide diagnoses and outpatient care only) or to nursing homes (facilities devoted to the care of persons unable to care for themselves).

HOTEL/MOTEL

Hotels and motels are commercial establishments primarily engaged in providing lodging, or lodging and meals, for the general public. As defined by Government Code Section 65995(d), the hotel/motel category includes, but is not limited to, any hotel, motel, inn, tourist home, or other lodging for which the maximum term of occupancy does not exceed 30 days. It does not, however, include any residential hotel as defined by Section 50519(b)(1) of the Health and Safety Code.

SELF-STORAGE

This category includes buildings in which a storage unit or vault is rented for the storage of goods and/or personal materials. This category may also include office areas associated with storage.

Note that CID land use categories may include different industry types. For example, firms in the transportation, communications, or utilities industries may be classified in up to six (6) of the seven (7) land use categories shown above. Similarly, retail firms may also occupy office or industrial space (e.g., for corporate headquarters or warehousing) and manufacturing firms may occupy retail space (e.g., factory retail outlets). In evaluating any given project, the School District should assign the project to whichever CID category is the predominant use within the project.

IV. FACILITIES CAPACITY AND STUDENT ENROLLMENT

In order to determine whether the School District's existing school facilities contain excess capacity to house students generated by new residential and CID development, school year 2019/2020 student enrollment and school facilities capacity of the School District were evaluated.

Collectively, the School District's school facilities in school year 2019/2020 have a capacity of 10,384 students based on the information provided by the School District. Of these 10,384 existing seats, 4,446 are at the elementary school level, 2,656 are at the middle school level, and 3,282 are at the high school level(see Exhibit A for the school facilities capacity calculation).The enrollment of the School District in school year 2019/2020 is 10,123 students. As shown in Table 1 below, the School District's student enrollment exceeds facilities capacity at the elementary school level while facilities capacity exceeds student enrollment at the middle school and high school levels in school year 2019/2020.

TABLE 1

EXISTING SCHOOL FACILITIES CAPACITY AND STUDENT ENROLLMENT

School Level	2019/2020 Facilities Capacity	2019/2020 Student Enrollment	Excess/ (Shortage) Capacity
Elementary School (Grades K-5)	4,446	4,624	(178)
Middle School (Grades 6-8)	2,656	2,296	360
High School (Grades 9-12)	3,282	3,203	79
Total	10,384	10,123	261

As indicated in Table 1, 360 middle school seats and 79 high school seats are available to house students generated from Future Units. These surplus seats will be addressed in Section V below.

V. IMPACT OF RESIDENTIAL DEVELOPMENT ON SCHOOL FACILITIES NEEDS

As discussed in Section III, the objective of the Study is to determine the appropriateness of the imposition of a School Fee to finance school facilities necessitated by students to be generated from new residential development. Section III outlined the methodology which was employed in the Study to meet that objective. Section V is a step-by-step presentation of the results of the analysis.

A. PROJECTED RESIDENTIAL DEVELOPMENT WITHIN THE SCHOOL DISTRICT

The initial step in developing a nexus as required by AB 2926 and AB 1600 is to determine the number of Future Units to be constructed within the School District's boundaries. Based on information provided by SCAG, the School District expects the construction of approximately 1,246 Future Units through calendar year 2035. Of these 1,246 Future Units,374 are expected to be SFD units and 872 are expected to be MFA units. Table 2 distinguishes Future Units by land use.

TABLE 2

FUTURE UNITS

Land Uses	Total Future Units
Single Family Detached	374
Multi-Family Attached	872
Total Units	1,246

B. RECONSTRUCTION

Reconstruction is the act of replacing existing structures with new construction, which may have an alternative land use (i.e., commercial/industrial versus residential) or may consist of different residential unit types (i.e., SFD versus MFA, etc.).

B1. RESIDENTIAL RECONSTRUCTION

Residential Reconstruction consists of voluntarily demolishing existing residential units and replacing them with new residential development. To the extent Reconstruction increases the residential square footage beyond what was demolished ("New Square Footage"), the increase in square footage is subject to the applicable School Fee as such construction is considered new residential development. As for the amount of square footage constructed that replaces only the previously constructed square footage ("Replacement Square Footage"), the determination of the applicable fee, if any, is subject to a showing that the Replacement Square Footage results in an increase in student enrollment and, therefore, an additional impact being placed on the School District to provide school facilities for new student enrollment.

Prior to the imposition of fees on Replacement Square Footage, the School District shall undertake an analysis on any future proposed projects(s) to examine the extent to which an increase in enrollment can be expected from Replacement Square Footage due to any differential in SGFs as identified in the Study for the applicable unit types between existing square footage and Replacement Square Footage. Any such fee that is calculated for the Replacement Square Footage shall not exceed the School Fee that is in effect at such time.

B2. RECONSTRUCTION OF COMMERCIAL/INDUSTRIAL CONSTRUCTION INTO RESIDENTIAL CONSTRUCTION

The voluntary demolition of existing commercial/industrial buildings and replacement of them with new residential development is a different category of Reconstruction. Cooperative Strategies is aware that such types of Reconstruction may occur within the School District in the future, however, Cooperative Strategies was unable to find information (i) about the amount planned within the School District in the future or (ii) historical levels, which might indicate the amount to be expected in the future. Due to the lack of information, the School District has decided to evaluate the impacts of Commercial/Industrial Reconstruction projects on a case-by-case basis and will make a determination of whether a fee credit is justified based on the nature of the project.

C. STUDENT GENERATION FACTORS PER RESIDENTIAL UNIT

In order to analyze the impact on the School District's student enrollment from Future Units, Cooperative Strategies calculated SGFs for SFD and MFA units. The process of determining SGFs involved cross-referencing the School District's enrollment data against the County Assessor residential data.

Sorting and extracting the County Assessor records by land use, Cooperative Strategies developed a database of 8,470 SFD units. This database was then compared with the School District's student enrollment database to identify address matches. Upon comparison of the two (2) databases, 3,512 student matches were found, resulting in the SGFs shown in Table 3.

TABLE 3

STUDENT GENERATION FACTORS FOR SINGLE FAMILY DETACHED UNITS

School Level	Students Matched	Single Family Detached Units	Student Generation Factors
Elementary School	1,643	8,470	0.1940
Middle School	801	8,470	0.0946
High School	1,068	8,470	0.1261
Total	3,512	N/A	0.4147

A procedure identical to the one used in calculating the SGFs for SFD units was used to determine SGFs for MFA units. A total of 5,376 students matched to the MFA database which consisted of 17,702 units. The resulting SGFs for MFA units are shown in Table 4 below.

TABLE 4

STUDENT GENERATION FACTORS FOR MUTLI-FAMILY ATTACHED UNITS

School Level	Students Matched	Multi-Family Attached Units	Student Generation Factors
Elementary School	2,612	17,702	0.1476
Middle School	1,194	17,702	0.0675
High School	1,570	17,702	0.0887
Total	5,376	N/A	0.3038

However, due to incomplete and incorrect address information in both the student enrollment and residential databases, Cooperative Strategies was unable to match all of the School District's students. The results are SGFs that understate the number of students generated by SFD and MFA units. After accounting for incoming interdistrict students that reside outside of the School District's boundaries, there were 476 unmatched students. Therefore, Cooperative Strategies adjusted the SGFs listed in Tables 3 and 4 based on a rate which considers the number of students successfully matched to a school level and land use. The adjusted SGFs for each land use by school level are shown in Table 5.

TABLE 5

ADJUSTED STUDENT GENERATION FACTORS

School Levels	Single Family Detached Units	Multi-Family Attached Units
Elementary School	0.2004	0.1524
Middle School	0.0972	0.0693
High School	0.1396	0.0981
Total	0.4372	0.3198

D. SCHOOL DISTRICT FACILITIES REQUIREMENTS

By multiplying the Future Units as listed in Table 2 by the SGFs identified in Table 5, the Study determined the projected number of new students to be generated from Future Units. The Projected Student Enrollment by school level is shown in Table 6.

TABLE 6

PROJECTED STUDENT ENROLLMENT FROM FUTURE UNITS

School Level	Projected Student Enrollment from Future SFD Units	Projected Student Enrollment from Future MFA Units	Projected Student Enrollment from Future Units
Elementary School	75	133	208
Middle School	36	60	96
High School	52	86	138
Total	163	279	442

As indicated in Section IV, 360 surplus middle school seats and 79 surplus high school seats are available to accommodate the Projected Student Enrollment. Based on the "Enrollment Analysis and Capacity Study" prepared for the School District by Cooperative Strategies in school year 2018/2019, enrollment from existing residential units is expected to decrease to 4,394 students at the elementary school level, and increase to 2,474 students at the middle school level and 3,713 at the high school level by school year 2028/2029, resulting in 52 surplus seats at the elementary school level, while reducing the number of surplus seats to 182 at the middle school level and to zero (0) at the high school level. Therefore, the Projected Unhoused Students are less than the Projected Student Enrollment at the elementary school and middle school levels. Table 7 shows Projected Unhoused Students for the School District.

TABLE 7

PROJECTED UNHOUSED STUDENTS FROM FUTURE UNITS

School Levels	Projected Students from Future Units	Surplus Seats	Projected Unhoused Students
Elementary School	208	52	156
Middle School	96	182	0
High School	138	0	138
Total	442	234	294

To determine the number of elementary school and high school facilities necessary to adequately house the Projected Unhoused Students, Cooperative Strategies divided the Projected Unhoused Students by the estimated school facilities capacity at each school level, as provided by the School District. The additional school facilities requirements are identified in Table 8.

TABLE 8

ADDITIONAL SCHOOL FACILITIES FOR PROJECTED UNHOUSED STUDENTS

School Levels	Projected Unhoused Students	Estimated Teaching Station Capacity	Additional Teaching Stations Needed
Elementary School	156	25	6.2400
Middle School	0	N/A	0.0000
High School	138	27	5.1111

E. SCHOOL DISTRICT FACILITIES COSTS

The cost of expanding the existing elementary school and high school facilities by adding additional teaching stations is based on costs experienced by other school Districts in the County. It must be noted that the facilities costs are in 2020 dollars and do not include interest costs associated with debt incurred to finance the construction of facilities. The estimated site costs and facility construction costs by school level are shown in Table 9.

TABLE 9

ESTIMATED SCHOOL FACILITIES COSTS (2020$)

School Levels	Estimated Total Cost per Teaching Station
Elementary School	$1,000,000
Middle School	N/A
High School	$1,000,000

The costs in Table 9 do not include costs associated with Central Administrative and Support Facilities. As indicated in Table 7, Future Units will cause the enrollment of the School District to increase by approximately 294 students. In accordance with the Provisions of Chapter 341, Statutes of 1992, SB 1612, the SAB adopted a report on January 26, 1994, requiring approximately four (4) square feet of central administrative and support facilities for every student. Based on this report and the estimated cost per square foot to construct and furnish these types of facilities, the Study incorporates a Central Administrative and Support Facilities cost impact of $800 per student.

F. TOTAL SCHOOL FACILITIES COST IMPACTS

To determine the total school facilities cost impacts caused by Future Units, Cooperative Strategies (i) multiplied the school facilities costs (Table 9) by the additional school facilities needed (Table 8) and (ii) multiplied the central administrative and support facilities costs per student (above paragraph) by the Projected Unhoused Students (Table 7). Table 10 on the following page illustrates the total school facilities cost impacts from future residential development.

TABLE 10

TOTAL SCHOOL FACILITIES COST IMPACTS FROM FUTURE UNITS (2020$)

School Levels	Cost Per Teaching Station/Student	Teaching Stations Required/Students Generated	Total School Facilities Cost Impacts
Elementary School	$1,000,000	6.2400	$6,240,000
Middle School	N/A	0.0000	$0
High School	$1,000,000	5.1111	$5,111,100
Central Admin Impacts	$800	294	$235,200
Total	N/A	N/A	$11,586,300

G. SCHOOL FACILITIES COST IMPACTS PER RESIDENTIAL UNIT

To determine the total school facilities cost impacts per future residential unit, the total school facilities cost impacts listed above need to first be apportioned by land use based on the number of elementary school and high school students to be generated from such land use. Table 11 shows total school facilities cost impacts by land use.

TABLE 11

TOTAL SCHOOL FACILITIES COST IMPACTS BY LAND USE (2020$)

School Level	Single Family Detached Units	Multi-Family Attached Units	Total School Facilities Cost Impacts
Elementary School	$2,284,800	$4,080,000	$6,364,800
Middle School	$0	$0	$0
High School	$1,967,522	$3,253,978	$5,221,500
Total	$4,252,322	$7,333,978	$11,586,300

Total school facilities cost impacts for each land use were then divided by the number of Future Units in such land use to determine school facilities cost impacts per SFD unit and MFA unit. These impacts are shown in Table 12 on the following page.

TABLE 12

SCHOOL FACILITIES COST IMPACTS PER FUTURE UNIT (2020$)

Land Uses	Total School Facilities Cost Impacts	Future Units	School Facilities Cost Impacts per Residential Unit
Single Family Detached	$4,252,322	374	$11,370
Multi-Family Attached	$7,333,978	872	$8,411

H. SCHOOL FACILITIES COST IMPACTS PER SQUARE FOOT

To determine the school facilities cost impacts per square foot of residential construction for each land use, the school facilities cost impacts per unit listed in Table 12 were divided by the average square footage of such type of residential unit. Using square footage information for units constructed within the School District obtained from the County Assessor, Cooperative Strategies estimates that the average square footage of an SFD unit in the School District is projected to be 2,700 square feet while the average square footage of an MFA unit is projected to be 1,200 square feet. Table 13 shows the school facilities cost impacts per square foot of residential construction in the School District.

TABLE 13

SCHOOL FACILITIES COST IMPACTS PER RESIDENTIAL SQUARE FOOT (2020$)

Land Uses	School Facilities Cost Impacts per Residential Unit	Average Square Footage	School Facilities Cost Impacts per Square Foot
Single Family Detached	$11,370	2,700	$4.21
Multi-Family Attached	$8,411	1,200	$7.01

VI. IMPACT OF COMMERCIAL/INDUSTRIAL DEVELOPMENT ON SCHOOL FACILITIES NEEDS

This section presents the quantitative findings of the commercial/industrial nexus analysis summarized in Section III. In particular, this section presents estimates of the following:

1. All "linkage impacts" discussed in Section III, by CID land use category.
2. Gross school facilities cost impacts per 1,000 square feet of commercial/ industrial floor space.
3. Net school facilities cost impacts (i.e., gross school facility cost impacts minus residential revenues) per 1,000 square feet of commercial/industrial floor space.
4. The percentage of the maximum CID School Fee per square foot allowed by law that can be justified to pay for new school facilities.

A. EMPLOYMENT IMPACTS

As indicated in Section III, employment impacts for different CID categories equal the estimated number of on-site employees generated per 1,000 square feet of commercial/industrial floor space, which are referred to in the Study as CID Land Use Categories. Consistent with the provisions of Section 17621(e)(1)(B) of the Education Code, employment impacts for each category are based on data from SANDAG. The employment impacts are shown in Table 14.

TABLE 14

EMPLOYMENT IMPACTS PER 1,000 SQUARE FEET (2020$)

CID Land Use Category	Square Feet per Employee
Retail and Services	447
Office	286
Research and Development	329
Industrial/Warehouse/Manufacturing	371
Hospital	360
Hotel/Motel	883
Self-Storage	15,552

B. HOUSEHOLD IMPACTS

As noted in Section III, household impacts equal the estimated number of households associated with each category of employment impacts, per 1,000 square feet of commercial/industrial floor space. Household impacts include the following components:

1. Households per Employee

   The average number of households per employee are calculated based on information obtained from the Census. Based on this information, the total household impacts are 0.7366 households per employee within the School District.

2. Employed Persons Living within the School District

   In order to determine the number of employed persons who live within the School District, Cooperative Strategies utilized data from the Census. Based on this data, approximately 38.53 percent of the employed persons within the School District are estimated to live within the School District. This trend is expected to increase as new residential and CID projects are approved and additional homes and jobs are created within the School District.

3. Propensity to Occupy New Homes

   The propensity to occupy new housing within the general area of the School District helps determine the number of employees generated from new homes. Based on data on recent resales and new home sales obtained from CoreLogic, new home sales in the School District were estimated to equal 3.56 percent of the total housing units which experienced occupant turnover between 2018 and 2019.

4. Total Household Impact

   In order to determine the Total Household Impact of new residential units, the Study multiplied the average employed persons per household, employed person living within the School District, and the propensity to occupy new homes. This helps determine the number of new employees coming to live and work within the School District produced by new residential development, as shown in Table 15 on the following page.

TABLE 15

TOTAL HOUSEHOLD IMPACTS FROM NEW CID

Household Impact	Factor
Households per Employees	0.7366
Employees Living within the School Districts	38.53%
Households with Employees Working within the School District	0.2838
Propensity to Occupy New Homes	3.56%
Total Household Impacts	0.0101

C. STUDENT GENERATION IMPACTS

As noted in Section III, student generation impacts equal the number of the School District's students associated with each category of CID space. Separate student generation impacts are estimated for each CID category and school level.

1. RESIDENTIAL STUDENT GENERATION IMPACTS

In order to analyze household formation as a result of new CID, the SGFs shown in Table 5 must be blended. To blend the SGFs of the two (2) land uses into a single SGF for each school level, the land uses were weighted in proportion to each type's percentage of the future residential units to be constructed within the School District. Applying these weighting factors yields the following blended SGFs shown in Table 16.

TABLE 16

BLENDED STUDENT GENERATION FACTORS

School Level	Student Generation Factors
Elementary School	0.1668
Middle School	0.0777
High School	0.1106

2. TOTAL STUDENT GENERATION IMPACTS

Multiplying total household impacts shown in Table 15 by the blended SGFs shown in Table 16 results in the average student generation impacts. These average student generation impacts are shown by school level in Table 17 below.

TABLE 17

AVERAGE STUDENT GENERATION IMPACTS

School Level	Student Generation Factors	Total Household Impacts	Average Student Generation Impacts
Elementary School	0.1668	0.0101	0.0017
Middle School	0.0777	0.0101	0.0008
High School	0.1106	0.0101	0.0011

D. INTER-DISTRICT TRANSFER IMPACTS

The Study also evaluates the impact of students attending the School District on an inter-district transfer basis. The inter-district transfer rate is determined by calculating the ratio of student transfers into the School District's schools by the number of persons employed within its boundaries. Based on information provided by the School District, total student transfers into the School District's schools for school year 2019/2020 total 228 at the elementary school level, 247 at the middle school level, and 274 at the high school level. Employment within the School District's area is estimated at 30,179 persons based on employment estimates provided by SCAG. Table 18 shows the inter-district transfer impacts by school level.

TABLE 18

INTER-DISTRICT TRANSFER IMPACTS

School Level	Inter-District Transfer Impacts
Elementary School	0.0076
Middle School	0.0082
High School	0.0091

E. TOTAL STUDENT GENERATION IMPACT

To determine the total student generation impacts of CID on the School District, the average student generation impacts from Table 17 are added to the inter-district transfer impacts from Table 18. The resulting total student generation impacts are displayed in Table 19 below.

TABLE 19

TOTAL STUDENT GENERATION IMPACTS

School Level	Average Student Generation Impacts	Inter-District Transfer Impacts	Total Student Generation Impacts
Elementary School	0.0017	0.0076	0.0093
Middle School	0.0008	0.0082	0.0090
High School	0.0011	0.0091	0.0102

F. GROSS SCHOOL FACILITIES COST IMPACTS

As noted in Section III, school facilities cost impacts equal the gross school facilities cost impacts (exclusive of residential revenues) associated with the total student generation impact of each CID category.

1. SCHOOL FACILITIES COSTS PER STUDENT

The school facilities costs per student are the average cost impact produced by students generated from Future Units. This impact estimate is derived from the school facilities costs (Table 11) divided by the Projected Student Enrollment from Future Units (Table 7) by school level. Multiplying the total student generation impacts by the school facilities costs per student results in the gross school facilities cost impacts shown in Table 20 on the following page.

TABLE 20

GROSS SCHOOL FACILITIES COSTS IMPACTS PER HOUSEHOLD (2020$)

School Level	Total Student Generation Impacts	Cost per Student	Gross School Facilities Costs Impacts per Household
Elementary School	0.0093	$30,600	$284.58
Middle School	0.0090	$0	$0.00
High School	0.0102	$37,837	$385.94
Total	N/A	N/A	$670.52

G. FEE REVENUES

As noted in Section III, fee revenues include two (2) components: residential revenues and potential CID School Fee revenues.

1. RESIDENTIAL REVENUES AND NET SCHOOL FACILITY COSTS

Residential revenues equal the maximum revenues from residential development associated with each school level. These revenues are derived from a weighted average of (i) the School District's proposed School Fee of $4.08 per square foot multiplied by the School District's weighted average square footage for residential units of 1,650 square feet. Based on this calculation, the residential revenues per unit in the School District are estimated to be $6,732. Multiplying the total household impact shown in Table 15 by residential revenues results in the residential revenues per student shown in Table 21.

TABLE 21

RESIDENTIAL REVENUES PER HOUSEHOLD (2020$)

Item	Amount
Revenue per Residential Unit	$6,732
Total Household Impact	0.0101
Residential Revenue per Household	$67.99

2. NET SCHOOL FACILITIES COST IMPACTS

In order to calculate the net school facilities cost impacts per grade level, the residential revenues shown in Table 21 were subtracted from the gross school facilities cost impacts shown in Table 20. The results are the net school facilities cost impacts that must be funded by CID School Fees, as shown in Table 22 below.

TABLE 22

NET SCHOOL FACILITIES COST IMPACTS PER HOUSEHOLD (2020$)

Item	Amount
Gross School Facilities Cost Impacts per Household	$670.52
Residential Revenue per Household	$67.99
Net School Facilities Cost Impacts per Household	$602.53

H. JUSTIFICATION OF COMMERCIAL/INDUSTRIAL SCHOOL FEES

Dividing net school facilities cost impacts shown in Table 22 by total the square feet per employee for each land use category, as shown in Table 14, results in the CID impacts shown in Table 23.

TABLE 23

SCHOOL FACILITIES COST IMPACTS PER SQUARE FOOT (2020$)

CID Land Use Category	Net Impact per Household	Square Feet per Employee	Cost Impact per Square Foot Of CID
Retail and Services	$602.53	447	$1.348
Office	$602.53	286	$2.107
Research and Development	$602.53	329	$1.831
Industrial/Warehouse/Manufacturing	$602.53	371	$1.624
Hospital	$602.53	360	$1.674
Hotel/Motel	$602.53	883	$0.682
Self-Storage	$602.53	15,552	$0.039

VII. CONCLUSION

On January 22, 2020, the SAB increased the maximum Residential and CID School Fees authorized by Section 17620 of the Education Code from $3.79 to $4.08 per residential building square foot, and from $0.61 to $0.66 per CID square foot for unified school districts.

This section summarizes the findings of the Study for new residential and commercial/industrial construction within the School District. In particular, this section summarizes the following:

1. RESIDENTIAL FEES

As shown in Table 13, the impact per residential square foot exceeds the maximum residential School Fee of $4.08 per square foot and, therefore, School Fees would provide for less than 100 percent of the school facilities cost impacts. The Study concludes that the School District is fully justified in levying the maximum residential School Fee of $4.08 per square foot for all new residential development within its boundaries, subject to the limitations under the law.

Based on this information, the School District is justified in charging the Statutory Fee Amounts per square foot shown in Table 24 on new residential construction:

TABLE 24

MAXIMUM JUSTIFIED STATUTORY RESIDENTIAL FEE PER SQUARE FOOT (2020$)

Item	Residential Fee per Square Foot
Single Family Detached	$4.08
Multifamily Attached	$4.08

2. COMMERCIAL/INDUSTRIAL FEES

As shown in Table 23, the impact per CID square foot exceeds the maximum CID School Fee of $0.66 per square foot for all CID land use categories, except for Self-Storage. The Study concludes that the School District is fully justified in levying the maximum CID School Fee of $0.66 per square foot for all CID land use categories, except for Self-Storage, where it is justified in levying $.039 per square foot of CID development.

Based on this information, the School District is justified in charging the Statutory Fee Amounts per square foot shown in Table 25 on new CID construction:

TABLE 25

MAXIMUM JUSTIFIED STATUTORY CID FEE PER SQUARE FOOT (2020$)

CID Land Use Category	CID Fee per Square Foot
Retail and Services	$0.66
Office	$0.66
Research and Development	$0.66
Industrial/Warehouse/Manufacturing	$0.66
Hospital	$0.66
Hotel/Motel	$0.66
Self-Storage	$0.039

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EXHIBIT A

SCHOOL FACILITIES CAPACITY CALCULATION

Redondo Beach Unified School District

School Facilities Capacity Calculation

School	Elementary School	Middle School	High School
Adams MS		1,337	
Alta Vista ES	666		
Beryl Heights ES	438		
Birney ES	468		
Jefferson ES	576		
Lincoln ES	654		
Madison ES	432		
Parras MS		1,319	
Patricia Dreizler Continuation HS			60
Redondo Union HS			3,222
Tulita ES	438		
Washington ES	774		
Capacity	**4,446**	**2,656**	**3,282**

Redondo Beach General Plan Update, Zoning Code Update and Local Coastal Program Amendment
Redondo Beach Public Library

1. There are two libraries that serve the City of Redondo Beach. Please confirm or correct the following information:

Library	Location	Square Footage and Number of Books
Redondo Beach Main Library	303 N. Pacific Coast Hwy. Redondo Beach, CA 90277	**Square Footage**: 49,387 **Number of Books**: 161,867
Redondo Beach North Branch Library	2000 Artesia Blvd. Redondo Beach, CA 90278	**Square Footage**: 12,900 **Number of Books**: 45,149

a. Are the existing library space and number of books considered adequate for the existing population within the libraries' service area? Yes

b. If not, what are the estimated deficits of:

i. Building area in square feet?

ii. Volumes or collection size?

iii. Other resources (computers, etc.)?

2. What demand factors or standards are used to determine the amount of library space and number of volumes, or collection size, needed to serve a given population?

There are no prescriptive standards established for public libraries by the American Library Association, Public Library Association, or the State of California used to determine the amount of library space and number of volumes, or collection size, needed to serve a given population. However, these organizations recommend an outcomes-based assessment process based on the fact that each library serves a diverse community with a variety of needs and that libraries should reflect the needs of the communities they serve.

The Library Services Department collects monthly and annual data on the number of visitors to each library, the number of physical materials checked out, and the number of Library program attendees. Utilizing this data, the Redondo Beach Public Library staff act responsively to meet service demands and follow the City's strategic planning process to determine gaps or needs and how to address areas for improvement in terms of collections, services, programs and facilities.

3. Are there any plans for future library expansion or new libraries that would potentially serve the proposed project? If so, how would these facilities be funded?
No.

4. What measures, if any, would you recommend to reduce project impacts to library facilities and/or collections?
None.

5. Please add any other comments you may wish to make regarding this project.

Appendix F Infrastructure Assessment Report

Appendices

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CITY OF REDONDO BEACH
GENERAL PLAN UPDATE

Infrastructure Report for Water, Sewer, Storm Drainage, and Water Quality

City of Redondo Beach
Los Angeles County, California

Prepared For:

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Date Prepared: February 27, 2024

Revised: July 10, 2024

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1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The City of Redondo Beach ("City") is currently undergoing a General Plan Update (GPU) which is intended to shape development and redevelopment in the City over the next 30-plus years. A General Plan is the principal long-range policy and planning document for guiding the physical development, conservation, and enhancement of California cities and counties. As part of the GPU, infrastructure such as drainage, sewer, water systems, and water quality that support the existing and proposed land uses will be analyzed at a citywide level in connection with the City's proposed land use element, residential overlay areas, and special policy areas. The City is located on the coastal edge of Los Angeles County, twenty miles from downtown Los Angeles and is bounded by the cities of Hawthorne, Manhattan Beach, and Hermosa Beach to the north, Lawndale and Torrance to the east, Palos Verdes and Torrance to the south, and the Pacific Ocean to the west. See Figure 1 for an aerial extent of the Redondo Beach GPU area.

1.2 SCOPE OF WORK

This infrastructure assessment report focuses on describing the primary wet utility infrastructure systems that support the City of Redondo Beach including water, sewer, storm drainage systems, and water quality programs. As part of the California Environmental Quality Act (CEQA) process associated with GPUs, infrastructure, and utilities that support the existing and proposed land uses will be analyzed at a level consistent with the GPU city-wide program-level planning of an Environmental Impact Report ("EIR"). This report will evaluate the existing conditions of these infrastructure systems that serve the City ("Redondo Beach GPU"). Under the proposed GPU buildout, land use changes will alter demands on existing infrastructure and utilities. The analysis will review, identify, and summarize the effects of the proposed conditions on the existing infrastructure within the water, sewer, storm drainage, or water quality systems, noting any major deficiencies, and if there are any major Capital Improvements Plans (CIP) planned within the City area to remedy existing or prospective deficiencies.

1.3 LAND USE DESCRIPTION

The entire City encompasses approximately 3,973 acres (6.2 square miles). Existing land uses include approximately 30,431 residential dwelling units (DUs) and 11.8 million square-feet (SF) of non-residential. Individual land uses and footprints are provided in Table 1.

Table 1 Existing Land Uses

EXISTING RESIDENTIAL LAND USES		
MFR: 2-3	7,406	DUs
MFR: 4 or More	14,285	DUs
Institutional	96	DUs
Mixed Use Res/Com	250	DUs
SFR	8,394	DUs
ADU	-	DUs
Senior Housing	-	DUs
TOTAL RESIDENTIAL (DUs)	**30,431**	**DUs**
EXISTING NON-RESIDENTIAL LAND USES		
Commercial	5,239,913	SF
Industrial	4,978,121	SF
Institutional	875,799	SF
Mixed Use Res/Com	525,392	SF
Utility	207,052	SF
TOTAL NON-RESIDENTIAL (SF)	**11,826,277**	**SF**

DU = Dwelling Unit, SF = Square-Feet
Source: City of Redondo Beach, April 2023. Buildout Summary. Received November 2023

The City is updating its GPU to guide development and land use decisions through the framework of the Land Use Element, which establishes land use plans, special policy areas, buildout assumptions, and implementation goals. The land use designations define the types and intensities of land uses, and the City plans to expand residential land uses up to 35,387 DUs and 17.5 million SF. To accommodate for the increased land use intensities zoning code updates will be necessary to ensure consistency with the proposed GPU, Housing Element, and other state laws. See Table 2 for the City's proposed individual land uses and footprints.

Table 2 Proposed Land Uses

PROPOSED RESIDENTIAL LAND USE		
MFR: 2-3	8,810	DUs
MFR: 4 or More	15,027	DUs
Institutional	-	DUs
Mixed Use Res/Com	2,881	DUs
SFR	7,792	DUs
ADU	624	DUs
Senior Housing	253	DUs
TOTAL RESIDENTIAL (DUs)	**35,387**	**DUs**
PROPOSED NON-RESIDENTIAL LAND USE		
Commercial	8,491,808	SF
Industrial	7,125,235	SF
Institutional	727,692	SF
Mixed Use Res/Com	956,950	SF
Utility	206,591	SF
TOTAL NON-RESIDENTIAL (SF)	**17,508,276**	**SF**

DU = Dwelling Unit, SF = Square-Feet
Source: City of Redondo Beach, April 2023. Buildout Summary. Received November 2023

Overall, the City expects to increase residential land uses by 4,956 DUs and 5.6 million SF from the existing to proposed land use conditions, as shown in Table 3. A majority of the residential land use increases consists of multifamily residential units (MFR) and mixed-use residential and commercial uses. Other uses include a decrease in single-family residential units (SFR) and institutional DUs and increases in Additional Dwelling Units (ADU) and senior housing. While non-residential uses will consist of increases in various commercial, industrial, and mixed-use commercial SF alongside decreases in non-residential institutional and utility land uses.

Table 3 Net Change of Existing to Proposed Land Uses

NET CHANGE OF EXISTING TO PROPOSED RESIDENTIAL LAND USES		
MFR: 2-3	1,404	DUs
MFR: 4 or More	742	DUs
Institutional	(96)	DUs
Mixed Use Res/Com	2,631	DUs
SFR	(602)	DUs
ADU	624	DUs
Senior Housing	253	DUs
TOTAL	**4,956**	**DUs**
NET CHANGE OF EXISTING TO PROPOSED NON-RESIDENTIAL LAND USES		
Commercial	3,251,895	SF
Industrial	2,147,114	SF
Institutional	(148,107)	SF
Mixed Use Res/Com	431,558	SF
Utility	(461)	SF
TOTAL	**5,681,999**	**SF**

(#) = negative value, DU = Dwelling Unit, SF = Square-Feet
Source: City of Redondo Beach, April 2023. Buildout Summary. Received November 2023

A majority of the proposed residential and non-residential land uses are encompassed in the City's special policy areas (SPAs), several of which include high density residential overlays (up to 55 du/ac). These high-density residential overlays within the SPA represent around 30% of the City's proposed land use growth. The seven SPAs within the City's land use element, have been identified for special policy direction due to the role they play in the City as a gateway, corridor, district, or activity center. These areas and their policy directions are described as follows[1]:

- **SPA 1 – North Redondo Tech District**: Maintain a thriving jobs center of innovation that has regional transit connectivity.

- **SPA 2 – Artesia Boulevard**: An active and revitalized corridor that serves as the "main street" of North Redondo through the thoughtful implementation of placemaking, mobility, parking, land use, and economic development strategies.

- **SPA 3 – Aviation Boulevard**: An active and revitalized corridor that provides local-serving commercial and office uses and prioritizes improvements that

[1] City of Redondo Beach, Notice Of Preparation Of A Draft Environmental Impact Report And Notice Of Public Scoping Meeting. June 1, 2023. Found here: https://cms2.revize.com/revize/redondobeachca/Documents/Departments/Community%20Development/Planning/General%20Plan%20And%20Long-Range%20Planning/RBGPEIR_NOP_5_24_23.pdf

generate connectivity to the surrounding neighborhoods through thoughtful implementation of placemaking, mobility, parking, land use, and economic development strategies.

- **SPA 4 – Galleria**: A mixed-use transit node that serves as a regional draw for commercial uses and center for new innovative jobs and high-density housing.

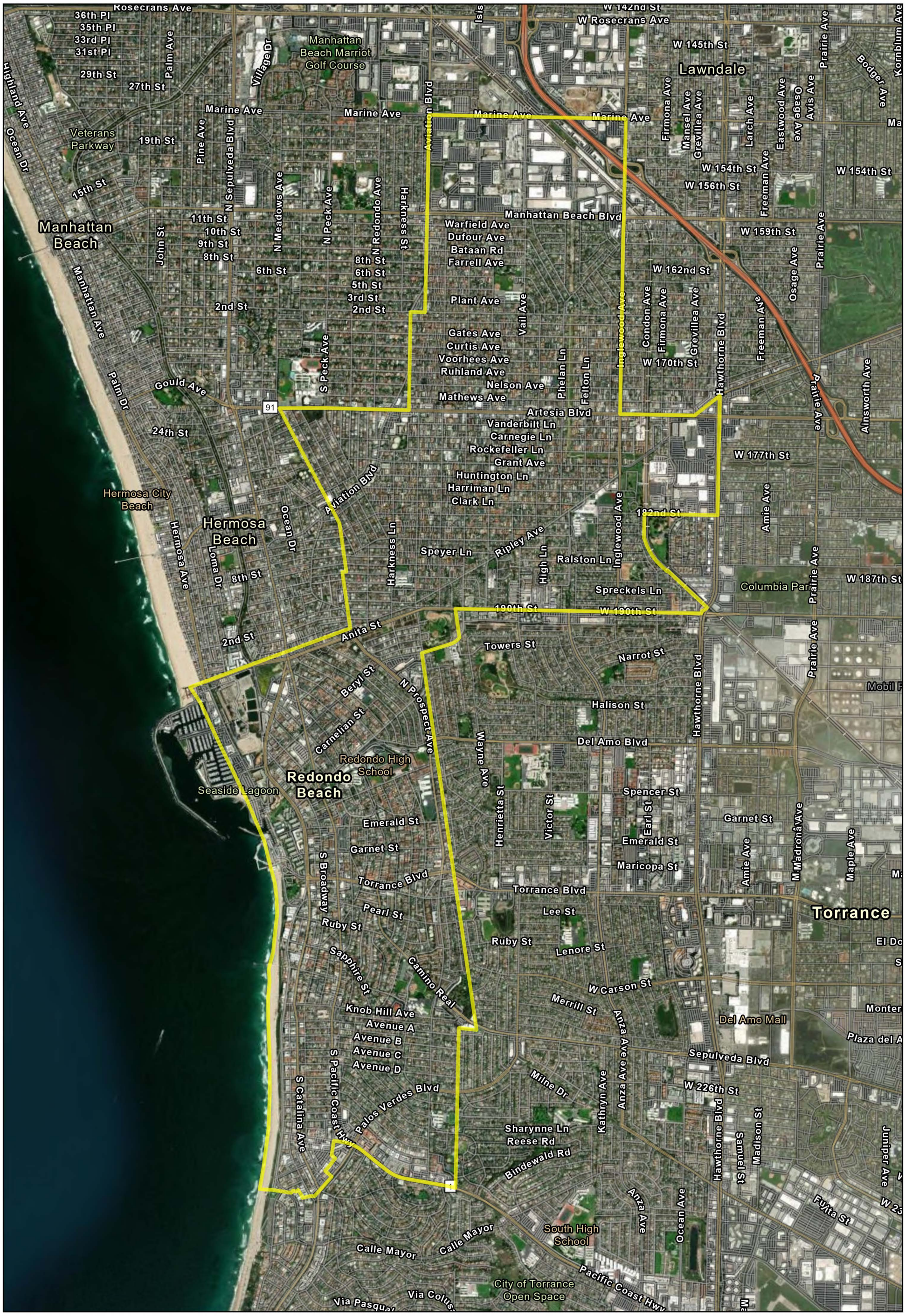
- **SPA 5abc – North PC, Central PCH, and Torrance Boulevard**: Corridors that are neighborhood serving and provide visual gateways, connectivity, and access into the City.

- **SPA 6 – South PCH**: Maintains the South PCH corridor as a neighborhood-serving commercial district and the primary visitor-serving hospitality location in south Redondo with safe pedestrian and bicycle access to the Riviera Village and beaches.

- **SPA 7 – Riviera Village**: Maintains Riviera Village as a low-density, local-serving commercial district that is identifiable as a distinct "village-like" environment characterized by a high level of pedestrian activity.

See Appendix A for a figure of the City's proposed land use plan including an outline of the City's SPAs and residential overlays.

This report will review the baseline conditions of the water, sewer, storm drainage system, and existing water quality regulations and analyze the potential impact of these proposed land uses on the existing infrastructure systems. This analysis will also utilize GIS tools, data, and communication with City staff.



City of Redondo Beach Aerial Extent

Figure 1

Redondo Beach, Ca

2/2/2024

FUSCOE ENGINEERING
FULL CIRCLE THINKING

N

1 inch = 2,400 feet

0 2,000 4,000 Feet

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2. WATER

2.1 WATER SYSTEM ENVIRONMENTAL SETTING & INFRASTRUCTURE

CALIFORNIA WATER SERVICES, HERMOSA-REDONDO DISTRICT

The regional water system around and within the City is managed by California Water Services – Hermosa Redondo District ("Cal Water" "District"). Namely, the District serves the cities of Hermosa Beach, Redondo Beach, and portions of Torrance. The Hermosa Redondo District water system consists of approximately 212 miles of pipeline, two active wells with well-head treatment facilities, 15 storage tanks, and 4 MWD connections. Water within the District consists of local groundwater and imported water from the Metropolitan Water District of Southern California (MWD) and is distributed to residential, commercial, industrial, and governmental customers. Residential demands represent 74% the District's water demands, with non-residential uses accounting for 20%, and distribution system losses 6%. Cal Water was contacted to obtain maps and GIS linework for the existing water system within Redondo Beach, but they declined to provide this information. Figure 2 provides the District's overall service area including Redondo Beach. Data on the City's local water system is limited to information in the District's Urban Water Management Plan (UWMP)[2]. Refer to Figure 2 to see the District's service area map.

WEST BASIN MUNICIPAL WATER DISTRICT (WBMWD)

The City is also within the service area of WBMWD, which encompasses approximately 185 square miles that includes 16 other cities and unincorporated areas. WBMWD provides imported potable water as a wholesaler to CalWater (no direct-to-consumer potable water supply) and provides recycled water. Overall WBMWDs recycled water distribution infrastructure includes over 100 miles of pipelines that are separate from the potable water system[3]. See Figure 2.1 for a map of WBMWDs recycled water distribution system.

2.2 WATER DEMANDS

REGIONAL

Water demands throughout the District are driven by existing populations and projected growth linked to the Southern California Associations of Governments (SCAG) projections. SCAG utilizes a detailed modeling framework covering multiple Southern California counties including Los Angeles County and the City. The population, household, and employment projections used by the District to forecast service area population and service connections tie back to the SCAG census tract land use and growth projections. See Table 4 for the District's estimated water demands for 2020 and projected demands for 2025 to 2045.

[2] California Water Services – Hermosa Redondo District, 2020 UWMP. June 2021. Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/8827961564/HR%5F2020%5FUWMP%5FFINAL.pdf

[3] West Basin Municipal Water District, UWMP. June 2021. Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/1728223502/WBMWD%202020%20UWMP%5FFinal%5F2021%2D06%2D30.pdf

Table 4 Projected Water Demands

Land Use Type	Projected Water Use (AFY)					
	2020	2025	2030	2035	2040	2045
Single Family	5,947	5,827	5,762	5,782	5,790	5,866
Multi-Family	2,147	2,072	2,044	2,042	2,045	2,063
Commercial	1,262	1,183	1,126	1,100	1,082	1,070
Institutional/ Gov.	387	368	354	349	345	343
Industrial	567	582	582	582	582	582
Other Potable	12	6	6	6	6	6
Losses	624	621	618	624	629	634
TOTAL	**10,945**	**10,660**	**10,493**	**10,485**	**10,480**	**10,564**

AFY = Acre-Feet Per Year
Source: California Water Services – Hermosa Redondo District, UWMP "Table 4-1 and 4-2". Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/8827961564/HR%5F2020%5FUWMP%5FFINAL.pdf

As seen in the table above, the District estimates that from 2020 to 2045 the District's water demands will decrease to 10,564 acre-feet per year (AFY). The decrease in demands is due to the District's accounting for reductions in water use due to the ongoing effects of appliance standards and plumbing codes, the District's conservation, and customer assistance programs. The UWMP is required to be updated in 2025 (with lead agency approval of the UWMP required by June 2026) and will account for the changes in land use associated with the GPU.

LOCAL

Under the proposed land use condition, the GPU will increase the number of residential units by 4,956 DUs and 5,681,999 non-residential square-feet. Based on a review of the available UWMP and other available resources, City specific water demands were requested from Cal Water, but they declined to provide this information. Thus, the City of Los Angeles's Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial Categories were utilized to estimate changes in water demand associated with the changes in land use (See Appendix B). Each of the general plans land uses were aligned to land use types listed on the sewerage facilities sheet and multiplied by 110% to yield a conservative indoor and outdoor water demand. See Table 5 and Appendix B for an estimate of the City's total net change in water demands from existing to proposed land uses.

Table 5 Total Net Change In Water Demands

From Existing To Proposed Land Uses

Net Change of Existing to Proposed Residential Land Uses			Water Use Factor		Water Demand (GPD)		Water Demand (AFY)	
MFR: 2-3	1,404	DUs	144	GPD/DU	202,651	GPD	227	AFY
MFR: 4 or More	742	DUs	144	GPD/DU	107,145	GPD	120	AFY
Institutional	(96)	DUs	77	GPD/DU	(7,392)	GPD	(8)	AFY
Mixed Use Res/Com	2,631	DUs	144	GPD/DU	379,798	GPD	425	AFY
SFR	(602)	DUs	204	GPD/DU	(122,422)	GPD	(137)	AFY
ADU	624	DUs	83	GPD/DU	51,480	GPD	58	AFY
Senior Housing	253	DUs	121	GPD/DU	30,613	GPD	34	AFY
TOTAL	**4,956**	**DUs**		**TOTAL**	**641,872**	**GPD**	**719**	**AFY**
Net Change of Existing to Proposed Non-Residential Land Uses			**Water Use Factor**		**Water Demand (GPD)**		**Water Demand (AFY)**	
Commercial	3,251,895	SF	0.06	GPD/SF	178,854	GPD	200	AFY
Industrial	2,147,114	SF	0.06	GPD/SF	118,091	GPD	132	AFY
Institutional	(148,107)	SF	0.13	GPD/SF	(19,550)	GPD	(22)	AFY
Mixed Use Res/Com	431,558	SF	0.06	GPD/SF	23,736	GPD	27	AFY
Utility	(461)	SF	0.06	GPD/SF	(25)	GPD	(0)	AFY
TOTAL	**5,681,999**	**SF**		**TOTAL**	**301,106**	**GPD**	**337**	**AFY**
TOTAL NET CHANGE IN WATER DEMANDS FROM EXISTING TO PROPOSED LAND USES					**942,978**	**GPD**	**1,056**	**AFY**

(#) = negative value, ADU = Additional Dwelling Unit, AFY = Acre-Feet Per Year, DU = Dwelling Unit, GPD = Gallons Per Day, MFR = Multi-Family Residential, SF = Square-Feet, SFR = Single-Family Residential

Source: City of Los Angeles Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial. Accessed February 2024. Found here: https://engpermitmanual.lacity.org/sites/default/files/documents/Sewage%20Generation%20Factors%20Chart.pdf

As shown above, it is projected that these land use changes will produce an estimated water demand increase of 1,056 AFY (942,978 GPD). See Appendix B and C to review the sewerage generation factors and notes detailing how each of the listed water use factors are calculated.

2.3 WATER SUPPLY

The City is supplied by a mix of local groundwater, imported water, and recycled water through the District and WBMWD. These water resources are described below.

LOCAL GROUNDWATER

The City lies within the Coastal Plain of Los Angeles Groundwater Basin and is within the adjudicated West Coast Groundwater Subbasin ("West Coast Basin" or "Basin")[4]. The West Coast Subbasin is shaped by the Ballona Escarpment, Newport-Inglewood fault, and the Pacific Ocean. Overdraft issues emerged in the 1930s due to the increased pumping linked to population growth and industrialization. Adjudication efforts began in 1945 and lead to the formation of the WBMWD in 1947. The Water Replenishment District of Southern California (WRD), established in 1959, collaborated with the West Coast Basin Water Association to address overdraft and seawater intrusion. In 1965, stakeholders agreed to adjudicate water from the Basin with a limiting Allowable Pumping Allocation (APA) of 80%. The Basin provides approximately 64,468 AF of groundwater annually to the City and several other cities in the region, the City specifically has an APA right to extract 4,070 AFY from the Basin.

IMPORTED WATER

The WBMWD acts as a secondary wholesale water agency and purchases imported water from Metropolitan Water District of Southern California (MWD) and resells it to Cal Water – Hermosa Redondo District. WBMWD's imported water comes from the State Water Project (SWP) and Colorado River via MWD pipelines and aqueducts. The SWP is owned and operated by the California Department of Water Resources (DWR) and MWD transports water stored in the Oroville Dam through the Bay-Delta and California Aqueduct. The Colorado River Aqueduct (CRA) is owned and operated by MWD and transports water from Lake Havasu, at the border of California and Arizona, approximately 242 miles west to its end at Lake Matthews.

RECYCLED WATER

Cal Water relies on WBMWD for recycled water services and is sourced from the Hyperion Wastewater Treatment Plant and undergoes secondary treatment at the Edward C. Little Water Recycling Facility (ELWRF). The ELWRF treats and produces water at varying water quality levels, and uses include seawater intrusion barriers, industrial operations, and landscape irrigation. WBMWD provides around 32,200 AFY to over 200 sites. As of fiscal year (FY) 2020-2021 WBMWD served 224.3 AF of water to nineteen of Cal Water – Hermosa Redondo's customers[5].

See Table 6 for the District's estimated water supply for 2020 and supply projections for 2025 to 2045.

[4] Map of the West Coast Groundwater Basin. Found here: https://dwr.maps.arcgis.com/apps/Styler/index.html?appid=740d10eefd6148579321a3abcd065a36
[5] West Basin Municipal Water District, Water Use Report Fiscal Year 2020-2021. February 2022. Found here: https://www.westbasin.org/wp-content/uploads/2022/02/FY-2020-2021-Water-Use-Report-Final.pdf

Table 6 Projected Water Supply

Water Supply	Existing & Projected Water Supply (AFY)					
	2020	**2025**	**2030**	**2035**	**2040**	**2045**
WBMWD – Purchased or Imported Water	10,450	6,590	6,423	6,415	6,410	6,494
West Coast Subbasin – Groundwater (not desalinated)	495	4,070	4,070	4,070	4,070	4,070
Edward C. Little Water Recycling Facility – Recycled Water	208	193	193	193	193	193
TOTAL	**11,153**	**10,853**	**10,686**	**10,678**	**10,673**	**10,757**

AFY = Acre-Feet Per Year
Source: California Water Services – Hermosa Redondo District, UWMP "Table 6-8 and 6-9". Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/8827961564/HR%5F2020%5FUWMP%5FFINAL.pdf

As seen in the table above, the District estimates that from 2020 to 2045 the District's water supply will decrease from 11,153 AFY to 10,757 AFY. As shown in the table above the District plans to purchase less imported water from WBMWD and rely more on groundwater from the West Coast Subbasin. This trend is a result of the District's plans to maximize the use of its groundwater and recycled water supplies. Additional, imported water resources are available to the District through the WBMWD and the District has historically purchased up to 9,031 AFY and projected purchasing up to 8,527 AFY within its 2015 UWMP[6].

The 2020 UWMP assumed recycle water demand and supply would remain consistent throughout the planning period (2020-2045). Subsequent to the 2020 UWMP, the West Basin Municipal Water District completed a Water Recycled Master Plan (January 2022). The plan identified new opportunities within Redondo Beach for expanding the use of recycled water for an additional demand of 150 AFY for irrigation at schools, parks and medians within the service area. The 2025 UWMP should incorporate the findings from the Water Recycled Master Plan and demonstrate the potential for increased usage of recycled water within the service area.

[6] California Water Services – Hermosa Redondo District, 2015 UWMP. June 2016. Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/9883786857/01%5FHR%5F2015%5FUWMP%5FFINAL.pdf

Figure 2 California Water Services – Hermosa Redondo District Service Area Map

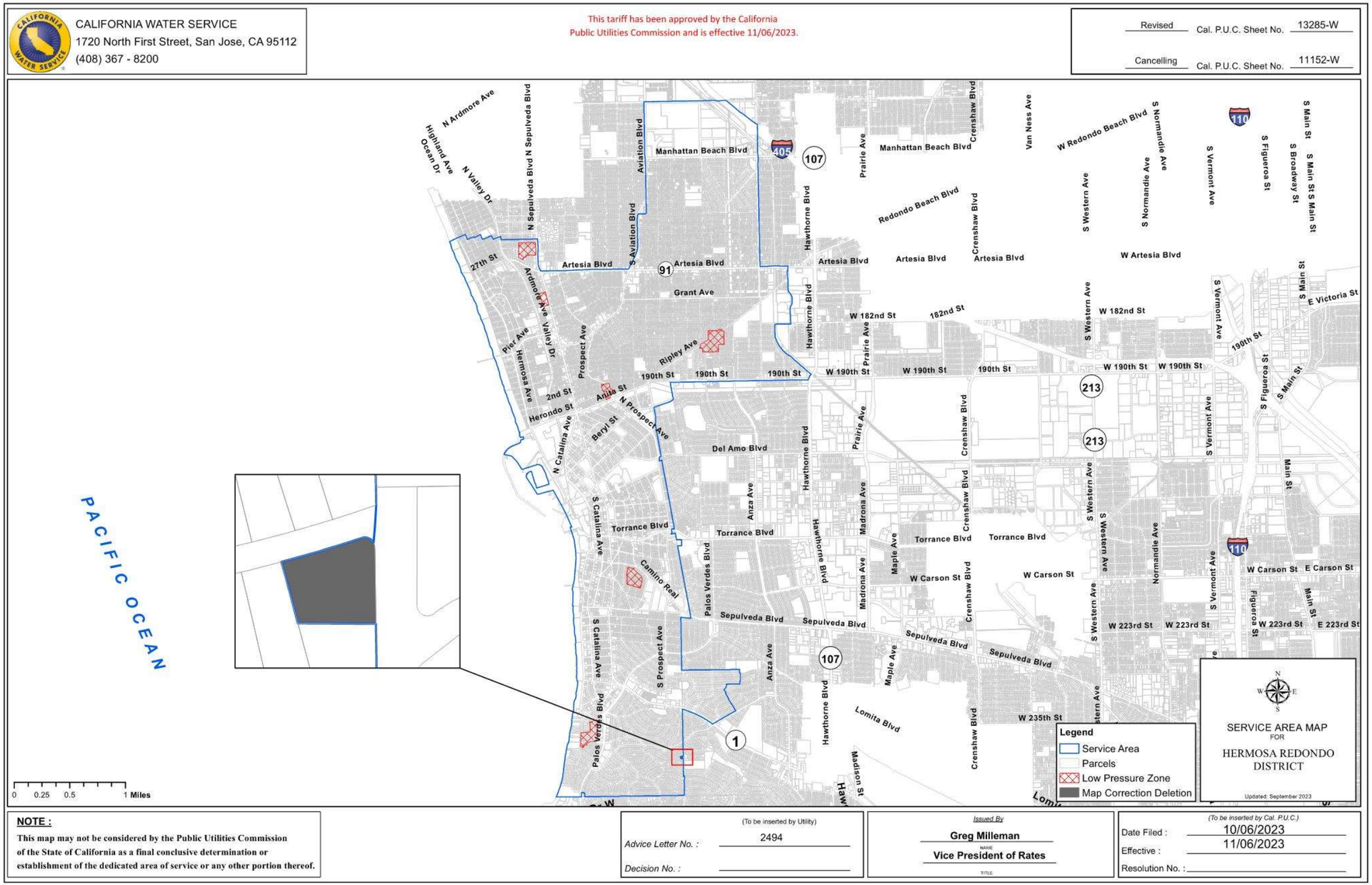
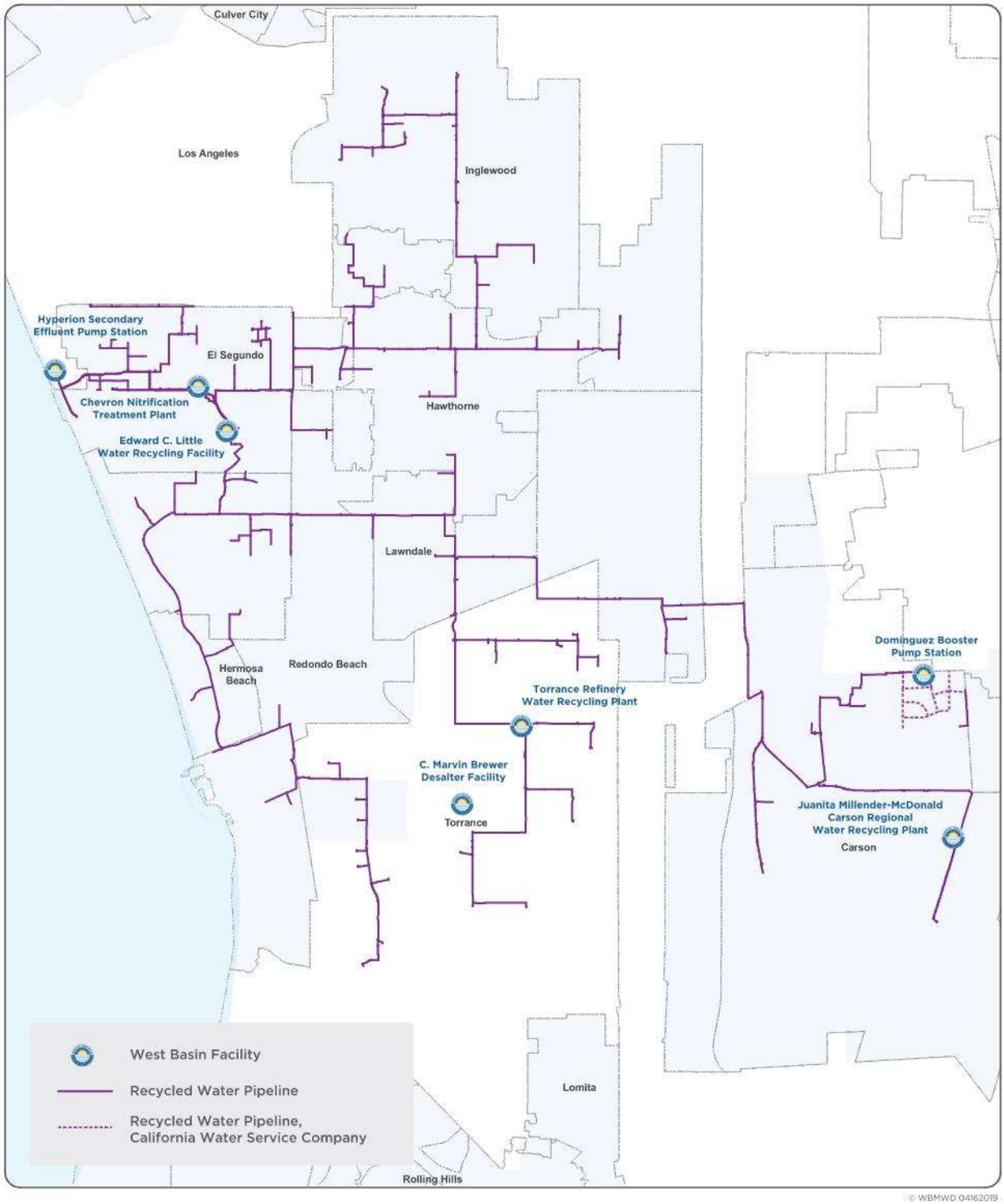


Figure 2.1 City of Redondo Beach Existing Recycled Water System Facilities



Source: West Basin Municipal Water District, Recycled Water Distribution System. Found here: https://www.westbasin.org/wp-content/uploads/2020/07/04-16-19-Recycled-Water-Distribution-System-Map.pdf

2.4 WATER CAPACITY ASSESSMENT

The management of the City's water systems involves multiple entities including Cal Water Hermosa Redondo, WBMWD, and the City's Public Works Department. Although the broader responsibility for the public water system, including capacity assessments and oversight of private water improvements affecting public systems, is Cal Water's responsibility, the collaborative approach between Cal Water, WBMWD and the City ensures that water capacity, maintenance, and development throughout the City are addressed comprehensively.

URBAN WATER MANAGEMENT PLAN (UWMP)

Through the Urban Water Management Plan (UWMP) reporting, Cal Water uses population growth, climate scenarios, water supplies, water conservation, large development projects, and approved specific plans to estimate future water demands and evaluate the ability to meet this demand through various water supply sources over a 20-year projections. The California Water Code requires this document, and it is updated every five years; the latest was prepared in 2020 and planning will begin in 2025 for the 2025 UWMP.

WATER SHORTAGE CONTINGENCY PLAN (WSCP)

Long-range water supply planning, like the WSCP, is essential to ensure the District and its service areas have access to adequate water supplies. Cal Water's 2020 WCSP includes the stages of response to water shortages caused by drought or supply interruptions as a result of infrastructure failure, regulatory mandate, or catastrophic human-caused or natural events. The primary objective of the WSCP is to ensure that the District has in place the necessary resources and management responses needed to protect health and human safety, minimize economic disruption, and preserve environmental and community assets during water supply shortages and interruptions[7].

SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

The SGMA addresses the sustainable management of groundwater in California. This legislation results from water shortages in California, long-term issues with land subsidence, and over drafting of groundwater aquifers. The Department of Water Resources (DWR) identified the status of water basins by overdraft and priority levels (e.g., very low, low, medium, or high). The consistency requirement between the District's UWMP and SGMA is not applicable because the West Coast Subbasin is categorized as very-low priority. Thus, the implementation of a Groundwater Sustainability Plan (GSP) is not required as groundwater storage and extraction in the West Coast Basin is governed by basin adjudication, with excess production restricted to emergencies[8].

[7] California Water Services – Hermosa Redondo District, 2020 Water Shortage Contingency Plan. June 2021. Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/9883786857/01%5FHR%5F2015%5FUWMP%5FFINAL.pdf

[8] U.S. Department of the Interior Bureau of Reclamation Engineering Services Office, Los Angeles Basin Groundwater Adjudication Summary. July 2014. Found here: https://www.usbr.gov/lc/socal/basinstudies/LA%20Adjudication%20Dec%202014.pdf

Cal Water has a total of three wells and 15 surface storage structures located within the service area, which allow the District to pump water into storage during non-peak demand periods. The District has consistently had sufficient capacity to supply all of the current annual average day and maximum day demands. A decrease in groundwater production from 2016 to 2020 was due to the temporary shutdown of wells for rehabilitation. Current rehabilitation efforts are aimed at preparing wells for a blending project that would lower the concentration of Toal Dissolved Solids (TDS) in local water supplies.

2.4.1 WATER CAPITAL IMPROVEMENT PLANS

Cal Water submits an Infrastructure Improvement Plan (IIP) with anticipated capital improvement plans (CIP). This report is produced every three years and is reviewed and subject to approval by an independent state agency and the Office of Ratepayer Advocates. These IIPs outline necessary infrastructure updates throughout the District's service area and ensures that reliable water supply and resources are available for customers. The IIP covering 2022 to 2025 was submitted in July 2021 but was not accessible for review. Additionally, requests for CIPs from Cal Water were unsuccessful.[9].

In addition to Cal Water's IIP, WBMWD also outlines several infrastructure projects within its 2020 UWMP, its 2021 Recycled Water Master Plan, and various other planning programs. WBMWD mainly allocates annual funds for the operations and maintenance of its recycled water distribution system and the C. Marvin Brewer Desalter Facility, which uses reverse osmosis to treat brackish groundwater. They respond to repairs as needed and conduct scheduled maintenance as identified through the program, ensuring compliance with regulations, and addressing evolving water management needs.

Several of the CIPs represented in Cal Water and WBMWDs planning resources are described below in Table 7.

[9] California Water Service, Infrastructure Improvement Plans. Accessed February 2024. Found here: https://www.calwater.com/rates/iip/

Table 7 Water System Capital Improvement Plans

CIP Project Name	Phase/ FY Completion	Project Description
Cal Water – Booster Pump Station Upgrade	Completed FY 20-21	This project replaced a 27-year-old pump and installed a new booster pump capable of transferring 750 gallons of water per minute. The pump ensures that continuous water supply is available for customers.
Cal Water – Redondo Beach Infrastructure Improvement Project	Completed FY 22-23	This project replaced aging water mains and installed more than 2,800 ft (0.53 miles) new 6- and 8-inch pipes. Three new fire hydrants were also installed to improve fire flows.
Cal Water – Redondo Beach Tank Coating Project	Completed FY 22-23	This project recoated the interior and exterior of a storage tank in order to extend the tanks longevity and improve water supply reliability,
West Basin Recycled Water Expansion, Redondo Beach	Phase 2 FY 25-30	This project is estimated to allow the City of Redondo Beach to request an additional 150 AFY of recycled water for irrigation end use at schools, parks, and medians.
West Basin Recycled Water Expansion, Torrance Project	Phase 2 FY 25-30	This project is located in various areas within the WBMWD service area including the City of Redondo Beach. The project aimas to provide 50 potential recycled water customers with up to 870 AFY of recycled water.

Sources

1. California Water Service, Latest News. Accessed February 2024. Found here: https://www.calwater.com/latest-news/2021-0216-booster-pump-station-upgrade-completed-in-redondo-beach/
2. California Water Service, Latest News. Accessed February 2024. Found here: https://www.calwater.com/latest-news/2022-0325-redondo-beach-infrastructure-improvement-project/
3. California Water Service, Latest News. Accessed February 2024. Found here: https://www.calwater.com/latest-news/2022-0819-tank-coating-project-to-start-in-redondo-beach/
4. West Basin Municipal Water District, Recycled Water Master Plan. January 2022. Found here: https://www.westbasin.org/wp-content/uploads/2022/05/West-Basin-Master-Plan_final_rev4.pdf

As shown above Cal Water and the WBMWD are continually exploring water reliability CIPs to secure the Districts infrastructure reliability and future water supply in preparation for short-term and long-term supply emergencies.

2.5 PROPOSED LAND USE AND CEQA THRESHOLD ANALYSIS – WATER SYSTEM

The following question regarding Utilities and Service Systems are identified in the CEQA Checklist related to water.

Would the Project:

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

Should the answer to this prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold. The following impact assessments are based on the significance criteria established earlier in the section.

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

Impact Analysis: Implementation of proposed land uses within the GPU will have the potential for water demands to increase in the range of 0.94 MGD or 1,056 AFY over existing conditions. Implementation of projects consistent with the land use will require the construction of new water infrastructure where existing water lines are not sufficient to accommodate the increased supply demands. These determinations will be made on a project-by-project basis including the Will-Serve process, connection fees, site specific fire flow tests and hydraulic pressure analyses. The Will-Serve process requires the applicant to provide a detailed description of the proposed project including the existing water demands and the proposed water demands. Based on the increased demand, connection fees will be applied to ensure the water agency collects funds to provide the additional demand while maintaining services to existing consumers and set aside reserves for future upgrades where needed. The results of the fire flow and hydraulic pressure analyses determine the on-site and off-site improvements required to ensure proper water delivery and fire flow to the project site while maintaining services to existing clients. Cal Water typically requires a minimum off 20 psi (pounds per square inch) as a lower limit of pressure within the water pipeline during fire suppression operations. This will ensure that firefighters have access to water of sufficient pressure. Additionally, the American Water Works Association recommends a normal static pressure of 60 – 75 psi throughout the water system. A minimum normal operating pressure of 35 – 45 psi is typically permitted for peak-hour flow conditions. Maximum allowable velocities within the pipelines range from 5 – 8 fps (feet per second) for peak-hour scenarios, and 10 – 12 fps for fire suppression operations. This comprehensive process covers both potable water system and recycled water systems.

Proposed improvements may include upsizing water lines on-site and off-site and additions of boosters in low pressure areas.

The construction of the on-site and off-site water lines and associated improvements will primarily include trenching for the pipelines. All construction will be performed in accordance with the Construction General Permit and all associated requirements. Any work that may affect services to the existing water lines will be coordinated with the City and Cal Water including the obtainment of encroachment permits from the City for all improvements within the public right of way. When considering impacts resulting from the installation of any required water infrastructure, all impacts are of a relatively short-term duration and would cease to occur once the installation is complete. Therefore, Project impacts on water associated with construction activities would be less than significant.

3. SEWER

3.1 SEWER SYSTEM ENVIRONMENTAL SETTING & INFRASTRUCTURE

CITY OF REDONDO BEACH

The City owns, operates, and maintains the majority of the sewer collection system within the City boundary. The City's system consists of approximately 113 miles of 8" to 39" sewer lines. The majority of the lines are gravity mains (97%) and force mains (2%), with the remaining consisting of laterals (less than 1%) and siphons (less than 1%). Most of the lines are made from vitrified clay (94%) and reinforced concrete (2%). A majority of the lines are owned and maintained by the City (85%) and remaining lines are owned and maintained by the Los Angeles County Sanitation District, District No. 5 (LACSD) (13%), Los Angeles County (1%), private entities, City of Hermosa Beach, and City of Torrance (less than 1%). Most lines are maintained throughout the year ranging from one to five times annually. Within the City there are also 22 pump stations, 16 are owned and operated by the City and the remaining 6 are owned by LACSD. Other infrastructure includes 22 cleanout structures, with 12 being privately owned and managed, 8 by the City, and the remaining two by Hermosa Beach. The City's Public Works Department is largely responsible for the cleaning and maintenance of the City's sewer collection system and works closely with the Engineering Services and Operations Division to ensure the sewer system is functioning effectively within the City boundary. Cal Water, which serves the City potable water, relies on LACSD and WBMWD for wastewater treatment.

LOS ANGELES COUNTY SANITATION DISTRICT, DISTRICT NO. 5 (LACSD)

Sewer flows from the City ultimately connect to LACSD sewer trunk lines that convey wastewater to LACSDs regional treatment plants. Within the City LACSD owns, operates, and maintains six wastewater pumping plants that serve the local community.

Joint Water Pollution Control Plant (JWPCP) - Wastewater generated by the City and Cal Water's service area is treated at the Joint Water Pollution Control Plant (JWPCP) (now called the A.K. Warren Water Resource Facility) located at 24501 South Figuroa Street in Carson. The JWPCP is located in the City of Carson and has a treatment capacity of 400 million gallons per day (MGD) and currently processes an average flow of 243.1 MGD, which leaves approximately 156.9 MGD in remaining treatment capacity. The JWPCP disinfects treated wastewater with chlorine before releasing it into the Pacific Ocean through outfalls off the Palos Verdes Peninsula[10].

WEST BASIN MUNICIPAL WATER DISTRICT (WBMWD)

Recycled water is provided to the Cal Water – Hermosa Redondo District service area by the WBMWD. The source of the recycled water is treated effluent from the City of Los Angeles' Hyperion Wastewater Treatment Plant (WWTP). The Hyperion WWTP

[10] Los Angeles County Sanitation District, Facilities. Accessed February 2024. Found here: https://www.lacsd.org/services/wastewater-sewage/facilities/ak-warren-water-resource-facility

primarily disposes of treated effluent through ocean outfalls, but around 6% of its treated effluent is direct to the Edward C. Little Water Recycling Facility (ELWRF) owned by WBMWD. See Figure 3 for a map of the City's existing sewer infrastructure.

3.2 SEWER FLOWS

REGIONAL

Sewer flows throughout the Cal Water – Hermosa Redondo District are driven by population and service growth linked to SCAG projections. As discussed in Section 2 of the report on Water, SCAG utilizes a detailed modeling framework covering multiple Southern California counties including Los Angeles County and the City. The population, household size, and employment projections used by the District to forecast service area population and service connections tie back to the SCAG census tract land use and growth projections. See Table 8 for an estimate of the District's indoor sewer generation for 2020.

Table 8 Wastewater Collection 2020

Wastewater Collection Agency	Volume of Wastewater Collected	Wastewater Treatment Agency	Treatment Plant
Los Angeles County Sanitation Districts	8,594 AF	West Basin Municipal Water District	Edward C. Little Water Recycling Facility

Source: California Water Services – Hermosa Redondo District, UWMP "Table 6-2". Found here: https://wuedata.water.ca.gov/public/uwmp_attachments/8827961564/HR%5F2020%5FUWMP%5FFINAL.pdf

As seen in the table above, the District estimated that in 2020 the volume of wastewater collected and treated by the ELWRF was 8,594 AF. This estimated volume was generated by annualizing 90 percent of January water use in Cal Water's service area.

LOCAL

Under the proposed land use condition, the GPU will increase the number of residential units by 4,956 DUs and 5,681,999 non-residential square-feet. Based on a review of the available resources, City specific sewer generation factors were not available. Thus, the City of Los Angeles's Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial Categories were utilized. Each of the general plan's land uses were aligned to land use types listed on the sewerage facilities sheet. See Table 9 and Appendix D for an estimate of the City's total net change in sewer flows from existing to proposed land uses.

Table 9 Total Net Change In Sewer Flows

From Existing To Proposed Land Uses

Net Change of Existing to Proposed Residential Land Uses			Sewer Use Factor		Sewer Flows (GPD)		Sewer Flows (AFY)	
MFR: 2-3	1,404	DUs	131	GPD/DU	184,228	GPD	206	AFY
MFR: 4 or More	742	DUs	131	GPD/DU	97,404	GPD	109	AFY
Institutional	(96)	DUs	70	GPD/DU	(6,720)	GPD	(8)	AFY
Mixed Use Res/Com	2,631	DUs	131	GPD/DU	345,271	GPD	387	AFY
SFR	(602)	DUs	185	GPD/DU	(111,293)	GPD	(125)	AFY
ADU	624	DUs	75	GPD/DU	46,800	GPD	52	AFY
Senior Housing	253	DUs	110	GPD/DU	27,830	GPD	31	AFY
TOTAL	**4,956**	**DUs**	**TOTAL**		**583,520**	**GPD**	**654**	**AFY**
Net Change of Existing to Proposed Non-Residential Land Uses			**Sewer Use Factor**		**Sewer Flows (GPD)**		**Sewer Flows (AFY)**	
Commercial	3,251,895	SF	0.05	GPD/SF	162,595	GPD	182	AFY
Industrial	2,147,114	SF	0.05	GPD/SF	107,356	GPD	120	AFY
Institutional	(148,107)	SF	0.12	GPD/SF	(17,773)	GPD	(20)	AFY
Mixed Use Res/Com	431,558	SF	0.05	GPD/SF	21,578	GPD	24	AFY
Utility	(461)	SF	0.05	GPD/SF	(23)	GPD	(0)	AFY
TOTAL	**5,681,999**	**SF**	**TOTAL**		**273,732**	**GPD**	**307**	**AFY**
TOTAL NET CHANGE IN SEWER FLOWS FROM EXISTING TO PROPOSED LAND USES					**857,253**	**GPD**	**960**	**AFY**

(#) = negative value, ADU = Additional Dwelling Unit, AFY = Acre-Feet Per Year, DU = Dwelling Unit, GPD = Gallons Per Day, MFR = Multi-Family Residential, SF = Square-Feet, SFR = Single-Family Residential

Source: City of Los Angeles Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial. Accessed February 2024. Found here: https://engpermitmanual.lacity.org/sites/default/files/documents/Sewage%20Generation%20Factors%20Chart.pdf

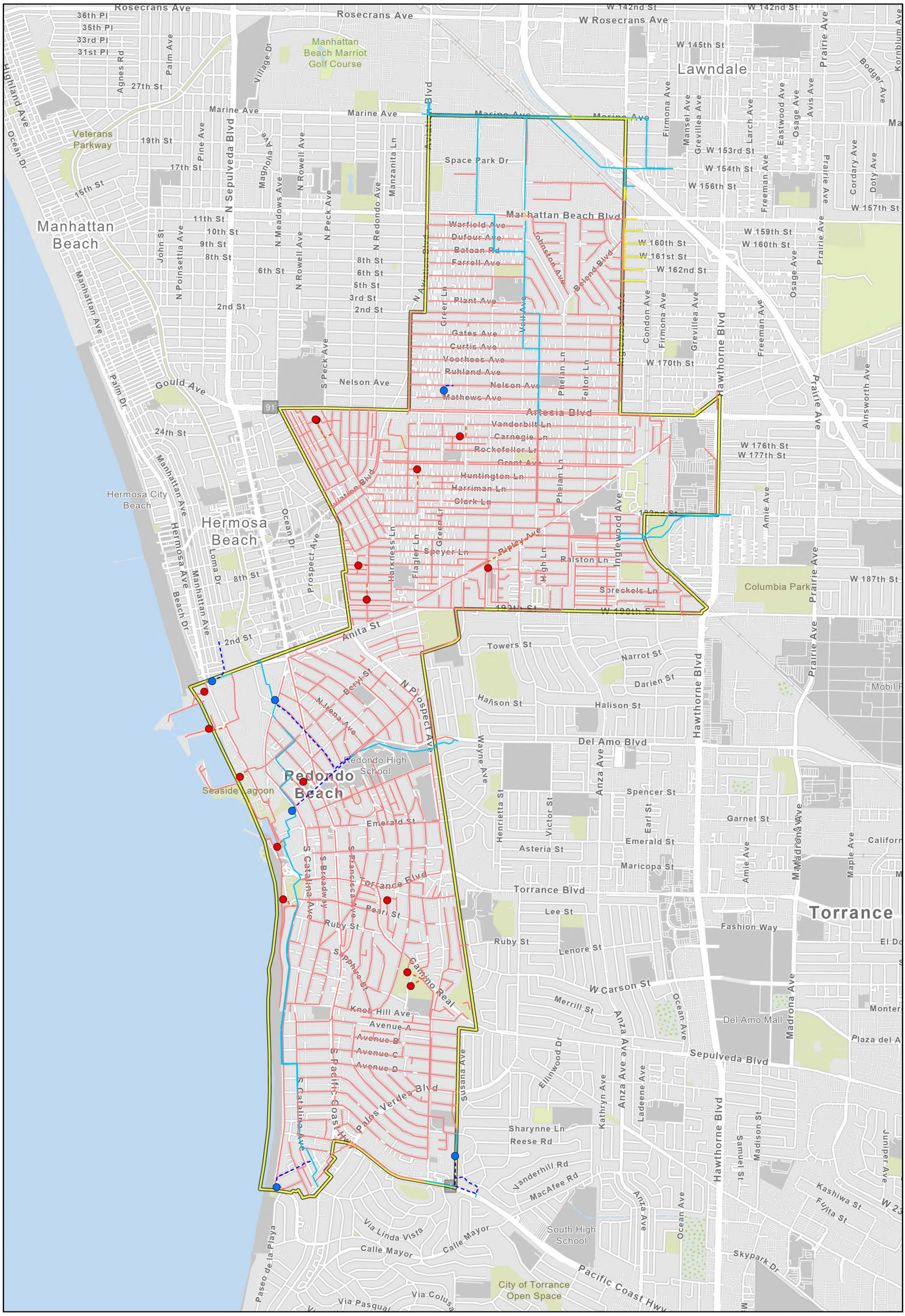
As shown above, it is projected that these land use changes will produce an estimated additional 960 AFY (857,253 GPD)or approximately 0.86 MGD of sewer flows. As there are only several general land use categories and associated unit flow factors from the City of Los Angeles's Sewerage Facilities Charge, it is anticipated that the estimates of net change in sewer flow are conservative. For example, an average of factors for residential "apartments, condos, and duplex/townhouses" was used to generate the sewer flow factor of 131 GPD/DU. Although unit types may vary the sewer flow factor of 131 GPD/DU was applied to all the proposed MFR and Mixed-Use Residential land uses.

Fuscoe Engineering, Inc.

See Appendix B and D to review the sewerage generation factors and notes detailing how each of the listed sewer use factors are calculated.

It's also important to note the projected increase in sewer flows are lower than estimates provided by LACSD in their formal comment letter associated with the Notice of Preparation (NOP) (See Appendix E). LACSD estimated that the City's GPU would generate up to 2.8 MGD, which is considered a conservative estimate.. Table 9 takes into account a more detailed land use breakdown and also assumes lower sewer generation rates due to more recent trends in water use. Water demand rates have dropped significantly over the past decade due to drought requirements, improvements in water efficiency for new construction and recognition that higher density residential tends to utilize less water per unit than other residential types. In general, local water providers have made significant strides to analyze and provide more current water demands influenced by these factors while sewer flow projections have remained conservative. In addition to conservation trends, legislation has also resulted in lower water demands which in turn results in lower sewer demands. Senate Bill No. 1157 is a good example which requires the standard for indoor water usage to be no more than 55 gallons per capita per day (gpcd) currently and reduces to 47 gpcd in 2025[11]. Based on these trends, it's not unusual to observe agencies produce water demand estimates that are lower than the sewer flow projections for the same project. Therefore, the City of Los Angeles's sewer generation rates were utilized as they are more reflective of current water and sewer demands.

[11] Senate Bill No.1157, 2022 Hertzberg. Urban water use objectives. Found here: https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB1157



City of Redondo Beach Existing Sewer System Facilities

Figure 3

Redondo Beach, Ca

2/2/2024

Pump Stations
- Redondo Beach
- LACSD
- City Boundary

Main Lines
- In Service Siphon Or Suction (LACSD)
- In Service Force Main (Redondo Beach)
- In Service Force Main (LACSD)
- In Service Gravity (LA County DPW)
- In Service Gravity (LACSD)
- In Service Gravity (Redondo Beach)

N

1 inch = 2,400 feet

0 — 2,400 — 4,800 Feet

X:\Projects\511\26\mxd\2024_GPUfigures\3_Sewer.aprx

3.3 SEWER CAPACITY ASSESSMENT

CITY OF REDONDO BEACH SEWER SYSTEM MANAGEMENT PLAN

The City maintains the local sanitary sewer system and is committed to protecting the public's health and the environment. Federal and State Water Quality regulations require agencies to maintain a comprehensive Sewer System Management Plan (SSMP) with the goal of preventing Sanitary Sewer Overflows (SSOs). In order to provide a statewide regulatory approach to address SSOs, the California State Water Resources Control Board adopted Statewide General Waste Discharge Requirements for sanitary sewer systems (Order No. 2006-0003- DWQ) in 2006. In 2008, the Monitoring and Reporting Program portion of the WDRs was revised as Order No. 2008-0002-EXEC. These two Water Quality Orders are referred to as the Sanitary Sewer System Waste Discharge Requirements (SSS WDRs). Provision 14 of Order 2006-003-DWQ requires the SSMP to updated every five years and shall include any significant program changes. Recertification by the City Council is required when significant updates to the SSMP are made.

The City's Sewer System Management Plan (SSMP) was originally developed in 2009 and approved by the City Council in 2010. The purpose of the SSMP was to provide a plan and schedule that would enable the City to properly manage and maintain all parts of the city's sanitary sewer system. The expectation was that with proper planning and management of the city's sewer infrastructure, the city would be able to protect the health, safety, and welfare of the public, property, and the environment.

By implementing the recommendations and recertifications of the City's SSMP, the City has endeavored to accomplish the goals of preventing sewer system overflows (SFO's) by performing systematic and timely condition evaluation of the sewer mains to ensure a high level of system serviceability. Where needed, the city has identified deficiencies and performed sewer repairs and replacements to the greatest degree possible. These improvements include upgrades and replacements to sewer mains, along with upgrades to and maintenance of pump station systems.

The SSMP certifications have also provided for implementation of an effective sewer mainline cleaning/flushing program to ensure that the full capacity of the collection system is sufficiently maintained. Timely repairs and replacements of sewer collection systems as identified by system evaluations have been performed over the years.

The sewer improvements that have been performed include implementing and maintaining the pump station Supervisory Control and Data Acquisition (SCADA) system to ensure timely response to pump station failures so that an SSO does not occur, and to provide system operational data to make timely and appropriate decisions on equipment repairs and replacements.

Sufficient emergency electric power generation shall be provided to ensure no pump station will cause a sewer system overflow due to the loss of electrical power from the service provider.

The SSMP certifications require that a routine pump station system maintenance plan be implemented to ensure that the system does not fail to operate due to foreseeable mechanical, electrical, and control equipment malfunction. Systematic and timely

evaluations of pump station systems (condition and capacity) have been performed to ensure a high level of system serviceability is maintained at all times.

The City has been authorized to conduct timely capacity evaluations of the entire wastewater collection system to ensure adequate dry weather flow capacity is provided for customer service demands, and surplus capacity is provided for inflow and infiltration during wet weather, while cost effectively minimizing the sources of inflow and infiltration, where possible.

The SSMP certifications include requiring the city to provide all necessary training of personnel to ensure they have the skills and knowledge to operate and maintain the system to the highest standards.

The SSMP certifications include implementing the fats, oils, and grease (FOG) control program to minimize the entry of these substances into the collection system.

The City hopes to maintain the necessary level of funding and staffing required to provide proper operation, maintenance, and repair of the system as detailed in the Operation and Maintenance Program; and providing adequate capacity as detailed in the System Evaluation and Capacity Assurance Plan through periodic reviews of the rate structure.

The City is working on developing strategies to better monitor the status of the sewer flows. The city has prepared plans to install “smart manhole cover” devices to monitor the sewer system’s operation and provide a real time warning and notification of any upsets, thereby preventing potential overflows. Additionally, to minimize the impact of any sewer system overflows (SSO’s) that may occur the city has been authorized to prepare an Overflow Emergency Response Plan, training staff in its implementation, and implementing the plan when needed.

In 2015, the City conducted an audit of its sewer program. The effectiveness of the SSMP was evaluated by individually addressing the elements listed in Provision 13 of the Order 2006-0003-DWQ. The audit reviewed elements of the SSMP, specifically, the requirements of Order 2006-0003- DWQ, implementation of SSMP requirements, and made recommendations for updating or improving the existing SSMP. All recommendations for improving the SSMP were implemented and incorporated into the City’s SSMP. Table 10 below includes a list of the programs that were included in the 2015 audit.

Table 10 City of Redondo's 2015 Audit Programs

Date	Program
May 2009	Sewer Overflow Emergency Response Plan
September 2009	Sewer System Management Plan
December 2010	System Evaluation And Capacity Assurance Plan And Rehabilitation And Replacement Program,
February 2011	Operation And Maintenance Program
May 2011	Wastewater System SSMP Audit
May 2015	Conveyance System Condition Assessment Report
October 2020	Redondo Beach Municipal Code, Title 5 Sanitation & Health, Chapter 4 Wastewater System
May 2015	Sewer Maintenance Files From The Water Program (Maintenance Management System)
May 2015	GIS Files
May 2015	Sewer Hydraulic Model
May 2015	Sanitary Sewer Overflow Reports
May 2015	Training Records
December 2015	Sewer System Management Plan

Source: City of Redondo, Sewer System Management Plan Certification. July 2022. Found here: https://redondo.legistar.com/LegislationDetail.aspx?ID=5743067&GUID=29440866-AFE9-44AE-B1CA-B8138812375D&Options=&Search=

The City's SSMP was re-approved on 8/2/2022 by City Council, as reflected in the City's Administrative Report. The report confirmed that the City had made significant improvements in the management of the sanitary sewer system since original adoption and implementation of the SSMP in 2010, as reflected in the reduced number of SSOs to only a single incident during the previous 5 years. The City's SSMP was recertified as a result, with direction of City staff to continue to implement the recommended actions included in the plan.

In the 2022 Administrative Report, the City Council re-certified the SSMP and directed staff to continue implementing the requirements outlined in the updated SSMP. Near-term anticipated work at that time included constructing significant upgrades to the Portofino and Yacht Club Way lift stations, continuation of the pipe lining program, and a city-wide video inspection of the system to assess further rehabilitation needs.

The 2022 Administrative Report stated that the SSMP would be coordinated by the City's Public Works Department. Further, the report added that there would be no fiscal impact associated with the action, and that improvements to and operation of the City sewer system would be funded by residential property fees that accrue to the City's Wastewater Fund.

3.3.1 SEWER CAPITAL IMPROVEMENTS PLANS

CITY OF REDONDO BEACH CAPITAL IMPROVEMENT PROGRAM

The City has made significant improvements to its SSMP since the original plan was approved by City Council in 2010. These improvements have contributed to significantly reducing the annual number of sanitary sewer overflows over the years. The City has invested staffing and financial resources over the last decade on the sewer system and focused improvements on areas of concerns. Following are discussions of some of the most important improvements over the years.

The City's 2022 Sewer Pump Out Station Upgrade Project & Harbor Patrol Dock Replacement Project provided a needed rehabilitation of the City's Harbor Patrol dock and rebuild and expand the City's vessel sewage pump-out facilities. The Harbor Patrol facilities are located at the most southern tip of Mole B in the Redondo Beach King Harbor area. The facility consists of the Fire Station No. 3 building and parking lot area on the landside, waterside facilities including the Harbor Patrol floating docks, public vessel sewage pump-out facility, and the administrative observation tower. The Project was awarded in December 2021 and it's currently under construction.

In 2010, the City implemented two important programs. First, the City implemented an ongoing sewer system piping root control system. Second, that same year, the City installed a sewer manhole and pump station monitoring alarm system, which installed an additional 16 water level depth-sensing sensors in critical sanitary sewer manholes and pump stations in high priority locations throughout the city. These sensors provide 24/7 monitoring and provide early warning if water levels rise above normal operational depths. This advance warning increases the likelihood maintenance staff will be able to correct the problem before a Sanitary Sewer Overflow (SSO) occurs.

Also in 2010, the City implemented it's SCADA assessment system, to understand existing field conditions, design issues, and City's needs. The result was an established emergency services response team with 24-hour 7-day a week dispatching of service technicians. SCADA system repairs and upgrades are continuing to be evaluated and upgraded, as necessary.

In 2011, the city performed construction of the Sanitary Sewer Facility Rehabilitation Project Phase 9-A, this project included replacement of over 1,000 feet of sewer mains throughout the City, along with various other sewer upgrades. Several of the new mains were designed to be larger than the previous mains to accommodate current and future sewer flows. Additionally, the project included repairs at the Carnegie and Goodman Pump Stations.

In 2012 the City performed improvements to the Yacht Club Way Lift Station. These improvements included replacement of pump control panel interiors, along with installation of new programming for communication with the City's wastewater SCADA system.

In 2013, the city constructed Sanitary Sewer Facility Rehabilitation Project Phase 10, Job No. 50150. This project included the repair and/or replacement of 7,000 lineal feet of sewer mains citywide. Several of the new mains were designed to be larger than previous mains in order to increase existing sewer system capacity and accommodate increasing current and future sewer flows.

In 2014, improvements were made to the Portofino Way Lift Station, including replacement of PLC and pump control panels, along with installation of new programming for the City's wastewater SCADA system.

In 2015, the City's programs included implementation of a Fats, Oils, and Grease and National Pollutant Discharge Elimination system, along with upgrading of the SCADA communications system.

To comply with the Los Angeles County Sanitation District's Permit and Policy on Rainwater and other Water Discharges, the City performed significant drainage upgrades at the City's Public Works Maintenance Yard in 2015. This project brought the site into compliance by limiting the amount of runoff that discharges into the sanitary sewer system during rain events through an automatic diversion system. The system uses a rain gage at the site to activate an automatic diversion of flow from the sanitary sewer into the storm drain system. The diversion system limits the rainfall discharge to only the first 0.01 inch of rainfall.

In 2017, the City constructed the Sanitary Sewer Facilities Rehabilitation Project. This project included the repair, replacement, and/or upgrade of over 6,232 lineal feet of sewer mains citywide, and construction of a new 8" sewer main along Camino Real west of Juanita Avenue. Several of the replacement mains were upsized in order to increase the existing sewer system capacity and accommodate increasing current and projected future sewer flows.

Another 2017 project included the Rindge Sanitary Sewer Pump Station Project. This pump station is the City's largest sanitary sewer pumping plant. It serves a net tributary of 224 acres with an estimated peak dry-weather flow rate of 540 gallons per minute and a peak wet weather flow rate of 775 gallons per minute. The project included replacing the existing sewer lift station within the existing facility's site footprint. The new facility construction consists of a new pump station with a new electrical building and an emergency generator enclosure, complete with all architectural, structural, mechanical, HVAC, plumbing, and electrical elements. The Project awarded in December 2017 and completed in June 2020.

In 2018 new VFD's and controls at Flagler Lift Station were installed, along with other improvements. These improvements included backup floats in the wet well, and modified PLC programming for new components to communicate with the City's wastewater SCADA System. A new exhaust fan in the pump vault was installed, to provide proper ventilation for City personnel.

In 2019, a citywide CIPP sewer lining program was established. The City Council approved a service contract with Sancon for a 5-year on-call maintenance and repair service to the wastewater underground piping networks through a trenchless technology called Cured-In-Place Pipe (CIPP) to minimize cost and disruption to the community. Phase 1 in 2019 included approximately 1830 LF for sewer lining, and Phase 2 in 2020 included about 600 LF. Phase 3 included approximately 6,700 sewer linings along the easement areas and was completed by the end of 2022.

In 2020, the city approved a series of sanitary sewer upgrades to PCH/Vista Del Mar Project, Job No. 50150. This project was designed to divert and relieve the existing sewer system by diverting sewer flow from the Avenue I sewer shed to a new 12-inch sewer line. The project improvements included the installation of 550 LF of new conveyance

pipe and five (5) new manhole structures. The new pipe segment was constructed southeast of the intersection of PCH and Palos Verdes Boulevard, crossing PCH, and connecting to the existing sewer system on Vista Del Mar. The Project was awarded in August 2020 and was completed in August 2021.

Several projects were performed to the city's sewer system in 2021, including SCADA upgrades, along with two pump stations, as described in the following paragraphs.

In 2021, the City upgraded all wastewater SCADA cellular modems. To keep the wastewater cellular communications up to date with the latest technology, the City replaced the aging Sierra Wireless cellular modems to a new Cradlepoint model. This new modem allows for remote configuration and diagnostics, which is the same model as police and fire use to standardize the City's communications to remote facilities.

Also in 2021, the City's Alta Vista Sewer Pump Station Project was developed to replace two small existing pump stations with one larger station with an emergency stand-by generator. The new pump station will replace the existing Alta Vista Ball Park Pump Station and Alta Vista Park Community Center Pump Station, both located near high activity areas in Alta Vista Park. The new pump station would be constructed within Alta Vista Park north of the Community Center parking lot in the hillside adjacent to Camino Real. Replacement of these older and less efficient stations with one designed to meet all current safety and building codes for the protection and preservation of life and property is considered an important part of maintaining the City's sanitary sewer system as recommended in the City's Sewer System Master Plan. The Project was awarded in November 2021 and its currently under construction.

Basin 2 Sewer Pump Out Station Upgrade Project & Harbor Patrol Dock Replacement Project is another 2021 development and is a combined project that will provide a needed rehabilitation of the City's Harbor Patrol dock and rebuild and expand the City's vessel sewage pump-out facilities. The Harbor Patrol facilities are located at the most southern tip of Mole B in the Redondo Beach King Harbor area. The facility consists of the Fire Station No. 3 building and parking lot area on the landside, waterside facilities including the Harbor Patrol floating docks, public vessel sewage pump-out facility, and the administrative observation tower. The Project was awarded in December 2021 and it's currently under construction.

In 2022, the City-approved upgrades included lift stations throughout the city, along with installation of added programming for communication with the City's wastewater SCADA system. The lift station upgrades include Goodman Lift Station, Marina Way Lift Station, and the Carnegie Lane Lift Station.

LACSD CAPITAL IMPROVEMENT PROGRAM

Los Angeles County Sanitation District's (LACSD) has an active Capital Improvement Program to ensure the addition and repair of sewer infrastructure and facilities as needed[12]. In addition to the Capital Improvement Program, LACSD also tracks the peak

[12] Los Angeles County Sanitation District, Construction Projects. Accessed February 2024. Found here: https://www.lacsd.org/services/wastewater-sewage/construction-updates

flows from sewer trunks and facilities in its service area and determined that presently there are no deficiencies in the Districts' facilities that serve the City of Redondo Beach.[13] Within the Flow Clearance Diagrams that LACSD provided the most recent data demonstrates that peak flows throughout the City are well below the design capacity of the LACSD trunk lines indicating that there is sufficient capacity for growth.

Refer to Table 11 below for a description of sewer system CIPs occurring throughout the City.

[13] Los Angeles County Sanitation District, Patricia Horsley. "City of Redondo Existing Peak Flows Inquiry." Email to Fuscoe Engineering, 20 December 2023.

Table 11 Sewer System Capital Improvement Plans

CIP Project Name	Phase / FY Completion	Project Description
LACSD - El Nido Trunk Sewer Rehabilitation	Construction Ongoing	The project will rehabilitate approximately 12,228 feet of existing corroded 12-inch through 21-inch diameter non-reinforced concrete pipe (NRCP) with cured-in-place pipe liner and approximately 46 manholes with a protective coating system on the El Nido Trunk Sewer. The project location consists of the Cities of Redondo Beach and Torrance.
Basin 2 Marine Vessel Sewer Pump Out Station	Construction Ongoing	Replacing deficient and damaged pump house, discharge and suction pipes, valves, controls, electronics, mechanical components, and related dock system for the two existing vessel pump-outs.
Portofino Way Sewer Pump Station	Construction Ongoing FY 23-24	Replace deficient and damaged pump house, discharge and suction pipes, valves, wet and dry wells, controls, electronics, and mechanical components.
City-wide Sanitary Sewer SCADA Installation	Construction Ongoing	Repairing and upgrading the citywide SCADA hardware and software components as well as upgrade existing deficient pump station equipment and communications networks, which will reduce and prevent the risk of sanitary sewage overflows.
Sanitary Sewers Facilities Rehabilitation	Construction Ongoing	Maintaining and improving the City's sewer infrastructure to meet existing and future sewer demands.
Yacht Club Way Sewer Pump Station	Construction Ongoing FY 23-24	Replace deficient and damaged pump house, discharge and suction pipes, valves, wet and dry wells, controls, electronics, and mechanical components.
Morgan Sewer Pump Station	Design/ Construction FY 24-25	Replace deficient and damaged pump house, discharge and suction pipes, valves, wet and dry wells, controls, electronics, and mechanical components.
City-Wide Sanitary Sewer System Camera Inspection	Design FY 24-25	Maintain and improve the City's sewer infrastructure to meet existing and future sewer demands.

Sources
1. Los Angeles County Sanitation District, RFP Posts List. Accessed February 2024. Found here: https://www.lacsd.org/Home/Components/RFP/RFP/263/
2. City of Redondo Beach, Public Works – Engineering Division, Capital Improvement Program. Accessed February 2024. Found here: https://redondobeachgis.maps.arcgis.com/apps/dashboards/6c1a620190d040168eff642e4aa47789

As shown above the City and the LACSD continually explore sewer reliability CIPs in preparation for increased sewer generation and flows.

LOCAL SEWER SYSTEMS

According to discussions with City staff, a significant number of land use changes have occurred in the past twenty years, including converting low-density residential into higher density multi-family developments and a significant number of single family

residential have taken advantage of lot splits and the addition of accessory dwelling units (ADUs), especially in the northern portion of the city. The redevelopment pattern has progressed significantly since the early 2000's, while the evaluation and associated potential upgrades to the City's sewer infrastructure improvements to accommodate the increased sewer flows has not kept up as quickly, especially in the northern area of the City. Therefore, it is imperative the City obtain current sewer flow conditions to assist with capacity evaluations. All development or redevelopment projects resulting in changes to existing sewer flows will be required to perform sewer flow monitoring tests at specific manholes approved by the Public Works Department to confirm existing flow depths. The flow monitoring data will help determine potential impacts to the local sewer system serving the project. The developer or applicant will be responsible for any sewer upgrades needed to support the project while maintaining the sewer capacity for existing customers.

In addition to obtaining more accurate sewer flow monitoring data, it is recommended the City prepare a Sewer Master Plan (SMP) to accurately analyze the existing sewer conditions, capacity and integrity of the system and evaluate sewer requirements to support the full buildout of the proposed GPU land use changes. The SMP would also prioritize upgrades based on levels of various deficiencies in the system.

The SMP should also include an updated sewer rate study to adequately assign "fair-share fees to project applicants to support the future sewer upgrades." Future development that results in a net increase in wastewater flows to the various reaches of the sewer systems could be charged a percentage of the sewer improvement costs, based on the applicable portion of the flows that the new development would contribute. An updated sewer rate study would allow the City to collect adequate fees to maintain existing service and plan accordingly for future regional improvements.

3.4 PROPOSED CONDITION AND CEQA THRESHOLD ANALYSIS

The following questions regarding Utilities and Service Systems are identified in the CEQA Checklist related to sewer.

Would the Project:

A. Require or result in the relocation or construction of new or enhanced water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?
B. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Should the answers to these environmental factors prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold.

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

Impact Analysis: Implementation of proposed land uses within the City's GPU will require construction of new sewer infrastructure where existing sewer lines are not sufficient to accommodate the increased demand. These determinations will be made on a project-by-project basis including site specific sewer flow monitoring and hydraulic sewer analysis. Although the City's Sewer System Master Plan (SSMP) does not include criteria for determination of hydraulic capacity, typical criteria include D/d (flow depth over diameter ratio) of not greater than 50 – 75 percent. The CIP process, mentioned previously in this document includes city-constructed upgrades to sewer pipelines based on flow depth assumptions. The City is considering implementing an impact fee assessment program to assist with funding for sewer main improvement projects that are driven by the additional wastewater generated by proposed development. As part of this program, the developer would fund flow monitoring of existing downstream sewer manholes to determine existing D/d for the sewer system and prepare a sewer capacity analysis to determine impacts the proposed development would have on the existing sewer system. If upgrades were deemed necessary due to the proposed development, then the developer would provide "fair-share" funding of proposed sewer main improvements.

As part of the GPU, it is recommended that the City budget for a Sewer Master Plan to help prioritize future sewer upgrades to support the GPU land uses and develop a fair-share study (i.e. sewer rate study) to collect fees for the future sewer improvements.

The construction of the on-site and off-site sewer lines and associated improvements will primarily include trenching for the pipelines. All construction will be performed in accordance with the Construction General Permit and all associated requirements. Any work that may affect services to the existing sewer lines will be coordinated with the City and LACSD shall review all future developments within the city to determine whether or not sufficient trunk sewer capacity exists to serve each development, and if the LACSD's facilities would be impacted by the development. This review is accomplished through the LACSD's Will-Serve Program. Important information gleaned from the LACSD's review will be presented in the form of the Will-Serve letter. The Will-Serve letter includes information regarding the anticipated wastewater flows that would be generated by the proposed development, along with a statement of whether the LACSD's trunk sewer system would have capacity to accept the flows. For this project, the LACSD's Will-Serve letter states that there are not any know deficiencies within the LACSD's trunk sewer system that serve the City.

Furthermore, a Construction Management Plan or equivalent, which would ensure safe pedestrian access as well as emergency vehicle access and safe vehicle travel in general, will be implemented to reduce any temporary pedestrian and traffic impacts occurring as a result of construction activities. Moreover, when considering impacts resulting from the installation of any required wastewater infrastructure, all impacts are of a relatively short-term duration and would cease to occur once the installation is complete. Therefore, Project impacts on wastewater associated with construction activities would be less than significant.

Impact B: Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Impact Analysis: The proposed land uses within the GPU are expected to increase sewer flows by approximately 0.86 MGD, which is well within the JWPCPs remaining treatment capacity of 156.9 MGD. As development occurs sewer flow increases will be evaluated alongside JWPCPs other service areas.

4. Storm Drainage and Water Quality

4.1 STORM DRAINAGE ENVIRONMENTAL SETTING & INFRASTRUCTURE

4.1.1 EXISTING DRAINAGE FACILITIES

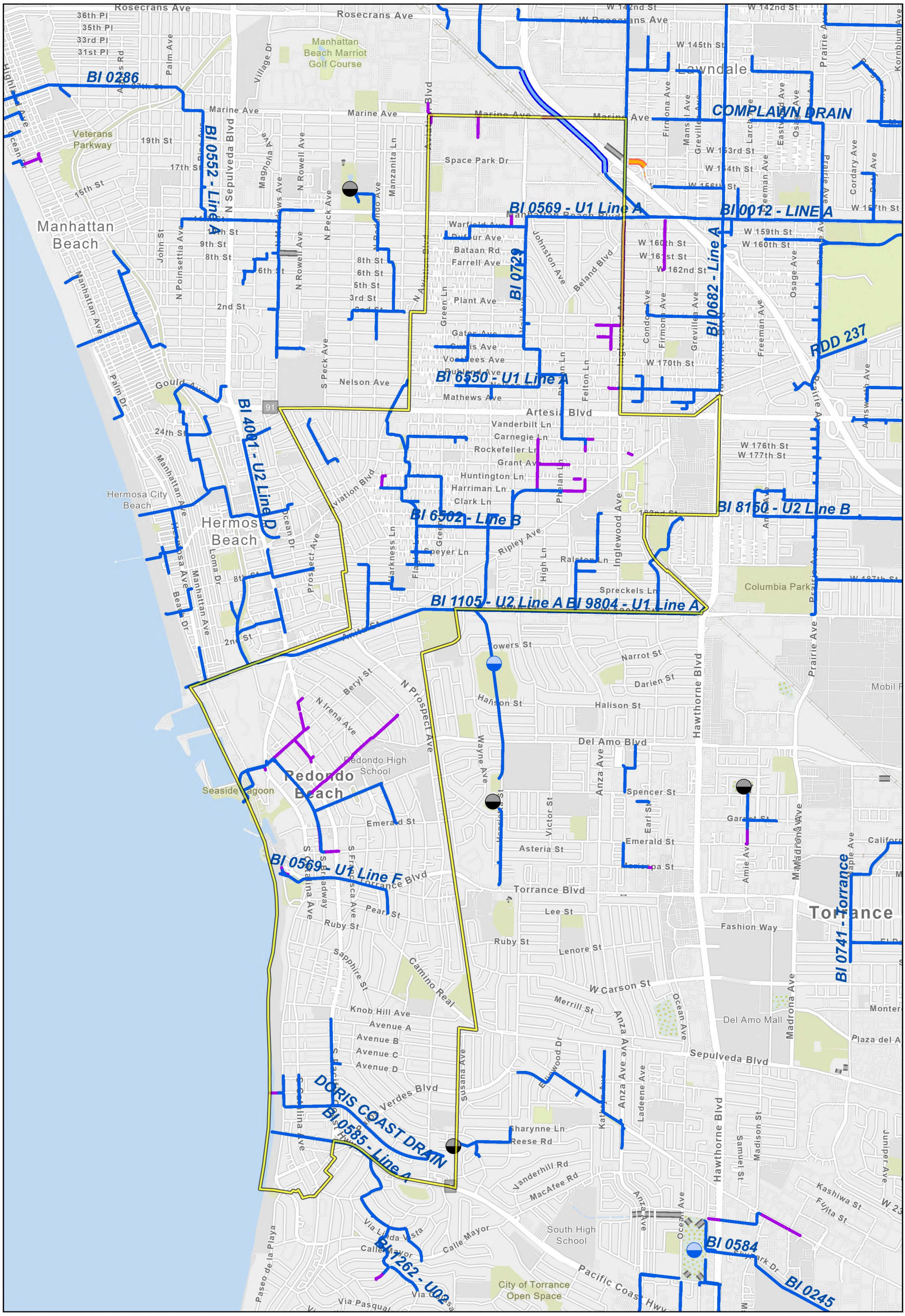
The facilities and infrastructure throughout and connecting to the City are managed and operated by the City of Redondo Beach Public Works Department and the County of Los Angeles Department of Public Works Flood Control District (LACFCD). Within the City the City's Public works Department is responsible for maintaining, approximately 185,756 feet (35 miles) of storm drains, 784 catch basins (472 with Connector Pipe Screens), eight controlled debris collection systems units (CDS), 15 dry wells, 3 stormwater pump stations, and 2 stormwater diversion system units. Approximately 25% of the storm drainage system is owned, operated, and maintained by the City of Redondo Beach Public Works Department; the remaining 75 percent is owned, operated, and maintained by LACFCD[14]. Although LACFCD owns and maintains infrastructure within the City's watersheds, it is not responsible for land uses within the City. LACFCD and the City have a detailed GIS-based inventory of drainage facilities, including storm drain pipes, catch basins, for public and private properties. See Figure 4 below for the existing storm drain system throughout the City.

4.1.2 WATERSHED SETTING

The City resides within the Beach Cities Watershed Management Group (WMG), which includes the watershed management areas (WMA) for the Santa Monica Bay (SMB), Dominguez Channel (DC), and Machado Lake (ML) Watersheds. The DC Watershed encompasses the north portion of the City (1,251.8 acres) bordering Lawndale and Torrance. The SMB Watershed includes most of the southeastern part of the City (2,592.3 acres), with a small section falling within the ML Watershed. Stormwater and excess water follow three routes out of the City via the Dominguez Channel, drainage outfalls, and sump pumps. Stormwater from the north and northeast portions of Redondo Beach is carried out of the City to the east and drains into the Dominguez Channel, a major regional drainage facility. From the southern part of the City, stormwater is directed into the Pacific Ocean through thirteen different drainage outfalls along the southwestern shoreline. Water collected in each of the five sumps is pumped backed into the system and drained through one of the ocean drainage outfall pipes[15]. See Figure 5 below for a map of the watersheds within and surrounding the City.

[14] City of Redondo Beach, General Plan Update – Section 3.2 Utilities; Found here: https://cms2.revize.com/revize/redondobeachca/Documents/Departments/Community%20Development/Planning/General%20Plan%20And%20Long-Range%20Planning/3.2%20utilities.pdf

[15] Beach Cities Watershed Management Group, June 2021. Updated Beach Cities Enhanced Watershed Management Program. Found here: https://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/watershed_management/beach_cities/index.html



City of Redondo Beach Existing Storm Drainage System Facilities

Figure 4

Redondo Beach, Ca

2/27/2024

- Drains Maintained by LACFCD
- Drains Maintained by City
- Debris Basins Maintained by LACFCD
- Debris Basins Maintenance Unknown
- Channels Maintained by Caltrans
- Channels Maintained by LACFCD
- Channels Maintenance Unknown
- City Boundary

N

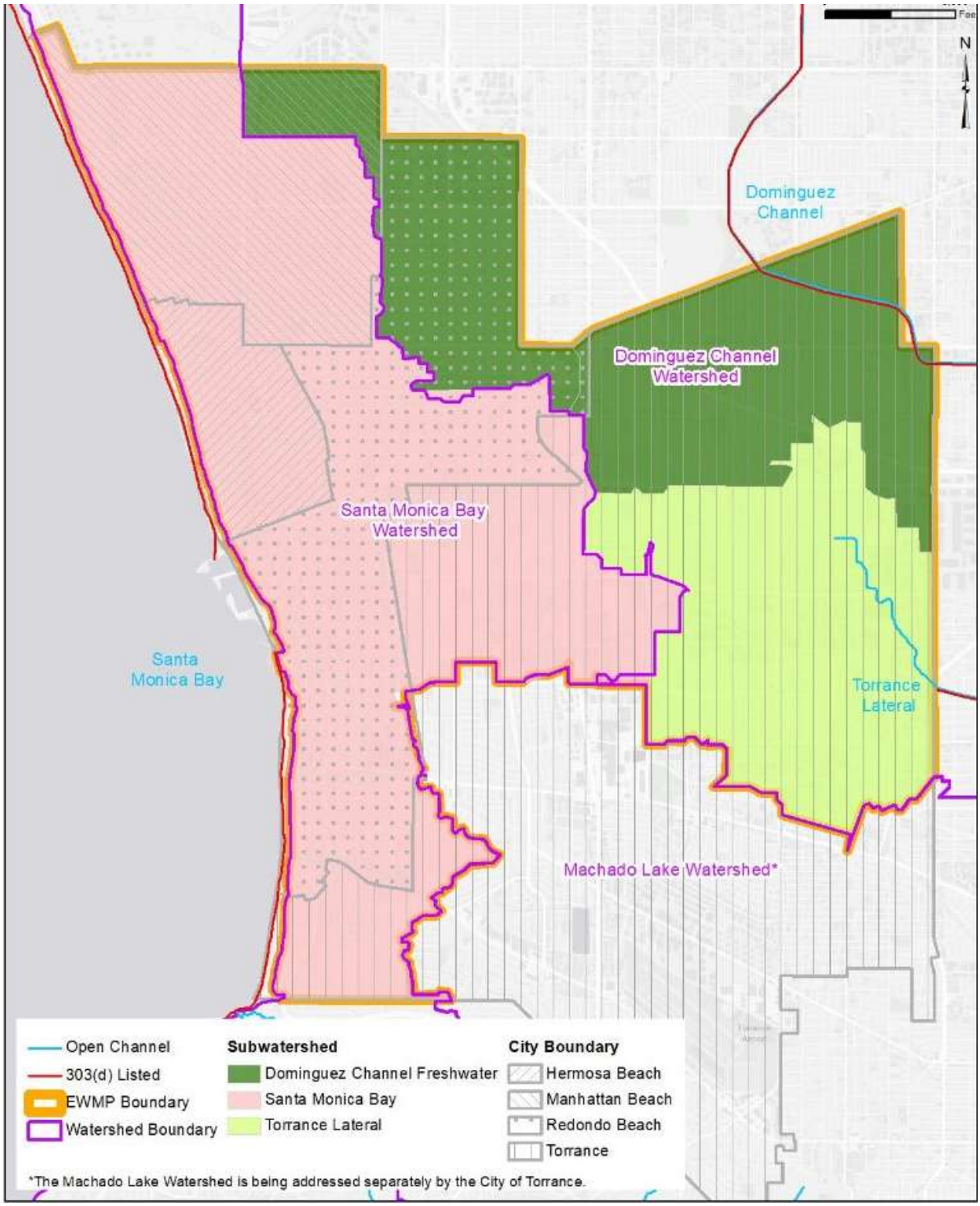
1 inch = 2,400 feet

0 2,400 4,800 Feet

FUSCOE ENGINEERING
FULL CIRCLE THINKING

X:\Projects\511\26\mxd\2024_GPUfigures\4_StormDrain.aprx

Figure 5 City of Redondo Beach Watersheds



Source: Beach Cities, June 2021. Enhanced Watershed Management Program (EWMP) "Figure 1 Beach Cities EWMP Area Overview"

4.2 EXISTING FLOOD PLAIN MAPPING

The National Flood Insurance Act (1968) established the National Flood Insurance Program, based on the minimal requirements for flood plain management and designed to minimize flood damage within Special Flood Hazard Areas. The Federal Emergency Management Agency (FEMA) is the agency that administrates the National Flood Insurance Program. Special Flood Hazard Areas (SFHA) are defined as areas with a 1 percent chance of flooding within a given year, also called the 100-year flood. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community.

According to the Flood Zone determination, the majority of the City is designated as Zone X. Zone X is defined as the area determined to be outside the 500-year flood, protected by a levee from a 100-year flood, and with a minimal or 0.2% chance of flooding. Other portions of the City and the coast are marked as Special Flood Hazard Zone AE and VE, which are areas that have a 1% chance of flooding in any given year or 100-year floodplain. See Table 12 for description of the City's flood zone designations.

Table 12 FEMA Flood Zone Designations

Zone Designation	Zone	Zone Description
Special Flood Hazard Area – With Base Flow Elevation or Depth	Zone AE	The base floodplain where base flood elevations are provided.
	Zone VE	Coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding.
Other Areas of Flood Hazard	Zone X	Shaded: Area of 500-year flood; area subject to the 100-year flood with average depths of less than 1 foot or with contributing drainage area less than one square mile; and areas protected by levees from the base flood.
Source: FEMA, Glossary. Found here: https://www.fema.gov/about/glossary.		

Any development within Special Flood Hazard Areas (Zone AE & Zone VE) must follow FEMA and the City's floodplain safety requirements, including flood analysis, proper setbacks, and sufficient pad elevations. The City also has preparation measures to protect residents and limit damage and infrastructure loss[16]. See Figure 6 for a map of the FEMA flood zones within the Redondo Beach GPU.

CITY OF REDONDO BEACH – FLOOD CONTROL POLICY

In 2009, the City published an Administrative Report approving the City's policy on flood control. The report referenced the City's Strategic Plan and designated the City Engineer as the policy administrator. As requested as part of the City's Strategic

[16] City of Redondo Beach. Storm Preparation. Accessed February 2024. Found here: https://www.redondo.org/departments/public_works/storm_preparation/preparation_measure_for_residents.php

Planning document, the Engineering Division prepared a proposed Administrative policy in order to address requirements for driveway slopes and approaches.

The proposed flood control policy was discussed by the Public Works Commission on February 26, 2009, and was approved with additional recommendations. The Department of Engineering and Building Services references the American Public Works Association (APWA) Standard Plans and Specifications as the official standards for all construction within the Public Right of Way. However, the APWA standard plans (now referred to as SPPWC) do not address Redondo Beach flood control issues related to the unique terrain of the City. This has necessitated that City staff customize a flood control policy specific to the City of Redondo Beach.

Under the "Enhance the Livability of our Community" heading in the City's Strategic Plan at the time, the Engineering Division was tasked with investigating its current policies and practices regarding driveway slope and approach requirements in order to report the findings back to Council. Prior to the submission of the policy to the City Council, staff was directed to bring the policy before the Public Works Commission for review and comment. On February 26, 2009, the proposed driveway slope and approach provisions were brought before the Public Works Commission. Engineering Division staff accomplished these requests and presented in 2009 for City Council review and comment the proposed Administrative Policy attached and detailed below.

The topographic terrain of Redondo Beach contains numerous variations in ground elevations. This has led to the formation of many sump areas that are flood-susceptible. Consequently, Engineering staff developed an administrative policy to mitigate for the various flood control risks, and take action as follows:

(a) Provide for the safety of pedestrians, traffic, and property;

(b) Provide reasonable access for pedestrians, traffic, and property;

(c) Provide guidelines for properly designing and installing various flood control systems for private properties so as to reduce the potential for flooding of said private properties and surrounding private and public improvements;

(d) Reduce unnecessary exposure of the City to claims on personal injury and property damage;

(e) Maintain and protect the various public improvements; and

(f) Maintain and protect the value of surrounding properties and businesses.

The flood control policy includes the following definitions:

(a) "Design Storm" shall mean peak rainfall intensity measured in inches per hour.

(b) "Design Storm Frequency" shall mean the recurrence rate of the design storm measured in occurrence per year. "Tributary Area" shall mean all or portion of the site area that drains in one direction.

(c) "Time of Concentration" shall mean the time in minutes that the storm water takes to travel from the farthest point in a tributary area to the point of collection in said area.

(d) "Discharge pipe" shall mean the conduit conveying water from anywhere on a private property to a point at the street gutter or at a storm drain system.

(e) "Free Board" shall mean the distance from the top of a basin to the level of water in that basin.

(f) "Catch Basin" shall mean a square underground concrete basin properly designed to collect any type of water and discharge it safely to a designated point.

(g) "Channel Drain" shall mean a longitudinal underground concrete basin properly designed to collect any type of water and discharge it safely to a designated point.

(h) "Detention Basin" shall mean an underground concrete basin properly designed to collect storm water, detain it for a given period of time and discharge it safely and gradually to a public storm drain system.

(i) "Parkway Drain" shall mean a wide and thin conduit, under the public walkway, conveying water from a point on a private property to a point at the street gutter.

(j) "Tenant Improvement" shall mean the remodeling,

(k) refurbishment or retrofitting of existing facilities.

(l) "ADA" shall stand for Americans with Disabilities Act.

(m) "APWA" shall stand for American Public Works Association.

The following is the City's flood control policy:

(a) It shall be unlawful to discharge storm water or any other type of water, from a private property over a public walkway, public street, alley, or any other type of public improvement.

(b) It shall be unlawful to discharge storm water or any other type of water, from one private property over another private property.

(c) It shall be unlawful to change the existing course of water flow coming from surrounding improvements. New improvements shall be designed to accommodate this requirement.

(d) Storm water and any other type of water generated by a private property shall be collected on site and safely discharge to the gutter of the adjacent public street/alley or public storm drain as required by the provisions of this policy.

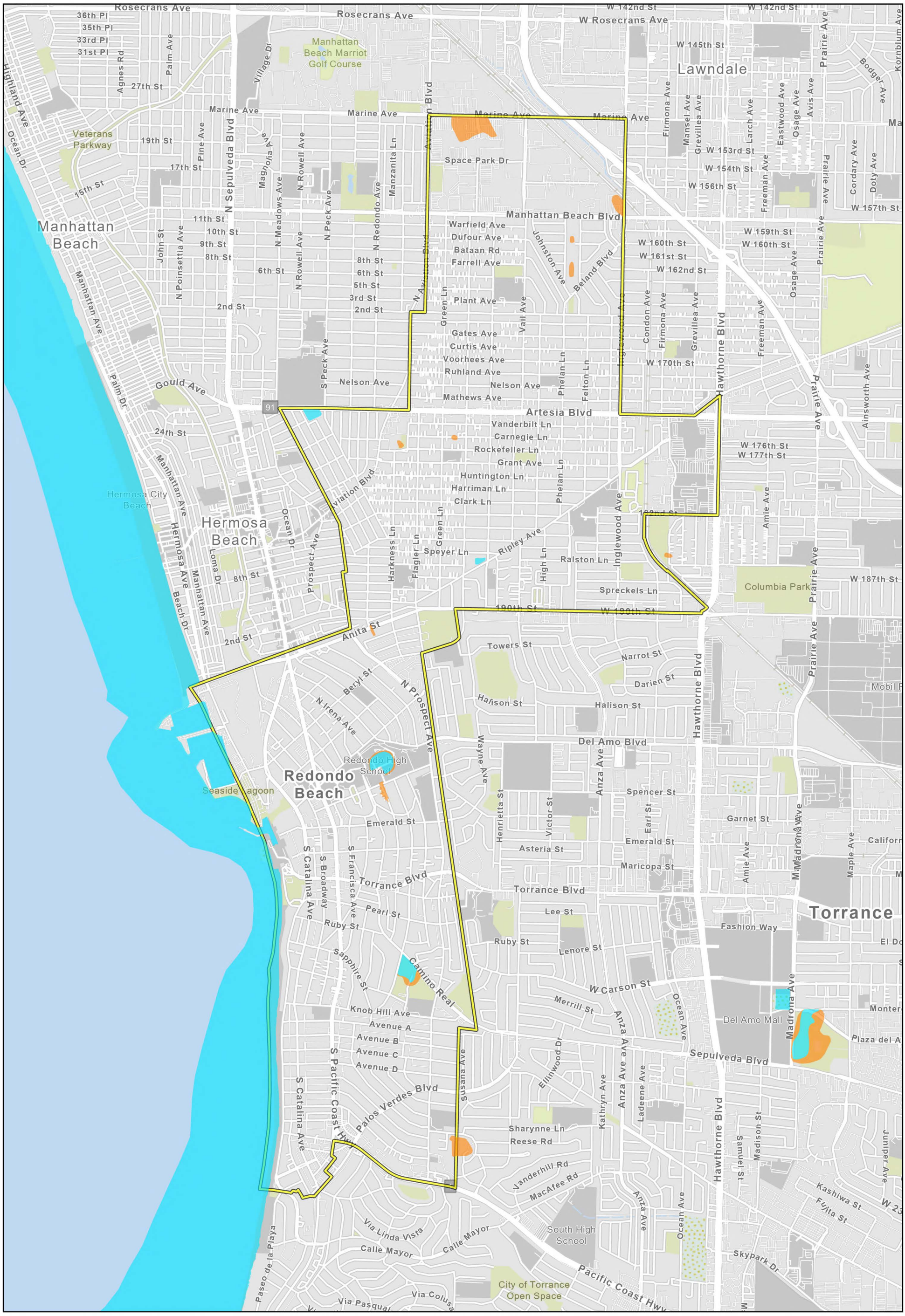
The design of basins, sumps, pumps, pipes and all other flood control elements shall be performed in accordance with the latest requirements of the National Pollutant

Discharge Elimination Systems (NPDES), and with the latest edition of the Hydraulic Design Manual and Hydrology/Sedimentation appendix of the Los Angeles County Department of Public Works, to the satisfaction of the City Engineer.

When a private property slopes downward toward the public right-of-way, and when the driveway of said private property measures twenty (20) feet (or longer) from the back of public walkway to the garage door, waters coming from that property shall be collected into a basin before it reaches the public right- of-way and shall be drained through pipes under the public walkway to a safe discharge at the street gutter.

Developers seeking to construct a multi-residential project of more than four (4) units, or a commercial project of more than one (1) acre in land area, shall construct an on-site detention system to meet the following flood control requirements:

1. Site hydrology/hydraulics shall be based on 25-year design storm.
2. Time of concentration shall not be more than five (5) minutes unless calculated otherwise.
3. Discharging storm water shall only and only occur at a direct connection to the nearest storm drain system.
4. Storm water shall be detained on site and gradually discharged at a rate of no more than one (1) cubic foot per second (cfs), per acre of site area.
5. The differential between the total site storm water rate and the discharge rate of one (1) cubic foot per second, per acre of land, shall be detained on site for no less than seven (7) minutes.



City of Redondo Beach Flood Zones

Figure 6

Redondo Beach, Ca

2/2/2024

City Boundary

Flood Hazard Zones

Zones AE, AH, & VE: 1% Annual Chance Flood Hazard (AE with Base Flood Elevations Determined)

Zone X: 0.2% Annual Chance Flood Hazard

N

1 inch = 2,400 feet

0 2,400 4,800 Feet

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4.3 STORM DRAINAGE CAPACITY ASSESSMENT

CITY OF REDONDO BEACH STORMWATER MANAGEMENT

The City has a storm drain system comprised of catch basins, CDS, dry wells, pump stations, and diversion system units. The City has ongoing monitoring and maintenance procedures in place to ensure that the system functions effectively. To prevent significant flooding during storm events, the City and LACFCD monitor and maintain stormwater pumping stations to ensure they operate efficiently.

As of 2019, the City has worked to improve five deficient pump stations to increase performance and operation. Similar improvements are being made to reduce offshore trash, debris, leaks, and urban runoff. These ongoing improvements are updated annually in the City's Capital Improvement Programs (CIP)[17]. In addition, the City currently requires individual drainage analyses for redevelopments to ensure conformity with the Citywide drainage system. New developments and significant redevelopments must analyze the 10- and 25-year storm events of their project and determine if there are any impacts to the public storm drain system. The City uses a hybrid approach to maintain storm drain capacity and promotes using existing features (i.e., parks) to serve as detention systems wherever needed and practical.

ENHANCED WATERSHED MANAGEMENT PROGRAM (EWMP)

The Beach Cities Watershed management Group (WMG) is compromised of the cities of Hermosa Beach, Manhattan Beach, Redondo Beach, and Torrance, along with LACFCD, all of which collaborated on the development of the Enhanced Watershed Management Program (EWMP) for the Santa Monica Bay (SMB) and Dominguez Channel (DC) areas. This program was initiated following the adoption of the 2012 Los Angeles Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System Permit(NPDES). Over subsequent years, the EWMP underwent multiple revisions, to incorporate changes within the Beach Cites area and comply with regulatory requirements, with the latest EWMP drafted in June 2021. The EWMP focuses on managing stormwater within the Beach Cities Watershed Management Area (WMA), which includes the incorporated MS4 areas of the jurisdictions within the area. The local MS4 Permit requires each regulated entity, including the City of Redondo Beach, to participate in regional watershed working groups to identify regional projects to improve water quality in the local receiving waters. See Table 16 for more information on the projects that the City is involved in.

4.4 EXISTING WATER QUALITY REGULATIONS

In addition to the resources discussed above there are several state and regional regulations that focus on protecting storm water quality throughout the City and Los Angeles County region. They are described as follows.

[17] City of Redondo Beach Budget and Capital Improvement Program; Found here: https://www.redondo.org/departments/financial_services/budget_and_capital_improvement_program_(cip).php

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD (LARWQCB) MS4 PERMIT

The City is within the jurisdiction of the LARWQCB and is subject to the regional Municipal Separate Storm Sewer Systems (MS4) Permit requirements. The Regional MS4 Permit covers 84 incorporated cities within the coastal watersheds of Los Angeles County, with the exception of the City of Long Beach (referred to jointly as permittees and dischargers) who own and operate large MS4s which discharge storm water runoff and non-storm water runoff to surface waters throughout the County[18]. The area covered under the MS4 Permit encompasses more than 3,000 square miles. This area contains a vast drainage network that serves incorporated and unincorporated areas in every WMA within the Los Angeles Region.

The MS4 Permit MS4s, as defined by Section 122.26(b)(8) of title 40 of the Code of Federal Regulations (CFR). Stormwater discharges originate from precipitation events, while non-stormwater discharges encompass all other discharges through an MS4. Non-stormwater discharges are prohibited unless authorized under a separate NPDES permit or meet specific exemptions outlined in the order[19]. The order allows for separate stormwater management programs tailored to individual Permittees or groups of Permittees, with specific provisions for LACFCD due to its limited land use authority. The LACFCD's stormwater management program differs in certain aspects from other Permittees, but it remains subject to key programs such as Public Information and Participation, Illicit Connections and Discharges Elimination, and Public Agency Activities.

TOTAL MAXIMUM DAILY LOADS (TMDLS)

A TMDL is an estimate of the daily load of pollutants that a water body may receive from point sources, non-point sources, and natural background conditions (including an appropriate margin of safety), without exceeding its water quality standard. The 303(d) list, a TMDL for the constituent of concern (pollutant) must be developed for that water body. Those facilities and activities that are discharging into the water body, collectively, must not exceed the TMDL. In general terms, MS4 and other dischargers within each watershed are collectively responsible for meeting the required reductions and other TMDL requirements by the assigned deadline.

Identifying water quality priorities is a main component of the EWMP process as the MS4 Permit requires that water quality characterization, water body pollutants, and source assessments are prioritized. The MS4 Permit describes three categories of priority as follows:

- Category 1 – Highest Priority
    - Water body pollutants with an established TMDL in the MS4 Permit.

[18] Los Angeles Regional Water Quality Control Board, Regional Permit Program Page. Accessed February 2024. Found here: https://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/regional_permit.html

[19] Los Angeles Regional Water Quality Control Board, ORDER NO. R4-2012-0175 as amended by State Water Board Order WQ 2015-0075 and Los Angeles Water Board Order R4-2012-0175-A01 NPDES PERMIT NO. CAS004001. Found here: https://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/los_angeles_ms4/2016/6948_R4-2012-0175_WDR_PKG_amd2.pdf

- Category 2 – High Priority
    - Pollutants that indicate water quality impairment according to the State's Water Quality Control Policy 303(d) list and MS4 discharges that could be contributing to water quality impairment.

- Category 3 – Medium Priority
    - Pollutants that have exceeded applicable receiving water limitations in the MS4 Permit but have insufficient data to indicate they contribute to water quality impairment or exceedance in the receiving water(s).

In addition, the California State Water Resources Control Board (State Board) has adopted the statewide Trash Provisions[20] that requires implementation of best management practices (BMPs) that mitigate or abate trash within Priority Land Use Areas (PLUs). PLUs are defined as, "high density residential, industrial, commercial, mixed urban, and public transportation stations." The purpose of the Trash Provisions is to establish a statewide water quality objective that ensures the quality of surface waters that enter storm drains and eventually lead out to major water ways are free of trash. State and Regional Water Board MS4 permits have or will contain trash control implementation requirements and compliance milestones to demonstrate progress towards 100 percent compliance with the Trash Provisions. The City is currently undergoing and implementing this process through the LARWQCB requirements.

Presented below in Table 13 are the 303(d) list and TMDLs for the applicable regional channels and water bodies that receive flows from the Redondo Beach GPU area.

[20] State Water Resources Control Board - Statewide Storm Water Program – Trash Implementation Program. Accessed January 2024 Found here: https://www.waterboards.ca.gov/water_issues/programs/stormwater/trash_implementation.html

Table 13 List of 303(d) Impairments and TMDLs

Santa Monica Bay Watershed		
Water Body / Channel	**List of 303(d) Impairments**	**TMDL**
Redondo Beach Santa Monica Bay Offshore/Nearshore	Arsenic, DDT, Indicator Bacteria, Mercury, PCBs (Polychlorinated biphenyls), Trash	Santa Monica Bay Beaches • Bacteria TMDL Santa Monica Bay Nearshore and Offshore • Debris TMDL Santa Monica Bay • TMDL for DDTs and PCBs
Dominguez Channel Watershed		
Water Body / Channel	**List of 303(d) Impairments**	**TMDL**
Dominguez Channel Dominguez Channel Estuary Machado Lake Torrance Lateral	Algae, Ammonia, ChemA, Chlordane (tissue), Copper, DDT (tissue), Dieldrin (tissue), Eutrophic, Indicator Bacteria, Lead, Odor PCBs (tissue), Toxicity, Trash, Zinc	Dominguez Channel and Greater Los Angeles and Long Beach Harbor Waters • Toxic Pollutants TMDL Machado Lake • Nutrient TMDL • Pesticides and PCBs TMDL • Trash TMDL
Source: Los Angeles Regional Water Quality Control Board, Beach Cities Watershed Management Group - Enhanced Watershed Management Program. Found here: https://www.waterboards.ca.gov/losangeles/water_issues/programs/stormwater/municipal/watershed_management/beach_cities/index.html		

4.4.1 EXISTING GROUNDWATER CONDITIONS

The City is located within the West Coast Subbasin (West Coast Basin) of the Coastal Plain of Los Angeles Groundwater Basin. Various entities and stakeholders, including the Water Replenishment District (WRD), Los Angeles County Department of Public Works (LACPW), and LARWQCB manage and maintain water quality within the West Coast Basin. Overall, the current groundwater quality in the West Coast Basin is generally good, with only some areas experiencing water quality challenges from natural or human-induced sources. WRD closely monitors water quality trends and proposed water quality compliance in agency production wells, monitoring wells, and recharge/injection waters into the West Coast Basin. If non-compliance is identified, WRD develops an action plan and implements measures to achieve compliance. WRD also evaluates the impacts of prospective drinking water regulations and legislation. WRD also collaborates with well owners on these projects and focuses on installing wellhead treatment facilities at existing production wells. Currently WRD is focusing on the removal of volatile organic compounds and offers financial assistance for the design of and equipment of treatment facilities. In doing so, WRD hopes to remove contaminants from the underground supply and use the extracted water as potable supply. Further information regarding WRD groundwater quality monitoring are

available in its Engineering and Survey Reports, as well as Regional Groundwater Monitoring Reports.

BENEFICIAL USES

The West Coast Basin has prescribed beneficial uses and water quality objectives as stated in the LARWQCB Basin Plan (Basin Plan)[21] and described below. According to the LARWQCB Basin Plan, the West Coast Subbasin is split further into several land areas including the underlying Ports of Los Angeles and Long Beach, parts underlying El Segundo/ Seaward of Barrier, and remainder of basin. The benefits of each of these areas are listed below in Table 14.

Table 14 Beneficial Uses of the West Coast Subbasin

West Coast Subbasin – Underlying Ports of Los Angeles & Long Beach
IND – Industrial Service Supply PROC – Industrial Process Supply AGR – Agricultural Supply
West Coast Subbasin – Underlying El Segundo, Seaward of Barrier
IND – Industrial Service Supply PROC – Industrial Process Supply AGR – Agricultural Supply
West Coast Subbasin – Remainder of Basin
MUN – Municipal and Domestic Supply IND – Industrial Service Supply PROC – Industrial Process Supply AGR – Agricultural Supply
Source: LARWQCB, Basin Plan - Water Quality Control Plan, Table 2.2 Beneficial Uses of Groundwater. Found here: https://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/2020/Chapter_2/Chapter_2_Table_2-2/Chapter_2_-_Table_2-2.pdf

As shown above most of the beneficial uses available to the West Coast Basin include different water supply uses for the region ranging from agricultural, municipal, and industrial supplies. Understanding the beneficial uses of groundwater provides a necessary foundation to understand effective water quality objectives.

WATER QUALITY OBJECTIVES

The Clean Water Act mandates states to establish water quality standards, which include beneficial uses and water quality objectives. Similarly, the California Water Code requires Regional Water Quality Control Boards to establish water quality objectives to protect beneficial uses and prevent nuisances. These objectives guide regulatory efforts, such as Waste Discharge Requirements, to maintain or improve water quality.

[21] Los Angeles Regional Water Quality Control Board, Basin Plan - Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties. Found here: https://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/2020/

The LARWQCB regularly reviews and updates these objectives to reflect new information and ensure ongoing protection of regional waters.

Numeric water quality objectives within the Basin Plan have been established for the West Coast Basin and are listed below in Table 15.

Table 15 Numeric Water Quality Objectives

West Coast Basin	
Water Quality Objective	Numeric Objective (mg/L)
Total Dissolved Solids (TDS)	800
Sulfate	250
Chloride	150
Boron	1.0
Source: LARWQCB, Basin Plan - Water Quality Control Plan, Chapter 3 Water Quality Objectives. Found here: https://www.waterboards.ca.gov/rwqcb4/water_issues/programs/basin_plan/2020/Chapter_3/Chapter_3.pdf **Error! Hyperlink reference not valid.**	

Seawater intrusion and thus salinity is a significant water quality problem in many parts of southern California, including Los Angeles County. Salinity is a measure of the dissolved minerals in water including both TDS and Chloride. The West Coast Basin has a critical role in reducing the sea water intrusion further inland through injection wells. Injection wells create a groundwater ridge, which inhibits the inland flow of saltwater into the sub-basin to protect and maintain groundwater elevations.

To maintain groundwater quality WRD conducts an extensive monitoring program that serves and manages the West Coast Basin's groundwater production, contamination, and compliance with all required laws and regulations. Additionally, to ensure accurate data WRD uses depth specific (nested) monitoring wells that tap discrete aquifer zones. In the most recent Regional Groundwater Monitoring Report[22] WRD presents water quality results from the 22 WRD nested monitoring wells (112 individual wells zones) during the 2021-2022 water year. The WRD collected over hundreds of samples from these wells and concluded that groundwater in their service area is of generally good quality and suitable for use, noting that any localized areas with marginal to poor water quality can be treated and utilized as potable water.

[22] WRD. March 2023. Regional Groundwater Monitoring Report. Found here: https://www.wrd.org/files/997eea70a/Regional+Groundwater+Monitoring+Report+2021-2022.pdf

4.4.2 STORM DRAINAGE CAPITAL IMPROVEMENT PLAN PROJECTS

CITY OF REDONDO BEACH CAPITAL IMPROVEMENT PROGRAM PROJECTS

The City alongside other stakeholders has multiple plans for CIP to continually improve water quality and plan for future drainage projects. The City specifically has a 5-year CIP document that describes several projects that impact drainage facilities within the Redondo Beach GPU area. These are summarized in Table 16 below.

Table 16 Storm Drainage Capital Improvement Plans

Project Name	CIP Year	Project Description
Santa Monica Bay Near/Offshore Marine Debris TMDL	Ongoing	The project includes the installation and maintenance of catch basin trash screeners. to achieve 20% trash reduction; five years - 40%; six years - 60%; seven years - 80%; and eight years - 100% trash reduction.
Enhanced Watershed Management Plan (EWMP) Implementation	Ongoing	EWMP implementation will include both structural water quality enhancement projects and non-structural measures that address the need to comply with three new TMDLs recently approved by the EPA. They are PCB/DDT and debris for Santa Monica Bay and toxics for Dominguez Channel.
Drainage Improvement Project	Construction commenced FY 21-22	This project will address nuisance water location and replace all of the corrugated metal pipe (CMP), cross-drains and culverts throughout the City with reinforced concrete pipe (RCP) to improve leakage.
Beach Cities Green Street Improvements	Construction FY 22-23	Expansion of green street features, infiltration wells, and permeable pavers, control the peak rate from high intensity storm events, alleviate localized flooding/ponding, and can recharge groundwater.
Fulton Playfield Multi-Benefit Infiltration Project	Construction FY 23-24	The Project will enhance an existing underground flood control basin managed by Los Angeles County Flood Control District (LACFCD) by modifying the inlet structure and adding infiltration drywells.
Glen Anderson Park Regional Stormwater Capture Green Streets	Design FY 23-24	A Beach Cities EWMP project that supports regional MS4 compliance and creates recreational and greening benefits to the community

Source: City of Redondo Beach, Public Works – Engineering Division, Capital Improvement Program. Accessed February 2024. Found here: https://redondobeachgis.maps.arcgis.com/apps/dashboards/6c1a620190d040168eff642e4aa47789

Source: County of Los Angeles, Safe Clean Water Program Portal. Accessed November 2023. Found here: https://portal.safecleanwaterla.org/scw-reporting/map

As shown above, there are six CIP projects within the Redondo Beach GPU area that will be implemented over the next five years. These projects in addition to others not listed here will continually improve the regional water quality and drainage infrastructure serving the City and region.

4.5 PROPOSED CONDITION AND CEQA THRESHOLD ANALYSIS

California Environmental Quality Act (CEQA) significance criteria are used to evaluate the degree of impact caused by a development project on environmental resources such as hydrology and water quality. According to Appendix G of the CEQA Guidelines[23], a project would normally have a significant effect on the environment if the project would impact any of the items listed below.

Would the Project:

A. Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?
B. Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.
C. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

    (i) Result in a substantial erosion or siltation on- or off-site;
    (ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    (iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
    (iv) Impede or redirect flood flows?

D. In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?
E. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Should the answers to these environmental factors prove to be a potentially significant impact, mitigation measures would be required to reduce those impacts to a less-than-significant threshold.

Impact A: Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Impact Analysis: Construction activities within the GPU area could potentially result in soil erosion and temporary adverse impacts to surface water quality from construction materials and wastes if left unregulated or unmitigated.

Both State and Local regulations will effectively mitigate construction storm water runoff impacts from the proposed land use changes. Standard erosion control practices shall be implemented for all construction within the City.

[23] California Natural Resources Agency, CEQA appendix G. Found here: https://resources.ca.gov/CNRALegacyFiles/ceqa/docs/ab52/final-approved-appendix-G.pdf

Additionally, construction sites will be required to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the requirements of the Statewide Construction General Permit and subject to the oversight of the Los Angeles Regional Water Quality Control Board. The SWPPP must include BMPs to reduce or eliminate erosion and sedimentation from soil disturbing activities, as well as proper materials and waste management. Implementation of these State and Local requirements would effectively prohibit projects from violating any water quality standards or waste discharge requirements resulting from construction activities.

In terms of post-construction related impacts, the incorporation of site design, LID features and BMPs as required under the Los Angeles County MS4 Permit, the individual development and redevelopment projects within the GPU will effectively retain or treat the 85th percentile 24-hour storm water runoff for pollutants such as bacteria, metals, nutrients, oil & grease, organics, pesticides, sediment, trash, and oxygen demanding substances prior to discharge off their property. As properties within the City undergo redevelopment, existing properties that do not have water quality BMPs will be replaced with projects incorporating LID BMPs. Therefore, long-term surface water quality of runoff from the GPU areas would be expected to improve over existing conditions as more LID BMPs are implemented. This is considered an overall benefit of the proposed land use changes associated with implementation of the GPU.

In addition to LID BMPs associated with development, the City is part of the Beach Cities Watershed Management Area (WMA) requires the City to identify regional projects to improve water quality in the local receiving waters. Over the next 20 years, the City will be contributing to engineering design, construction and operations and maintenance of regional watershed improvement projects in accordance with the approved EWMP and in partnership with other cities and LA County. Impacts to surface water and groundwater quality will be less than significant.

Impact B: Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact Analysis: Since groundwater is actively managed throughout the City by numerous water agencies and stakeholders, individual projects will not utilize site-specific wells for groundwater supply. All groundwater is managed through the water agencies and planning documents such as the Urban Water Management Plans. It is also likely that through LID features, infiltration will be feasible and will augment groundwater recharge. Through management by the local water districts, land development and redevelopment within the City will not result in interference with groundwater recharge or management of the groundwater basin.

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

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

(ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
(iii) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or
(iv) Impede or redirect flood flows?

Impact Analysis: Under the existing conditions and proposed conditions, drainage patterns will largely be maintained and will utilize the existing drainage facilities within the public right of way. Current runoff is captured and conveyed by existing City storm drain infrastructure throughout the City before discharging to County flood control facilities and channels before ultimately reaching the Pacific Ocean. The City is primarily built-out and no major changes in flood flows are anticipated. As noted above, the City and County have policies in place to require detention systems to mitigate peak flows for certain development projects, and/or if downstream drainage facilities ever become deficient.

For proposed development that would include storm drain system improvements that would directly connect to Los Angeles County Flood Control systems, hydrology and LID studies shall be prepared, and reviewed and approved by Los Angeles County Department of Public Works. Los Angeles County Flood Control District (LACFCD) published its Hydraulic Design Manual in 1982. This manual presents the design criteria to be used for both closed conduits and open channels. Additionally, Chapter 14 of the 2006 Los Angeles County Department of Public Works Hydrology Manual includes procedures for requesting Q-allowable, or the maximum stormwater discharges that would be allowed from the proposed development associated with the proposed storm drain connection.

In 2009, the City published an Administrative Report approving the City's policy on flood control. Developers seeking to construct a multi-residential project of more than four (4) units, or a commercial project of more than one (1) acre in land area will be allowed to discharge 1 cfs per acre of site area. Detention systems would be required, when necessary, to mitigate the drainage impacts.

In addition, the majority of storm drainage structures, streams, and channels that collect runoff within the City are concrete lined and not susceptible to scour or erosion. For areas that are tributary to streams and may be susceptible to scour, hydromodification requirements, as part of the regional MS4 permit, will ensure that impacts are minimized. Overall impacts to erosion and siltation, as a result of GPU land use changes, are anticipated to be less than significant.

Impact D: In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Impact Analysis: The majority of the City of Redondo Beach is located outside the 100-year flood zone and potential impacts to flooding are less than significant. For the areas adjacent to the coastline and other portions of the City defined as AE there is a 1% chance of annual flood hazards. All development in these areas will require conformance with FEMA requirements and setbacks to

adequately protect structures from flood hazards. These requirements are typically implemented through the City and impacts are also considered less than significant for these areas when meeting all FEMA requirements. The only area of the City within the tsunami hazard area includes King Harbor and it's various commercial/visitor accommodations on the west side of Harbor Dr.

Tsunamis are a series of large ocean waves, generated by large undersea disturbances, such as major earthquakes on the sea floor or landslide. Tsunamis are not affected by tides or currents – a tsunami in the ocean means that the whole column of water is moving, not just the surface.

When tsunami waves enter shallow water, they rise to form massive moving water called "run-up". The run-up of water many feet high rushes onto shore, striking the coast with tremendous destructive force.

If you are on the shore and in low coastal areas, you should know that a tsunami could arrive within minutes after the earth shakes. Devastating tsunamis can also happen when major earthquakes happen far away. Recent earthquakes in Chile and Japan have caused tsunami strikes in Hawaii, Alaska, Washington, Oregon, and California, causing loss of life and millions in property damage.

The tsunami danger period can continue for many hours as the waters move onto land, recede, and return. Sometimes the second or third waves are more devastating than the first. A tsunami can occur during any season of the year and at any time, day or night.

Based on the frequency of historical tsunami, the probability of occurrence of any tsunami in any time period in Redondo Beach is rare. In the unlikely event one does occur, the Redondo Beach Fire Department has recommended evacuation routes, tsunami inundation map, and tsunami safety and awareness guidelines on the Fire Department section of its website. If there is a tsunami warning, the goal is to get to higher ground and away from the ocean in the most expeditious means possible.
All facilities within King Harbor are required to follow tsunami guidelines and emergency preparedness requirements. The City is not subject to impacts from seiche zones, and thus are not applicable.

Impact E: Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Impact Analysis: New development and redevelopment within the City of Redondo Beach is not anticipated to impact implementation of local or regional water quality control plans or sustainable groundwater management plans. All development within the City will follow the Los Angeles County MS4 permit including provisions for protecting groundwater. Groundwater levels are managed by various stakeholders, and development projects with infiltration will be reviewed for conformance with the LA County MS4 permit. Impacts to water quality and groundwater management will be less than significant.

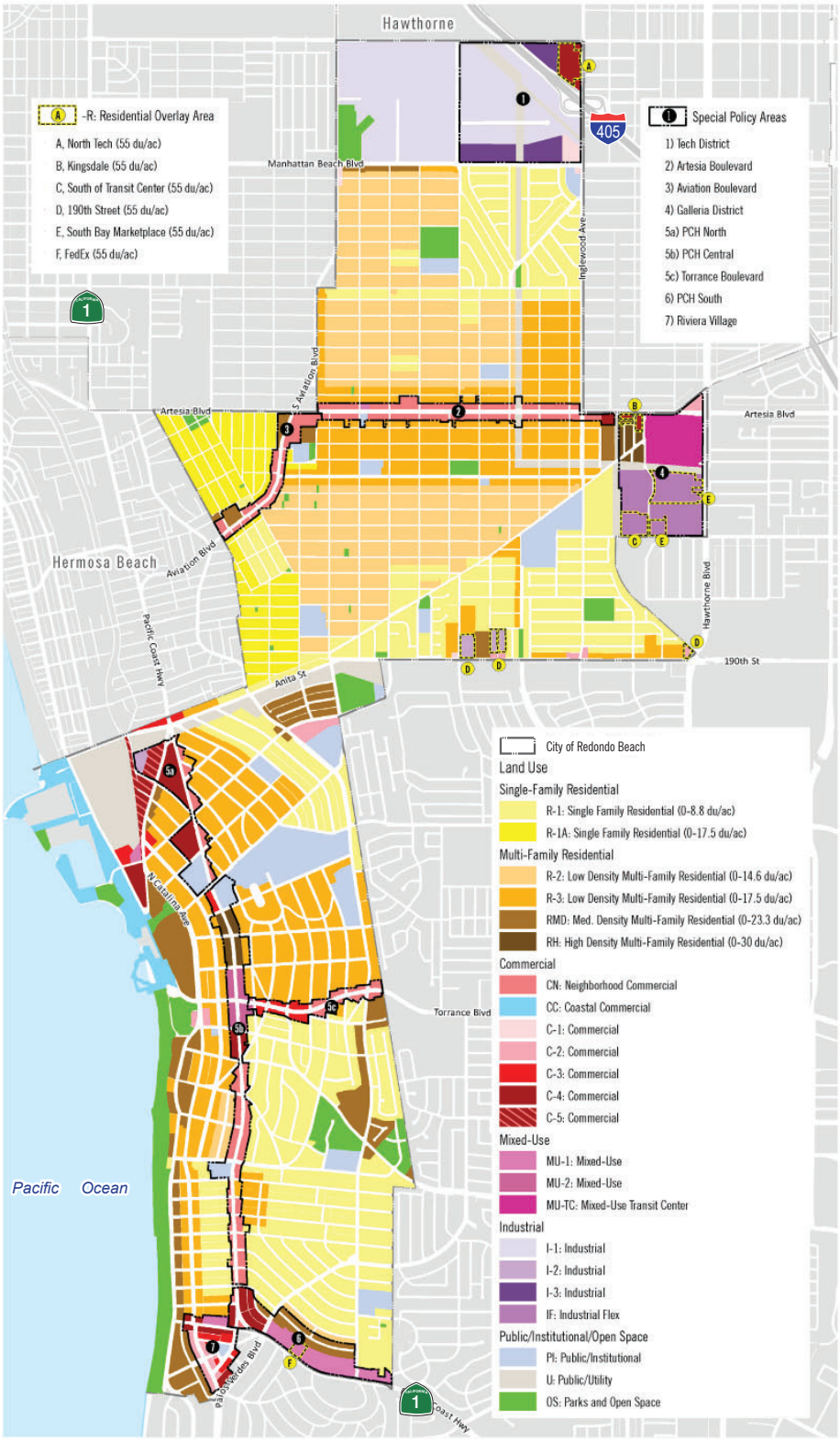
5. APPENDICES

Appendix A City of Redondo Beach Proposed Land Use Plan
Appendix B City of Los Angeles Sewerage Generation Factors Chart
Appendix C Water Demand Calculations
Appendix D Sewer Flow Calculations
Appendix E LACSD's Response to the City of Redondo Beach's NOP

APPENDIX A

CITY OF REDONDO BEACH PROPOSED LAND USE PLAN

Figure 4 - Proposed Land Use Plan



0 3,750
Scale (Feet)

Source: City of Redondo Beach and PlaceWorks, 2023.

PlaceWorks

APPENDIX B

CITY OF LOS ANGELES SEWERAGE GENERATION FACTORS CHART

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
1	Acupuncture Office/Clinic	120/1,000 Gr SF	265	275
2	Arcade - Video Games	50/1,000 Gr SF	265	275
3	Auditorium (a)	3/Seat	265	275
4	Auto Parking (a)	20/1,000 Gr SF	265	275
5	Auto Mfg., Service Maintenance (b)	Actual	1,260	1,165
6	Bakery	280/1,000 Gr SF	3,020	2,540
7	Bank: Headquarters	120/1,000 Gr SF	265	275
8	Bank: Branch	50/1,000 Gr SF	265	275
9	Ballroom	350/1,000 Gr SF	265	275
10	Banquet Room	350/1,000 Gr SF	265	275
11	Bar: Cocktail, Fixed Set (a) (c)	15/Seat	265	275
12	Bar: Juice, No Baking Facilities (d)	720/1,000 Gr SF	265	275
13	Bar: Juice, with Baking Facilities (d)	720/1,000 Gr SF	265	275
14	Bar: Cocktail, Public Table Area (c)	720/1,000 Gr SF	265	275
15	Barber Shop	120/1,000 Gr SF	265	275
16	Barber Shop (s)	15/Stall	265	275
17	Beauty Parlor	425/1,000 Gr SF	265	275
18	Beauty Parlor (s)	50/Stall	265	275
19	Bldg. Const/Field Office (e)	120/Office	265	275
20	Bowling Alley: Alley, Lanes & Lobby Area	50/1,000 Gr SF	265	275
21	Bowling Facility: Arcade/Bar/Restaurant/Dancing	Total	Average	Average
22	Cafeteria: Fixed Seat	30/Seat	1,000	600
23	Car Wash: Automatic (b)	Actual	265	285
24	Car Wash: Coin Operated Bays (b)	Actual	265	285
25	Car Wash: Hand Wash (b)	Actual	265	285
26	Car Wash: Counter & Sales Area	50/1,000 Gr SF	265	275
27	Chapel: Fixed Seat	3/Seat	265	275
28	Chiropractic Office	120/1,000 Gr SF	265	275
29	Church: Fixed Seat	3/Seat	265	275
30	Church School: Day Care/Elem	9/Occupant	265	275
31	Church School: One Day Use (s)	9/Occupant	265	275
32	Cocktail Lounge: Fixed Seat (f)	15/Seat	265	275
33	Coffee House: No Food Preparation (d)	720/1,000 Gr SF	265	275
34	Coffee House: Pastry Baking Only (d)	720/1,000 Gr SF	265	275
35	Coffee House: Serves Prepared Food (d)	25/Seat	1,000	600
36	Cold Storage: No Sales (g)	30/1,000 Gr SF	265	275
37	Cold Storage: Retail Sales (g)	50/1,000 Gr SF	265	275
38	Comfort Station: Public	80/Fixture	265	275
39	Commercial Use (a)	50/1,000 Gr SF	265	275

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
40	Community Center	3/Occupant	265	275
41	Conference Room of Office Bldg.	120/1,000 Gr SF	265	275
42	Counseling Center (h)	120/1,000 Gr SF	265	275
43	Credit Union	120/1,000 Gr SF	265	275
44	Dairy	Average Flow	1,510	325
45	Dairy: Barn	Average Flow	1,510	325
46	Dairy: Retail Area	50/1,000 Gr SF	265	275
47	Dancing Area (of Bars or Nightclub) (c)	350/1,000 Gr SF	265	275
48	Dance Studio (i)	50/1,000 Gr SF	265	275
49	Dental Office/Clinic	250/1,000 Gr SF	265	275
50	Doughnut Shop	280/1,000 Gr SF	1,000	600
51	Drug Rehabilitation Center (h)	120/1,000 Gr SF	265	275
52	Equipment Booth	30/1,000 Gr SF	265	275
53	Film Processing (Retail)	50/1,000 Gr SF	265	275
54	Film Processing (Industrial)	Actual	265	275
55	Food Processing Plant (b)	Actual	2,210	1,450
56	Gas Station: Self Service	100/W.C.	265	275
57	Gas Station: Four Bays Max	430/Station	1,950	1,175
58	Golf Course Facility: Lobby/Office/Restaurant/Bar	Total	700	450
59	Gymnasium: Basketball, Volleyball (k)	200/1,000 Gr SF	265	275
60	Hanger (Aircraft)	50/1,000 Gr SF	265	275
61	Health Club/Spa (k)	650/1,000 Gr SF	265	275
62	Homeless Shelter	70/Bed	265	275
63	Hospital	70/Bed	820	1,230
64	Hospital: Convalescent (a)	70/Bed	265	275
65	Hospital: Animal	300/1,000 Gr SF	820	1,230
66	Hospital: Psychiatric	70/Bed	265	275
67	Hospital: Surgical (a)	360/Bed	265	275
68	Hotel: Use Guest Rooms Only (a)	120/Room	265	275
69	Jail	85/Inmate	265	275
70	Kennel: Dog Kennel/Open	100/1,000 Gr SF	265	275
71	Laboratory: Commercial	250/1,000 Gr SF	265	275
72	Laboratory: Industrial	Actual	265	275
73	Laundromat	185/Machine	550	370
74	Library: Public Area	50/1,000 Gr SF	265	275
75	Library: Stacks, Storage	30/1,000 Gr SF	265	275
76	Lobby of Retail Area (l)	50/1,000 Gr SF	265	275
77	Lodge Hall	3/Seat	265	275
78	Lounge (l)	50/1,000 Gr SF	265	275

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
79	Machine Shop (No Industrial Waste Permit Required) (b)	50/1,000 Gr SF	265	275
80	Machine Shop (Industrial)	Actual	265	275
81	Mfg or Industrial Facility (No IW Permit Required) (b)	50/1,000 Gr SF	265	275
82	Mfg or Industrial Facility (Industrial)	Actual	265	275
83	Massage Parlor	250/1,000 Gr SF	265	275
84	Medical Building (a)	225/1,000 Gr SF	265	275
85	Medical: Lab in Hospital	250/1,000 Gr SF	340	275
86	Medical Office/Clinic	250/1,000 Gr SF	265	275
87	Mini-Mall (No Food)	50/1,000 Gr SF	265	275
88	Mortuary: Chapel	3/Seat	265	275
89	Mortuary: Embalming	300/1,000 Gr SF	800	800
90	Mortuary: Living Area	50/1,000 Gr SF	265	275
91	Motel: Use Guest Room Only (a)	120/Room	265	275
92	Museum: All Area	30/1,000 Gr SF	265	275
93	Museum: Office Over 15%	120/1,000 Gr SF	265	275
94	Museum: Sales Area	50/1,000 Gr SF	265	275
95	Office Building (a)	120/1,000 Gr SF	265	275
96	Office Bldg w/Cooling Tower	170/1,000 Gr SF	265	275
97	Plating Plant (No IW Permit Required) (b)	50/1,000 Gr SF	265	275
98	Plating Plant (Industrial) (b)	Actual	265	275
99	Pool Hall (No Alcohol)	50/1,000 Gr SF	265	275
100	Post Office: Full Service (m)	120/1,000 Gr SF	265	275
101	Post Office: Private Mail Box Rental	50/1,000 Gr SF	265	275
102	Prisons	175/Inmate	265	275
103	Residential Dorm: College or Residential (n)	70/Student	265	275
104	Residential: Boarding House	70/Bed	265	275
105	Residential: Apt - Bachelor (a)	75/DU	265	275
106	Residential: Apt - 1 BDR (a) (o)	110/DU	265	275
107	Residential: Apt - 2 BDR (a) (o)	150/DU	265	275
108	Residential: Apt - 3 BDR (a) (o)	190/DU	265	275
109	Residential: Apt - >3 BDR (o)	40/BDR	265	275
110	Residential: Condo - 1 BDR (o)	110/DU	265	275
111	Residential: Condo - 2 BDR (o)	150/DU	265	275
112	Residential: Condo - 3 BDR (o)	190/DU	265	275
113	Residential: Condo - >3 BDR (o)	40/BDR	265	275
114	Residential: Duplex/Townhouse - 1 BR (o)	110/DU	265	275
115	Residential: Duplex/Townhouse - 2 BR (o)	150/DU	265	275
116	Residential: Duplex/Townhouse - 3 BR (o)	190/DU	265	275
117	Residential: Duplex/Townhouse - >3 BR (o)	40/BDR	265	275

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
118	Residential: SFD - 1 BR (o)	140/DU	265	275
119	Residential: SFD - 2 BR (o)	185/DU	265	275
120	Residential: SFD - 3 BR (o)	230/DU	265	275
121	Residential: SFD - >3 BR (o)	45/BDR	265	275
122	Residential Room Addition: Bedroom (o)	45/BDR	265	275
123	Residential Room Conversion: Into a Bedroom (o)	45/BDR	265	275
124	Residential: Mobile Home	Same as Apt	265	275
125	Residential: Artist (2/3 Area)	75/DU	265	275
126	Residential: Artist Residence	75/DU	265	275
127	Residential: Guest Home w/ Kitchen	Same as Apt	265	275
128	Residential: Guest Home w/o Kitchen	45/BDR	265	275
129	Rest Home	70/Bed	555	490
130	Restaurant: Drive-In	50/Stall	1000	600
131	Restaurant: Drive-In Seating Area	25/Seat	1000	600
132	Restaurant: Fast Food Indoor Seat	25/Seat	1000	600
133	Restaurant: Fast Food Outdoor Seat	25/Seat	1000	600
134	Restaurant: Full Service Indoor Seat (a)	30/Seat	1000	600
135	Restaurant: Full Service Outdoor Seat	30/Seat	1000	600
136	Restaurant: Take Out	300/1,000 Gr SF	1000	600
137	Retail Area (greater than 100,000 SF)	50/1,000 Gr SF	265	275
138	Retail Area (less than 100,000 SF)	25/1,000 Gr SF	265	275
139	Rifle Range: Shooting Stalls/Lanes, Lobby	50/1,000 Gr SF	265	275
140	Rifle Range Facility: Bar/Restaurant	Total	Average	Average
141	School: Arts/Dancing/Music (i)	11/Student	265	275
142	School: Elementary/Jr. High (a) (p)	9/Student	265	275
143	School: High School (a) (p)	11/Student	265	275
144	School: Kindergarten (s)	9/Student	265	275
145	School: Martial Arts (i)	9/Student	265	275
146	School: Nursery-Day Care (p)	9/Child	265	275
147	School: Special Class (p)	9/Student	265	275
148	School: Trade or Vocational (p)	11/Student	265	275
149	School: Training (p)	11/Student	265	275
150	School: University/College (a) (p)	16/Student	265	275
151	School: Dormitory (a) (n)	70/Student	265	275
152	School: Stadium, Pavilion	3/Seat	265	275
153	Spa/Jacuzzi (Commercial with backwash filters)	Total	265	275
154	Storage: Building/Warehouse	30/1,000 Gr SF	265	275
155	Storage: Self-Storage Bldg	30/1,000 Gr SF	265	275
156	Store: Ice Cream/Yogurt	25/1,000 Gr SF	1000	600

SEWERAGE FACILITIES CHARGE
SEWAGE GENERATION FACTOR FOR
RESIDENTIAL AND COMMERCIAL CATEGORIES

EFFECTIVE DATE: April 6, 2012

Line No.	FACILITY DESCRIPTION	PROPOSED SGF IN GPD	BOD (mg/l)	SS (mg/l)
157	Store: Retail (l)	50/1,000 Gr SF	265	275
158	Studio: Film/TV - Audience Viewing Room (q)	3/Seat	265	275
159	Studio: Film/TV - Regular Use Indoor Filming Area (q)	50/1,000 Gr SF	265	275
160	Studio: Film/TV - Ind. Use Film Process/Machine Shop (q)	50/1,000 Gr SF	265	275
161	Studio: Film/TV - Ind. Use Film Process/Machine Shop	Total	265	275
162	Studio: Recording	50/1,000 Gr SF	265	275
163	Swimming Pool (Commercial with backwash filters)	Total	265	275
164	Tanning Salon: Independent, No Shower (r)	50/1,000 Gr SF	265	275
165	Tanning Salon: Within a Health Spa/Club	640/1,000 Gr SF	265	275
166	Theater: Drive-In	6/Vehicle	265	275
167	Theater: Live/Music/Opera	3/Seat	265	275
168	Theater: Cinema	3/Seat	265	275
169	Tract: Commercial/Residential	1/Acre	265	275
170	Trailer: Const/Field Office (e)	120/Office	265	275
171	Veterinary Clinic/Office	250/1,000 Gr SF	265	275
172	Warehouse	30/1,000 Gr SF	265	275
173	Warehouse w/ Office	Total	265	275
174	Waste Dump: Recreational	400/Station	2650	2750
175	Wine Tasting Room: Kitchen	200/1,000 Gr SF	265	275
176	Wine Tasting Room: All Area	50/1,000 Gr SF	265	275

APPENDIX C

WATER DEMAND CALCULATIONS

Table 5 Total Net Change In Water Demands From Existing To Proposed Land Uses

Net Change of Existing to Proposed Residential Land Uses			Water Use Factor	Water Demand (GPD)		Water Demand (AFY)	
MFR: 2-3	1,404	DUs	144 GPD/DU	202,651	GPD	227	AFY
MFR: 4 or More	742	DUs	144 GPD/DU	107,145	GPD	120	AFY
Institutional	(96)	DUs	77 GPD/DU	(7,392)	GPD	(8)	AFY
Mixed Use Res/Com	2,631	DUs	144 GPD/DU	379,798	GPD	425	AFY
SFR	(602)	DUs	204 GPD/DU	(122,422)	GPD	(137)	AFY
ADU	624	DUs	83 GPD/DU	51,480	GPD	58	AFY
Senior Housing	253	DUs	121 GPD/DU	30,613	GPD	34	AFY
TOTAL	**4,956**	**DUs**	**TOTAL**	**641,872**	**GPD**	**719**	**AFY**
Net Change of Existing to Proposed Non-Residential Land Uses			**Water Use Factor**	**Water Demand (GPD)**		**Water Demand (AFY)**	
Commercial	3,251,895	SF	0.06 GPD/SF	178,854	GPD	200	AFY
Industrial	2,147,114	SF	0.06 GPD/SF	118,091	GPD	132	AFY
Institutional	(148,107)	SF	0.13 GPD/SF	(19,550)	GPD	(22)	AFY
Mixed Use Res/Com	431,558	SF	0.06 GPD/SF	23,736	GPD	27	AFY
Utility	(461)	SF	0.06 GPD/SF	(25)	GPD	(0)	AFY
TOTAL	**5,681,999**	**SF**	**TOTAL**	**301,106**	**GPD**	**337**	**AFY**
TOTAL NET CHANGE IN WATER DEMANDS FROM EXISTING TO PROPOSED LAND USES				**942,978**	**GPD**	**1,056**	**AFY**

Sources

1 City of Los Angeles Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial. Accessed February 2024.

Notes

* 144 GPD/DU is derived from the average of the City of LAs Sewage Generation Factors for residential (apartments, condos, duplex/townhouse), which is an estimated (75+110+150+190 GPD/DU)/4 = 131 GPD/DU. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be (131 GPD/DU) * 1.1 = 144 GPD/DU

* 77 GPD/DU is derived from the City of LAs Sewage Generation Factors for Residential Dorm (College or Residential), which is 70 GPD/student. Assuming there is 1 student per institutional DU results in the factor 70 GPD/DU. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be (70 GPD/DU) * 1.1 = 77 GPD/DU

* 204 GPD/DU is derived from the average of the City of LAs Sewage Generation Factors for residential (SFD), which is an estimated (140+185+230 GPD/DU)/3 = 185 GPD/DU. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be (185 GPD/DU) * 1.1 = 204 GPD/DU

* 83 GPD/DU is derived from the City of LAs Sewage Generation Factors for residential (Bachelor Apartment), which is 75 GPD/DU. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be an estimated (75 GPD/DU) * 1.1 = 83 GPD/DU

* 121 GPD/DU is derived from the City of LAs Sewage Generation Factors for residential (1 Bedroom Apartment), which is 110 GPD/DU. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be an estimated (110 GPD/DU) * 1.1 = 121 GPD/DU

* 0.06 GPD/SF is derived from the City of LAs Sewage Generation Factors for Commercial Use (a) and Industrial Facility (b) both estimate that 50 GPD is produced per every 1000 square feet. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be (50 GPD/1000 SF) * 1.1 = 0.06 GPD/SF

* 0.13 GPD/SF is derived from the City of LAs Sewage Generation Factors for Office Building (a) which estimates that 120 GPD is produced per every 1000 square feet. Estimating that indoor and outdoor water demands are 10% greater than sewer flows the water demand would be (120 GPD/1000 SF) * 1.1 = 0.13 GPD/SF

APPENDIX D

SEWER FLOW CALCULATIONS

Table 9 Total Net Change In Sewer Flows From Existing To Proposed Land Uses

Net Change of Existing to Proposed Residential Land Uses			Sewer Use Factor	Sewer Flows (GPD)	Sewer Flows (AFY)
MFR: 2-3	1,404	DUs	131 GPD/DU	184,228 GPD	206 AFY
MFR: 4 or More	742	DUs	131 GPD/DU	97,404 GPD	109 AFY
Institutional	(96)	DUs	70 GPD/DU	(6,720) GPD	(8) AFY
Mixed Use Res/Com	2,631	DUs	131 GPD/DU	345,271 GPD	387 AFY
SFR	(602)	DUs	185 GPD/DU	(111,293) GPD	(125) AFY
ADU	624	DUs	75 GPD/DU	46,800 GPD	52 AFY
Senior Housing	253	DUs	110 GPD/DU	27,830 GPD	31 AFY
TOTAL	**4,956**	**DUs**	**TOTAL**	**583,520 GPD**	**654 AFY**
Net Change of Existing to Proposed Non-Residential Land Uses			**Sewer Use Factor**	**Sewer Flows (GPD)**	**Sewer Flows (AFY)**
Commercial	3,251,895	SF	0.05 GPD/SF	162,595 GPD	182 AFY
Industrial	2,147,114	SF	0.05 GPD/SF	107,356 GPD	120 AFY
Institutional	(148,107)	SF	0.12 GPD/SF	(17,773) GPD	(20) AFY
Mixed Use Res/Com	431,558	SF	0.05 GPD/SF	21,578 GPD	24 AFY
Utility	(461)	SF	0.05 GPD/SF	(23) GPD	(0) AFY
TOTAL	**5,681,999**	**SF**	**TOTAL**	**273,732 GPD**	**307 AFY**
TOTAL NET CHANGE IN SEWER FLOWS FROM EXISTING TO PROPOSED LAND USES				**857,253 GPD**	**960 AFY**

Sources

1 City of Los Angeles Sewerage Facilities Charge and Sewage Generation Factors for Residential and Commercial. Accessed February 2024.

Notes

* 131 GPD/DU is derived from the average of the City of LAs Sewage Generation Factors for residential (apartments, condos, duplex/townhouse), which is an estimated (75+110+150+190 GPD/DU)/4 = 131 GPD/DU.

* 70 GPD/DU is derived from the City of LAs Sewage Generation Factors for Residential Dorm (College or Residential), which is 70 GPD/student. Assuming there is 1 student per institutional DU results in the factor 70 GPD/DU.

* 185 GPD/DU is derived from the average of the City of LAs Sewage Generation Factors for residential (SFD), which is an estimated (140+185+230 GPD/DU)/3 = 185 GPD/DU.

* 75 GPD/DU is derived from the City of LAs Sewage Generation Factors for residential (Bachelor Apartment), which is 75 GPD/DU.

* 110 GPD/DU is derived from the City of LAs Sewage Generation Factors for residential (1 Bedroom Apartment), which is 110 GPD/DU.

* 0.05 GPD/SF is derived from the City of LAs Sewage Generation Factors for Commercial Use (a) and Industrial Facility (b) both estimate that 50 GPD is produced per every 1000 square feet.

* 0.12 GPD/SF is derived from the City of LAs Sewage Generation Factors for Office Building (a) which estimates that 120 GPD is produced per every 1000 square feet.

APPENDIX E

LACSD's Response to the City of Redondo Beach's NOP

LOS ANGELES COUNTY SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

June 22, 2023

Ref. DOC 6934827

VIA EMAIL GeneralPlanEIR@redondo.org

Mr. Sean Scully, Planning Manager
City of Redondo Beach
Community Development Department
415 Diamond Street
Redondo Beach, CA 90211

Dear Mr. Scully:

NOP Response to
Redondo Beach General Plan, Zoning Code Update and Local Coastal Program Amendment

The Los Angeles County Sanitation Districts (Districts) received a Notice of Preparation (NOP) of a Draft Environmental Impact Report for the subject project on May 30, 2023. The City of Redondo Beach (City) is located within the jurisdictional boundaries of District No. 5 and the South Bay Cities Sanitation District. We offer the following comments regarding sewerage service:

1. The Districts own, operate, and maintain six (6) wastewater pumping plants in the City that serve the local community: Green Lane, Herondo, Gertruda Avenue, Diamond Street, Clifton, and Hollywood Riviera Pumping Plants. Green Lane Pumping Plant is located at 2108 Green Lane and its emergency generator is located at 1928 Nelson Avenue. The other pumping plants are located at 200 Herondo Street, 601 North Gertruda Avenue, 145 North Catalina Avenue, 1960½ South Prospect Avenue, and 1901 Esplanade, respectively. Pursuant to California Government Code 53091, the Districts are exempt from the City's Building and Zoning Codes. The Districts do not object to the proposed land use specified in the draft General Plan at the locations of our pumping plants provided that any subsequent ordinances or regulations that may stem from any updates to the land use do not impact or otherwise limit our ability to continue to operate, maintain, or repair these critical wastewater conveyance facilities that serve the local community.

2. The Districts own, operate, and maintain the large trunk sewers that form the backbone of the regional wastewater conveyance system. Local collector and/or lateral sewer lines are the responsibility of the jurisdiction in which they are located. As such, the Districts cannot comment on any deficiencies in the sewerage system in the City except to state that presently no deficiencies exist in Districts' facilities that serve the City.

3. Wastewater generated by the residents and businesses in the City is treated at the Joint Water Pollution Control Plant located in the City of Carson, which has a capacity of 400 million gallons per day (mgd) and currently processes an average flow of 243.1 mgd.

4. The Districts should review all future individual developments within the City to determine whether or not sufficient trunk sewer capacity exists to serve each development and if Districts' facilities will be affected by the development. This is accomplished through the Districts' Will Serve Program, information for which can be found on our website at Will Serve Program.

5. The expected average wastewater flow from the City, described in the NOP as an additional 4,956 residential units and 5,681,999 square feet of non-residential uses, is approximately 2.8 mgd. For a copy of the Districts' average wastewater generation factors, go to www.lacsd.org, under Services, then Wastewater Program and Permits and select Will Serve Program, and click on the Table 1, Loadings for Each Class of Land Use link.

6. The Districts are empowered by the California Health and Safety Code to charge a fee to connect facilities (directly or indirectly) to the Districts' Sewerage System or to increase the strength or quantity of wastewater discharged from connected facilities. This connection fee is used by the Districts for its capital facilities. Payment of a connection fee may be required before this project is permitted to discharge to the Districts' Sewerage System. For more information and a copy of the Connection Fee Information Sheet, go to www.lacsd.org, under Services, then Wastewater (Sewage) and select Rates & Fees. In determining the impact to the Sewerage System and applicable connection fees, the Districts will determine the user category (e.g. Condominium, Single Family Home, etc.) that best represents the actual or anticipated use of the parcel(s) or facilities on the parcel(s) in the development. For more specific information regarding the connection fee application procedure and fees, please contact the Districts' Wastewater Fee Public Counter at (562) 908-4288, extension 2727.

7. In order for the Districts to conform to the requirements of the Federal Clean Air Act (CAA), the capacities of the Districts' wastewater treatment facilities are based on the regional growth forecast adopted by the Southern California Association of Governments (SCAG). Specific policies included in the development of the SCAG regional growth forecast are incorporated into clean air plans, which are prepared by the South Coast and Antelope Valley Air Quality Management Districts in order to improve air quality in the South Coast and Mojave Desert Air Basins as mandated by the CAA. All expansions of Districts' facilities must be sized and service phased in a manner that will be consistent with the SCAG regional growth forecast for the counties of Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. The available capacity of the Districts' treatment facilities will, therefore, be limited to levels associated with the approved growth identified by SCAG. As such, this letter does not constitute a guarantee of wastewater service but is to advise the City that the Districts intend to provide this service up to the levels that are legally permitted and to inform the City of the currently existing capacity and any proposed expansion of the Districts' facilities.

If you have any questions, please contact the undersigned at (562) 908-4288, extension 2743, or mandyhuffman@lacsd.org.

Very truly yours,

Mandy Huffman

Mandy Huffman
Environmental Planner
Facilities Planning Department

MNH:mnh

Appendix G Noise Data

Appendices

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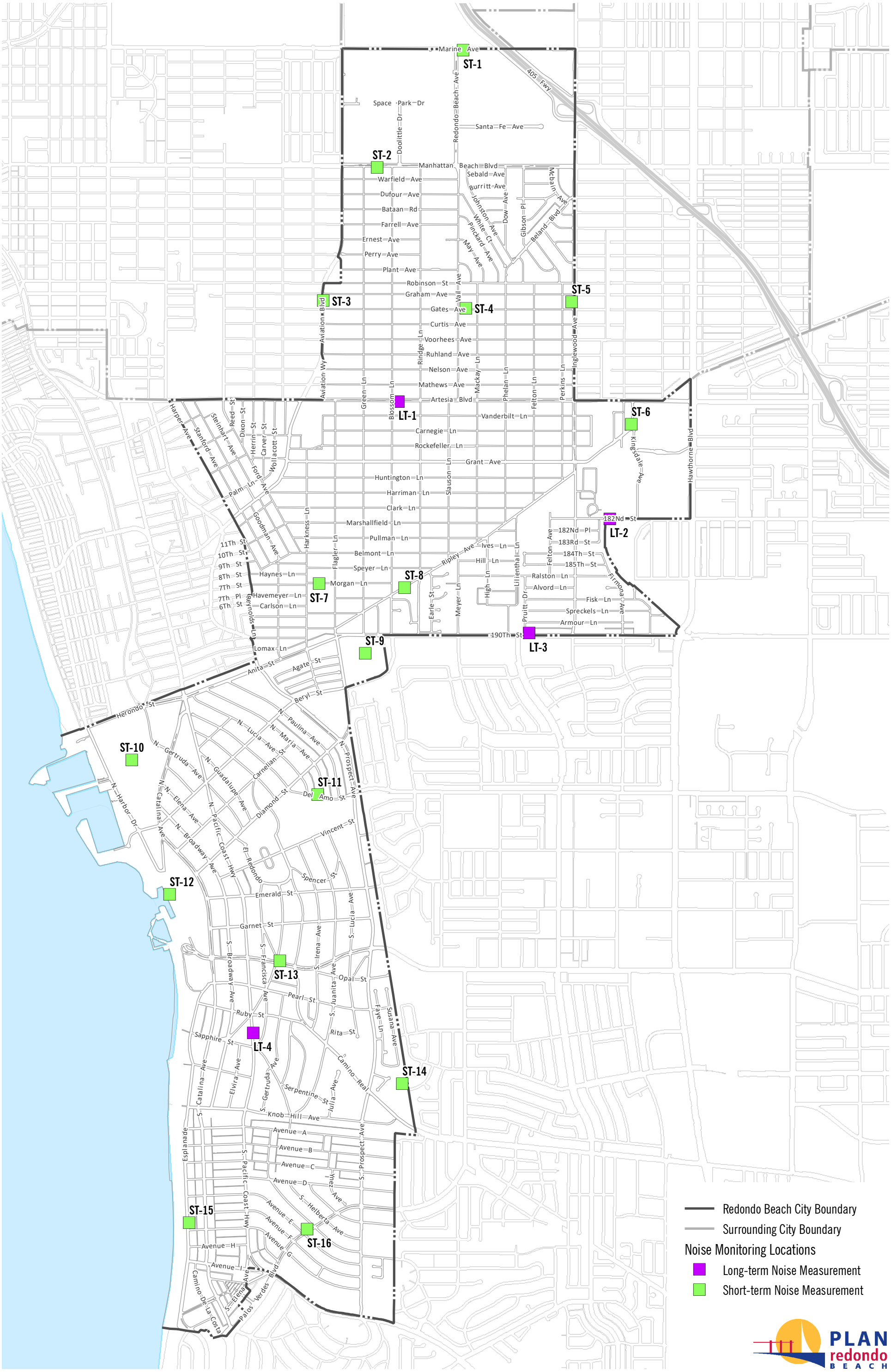
LIST OF ATTACHMENTS

Attachment A - Baseline (Existing) Noise Measurements

Attachment B - FHWA Highway Traffic Noise Prediction Model

ATTACHMENT A

Baseline (Existing) Noise Measurements



Noise Monitoring Locations

Redondo Beach General Plan

EXISTING SHORT-TERM BASELINE NOISE MEASUREMENT OUTPUTS

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #1 Time Start: 3:10 p.m. End: 3:25 p.m.

Site Location/Address: Southeast corner of the Marine Avenue/Redondo Beach Avenue Intersection - south side of Marine Avenue & 150 feet east of Redondo Beach Avenue.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	70.5
Lmax	90.9
Lmin	57.5
L2	77.0
L8	74.0
L25	59.5
L50	65.6
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
3:09 p.m.	Train idling in tracks	Negligible
	Ambient Background	60-62
	Auto Traffic	70-78
	Fast Vehicle	78

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
8.4	1.8	78	67


M
Metro
Redondo
Beach

Summary

File Name on Meter	LxT_Data.001
File Name on PC	SLM_0005426_LxT_Data_001.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 15:10:04
Stop	2018-09-12 15:25:05
Duration	00:15:00.8
Run Time	00:15:00.8
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}	70.5 dB		
LAE	100.1 dB		
EA	1.131 mPa²h		
EA8	36.170 mPa²h		
EA40	180.851 mPa²h		
$LA_{peak\ (max)}$	2018-09-12 15:23:35	108.7 dB	
LAS_{max}	2018-09-12 15:23:35	90.9 dB	
LAS_{min}	2018-09-12 15:25:05	57.5 dB	
SEA	-99.9 dB		

LAS > 85.0 dB (Exceedance Counts / Duration)	1	4.5 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	81.0 dB
LA_{eq}	70.5 dB
LC_{eq} - LA_{eq}	10.5 dB
LAI_{eq}	72.6 dB
LA_{eq}	70.5 dB
LAI_{eq} - LA_{eq}	2.1 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	70.5		81.0			
$L_{S(max)}$	90.9	2018/09/12 15:23:35				
$L_{S(min)}$	57.5	2018/09/12 15:25:05				
$L_{Peak(max)}$	108.7	2018/09/12 15:23:35				

# Overloads	0	
Overload Duration	0.0 s	

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.16	0.16	%
Projected Dose	5.03	5.03	%
TWA (Projected)	68.4	68.4	dB
TWA (t)	43.4	43.4	dB
Lep (t)	55.5	55.5	dB

Statistics		
LAS2.00	77.0	dB
LAS8.00	74.0	dB
LAS25.00	69.5	dB
LAS50.00	65.6	dB
LAS90.00	60.6	dB
LAS99.00	58.9	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #2 Time Start: 4:00 p.m. End: 4:15 p.m.

Site Location/Address: Manhattan Beach Boulevard, between Green Lane and Blossom Lane. South side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	72.4
Lmax	84.5
Lmin	52.4
L2	78.4
L8	76.8
L25	74.1
L50	70.2
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	53-56
	Traffic	72-78
	Medium Duty Truck	78
	Dump Truck	84

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
6	2	77	64

Summary

File Name on Meter	LxT_Data.002
File Name on PC	SLM_0005426_LxT_Data_002.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 16:01:22
Stop	2018-09-12 16:16:23
Duration	00:15:00.9
Run Time	00:15:00.9
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}	72.4 dB	
LAE	102.0 dB	
EA	1.751 mPa²h	
EA8	55.992 mPa²h	
EA40	279.958 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 16:06:46	101.7 dB
LAS_{max}	2018-09-12 16:08:04	84.5 dB
LAS_{min}	2018-09-12 16:15:27	51.5 dB
SEA	-99.9 dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	78.4 dB
LA_{eq}	72.4 dB
LC_{eq} - LA_{eq}	6.0 dB
LAI_{eq}	73.9 dB
LA_{eq}	72.4 dB
LAI_{eq} - LA_{eq}	1.5 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	72.4		78.4			
$L_{S(max)}$	84.5	2018/09/12 16:08:04				
$L_{S(min)}$	51.5	2018/09/12 16:15:27				
$L_{Peak(max)}$	101.7	2018/09/12 16:06:46				

# Overloads	0	
Overload Duration	0.0 s	

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.23	0.23	%
Projected Dose	7.47	7.47	%
TWA (Projected)	71.3	71.3	dB
TWA (t)	46.3	46.3	dB
Lep (t)	57.4	57.4	dB

Statistics		
LAS2.00	78.4	dB
LAS8.00	76.8	dB
LAS25.00	74.1	dB
LAS50.00	70.2	dB
LAS90.00	58.6	dB
LAS99.00	52.4	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #3 Time Start: 4:34 p.m. End: 4:49 p.m.

Site Location/Address: Aviation Boulevard, between Graham Avenue and Gates Avenue. East side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	71.2
Lmax	87.3
Lmin	49.9
L2	77.2
L8	74.9
L25	72.9
L50	68.3
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	60
	Traffic	73-76
	Fast motorist 1	83
	Fast motorist 2	86

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
5	2	76	71

Summary

File Name on Meter	LxT_Data.003
File Name on PC	SLM_0005426_LxT_Data_003.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 16:34:42
Stop	2018-09-12 16:49:42
Duration	00:15:00.7
Run Time	00:15:00.7
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}		71.2 dB		
LAE		100.8 dB		
EA		1.334 mPa²h		
EA8		42.645 mPa²h		
EA40		213.227 mPa²h		
$LA_{peak\ (max)}$	2018-09-12 16:44:41		110.4 dB	
LAS_{max}	2018-09-12 16:44:41		87.3 dB	
LAS_{min}	2018-09-12 16:42:40		49.9 dB	
SEA		-99.9 dB		

LAS > 85.0 dB (Exceedance Counts / Duration)	1	1.7 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	79.8 dB	
LA_{eq}	71.2 dB	
LC_{eq} - LA_{eq}	8.5 dB	
LAI_{eq}	73.2 dB	
LA_{eq}	71.2 dB	
LAI_{eq} - LA_{eq}	2.0 dB	

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	71.2		79.8			
$L_{S(max)}$	87.3	2018/09/12 16:44:41				
$L_{S(min)}$	49.9	2018/09/12 16:42:40				
$L_{Peak(max)}$	110.4	2018/09/12 16:44:41				

# Overloads	0	
Overload Duration	0.0 s	

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB

Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.20	0.20 %
Projected Dose	6.27	6.27 %
TWA (Projected)	70.0	70.0 dB
TWA (t)	45.0	45.0 dB
Lep (t)	56.2	56.2 dB

Statistics	
LAS2.00	77.2 dB
LAS8.00	74.9 dB
LAS25.00	72.9 dB
LAS50.00	68.3 dB
LAS90.00	59.1 dB
LAS99.00	53.8 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #4 Time Start: 5:01 p.m. End: 5:16 p.m.

Site Location/Address: Gates Avenue, between Vail Avenue and McKay Lane.
South side of the street.

Primary Noise Source: Wind through trees. Typical neighborhood noise.

Measurement Results	
Percentiles	dBA
Leq	54.1
Lmax	69.3
Lmin	42.0
L2	64.4
L8	58.3
L25	50.7
L50	48.0
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	43.5
	Bicycle Traversing over Manhole Cover	73-76
	Motorist 1	62
	Motorist 2	67
	Overhead Plane	50-60
	Slow Utility Truck	68

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
9.4	4	75	72

Summary

File Name on Meter	LxT_Data.004
File Name on PC	SLM_0005426_LxT_Data_004.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 17:01:12
Stop	2018-09-12 17:16:13
Duration	00:15:00.6
Run Time	00:15:00.6
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}		54.1	dB	
LAE		83.6	dB	
EA		25.666	µPa²h	
EA8		820.751	µPa²h	
EA40		4.104	mPa²h	
$LA_{peak\ (max)}$	2018-09-12 17:11:56	92.4	dB	
LAS_{max}	2018-09-12 17:15:04	69.3	dB	
LAS_{min}	2018-09-12 17:02:24	42.0	dB	
SEA		-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

LC_{eq}	65.4	dB	
LA_{eq}	54.1	dB	
LC_{eq} - LA_{eq}	11.3	dB	
LAI_{eq}	58.0	dB	
LA_{eq}	54.1	dB	
LAI_{eq} - LA_{eq}	3.9	dB	

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	54.1		65.4			
$L_{S(max)}$	69.3	2018/09/12 17:15:04				
$L_{S(min)}$	42.0	2018/09/12 17:02:24				
$L_{Peak(max)}$	92.4	2018/09/12 17:11:56				

# Overloads	0		
Overload Duration	0.0	s	

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.02	0.02	%
Projected Dose	0.50	0.50	%
TWA (Projected)	51.8	51.8	dB
TWA (t)	26.8	26.8	dB
Lep (t)	39.0	39.0	dB

Statistics		
LAS2.00	64.4	dB
LAS8.00	58.3	dB
LAS25.00	50.7	dB
LAS50.00	48.0	dB
LAS90.00	44.4	dB
LAS99.00	42.8	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #5 Time Start: 5:24 p.m. End: 5:39 p.m.

Site Location/Address: Inglewood Avenue, between Graham Avenue and Gates Avenue. West side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	71.2
Lmax	82.9
Lmin	52.7
L2	76.0
L8	74.2
L25	72.8
L50	70.3
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	52
	Barking Dog 1	82
	Traffic	71-75
	Barking Dog 2	70
	Fast Motorist	78

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
6.5	3	76	69


NO
PARKING
NO
PARKING

Summary

File Name on Meter	LxT_Data.005
File Name on PC	SLM_0005426_LxT_Data_005.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 17:24:24
Stop	2018-09-12 17:39:25
Duration	00:15:00.7
Run Time	00:15:00.7
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}		71.2	dB	
LAE		100.8	dB	
EA		1.324	mPa^2h	
EA8		42.332	mPa^2h	
EA40		211.660	mPa^2h	
$LA_{peak\ (max)}$	2018-09-12 17:30:15	104.1	dB	
LAS_{max}	2018-09-12 17:30:16	82.9	dB	
LAS_{min}	2018-09-12 17:38:44	52.7	dB	
SEA		-99.9	dB	
LAS > 85.0 dB (Exceedance Counts / Duration)		0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)		0	0.0	s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)		0	0.0	s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)		0	0.0	s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)		0	0.0	s
LC_{eq}		77.0	dB	
LA_{eq}		71.2	dB	
$LCeq - LAeq$		5.8	dB	
LAI_{eq}		73.5	dB	
LA_{eq}		71.2	dB	
$LAI_{eq} - LA_{eq}$		2.3	dB	

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	71.2		77.0			
$L_{S(max)}$	82.9	2018/09/12 17:30:16				
$L_{S(min)}$	52.7	2018/09/12 17:38:44				
$L_{Peak(max)}$	104.1	2018/09/12 17:30:15				

# Overloads	0		
Overload Duration	0.0	s	

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.21	0.21	%
Projected Dose	6.82	6.82	%
TWA (Projected)	70.6	70.6	dB
TWA (t)	45.6	45.6	dB
Lep (t)	56.2	56.2	dB

Statistics		
LAS2.00	76.0	dB
LAS8.00	74.2	dB
LAS25.00	72.8	dB
LAS50.00	70.3	dB
LAS90.00	62.3	dB
LAS99.00	54.1	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #6 Time Start: 5:55 p.m. End: 6:10 p.m.

Site Location/Address: Kingsdale Avenue, just north of Grant Avenue/Kingsdale Avenue Intersection. 450 feet south of Artesia Boulevard. West side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	68.9
Lmax	88.9
Lmin	58.3
L2	73.5
L8	70.8
L25	67.9
L50	65.4
Other	
SEL/CNEL	58.3

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	61
	Medium Duty Truck	72
	Traffic	65
	Bus	73
	Fast Motorist	87-89

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.007
File Name on PC	SLM_0005426_LxT_Data_007.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 17:55:07
Stop	2018-09-12 18:10:07
Duration	00:15:00.8
Run Time	00:15:00.8
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}		68.9 dB		
LAE		98.5 dB		
EA		785.582 µPa²h		
EA8		25.116 mPa²h		
EA40		125.582 mPa²h		
$LA_{peak\ (max)}$	2018-09-12 18:06:33		109.1 dB	
LAS_{max}	2018-09-12 18:06:31		88.8 dB	
LAS_{min}	2018-09-12 18:06:47		58.3 dB	
SEA		-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)		1	4.9 s	
LAS > 115.0 dB (Exceedance Counts / Duration)		0	0.0 s	
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)		0	0.0 s	
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)		0	0.0 s	
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)		0	0.0 s	
LC_{eq}		78.5 dB		
LA_{eq}		68.9 dB		
$LCeq - LAeq$		9.6 dB		
LAI_{eq}		71.5 dB		
LA_{eq}		68.9 dB		
$LAI_{eq} - LA_{eq}$		2.5 dB		

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	68.9		78.5			
$L_{S(max)}$	88.8	2018/09/12 18:06:31				
$L_{S(min)}$	58.3	2018/09/12 18:06:47				
$L_{Peak(max)}$	109.1	2018/09/12 18:06:33				

# Overloads	0	
Overload Duration	0.0 s	

Dose Settings

Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.13	0.13	%
Projected Dose	4.19	4.19	%
TWA (Projected)	67.1	67.1	dB
TWA (t)	42.1	42.1	dB
Lep (t)	53.9	53.9	dB

Statistics		
LAS2.00	73.5	dB
LAS8.00	70.8	dB
LAS25.00	67.7	dB
LAS50.00	65.4	dB
LAS90.00	61.7	dB
LAS99.00	59.1	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #7 Time Start: 6:36 p.m. End: 6:51 p.m.

Site Location/Address: Morgan Lane, between Flagler Lane and Harkness Lane. South side of street. Just north of Jefferson Elementary School.

Primary Noise Source: Traffic

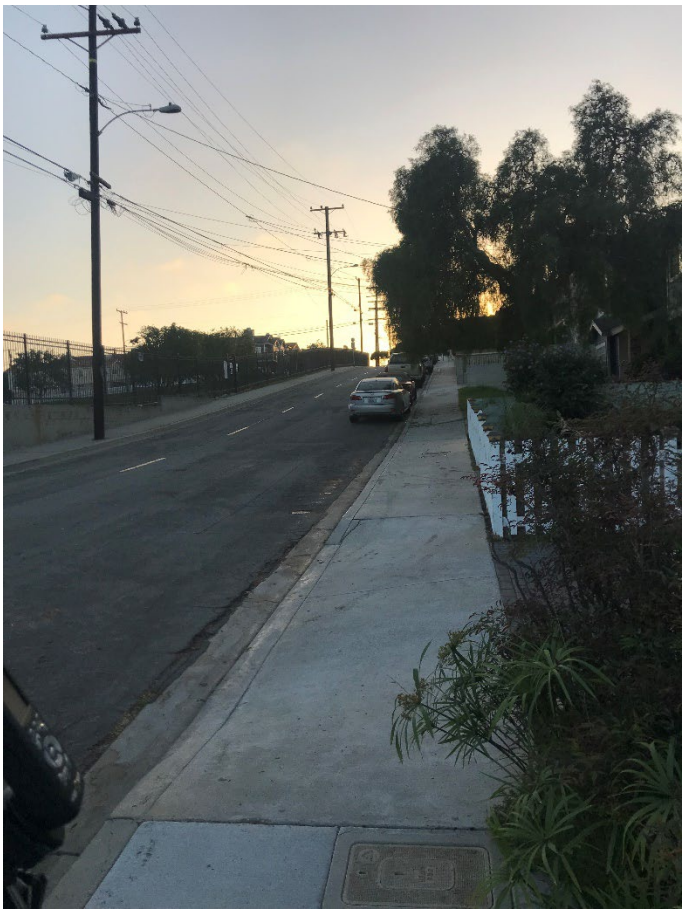
Measurement Results	
Percentiles	dBA
Leq	52.8
Lmax	73.8
Lmin	39.7
L2	63.3
L8	54.6
L25	48.4
L50	44.0
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	41
	Overhead Plane	50
	Distant Motorist	54
	Car Alarm	72
	Birds	51

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A



Summary

File Name on Meter	LxT_Data.009
File Name on PC	SLM_0005426_LxT_Data_009.01.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	igarcia
Location	OC
Job Description	CORB-01.0
Note	Redondo Beach GP ST Monitoring

Measurement

Description	
Start	2018-09-12 18:36:01
Stop	2018-09-12 18:51:03
Duration	00:15:01.4
Run Time	00:15:01.4
Pause	00:00:00.0
Pre Calibration	2018-09-12 14:57:03
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.1 dB			
	A	**C**	**Z**	
Under Range Peak	**100.3**	97.3	102.3	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.3	dB

Results

LA_{eq}		52.8	dB	
LAE		82.3	dB	
EA		19.070	µPa²h	
EA8		609.283	µPa²h	
EA40		3.046	mPa²h	
$LA_{peak\ (max)}$	2018-09-12 18:36:43	99.3	dB	
LAS_{max}	2018-09-12 18:40:37	73.8	dB	
LAS_{min}	2018-09-12 18:47:23	39.7	dB	
SEA		-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

LC_{eq}	62.5	dB
LA_{eq}	52.8	dB
LC_{eq} - LA_{eq}	9.7	dB
LAI_{eq}	58.4	dB
LA_{eq}	52.8	dB
LAI_{eq} - LA_{eq}	5.6	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	52.8		62.5			
$L_{S(max)}$	73.8	2018/09/12 18:40:37				
$L_{S(min)}$	39.7	2018/09/12 18:47:23				
$L_{Peak(max)}$	99.3	2018/09/12 18:36:43				

# Overloads	0	
Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB

Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.01	0.01	%
Projected Dose	0.36	0.36	%
TWA (Projected)	49.3	49.3	dB
TWA (t)	24.3	24.3	dB
Lep (t)	37.8	37.8	dB

Statistics		
LAS2.00	63.3	dB
LAS8.00	54.6	dB
LAS25.00	48.4	dB
LAS50.00	44.0	dB
LAS90.00	41.3	dB
LAS99.00	40.3	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #8 Time Start: 2:54 p.m. End: 3:09 p.m.

Site Location/Address: Ripley Avenue, between Blossom Lane and Rindge Lane. South side of street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	61.9
Lmax	75.4
Lmin	48.9
L2	69.7
L8	65.8
L25	62.1
L50	58.4
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.003
File Name on PC	SLM_0005425_LxT_Data_003.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 14:54:03
Stop	2018-09-12 15:09:07
Duration	00:15:03.6
Run Time	00:15:03.6
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1		
Microphone Correction	Off		
Integration Method	Linear		
Overload	144.9 dB		
	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

LA_{eq}	61.9 dB	
LAE	91.5 dB	
EA	155.367 µPa²h	
EA8	4.952 mPa²h	
EA40	24.760 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 15:05:19	92.7 dB
LAS_{max}	2018-09-12 15:05:32	75.4 dB
LAS_{min}	2018-09-12 14:57:44	48.9 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s
LC_{eq}	73.6 dB	
LA_{eq}	61.9 dB	
LC_{eq} - LA_{eq}	11.7 dB	

LAIeq	63.9	dB
LAeq	61.9	dB
LAIeq - LAeq	2.0	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	61.9		73.6			
LS(max)	75.4	2018/09/12 15:05:32				
LS(min)	48.9	2018/09/12 14:57:44				
LPeak(max)	92.7	2018/09/12 15:05:19				

# Overloads	0	
Overload Duration	0.0	s

Dose Settings			
Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.05	0.05	%
Projected Dose	1.70	1.70	%
TWA (Projected)	60.6	60.6	dB
TWA (t)	35.6	35.6	dB
Lep (t)	46.9	46.9	dB

Statistics		
LAS2.00	69.7	dB
LAS8.00	65.8	dB
LAS25.00	62.1	dB
LAS50.00	58.4	dB
LAS90.00	53.2	dB
LAS99.00	51.3	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #9 Time Start: 1:20 p.m. End: 1:35 p.m.

Site Location/Address: Dominguez Park

Primary Noise Source: Traffic. Little League baseball game.

Measurement Results	
Percentiles	dBA
Leq	65.2
Lmax	99.7
Lmin	46.9
L2	71.5
L8	68.9
L25	66.0
L50	56.5
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.004
File Name on PC	SLM_0005425_LxT_Data_004.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 15:20:45
Stop	2018-09-12 15:35:51
Duration	00:15:05.5
Run Time	00:15:05.5
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1		
Microphone Correction	Off		
Integration Method	Linear		
Overload	144.9 dB		
	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

L_{Aeq}	65.2 dB	
LAE	94.8 dB	
EA	336.577 µPa²h	
EA8	10.705 mPa²h	
EA40	53.525 mPa²h	
$L_{Apeak\ (max)}$	2018-09-12 15:23:03	99.7 dB
L_{ASmax}	2018-09-12 15:32:12	77.7 dB
L_{ASmin}	2018-09-12 15:21:08	46.9 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{Apeak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{Apeak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
L_{Apeak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	74.7 dB
LA_{eq}	65.2 dB
LC_{eq} - LA_{eq}	9.4 dB
LAI_{eq}	66.6 dB
LA_{eq}	65.2 dB
LAI_{eq} - LA_{eq}	1.4 dB

	A		C		Z	
	dB	Time Stamp	dB	Time Stamp	dB	Time Stamp
L_{eq}	65.2		74.7			
$L_{S(max)}$	77.7	2018/09/12 15:32:12				
$L_{S(min)}$	46.9	2018/09/12 15:21:08				
$L_{Peak(max)}$	99.7	2018/09/12 15:23:03				

# Overloads	0
Overload Duration	0.0 s

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.09	0.09 %
Projected Dose	2.84	2.84 %
TWA (Projected)	64.3	64.3 dB
TWA (t)	39.4	39.4 dB
Lep (t)	50.2	50.2 dB

Statistics	
LAS2.00	71.5 dB
LAS8.00	68.9 dB
LAS25.00	66.0 dB
LAS50.00	63.3 dB
LAS90.00	56.5 dB
LAS99.00	50.2 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #10 Time Start: 1:57 p.m. End: 2:12 p.m.

Site Location/Address: Kay Etow Park, across from Electric Substation

Primary Noise Source: Typical park activity. Traffic

Measurement Results	
Percentiles	dBA
Leq	67.8
Lmax	90.4
Lmin	77.4
L2	74.0
L8	72.6
L25	69.7
L50	63.9
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.005
File Name on PC	SLM_0005425_LxT_Data_005.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 15:57:07
Stop	2018-09-12 16:12:09
Duration	00:15:01.5
Run Time	00:15:01.5
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1		
Microphone Correction	Off		
Integration Method	Linear		
Overload	144.9 dB		
	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

LA_{eq}	67.8 dB	
LAE	97.3 dB	
EA	600.381 µPa²h	
EA8	19.180 mPa²h	
EA40	95.901 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 16:10:09	90.4 dB
LAS_{max}	2018-09-12 16:03:10	77.4 dB
LAS_{min}	2018-09-12 16:08:35	49.5 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s

LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	75.2 dB
LA_{eq}	67.8 dB
LC_{eq} - LA_{eq}	7.4 dB
LAI_{eq}	68.9 dB
LA_{eq}	67.8 dB
LAI_{eq} - LA_{eq}	1.1 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	67.8		75.2			
$L_{S(max)}$	77.4	2018/09/12 16:03:10				
$L_{S(min)}$	49.5	2018/09/12 16:08:35				
$L_{Peak(max)}$	90.4	2018/09/12 16:10:09				

# Overloads	0
Overload Duration	0.0 s

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.12	0.12 %
Projected Dose	3.89	3.89 %
TWA (Projected)	66.6	66.6 dB
TWA (t)	41.6	41.6 dB
Lep (t)	52.7	52.7 dB

Statistics	
LAS2.00	74.0 dB
LAS8.00	72.6 dB
LAS25.00	69.7 dB
LAS50.00	63.9 dB
LAS90.00	56.4 dB
LAS99.00	52.5 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #11 Time Start: 4:32 p.m. End: 4:47 p.m.

Site Location/Address: Del Amo Boulevard, between N Lucia Avenue and N Maria Avenue. North side of street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	55.5
Lmax	67.7
Lmin	51.2
L2	62.9
L8	58.1
L25	55.0
L50	53.7
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.006
File Name on PC	SLM_0005425_LxT_Data_006.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 16:32:35
Stop	2018-09-12 16:47:36
Duration	00:15:00.6
Run Time	00:15:00.6
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1		
Microphone Correction	Off		
Integration Method	Linear		
Overload	144.9 dB		
	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

LA_{eq}	55.5 dB	
LAE	85.0 dB	
EA	35.227 µPa²h	
EA8	1.127 mPa²h	
EA40	5.633 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 16:41:13	92.2 dB
LAS_{max}	2018-09-12 16:32:41	67.7 dB
LAS_{min}	2018-09-12 16:38:07	51.2 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

L_{Ceq}	65.4 dB
L_{Aeq}	55.5 dB
L_{Ceq} - L_{Aeq}	9.9 dB
L_{AIeq}	61.5 dB
L_{Aeq}	55.5 dB
L_{AIeq} - L_{Aeq}	6.1 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	55.5		65.4			
$L_{S(max)}$	67.7	2018/09/12 16:32:41				
$L_{S(min)}$	51.2	2018/09/12 16:38:07				
$L_{Peak(max)}$	92.2	2018/09/12 16:41:13				

# Overloads	0
Overload Duration	0.0 s

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.02	0.02 %
Projected Dose	0.78	0.78 %
TWA (Projected)	55.0	55.0 dB
TWA (t)	30.0	30.0 dB
Lep (t)	40.4	40.4 dB

Statistics	
LAS2.00	62.9 dB
LAS8.00	58.1 dB
LAS25.00	55.0 dB
LAS50.00	53.7 dB
LAS90.00	52.4 dB
LAS99.00	51.6 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #12 Time Start: 5:07 p.m. End: 5:22 p.m.

Site Location/Address: Redondo Beach Pier

Primary Noise Source: Commercial activity. Pedestrians.

Measurement Results	
Percentiles	dBA
Leq	63.7
Lmax	78.3
Lmin	50.7
L2	72.2
L8	67.5
L25	63.5
L50	60.6
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.007
File Name on PC	SLM_0005425_LxT_Data_007.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 17:07:14
Stop	2018-09-12 17:22:15
Duration	00:15:01.4
Run Time	00:15:01.4
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
Overload	144.9 dB

	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

L_{Aeq}	63.7 dB	
LAE	93.2 dB	
EA	233.773 µPa²h	
EA8	7.469 mPa²h	
EA40	37.346 mPa²h	
$L_{Apeak\ (max)}$	2018-09-12 17:09:26	94.3 dB
L_{ASmax}	2018-09-12 17:12:56	78.3 dB
L_{ASmin}	2018-09-12 17:11:50	50.7 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s

LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	74.7	dB
LA_{eq}	63.7	dB
LC_{eq} - LA_{eq}	11.1	dB
LAI_{eq}	65.4	dB
LA_{eq}	63.7	dB
LAI_{eq} - LA_{eq}	1.8	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	63.7		74.7			
$L_{S(max)}$	78.3	2018/09/12 17:12:56				
$L_{S(min)}$	50.7	2018/09/12 17:11:50				
$L_{Peak(max)}$	94.3	2018/09/12 17:09:26				

# Overloads	0	
Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results

Dose	0.07	0.07	%
Projected Dose	2.21	2.21	%
TWA (Projected)	62.5	62.5	dB
TWA (t)	37.5	37.5	dB
Lep (t)	48.6	48.6	dB

Statistics

LAS2.00	72.2	dB
LAS8.00	67.5	dB
LAS25.00	63.5	dB
LAS50.00	60.6	dB
LAS90.00	55.8	dB
LAS99.00	52.4	dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #13 Time Start: 5:37 p.m. End: 5:52 p.m.

Site Location/Address: Torrance Boulevard, between S Guadalupe Avenue and S Helberta Avenue. North side of street

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	64.0
Lmax	75.5
Lmin	48.3
L2	69.6
L8	67.8
L25	65.4
L50	62.8
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.008
File Name on PC	SLM_0005425_LxT_Data_008.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 17:37:58
Stop	2018-09-12 17:52:59
Duration	00:15:01.3
Run Time	00:15:01.3
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	144.9 dB			
	A	**C**	**Z**	
Under Range Peak	**101.2**	98.2	103.2	dB
Under Range Limit	**37.6**	35.6	43.6	dB
Noise Floor	24.8	25.3	32.8	dB

Results

LA_{eq}	64.0	dB	
LAE	93.6	dB	
EA	252.034	µPa²h	
EA8	8.053	mPa²h	
EA40	40.267	mPa²h	
$LA_{peak\ (max)}$	2018-09-12 17:44:03	94.3	dB
LAS_{max}	2018-09-12 17:39:04	75.5	dB
LAS_{min}	2018-09-12 17:43:07	48.3	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s

LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{eq}	73.3	dB
LA_{eq}	64.0	dB
LC_{eq} - LA_{eq}	9.3	dB
LAI_{eq}	65.6	dB
LA_{eq}	64.0	dB
LAI_{eq} - LA_{eq}	1.6	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	64.0		73.3			
$L_{S(max)}$	75.5	2018/09/12 17:39:04				
$L_{S(min)}$	48.3	2018/09/12 17:43:07				
$L_{Peak(max)}$	94.3	2018/09/12 17:44:03				

# Overloads	0	
Overload Duration	0.0	s

Dose Settings			
Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results			
Dose	0.08	0.08	%
Projected Dose	2.44	2.44	%
TWA (Projected)	63.2	63.2	dB
TWA (t)	38.2	38.2	dB
Lep (t)	49.0	49.0	dB

Statistics		
LAS2.00	69.6	dB
LAS8.00	67.8	dB
LAS25.00	65.4	dB
LAS50.00	62.8	dB
LAS90.00	53.0	dB
LAS99.00	48.9	dB

Project Name: Redondo Beach General Plan Date: 09/14/2018

Project Number: 2023-036.04 Monitoring Personnel: IG

Monitoring Site #: Short Term #14 Time Start: 2:19 p.m. End: 2:34 p.m.

Site Location/Address: Hopkins Wilderness Park, at pavilion.

Primary Noise Source: Children playing. Constant overhead air traffic.

Measurement Results	
Percentiles	dBA
Leq	54.0
Lmax	66.6
Lmin	44.7
L2	63.4
L8	58.3
L25	52.8
L50	48.9
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA
	Ambient Background	47-48
	Overhead Planes	54-60
	Children Playing	52-65

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.010
File Name on PC	SLM_0005426_LxT_Data_010.00.ldbin
Serial Number	0005426
Model	SoundTrack LxT®
Firmware Version	2.301
User	IG
Location	ST14
Job Description	Redondo Beach General Plan
Note	ST14 Park 14-Sep-2018

Measurement

Description	
Start	2018-09-14 14:19:49
Stop	2018-09-14 14:34:51
Duration	00:15:01.9
Run Time	00:15:01.9
Pause	00:00:00.0
Pre Calibration	2018-09-14 12:12:10
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
Overload	144.2 dB

	A	**C**	**Z**	
Under Range Peak	**100.4**	97.4	102.4	dB
Under Range Limit	**37.2**	35.2	43.2	dB
Noise Floor	24.4	24.9	32.4	dB

Results

LA_{eq}	54.0 dB

LAE		83.6	dB
EA		25.300	µPa²h
EA8		807.895	µPa²h
EA40		4.039	mPa²h
LApeak (max)	2018-09-14 14:26:30	82.7	dB
LASmax	2018-09-14 14:22:36	66.6	dB
LASmin	2018-09-14 14:30:56	44.7	dB
SEA		-99.9	dB

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LApeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	67.5	dB
LAeq	54.0	dB
LCeq - LAeq	13.5	dB
LAleq	57.8	dB
LAeq	54.0	dB
LAleq - LAeq	3.8	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	54.0		67.5			
LS(max)	66.6	2018/09/14 14:22:36				
LS(min)	44.7	2018/09/14 14:30:56				
LPeak(max)	82.7	2018/09/14 14:26:30				

# Overloads	0	
Overload Duration	0.0	s

Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results		
Dose	0.02	0.02 %
Projected Dose	0.55	0.55 %
TWA (Projected)	52.5	52.5 dB
TWA (t)	27.5	27.5 dB
Lep (t)	39.0	39.0 dB

Statistics	
LAS2.00	63.4 dB
LAS8.00	58.3 dB
LAS25.00	52.8 dB
LAS50.00	48.9 dB
LAS90.00	46.2 dB
LAS99.00	45.1 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #15 Time Start: 6:07 p.m. End: 6:22 p.m.

Site Location/Address: Esplanade, between Avenue G and Avenue F. East side of street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	52.9
Lmax	65.3
Lmin	48.4
L2	58.2
L8	55.1
L25	52.9
L50	51.7
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.009
File Name on PC	SLM_0005425_LxT_Data_009.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 18:07:20
Stop	2018-09-12 18:22:23
Duration	00:15:02.6
Run Time	00:15:02.6
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	A Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Linear
Overload	144.9 dB

	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

LA_{eq}	52.9 dB	
LAE	82.4 dB	
EA	19.395 µPa²h	
EA8	618.838 µPa²h	
EA40	3.094 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 18:21:57	85.2 dB
LAS_{max}	2018-09-12 18:15:47	65.3 dB
LAS_{min}	2018-09-12 18:10:24	48.4 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LCeq	68.0 dB
LAeq	52.9 dB
LCeq - LAeq	15.1 dB
LAleq	57.1 dB
LAeq	52.9 dB
LAleq - LAeq	4.2 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	52.9		68.0			
LS(max)	65.3	2018/09/12 18:15:47				
LS(min)	48.4	2018/09/12 18:10:24				
LPeak(max)	85.2	2018/09/12 18:21:57				

# Overloads	0
Overload Duration	0.0 s

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.02	0.02 %
Projected Dose	0.55	0.55 %
TWA (Projected)	52.5	52.5 dB
TWA (t)	27.5	27.5 dB
Lep (t)	37.8	37.8 dB

Statistics	
LAS2.00	58.2 dB
LAS8.00	55.1 dB
LAS25.00	52.9 dB
LAS50.00	51.7 dB
LAS90.00	49.9 dB
LAS99.00	48.9 dB

Project Name: Redondo Beach General Plan Date: 09/12/2018

Project Number: 2023-036.04 Monitoring Personnel: JC

Monitoring Site #: Short Term #16 Time Start: 6:30 p.m. End: 6:45 p.m.

Site Location/Address: Palos Verdes Boulevard, between Avenue E and S Gertruda Avenue. North side of street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Leq	62.8
Lmax	77.9
Lmin	43.9
L2	71.5
L8	68.3
L25	62.5
L50	55.3
Other	
SEL/CNEL	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
N/A	N/A	N/A	N/A

Summary

File Name on Meter	LxT_Data.010
File Name on PC	SLM_0005425_LxT_Data_010.00.ldbin
Serial Number	0005425
Model	SoundTrack LxT®
Firmware Version	2.301
User	JC
Location	Redondo Beach
Job Description	CORB-01 Redondo Beach GP
Note	

Measurement

Description	
Start	2018-09-12 18:30:06
Stop	2018-09-12 18:45:07
Duration	00:15:00.5
Run Time	00:15:00.5
Pause	00:00:00.0
Pre Calibration	2018-09-12 10:29:15
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting		
Peak Weight	A Weighting		
Detector	Slow		
Preamp	PRMLxT1		
Microphone Correction	Off		
Integration Method	Linear		
Overload	144.9 dB		
	A	**C**	**Z**
Under Range Peak	**101.2**	98.2	103.2 dB
Under Range Limit	**37.6**	35.6	43.6 dB
Noise Floor	24.8	25.3	32.8 dB

Results

LA_{eq}	62.8 dB	
LAE	92.3 dB	
EA	189.218 µPa²h	
EA8	6.052 mPa²h	
EA40	30.258 mPa²h	
$LA_{peak\ (max)}$	2018-09-12 18:42:22	94.9 dB
LAS_{max}	2018-09-12 18:36:10	77.9 dB
LAS_{min}	2018-09-12 18:40:29	43.9 dB
SEA	-99.9 dB	
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LA_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

L_{Ceq}	70.0 dB
L_{Aeq}	62.8 dB
L_{Ceq} - L_{Aeq}	7.3 dB
L_{AIeq}	65.5 dB
L_{Aeq}	62.8 dB
L_{AIeq} - L_{Aeq}	2.8 dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
L_{eq}	62.8		70.0			
$L_{S(max)}$	77.9	2018/09/12 18:36:10				
$L_{S(min)}$	43.9	2018/09/12 18:40:29				
$L_{Peak(max)}$	94.9	2018/09/12 18:42:22				

# Overloads	0
Overload Duration	0.0 s

Dose Settings		
Dose Name	OSHA-1	OSHA-2
Exchange Rate	5	5 dB
Threshold	90	80 dB
Criterion Level	90	90 dB
Criterion Duration	8	8 h

Results		
Dose	0.05	0.05 %
Projected Dose	1.68	1.68 %
TWA (Projected)	60.5	60.5 dB
TWA (t)	35.5	35.5 dB
Lep (t)	47.7	47.7 dB

Statistics	
LAS2.00	71.5 dB
LAS8.00	68.3 dB
LAS25.00	62.5 dB
LAS50.00	55.3 dB
LAS90.00	46.8 dB
LAS99.00	44.5 dB

EXISTING LONG-TERM BASELINE NOISE MEASUREMENT OUTPUTS

Project Name: Redondo Beach General Plan

Date: 09/12/2018

Project Number: 2023-036.04

Monitoring Personnel: IG

Monitoring Site #: Long Term #1

Time Start: 8:00 am on Sept 12, 2018

End: 11:00 am on Sept 14, 2018

Site Location/Address: Artesia Boulevard, between Blossom Lane and Rindge Lane. South side of street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Ldn	75.0
Leq	70.1
Lmax	87.5
Lmin	49.1
L2	77.1
L8	74.0
L25	70.0
L50	65.6
Other	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity


BAY SPA

C:\LARDAV\SLMUTIL\KIT6.bin Interval Data

Date	Time	Duration	Leq	SEL	Lmax	Lmin	L(2)	L(8)	L(25)	L(50)	L(99)	L(99)
12Sep	18 08:00:00	3600.0	72.6	108.1	86.5	53.0	78.9	76.4	73.5	70.5	57.0	57.0
12Sep	18 09:00:00	3600.0	72.0	107.5	86.6	52.8	78.1	76.0	73.2	70.0	54.7	54.7
12Sep	18 10:00:00	3600.0	72.1	107.7	87.8	51.5	78.6	76.2	73.1	69.6	55.2	55.2
12Sep	18 11:00:00	3600.0	72.2	107.8	87.3	53.8	79.0	76.1	73.3	70.0	56.2	56.2
12Sep	18 12:00:00	3600.0	72.3	107.9	91.3	53.2	78.8	76.0	73.3	70.2	55.2	55.2
12Sep	18 13:00:00	3600.0	71.7	107.3	90.3	51.6	78.3	75.5	72.6	69.5	56.2	56.2
12Sep	18 14:00:00	3600.0	71.6	107.2	89.4	52.6	77.7	75.2	72.7	69.7	55.9	55.9
12Sep	18 15:00:00	3600.0	71.8	107.4	93.2	51.9	77.9	75.6	73.0	69.7	53.7	53.7
12Sep	18 16:00:00	3600.0	71.6	107.2	86.2	50.8	77.6	75.5	73.0	69.9	54.3	54.3
12Sep	18 17:00:00	3600.0	71.0	106.6	82.8	51.5	76.9	75.0	72.5	69.5	53.9	53.9
12Sep	18 18:00:00	3600.0	71.0	106.5	83.6	49.8	76.8	75.1	72.5	69.1	53.5	53.5
12Sep	18 19:00:00	3600.0	71.6	107.2	86.8	48.2	77.6	75.6	72.9	69.4	52.5	52.5
12Sep	18 20:00:00	3600.0	71.2	106.8	84.6	47.3	77.3	75.6	72.9	69.1	49.6	49.6
12Sep	18 21:00:00	3600.0	70.0	105.6	82.2	47.7	76.9	74.7	71.4	67.0	51.0	51.0
12Sep	18 22:00:00	3600.0	74.3	109.9	103.2	44.8	77.8	74.8	70.8	65.7	46.8	46.8
12Sep	18 23:00:00	3600.0	67.3	102.8	90.1	40.1	75.7	72.5	66.6	60.8	44.3	44.3
13Sep	18 00:00:00	3600.0	64.7	100.3	83.7	39.3	74.6	69.8	62.5	55.3	40.0	40.0
13Sep	18 01:00:00	3600.0	63.7	99.3	80.7	38.8	74.0	69.1	61.4	53.6	39.7	39.7
13Sep	18 02:00:00	3600.0	62.1	97.7	84.1	39.8	72.8	66.1	57.6	49.3	40.1	40.1
13Sep	18 03:00:00	3600.0	61.8	97.4	80.9	41.1	72.7	66.1	57.2	49.3	41.2	41.2
13Sep	18 04:00:00	3600.0	64.2	99.8	84.1	39.7	74.3	69.1	61.8	53.7	40.3	40.3
13Sep	18 05:00:00	3600.0	68.2	103.8	85.1	40.2	76.3	73.5	68.5	63.1	42.7	42.7

```
  13Sep 18 06:00:00   3600.0  71.8 107.3  90.1  44.6  78.9  76.2  72.1  67.7  47.7
47.7
  13Sep 18 07:00:00   3600.0  72.5 108.0  83.9  51.9  79.1  76.8  73.7  70.3  54.9
54.9
  13Sep 18 08:00:00   3600.0  72.3 107.8  87.4  54.3  78.1  76.1  73.6  70.4  56.4
56.4
  13Sep 18 09:00:00   3600.0  72.5 108.0  86.8  51.5  78.9  76.2  73.7  70.3  56.0
56.0
  13Sep 18 10:00:00   3600.0  72.2 107.8  85.1  52.9  78.7  76.0  73.4  70.2  55.2
55.2
  13Sep 18 11:00:00   3600.0  70.2 105.8  84.7  51.7  77.8  74.6  70.8  67.0  54.2
54.2
  13Sep 18 12:00:00   3600.0  71.8 107.4  87.4  53.7  78.5  75.5  73.0  69.8  55.8
55.8
  13Sep 18 13:00:00   3600.0  72.0 107.6  86.5  52.9  78.5  75.9  73.2  69.9  55.9
55.9
  13Sep 18 14:00:00   3600.0  72.4 108.0  91.4  53.6  78.5  75.8  73.2  70.1  57.0
57.0
  13Sep 18 15:00:00   3600.0  71.7 107.3  87.3  53.6  78.3  75.6  73.1  69.4  55.1
55.1
  13Sep 18 16:00:00   3600.0  72.2 107.8  95.7  52.9  77.4  75.1  72.6  69.6  55.0
55.0
  13Sep 18 17:00:00   3600.0  71.5 107.0  83.3  52.4  77.1  75.4  73.2  69.9  54.6
54.6
  13Sep 18 18:00:00   3600.0  71.2 106.8  84.1  51.5  76.8  75.2  72.7  69.3  54.1
54.1
  13Sep 18 19:00:00   3600.0  71.5 107.1  83.4  49.4  77.5  75.7  72.9  69.6  51.8
51.8
  13Sep 18 20:00:00   3600.0  70.9 106.5  82.5  49.9  77.3  75.5  72.6  68.3  51.8
51.8
  13Sep 18 21:00:00   3600.0  73.6 109.1 100.9  47.9  77.6  75.3  71.9  67.3  51.4
51.4
  13Sep 18 22:00:00   3600.0  69.0 104.6  89.2  50.8  76.5  73.9  69.2  64.2  52.0
52.0
  13Sep 18 23:00:00   3600.0  66.5 102.0  82.8  47.8  75.4  71.9  65.7  60.2  49.0
49.0
  14Sep 18 00:00:00   3600.0  65.2 100.8  82.1  44.6  74.8  70.7  63.6  57.1  45.7
45.7
  14Sep 18 01:00:00   3600.0  63.4  98.9  82.9  43.8  73.3  68.7  61.1  54.4  44.4
44.4
  14Sep 18 02:00:00   3600.0  63.9  99.5  84.0  43.5  73.7  67.8  62.7  55.8  44.2
44.2
  14Sep 18 03:00:00   3600.0  62.2  97.8  81.5  46.3  72.8  65.8  57.0  50.7  46.5
46.5
  14Sep 18 04:00:00   3600.0  65.4 101.0  90.8  46.4  74.3  69.2  62.1  54.8  46.7
46.7
  14Sep 18 05:00:00   3600.0  68.4 103.9  82.4  48.6  77.0  73.5  68.4  62.8  49.4
49.4
  14Sep 18 06:00:00   3600.0  70.8 106.4  82.4  50.5  77.8  75.4  71.8  68.2  52.8
52.8
```

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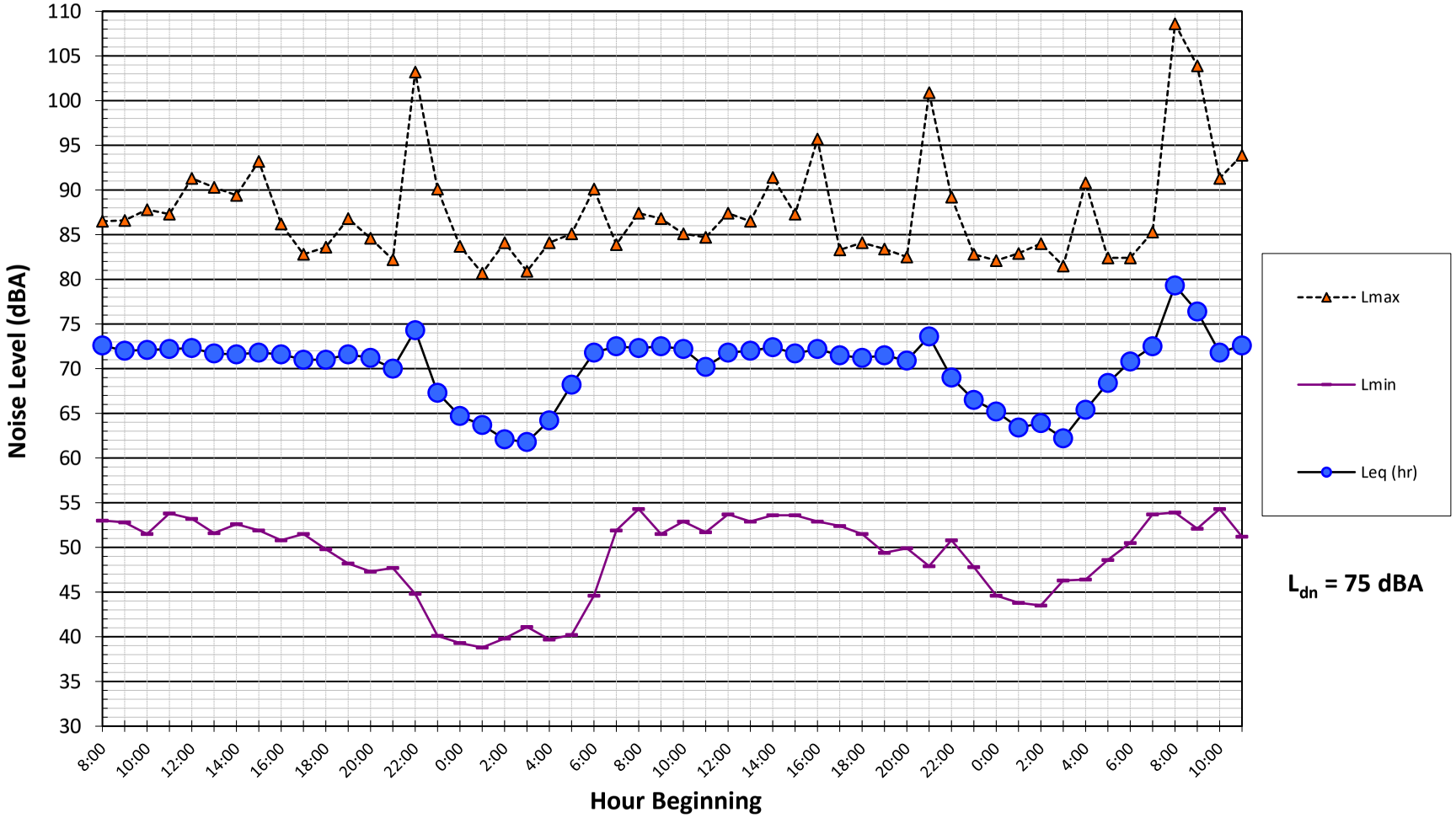
  14Sep 18 07:00:00   3600.0  72.5 108.0  85.3  53.7  78.4  76.5  73.8  70.7  57.1
57.1
  14Sep 18 08:00:00   3600.0  79.3 114.9 108.6  53.9  80.3  76.6  73.7  70.4  56.2
56.2
  14Sep 18 09:00:00   3600.0  76.4 112.0 103.9  52.1  81.3  76.2  73.4  70.1  56.8
56.8
  14Sep 18 10:00:00   3600.0  71.8 107.3  91.3  54.3  78.4  75.6  72.2  68.8  56.4
56.4
  14Sep 18 11:00:00   2448.8  72.6 106.5  93.9  51.2  79.3  76.4  73.3  70.1  55.1
55.1
```

Noise Levels at Site LT-1
Artesia Blvd and Blossom Ln, Redondo Beach
Wednesday, September 12 through Friday, September 14, 2018



L_{dn} = 75 dBA

Project Name: Redondo Beach General Plan

Date: 09/7/2023

Project Number: 2023-036.04

Monitoring Personnel: LL

Monitoring Site #: Long Term #2

Time Start: 9:40 am on Sept 07, 2023

End: 9:40 am on Sept 08, 2023

Site Location/Address: 182nd Street, between S Inglewood Avenue and Mansel Avenue. Northwest corner of El Nido Park. South side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Ldn	65.5
Leq	64.5
Lmax	104.7
Lmin	41.5
L5	66.5
L10	64.9
L33	58.1
L50	52.4
Other	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
3	3	71	

Measurement Report

Report Summary

Meter's File Name	LxT_Data.499.s	Computer's File Name	LxTse_0005120-20230907 094058-LxT_Data.499.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			
Start Time	2023-09-07 09:40:58	Duration	24:00:00.0
End Time	2023-09-08 09:40:58	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	64.5 dB		
LAE	113.9 dB	SEA	134.6 dB
EA	27.2 mPa²h		
LZ_{peak}	122.1 dB	2023-09-07 11:16:53	
LAS_{max}	104.7 dB	2023-09-07 11:16:53	
LAS_{min}	41.5 dB	2023-09-08 02:49:23	
LA_{eq}	64.5 dB		
LC_{eq}	72.4 dB	LC_{eq} - LA_{eq}	7.9 dB
LAI_{eq}	69.0 dB	LAI_{eq} - LA_{eq}	4.5 dB

Exceedances	Count	Duration
LAS > 85.0 dB	6	0:00:44.6
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	65.5 dB	66.5 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	65.8 dB	67.2 dB	59.9 dB	53.2 dB

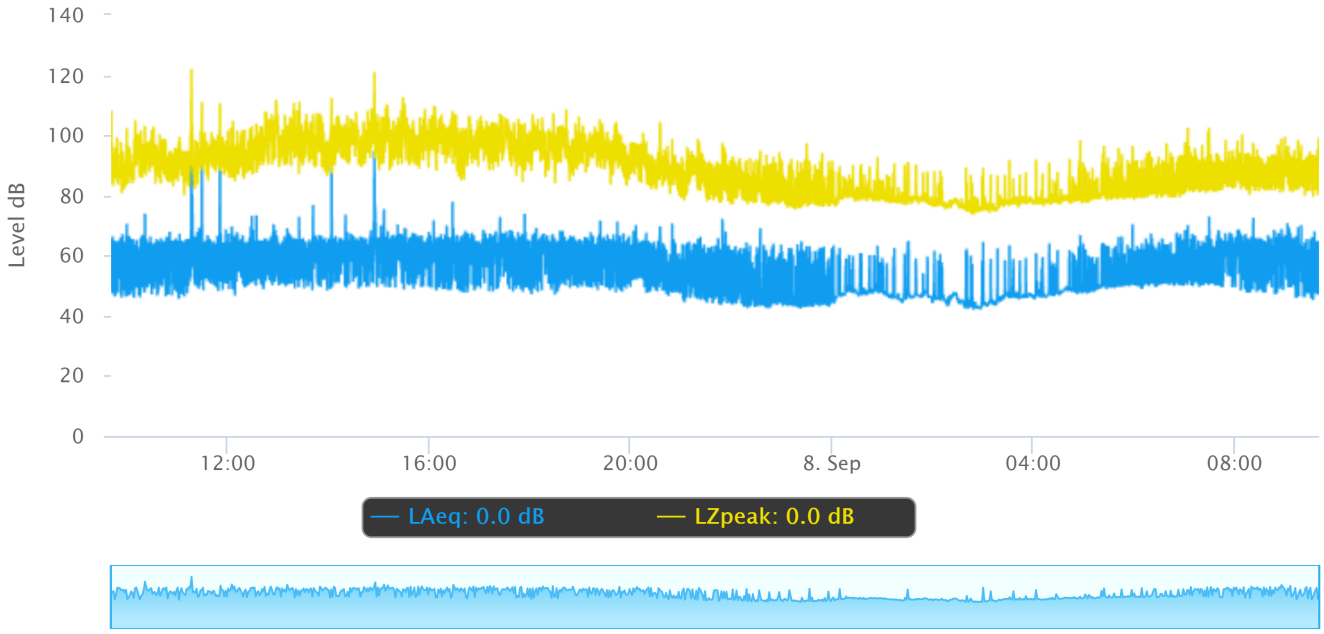
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	64.5 dB		72.4 dB		--- dB	
$Ls_{(max)}$	104.7 dB	2023-09-07 11:16:53	--- dB		--- dB	
$LS_{(min)}$	41.5 dB	2023-09-08 02:49:23	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		122.1 dB	2023-09-07 11:16:53

Overloads	Count	Duration	OBA Count	OBA Duration
	1	0:00:02.4	2731	5:10:10.6

Statistics

LAS 5.0	66.5 dB
LAS 10.0	64.9 dB
LAS 33.3	58.1 dB
LAS 50.0	52.4 dB
LAS 66.6	49.2 dB
LAS 90.0	45.3 dB

Time History



Project Name: Redondo Beach General Plan

Date: 09/12/2018

Project Number: 2023-036.04

Monitoring Personnel: IG

Monitoring Site #: Long Term #3

Time Start: 8:41 am on Sept 12, 2018

End: 1:31 pm on Sept 14, 2018

Site Location/Address: W 190th Street, between Anza Avenue and S Inglewood Avenue. North side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Ldn	70.0
Leq	71.4
Lmax	103.0
Lmin	40.4
L2	77.4
L8	74.9
L25	71.7
L50	68.2
Other	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity

Summary

File Name on Meter	L-T_Data.002
File Name on PC	SLM_0005427_L-T_Data_002.00.ldbin
Serial Number	0005427
Model	SoundTrack LxT®
Firmware Version	2.301
User	IG
Location	KIT 3 Location
Job Description	Redondo Beach General Plan
Note	LT Noise Monitoring Site

Measurement

Description	
Start	2018-09-12 08:41:43
Stop	2018-09-14 13:31:04
Duration	52:49:20.703
Run Time	52:49:20.703
Pause	00:00:00.0
Pre Calibration	2018-09-12 08:39:38
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	A Weighting			
Detector	Slow			
Preamp	PRMLxT1			
Microphone Correction	Off			
Integration Method	Linear			
Overload	146.2 dB			
	A	**C**	**Z**	
Under Range Peak	**102.5**	99.5	104.5	dB
Under Range Limit	**38.2**	36.2	44.2	dB
Noise Floor	25.3	25.8	33.4	dB

Results

LA_{eq}	71.4 dB

LAE		124.2	dB	
EA		290.642	mPa²h	
EA8		44.018	mPa²h	
EA40		220.090	mPa²h	
LApeak (max)	2018-09-12 08:42:03		127.8	dB
LASmax	2018-09-12 16:44:40		103.0	dB
LASmin	2018-09-13 03:15:21		40.4	dB
SEA		142.0	dB	

LAS > 35.0 dB (Exceedance Counts / Duration)	1	187800.4	s
LAS > 65.0 dB (Exceedance Counts / Duration)	4034	136495.8	s
LApeak > 100.0 dB (Exceedance Counts / Duration)	244	305.7	s
LApeak > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LApeak > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

LCeq	77.5	dB
LAeq	71.4	dB
LCeq - LAeq	6.1	dB
LAIeq	74.0	dB
LAeq	71.4	dB
LAIeq - LAeq	2.6	dB

	A		C		Z	
	dB	**Time Stamp**	**dB**	**Time Stamp**	**dB**	**Time Stamp**
Leq	71.4		77.5			
LS(max)	103.0	2018/09/12 16:44:40				
LS(min)	40.4	2018/09/13 3:15:21				
LPeak(max)	127.8	2018/09/12 8:42:03				

# Overloads	0	
Overload Duration	0.0	s

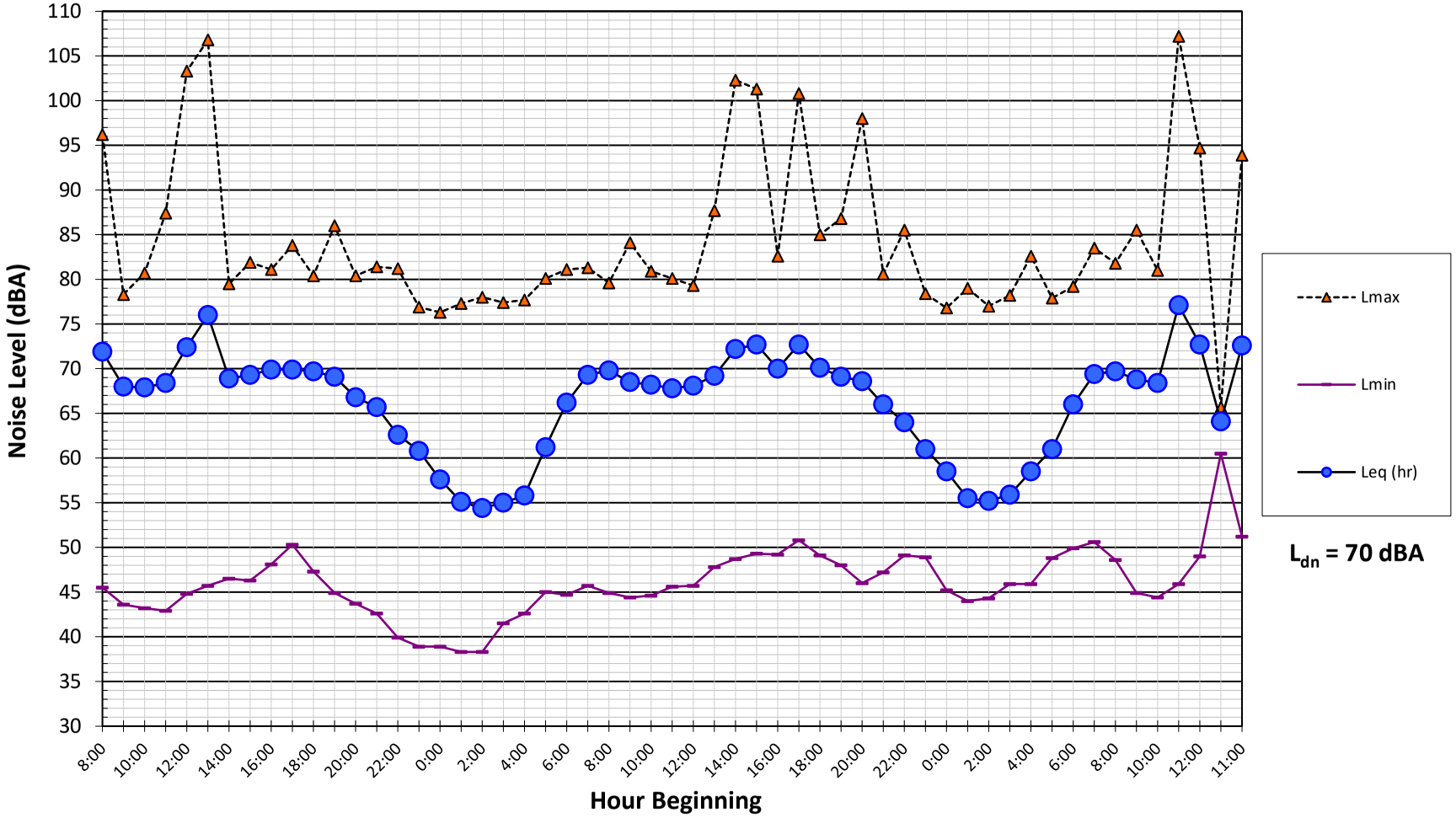
Dose Settings

Dose Name	OSHA-1	OSHA-2	
Exchange Rate	5	5	dB
Threshold	90	80	dB
Criterion Level	90	90	dB
Criterion Duration	8	8	h

Results		
Dose	38.39	38.39 %
Projected Dose	5.81	5.81 %
TWA (Projected)	69.5	69.5 dB
TWA (t)	83.1	83.1 dB
Lep (t)	79.6	79.6 dB

Statistics		
LAS2.00	77.4 dB	
LAS8.00	74.9 dB	
LAS25.00	71.7 dB	
LAS50.00	68.2 dB	
LAS90.00	52.9 dB	
LAS99.00	44.5 dB	

Noise Levels at Site LT-3
182nd Street and Firmona Avenue, Redondo Beach
Wednesday, September 12 through Friday, September 14, 2018



Project Name: Redondo Beach General Plan

Date: 08/31/2023

Project Number: 2023-036.04

Monitoring Personnel: LL

Monitoring Site #: Long Term #4

Time Start: 10:46 am on Aug 31, 2023

End: 10:46 am on Sept 01, 2023

Site Location/Address: Highway 1, between Sapphire Street and Ruby Street. East side of the street.

Primary Noise Source: Traffic

Measurement Results	
Percentiles	dBA
Ldn	77.9
Leq	73.6
Lmax	106.3
Lmin	40.7
L5	79.0
L10	77.7
L33	72.9
L50	68.8
Other	

Observed Noise Sources/Events		
Time	Noise Source Event	dBA

Comments (sound walls, height, etc.):

Atmospheric Conditions:

Maximum Wind Velocity (mph)	Average Wind Velocity (mph)	Temperature	Relative Humidity
3	3	73	


2 HOUR
PARKING
8AM-6PM

Measurement Report

Report Summary

Meter's File Name	LxT_Data.498.s	Computer's File Name	LxTse_0005120-20230831 104632-LxT_Data.498.ldbin
Meter	LxT SE 0005120		
Firmware	2.404		
User		Location	
Job Description			
Note			
Start Time	2023-08-31 10:46:32	Duration	24:00:00.0
End Time	2023-09-01 10:46:32	Run Time	24:00:00.0
Pause Time	0:00:00.0		

Results

Overall Metrics

LA_{eq}	73.6 dB		
LAE	123.0 dB	SEA	135.3 dB
EA	222.3 mPa²h		
LZ_{peak}	122.7 dB	2023-08-31 22:47:23	
LAS_{max}	106.3 dB	2023-08-31 22:47:23	
LAS_{min}	40.7 dB	2023-09-01 02:19:01	
LA_{eq}	73.6 dB		
LC_{eq}	77.7 dB	LC_{eq} - LA_{eq}	4.1 dB
LAI_{eq}	76.5 dB	LAI_{eq} - LA_{eq}	2.8 dB

Exceedances	Count	Duration
LAS > 85.0 dB	87	0:03:28.0
LAS > 115.0 dB	0	0:00:00.0
LZpeak > 135.0 dB	0	0:00:00.0
LZpeak > 137.0 dB	0	0:00:00.0
LZpeak > 140.0 dB	0	0:00:00.0

Community Noise	LDN	LDay	LNight
	77.9 dB	74.8 dB	0.0 dB

	LDEN	LDay	LEve	LNight
	78.3 dB	75.1 dB	73.5 dB	70.6 dB

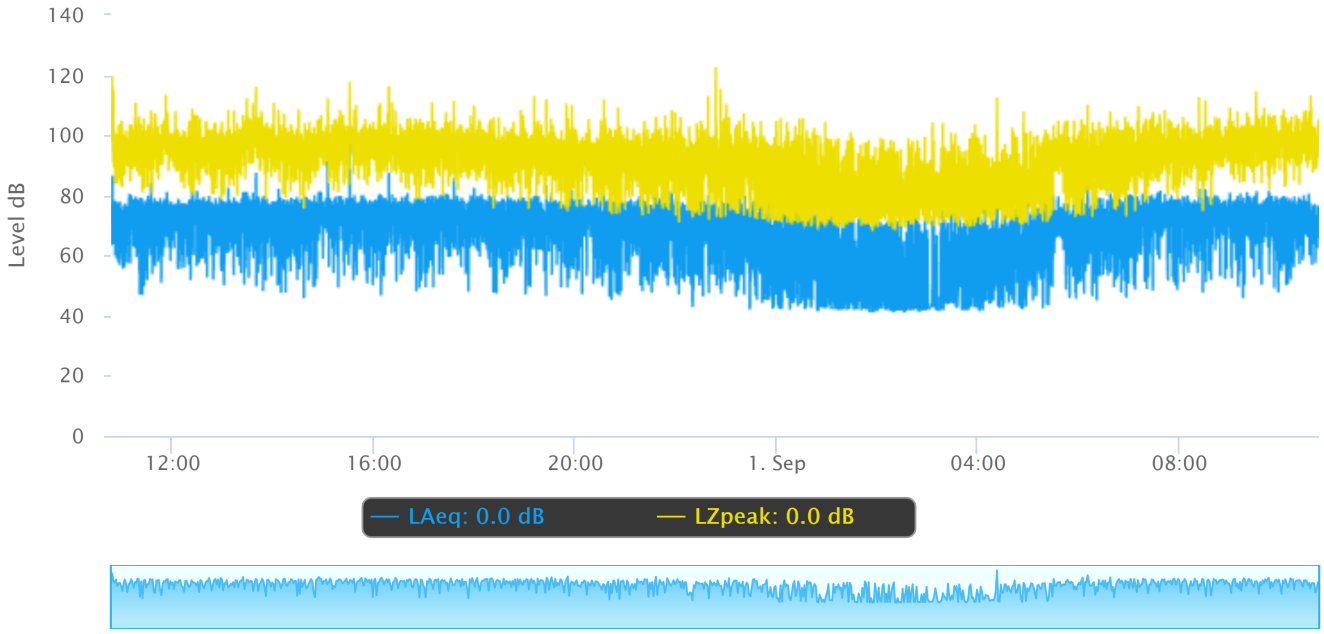
Any Data	A		C		Z	
	Level	Time Stamp	Level	Time Stamp	Level	Time Stamp
L_{eq}	73.6 dB		77.7 dB		--- dB	
$Ls_{(max)}$	106.3 dB	2023-08-31 22:47:23	--- dB		--- dB	
$LS_{(min)}$	40.7 dB	2023-09-01 02:19:01	--- dB		--- dB	
$L_{Peak(max)}$	--- dB		--- dB		122.7 dB	2023-08-31 22:47:23

Overloads	Count	Duration	OBA Count	OBA Duration
	1	0:00:02.5	4895	7:38:13.3

Statistics

LAS 5.0	79.0 dB
LAS 10.0	77.7 dB
LAS 33.3	72.9 dB
LAS 50.0	68.8 dB
LAS 66.6	62.4 dB
LAS 90.0	47.7 dB

Time History



ATTACHMENT B

FHWA Highway Traffic Noise Prediction Model

EXISTING TRAFFIC NOISE MODELING OUTPUTS

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2023-039.04
Project Name: City of Redondo Beach General Plan (PLANRedondo)

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Fehr & Peers
Community Noise Descriptor: L_{dn}: x CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

Existing Conditions Roadway, Segment	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	Distance from Centerline of Roadway: Ldn at 50 Feet	Distance to Contour: 70 Ldn	65 Ldn	60 Ldn	55 Ldn	Calc Dist
Highway 1 (PCH)													
South of Palos Verdes Boulevard	4	1.5	30,000	45	0	1.8%	0.7%	**70.2**	53	167	528	1,670	50
Between Palos Verdes & Knob Hill Blvd	4	1.5	27,500	45	0	1.8%	0.7%	**69.9**	48	153	484	1,531	50
Between Knob Hill Blvd & Ruby Street	4	1.5	28,657	45	0	1.8%	0.7%	**70.0**	50	160	504	1,595	50
Between Ruby Street & Torrance Blvd	4	1.5	36,000	45	0	1.8%	0.7%	**71.0**	63	200	634	2,004	50
Between Torrance Boulevard & Diamond St	4	1.5	36,500	45	0	1.8%	0.7%	**71.1**	64	203	642	2,032	50
North of Diamond Street	5	1.5	36,500	45	0	1.8%	0.7%	**71.4**	69	217	686	2,168	50
Interstate 405													
Between Marine Blvd & Redondo Beach Blvd	8	6	202,388	65	0	1.8%	0.7%	**85.8**	1,890	5,976	18,897	59,759	50
190th Street/Anita Street													
Between Hawthorne Rd & Blossom Lane	4	8	36,413	40	0	1.8%	0.7%	**70.0**	50	159	502	1,588	50
Between Blossom Lane & Prospect Ave	4	8	16,760	40	0	1.8%	0.7%	**66.6**	-	73	231	731	50
Anita Street/Herondo Street													
Between Prospect Ave & Hwy 1	4	10	36,413	40	0	1.8%	0.7%	**70.1**	51	161	508	1,606	50
Between Hwy 1 & Harbor Drive	2	8	4,410	35	0	1.8%	0.7%	**59.2**	-	-	41	130	50

Aviation Boulevard													
Between Marine Blvd & Manhatten Beach B	6	15	36,413	40	0	1.8%	0.7%	**71.3**	68	216	682	2,158	50
Between Manhattan Beach & Artesia Blvd	4	10	36,413	40	0	1.8%	0.7%	**70.1**	51	161	508	1,606	50
Between Artesia Blvd & Harper Ave	4	0	36,413	40	0	1.8%	0.7%	**69.9**	48	153	483	1,529	50
Artesia Boulevard													
Between Harper Ave & Kingsdale Ave	4	5	30,914	40	0	1.8%	0.7%	**69.2**	-	133	420	1,328	50
Between Kingsdale Ave & Hawthrone Blvd	5	5	30,914	40	0	1.8%	0.7%	**69.6**	-	143	452	1,428	50
Blossom Lane													
Between Manhattan Beach Blvd & 190th Ave	2	0	2,138	25	0	1.8%	0.7%	**53.5**	-	-	-	35	50
Catalina Avenue													
Between Highway 1 & Vista Del Mar	4	6	16,816	30	0	1.8%	0.7%	**64.3**	-	-	136	429	50
Diamond Street													
Between Catalina Ave & Prospect Avenue	2	8	4,117	35	0	1.8%	0.7%	**58.9**	-	-	39	122	50
Esplanade													
Between Catalina Ave & Vista Del Mar	2	8	5,306	25	0	1.8%	0.7%	**57.5**	-	-	-	89	50
Felton Lane													
Between Robinson Street & Ripley Ave	2	0	2,579	25	0	1.8%	0.7%	**54.3**	-	-	-	43	50
Phelan Lane													
Between Robinson Street & Ripley Ave	2	0	1,239	25	0	1.8%	0.7%	**51.1**	-	-	-	-	50
Hawthorne Boulevard													
Between 182nd St & Redondo Beach Blvd	8	10	62,255	45	0	1.8%	0.7%	**77.8**	299	946	2,990	9,457	50
Inglewood Avenue													
Between Marine Ave & Manhattan Beach	6	0	36,413	45	0	1.8%	0.7%	**71.7**	74	235	743	2,349	50
Between Manhattan Beach & Faber St	5	8	36,413	45	0	1.8%	0.7%	**71.6**	72	227	717	2,268	50
Between Faber St & Artesia Blvd	4	8	36,413	45	0	1.8%	0.7%	**71.2**	66	209	662	2,092	50
Marine Boulevard													
Between Inglewood Ave & Aviation Blvd	4	0	16,760	40	0	1.8%	0.7%	**66.5**	-	70	223	704	50
Manhattan Beach Blvd													
Between Inglewood Ave & Aviation Blvd	5	8	36,413	40	0	1.8%	0.7%	**70.4**	54	172	544	1,722	50
Prospect Avenue													
Between Anita St & Knob Hill Ave	4	8	19,463	35	0	1.8%	0.7%	**66.0**	-	63	199	628	50
Between Knob Hill Ave & Hwy 1	4	0	19,463	35	0	1.8%	0.7%	**65.8**	-	60	191	605	50

Redondo Beach Boulevard													
Between Hawthrone Blvd & Artesia Blvd	4	10	36,413	40	0	1.8%	0.7%	**70.1**	51	161	508	1,606	50
Ripley Avenue													
Between Flagler Lane & Inglewood Ave	2	0	3,653	30	0	1.8%	0.7%	**57.3**	-	-	-	85	50
Torrance Boulevard													
Between Catalina Ave & Prospect Ave	4	6	16,353	30	0	1.8%	0.7%	**64.2**	-	-	132	417	50

GENERAL PLAN BUILDOUT TRAFFIC NOISE MODELING OUTPUTS

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 2023-039.04
Project Name: City of Redondo Beach General Plan (PLANRedondo)

Background Information

Model Description: FHWA Highway Noise Prediction Model (FHWA-RD-77-108) with California Vehicle Noise (CALVENO) Emission Levels.
Source of Traffic Volumes: Fehr & Peers
Community Noise Descriptor: L_{dn}: x CNEL:

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77.70%	12.70%	9.60%
Medium-Duty Trucks	87.43%	5.05%	7.52%
Heavy-Duty Trucks	89.10%	2.84%	8.06%

General Plan Buildout Conditions				Design		Vehicle Mix		Distance from Centerline of Roadway					
Roadway, Segment	Lanes	Median Width	ADT Volume	Speed (mph)	Alpha Factor	Medium Trucks	Heavy Trucks	Ldn at 50 Feet	Distance to Contour 70 Ldn	65 Ldn	60 Ldn	55 Ldn	Calc Dist
Highway 1 (PCH)													
South of Palos Verdes Boulevard	4	1.5	30,900	45	0	1.8%	0.7%	70.4	54	172	544	1,720	50
Between Palos Verdes & Knob Hill Blvd	4	1.5	28,353	45	0	1.8%	0.7%	70.0	50	158	499	1,578	50
Between Knob Hill Blvd & Ruby Street	4	1.5	29,550	45	0	1.8%	0.7%	70.2	52	164	520	1,645	50
Between Ruby Street & Torrance Blvd	4	1.5	37,116	45	0	1.8%	0.7%	71.2	65	207	653	2,066	50
Between Torrance Boulevard & Diamond St	4	1.5	37,632	45	0	1.8%	0.7%	71.2	66	209	662	2,095	50
North of Diamond Street	5	1.5	37,632	45	0	1.8%	0.7%	71.5	71	224	707	2,235	50
Interstate 405													
Between Marine Blvd & Redondo Beach Blvd	8	6	203,802	65	0	1.8%	0.7%	85.8	1,903	6,018	19,029	60,176	50
190th Street/Anita Street													
Between Hawthorne Rd & Blossom Lane	4	8	33,848	40	0	1.8%	0.7%	69.7	-	148	467	1,476	50
Between Blossom Lane & Prospect Ave	4	8	18,626	40	0	1.8%	0.7%	67.1	-	81	257	812	50
Anita Street/Herondo Street													
Between Prospect Ave & Hwy 1	4	10	33,848	40	0	1.8%	0.7%	69.8	-	149	472	1,493	50
Between Hwy 1 & Harbor Drive	2	8	4,547	35	0	1.8%	0.7%	59.3	-	-	43	134	50

Aviation Boulevard													
Between Marine Blvd & Manhatten Beach B	6	15	33,848	40	0	1.8%	0.7%	**71.0**	50	201	634	2,006	50
Between Manhattan Beach & Artesia Blvd	4	10	33,848	40	0	1.8%	0.7%	**69.8**	-	149	472	1,493	50
Between Artesia Blvd & Harper Ave	4	0	33,848	40	0	1.8%	0.7%	**69.5**	45	142	449	1,421	50
Artesia Boulevard													
Between Harper Ave & Kingsdale Ave	4	5	31,800	40	0	1.8%	0.7%	**69.4**	-	137	432	1,366	50
Between Kingsdale Ave & Hawthrone Blvd	5	5	31,800	40	0	1.8%	0.7%	**69.7**	-	147	465	1,469	50
Blossom Lane													
Between Manhatten Beach Blvd & 190th Ave	2	0	2,200	25	0	1.8%	0.7%	**53.6**	-	-	-	36	50
Catalina Avenue													
Between Highway 1 & Vista Del Mar	4	6	17,200	30	0	1.8%	0.7%	**64.4**	-	-	139	439	50
Diamond Street													
Between Catalina Ave & Prospect Avenue	2	8	4,400	35	0	1.8%	0.7%	**59.2**	-	-	41	130	50
Esplanade													
Between Catalina Ave & Vista Del Mar	2	8	5,500	25	0	1.8%	0.7%	**57.6**	-	-	-	92	50
Felton Lane													
Between Robinson Street & Ripley Ave	2	0	2,800	25	0	1.8%	0.7%	**54.7**	-	-	-	46	50
Phelan Lane													
Between Robinson Street & Ripley Ave	2	0	1,300	25	0	1.8%	0.7%	**51.3**	-	-	-	-	50
Hawthorne Boulevard													
Between 182nd St & Redondo Beach Blvd	8	10	60,442	45	0	1.8%	0.7%	**77.6**	290	918	2,903	9,181	50
Inglewood Avenue													
Between Marine Ave & Manhattan Beach	6	0	33,848	45	0	1.8%	0.7%	**71.4**	69	218	691	2,184	50
Between Manhattan Beach & Faber St	5	8	33,848	45	0	1.8%	0.7%	**71.2**	67	211	667	2,108	50
Between Faber St & Artesia Blvd	4	8	33,848	45	0	1.8%	0.7%	**70.9**	62	194	615	1,945	50
Marine Boulevard													
Between Inglewood Ave & Aviation Blvd	4	0	18,626	40	0	1.8%	0.7%	**66.9**	-	78	247	782	50
Manhattan Beach Blvd													
Between Inglewood Ave & Aviation Blvd	5	8	33,848	40	0	1.8%	0.7%	**70.1**	50	160	506	1,600	50
Prospect Avenue													
Between Anita St & Knob Hill Ave	4	8	20,800	35	0	1.8%	0.7%	**66.3**	-	67	212	671	50
Between Knob Hill Ave & Hwy 1	4	0	20,800	35	0	1.8%	0.7%	**66.1**	-	65	204	646	50

Redondo Beach Boulevard													
Between Hawthorne Blvd & Artesia Blvd	4	10	33,848	40	0	1.8%	0.7%	**69.8**	-	149	472	1,493	50
Ripley Avenue													
Between Flagler Lane & Inglewood Ave	2	0	3,700	30	0	1.8%	0.7%	**57.4**	-	-	-	86	50
Torrance Boulevard													
Between Catalina Ave & Prospect Ave	4	6	16,900	30	0	1.8%	0.7%	**64.4**	-	-	136	431	50

Traffic Noise Calculator: FHWA 77-108 **City of Redondo Beach General Plan (CORB-1.0) Existing Traffic Noise**

	Output						Inputs													Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour				Segment													
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	From - To		ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	68.0	70.8	71.4	62	133	287	Inglewood Avenue	Artesia Blvd	182nd St	28,920	40	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
2	65.7	68.4	69.0	43	93	200	Inglewood Avenue	182nd St	190th St	23,270	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
3	61.2	63.9	64.5	22	46	100	Grant Avenue	Aviation Blvd	Flagler Ln	12,190	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
4	61.1	63.8	64.4	21	46	99	Grant Avenue	Flagler Ln	Green Ln	11,955	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
5	61.1	63.9	64.5	21	46	99	Grant Avenue	Green Ln	Rindge Ln	12,060	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
6	60.7	63.5	64.1	20	43	94	Grant Avenue	Rindge Ln	Slauson Ln	11,025	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
7	60.8	63.5	64.1	20	44	94	Grant Avenue	Slauson Ln	Mackay Ln	11,130	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
8	60.8	63.6	64.2	20	44	95	Grant Avenue	Mackay Ln	Felton Ln	11,295	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
9	61.0	63.7	64.3	21	45	97	Grant Avenue	Felton Ln	Inglewood Ave	11,660	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
10	58.6	61.4	62.0	15	31	68	Grant Avenue	Inglewood Ave	Kingsdale Ave	6,755	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
11	58.7	61.4	62.0	15	32	68	Grant Avenue	Kingsdale Ave	City Limit	6,845	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
12	60.2	63.0	63.6	19	40	87	Beryl Street	190th St	North Prospect Ave	9,880	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
13	57.5	60.3	60.9	12	27	57	Beryl Street	North Prospect Ave	Pacific Coast Hwy	5,305	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
14	61.3	64.1	64.7	22	48	103	Beryl Street	Pacific Coast Hwy	Catalina Ave	12,645	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
15	65.3	68.1	68.7	41	88	189	Torrance Boulevard	South Prospect Ave	City Limit	21,375	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
16	57.3	60.1	60.7	12	26	56	Camino Real	Torrance Blvd	South Prospect Ave	4,905	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
17	61.6	64.4	65.0	23	50	107	Camino Real	South Prospect Ave	City Limit	13,120	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
18	65.3	68.1	68.7	41	88	190	Palos Verdes Blvd	South Catalina Ave	Pacific Coast Hwy	21,590	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
19	61.7	64.5	65.1	24	52	111	Palos Verdes Blvd	Pacific Coast Hwy	South Prospect Ave	13,880	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	51	0.5	44
20	61.6	64.4	65.0	24	52	112	Palos Verdes Blvd	South Prospect Ave	City Limit	13,955	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	52	0.5	44

Traffic Noise Calculator: FHWA 77-108 **City of Redondo Beach General Plan (CORB-1.0) General Plan Buildout No Project Traffic Noise**

	Output						Inputs														Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour																		
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	Segment From	Segment To	ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	67.9	70.7	71.3	61	132	283	Inglewood Avenue	Artesia Blvd	182nd St	28,305	40	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
2	65.6	68.3	68.9	42	92	197	Inglewood Avenue	182nd St	190th St	22,775	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
3	61.1	63.8	64.4	21	46	99	Grant Avenue	Aviation Blvd	Flagler Ln	11,930	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
4	61.0	63.7	64.3	21	45	97	Grant Avenue	Flagler Ln	Green Ln	11,700	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
5	61.0	63.8	64.4	21	45	98	Grant Avenue	Green Ln	Rindge Ln	11,805	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
6	60.6	63.4	64.0	20	43	92	Grant Avenue	Rindge Ln	Slauson Ln	10,790	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
7	60.7	63.4	64.0	20	43	93	Grant Avenue	Slauson Ln	Mackay Ln	10,895	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
8	60.7	63.5	64.1	20	44	94	Grant Avenue	Mackay Ln	Felton Ln	11,055	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
9	60.9	63.6	64.2	21	44	96	Grant Avenue	Felton Ln	Inglewood Ave	11,415	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
10	58.5	61.3	61.9	14	31	67	Grant Avenue	Inglewood Ave	Kingsdale Ave	6,610	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
11	58.6	61.3	61.9	14	31	67	Grant Avenue	Kingsdale Ave	City Limit	6,700	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
12	60.3	63.0	63.6	19	41	87	Beryl Street	190th St	North Prospect Ave	9,945	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
13	57.6	60.3	60.9	12	27	58	Beryl Street	North Prospect Ave	Pacific Coast Hwy	5,340	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
14	61.3	64.1	64.7	22	48	103	Beryl Street	Pacific Coast Hwy	Catalina Ave	12,725	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
15	65.3	68.1	68.7	41	88	190	Torrance Boulevard	South Prospect Ave	City Limit	21,515	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
16	57.4	60.1	60.7	12	26	56	Camino Real	Torrance Blvd	South Prospect Ave	4,935	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
17	61.6	64.4	65.0	23	50	108	Camino Real	South Prospect Ave	City Limit	13,205	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
18	65.5	68.2	68.8	42	90	194	Palos Verdes Blvd	South Catalina Ave	Pacific Coast Hwy	22,245	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
19	61.9	64.6	65.2	24	53	114	Palos Verdes Blvd	Pacific Coast Hwy	South Prospect Ave	14,300	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	51	0.5	44
20	61.7	64.5	65.1	25	53	114	Palos Verdes Blvd	South Prospect Ave	City Limit	14,380	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	52	0.5	44

Traffic Noise Calculator: FHWA 77-108 **City of Redondo Beach General Plan (CORB-1.0) General Plan Buildout Plus Project Traffic Noise**

	Output						Inputs														Auto Inputs	
	dBA at 50 feet			Distance to CNEL Contour				Segment														
ID	$L_{eq\text{-}24hr}$	L_{dn}	CNEL	70 dBA	65 dBA	60 dBA	Roadway	From - To		ADT	Posted Speed Limit	Grade	% Autos	% Med Trucks	% Heavy Trucks	% Daytime	% Evening	% Night	Number of Lanes	Site Condition	Distance to Reciever	Ground Absorption	Lane Distance
1	68.1	70.9	71.5	63	136	292	Inglewood Avenue	Artesia Blvd	182nd St	29,660	40	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
2	65.8	68.5	69.1	44	94	203	Inglewood Avenue	182nd St	190th St	23,865	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
3	61.3	64.0	64.6	22	47	102	Grant Avenue	Aviation Blvd	Flagler Ln	12,500	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
4	61.2	63.9	64.5	22	47	100	Grant Avenue	Flagler Ln	Green Ln	12,260	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
5	61.2	64.0	64.6	22	47	101	Grant Avenue	Green Ln	Rindge Ln	12,370	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
6	60.8	63.6	64.2	21	44	95	Grant Avenue	Rindge Ln	Slauson Ln	11,305	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
7	60.9	63.6	64.2	21	44	96	Grant Avenue	Slauson Ln	Mackay Ln	11,415	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
8	60.9	63.7	64.3	21	45	97	Grant Avenue	Mackay Ln	Felton Ln	11,585	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
9	61.1	63.8	64.4	21	46	99	Grant Avenue	Felton Ln	Inglewood Ave	11,960	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
10	58.7	61.5	62.1	15	32	69	Grant Avenue	Inglewood Ave	Kingsdale Ave	6,930	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
11	58.8	61.5	62.1	15	32	69	Grant Avenue	Kingsdale Ave	City Limit	7,020	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
12	60.4	63.1	63.7	19	41	88	Beryl Street	190th St	North Prospect Ave	10,135	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
13	57.7	60.4	61.0	13	27	58	Beryl Street	North Prospect Ave	Pacific Coast Hwy	5,445	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
14	61.4	64.2	64.8	22	48	104	Beryl Street	Pacific Coast Hwy	Catalina Ave	12,975	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	2	Soft	50	0.5	20
15	65.4	68.2	68.8	41	89	192	Torrance Boulevard	South Prospect Ave	City Limit	21,930	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
16	57.4	60.2	60.8	12	26	57	Camino Real	Torrance Blvd	South Prospect Ave	5,035	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
17	61.7	64.5	65.1	23	51	109	Camino Real	South Prospect Ave	City Limit	13,460	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
18	65.4	68.2	68.8	41	89	193	Palos Verdes Blvd	South Catalina Ave	Pacific Coast Hwy	21,970	35	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	50	0.5	44
19	61.8	64.6	65.2	24	52	113	Palos Verdes Blvd	Pacific Coast Hwy	South Prospect Ave	14,125	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	51	0.5	44
20	61.7	64.5	65.1	24	52	113	Palos Verdes Blvd	South Prospect Ave	City Limit	14,200	30	0.0%	97.5%	1.8%	0.7%	78.0%	13.0%	10.0%	4	Soft	52	0.5	44

Appendix H Tribal Consultation Letter Correspondence

Appendices

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Jennifer Kelley

From: Sean Scully <Sean.Scully@redondo.org>
Sent: Wednesday, May 31, 2023 12:15 PM
To: Jennifer Kelley
Cc: Wendy Nowak; Halley Grundy
Subject: FW: Redondo Beach General Plan Zoning Code Update & Local Coastal Program Amendment Environmental Impact Report

Tribal response. No Comment.

Sean Scully
Planning Manager
Community Development Department, Planning Division
415 Diamond Street, Door "2"
Redondo Beach, CA 90277
Tel 310-318-0637/1+2405
Fax 310-372-8021
sean.scully@redondo.org
www.redondo.org

From: Jill McCormick <historicpreservation@quechantribe.com>
Sent: Wednesday, May 31, 2023 11:01 AM
To: Sean Scully <Sean.Scully@redondo.org>
Subject: Redondo Beach General Plan Zoning Code Update & Local Coastal Program Amendment Environmental Impact Report

This email is to inform you that we do not wish to comment on this project. We defer to the more local Tribes and support their determinations on this matter.

Thank you,
H. Jill McCormick, M.A.

Quechan Indian Tribe
Historic Preservation Officer
P.O. Box 1899
Yuma, AZ 85366-1899
Office: 760-572-2423
Cell: 928-261-0254
E-mail: historicpreservation@quechantribe.com

Please note that email correspondence with the City of Redondo Beach, along with attachments, may be subject to the California Public Records Act, and therefore may be subject to disclosure unless otherwise exempt. The City of Redondo Beach shall not be responsible for any claims, losses or damages resulting from the use of digital data that may be contained in this email.

GABRIELENO BAND OF MISSION INDIANS - KIZH NATION
Historically known as The San Gabriel Band of Mission Indians recognized by the State of California as the aboriginal tribe of the Los Angeles basin

June 7, 2023

Project Name: Redondo Beach General Plan, Zoning Code Update, and local Coastal Program Amendment Environmental Impact Report

Thank you for your letter dated June 1,2023. Regarding the project above. This is to concur that we agree with the General Plan Amendment. However, our Tribal government would like to request consultation for all future projects within this location.

Andrew Salas, Chairman
Gabrieleno Band of Mission Indians – Kizh Nation

PO Box 393 Covina, CA 91723 www.gabrielenoindians@yahoo.com gabrielenoindians@yahoo.com

Jennifer Kelley

From: Sean Scully <Sean.Scully@redondo.org>
Sent: Wednesday, June 7, 2023 12:07 PM
To: Jennifer Kelley
Cc: Wendy Nowak; Halley Grundy
Subject: FW: Redondo Beach General Plan, Zoning Code Update, and local Coastal Program Amendment Environmental Impact Report
Attachments: Redondo Beach General Plan, Zoning Code Update, and local Coastal Program Amendment Environmental Impact Report.pdf

See below... Thanks.

Sean Scully
Planning Manager
Community Development Department, Planning Division
415 Diamond Street, Door "2"
Redondo Beach, CA 90277
Tel 310-318-0637/1+2405
Fax 310-372-8021
sean.scully@redondo.org
http://www.redondo.org/

-----Original Message-----
From: Gabrieleno Administration <admin@gabrielenoindians.org>
Sent: Wednesday, June 7, 2023 11:24 AM
To: Sean Scully <Sean.Scully@redondo.org>
Subject: Redondo Beach General Plan, Zoning Code Update, and local Coastal Program Amendment Environmental Impact Report

CAUTION: Email is from an external source; Stop, Look, and Think before opening attachments or links.

Hello Sean,

Thank you for your letter dated June 1,2023. Please see the attachment below.

Thank you

Sincerely,

Savannah Salas
Admin Specialist
Gabrieleno Band of Mission Indians - Kizh Nation PO Box 393 Covina, CA 91723
Office: 844-390-0787
website: http://www.gabrielenoindians.org/

The region where Gabrieleño culture thrived for more than eight centuries encompassed most of Los Angeles County, more than half of Orange County and portions of Riverside and San Bernardino counties.
It was the labor of the Gabrieleño who built the missions, ranchos and the pueblos of Los Angeles. They were trained in the trades, and they did the construction and maintenance, as well as the farming and managing of herds of livestock.
"The Gabrieleño are the ones who did all this work, and they really are the foundation of the early economy of the Los Angeles area " . "That's a contribution that Los Angeles has not recognized--the fact that in its early decades, without the Gabrieleño, the community simply would not have survived."

Appendix I Implementation Plan

Appendices

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Appendix B– General Plan Implementation

The following Implementation Tables list specific actions that should be pursued to implement the intent of each goal and policy. For each action, a recommended timeframe for completion is noted and the responsible City department is listed. The timeframes are as follows:

- Short (1-5 years)
- Mid (when resources become available, but prioritized after 5 years)
- Long (10 years or more)

Introduction Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	Noise			
IM-INT-1	**Staff Training.** Promote capacity-building and educational efforts to train planning staff to create public participation programs that are right-sized and "meet people where they are" to create effective engagement activities that generates helpful input and feedback from the public.	INT-1, INT-2, INT-4, INT-6, INT-7	Community Development	Short term
IM-INT-2	**Large Projects.** Create public participation plans for large projects that identify the best way to connect with the stakeholders most affected by the decision being made (personal contact, online engagement, surveys, translation, holding meetings at specific times of day and various days of the week, providing childcare options, etc.).	INT-1, INT-2, INT-3, INT-4, INT-7	Community Development	Short term
IM-INT-3	**Local Partnerships.** Establish ongoing partnerships with local community-based organizations and other local stakeholder groups to help increase public awareness and engagement in the planning process, particularly in communities or regarding topics with historically low public participation.	INT-3, INT-4, INT-5, INT-6	Community Development	Mid term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
Balance				
IM-LU-01	**Zoning ordinance update.** Prepare a comprehensive update to the Zoning Ordinance and Zoning Ordinance for the Coastal Zone to ensure that the City's zoning regulations align with the General Plan's goals and policies. Evaluate the potential to use Form Based Codes in the Residential Overlay areas and Special Policy areas in addition to, as part of or as an alternative to implementing the Redondo Beach Objective Design Standards and Applicant Guidelines and traditional setback requirements. Periodically review and update the City's building and development codes and regulations to ensure that they incorporate best practices. This includes a review and evaluation of the functionality and application of the Harbor/Civic Center Specific Plan to determine the current viability of its provisions , and to determine if the provisions can be folded into the City's Zoning Ordinance (eliminating the stand-alone specific plan document altogether to streamline future implementation).	LU-1.1, LU-1.4, LU-1.9, LU-1.10, LU-1.12, LU-1.13, LU-3.1, LU-5.4	Community Development	Short, on-going
IM-LU-02	**Local Coastal Plan (LCP) update.** Update the LCP to ensure compatibility with the City's General Plan	LU-1.1	Community Development	Short term
IM-LU-03	**Periodic review.** Periodically review, revise and update the General Plan.	LU-1.1	Community Development	Mid, on-going
IM-LU-04	**Community benefits.** Require new development projects including those proposing a general plan amendment and/or a zone change to include as part of the development proposal, a community benefit and implementation plan providing a net community benefit as desired by the City and neighborhoods through public outreach. Examples of community benefits may include, but are not limited to public realm improvements, dedication of park and open space for public use, expanded economic development opportunities, job opportunities, new community serving businesses and services, and removal of blight and incompatible land uses. Assess capital and public infrastructure costs and ongoing operations and maintenance costs of said capital and public infrastructure; conduct a financial feasibility analysis to determine the impacts of community benefits on the feasibility of desired types of development.	LU-1.2, LU-1.11, LU-2.3, LU-2.4, LU-2.7, LU-3.1, LU-6.15	Community Development, Community Services, Public Works	Mid, on-going
IM-LU-05	**Universal access**. Evaluate the feasibility of developing standards that require a percentage of units in new residential development projects to incorporate universal design principles.	LU-1.2, LU-1.3	Community Development	Mid term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-06	**Inclusionary housing.** Adopt and periodically review and update inclusionary housing program to ensure a balance between affordable housing requirements, affordable housing needs, and market conditions.	LU-1.3, LU-1.4, LU-1.7, LU-1.10, LU-6.7	Community Services	Short term
IM-LU-07	**Local preference.** Require a first priority preference for Redondo Beach residents and workers in tenant selection policies for affordable housing projects that receive financial assistance from the City or qualify for a density bonus.	LU-1.4, LU-6.7	Community Development	Short, on-going
IM-LU-08	**Open space acquisition funds.** Partner with community organizations to identify opportunities for and pursue grants to fund the acquisition of additional open space and community space in underserved areas, as identified in the parks needs assessment / parks master plan. [Make OSCE imp action?]	LU-1.11	Community Services	Mid, on-going
IM-LU-09	**Annual review**. Prepare a general plan status report annually. Review the General Plan land use Goals, Policies, buildout, and map to ensure they continue to support the community's long-term land use vision.	LU-1.1, LU-1.3, LU-1.9, LU-1.10, LU-1.12, LU-1.13, LU-1.14, LU-6.13	Community Development	Short, On-going
IM-LU-10	**Facilities to support lifelong learning.** Create, maintain, and publicize an inventory of public, nongovernmental, and private facilities that can be used by organizations to support early childhood education, after school activities, libraries and learning centers, and other meetings and educational opportunities.	LU-1.5, LU-1.13	Community Services	Mid term
IM-LU-11	**School sites.** Coordinate with local school districts and community colleges serving Redondo Beach residents on the need for adjustments in student capacity as well as plans for surplus property.	LU-1.5, LU-1.11	Community Development	Short, On-going
IM-LU-12	**Community serving commercial retail & service diversity impact analysis**. Implement a requirement for mixed-use projects or proposals that convert commercial and other non-residential uses to residential or mixed-use projects to complete a community serving commercial retail & service diversity impact analysis to inform the decision-making process and to ensure availability and diversity of commercial retail and service uses in Redondo Beach as part of the development proposal.	LU-1.2, LU-1.14, LU-6.10	Community Development, Waterfront Economic Development	Short, On-going
Note: See *Housing Element Programs and Open Space & Conservation Element Implementation* for additional actions related to this goal.				
Identity				
IM-LU-13	**Expanded design guidelines.** Identify areas that need customized design guidelines and develop a prioritization list to create them. Start with a review of the Special Policy Areas that need the most immediate attention or direction.	LU-2.1, LU-2.2, LU-2.5, LU-2.8 SPA-1, SPA-2, SPA-3, SPA-4, SPA,5, SPA-6, SPA-7	Community Development	Mid, on-going

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-14	**Redondo Beach objective design standards and applicant guidelines.** Update the residential design guidelines that direct architectural design, building siting and orientation, neighborhood identity including monumentation, wayfinding, placemaking elements, and other public realm features for mixed-use areas, transit-oriented higher intensity areas, and residential overlays.	LU-2.2, LU-2.5, LU-2.6, LU-2.8, LU-3.5, LU-6.14	Community Development	Short, on-going
IM-LU-15	**Monitor.** Monitor the effectiveness of the use of the architectural objective design standards and Community Development Department staff in attaining the desired quality of development and, if determined to be ineffective, modify these with more effective standards or by other methods.	LU-2.2	Community Development	Mid, on-going
IM-LU-16	**Code enforcement.** Continue code enforcement programs and activities to maintain community pride and promote reinvestment in Redondo Beach neighborhoods.	LU-2.2	Community Development, Police Department	Short, on-going
IM-LU-17	**Underground utilities.** Consider the establishment of programs for the undergrounding of overhead utilities throughout the City.	LU-2.2	Public Works, Community Development	Mid, on-going
IM-LU-18	**Signage ordinance**. Update the sign ordinance to incorporate measures that reduce visual clutter.	LU-2.4	Community Development	Mid term
IM-LU-19	**Master Plan of Signage**. Consider developing a Master Plan of Signage to establish a consistent design vocabulary, ensure signage is adequately spaced and visible, provides for distinctive and weather-resistant signage which identifies principal entries to the City, unique districts, neighborhoods, locations, and public buildings and parks, and ensures that public signage complements and does not detract from adjacent uses. Consider implementing Master Plan of Signage for Special Policy areas.	LU-2.4, SPA-1, SPA-2, SPA-3, SPA-4, SPA,5, SPA-6, SPA-7	Public Works, Community Services	Mid term
IM-LU-20	**Gateways**. Establish a master plan for the installation of improvements along the principal streets at the City's boundary with adjacent jurisdictions which clearly distinguishes these as major entries to the City; including elements such as signage, landscape clusters, vertical pylons or flags, banners, public art, and/or other distinctive treatment.	LU-2.5, SPA-2, SPA-3, SPA-5, SPA-6	Public Works, Community Development	Mid term
IM-LU-21	**Streetscape improvements**. Conduct a citywide windshield study to identify arterial streets or corridors in most need of comprehensive streetscape improvements. Identify funding or resources to complete Area plans (if in Special Policy Area) or Public Realm Plans for these corridors to enhance the pedestrian experience, amenities, safety, sense of place and aesthetics.	LU-2.4	Public Works, Community Development	Mid term
IM-LU-22	**Funding for placemaking**. Evaluate best practices and standards for public-private partnerships to fund placemaking elements on public property.	LU-2.4, LU-2.5, LU-2.7, 2.8	Community Development, Waterfront Economic Development, Public Works	Short term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-23	**Parking**. Update the City's Circulation Element to address updated parking strategies, including parking management strategies to support the Land Use Plan and reduce dependency on single-passenger vehicles, considering the parking needs for existing development and future activity nodes, changes in automotive technologies and car usage trends, and options for City-operated facilities. Explore parking strategies through pilot projects within Special Policy Areas.	LU-2.2, LU-2.3, LU-2.6, LU-2.8		Mid Term
IM-LU-24	**Emerging technology.** Update the City's Circulation Element, Zoning Ordinance and Zoning Ordinance for the Coastal Zone to require mixed-use and multifamily residential projects to incorporate on-site lanes/spaces for transportation network companies (TNC) and other emerging technologies. As parking demand begins to outstrip parking supply in established business districts, conduct curbside management studies to identify pick-up and drop-off areas for TNC services to maintain the character of historic and established districts; reduce parking demand; limit vehicle idling, searching, and circling; and encourage pedestrian activity.	LU-2.3, LU-2.8	Community Development, Public Works, Waterfront Economic Development	Mid term
IM-LU-25	**Bicycle parking**. Update the City's Circulation Element, Zoning Ordinance and Zoning Ordinance for the Coastal Zone to require safe and secure bicycle parking and promote bicycle access for special events. Explore options to update the Zoning Ordinance and Zoning Ordinance for the Coastal Zone to require secure bicycle parking for any new development project that also has a parking requirement.	LU-2.1, LU-2.7, LU-2.8	Community Development	Mid term
IM-LU-26	**Cross-access.** Amend the Zoning Ordinance and Zoning Ordinance for the Coastal Zone to require reciprocal access on commercial development projects adjacent to other commercially zoned developments.	LU-2.1, LU-2.7, LU-2.8	Community Development	Mid term
IM-LU-27	**Community advertising.** Explore options to incorporate digital signage or advertisements that promote community activities on small-scale structures such as bus shelters or trash receptacles.	LU-2.4, LU-3.11	Public Works, Community Services	Mid term
Compatibility				
IM-LU-28.	**Building massing.** Identify the best vehicle (design guidelines, zoning ordinance, area plan, etc.) to define standards that reflect best practices in addressing transitions in building height and bulk for new development adjacent to lower density neighborhoods, and define standards accordingly	LU-2.3, LU-3.1, LU-3.2	Community Development	Short term
IM-LU-29	**Industrial standards**. Evaluate and update the Zoning Ordinance and Zoning Ordinance for the Coastal Zone's development and operational standards for industrial zones to reflect the types of industrial uses expected.	LU-3.2, LU-3.4	Community Development	Short term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-30	**Police review**. Ensure the development review process requires Police Department review of uses which may be characterized historically by high levels of nuisance (noise, nighttime patronage, and/or rates of criminal activity). Review and revise Zoning Ordinance and Zoning Ordinance for the Coastal Zone if necessary to provide for conditions of control of use to prevent adverse impacts on adjacent residences, schools, religious facilities, and similar "sensitive" uses.	LU-3.1, LU-3.4	Community Development, Police Department	Short, on-going
IM-LU-31	**South Bay Bicycle Master Plan.** Prioritize bicycle facility improvement projects identified in the Bicycle Master Plan, and seek funding to implement.	LU-3.6, LU-4.5, LU-4.6	Public Works	Short, Mid, Long term
IM-LU-32	**Adequate infrastructure**. Update development application process to require developers to pay the cost of studies needed to determine infrastructure capacity for proposed projects if there is a rational nexus between the project and the need for additional capacity or upgrades of impacted infrastructure. Require the physical improvements or their fair share contribution of necessary infrastructure.	LU-3.9	Community Development, Public Works	Short term
IM-LU-33	**Utility corridors.** Develop a plan for the reuse of SCE rights-of-way for active transit and open space should they no longer be required for their current operations.	LU-3.8, LU-3.10, LU-4.4	Community Services, Community Development, Public Works	Short, Mid term
IM-LU-34	**Public noticing**. Review and evaluate existing public noticing requirements for development projects to ensure adequate public awareness.	LU-3.11	Community Development	Short term
IM-LU-35	**Public hearings**. Continue to provide online and in-person access to commission and council meetings.	LU-3.11	Community Development, City Manager's Office	Short, on-going
Note: See *Open Space & Conservation Element Implementation* for additional actions related to this goal.				
Health and Vitality				
IM-LU-36	**On site open space.** Study the need for additional on-site open space in new residential, mixed use, and commercial developments.	LU-4.1, LU-4.2	Community Development	Short term
IM-LU-37	**Health in corridors.** Require a Health Risk Assessment to identify best practices to minimize air quality and noise impacts when considering new residential uses within 500 feet of a freeway.	LU-4.2	Community Development	Short term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-38.	**Circulation Element Update.** Update Circulation Element of the General Plan to include: • Confirmation or update of the Master Plan of Streets • Consistency with land uses. • Active transportation routes that link the City's parks, public spaces, other open spaces, and neighboring facilities like the Hermosa Beach Greenbelt, through a connected, usable, desirable, and accessible network of sidewalks, bike paths, trails, parkettes, and landscaped interventions, consistent with the South Bay Bicycle Master Plan	LU-3.6, LU-3.8, LU- 4.3	Community Development, Public Works	Short term
IM-LU-39	**Health partnerships.** Identify health care providers, health promoting non-profits and community-based organizations, working to improve public health through land use projects in Redondo Beach.	LU-4.7	Community Services, Community Development	Short term
Note: See *Open Space & Conservation Element Implementation* for additional actions related to this goal.				
Environmental Sustainability				
IM-LU-40	**CEQA review.** Continue to evaluate land use compatibility through required environmental clearance of new development projects.	LU-3.4, LU-3.9, LU-5.1, LU-5.6	Community Development	On-going
IM-LU-41	**Fleet electrification.** Evaluate the possibility and phasing for electrification of the City's fleet vehicles.	LU-5.5	Public works?	Mid term
IM-LU-42	**CAP.** Continue to implement the strategies identified in the City of Redondo Beach Climate Action Plan (CAP).	LU-5.2, LU-5.5, LU-5.6	Community Development, Public Works	Short, on-going
IM-LU-43	**Sustainable buildings.** Require LEED silver or better for all City projects/buildings. Encourage LEED certification on all projects.	LU-5.1, LU-5.5, LU-5.6	Community Development	Short term
IM-LU-44	**Landscaping**. Evaluate the potential of establishing landscape design criteria/guidelines that require the exclusive use of native California and drought resistant vegetation in all housing and commercial developments.	LU-5.2, LU-5.5	Community Development	Short term
IM-LU-45	**Urban Forest.** Continue to investigate the development of an urban forest ordinance to provide for the consistent use of street trees to identify City streets, neighborhoods, commercial districts, and community gateways, consistent with the City's list of approved tree species. Conduct a survey of public streets, and identify areas where street trees do not exist, but could be supported. Partner with community groups and seek funding to expand the urban forest in these areas, with priority given to areas identified as park-deficient in the Parks Master Plan or Open Space and Conservation Element	LU-5.8, LU-5.9	Public Works, Community Development	Mid term
IM-LU-46	**Tree trimming.** Adopt a citywide street tree trimming and pruning master plan or ordinance, which cultivates the full potential of street trees as providers of shade and designators of key design corridors	LU-5.8, LU-5.9	Public Works	Mid term

Land Use Element Implementation Actions

	Implementation Action	Applicable Policy	Responsible Department	Time Frame
Note: See *Open Space & Conservation Element Implementation* for additional actions related to this goal.				
Economic Sustainability				
IM-LU-47	**Economic development strategy.** Adopt and maintain an economic development strategy. The strategy shall provide measurable objectives and action plans intended to achieve the goals of this element. The strategy may include additional, shorter-term goals that are not in conflict with this element. Upon adoption of an economic development strategy, the following shall apply: • Prioritize the investment of public resources based on the adopted strategy. • Annually review the effectiveness of the economic development strategy. • Every three to five years, comprehensively review the adopted strategy and update it if necessary.		Waterfront and Economic Development, Community Development	Mid term
IM-LU-48	**Fiscal impact analysis.** Explore the development of a fiscal impact analysis model that incorporates the appropriate mix of land uses to achieve fiscal sustainability, or at a minimum, fiscal neutrality to make informed land use decisions. Require the completion of fiscal impact analysis in mixed-use land use designations, residential overlay areas, and in proposed conversion of existing commercial uses to residential or mixed-use projects to fully understand implications for tax revenue and community services (police, fire, infrastructure).	LU-1.1, LU-6.1, LU-6.8, LU-6.10	Community Development, Waterfront Economic Development, Public Works	Short, On-going
IM-LU-49	**Fiscal impacts of land use changes**. Document the potential economic and fiscal impacts associated with significant land use plan amendments involving land use or intensity revisions.	LU-1.4, LU-6.8, LU-6.10, LU-6.13	Community Development	Short, On-going
IM-LU-50	**Fee assessment.** Conduct a periodic review of developer fees and assessment districts to ensure fees are adequate to provide services and mitigate impacts of development, with consideration given to feasibility concerns of building new development.	LU-1.11, LU-6.1, LU-6.10, LU-6.11, LU-6.17	Community Development	Short, On-going
IM-LU-51	**Broker outreach**. Conduct outreach meetings with commercial real estate brokers to discuss the types of businesses considering a Redondo Beach business location; identify challenges that discourage business from locating in the City; implement a plan to address such challenges.	LU-6.2, LU-6.3, LU-6.10, LU-6.12	Waterfront and Economic Development	Mid term
IM-LU-52	**Business development targets**. Prepare and regularly update a business development target list that identifies the types of businesses that are most likely to be interested in a Redondo Beach business location, the types of businesses most likely to employ City residents, types of businesses that broaden the local economy, and the types of businesses expected to generate higher net revenues for the City or to create shared revenue	LU-6.2, LU-6.3, LU-6.10, LU-6.12, LU-6.20	Waterfront and Economic Development	Mid term

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	opportunities; target the City's business attraction efforts on these types of businesses.			
IM-LU-53	**Business attraction**. Participate in state and national economic development organizations. Attend trade shows and market Redondo Beach to preferred and high-growth business clusters for South Bay cities.	LU-6.2, LU-6.3, LU-6.10, LU-6.12, LU-6.20	Waterfront and Economic Development	Mid term
IM-LU-54	**Business outreach and retention**. Continue to support existing business attraction and retention programs. Maintain partnerships with local business improvement districts and other nonprofit organizations. Continue to reach out to national retailers and employers.	LU-6.12, LU-6.20	Waterfront and Economic Development	Mid term
IM-LU-55	**Communication Technology**. Partner with public and private enterprises to facilitate communication technology, such as fiber optics, to address current and future technology needs relative to available resources and ensure that the City maintains a competitive business environment.	LU-6.3	Public Works, Community Development	Mid term
IM-LU-56	**Assessment Districts**. Explore where special assessment districts would benefit the community and encourage formation of such districts.	LU-6.18	Waterfront and Economic Development	Mid term
IM-LU-57	**Institutional outreach**. Identify institutional uses that may consider a Redondo Beach location; meet with potential institutions to identify challenges that discourage locating in the City; implement a plan to address such challenges.	LU-6.19	Waterfront and Economic Development	Mid term
IM-LU-58	**Employ local initiative**. Continue to support local initiatives like worker cooperatives and develop a package of business incentives like reduced business license fees to encourage Redondo Beach businesses to hire local residents.	LU-1.4, LU-6.5, LU-6.7, LU-6.20	Waterfront and Economic Development	Short term
IM-LU-59	**Home Based Business**. Review City standards for allowable use, parking, business permit, and others to identify barriers to establishing home-based businesses, and revise as necessary.	LU-6.21	Community Development, Waterfront and Economic Development	Mid term
Historic Preservation				
IM-LU-60	**Historic properties**. Update, expand, and periodically update the Citywide Historic Properties Survey to identify potential historic resources for placement on local Register and those that are at risk of losing their historic value. Include details documenting architecturally significant features that could be salvaged and reused. Consider including historically significant public landscape features, including specimen trees be designated as landmarks and preserved.	LU-2.1, LU-7.3, LU-7.4, LU-7.9	Community Development	Short term
IM-LU-61	**Mills Act**. Continue to facilitate the designation of historic buildings through Mills Act applications. Prioritize applications for resources at risk of being lost.	LU-2.1, LU-7.2, LU-7.8	Community Development	Short, on-going

Land Use Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-LU-62	**Equitable access**. Review the fee structure for applicants to ensure reasonable and equitable access and participation in the Mills Act Program.	LU-7.8	Community Development	Short term
IM-LU-63	**Oral history**. Seek funding to establish a local oral history program to capture Redondo Beach's historic and cultural narrative.	LU-7.6	Community Services, Community Development	Mid term
IM-LU-64	**City branding.** Include historic resources and cultural imagery in future City branding and marketing campaigns.	LU-2.1, LU-7.5	Waterfront and Economic Development	Short term
IM-LU-65	**Public awareness of historic preservation.** Participate in and support efforts of preservation organizations, affiliated tribes listed with the California Native American Heritage Commission, and business groups to promote public awareness and educational opportunities that highlight historic preservation.	LU-7.7	Waterfront and Economic Development, Community Services, Community Development	Mid term
IM-LU-66	**Historic preservation ordinance**. Update and periodically review the historic preservation ordinance to incorporate findings of the updated Historic Resources Survey.	LU-7.9	Community Development	Short term
Special Policy Areas				
IM-LU-67	**Special Policy Areas.** Identify and prioritize which special policy areas would most benefit from an area plan, specific plan, or corridor plan. As resources permit, develop and implement identified plans in order of priority. Resulting plans may include, but are not limited to the following, as appropriate for each area: • Strategies to promote desired reinvestment and redevelopment; • Regulations, and design standards with consideration of the character, history and uniqueness of existing corridors and neighborhoods. (Including standards that minimize impact of higher intensity development near established neighborhoods, and minimize viewshed impacts of new development on established neighborhoods) • A public realm plan to achieve a unified vision for long-term improvements to streets, sidewalks, plazas, other public spaces, and placemaking elements including landscaping palettes that uniquely identify unique commercial districts and residential neighborhoods in the City. • Public improvement priorities and pilot projects for inclusion in the City's Capital Improvement Program. • Strategies to integrate improvements that facilitate transit use.	SPA-1, SPA-4, SPA-5, SPA-6, SPA-7	Community Development	Short, Mid term
IM-LU-68	**Artesia Boulevard.** Implement the action items identified in Chapter 6 of the Artesia Aviation Boulevards Area Plan (AACAP)	SPA-2, SPA-3	Community Development, Public Works, Community Services, City Manager	Varies – See AACAP for specifics

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
Quantity, Location, and Access				
IM-OS-1	**Public and quasi-public land for public space.** Conduct a feasibility Study to identify realistic opportunities and strategies to convert inaccessible and underutilized public and quasi-public properties into public spaces.	OS-1.2, OS-1.3, OS-1.4, LU-4.4, LU-4.5	Community Services, Public Works, Community Development	Mid term
IM-OS-2	**Usable Public Open Space.** Update municipal code to redefine "Usable Public Open Space" to specify that these spaces must be usable, desirable, and accessible to the public and update standards for such spaces to ensure this intent is realized	OS-1.5, OS-1.6, LU-4.1, LU-4.2, LU-4.4	Community Development	Short term
IM-OS-3	**Define Parklet.** Update Zoning Code to include a definition of parklet, consistent with the Open Space and Conservation Element.	OS-1.4, OS-1.5, OS-1.6	Community Development	Short Term
IM-OS-4	**Define types of open space.** Update municipal code to define and distinguish private open space, common open space, and usable public open space.	OS-1.6	Community Development	Short term
IM-OS-5	**Parkland fees.** Impose exactions/mitigation fees on new residential development to be used for parkland and recreation facilities development. Periodically assess and update fee structure.	OS-1.1, OS-1.6, OS-5.1, LU-1.11, LU-4.4, LU-4.5, LU-6.11, LU-6.18	Community Services, Community Development	Short term, Ongoing
IM-OS-6	**Joint use.** Work with the School District and health care providers, health promoting non-profits and community-based organizations to identify programs and measures that would allow for the joint use of recreational facilities while minimizing the risks assumed by the School District and other partners. Prioritize existing facilities that are located in underserved areas of the City.	OS-1.2, OS-1.7, LU-4.4, LU-4.5, LU-4.7	Community Services	Short term
IM-OS-7	**Active transit and access to parks and open spaces.** Update the Circulation Element of the General Plan to reflect active transportation routes that link the City's parks, public spaces, other open spaces, and neighboring facilities like the Hermosa Beach Greenbelt, through a connected, usable, desirable, and accessible network of sidewalks, bike paths, trails, parkettes, and landscaped interventions, consistent with the South Bay Bicycle Master Plan.	OS-1.8, OS-1.9, OS-1.10, LU-4.5, LU-4.6	Community Development, Community Services, Public Works	Short term
IM-OS-8	**Greenbelts.** Extend Greenbelt Park from Hermosa Beach into the City of Redondo Beach to create a greenbelt to the sea.	OS-1.3, OS-1.4, LU-4.5, LU-4.6	Community Services	Long term
IM-OS-9	**Coastal access.** Evaluate circulation, parking, and transit options that would enhance access to coastal parks and recreation facilities.	OS-1.8, LU-4.1, LU-4.3, LU-4.5, LU-4.6	Community Services	Short Term
IM-OS-10	**Transit to recreational facilities.** Promote City-sponsored transportation (i.e Beach Cities Transit, The Wave Dial-a-Ride), ride sharing, and the public transit system to encourage citizen use of alternative options to access local recreation facilities.	OS-1.8	Community Services, Public Works	Short Term

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-OS-11	**Turf.** Conduct a study to identify the appropriate use, application, and regulations for the installation and maintenance of artificial turf and update the development code to reflect findings.	OS-1.9, OS-6.3	Community Development	Mid term
IM-OS-12	**Tree ordinance.** Review and revise as needed, the City's tree ordinance to ensure protection of existing parkway trees and update the master tree list.	OS-1.9, LU-5.7, LU-5.6, Circulation Element P29	Community Services, Community Development	Short term
IM-OS-13	**Urban forest inventory.** Complete and maintain a citywide public tree inventory, including quantity, species type, diameter, condition, trimming strategies, geo-codes and recommendations, and identify areas where street trees do not exist, but could be supported. Partner with community groups and seek funding to expand the urban forest in these areas, with priority given to areas identified as park-deficient in the Parks Master Plan or Open Space and Conservation Element.	OS-1.9, OS-8.4, LU-5.6	Community Services, Community Development	Mid term
IM-OS-14	**Landscape Palette.** Maintain a list of approved plantings for trees and drought tolerant landscaping within access routes to City recreation facilities.	OS-1.9, OS-8.4, LU-5.6	Community Services, Community Development	Short term
IM-OS-15	**King Harbor Public Amenities Plan.** Develop, maintain and implement a King Harbor Public Amenities Plan that includes: • Preserving or improving the connection between the Harbor Drive Class IV bicycle facility and the Beach multiuse trail. • Supporting a variety of recreational opportunities such as, sportfishing, boating, and improvements/enhancements to City parks (Seaside Lagoon and Moonstone Park).	OS-1.10, OS-2.11, OS-2.12, OS-2.13, LU-1.12, LU-4.1, LU-4.3, LU-6.5	Waterfront and Economic Development	Short term
IM-OS-16	**Regional trails.** Consider Capital Improvement projects to: • Improve connections to the South Bay and regional trail network.	OS-1.10, LU-4.5, LU-4.6	Public Works	Long term
High Quality Open Spaces and Recreational Facilities				
IM-OS-17	**Parks Master Plan.** Develop a Parks Master Plan, including: • A detailed inventory of parks, public spaces, other open spaces, and recreational facilities, including existing amenities. • Recommendations to improve the resiliency of parks, public spaces, other open spaces, and recreational facilities to fortify against the impacts of climate change and sea-level rise. • Opportunities to establish a greenbelt to the sea that connects parks, public spaces, and other open spaces (including habitat and conservation areas) to the coast via future opportunity sites.	OS-2.1, OS-2.5, OS-2.6, OS-2.7, OS-2.8, OS-2.9, OS-2.10, OS-4.6, OS-8.1, OS-8.6, LU-4.1, LU-4.3, LU-4.8	Community Services	Mid term

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-OS-18	**Accessible facilities.** Evaluate the financial and operational ramifications of bringing the City's parkland and recreation facilities into full conformance with the provisions of the Americans with Disabilities Act (ADA) of 1990	OS-2.2, OS-2.3, OS-2.4	Community Services; Community Development	Mid term
IM-OS-19	**Parks engagement.** Develop a community engagement strategy to solicit input from the community on park, public space, and recreation-related issues.	OS-2.4	Community Services	Short term
IM-OS-20	**Parks survey.** Periodically survey park users to determine who is using the parks and how they are being used to adjust the Parks Master Plan as needed. Also inventory park amenities for age, use, demand, and maintenance.	OS-2.5, LU-4.1, LU-4.8	Community Services	Short term; ongoing
IM-OS-21	Create an Emergency Operation Plan (Safety Element).	OS-2.6, S-1.1	Fire, Police	Short term
IM-OS-22	**Resilience hubs.** Identify existing facilities to serve as resilience hubs and cooling centers that open during emergencies or specific temperature triggers for residents to go to seek refuge from extreme heat days or emergency shelter.	OS-2.6	Community Services, Fire	Short term
IM-OS-23	**Resilient facilities.** Coordinate with emergency management services to establish backup power, preferably from renewable energy sources, and water resources at resilience hubs, and cooling centers in case of power outages.	OS-2.6	Community Services, Fire, Public Works	Long term
IM-OS-24	**Partnerships.** Identify an approved list of commercial and non-profit operations that the City would like to partner with to provide future recreation, conservation and educational services.	OS-2.11	Community Services, Public Works	Mid term
IM-OS-25	**Conservation resources.** Develop a priority list of community resources that should be a part of any future conservation efforts initiated by the City.	OS-2.10	Community Services; Community Development	Mid term
IM-OS-26	**Coastal wayfinding, access, and Harbor Revitalization.** Develop a harbor and coastal access sign program to assist the public to locate and use coastal access points. Develop a harbor revitalization program that ensures enhanced recreational facilities and space for coastal dependent recreation.	OS-2.12, OS-2.13, LU-2.1, LU-2.4, LU-4.1	Community Services; Community Development	Mid term
Prominent Public Viewpoints				
IM-OS-27	**Scenic vistas**. Conduct a study to identify scenic vistas, the prominent public viewpoints from which scenic vistas are observed, and the extent of the prominent public viewshed that should be protected for public enjoyment; evaluate strategies and regulations to protect identified vistas, viewpoints, and viewsheds.	OS-3.1, LU-2.1, LU-3.2	Community Development	Mid term
IM-OS-28	**Update code to protect scenic vistas**. Following the scenic vista study, amend the municipal code as necessary to incorporate "Prominent Public Viewpoint Protection Areas," that reflect the results of the study to identify prominent public viewpoints and require new development, significant remodels, and redevelopment within the Viewpoint	OS-3.2, OS-3.3, LU-2.1, LU-3.2	Community Development	Mid term

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	Protection Areas to conduct a visual impact analysis. If impacts are found, require citywide public noticing and community engagement unless such measures would conflict with state laws.			
IM-OS-29	**Protect scenic vistas**. Regulate buildings, signage, landscaping and infrastructure improvements that encroach into the established viewpoint/viewshed areas.	OS-3.2, OS-3.3, OS-3.4, LU-2.1, LU-3.2	Community Development	Mid term
IM-OS-30	**Light pollution.** Establish standards to minimize nighttime light pollution through treatments such as installation of low intensity, shielded and downcast lighting concealed to the greatest feasible extent so that light sources have minimized visibility from public viewing areas. Establish measurable lighting standards for specific land uses and require determined lighting standards to be maintained on-site only.	OS-3.5, LU-2.1, LU-2.3	Community Development	Mid term
Programs and Events				
IM-OS-31	**Public Art.** Continue to implement the City's established Public Art Program and review periodically to assess how the funds are being implemented to determine if additional prioritization or guidance on where the funds are spent is needed.	OS-4.1, LU-2.4, LU-SPA-2, LU-SPA-5, LU-SPA-6, LU-SPA-7,	Community Development, Community Services	Short term; Ongoing
IM-OS-32	**Coastal events**. Regularly evaluate the public recreational activities and special events such as outdoor concerts, a public market, farmer's market, block party, crafts/food fair, art walk, and other similar types of social festivities in the Coastal Zone.	OS-4.1, LU-6.5	Community Services, Waterfront and Economic Development	Short term; Ongoing
IM-OS-33	**Program review.** Evaluate the public interest, participation rates, cost effectiveness, and strengths and weaknesses of existing recreation programs on an annual basis. Incorporate resiliency programs in the evaluation.	OS-4.1, OS-4.2, OS-4.5	Community Services	Short term, Ongoing
IM-OS-34	**Program evaluation.** Evaluate recreation programs on an ongoing basis to ensure they meet changing community needs.	OS-4.1, OS-4.2	Community Services	Short term, Ongoing
IM-OS-35	**Inclusive programming.** Evaluate the specific needs of various local demographic groups (including young children, families, young-to-middle aged adults, and senior citizens) for purposes of recreation program and facility planning. Engage the business community and civic organizations for support and scholarships to expand opportunities for participation.	OS-4.1, OS-4.2, OS-4.3	Community Services	Short term, Ongoing
Funding				
IM-OS-36	**Parks and recreation fees.** Evaluate, on an annual basis with the Fiscal Year Budget, all park and recreation user fees to ensure recreation programs are affordable and self-sustaining.	OS-5.1, OS-5.2	Community Services	Short term
IM-OS-37	**Contributions.** Support the acquisition and improvement of parkland through private donations, establishment of tax benefits, living trusts, etc.	OS-5.4	Community Services	Mid term

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-OS-38	**Parks advocacy.** Explore the possibility of establishing a Parks Foundation or partnering with established non-profit organizations to seek additional funding for parks, recreation, conservation, and habitat-related projects, programs, and efforts within the City. Additionally, explore the opportunities for establishing financing districts to fund the acquisition, development, and maintenance of parkland and recreation facilities.	OS-5.3, OS-5.5	Community Services	Mid term
IM-OS-39	**Maximize public funding**. Prioritize Federal and State resources that will actively be pursued and identify parks projects or programs that would be candidates for funding. Identify things that would make project most competitive (outreach and input from community, direction from City Council, surveys, etc.) and initiate them far enough in advance of the notice of funding availability that the City can be responsive to the application. Proactive pursuit of funds vs. reactive.	OS-5.5	Community Services	Short term
IM-OS-40	**Monitor funding resources.** Develop a list of available Federal and State funding sources and actively monitor for notifications of availability.	OS-5.6	Community Services	Mid term
Coastal Resources				
IM-OS-41	**Water quality.** Develop and implement an educational awareness campaign to homeowners and businesses regarding the importance of water quality and what they can do to help limit discharge and erosion.	OS-6.1 OS-6.2 OS-6.3 OS-6.4	Public Works	Mid term
IM-OS-42	**Water monitoring.** Monitor discharge into the Santa Monica Bay.	OS-6.3	Harbor Department; Public Works	Short term; ongoing
IM-OS-43	**Erosion**. Continue to partner with Los Angeles County and neighboring jurisdictions to monitor beach erosion and participate in regional initiatives to prevent and address coastal erosion.	OS-6.4	Community Services	Short term, on-going
Water Management				
IM-OS-44	**Education.** Develop an education program to inform homeowners and business owners about water conservation and stormwater management strategies and utilize the city's recreational facilities and programs to support the program and serve as the community's resources concerning water conservation. Engage the County and utility purveyors in this program.	OS-7.2, OS-7.4	Community Development, Community Services, Public Works	Short term
IM-OS-45	**Infiltration.** Update the municipal code to require all new public or private development projects to incorporate ground water infiltration best practices such as bioswales and permeable hardscape, and prioritize use of native plants.	OS-7.1, OS-7.3, LU-5.8	Community Development	Short term

Open Space Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-OS-46	**Gray water.** Update the municipal code to allow for and regulate use of gray water for landscaping.	OS-7.1, LU-5.X, Utilities 6.3.13 Utilities 6.3.14	Community Development	Short term
IM-OS-47	**Low Impact Development.** Study the possibility of implementing stricter requirements (lower thresholds) for "Low Impact Development" stormwater management measures citywide. Update city ordinance as necessary.	OS-7.3, LU-5.8	Community Development	Short term
IM-OS-48	**Groundwater recharge.** Identify sites and preserve significant areas that contribute to the infiltration of water into the local groundwater basin.	OS-7.3, LU-5.8	Public Works	Short term
IM-OS-49	**Bioswales.** Consider capital improvement projects to incorporate bioswales into city streets and medians, where appropriate, to mitigate flooding and improve infiltration	OS-7.3, LU-5.8	Public Works	Long term
IM-OS-50	**Recycled water.** Work with utility companies to expand the City's recycled water infrastructure (purple pipes).	OS-7.5, LU-5.8, Utilities 6.3.12	Public Works	Mid term
Biological Resources				
IM-OS-51	**Wildlife corridor plan.** Develop a wildlife corridor plan that includes a comprehensive strategy to implement an urban forest throughout the City.	OS-8.1, OS-8.4, LU-5.6	Community Development, Community Services, Waterfront and Economic Development	Long term
IM-OS-52	**ESHA.** Conduct ESHA studies as required by wildlife corridor plan, including studies of potential Burrowing Owl habitat	OS-8.1, LU-5.6	Community Development	Mid term
IM-OS-53	**Habitat restoration.** Contact local non-profit and community groups to establish a partnership to continue the habitat enhancement program for the El Segundo Blue Butterfly along the Redondo Beach bluffs, between the Esplanade and the beach promenade.	OS-8.2, LU-5.6	Community Development	Mid term
IM-OS-54	**Environmental Education.** Sponsor and encourage community participation in community festivals or events focused on environmental education and stewardship. Promote volunteer opportunities such as coastal cleanup days, adopt-a-beach, and other citywide events. Engage the community on the City's efforts to expand the urban forest throughout the City.	OS-8.3, OS-8.4	Community Development, Community Services, Waterfront and Economic Development	Short term
IM-OS-55	**Bluff restoration.** Evaluate existing bluff conditions and identify areas that may be appropriate to restore vegetation or habitat. Pursue grant funding.	OS-8.5, LU-5.6	Community Services, Community Development	Mid term
IM-OS-56	**Powerplant property.** Continue conversations with property owners of the powerplant site and other agencies to re-establish wetlands and native habitat on site and in the utility right of way next to Herondo Avenue.	OS-8.6, LU-5.6	Community Development	Short term; ongoing

Safety Element Implementation Actions

	Implementation Action	Applicable Policy	Responsible Department	Time Frame
Emergency Preparedness, Response, and Recovery; Critical Facilities; Hazard and Emergency Data				
IM-S-01	**Rebuilding programs.** Develop recovery and rehabilitation programs to help re-build after a hazardous event.	S-1.2	Community Development, Public Works, Fire	Ongoing
IM-S-02	**CERT.** Expand participation in the Redondo Beach Community Emergency Response Team (CERT) program.	S-1.3	Fire	Ongoing
IM-S-03	**Safety Element Updates.** Update the Safety Element upon each update to the Local Hazard Mitigation Plan and Housing Element, but no less than every 8 years.	S-1.1, S-3.3	Community Development, Fire, Police	Mid (5 years)
IM-S-04	**LHMP Updates.** Update the Local Hazard Mitigation Plan every 5 years to maintain eligibility for disaster grant funding.	S-1.1, S-3.3	Fire, Community Development, Public Works	Short (4 years)
IM-S-05	**Public Safety disaster information.** Prepare public safety disaster information release programs for use in emergencies.	S-1.3, S-1.4	Fire, Police	Ongoing
IM-S-06	**Public safety awareness.** Develop a public information awareness program to expose and familiarize the citizens of the City of Redondo Beach with the Safety Element of the General Plan and the City's Local Hazard Mitigation Plan (LHMP).	S-1.3	Community Development, Fire	Short (2 Years)
IM-S-07	**Public safety outreach.** Partner and coordinate with local school districts and public agencies related to or involved with seniors, persons with disabilities, persons with chronic illnesses, and other vulnerable populations to provide educational and information programs relative to public safety preparedness and response.	S-1.3	Community Development, Fire, Police, Community Services	Ongoing
IM-S-08	**Emergency Operations Coordinator.** Designate an Emergency Operations Coordinator who will oversee emergency management functions for the City.	S-1.3, S-1.4, S-1.6, S-1.7, S-1.8	Fire	Short (2 years)
IM-S-09	**EOP.** Adopt an Emergency Operations Plan and update every five years.	S- 1.1, S-1.4, S-4.6	Fire, Police, Public Works	Mid (5 years)
IM-S-10	**Emergency drills.** Conduct yearly EOC emergency drills.	S-1.3, S-1.4, S-1.5, S-1.6, S-4.6	Fire, Police, Public Works, City Manager's Office, Community Development	Ongoing
IM-S-11	**Progress of related plans**. Track the progress of the implementation of the Local Hazard Mitigation Plan and other related hazard mitigation and emergency management plans and activities.	S-1.5, S-4.6	Fire, Police, Public Works	Ongoing
IM-S-12	**Seismic review**. Require that proposed Critical, Sensitive, and High-Occupancy facilities be subject to careful and rigorous standards of seismic review prior to any local approvals or permits, including detailed site investigations for faulting, liquefaction and ground motion characteristics, and application of the most current professional standards for seismic design.	S-2.1, S-2.3	Community Development, Public Works, Fire	Ongoing

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-S-13	**Safe places for residents during hazard events**. Review City facilities and collaborate with property owners of private community assets (e.g., meeting houses, lodges, faith-based buildings, etc.) to evaluate which of these facilities could become cooling centers, resilience hubs, or emergency shelters that provide safe places for residents during hazard events or emergency conditions. These places shall remain operational both during and after the hazard event, as needed.	S-2.2, S-2.3, S-2.4, S-2.5. S-2.6	Community Development, Public Works, Police, Fire, Community Services	Ongoing
IM-S-14	**Liquefaction and landslide data and maps**. Continue collecting data from the California Geologic Survey related to liquefaction and landslides and update citywide maps and/or GIS data for areas susceptible to liquefaction and landslide.	S-3.1	Community Development, Public Works	Ongoing
IM-S-15	**Previously undetermined or unexposed faults**. Should a previously undetermined or unexposed fault be identified within the City limits, it should be evaluated immediately, and a determination made of the siting and construction limitations that should be imposed on new development and construction in these areas.	S-3.2	Community Development, Public Works	Ongoing
Seismic and Geologic Hazards				
IM-S-16	**California Building Code**. The most current version of the California Building Code shall be integrated, or incorporated by reference, into the City of Redondo Beach Municipal Code to ensure buildings are protected from high-intensity seismic and earthquake events.	S-4.1, S- 4.2, S-4.3, S-4.5	Community Development	Ongoing
IM-S-17	**Requirements for geotechnical reports and EIRs**. Evaluate and update the formats and guidelines required for geotechnical reports and environmental impact reports for proposed development projects to maintain consistency with the current version of the California Building Code and require these reports and EIRs to utilize latest data sets from the California Geologic Survey and United States Geologic Survey to ensure areas are identified and mapped that are prone to potential landslides and/or mudflows.	S-4.1, S-4.2, S-4.4, S-4.11	Community Development	Ongoing
IM-S-18	**Landslide and liquefaction prone areas**. Require that new construction in landslide and liquefaction prone areas prepare geologic and soil studies and incorporate design features to stabilize slopes and reduce the risk of landslides and seismic related failures Additionally, require new development to upgrade major roadway corridors in liquefaction prone areas to reduce damage and disruptions of transportation and evacuation routes.	S-4.1, S-4.5, S-4.7	Community Development, Public Works	Ongoing

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-S-19	**Best practices for seismic safety**. Update municipal code with grading standards, slope retainage standards, and erosion control mitigation measures required for private development projects and public improvements with new best practices to ensure local regulations are adequate for seismic safety. Include notification procedures of potentially impacted property owners in the event new faults are discovered/exposed.	S-4.1, S-4.4, S-4.9, S-4.10	Community Development	Ongoing
IM-S-20	**Seismically vulnerable buildings**. Create and maintain an inventory of seismically vulnerable buildings and structures in Redondo Beach, such as buildings with "soft stories, and" Explore feasible solutions to mitigate vulnerable buildings and structures to be retrofitted.	S-4.1, S-4.8	Community Development	Ongoing
IM-S-20	**Evacuation and emergency response to tsunami hazards**. Conduct a study of existing development within the tsunami hazard to determine evacuation and emergency response needs prior and during a tsunami event.	S-5.1	Public Works, Police, Fire, Waterfront Economic Development	Short (1-2 years)
IM-S-21	**TsunamiReady**. Pursue a TsunamiReady designation and certification as a TsunamiReady Tier Two community. Incorporate an evacuation notification system in the event of a tsunami. This program is led by the National Weather Service to help high-risk communities more completely prepare for and mitigate extreme tsunami risks for a higher level of disaster resilience. Tier Two hazard reduction measures are for areas directly along the west coast. This strategy is Mitigation Action 6.5 in the LHMP.	S-5.2	Public Works, Police, Fire, Waterfront Economic Development	Ongoing
Flooding and Sea Level Rise Hazards				
IM-S-22	**Drainage and flood control facilities**. Coordinate with the Los Angeles County Flood Control District and other appropriate entities to maintain locally and regionally effective strategies for the planning, construction, operation, and maintenance of drainage and flood-control facilities.	S-6.1, S-6.4	Community Development, Public Works	Ongoing
IM-S-23	**Flood prevention, preparedness and response awareness**. Provide information annually to residents promoting flood-control measures that reduce potential impacts from flooding and informing residents of areas susceptible to flooding and what to do prior to and during a flood event. Information should be provided in multiple languages and formats and appropriate for people with access and functional needs.	S-6.2	Community Development, Fire, Public Works	Ongoing
IM-S-24	**City-owned building flood risk assessment**. Prepare an assessment of at-risk City-owned buildings to determine their level and ability to withstand the impacts of flooding and conduct structural retrofits and flood mitigation where needed.	S-6.3	Fire, Community Development, Public Works	Short (1-3 years)

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-S-25	**Stormwater management**. Require new development in Redondo Beach to address and mitigate adverse impacts on the carrying capacity of local and regional storm drain systems. Additionally, require new development within identified 100-year or 500-year floodplain to comply with the Redondo Beach Flood Damage Prevention Ordinance.	S-6.4, S-6.5	Community Development, Public Works	Ongoing
IM-S-26	**Compliance with state flood requirements**. Update the Zoning Ordinance as necessary to comply with state requirements and projections of future flood risks for flood control.	S-6.1, S-6.4	Community Development, Public Works	Ongoing
IM-S-27	**Consistency with county, state and federal standards for flood.** Update the City's policies and standards, if necessary, to remain consistent with county, state and federal standards for floodplains and urban development in areas subject to flooding as identified in the General Plan.	S-6.1, S-6.4	Community Development, Public Works	Ongoing
IM-S-28	**Poor drainage areas**. Identify and remedy poor drainage areas to reduce risk from stagnant water.	S-6.4	Public Works	Ongoing
IM-S-29	**Seal Level Rise Overlay Zone**. Adopt a Sea Level Rise Overlay Zone with associated land use regulations for site planning and minimum construction elevations that reflects sea level rise data.	S-7.1	Community Development, Waterfront and Economic Development, Public Works	Short (1-3 Years)
IM-S-30	**Sea level rise adaptation plan**. Collaborate with South Bay cities, regional agencies, utilities, property owners, community groups, and other stakeholders to prepare and adopt a South Bay sea level rise adaptation plan, addressing increased flooding and sea level rise that provides unique adaptation options for the entire shoreline and identifies mechanisms for implementation.	S-7.2, S-7.4	Community Development, Public Works, Waterfront and Economic Development	Short (1-3 Years)
IM-S-31	**Sea level rise education**. Develop a sea level rise education program targeted to shoreline property owners, business owners and operators and the public about the impacts and potential risks sea level rise could have on facility operations, tourism, and the movement of goods and services. Additionally, include potential mitigation options in this education program.	S-7.3, S-7.4, S-7.7	Community Development, Waterfront and Economic Development	Ongoing
IM-S-32	**Managed retreat**. Conduct a managed retreat feasibility study that identifies specific assets at risk and cost of facilitating managed retreat through partnerships with local, regional, and state agencies and organizations. This would include the feasibility of acquiring easements for coastal parcels that are unsafe or soon to be unsafe due to erosion.	S-7.2, S-7.4, S-7.5, S-7.6, S-7.7	Community Development, Waterfront and Economic Development	Short (1-3 Years)
IM-S-33	**Harbor Climate Resiliency Master Plan**. Develop a Harbor Climate Resiliency Master Plan to strengthen the resiliency of the harbor to coastal flooding hazards such as sea-level rise and coastal flooding hazards.	S-7.2, S-7.4, S-7.5, S-7.6, S-7.7	Waterfront and Economic Development, Fire	Short (1-3 Years)

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
Hazardous Materials				
IM-S-34	**Multi-jurisdictional hazardous materials abatement plan.** Partner with surrounding cities and Los Angeles County to develop a multi-jurisdictional hazardous materials abatement plan addressing water resource evaluation and mitigation programs to protect contamination of the local water supply and the proper closure and remediation of any sites currently or formerly storing or disposing of hazardous materials. Additionally, this abatement plan will include procedures for coordinating with state and regional agencies to facilitate coordinated responses to toxic and hazardous waste and materials emergencies. This plan will also prohibit new facilities utilizing hazardous materials from being located directly adjacent to existing residential or schools.	S-8.1, S-8.4, S-8.5, S-8.8	Fire	Ongoing
IM-S-35	**Toxic and hazardous waste training.** Partner with the County of Los Angeles to ensure training for operators of toxic and hazardous waste or materials transportation or disposal services occurs on a yearly basis. This training shall also encourage hardening of hazardous waste storage containers to minimize risks due to floods, earthquakes, sea level rise, and severe weather.	S-8.1, S-8.2, S-8.3, S-8.7, S-8.9	Fire	Ongoing
IM-S-36	**Toxic and hazardous waste clean-up.** Develop programs and incentives for prevention and clean-up of toxic or hazardous wastes by private owners, businesspeople, and the public at-large to eliminate and/or clean existing sources of water supply contaminants due to toxic or hazardous materials and uses.	S-8.6, S-8.7, S-8.9	Fire, Community Development, Public Works	Ongoing
IM-S-37	**Hazardous materials disclosure.** Require public disclosure of all companies, facilities, buildings, and properties that use, store, produce, and/or import/export any hazardous materials and wastes in the city. The City will maintain and share their inventory with the Los Angeles County Environmental Health and Fire Departments.	S-8.3	Fire, Community Development	Ongoing
IM-S-38	**Hazardous materials emergency response plan.** Require that any business that handles a hazardous material prepare a plan for emergency response to a release or threatened release of a hazardous material, including providing updated information to emergency responders on the type and quantity of hazardous materials kept on-site.	S-8.3, S-8.7	Fire, Community Development	Ongoing
Fire Hazards				
IM-S-39	**Fire suppression infrastructure and services.** Monitor, maintain, and upgrade the condition and operation of the local water system and supply, the distribution and operation of local fire hydrants, fire alarm boxes, and fire hose cabinets on the Municipal Pier. Assess fire suppression services to ensure quick responses to emergencies and continue to cooperate with fire, paramedic, and emergency operations personnel in	S-9.1, S-9.2, S-9.3, S-9.6	Fire	Ongoing

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	adjacent municipalities and the County of Los Angeles to carry out the existing regional fire protection agreement.			
IM-S-40	**Fire education in primary schools.** Initiate and conduct educational programs in local primary schools using displays and demonstrations which will expose younger children to the threat of fire. Such programs would tend to replace their natural curiosity with a sense of respect. Proactive parental cooperation and assistance in overall fire education programs should be encouraged.	S-9.5, S-9.7	Fire	Ongoing
IM-S-41	**Fire education in secondary schools.** Support and sponsor exhibits and presentations in secondary schools which demonstrate the more involved aspects of fire hazards and fire dynamics, (including major contributing factors to fire hazard and the relationship of fire to the natural ecology). Proactive parental cooperation and assistance in overall fire education programs should be encouraged.	S-9.5, S-9.7	Fire	Ongoing
IM-S-42	**Fire safety requirements.** Continuously re-evaluate and study the need to upgrade the specific provisions of the Redondo Beach Municipal Code relating to sprinkler systems, smoke detector systems, heat detector systems, and fire alarm systems.	S-9.4, S-9.8	Community Development, Fire	Ongoing
IM-S-43	**Fire inspections.** Continue to inspect local residential, commercial, and industrial structures for compliance with state and local fire laws, regulations, ordinances, and practices.	S-9.4	Fire	Ongoing
Additional Climate Change Hazards				
IM-S-44	**Climate Vulnerability Assessment.** The City shall integrate the data, findings, results and adaptive policies of applicable local, regional, state and federal documents including but not limited to the California Climate Change Assessment, the California Adaptation Planning Guide, the Safeguarding California Plan, and the City's Climate Vulnerability Assessment into other City planning documents where feasible, including this General Plan Safety Element, the Local Hazard Mitigation Plan, Zoning Ordinance, building code, and other applicable codes.	S-10.2	Community Development, Fire	Short (1-2 Years)
IM-S-45	**Safety Element update.** The City shall review the Safety Element policies, no less than every 8 years, and shall update them as needed to ensure compliance with state laws and community needs.	S-10.2, S-10.4, S-10.5, S-10.9	Community Development	Annually
IM-S-46	**Vulnerability Assessment update.** The City shall update the Vulnerability Assessment every five to eight years to incorporate new technology, programs, partnerships, and policies to improve adaptation to climate-related hazards, including but not limited to working with regional water providers to implement extensive water conservation measures and ensure sustainable water supplies, and Los Angeles County, and the Los Angeles Regional	S-10.2, S-10.3, S-10.5, S-10.6, S-10.7, S-10.9, S-10.11	Community Development, Public Works, Fire	Ongoing

Safety Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	Collaborative to develop and implement regional climate change adaptation and resiliency initiatives.			
IM-S-47	**Renewable and resilient energy supplies and funding.** Evaluate City facilities for energy efficiency and upgrade City facilities, as feasible, with renewable and resilient energy supplies. As feasible, extend information outreach efforts, and funding/financing programs to support and encourage energy efficiency and renewable energy improvements for economically disadvantaged households and businesses, and new developments and existing property owners in general.	S-10.1, S-10.4, S-10.6, S-10.7, S-10.8, S-10.10, S-10.11	Community Development, Community Services, Public Works	Ongoing
IM-OS-17	***(Open Space and Conservation Element Implementation Action)*** **Parks Master Plan.** Develop a Parks Master Plan, including: • A detailed inventory of parks, public spaces, other open spaces, and recreational facilities, including existing amenities. • Recommendations to improve the resiliency of parks, public spaces, other open spaces, and recreational facilities to fortify against the impacts of climate change and sea-level rise. Opportunities to establish a greenbelt to the sea that connects parks, public spaces, and other open spaces (including habitat and conservation areas) to the coast via future opportunity sites.	OS-2.1, OS-4.6, OS-8.1, OS-8.6, LU-4.1, LU-4.3, LU-4.8, S-10.5, S-10.11	Community Services, Community Development, Public Works	Mid term
IM-S-47	**Urban Forest Master Plan.** Pursue funding to prepare an urban forest master plan for the city in coordination with transit agencies and other local agencies, that includes quantified goals and tracking methods, inclusive of increasing shading and heat mitigating materials on pedestrian walkways and transit stops.	S-10.5, S-10.7, S-10.8, S-10.11, LU-5.7, LU-5.8	Community Development, Public Works	Short, Mid (3-5 Years)
IM-LU-45	***(Land Use Element Implementation Action)*** **Urban Forest.** Continue to investigate the development of an urban forest ordinance to provide for the consistent use of street trees to identify City streets, neighborhoods, commercial districts, and community gateways, consistent with the City's list of approved tree species. Conduct a survey of public streets, and identify areas where street trees do not exist, but could be supported. Partner with community groups and seek funding to expand the urban forest in these areas, with priority given to areas identified as park-deficient in the Parks Master Plan or Open Space and Conservation Element.	LU-5.7, LU-5.8, S-10.7, S-10.8, S-10.11	Public Works, Community Development	Mid term

Noise Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
	Noise			
IM-N-1	**Noise evaluation.** Continue to evaluate the noise impacts of new projects during the development review process; begin evaluation of the impacts cumulative noise conditions may have on proposed noise-sensitive uses, including residential, during the development review process; consider requirements for noise analysis conducted by an acoustical specialist for projects involving land uses where operations are likely to impact adjacent noise-sensitive land uses.	N-1.1, N-1.4, N-1.5, N-1.6	Community Development	Short term (Ongoing)
IM-N-2	**Noise mitigation in impacted areas.** Evaluate options to expand noise mitigation in areas that are planned for growth but where ambient noise levels already exceed noise standards.	N-1.1, N-1.2	Community Development, Public Works, Police	Short term (Ongoing)
IM-N-3	**Mitigate existing impacts.** Identify existing business operations that produce exterior noise above the maximum levels specified in the City's General Plan or noise ordinance for adjacent land uses. Reach out to those businesses to provide educational resources about best practices for noise prevention and mitigation. Assist businesses to implement mitigation strategies through permit assistance, expedited permitting, and other incentives. If the noise impact cannot be mitigated, provide site selection assistance to help businesses relocate to other areas of the city.	N-1.1, N-1.2, N-1.6	Community Development, Police, Waterfront Economic Development	Mid term
IM-N-4	**Best practice.** Conduct a study of best practices for the prevention and mitigation of noise impacts on sensitive land uses caused by existing or new business operations.	N-1.1, N-1.6	Community Development	Mid term
IM-N-5	**Disclosure statements.** As part of any approvals of noise-sensitive projects where reduction of exterior noise to the maximum levels specified in the City's General Plan or noise ordinance is not reasonably feasible, require the developer to issue disclosure statements—to be identified on all real estate transfers associated with the affected property—that identifies regular exposure to noise	N-1.1,N-1.3, N-1.4, N-1.5	Community Development	Short term
IM-N-6	**Adjacent jurisdictions.** Continue to monitor development projects in adjacent jurisdictions and comment on projects with the potential for noise impacts in Redondo Beach.	N-1.1, N-1.11	Community Development	Short term
IM-N-7	**Site design and technology.** Require designs of parking structures, terminals, and loading docks for noise-generating land uses that minimize the potential noise impacts of vehicles on-site and on adjacent land uses. Encourage and/or require feasible technological options to reduce noise to acceptable levels.	N-1.1, N-1.5, N-1.6	Community Development	Ongoing
IM-N-8	**Baseline ambient noise levels.** Explore programs, services, and other opportunities to establish baseline ambient noise levels, with priority given to areas planned for growth.	N-1.1, N-1.2	Community Development, Police, Public Works	Short term

Noise Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-N-9	**Nuisance noise.** Review all permit applications, including temporary use permits, for potential noise impacts. Utilize existing noise ordinances to reduce the occurrence of nuisance noise violations.	N-1.1, N-1.2	Police, Community Development	Ongoing
IM-N-10	**Noise monitoring equipment, training, and staff resources.** Continue to allocate sufficient resources, training, and staff to acquire, maintain, and use necessary noise monitoring equipment to respond to noise complaints and enforce the noise ordinance.	N-1.2, N-1.6	Police, Community Development, Public Works	Short term (Ongoing)
IM-N-11	**Ongoing noise monitoring**. Explore programs, services, and other opportunities to monitor noise levels in areas where baseline ambient noise levels already exceed guidelines, and in areas where new development projects may change the ambient noise quality.	N-1.1, N-1.2, N-1.4, N-1.5, N-1.6	Community Development, Police, Public Works	Ongoing
IM-N-12	**Update noise ordinance**. Update the noise ordinance to reflect current zoning and general plan land use designations. Update the presumed ambient noise levels in the noise ordinance and General Plan based on updated baseline information (Implementation Action IM-N-8). Update the noise ordinance to require new noise-generating uses proposed within 1,000 feet of existing sensitive uses (such as homes, schools, and daycares) to conduct a stationary sound study and require the project mitigate impacts on existing uses to sound levels consistent with the city's noise ordinance.	N-1.2, N-1.5	Community Development, City Attorney, Police, Public Works	Short term, Mid term
IM-N-13	**Maintain noise ordinance.** As new noise issues are identified due to new development patterns, complaints to code enforcement, or other avenues, update the noise ordinance as necessary to ensure standards are appropriate for their intended purpose, are consistent with existing technical standards, are legally adequate, and are enforced according to their terms. Review and confirm noise ordinance after any General Plan Amendment to the Noise Element.	N-1.2	Community Development, Police	Mid term
IM-N-14	**Building Standards.** Continue to enforce interior noise standards for new construction.	N-1.3	Community Development	Short term (Ongoing)
IM-N-15	**Alternative paving.** Evaluate the use of alternative paving materials that can reduce traffic noise, as feasible, depending on roadway conditions and cost-efficiency.	N-1.7	Public Works	Mid term
IM-N-16	**Freeways.** Continue cooperation with Caltrans in the planning of noise attenuation along freeways and assist with outreach efforts to notify residents of major projects that may impact noise levels and aesthetics	N-1.7	Public Works	Mid term
IM-N-17	**Roadway designations.** Periodically review major roadways and designated truck routes to reduce truck traffic through residential neighborhoods and near schools.	N-1.1, N-1.7	Public Works	Short Term (Ongoing)

Noise Element Implementation Actions

Implementation Action		Applicable Policy	Responsible Department	Time Frame
IM-N-18	**Rail coordination.** Continue to work with rail owners and operators to manage existing quiet zones, monitor safety adjacent to railroad tracks, and consider feasible alternatives that reduce noise.	N-1.1, N-1.8, N-1.13	Public Works	Short Term (Ongoing)
IM-N-19	**Aircraft altitude standards and flight paths.** Continue working with the Federal Aviation Administration to determine appropriate altitude standards for aircraft flying over residential areas, taking into account public health and safety. Coordinate with regional airports to advocate for increased altitude and alternative flight paths to minimize potential aircraft noise impacts on residential neighborhoods.	N-1.9, N-1.11	Community Development	Mid term
IM-N-20	**Construction noise**. Continue to implement best practices in controlling construction noise including designated work hours, noise dampening equipment, noise barriers, and public noticing.	N-1.10	Community Development	Short term (Ongoing)
IM-N-21	**Agency coordination.** Continue to coordinate with the California Department of Transportation, the LA County Airport Land Use Commission, rail operators, and Metro to evaluate the need for sound barriers or other mitigation strategies along segments of the freeways, rail, and transit travel ways that impact existing noise-sensitive land uses.	N-1.7, N-1.8, N-1.9, N-1.11, N-1.12, N-1.13	Public Works, Community Development	Short term (Ongoing)
IM-N-22	**Regional Planning Efforts.** Continue to participate in and advocate for City priorities through regional planning processes related to roadway, rail, metro, and airport-related noise issues.	N-1.11, N-1.12, N-1.13	Community Development	Short term (Ongoing)
IM-N-23	**General Plan.** Continue to update the Noise Element for consistency with other elements. Continue to require updates to the Noise Element whenever the Land Use or Circulation Elements are updated to allow more intense land uses, change roadway designations, or allow for changes that would significantly alter projected sources of mobile noise. Continue to review the Noise Element for consistency whenever the Safety Element is updated.	N-1.14	Community Development	Short term (Ongoing)