Ocean Beach Climate Change Adaptation Project

San Francisco Planning
Case No. **2019-020115ENV**

State Clearinghouse No. 2020090171

Public Draft	*Draft EIR Publication Date:*	December 8, 2021	*Written comments should be sent to:* **Julie Moore** 49 South Van Ness Ave, Suite 1400 San Francisco, CA 94103 or CPC.OceanBeachEIR@sfgov.org
	Draft EIR Public Hearing Date:	January 6, 2022	
	Draft EIR Public Comment Period:	December 9, 2021 to January 24, 2022	

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San Francisco Planning

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SUMMARY

S.1 Introduction

This document is a draft environmental impact report (EIR) for the proposed Ocean Beach Climate Change Adaptation Project ("project"). This chapter provides a summary of the project; anticipated environmental impacts of the project and recommended mitigation measures; areas of controversy to be resolved; and alternatives, including the environmentally superior alternative.

The City and County of San Francisco (the city) proposes a coastal adaptation and sea level rise resiliency project along a portion of the city's western shoreline from Sloat Boulevard to Fort Funston known as "South Ocean Beach." The project is needed to address shoreline erosion, severe coastal storm and wave hazards, and sea level rise, which threaten city infrastructure, coastal access and recreational facilities, and public safety. Project planning and design are being led by the San Francisco Public Utilities Commission (SFPUC); however, the project is a collaborative, multi-agency initiative involving the SFPUC, San Francisco Recreation and Parks (Rec and Park), San Francisco Public Works (Public Works), San Francisco Municipal Transportation Agency (SFMTA), the Federal Highway Administration (FHWA), and the National Park Service (NPS).[1] The SFPUC is also coordinating with the U.S. Army Corps of Engineers (Corps).

Under the San Francisco Administrative Code, chapter 31, the San Francisco Planning Department's Environmental Planning Division is responsible for conducting the environmental review of all City and County of San Francisco projects pursuant to the requirements of the California Environmental Quality Act (CEQA). The planning department is the lead agency responsible for preparing this EIR in compliance with CEQA. The SFPUC, in coordination with other city agencies, is the project sponsor proposing to implement the project.

S.2 Background

Ocean Beach comprises a 3.5-mile stretch of sandy beach that forms the western boundary of San Francisco. It is influenced by complex coastal processes, including an intense wave climate, strong tidal currents, and irregular offshore underwater features. Chronic erosion of the beach and bluffs by episodic coastal storms occurs at South Ocean Beach. This erosion has undermined and damaged beach parking lots, stormwater drainage facilities and the Great Highway, threatens existing underground wastewater system infrastructure, and has constrained public shoreline access and recreational opportunities.

Since the 1990s, the city has responded to the erosion – mainly to protect the Great Highway, a city asset – through both hard shoreline armoring (e.g., construction of rock and rubble revetments) and soft shoreline protection measures (e.g., beach nourishment and sandbag revetments). In the intervening period, the city has also undertaken planning initiatives aimed at developing a long-term strategy for managing the South Ocean Beach shoreline. Notably, the city partially funded and participated in the preparation of the 2012

1 The FHWA and NPS will be lead agencies for a separate federal environmental review process, including preparation of National Environmental Policy Act (NEPA) compliance documentation.

Ocean Beach Master Plan (master plan).[2] Led by the San Francisco Bay Area Planning and Urban Research Association (SPUR), the master planning process brought together community members, agency representatives, and other stakeholders to develop a sustainable long-term vision for Ocean Beach, addressing public access, recreational use, environmental protection, and infrastructure needs in the context of erosion and climate-related sea level rise. The terms of a 2014 legal settlement agreement[3] and a 2015 California Coastal Commission permit[4] both establish timelines for developing and implementing a long-term solution to shoreline management at South Ocean Beach.

In 2018, the city amended its local coastal program, the Western Shoreline Area Plan,[5] to adopt policies that advance the Ocean Beach Master Plan's general vision for South Ocean Beach. The local coastal program policies concerning managed retreat, beach nourishment, and shoreline armoring strategies aim to preserve and enhance public access, coastal recreation, and scenic resources at South Ocean Beach, while protecting critical wastewater system infrastructure from damage due to coastal hazards. The project design represents the city's long-term strategy for addressing current and future erosion challenges at South Ocean Beach, drawing upon ideas and information obtained through many years of community engagement, technical investigation, and interim management efforts.

S.3 Project Description

S.3.1 Proposed Facilities and Project Location

Major project components include: (1) permanently closing the Great Highway between Sloat and Skyline boulevards to public vehicular traffic, reconfiguring affected intersections and San Francisco Zoo parking access, and maintaining a service road to SFPUC facilities; (2) constructing a buried wall to protect existing wastewater infrastructure from shoreline erosion; (3) removing pavement, rock and sandbag revetments,[6] rubble and debris from the beach, reshaping the bluff, and planting native vegetation; (4) constructing a multi-use trail, beach access stairway, coastal access parking, and restrooms; and (5) providing long-term *beach nourishment* (sand replenishment).[7] **Figures S-1a and S-1b** show the project components, each of which is described in more detail below.

The project area generally encompasses the portion of San Francisco's Ocean Beach extending south from Sloat Boulevard to the northern edge of the Fort Funston bluffs, and the Great Highway from Sloat Boulevard to Skyline Boulevard, along with a portion of Ocean Beach north of Lincoln Boulevard where sand is harvested for placement south of Sloat Boulevard. **Figure S-2** shows the project location.

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2 The Ocean Beach Master Plan was published in 2012 with subsequent documents published in April 2015 (Coastal Protection Measures & Management Strategy for South Ocean Beach. Ocean Beach Master Plan: Coastal Management Framework) and in February 2017 (Ocean Beach Open Space Landscape Design Summary).These documents are available at: https://www.spur.org/featured-project/ocean-beach-master-plan

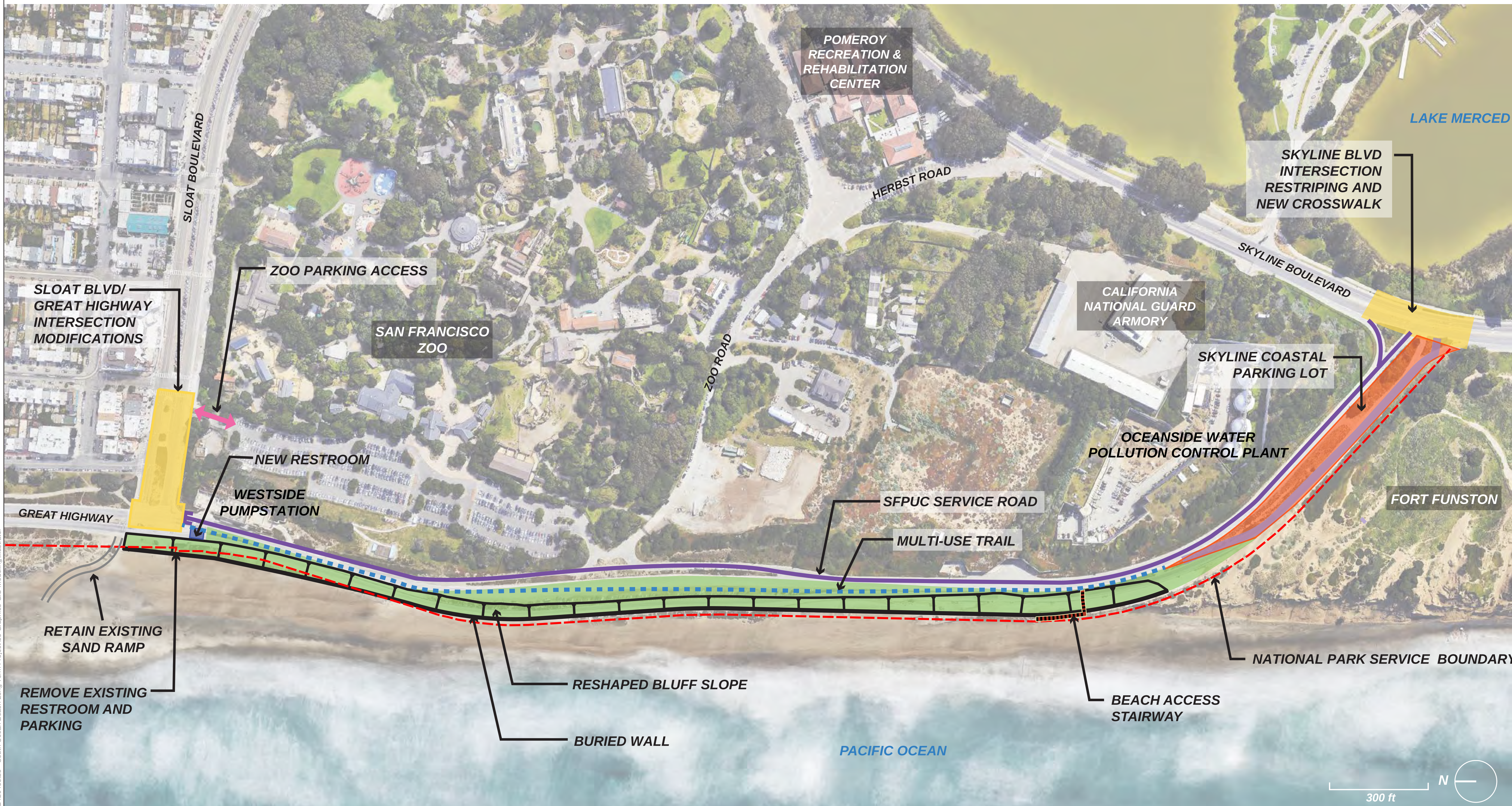
3 California Coastal Protection Network and City and County of San Francisco, 2014. Settlement Agreement and Mutual Release in the case *California Coastal Protection Network v. City & County of San Francisco*, Case No. CGC-11-513176. This document, and all other documents referenced in this EIR unless otherwise noted, is available for review at https://tinyurl.com/Ocean-Beach-EIR.

4 California Coastal Commission, Coastal Development Permit 2-15-1537, Issued November 9, 2015.

5 The Western Shoreline Area Plan is the land use plan component of the city's local coastal program. The city obtained California Coastal Commission certification of the amendment in May 2018.

6 In coastal engineering, revetments are sloping structures placed on the shoreline to protect the shoreline from erosion or other modification by waves.

7 Beach nourishment is the practice of adding large quantities of sand to beaches to slow erosion, increase beach width, and provide for continued public beach access and recreation opportunities.



Note: Project elements conceptual and not necessarily shown to scale. Long-term beach nourishment not shown.

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure S-1a
Project Elements Proposed for South Ocean Beach

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SOURCE: ESA, 2020; Google Earth, 2020

Ocean Beach Climate Change Adaptation Project

Figure S-1b
Project Elements Proposed for North Ocean Beach

SOURCE: ESA, 2019; Google Earth, 2019

Ocean Beach Climate Change Adaptation Project

Figure S-2
Project Location and Existing Roadway Configuration

S.3.2 Roadway and Intersection Modifications

The city would permanently close the Great Highway between Sloat and Skyline boulevards to vehicular access. To accommodate the road closure, the city would modify intersections at Sloat Boulevard/Great Highway and Skyline Boulevard/Great Highway, and reconfigure the Sloat Boulevard entrance to the San Francisco Zoo to accommodate both an entrance and an exit. The city would remove the Great Highway and the NPS parking lot and restrooms near the Sloat Boulevard/Great Highway intersection. The Great Highway's existing eastern northbound travel lane would be retained in place (or reconstructed east of the current road alignment to allow for more open space) to provide a service road for continued, restricted access to the Oceanside Treatment Plant and Westside Pump Station for SFPUC operations, as well as for emergency and maintenance vehicles. A multi-use trail would be installed to the west of the service road.

S.3.3 Buried Wall

To protect the Lake Merced Tunnel, an essential wastewater system facility at risk of exposure to coastal hazards, the city would construct a below-grade wall adjacent to and seaward of the Lake Merced Tunnel, shown on **Figure S-3**.

The proposed wall would extend from Sloat Boulevard to approximately 3,000 feet to the south. The wall would be approximately 3 feet thick, set back as far from the shoreline as feasible, and buried under sand. To stabilize the bluff inland of the wall, the city would reshape the remaining bluff face and install a 3-foot thick, gently sloping (3:1 horizontal to vertical slope) layer of cementitious material (slope stabilization). Bluff reshaping would involve removing or grading portions of the bluff to create a more gently sloping shape. The slope stabilization would minimize erosion of the material overlying the tunnel to protect against scour behind the wall from waves and high surf conditions. The reshaped bluff would provide a broad, publicly accessible open space area extending from the proposed service road and multi-use trail toward the beach (multi-use trail described below).

S.3.4 Debris and Revetment Removal, and Sand Placement and Revegetation

In addition to removing the Great Highway, the city would remove the existing shoreline protection structures and debris, including rock and sandbag revetments and rubble, from the beach and bluff. The city would place sand over the stabilized slope, plant native vegetation, and may implement wind-erosion control measures to help keep the placed sand on the beach and bluff. These measures could include sand fencing[8] and placing a layer of coarse sand over the finer beach sand.

S.3.5 Public Access, Parking, and Restroom Improvements

The project would construct a multi-use trail, beach access stairs, parking, and restrooms. The multi-use trail would extend from Sloat Boulevard to Skyline Boulevard and include one beach stairway and several waysides, or turnouts. The existing beach access sand ramp at the northwestern corner of the Sloat Boulevard/Great Highway intersection would be retained for pedestrian and emergency vehicle access. The service road may also be used as a bikeway.

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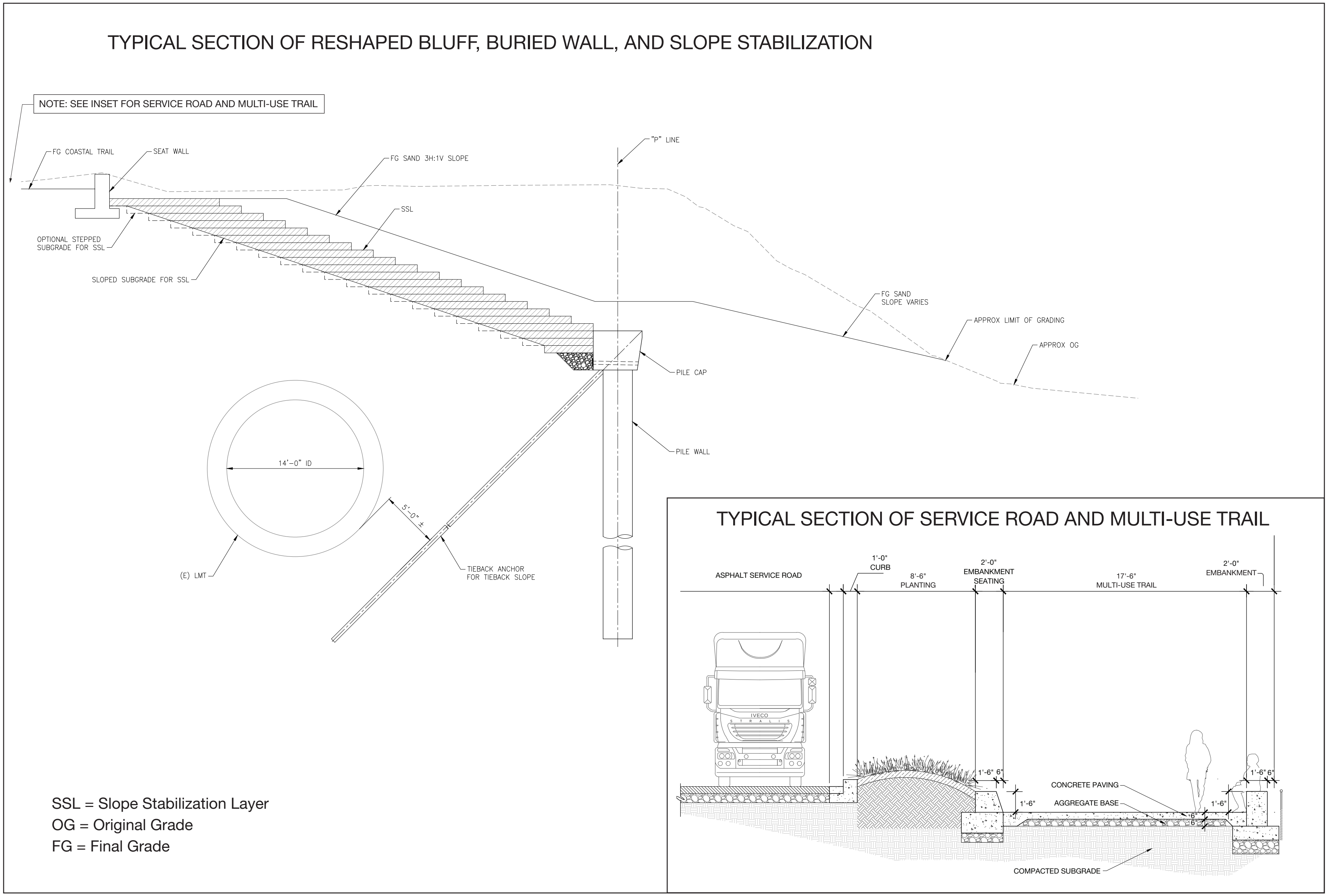
8 Sand fencing consists of wooden slats, plastic, or fabric attached to fence posts and is designed to reduce local wind speed and trap sand. Sand fencing on a beach or berm can assist in building additional berms and helps prevent sand from blowing onto roads and paths.



SOURCE: San Francisco Public Utilities Commission Ocean Beach
Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure S-3
Conceptual Cross Sections of Access Improvements
Proposed for South Ocean Beach

The coastal parking lot would be located within the approximate limits of the closed Great Highway southbound lanes and median, near their intersection with Skyline Boulevard. A new restroom structure would be constructed near the Sloat Boulevard/Great Highway intersection approximately 50 feet east (inland) of the existing Sloat Boulevard restrooms, and east of the proposed buried wall.

The turnaround route and layover space for Muni Line 23 would change in response to the Sloat Boulevard/ Great Highway intersection reconfiguration. Muni Line 23 would continue service to the existing last bus stop on the north side of Sloat Boulevard between Lower Great Highway and 47th Avenue. This stop would then serve as the layover space instead of the current layover location at the western terminus of Sloat Boulevard. The city would modify Muni Line 23's turnaround route to follow a clockwise loop along Lower Great Highway, Wawona Street, and 47th Avenue.

S.3.6 Beach Nourishment

By removing the existing shoreline revetments at South Ocean Beach, the project would allow erosion and retreat of the remaining bluff face seaward of the buried wall. With bluff retreat and erosion of sand placed over the slope stabilization, portions of the wall would occasionally be exposed, and the beach would narrow. To address these issues, the city proposes to implement a shoreline monitoring program and place sand as deemed needed based on the results of annual monitoring.

The city has identified two primary sand sources and placement methods. The first is the San Francisco Harbor – Main Ship Channel, which is regularly dredged by the Corps as part of that agency's ongoing federal navigation channels maintenance program.[9] Under this first option – referred to as the "large placement"– a Corps dredge would pump up to 575,000 cubic yards of sand in a *slurry*[10] form onto the beach, rather than disposing of it offshore.[11] The second primary source is North Ocean Beach (i.e., north of Lincoln Way). Under this option – referred to as the "small placement"– the city would continue its practice of excavating and trucking excess sand from North Ocean Beach to South Ocean Beach (referred to as *sand backpass*).[12] The small placement option would involve trucks dumping up to 85,000 cubic yards of sand onto the beach and reshaped bluff. The city could also obtain a smaller volume of sand from a commercial vendor if necessary.

The type and frequency of sand placements would depend upon sand availability (i.e., Corps and North Ocean Beach) and shoreline conditions (e.g., sea level rise and related erosion rates). Sand placements would occur about once every four to ten years, generally in summer or fall.[13]

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9 To provide deep-draft marine vessel access between the Pacific Ocean and San Francisco Bay, the Army Corps regularly dredges a sandbar located approximately 2 miles offshore of the Golden Gate. Commonly known as the main ship channel, the passage measures approximately 2,000 feet wide, 26,000 feet long, and is maintained at a depth of approximately 55 feet mean lower low water.

10 A mix of sand and ocean water that can be transported via pipeline from an offshore dredge to the beach.

11 Accounting for material loss in transport of the sand between the dredge and the final placement location (assumed to be about 15 percent), up to 575,000 cubic yards of sand would be pumped from the dredge in order to achieve a target placed volume of 500,000 cubic yards.

12 Sand backpassing has been performed at Ocean Beach since 2013 and occurred most recently in 2019.

13 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

S.3.7 Operations and Maintenance

Agencies and entities with jurisdiction and/or oversight responsibility would operate and maintain project facilities, as is done under existing conditions and generally in a similar fashion. Operations and maintenance would be required for public access features (such as the restrooms, trash enclosures, trails, signs and lighting), the service road and parking lot, and the beach and bluff areas. Periodic removal of sand on the trail and the service road would be necessary. SFPUC vehicles, employees, vendors and visitors would use the service road daily to access the Oceanside Treatment Plant and Westside Pump Station. The city would undertake ongoing beach nourishment activities as described above for “Beach Nourishment.” Large sand placements would be conducted by the Corps, in coordination with the city, and would depend upon a future Corps maintenance dredging program that requires additional environmental review under the National Environmental Policy Act (NEPA) and regulatory approvals. No changes to city agency or NPS staffing levels are anticipated.

S.3.8 Construction

Construction activities would proceed in five phases. The city would first modify the affected intersections and zoo parking lot access, close the Great Highway south of Sloat Boulevard, relocate the MUNI layover, and remove the existing restroom at the Sloat Boulevard terminus. The city would then construct the buried wall, reshape and stabilize the bluff, and remove the existing revetments and rubble from the beach. The city would place clean, debris-free sand excavated from the buried wall construction onto the reshaped bluff and beach. Following shore stabilization and associated earthwork, the project focus would shift to recreational facilities and amenities, such as coastal access parking, the multi-use trail, restrooms, the beach stairway, and landscaping. Upon construction completion, the city would remove all construction debris and waste, and restore remaining disturbed areas to their approximate preconstruction conditions.

The city would construct the project over approximately four years with an estimated construction period spanning 2023 through 2027. Project construction would typically be conducted five days per week but could proceed up to seven days per week, except holidays, between 7 a.m. and 8 p.m. consistent with the city's noise ordinance. Some nighttime construction is also proposed.

S.4 Summary of Project Impacts and Mitigation Measures

The initial study determined that the following topics would have either no significant impacts or impacts that can be reduced to less than significant with mitigation: land use and land use planning; population and housing; cultural resources; tribal cultural resources; air quality; greenhouse gas emissions; wind; shadow; utilities and services systems; public services; geology and soils; hydrology and water quality; hazards and hazardous materials; mineral resources; energy; agricultural and forestry resources; and wildfire. Discussion and analysis of impacts in these resource areas are presented in **Appendix B**.

Chapter 4 of this EIR presents detailed environmental impacts analyses for the following resource areas: aesthetics, transportation and circulation, noise and vibration, recreation, and biological resources. For each resource area, the impact analysis describes the environmental setting, identifies significance criteria used in the analysis, evaluates potential physical effects of the project on both a project and cumulative basis, and provides feasible mitigation measures that would reduce the severity of significant impacts.

Table S-1 (located at the end of this chapter) summarizes (1) impact description, (2) level of significance prior to mitigation measures (if applicable), (3) mitigation measures (if applicable), and (4) level of significance after mitigation (if applicable). The summary table includes all impacts and mitigation measures applicable to the project, with the EIR sections presented first, followed by the initial study sections.

This EIR determined that the project would result in significant and unavoidable impacts in the areas of transportation and circulation, noise and vibration and biological resources, as follows:

- **Transportation and Circulation**. Project operations would redirect vehicular traffic around the closed portion of the Great Highway, which would result in substantial additional vehicle miles traveled and a cumulatively considerable contribution to a significant cumulative VMT impact (Impacts TR-5 and C-TR-5).
- **Noise and Vibration**. Project operations would redirect vehicular traffic around the closed portion of the Great Highway, which would result in a permanent increase in ambient noise at noise-sensitive receptors along affected roadways and a cumulatively considerable contribution to significant cumulative traffic-related noise impact (Impacts NO-3, C-NO-3).
- **Biological Resources.** Project construction would remove portions of existing bluff which provides habitat for the protected bank swallow. Removal of a portion of the limited bluff habitat currently suitable for hosting the breeding colony could potentially contribute to the extirpation of the Fort Funston breeding colony (Impact BI-2).

The EIR identified significant impacts that could be mitigated to a less-than-significant level with implementation of identified mitigation measures in the following areas:

- **Noise and Vibration.** Project construction, in combination with construction of other projects near the intersection of Sloat Boulevard and Great Highway, could result in a cumulatively considerable contribution to significant temporary or periodic increases in ambient noise levels at noise-sensitive receptors (Impact C-NO-1).
- **Biological Resources**. Project construction could adversely affect nesting bank swallows and special-status bats or bat maternity colonies (Impacts BI-2 and BI-9); project operations (beach nourishment) may also have adverse effects on nesting bank swallows (Impact BI-2).
- **Air Quality**. Project construction-related nitrogen oxide emissions would represent cumulatively considerable increase of a criteria pollutant precursor for which the project region is in non-attainment under applicable state and federal standards (Impact AQ-2).
- **Paleontological Resources.** Construction would involve excavation which could damage or destroy potential paleontological resources (Impact GE-5).

Chapter 5 evaluates the growth-inducing impacts of the project and determined that the project would not have a substantial growth-inducing impact.

S.5 Alternatives to the Project

Chapter 6 presents the CEQA alternatives analysis to identify potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for the project while still meeting most of the project objectives. The four alternatives analyzed in this EIR are:

- **Alternative A: No Project** — Represents what would reasonably be expected to occur in the foreseeable future if the project is not approved. The city would not close the Great Highway, construct a buried wall, remove revetments and rubble from the beach, or construct public access improvements and amenities. Coastal erosion along South Ocean Beach would continue to threaten existing underground wastewater system infrastructure and constrain public shoreline access and recreational opportunities. The city would continue to monitor shoreline erosion and implement periodic sand backpassing and install sandbag revetments, as conditions warrant.
- **Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment** — The city would remove the existing revetments and shoreline protection structures from South Ocean Beach, and would place more sand at a greater frequency relative to the project. The city would not close the Great Highway (until erosion results in the need to close the road) or construct a multi-use trail, restroom, parking lot or stairs, and would not reshape the existing bluffs.
- **Alternative C: Protect Critical Infrastructure with Conventional Seawall** — The city would construct a seawall from Sloat Boulevard to Fort Funston to the height of the existing revetments and remove the revetments and rubble. The Great Highway would remain open, the existing NPS restroom and parking lot would remain, and the city would construct a new multi-use trail. The city would not reshape the bluff, but would place more sand at a greater frequency relative to the project.
- **Alternative D: Replace Lake Merced Tunnel with Inland Infrastructure** — The city would construct new inland infrastructure to replace the function of the existing Lake Merced Tunnel. Existing revetments and rubble would be removed, and the Lake Merced Tunnel would be abandoned in place. The city would close the Great Highway, construct a multi-use trail, coastal access parking, and restrooms as described for the project. The city would not reshape the bluff, but would place slightly more sand at similar or slightly greater frequency relative to the project.

The San Francisco Planning Department determined that these four alternatives are potentially feasible and adequately represent the range of alternatives required under CEQA. These alternatives would lessen or eliminate one or more of the significant and unavoidable adverse impacts related to transportation and circulation, biological resources, and noise that were identified for the project, as well as meet most of the project objectives. A “no project alternative” is included as Alternative A, as required by CEQA, even though it would not meet the basic project objectives.

S.6 Environmentally Superior Alternative

Pursuant to CEQA Guidelines section 15126(e)(2), an EIR is required to identify the environmentally superior alternative from among the alternatives evaluated if the project has significant impacts that cannot be mitigated to a less-than-significant level. The environmentally superior alternative is the alternative that best avoids or lessens any significant effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives.

As discussed in greater detail in Chapter 6, Alternatives, Alternative B is the environmentally superior alternative among the project alternatives (other than Alternative A (No Project)). Alternative B would avoid the significant and unavoidable effects identified for the project related to bank swallow habitat, vehicle miles traveled, and vehicular traffic noise. Alternative B would fully meet project objectives 1 and 2, related to implementing the city's local coastal program and complying with Coastal Commission permit requirements, and preserving and enhancing coastal public access, habitat, and scenic quality. Alternative B would partially meet project objectives 3 and 4, related to protection of wastewater system infrastructure and maintenance of operational capacity, and maintaining vehicle access. Therefore, the alternative would meet or partially meet most of the project objectives. However, it is notable that one of the objectives that the alternative would not fully meet is related to wastewater system infrastructure protection. While the alternative would be expected to provide wastewater system reliability, the shoreline conditions at South Ocean Beach are dynamic, highly variable, and remain the subject of much coastal engineering research. If through nourishment alone (i.e., without a seawall or other hard structure) the alternative were incapable of sufficiently reducing the rate of erosion such that the wastewater system were exposed to coastal hazards, the effects on the wastewater infrastructure and water quality could be substantial.

S.7 Areas of Known Controversy and Issues to be Resolved

Section 15123 of the CEQA Guidelines requires that an EIR summary identify each significant effect with proposed mitigation measures and alternatives that would reduce or avoid the effect; areas of controversy known to the lead agency, including issues raised by other agencies and the public; and issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects.

On September 9, 2020, the San Francisco Planning Department issued a Notice of Preparation (NOP) of an EIR. The public review process is the formal CEQA scoping process for the project and included a request for comments on environmental issues that should be addressed in the EIR. Comments received in response to the NOP are described in Chapter 1, Introduction and Background. The planning department provided notices of the NOP to governmental agencies, organizations, and persons interested in the project to initiate the 30-day public scoping period for the EIR, which started on September 9, 2020 and ended on October 9, 2020. The planning department held a scoping meeting on September 30, 2020, to solicit comments on the scope of the EIR, including the initial study. The NOP is included in Appendix A of this document.

The project's effects on bank swallow habitat and the project's interactions with coastal processes are the primary areas of scientific or technical controversy for this project:

- Effects of bank swallow habitat removal on the Fort Funston bank swallow colony, given the extent of the nesting habitat and varying amount of bank swallow nesting that has historically occurred within the project area
- Effective bank swallow habitat mitigation is not known to the agency with primary jurisdiction over management of the species (California Department of Fish and Wildlife)
- Estimating rates of sediment transport and erosion of beaches and bluffs are inherently uncertain because of the highly variable nature of the forcing mechanisms that include ocean swells, storm surges, El Nino events, and other unpredictable natural processes.

Public comments received on the NOP for the project address the following topics:

- Effects on terrestrial and marine biological resources, including special-status plants and wildlife such as bank swallow, snowy plover, and their habitats
- Effects on shoreline erosion, sandbars, and cliff erosion
- Predictions for future sea level rise, effects on project components
- Effects on aesthetic resources, including views and nighttime lighting
- Effects on surfing, swimming, and public access along dry beach
- Project consistency with the 2012 Ocean Beach Master Plan concepts
- Ability to maintain dunes on the proposed slope stabilization and frequency of beach nourishment
- Use of native and climate-appropriate plantings
- Location of public restrooms and parking
- Project area maintenance, including management of invasive species and litter
- Effects of roadway closure on traffic congestion, travel patterns, and safety
- Noise, emissions, and pollution associated with traffic pattern changes
- Consideration for historical features of existing facilities
- Cumulative impacts of development of the project combined with development of other projects (including the SFPUC's Westside Pump Station Reliability Project)

Table S-1 Summary of Impacts and Mitigation Measures

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
		AESTHETICS, EIR SECTION 4.2	
Impact AE-1: Project construction would not substantially adversely affect a scenic vista, degrade the existing visual character or quality of public views of the site or its surroundings, or damage scenic resources.	LTS	No mitigation required.	NA
Impact AE-2: Project construction would not conflict with applicable zoning and other regulations governing scenic quality.	LTS	No mitigation required.	NA
Impact AE-3: Project construction would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	LTS	No mitigation required.	NA
Impact AE-4: Project operation would not substantially adversely affect a scenic vista, degrade the existing visual character or quality of public views of the site or its surroundings, or damage scenic resources.	LTS	No mitigation required.	NA
Impact AE-5: Project operation would not conflict with applicable zoning and other regulations governing scenic quality.	LTS	No mitigation required.	NA
Impact AE-6: Project operation would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.	LTS	No mitigation required.	NA
Impact C-AE-1: Implementation of the project, in combination with the cumulative projects, would not substantially degrade the existing visual character of public views of the site or its surroundings.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
TRANSPORTATION AND CIRCULATION, EIR SECTION 4.3			
Impact TR-1: Construction of the project would require a substantially extended duration, but the secondary effects would not create potentially hazardous conditions for people walking, bicycling, driving, or riding transit; or interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit.	LTS	No mitigation required.	NA
Impact TR-2: Operation of the project would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations.	LTS	No mitigation required.	NA
Impact TR-3: Operation of the project would not interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access.	LTS	No mitigation required.	NA
Impact TR-4: Operation of the project would not substantially delay public transit.	LTS	No mitigation required.	NA
Impact TR-5: Operation of the project would not substantially induce automobile travel but may cause substantial additional vehicle miles traveled due to rerouting of vehicular traffic.	S	No feasible mitigation identified.	SU
Impact TR-6: Operation of the project would not result in a commercial or passenger loading deficit.	LTS	No mitigation required.	NA
Impact C-TR-1: The project, in combination with the cumulative projects, would not result in significant construction-related transportation impacts.	LTS	No mitigation required.	NA
Impact C-TR-2: The project, in combination with the cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
TRANSPORTATION AND CIRCULATION, EIR SECTION 4.3 (CONT.)			
Impact C-TR-3: The project, in combination with the cumulative projects, would not interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access.	LTS	No mitigation required.	NA
Impact C-TR-4: The project, in combination with the cumulative projects, would not substantially delay public transit.	LTS	No mitigation required.	NA
Impact C-TR-5: The project, in combination with the cumulative projects, would not substantially induce automobile travel, but could result in a cumulatively considerable contribution to a significant cumulative impact related to additional vehicle miles traveled.	S	No feasible mitigation identified.	SU
Impact C-TR-6: The project, in combination with the cumulative projects, would not result in significant commercial or passenger loading impacts.	LTS	No mitigation required.	NA
NOISE AND VIBRATION, EIR SECTION 4.4			
Impact NO-1: Project construction would not cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors above levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	LTS	No mitigation required.	NA
Impact NO-2: Construction of the project would not generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
NOISE AND VIBRATION, EIR SECTION 4.4 (CONT.)			
Impact NO-3: Project operations would cause a substantial permanent increase in ambient noise levels at noise-sensitive receptors, above levels existing without the project, in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	S	**Mitigation Measure M-NO-3: Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan** To reduce roadside noise increases attributable to rerouted traffic resulting from the project, prior to the project's closure of the Great Highway, the SFPUC shall prepare and implement a Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan for Sloat and Skyline boulevards, as described further below. The goal of the Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan is to reduce roadway noise level increases sufficient to achieve a performance standard of a less than 3 dBA increase over existing ambient traffic noise levels along: a) Sloat Boulevard between Great Highway and 47th Avenue; b) Sloat Boulevard between 47th Avenue and Skyline Boulevard; and c) Skyline Boulevard between Sloat Boulevard and Harding Road. The Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan shall include the following elements: ***Part I – Noise Monitoring*** • Noise monitoring shall be conducted along the three segments of Sloat Boulevard and Skyline Boulevard listed above prior to and after intersection closure to empirically verify the amount of noise reduction required to meet the performance standard of less than 3dBA increase over existing ambient traffic noise. Noise monitoring shall consist of one-week-long 24-hour measurements collected at three, six, and nine months prior to closure of the Great Highway between Sloat and Skyline boulevards, and three, six, and nine months after the roadway closure. A noise monitoring plan shall be approved by the Environmental Review Officer (ERO), or its designee, prior to noise monitoring. ***Part II - Noise Reduction*** • If noise monitoring indicates that the project has resulted in an increase of traffic noise levels of 3 dBA or greater relative to pre-closure conditions, within the three, six, or nine months after post-closure noise monitoring completion, the SFPUC, in consultation with SFMTA, Public Works, the	SUM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
NOISE AND VIBRATION, EIR SECTION 4.4 (CONT.)			
Impact NO-3 (cont.)		planning department, and a qualified noise consultant, shall identify measures that would achieve the required performance standard (a noise level increase less than 3 dBA) on the affected roadway segments. The proposed traffic noise reduction measures must be described in a Traffic Re-Distribution Noise Reduction Plan that shall be submitted to the ERO for review and approval. The noise reduction measures may include, but are not limited to: speed limit reductions, installation of new traffic signals, and street redesign (e.g., lane reduction, speed tables, or other traffic calming features). • The SFPUC shall confer with Caltrans with respect to elements of the Traffic Re-Distribution Noise Reduction Plan that may require implementation on Skyline Boulevard, which is outside the jurisdiction of the city. • With the exception of measures within Caltrans' jurisdiction whose implementation is beyond the city's control, the SFPUC, in consultation with SFMTA and Public Works, shall implement noise reduction measures identified in the Traffic Re-Distribution Noise Reduction Plan within 24 months of ERO approval of the Plan. This timeline may be extended, with ERO approval, if the PUC identifies separate projects or other circumstances that may reduce traffic noise levels on the affected roadway segments (such as other changes to the transportation network or implementation of other traffic calming measures in the vicinity). • Within 6 months of noise reduction measure implementation, the SFPUC shall: (1) demonstrate to the ERO that implementation of the noise reduction measures has achieved the required performance standard; or (2) identify adjustments or alternative measures proposed to achieve the standard, along with an implementation and monitoring schedule.	
Impact NO-4: Operation of the project would not generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
NOISE AND VIBRATION, EIR SECTION 4.4 (CONT.)			
Impact C-NO-1: The project, in combination with the cumulative projects, would result in significant construction-related noise impacts.	S	**Mitigation Measure M-C-NO-1: Cumulative Construction Noise Control Measures** If exterior construction of the northern end of the buried wall for the proposed project is determined to overlap with that of nearby adjacent project(s) (2700 Sloat Boulevard Project, the Westside Pump Station Reliability Improvements Project, or the Westside Force Main Reliability Project), the SFPUC or contractor shall submit a project-specific construction noise control plan to the ERO or the ERO's designee for approval. Exterior construction for purposes of the proposed project and the nearby cumulative projects includes construction including the following activities; heavy-duty construction equipment for excavation, grading, foundation and shoring, and construction of building shells. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target of construction activities not resulting in a noise level greater than 90 dBA and 10 dBA above the ambient noise level at noise sensitive receptors. The SFPUC shall ensure that requirements of the construction noise control plan are included in contract specifications. If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received. The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels: • Use construction equipment that is in good working order, and inspect mufflers for proper functionality • Select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures)	LSM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
NOISE AND VIBRATION, EIR SECTION 4.4 (CONT.)			
Impact C-NO-1 (cont.)		• Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors • Prohibit the idling of inactive construction equipment to no more than five minutes • Locate stationary noise sources (such as compressors) as far from nearby noise sensitive receptors as possible, muffle such noise sources, and/or construct barriers around such sources and/or the construction site • Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors or other noise-sensitive properties • Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible • Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that completely closes the gaps, and dense enough to attenuate noise The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures and monitoring of construction noise levels: • Designation of an on-site construction noise manager for the project • Notification to neighboring noise sensitive receptors within 300 feet of the project construction area at least 30 days in advance of high-intensity noise-generating activities (e.g., pier drilling, pile driving, and other activities that may generate noise levels greater than 90 dBA at noise sensitive receptors) about the estimated duration of the activity	

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
NOISE AND VIBRATION, EIR SECTION 4.4 (CONT.)			
Impact C-NO-1 (cont.)		• A sign posted on-site describing noise complaint procedures and a complaint hotline number that shall always be answered during construction • A procedure for notifying the planning department of any noise complaints within one week of receiving a complaint • A list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat) • Conduct noise monitoring (measurements) at the beginning of major construction phases (e.g., demolition, grading, excavation) and during high-intensity construction activities to determine the effectiveness of noise attenuation measures and, if necessary, implement additional noise control measures	
Impact C-NO-2: The project, in combination with the cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels.	LTS	No mitigation required.	NA
Impact C-NO-3: The project, in combination with the cumulative projects, would result in a cumulatively considerable contribution to significant cumulative impacts related to a permanent increase in ambient noise levels at noise-sensitive receptors, above existing levels, in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.	S	Implement Mitigation Measure M-NO-3.	SUM
RECREATION, EIR SECTION 4.5			
Impact RE-1: Project construction and operation would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
RECREATION, EIR SECTION 4.5 (CONT.)			
Impact C-RE-1: Implementation of the project, in combination with the cumulative projects, would not increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.	LTS	No mitigation required.	NA
BIOLOGICAL RESOURCES, EIR SECTION 4.6			
Impact BI-1: Construction and operation of the project would not result in substantial adverse effects on special-status plants.	LTS	No mitigation required.	NA
Impact BI-2: Construction of the project would, but operation of the project would not, have a substantial adverse effect on bank swallows.	S	**Mitigation Measure M-BI-2a: Nesting Bank Swallow Protection Measures** This measure applies to construction activities and small sand placements. Nesting bank swallows, their eggs and their nests, and their young shall be protected during construction and during sand placement events through the implementation of the following measures: a. If construction or beach nourishment activities within 650 feet of the bluffs used by the Fort Funston bank swallow colony are conducted during bank swallow nesting season (nesting is from April 1 to August 1), a qualified wildlife biologist shall conduct preconstruction surveys for nesting bank swallow within seven days prior to the start of construction, beach nourishment activities, and prior to reinitiating construction at this location after any construction breaks of 14 days or more. b. If active bank swallow nest sites are located during the preconstruction nesting surveys, a 650-foot no-disturbance buffer shall be established around the burrow nest site and all project work shall halt within the buffer until a qualified biologist determines the nest is no longer in use.	SUM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
BIOLOGICAL RESOURCES, EIR SECTION 4.6 (CONT.)			
Impact BI-2 (cont.)		**Mitigation Measure M-BI-2b: Worker Environmental Awareness Program Training** This measure applies to construction activities and small sand placements. A project-specific Worker Environmental Awareness Program training shall be developed by a qualified biologist for the project and attended by all construction personnel prior to beginning on-site work. As part of the training, brochures may be given to provide reference material to contractors. The training may be provided by the qualified biologist or by designated SFPUC staff trained by the biologist to provide this training, using the materials developed by the qualified biologist, and may be administered via a video-recorded training produced specifically for the project by a qualified biologist. A more in-depth environmental training may be developed and provided for contractor supervisors in leadership roles. The environmental training shall generally include but not be limited to education about the following: a. Applicable state and federal laws, environmental regulations, project permit conditions, and penalties for non-compliance; b. Special-status species with potential to occur on or in the vicinity of the project sites, avoidance measures, and a protocol for encountering such species including a communication chain; c. Preconstruction surveys and biological monitoring requirements associated with each phase of work and at each project site as biological resources and protection measures will vary depending on project component location and the corresponding land managers (see f, below); d. Known sensitive resource areas in the project vicinity that are to be avoided and/or protected, as well as approved project work areas, access roads, and staging areas; e. Best management practices and their location at various project sites for erosion control and species exclusion, in addition to general housekeeping requirements; and f. Specific requirements sanctioned by the National Park Service (NPS) that the project must comply with while working on NPS-managed lands.	

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
BIOLOGICAL RESOURCES, EIR SECTION 4.6 (CONT.)			
Impact BI-2 (cont.)		**Mitigation Measure M-BI-2c: Bank Swallow Educational Signage and Protective Fencing** During the construction period and prior to project completion, the SFPUC, with the oversight of the planning department, shall implement the following: a. Develop and produce one, permanent educational kiosk or signage to be installed in the Skyline coastal parking lot or along the multi-use trail. Educational content, sign design and structure shall be coordinated with the San Francisco Recreation and Parks Department and the National Park Service (NPS). b. Develop and produce semi-permanent educational signs that shall be installed on NPS property along bluff top access points at Fort Funston near the bank swallow nesting locations to alert the public of the sensitive nesting area. The SFPUC and NPS shall enter into an agreement for the one-time development and production of the semi-permanent signs that the NPS shall install at its discretion as long as the bank swallow are listed as special-status and nesting within NPS-managed lands. c. Install semi-permanent fencing at a setback from the bluff edge above suitable nesting habitat to restrict public access above sensitive nesting areas. The SFPUC and NPS shall enter into an agreement for the one-time development and production of the semi-permanent fencing that the NPS shall design and install at its discretion as long as the bank swallow are listed as special-status and nesting within NPS-managed lands.	
Impact BI-3: Construction and operation of the project would not have a substantial adverse effect on western snowy plover.	LTS	No mitigation required.	NA
Impact BI-4: Construction and operation of the project would not have a substantial adverse effect on other special-status or sensitive birds.	LTS	No mitigation required.	NA
Impact BI-5: Construction and operation of the project would not have a substantial adverse effect on special-status marine species.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
BIOLOGICAL RESOURCES, EIR SECTION 4.6 (CONT.)			
Impact BI-6: Construction and operation of the project would not have a substantial adverse effect on the California Department of Fish and Wildlife-designated sensitive natural communities or jurisdictional wetlands or waters.	LTS	No mitigation required.	NA
Impact BI-7: Construction and operation of the project would not interfere substantially with the movement of any native resident or migratory wildlife species or established migratory corridors.	LTS	No mitigation required.	NA
Impact BI-8: Construction and operation of the project would not have a substantial adverse effect on nesting birds or result in an increase in bird collisions with project features.	LTS	No mitigation required.	NA
Impact BI-9: Construction and operation of the project could have a substantial adverse effect on special-status bats or bat maternity colonies.	S	**Mitigation Measure M-BI-9: Avoidance and Minimization Measures for Special-Status Bats and Maternity Roosts** A qualified biologist experienced in the identification of special-status bats shall conduct a preconstruction survey for special-status bat species habitat in advance of any tree trimming or removal to identify signs of potential bat habitat, including maternity colonies and any active roost sites. Identified bat maternity colonies shall be avoided, if possible. Should potential maternity colonies or active bat roosts be found in trees but cannot be avoided, SFPUC shall ensure the following measures are implemented: a. Trim trees or install bat exclusion devices when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of the bat maternity roosting season (approximately April 15 to August 15) if a maternity roost is present, and outside the months of winter torpor (approximately October 15 to February 28, or as determined by a qualified biologist experienced in the identification of special-status bats).	LSM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
BIOLOGICAL RESOURCES, EIR SECTION 4.6 (CONT.)			
Impact BI-9 (cont.)		b. If tree trimming is not feasible during the periods when bats are active, and bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the tree trimming, a qualified biologist shall delineate a no-disturbance buffer around these roost sites until they are no longer in use as maternity or hibernation roosts or the young are capable of flight. c. Based on the professional opinion of a qualified biologist, buffer distances may be adjusted around roosts depending on the level of surrounding ambient activity (e.g., if the subject tree is adjacent to a busy road) or if an obstruction, such as a large sand dune, is within the line-of-sight between the roost and construction. d. A biologist experienced in the identification of special-status bats shall be present during tree trimming and removal if bat roosts are present. Project activities shall disturb trees with roosts only when no rain is occurring or is not forecast to occur for three days and when daytime temperatures are at least 50 degrees Fahrenheit. e. Under the supervision of the qualified biologist, trim trees containing or suspected to contain roost sites over two days. On the first day, branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws. The following day, branches or limbs containing roost sites shall be trimmed with chainsaws, under the supervision of the biologist.	
Impact BI-10: Construction and operation of the project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LTS	No mitigation required.	NA
Impact C-BI-1: The project, in combination with the cumulative projects, would not result in significant construction-related biological resources impacts.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
BIOLOGICAL RESOURCES, EIR SECTION 4.6 (CONT.)			
Impact C-BI-2: The project, in combination with the cumulative projects, would not result in significant operation-related biological resources impacts.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.1, LAND USE AND PLANNING			
Impact LU-1: The project would not physically divide an established community.	LTS	No mitigation required.	NA
Impact LU-2: The project would not cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.	LTS	No mitigation required.	NA
Impact C-LU: The project, in combination with the cumulative projects, would not result in significant cumulative impacts related to land use.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.3, POPULATION AND HOUSING			
Impact PH-1: The project would not induce substantial unplanned population growth in an area, either directly or indirectly.	LTS	No mitigation required.	NA
Impact C-PH-1: The project, in combination with the cumulative projects, would not induce substantial unplanned population growth in an area, either directly or indirectly.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.4, CULTURAL RESOURCES			
Impact CR-1: The project would not cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5.	NI	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.4, CULTURAL RESOURCES (CONT.)			
Impact CR-2: The project would not cause a substantial adverse change in the significance of an archeological resource pursuant to section 15064.5.	LTS	No mitigation required.	NA
Impact CR-3: The project would not cause a substantial adverse change in the significance of human remains pursuant to section 15064.5.	LTS	No mitigation required.	NA
Impact C-CR-1: The project, in combination with the cumulative projects, would not result in significant cumulative impacts on historical resources, archeological resources, or human remains.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.5, TRIBAL CULTURAL RESOURCES			
Impact TC-1: The project would not result in a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	LTS	No mitigation required.	NA
Impact C-TC-1: The project, in combination with the cumulative projects, would not result in significant cumulative impacts on tribal cultural resources.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.8, AIR QUALITY			
Impact AQ-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.	LTS	No mitigation required.	NA
Impact AQ-2: The project's construction activities would generate fugitive dust and criteria air pollutants, and would result in a cumulatively considerable net increase in non-attainment criteria air pollutants.	S	**Mitigation Measure M-AQ-2: Construction Emissions Minimization** ***A. Engine Requirements.*** All off-road equipment greater than 125 horsepower and operating for more than 20 total hours over the entire duration of construction activities shall have engines that meet the USEPA or California Air Resources Board Tier 4 Final off-road emission standards in construction years 2, 3 and 4 (2024 through 2026).	LSM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

<table>
<tr><th>IMPACT</th><th>Level of Significance prior to Mitigation</th><th>Mitigation Measure</th><th>Level of Significance After Mitigation</th></tr>
<tr><td colspan="4">INITIAL STUDY SECTION E.8, AIR QUALITY (CONT.)</td></tr>
<tr><td>Impact AQ-2 (cont.)</td><td></td><td>B. Waivers.

The Environmental Review Officer (ERO) may waive the equipment requirements of section A if: (1) engines that comply with Tier 4 Final off-road emission standards are not available, (2) use of a particular piece of off-road equipment is technically not feasible; (3) the equipment would not produce desired emissions reduction due to expected operating modes; or (4) there is a compelling emergency need to use other off-road equipment.

If the SFPUC seeks a waiver from the requirements of section A, it shall submit documentation to the ERO of the following: 1) evidence that a waiver from the section A requirements meets the criteria set forth in section B; 2) identification of the compliance alternative in Table M-AQ-2-1 to be implemented (or other compliance alternative that yield sufficient emissions reductions); and 3) analysis demonstrating that with the compliance alternative the project would not exceed the significance threshold for NOx of an average of 54 pounds/day. The SFPUC shall maintain records concerning its efforts to comply with this requirement.

Table M-AQ-2-1 Off-Road Equipment Compliance Step-Down Schedule

<table>
<tr><th>Compliance Alternative</th><th>Engine Emission Standard</th></tr>
<tr><td>1</td><td>Tier 4 interim</td></tr>
<tr><td>2</td><td>Tier 3</td></tr>
<tr><td>3</td><td>Tier 2</td></tr>
</table>
How to use the table: If the Tier 4 Final emissions standards cannot be met for a specific piece of off-road equipment, then the SFPUC would need to meet Compliance Alternative 1. Should the SFPUC not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met. Should the SFPUC not be able to supply off-road equipment meeting Compliance Alternative 2, then Compliance Alternative 3 would need to be met.</td><td></td></tr>
</table>

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.8, AIR QUALITY (CONT.)			
Impact AQ-3: During project operations, the project would not result in a cumulatively considerable net increase in non-attainment criteria air pollutants.	LTS	No mitigation required.	NA
Impact AQ-4: Construction and operation of the project would generate toxic air contaminants, including diesel particulate matter, but would not expose sensitive receptors to substantial pollutant concentrations.	LTS	No mitigation required.	NA
Impact AQ-5: The project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.	LTS	No mitigation required.	NA
Impact C-AQ-1: The project, in combination with the cumulative projects, would result in less-than-significant cumulative air quality impacts.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.9, GREENHOUSE GAS EMISSIONS			
Impact C-GG-1: The project, in combination with the cumulative projects, would not generate greenhouse gas (GHG) emissions at levels that would result in a significant impact on the environment and would not conflict with a policy, plan, or regulation adopted for the purpose of reducing GHG emissions.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.10, WIND			
Impact WI-1: The project would not create wind hazards in publicly accessible areas of substantial pedestrian use.	LTS	No mitigation required.	NA
Impact C-WI-1: The project, in combination with the cumulative projects, would not create wind hazards in publicly accessible areas of substantial pedestrian use.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.11, SHADOW			
Impact SH-1: The project would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces.	LTS	No mitigation required.	NA
Impact C-SH-1: The project, in combination with the cumulative projects, would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.13, UTILITIES AND SERVICE SYSTEMS			
Impact UT-1: The project would not require the relocation or construction of new or expanded water, wastewater treatment, stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects.	LTS	No mitigation required.	NA
Impact UT-2: Project construction and operation would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years.	LTS	No mitigation required.	NA
Impact UT-3: The project would not result in a determination by the wastewater treatment provider which serves the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	LTS	No mitigation required.	NA
Impact UT-4: The project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs and would not impair the attainment of solid waste reduction goals.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.13, UTILITIES AND SERVICE SYSTEMS (CONT.)			
Impact UT-5: The project would comply with federal, state, and local management and reduction statues and regulations related to solid waste.	LTS	No mitigation required.	NA
Impact C-UT-1: The project, in combination with the cumulative projects, would not result in significant utilities and service systems impacts.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.14, PUBLIC SERVICES			
Impact PS-1: Construction and operation of the project would not result in an increase in demand for fire protection, police protection, schools, or other services to an extent that would result in substantial adverse physical impacts associated with the construction or alteration of governmental facilities.	LTS	No mitigation required.	NA
Impact C-PS-1: The project, in combination with the cumulative projects, would not result in significant impacts associated with the provision of new or physically altered governmental facilities.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.16, GEOLOGY AND SOILS			
Impact GE-1: Construction and operation of the project would not directly or indirectly cause substantial adverse effects, including the risk of loss, injury, or death involving seismic ground shaking, seismically induced ground failure, or landslides.	LTS	No mitigation required.	NA
Impact GE-2: The project would not result in substantial soil erosion or loss of topsoil.	LTS	No mitigation required.	NA
Impact GE-3: The project site would not be located on a geologic unit or soil that is unstable, or that could become unstable as a result of the project.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.16, GEOLOGY AND SOILS (CONT.)			
Impact GE-4: The project would not create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils.	LTS	No mitigation required.	NA
Impact GE-5: The project could directly or indirectly destroy a unique paleontological resource or site or a unique geological feature.	S	**Mitigation Measure M-GE-5: Paleontological Resources Monitoring and Mitigation Program** The SFPUC shall engage a qualified paleontologist meeting standards recommended by the Society for Vertebrate Paleontology (SVP) to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those activities that may affect sediments with moderate or greater sensitivity for paleontological resources. Prior to any ground-disturbing activities, the SFPUC shall submit the Paleontological Monitoring Plan to the Environmental Review Officer (ERO) for approval. At a minimum, the plan shall include: a. Project Description b. Regulatory Environment – outline applicable federal, state, and local regulations c. Summary of Sensitivity Classification(s) d. Research Methods, including but not limited to: • Field studies conducted by the qualified paleontologist to check for fossils at the surface and assess the exposed sediments. • Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area. • Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley.	LSM

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.16, GEOLOGY AND SOILS (CONT.)			
Impact GE-5 (cont.)		e. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known. f. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include: • Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation. • Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery. • Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Monitoring could identify the need for test sampling. • Data recovery and reporting: Fossil and associated data discovered during ground disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report.	

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.16, GEOLOGY AND SOILS (CONT.)			
Impact GE-5 (cont.)		g. The paleontologist shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the paleontologist shall be considered draft reports subject to revision until final approval by the ERO.	
Impact C-GE-1: The project, in combination with the cumulative projects, would not result in significant impacts on geology and soils or paleontological resources.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.17, HYDROLOGY AND WATER QUALITY			
Impact HY-1: The project would not violate water quality standards or otherwise substantially degrade water quality.	LTS	No mitigation required.	NA
Impact HY-2: The project would not alter the existing drainage pattern of the area in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite.	LTS	No mitigation required.	NA
Impact HY-3: The project would not substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or offsite, or 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.	LTS	No mitigation required.	NA
Impact HY-4: The project would not risk release of pollutants due to inundation by flooding, tsunami waves, or seiche waves.	LTS	No mitigation required.	NA
Impact HY-5: The project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.	LTS	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.17, HYDROLOGY AND WATER QUALITY (CONT.)			
Impact C-HY-1: The project, in combination with the cumulative projects, would not result in significant impacts on hydrology and water quality.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.18, HAZARDS AND HAZARDOUS MATERIALS			
Impact HZ-1: Construction and operation of the project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials, or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials.	LTS	No mitigation required.	NA
Impact HZ-2: Construction and operation of the project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.	LTS	No mitigation required.	NA
Impact HZ-3: Construction and operation of the project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LTS	No mitigation required.	NA
Impact C-HZ-1: The project, in combination with the cumulative projects, would not result in significant impacts related to hazards and hazardous materials.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.19, MINERAL RESOURCES			
Impact MN-1: Construction and operation of the project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.	LTS	No mitigation required.	NA
Impact C-MN-1: The project, in combination with the cumulative projects, would not result in a significant impact related to mineral resources.	NI	No mitigation required.	NA

Table S-1 Summary of Impacts and Mitigation Measures (Continued)

IMPACT	Level of Significance prior to Mitigation	Mitigation Measure	Level of Significance After Mitigation
INITIAL STUDY SECTION E.20, ENERGY			
Impact EN-1: The project would not result in the use of large amounts of fuel, water, or energy, or use these in a wasteful manner.	LTS	No mitigation required.	NA
Impact EN-2: The project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency.	LTS	No mitigation required.	NA
Impact C-EN-1: The project, in combination with the cumulative projects, would not result in significant impacts on energy resources.	LTS	No mitigation required.	NA
INITIAL STUDY SECTION E.21, AGRICULTURE AND FOREST RESOURCES			
NA	NA	NA	NA
INITIAL STUDY SECTION E.22, WILDFIRE			
NA	NA	NA	NA

DEFINITIONS:

LTS = Less than Significant
NI = No Impact
NA = Not Applicable
S = Significant
LSM = Less than Significant with Mitigation
SU = Significant and Unavoidable
SUM = Significant and Unavoidable with Mitigation

CHAPTER 1
INTRODUCTION AND BACKGROUND

1.1 Introduction

The City and County of San Francisco (the city) proposes the Ocean Beach Climate Change Adaptation Project (the project), a collaborative, multiagency initiative to address climate change-induced sea level rise and erosion hazards along a portion of the city's western shoreline. The primary project focus is long-term improvements for a segment of Ocean Beach, south of Sloat Boulevard, commonly known as South Ocean Beach (**Figure 1-1**). This stretch of shoreline is experiencing substantial beach and bluff erosion, which has undermined the Great Highway and stormwater conveyance facilities and threatens critical wastewater system infrastructure essential for protecting coastal water quality. Consistent with state and local coastal management policies and existing permit requirements,[1] the project would enact a combination of *managed retreat*,[2] *beach nourishment*,[3] and *shoreline protection*[4] strategies intended to protect critical wastewater system infrastructure from damage due to these hazards, while also preserving and enhancing coastal public access, scenic quality, and coastal habitat.

The San Francisco Public Utilities Commission (SFPUC) is responsible for managing critical wastewater system infrastructure that the project would protect. The city owns the land, under the jurisdiction of the San Francisco Recreation and Parks Department (Rec and Park), within a portion of the project area. Rec and Park would be responsible for managing public access and recreation elements of the project in this area. The Golden Gate National Recreation Area, a unit of the National Park Service (NPS) owns and manages the land west of the Great Highway (the beach) and would approve and oversee the project components on the beach. Therefore, the SFPUC is in charge of the project's design and construction, in close coordination with Rec and Park and the NPS.

Because the project requires approvals from other city and federal agencies, the project's implementation would be a collaborative, multiagency initiative involving the SFPUC, Rec and Park, San Francisco Public Works (Public Works), the San Francisco Municipal Transportation Agency (SFMTA), the NPS, and the Federal Highway Administration (FHWA). In addition, the long term operations and management of the project includes beach nourishment (large and small sand placements). One potential sediment source for the large placements is sand dredged by the U.S. Army Corps of Engineers (Corps) from the San Francisco Main Ship Channel. Therefore, the SFPUC is coordinating with the Corps on the potential of beneficially using the dredged sand for the project's long-term nourishment program.

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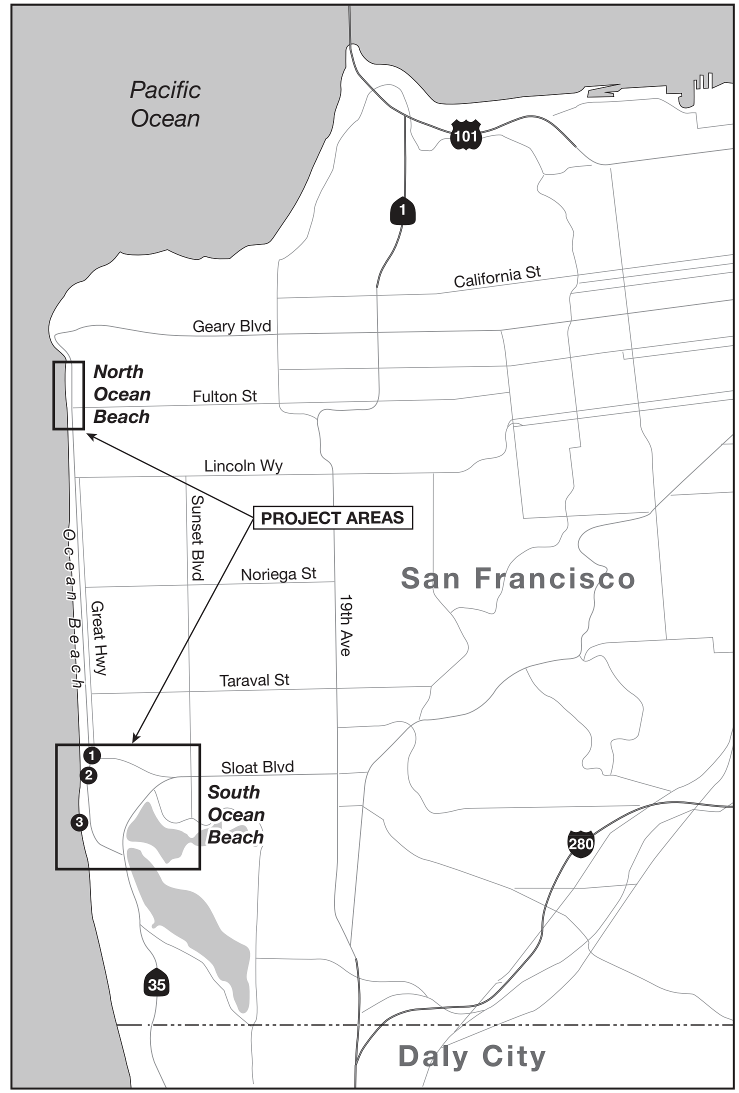
1 In addition to applicable California Coastal Act and San Francisco Western Shoreline Area Plan policies that govern shoreline development within the project area, the California Coastal Commission's Coastal Development Permit 2-15-1537, issued to the SFPUC on November 9, 2015, provides temporary authorization for the existing shoreline protection system and is conditioned upon the city's development of a long-term managed retreat solution to the erosion threat at this location.

2 Managed retreat refers to the planned movement of development and infrastructure away from areas of potential hazard.

3 Beach nourishment refers to the process of adding sand onto or adjacent to a portion of an eroding beach.

4 Shoreline protection refers to the use of physical structures to protect development and infrastructure from coastal erosion.



SOURCE: ESA, 2020

Ocean Beach Climate Change Adaptation Project

Figure 1-1
Project Area and Photos

The city's approach to climate change adaptation at South Ocean Beach has been informed by previous planning and engineering efforts, such as the Ocean Beach Master Plan,[5] and consists of three phases, as summarized below:

- **Short-term Improvements** – These actions provide interim (2015-2022) erosion protection and improved beach access by trucking sand from North Ocean Beach (Ocean Beach north of Lincoln Way) to South Ocean Beach (Ocean Beach south of Sloat Boulevard) and placing large sand bags based on shoreline monitoring.
- **Army Corps Beneficial Use of Dredged Sand** – In September 2021, the Army Corps placed 380,000 cubic yards of sand dredged from the Main Shipping Channel at South Ocean Beach, in partnership with SFPUC and NPS.
- **Long-Term Improvements** – The long-term components to address climate-induced erosion is the project described and analyzed in this EIR.

1.2 Purpose of this Environmental Impact Report

This environmental impact report (EIR) has been prepared by the San Francisco Planning Department (planning department) in conformance with the provisions of the California Environmental Quality Act (CEQA), the CEQA Guidelines (California Public Resources Code section 15000 et seq., "CEQA Guidelines"), and chapter 31 of the San Francisco Administrative Code. The planning department, through its Environmental Planning division, is the lead agency responsible for implementing CEQA for all projects sponsored by the city or located within San Francisco.

CEQA requires the preparation of an EIR when a project could significantly affect the physical environment. The planning department has determined that preparation of an EIR for the project is necessary to comply with CEQA.

The planning department has prepared this EIR to provide the public and the responsible and trustee agencies[6] reviewing the project with information about the project's potential effects on the environment. This EIR describes the potential environmental impacts that could result from implementation of the project, identifies mitigation measures for reducing impacts to a less-than-significant level where feasible, and evaluates alternatives to the project.

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5 The Ocean Beach Master Plan is the product of a collaborative effort among multiple government agencies, community stakeholders, and the public to develop a sustainable long-term vision for Ocean Beach, addressing public access, environmental protection, and infrastructure needs in the context of erosion and climate-related sea level rise. The document is available at: https://www.spur.org/featured-project/ocean-beach-master-plan.

6 "Responsible Agency" means a public agency other than the CEQA Lead Agency which has discretionary approval power over a project. A "trustee agency" refers to any of the state agencies having jurisdiction by law over natural resources affected by a project which are held in trust for the people of the state of California.

1.3 Type of EIR

This document is a project-level EIR pursuant to CEQA Guidelines section 15161. A project-level EIR focuses on the changes in the environment that would result from construction and operation of a specific development project. Furthermore, this EIR is also a focused EIR, in accordance with CEQA Guidelines section 15063(c). In accordance with section 15128, the planning department has prepared an initial study for the project (see **Appendix B** of this EIR) to identify topics for which the project's effects would be less than significant and not require further analysis, and those topics that warrant more detailed environmental analysis in the EIR. The initial study is being published concurrently with the EIR, and comments will be accepted on the initial study during the public review period for the EIR.[7]

1.4 Project Background

South Ocean Beach is an approximately 1-mile stretch of Pacific Ocean coastline that extends from Sloat Boulevard south to the Fort Funston bluffs (Figure 1-1). This stretch of shoreline is the visible portion of a complex and dynamic offshore sediment system, and in recent years has experienced rapid and substantial erosion of its beach and bluffs. South Ocean Beach is also a popular destination for beachgoers and recreationists, provides habitat for sensitive biological resources, and serves as a barrier between the ocean and important wastewater treatment infrastructure. The combination of these factors – ongoing shoreline erosion and recreational, biological, and infrastructural importance – presents management challenges that the project has been designed to address. This section provides additional information regarding coastal processes, critical infrastructure, and past management and planning efforts that have culminated in the project.

1.4.1 Coastal Processes at Ocean Beach

Ocean Beach is a 3.5-mile stretch of sandy beach that forms the western boundary of San Francisco. It is influenced by complex coastal processes, including an intense wave climate, strong tidal currents, and irregular offshore underwater features. The beach is the visible portion of a much larger coastal sand and sediment system, known as the San Francisco Littoral Cell.[8] The littoral cell extends from Fort Point in the north to Point San Pedro in the south. A prominent feature of the littoral cell is a large, semi-circular sandbar (the San Francisco bar) that extends from the Marin Headlands in the north to Ocean Beach in the south.[9] Within this area, sand circulates with the currents and tides, and alternately erodes and nourishes adjacent beaches. **Figure 1-2** includes a diagram showing the San Francisco Littoral Cell, the San Francisco bar, and Ocean Beach.

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7 Under CEQA Guidelines section 15128, the EIR must contain a brief statement indicating the reasons why certain effects were determined not to be significant and thus were not discussed in the EIR.

8 The littoral zone in marine ecosystems is the shore-area or intertidal zone where periodic exposure and submersion by tides is normal. A "littoral cell" is a self-contained area of coastline characterized by distinct sources of sand, littoral drift of sand along the shoreline, and routes where sand is lost from the cell.

9 ESA, Kearns & West, Peter R Baye, and Philip King, 2016. San Francisco Littoral Cell Coastal Regional Sediment Management Plan Draft – January 2016. Prepared for the California Coastal Sediment Management Workgroup. January. This document and all other documents referenced in this EIR unless otherwise noted are available for review at https://tinyurl.com/Ocean-Beach-EIR.

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SOURCE: U.S Army Corps of Engineers and San Francisco Bay Regional Water Quality Control Board, 2015; ESA et al., 2016

NOTES:
ft MLLW = Mean Lower Low Water

SF-8 = San Francisco Bar Channel Disposal Site (ocean side)
SF-17 = Ocean Beach Placement Site (near shore site, in process of being designated as a disposal site)

Ocean Beach Climate Change Adaptation Project

Figure 1-2
Dredging Operations in the San Francisco Littoral Cell

Sediment transport within the littoral cell is not fully understood and is the subject of ongoing research. Studies conducted over the past few decades present different hypotheses regarding how sediment moves and key drivers of shore change within the littoral cell.[10] However, the studies are generally in agreement that the areas of Ocean Beach north of Sloat Boulevard have remained stable or widened over the years; while the areas of Ocean Beach south of Sloat Boulevard have generally narrowed, or eroded, over the years.

Monthly U.S. Geological Survey (USGS) shoreline data collected at South Ocean Beach between 2004 and 2020 shows an average annual shoreline erosion rate of about 1.7 feet per year, with as much as 4.3 feet per year occurring towards the south end of the project site (i.e., near the Southwest Ocean Outfall).[11,12] For context, the USGS data for the shoreline to the north of the project area ("Middle Ocean Beach", extending south from Lincoln Boulevard to Sloat Boulevard) shows an average annual *accretion* (the accumulation of sand) rate of about 4.3 feet per year. Closer to the project site (i.e., within 1,000 feet upcoast of Sloat Boulevard), the average annual accretion rate is around 0.7 feet per year.[13] In contrast, the USGS data show average annual bluff and backshore erosion along Fort Funston to the south of the project area as roughly 2 to 3 feet per year, and closer to 5 feet per year immediately adjacent to the project site. *Revetments* slow shoreline retreat by protecting the land from direct exposure to ocean waves.[14]

1.4.2 Existing Wastewater System

South Ocean Beach coastal processes have raised concerns about the vulnerability of existing wastewater system facilities located inland of South Ocean Beach. The SFPUC operates and maintains the city's combined sewer system, which collects and treats the combined wastewater and stormwater flows at three SFPUC treatment facilities: the Southeast Water Pollution Control Plant, the Oceanside Water Pollution Control Plant (Oceanside Treatment Plant), and the North Point Wet Weather Facility.[15]

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10 For example, Battalio & Trivedi (1996) assert that sand placed atop the San Francisco Bar has effectively nourished Ocean Beach since the 1970s. Barnard, et al, (2013) attribute accretion along North Ocean Beach to shore rotation associated with the changes in the offshore San Francisco bar. Barnard, et al (2013) also conclude that South Ocean Beach is an erosion hot spot due to shrinkage of the San Francisco Bar, and that erosion is potentially further increased due to wave focusing by an exposed offshore wastewater pipeline on the seafloor. Barnard, et al (2013) emphasize the correlation of beach erosion with sand mining in central San Francisco Bay and dredging in the bay and ocean. Battalio (2014) reiterates that the massive accretion at North Ocean Beach since the 1970s and along the north shore of San Francisco since the mid-1980s correlates well with an increase in sand supply associated with the change in dredging practice in the 1970s.

- Barnard, P. L., Erikson, L. H., Elias, E. P. L., & Dartnell, P. (2013). Sediment transport patterns in the San Francisco Bay Coastal System from cross-validation of bedform asymmetry and modeled residual flux. Marine Geology, 345, 72–95. http://doi.org/10.1016/j.margeo.2012.10.011
- Battalio, R. T. (2014). Littoral processes along the Pacific and bay shores of San Francisco, California, USA. Shore & Beach, 82(1), 3-21.
- Battalio, R.T. & Trivedi, D. (1996). Sediment transport processes at Ocean Beach, San Francisco California. Proceedings of the 25th International Conference, American Society of Civil Engineers, Coastal Engineering, 3(208), 2691–2704.

11 Beach erosion and accretion is measured as the horizontal movement of the mean high water line over time.

12 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. *Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements*. Prepared for San Francisco Public Utilities Commission. July 2020.

13 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. *Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements*. Prepared for San Francisco Public Utilities Commission. July 2020.

14 In coastal engineering, revetments are sloping structures placed on banks or cliffs in such a way as to absorb the energy of incoming water

15 In 1974, the SFPUC issued its Sewer System Master Plan, which calls for upgrading sewer infrastructure citywide to reduce pollution caused by combined sewer-stormwater overflows and to bring the city into compliance with the 1972 Clean Water Act. Pursuant to this plan, from the late 1970s until 1993, the SFPUC constructed a major complex of sewer and stormwater infrastructure in the vicinity of Ocean Beach. This system reduced coastal water pollution events by a factor of 10. (San Francisco Public Utilities Commission, 2018. *Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems. Project No. CWWFAC01*. February 15, 2018).

The city is naturally divided by a ridgeline running roughly north-south into two main watersheds: bayside and westside (**Figure 1-3**). The westside watershed drains toward the Pacific Ocean and occupies approximately 11,000 acres. The combined stormwater and wastewater on the west side, comprising approximately 20 percent of combined stormwater and wastewater generated in the city, receive treatment at the Oceanside Treatment Plant, just east of South Ocean Beach, before being discharged to the Pacific Ocean.[16]

Existing wastewater system infrastructure within the project area is shown on **Figure 1-4**. Within the westside watershed, combined stormwater and wastewater are conveyed to the Oceanside Treatment Plant via smaller collection pipelines that drain to the Westside Transport Box, the Lake Merced Tunnel, and the Westside Pump Station. The Westside Transport Box is a 45-foot-deep-by-25-foot-wide concrete-box-like structure located beneath the Great Highway, north of Sloat Boulevard. The 14-foot-diameter Lake Merced Tunnel connects wastewater conveyance facilities near Lake Merced to the Westside Pump Station, and generally runs beneath the Great Highway between Skyline Boulevard and Sloat Boulevard at depths ranging from approximately 20 feet in the north to 38 feet in the south.[17] The Zoo Wet-Weather Pump Station (Zoo Pump Station), accessible via the zoo parking lot, receives both dry- and wet-weather flows by gravity from the zoo and areas south via a 54-inch sewer main and directs them to Westside Pump Station infrastructure.

The Westside Pump Station lifts wastewater to alleviate reduced gravity flow.[18] Collection system flows that exceed the Oceanside Treatment Plant's treatment capacity of 65 million gallons per day are stored in the Westside Transport Box, the Lake Merced Tunnel, and the Richmond Transport Box (located north of the Westside Transport Box). Combined wastewater from the Westside Transport Box and the Lake Merced Tunnel is pumped via the Westside Pump Station to the Oceanside Treatment Plant via a *force main*[19] located inland from the Lake Merced Tunnel when the plant has capacity to treat it. The treatment plant provides *primary* and *secondary treatment*[20] to the combined wastewater and discharges the treated water to the Pacific Ocean approximately 4 miles offshore through the Southwest Ocean Outfall.

1.4.3 Ocean Beach Shoreline Modification Projects

Activities modifying the Ocean Beach shoreline have occurred periodically since the middle of the 19th century. Sand was pushed west along the western shoreline north of Sloat Boulevard in the late 19th and early 20th centuries to create level ground for the construction of the adjacent neighborhoods and the Great Highway. South of Sloat Boulevard, the shoreline position fluctuated by several hundred feet between 1850 and 2010, extending west when sand or rubble was placed on the beach and migrating landward in subsequent periods as the placed material was eroded.[21,22]

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16 City of San Francisco, 2009. San Francisco Stormwater Guidelines. November 2009. *https://www.sfwater.org/Modules/ShowDocument.aspx?documentID=2779*. Accessed March 21, 2019.

17 SPUR, ESA PWA, Moffatt & Nichol, McMillen Jacobs Associates, and AGS, Inc., 2015, *Coastal Protection Measures & Management Strategy for South Ocean Beach, Ocean Beach Master Plan: Coastal Management Framework*, Prepared for San Francisco Public Utilities Commission, April 24, 2015

18 The pipelines of the combined sewer system generally are constructed such that water flows to wastewater treatment infrastructure by gravity (i.e., flows downhill); however, in some locations the water needs to be pumped or "lifted" in order to recreate a downhill slope and maintain flows toward wastewater treatment infrastructure.

19 Force mains are pipelines that convey wastewater under pressure.

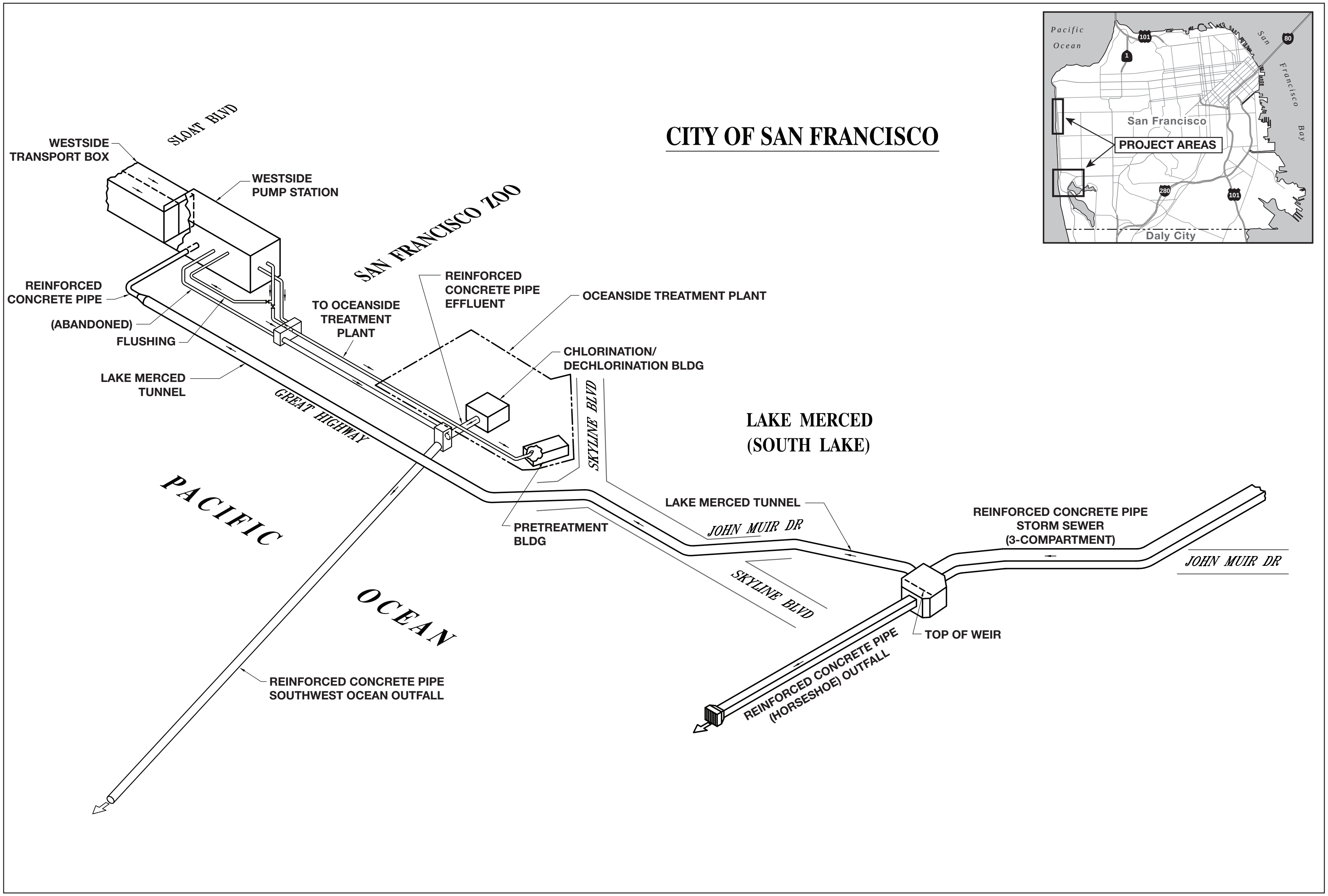
20 Secondary-treated effluent has undergone a two-phase treatment process (primary and secondary). The primary phase, or first stage of treatment, involves the separation of solids and a portion of the suspended sediments from the effluent. The secondary phase involves the use of chemical and biological measures to further remove dissolved organic matter, nutrients, and other contaminants such as suspended sediments.

21 Battalio, B., *Littoral processes along the Pacific and bay shores of San Francisco*, California, USA, *Shore & Beach* 82(1), Winter 2014.

22 ESA, Technical Memorandum: *Engineering, Geology, and Coastal Process Information for South Ocean Beach Immediate-Term Management Measures*, August 28, 2015.

SOURCE: SFPUC, Sewer System Improvement Program
Urban Watershed Assessment Factsheet, no date

Figure 1-3
San Francisco Watersheds



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SOURCE: SFPUC, Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach, February 15, 2018

Ocean Beach Climate Change Adaptation Project

Figure 1-4
Southwest Wastewater Collection System

Since the 1990s, the city has responded to the erosion – mainly to protect the Great Highway, a city asset – through implementation of a series of both hard and soft shoreline protection measures. The former (hard structures) include construction of rock and rubble revetments, shown on **Figure 1-5**. The latter (soft structures) include beach nourishment and sandbag revetments, including placement of a total of approximately 307,000 cubic yards (cy) of sand onto the beach and bluff from 1997 to 2019. In August to September 2021 the Corps placed approximately 380,000 cy of material dredged from the main ship channel along South Ocean Beach, instead of its past practices of placing the material offshore at SF-8 or the Ocean Beach Demonstration Site (see Figure 1-2).[23] **Table 1-1** summarizes notable interventions on the beach and bluff at South Ocean Beach.[24] While the sand placed during a given intervention event generally erodes from the area over the course of one or two ensuing storm seasons, each of the stone and sandbag revetments remains on the beach.

Table 1-1 Shoreline Modifications and Sand Placement at South Ocean Beach Since 1990

Year	Intervention Type and Volume or Length
1997	Two rows of armor stone revetment placed in response to erosion from El Nino storm event
1998	A 600-foot-long rock revetment, commonly referred to as the Emergency Quarrystone Revetment, placed over the 1997 stone revetments in response to erosion from El Nino storm event
1999	20,000 cubic yards of sand placed
2001	12,000 cubic yards of sand placed
2003	23,000 cubic yards of sand and 15,000 cubic yards of sand placed (two separate placement events)
2010	440-foot-long riprap revetment placed
2012	An 80-foot-long sandbag revetment placed
2013	77,000 cubic yards of sand, excavated from North Ocean Beach near the O'Shaughnessy Seawall and placed west of the bluffs along South Ocean Beach
2016 (February)	25,000 cubic yards of sand, excavated from North Ocean Beach near the O'Shaughnessy Seawall and placed west of the bluffs along South Ocean Beach
2016 (November-December)	70,000 cubic yards of sand, excavated from North Ocean Beach near the O'Shaughnessy Seawall and placed west of the bluffs along South Ocean Beach
2018	65,000 cubic yards of sand excavated from North Ocean Beach near the O'Shaughnessy Seawall placed in two locations west of the bluffs along South Ocean Beach Sandbag revetments placed in two locations along South Ocean Beach to stabilize eroding gullies
2019	53,000 cubic yards of sand, excavated from North Ocean Beach near the O'Shaughnessy Seawall and placed west of the bluffs along South Ocean Beach
2021	380,000 cubic yards of sand from the San Francisco Bay Main Ship Channel placed west of the bluffs along South Ocean Beach by the U.S. Army Corps of Engineers. With roughly 33 percent losses during placement, post placement surveys confirm 255,300 cubic yards of sand remained on the beach.

SOURCE: SFPUC, *Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems*, February 15, 2018;

ESA, *Ocean Beach Short-term Erosion Protection Measures Project – 2018-2019 Monitoring Report*. Prepared for San Francisco Public Utilities Commission. July 2019.

USACE, 2021, Email correspondence from Nathan Miller (USACE) to Karen Frye (SFPUC) and others; Re: Ocean Beach Project Status Update - 19 Sep. September 21, 2021.

23 With roughly 33 percent losses during placement, post placement surveys confirm 255,300 cubic yards of sand remained on the beach.

24 SFPUC, *Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems*, February 2018.

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SOURCE: ESA, 2019; Google Earth, 2019

Ocean Beach Climate Change Adaptation Project

Figure 1-5
Sandbag and Rock Revetments along South Ocean Beach

The city and NPS have undertaken other infrastructure modifications along South Ocean Beach in response to erosion. For example, South Ocean Beach historically included two NPS parking lots located west of the Great Highway. In response to bluff retreat, and to protect public safety, the NPS closed and removed the southern parking lot, and has closed and removed a portion of the northern lot. In addition, Public Works has narrowed the southbound roadway from two lanes to one lane. Ongoing measures along this stretch of coastline include authorized sand and sandbag placements. The terms of both a 2014 legal settlement agreement[25] and a 2015 California Coastal Commission permit[26] establish timelines to develop a long-term solution to shoreline management at South Ocean Beach.

1.4.4 Relationship to Ocean Beach Planning Initiatives

In addition to the various shoreline modification projects identified, the city has also participated in several planning initiatives aimed at developing a long-term strategy for managing the South Ocean Beach shoreline. The most comprehensive was the planning process for the Ocean Beach Master Plan (master plan), partially funded by the SFPUC on behalf of the city, the NPS, and the California Coastal Conservancy. In 2009, recognizing the need for an integrated, long-term management strategy for South Ocean Beach, the San Francisco Bay Area Planning and Urban Research Association (SPUR) initiated the development of the master plan. The master planning process built on prior efforts by the Ocean Beach Task Force and the Ocean Beach Vision Council to bring community members, public agencies, and other stakeholders together to develop a sustainable long-term vision for Ocean Beach, addressing public access, environmental protection, and infrastructure needs in the context of ongoing erosion and climate-related sea level rise.

Master plan recommendations for South Ocean Beach include: (1) rerouting the Great Highway between Sloat and Skyline boulevards; (2) constructing a low-profile structure to protect the Lake Merced Tunnel; (3) covering the low-profile structure with flexible, dynamic structures (i.e., cobble and sand) to dissipate wave energy; (4) reshaping and revegetating the surface, improving coastal access and ecological function; and (5) enhancing stormwater management.[27] The master plan has not been adopted by the city. However, recommendations from the master plan have been incorporated into the city's local coastal program, the Western Shoreline Area Plan, which governs public infrastructure and private development projects within the coastal zone in accordance with the California Coastal Act (see Chapter 3, Plans and Policies). The project has been designed based upon key Ocean Beach Master Plan principles and guided by relevant local coastal program objectives.

1.4.5 Background Technical Studies

In addition to the technical work performed in support of the Ocean Beach Master Plan, the city has completed a number of additional technical studies to inform project design. Notable relevant studies are discussed below.

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[25] California Coastal Protection Network and City and County of San Francisco, 2014. Settlement Agreement and Mutual Release in the case *California Coastal Protection Network v. City & County of San Francisco*, Case No. CGC-11-513176.
[26] California Coastal Commission, *Coastal Development Permit 2-15-1537*, Issued to SFPUC November 9, 2015.
[27] Ibid.

1.4.5.1 COASTAL PROTECTION MEASURES AND MANAGEMENT STRATEGY FOR SOUTH OCEAN BEACH

The Coastal Protection Measures and Management Strategy for South Ocean Beach[28] refines the Ocean Beach Master Plan concepts and assesses their feasibility in light of existing and anticipated future conditions at South Ocean Beach. The report presents an analysis of Lake Merced Tunnel vulnerability to coastal hazards over time and establishes metrics, referred to as “triggers,” for management action. The triggers comprise horizontal and vertical structural stability and safety buffers of soil around the Lake Merced Tunnel. Finally, the report presents a preferred project concept, developed with input from a technical advisory committee,[29] that would be feasible to address the assessed vulnerability and consistent with the Ocean Beach Master Plan’s guiding principles. The project proposed in this EIR was based on the preferred project concept identified in this plan.

1.4.5.2 OCEAN BEACH OPEN SPACE LANDSCAPE DESIGN SUMMARY

The Ocean Beach Open Space Landscape Design[30] presents schematic design improvements for North Ocean Beach and South Ocean Beach. The South Ocean Beach focus area comprises the roadway, parking lots, and beach access points south of Sloat Boulevard. The designs develop concepts recommended in the Ocean Beach Master Plan and were intended to be integrated into the Master Plan implementation efforts being pursued by multiple agencies. These designs are incorporated into the project proposed in this EIR.

1.4.5.3 ENGINEERING ALTERNATIVES ANALYSIS REPORT

The Alternatives Analysis Report for the project[31] identifies and evaluates the merits of feasible options to address infrastructure vulnerability to coastal hazards along South Ocean Beach. The options considered include onshore and offshore interventions, structural and non-structural interventions, and various combinations thereof. As protection of critical infrastructure is a key element of project need, and the Lake Merced Tunnel is the seaward-most component of the existing wastewater system, the Lake Merced Tunnel features prominently in each of the options identified. As is common practice for SFPUC alternatives analysis reports, a no-project option was also considered. The alternatives analysis identifies the “Protect Lake Merced Tunnel with Exterior Low-profile Wall” option as the preferred alternative, based on the relatively low capital cost, minimal post-construction environmental impact (beach width), and high resilience to sea level rise. Chapter 6, Alternatives, of this EIR provides additional information about the options considered in the alternatives analysis report, and how they relate to the CEQA alternatives discussed in this EIR.

1.4.5.4 CONCEPTUAL ENGINEERING REPORT

The Ocean Beach Long-Term Improvements Project Conceptual Engineering Report[32] advances the alternative concept selected through the alternatives analysis report process. The report presents an evaluation of coastal conditions and information on the geology of the South Ocean Beach area; these elements of the report form part of the basis for the project’s conceptual engineering design. The conceptual

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28 SPUR, ESA PWA, Moffatt & Nichol, McMillen Jacobs Associates, and AGS, Inc., 2015, *Coastal Protection Measures & Management Strategy for South Ocean Beach, Ocean Beach Master Plan: Coastal Management Framework*, Prepared for San Francisco Public Utilities Commission, April 24, 2015.

29 The technical advisory committee comprised key Ocean Beach stakeholders including representatives of the National Park Service, the U.S. Geological Survey, the U.S. Army Corps of Engineers, San Francisco Public Utilities Commission, SPUR, San Francisco State University, and others.

30 SPUR and AECOM, *Ocean Beach Open Space Landscape Design Summary*, February 2017.

31 SFPUC, *Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems*, February 2018

32 MN + AGS JV, *Ocean Beach Long-Term Improvements Project Conceptual Engineering Report*, Prepared for SFPUC, September 2019.

engineering report also describes engineering aspects of the project, with consideration to geotechnical, civil, structural, and coastal engineering design.

1.4.5.5 GEOTECHNICAL INTERPRETIVE REPORT

The geotechnical interpretive report provides geotechnical recommendations for use in design of the project's shoreline protection system.[33] Existing geotechnical data, supplemented by data from a field exploration and laboratory testing program, were used to develop the report's geotechnical recommendations. The geotechnical report is discussed in greater detail in this EIR's Appendix B, Section E.16, Geology and Soils.

1.4.5.6 SAND MANAGEMENT PLAN

The Sand Management Plan provides a framework for determining whether and how much sand should be placed in a given year following project completion in order to maintain a sandy beach.[34] The plan calls for regular monitoring of beach conditions over the course of a given year, and annual reporting with recommendations regarding sand placement. The analysis conducted in support of the plan establishes triggers for sand placement, based on the beach width or the length of buried wall exposure observed during annual monitoring. The analysis also assesses the range of potential future beach conditions with the project across multiple sand placement volume scenarios. The project's proposed monitoring and beach nourishment program, which is based upon the Sand Management Plan, is described in Chapter 2, Project Description, Section 2.4.5, Beach Nourishment, of this EIR.

1.5 Environmental Review Process

The environmental review process for the project includes multiple steps: publication of a Notice of Preparation (NOP) of an EIR, public scoping period, publication of a Draft EIR, public and agency review of the Draft EIR, publication of responses to public and agency comments on the Draft EIR, and certification of the Final EIR. Each of these steps involves public outreach.

1.5.1 Notice of Preparation and Public Scoping Period

The SFPUC filed a public project application with the planning department on October 24, 2019, initiating the environmental review process. In accordance with sections 15063 and 15082 of the CEQA Guidelines, on September 9, 2020, the planning department sent the NOP for the EIR to responsible public agencies and interested parties to begin the formal CEQA scoping process for the project. **Appendix A** presents the NOP. The NOP informed agencies and the public about the project and the planning department's decision to prepare an EIR, and included a request for comments on environmental issues that should be addressed in the EIR. The planning department also distributed a public notice of the availability of the NOP and notice of public scoping meeting to additional public agencies, interested parties, and landowners/occupants located near the project; these notices were posted on the planning department website and placed in the legal classified section of the *San Francisco Examiner* on September 9, 2020.

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[33] AGS, *Final Geotechnical Interpretive Report (GIR), South Ocean Beach Coastal Erosion and Wastewater Infrastructure Protection*, San Francisco, California, July 2021.

[34] Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. *Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements*. Prepared for San Francisco Public Utilities Commission. July 2020.

The planning department held a virtual public scoping meeting on September 30, 2020, to receive oral comments on the scope of the EIR. The 30-day scoping period ended on October 9, 2020. **Table 1-2** presents summaries of the written and oral comments received during the public scoping period, and indicates which initial study and/or EIR sections address comments pertaining to the project description or the scope and content of the environmental analysis.[35] The planning department has considered all comments made by the public and agencies in preparing the initial study and EIR for the project.

Table 1-2 Summary of Scoping Comments

Commenter	Summary of Comment	CEQA Subject Area(s)
AGENCIES		
California Department of Fish and Wildlife (CDFW; Gregg Erickson)	CDFW identifies state special-status species with potential to occur in or near project site: bank swallow (*Riparia riparia*), California black rail (*Laterallus jamaicensis coturniculus*), Western bumble bee, San Francisco lessingia (*Lessingia gemanorum*), Beach layia (*Layia carnosa*), nesting and migratory birds.	• Section 4.6, Biological Resources
	The EIR should fully describe the project, including future phases; and specifically features related to: sources of light and glare; noise increases and human presence from public access: impacts to vegetation; stormwater and drainage outlet systems; work along the bluff and at stream crossings; and fencing.	• Chapter 2, Project Description • Section 4.6, Biological Resources
	Draft EIR should consider the current state of the shoreline with existing revetments as “existing conditions.”	• Section 4.1.3, Baseline Conditions for Evaluation of Impacts • Section 4.6, Biological Resources
	The project may have potentially significant impacts on fully protected species. Recommends fully protected species surveys and fully protected species avoidance to mitigate such impacts.	• Section 4.6, Biological Resources
	Project-related noise, groundwork, and movement of workers have the potential to significantly impact state-listed wildlife species. Recommends state-listed wildlife species and species of special concern protocol-level surveys, state species of special concern avoidance, and state-listed species take authorization to mitigate such impacts.	• Section 4.6, Biological Resources
	State threatened, endangered, or rare plant species may occur within the project location and could be significantly impacted by the project. Recommends special-status plant protocol-level surveys, special-status plant avoidance, and special-status plant take authorization to mitigate such impacts.	• Section 4.6, Biological Resources

[35] ESA, 20201. *Ocean Beach Climate Change Adaptation Project – CEQA Scoping Comments*. Prepared for San Francisco Planning Department. November 2021.

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
AGENCIES (CONT.)		
California Department of Fish and Wildlife (CDFW; Gregg Erickson) (cont.)	Any project impacts on bank swallow individuals or colonies should be considered a substantial adverse change in the physical conditions within the area affected by the project. The loss of either colonies or individuals at Ocean Beach would reduce the size of the local population, contributing to reduced population fitness and potentially a regional extirpation of the species. This impact on the bank swallow population should be considered significant under CEQA. CDFW is not aware of feasible mitigation that would offset such an impact.	• Section 4.6, Biological Resources
	Encourages the lead agency to consider project designs in the EIR alternatives analysis that would not cause the loss of the bank swallow colonies at Ocean Beach.	• Chapter 6, Alternatives
	Advises that the project proponent obtain a California Endangered Species Act permit for bank swallows in advance of project implementation if the impacts cannot be avoided. Recommends early consultation with CDFW, and that the CEQA document should specify impacts and mitigation, and fully describe a mitigation, monitoring, and reporting program.	• Chapter 2, Project Description • Section 4.6, Biological Resources
	The project has potential to contribute to cumulative effects, such as decreased wildlife connectivity and increases in deleterious material (such as trash) in waterways. Recommends the project incorporate wildlife-friendly fencing, create wildlife bypasses, and educate visitors regarding trash cleanup, as applicable.	• Section 4.6, Biological Resources
	The project may increase light pollution, which may affect biological resources. Recommends eliminating non-essential artificial lighting or avoiding or limiting the use of artificial lights between dawn and dusk, and other approaches to mitigate such impacts.	• Section 4.6, Biological Resources
	Project work should occur during the bird non-nesting season to avoid impacts on nesting bird species. If ground-disturbing or vegetation-disturbing activities must occur during the bird breeding season (February through early September), recommends nesting bird surveys and nesting bird buffers to mitigate such impacts.	• Section 4.6, Biological Resources
	Identifies regulatory approvals/requirements: California Endangered Species Act for take of a state-listed plant or animal; notification under the Lake and Streambed Alteration program for effects on lakes, streams, and associated riparian and wetland areas; filing fees if the project would have an impact on fish and/or wildlife.	• Chapter 2, Project Description

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
AGENCIES (CONT.)		
Native American Heritage Commission (Nancy Gonzalez-Lopez)	Recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of the project as early as possible and summarizes tools for outreach and consultation.	• Appendix B, Sections E.4, Cultural Resources, and E.5, Tribal Cultural Resources
	Describes the AB52 and SB18 CEQA requirements for tribal cultural resources. Lead agencies should include in their mitigation monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources, provisions for disposition of recovered cultural items, and provisions for the treatment and disposition of inadvertently discovered Native American human remains.	• Appendix B, Sections E.4, Cultural Resources, and E.5, Tribal Cultural Resources
ORGANIZATIONS		
California Native Plant Society, Yerba Buena Chapter (Eddie Bartley et al.)	Requests the project description and figures be revised to indicate a firm commitment to use native plants for the site revegetation. Would like to see an objective of the project be to use native plants in revegetation and landscaping.	• Chapter 2, Project Description
	Requests the EIR analyze the environmental effects of any use of non-native plants. Appreciates that the EIR will analyze direct and indirect effects of project construction and operation on special-status plants.	• Section 4.6, Biological Resources
Golden Gate Audubon Society (Pat Young)	Asks about project impacts related to shoreline erosion and sand movement over the next 50 years, and how storms and sea level rise will be considered.	• Chapter 2, Project Description • Chapter 3, Plans and Policies • Appendix B, Sections E.16, Geology and Soils and E.17, Hydrology and Water Quality
	Asks what actions are being taken to protect marine wildlife and birds in the project area, and how dredging and sand placement might affect wildlife that feed in the project area.	• Section 4.6, Biological Resources
	Asks how the project will protect the nesting bank swallow colony, which is active April through July.	• Section 4.6, Biological Resources
	Asks about plans to protect snowy plovers, gulls, and shorebirds, and to ensure they can continue to use Ocean Beach as habitat.	• Section 4.6, Biological Resources
	A restroom at both parking locations would make sense.	• Chapter 2, Project Description

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
ORGANIZATIONS (CONT.)		
Golden Gate Audubon Society (Pat Young), (cont.)	Asks how trash, including trash caught in sand fencing, will be managed to prevent wildlife and water quality impacts at South Ocean Beach and Lake Merced.	• Appendix B, Section E.17, Hydrology and Water Quality • Section 4.6, Biological Resources
	Asks about the route people will take to the beach from the parking lot, and associated erosion, introduction of weeds, and trash due to the creation and use of social trails.	• Chapter 2, Project Description
	Asks what locally approved dune plants species are planned. The plants should support the city's Biodiversity Resolution. Asks how their establishment will be assured.	• Section 4.6, Biological Resources • Chapter 2, Project Description
	Asks which agencies will oversee/manage the dune vegetation, trail, and sand movement.	• Chapter 2, Project Description
	Asks how the project is addressing potential danger of cliff collapse.	• Appendix B, Section E.16, Geology and Soils
	Asks how artificial lighting impacts on wildlife will be addressed. References National Park Service dark skies protections.	• Section 4.6, Biological Resources • Section 4.2, Aesthetics • Chapter 3, Plans and Policies
	Requests description of annual sand monitoring and management.	• Chapter 2, Project Description
Sierra Club – San Francisco Group (Arthur Feinstein)	Requests that "natural resources preservation, enhancement, and restoration" be clearly identified in the EIR as a goal of the project.	• Chapter 2, Project Description
	The EIR should analyze construction and public access impacts on bank swallow nesting success and consider nesting season stoppage (April through July) or other measures to mitigate construction impacts.	• Section 4.6, Biological Resources
	The EIR should analyze construction, public access, and sand placement impacts on western snowy plover, along with other waterbirds and shorebirds.	• Section 4.6, Biological Resources
	The EIR should analyze impacts of sand placement and if there should be seasonal constraints to address the migratory nature of many of these species or propose other mitigations.	• Section 4.6, Biological Resources

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
AGENCIES (CONT.)		
Sierra Club – San Francisco Group (Arthur Feinstein) (cont.)	The EIR should address whether construction or post-construction activities will have any impact on wildlife species such as sea lions, harbor seals, sea ducks, pelicans, cormorants, loons, scoters that use and depend on nearshore habitats, and on birds that use Ocean Beach for roosting.	• Section 4.6, Biological Resources
	The EIR should address the National Park Service "dark sky" policy and analyze the project's impact on that policy.	• Chapter 2, Project Description • Chapter 3, Plans and Policies • Section 4.6, Biological Resources • Section 4.2, Aesthetics
Surfrider Foundation – San Francisco (Kyle Stanner and Mike Grizzle)	Asks about impacts on surfing and swimming.	• Section 4.5, Recreation • Appendix B, Section E.16, Geology and Soils
	Asks about public access, parking and bathrooms, and proximity to access points.	• Chapter 2, Project Description
	Asks about presence of a dry beach and the effects of ongoing beach nourishment on sandbars.	• Chapter 2, Project Description • Appendix B, Section E.16, Geology and Soils
	Asks about waste management at the beach, signage, and the inclusion of an interpretive center (as recommended in the Ocean Beach Master Plan) in the project.	• Chapter 2, Project Description
	Asks whether the project will include a public interaction/education center.	• Section 4.6, Biological Resources •
	The proposed wall does not look like the wall presented in the Ocean Beach Master Plan and the SFPUC conceptual engineering report. Not optimistic dunes can be maintained on the proposed 3:1 slope and hard surface of the proposed wall. Asks about the basis of wall design, ability to sustain dunes, and whether large versus small sand placements have been studied.	• Chapter 2, Project Description • Appendix B, Section E.16, Geology and Soils
	Asks whether all rubble will be removed as a lot is buried by sand below the mean high tide line.	• Chapter 2, Project Description
	Asks whether the SFPUC access road is as far east as possible, and notes that Ocean Beach Master Plan excluded an access road, so if it's necessary, would it be built to reduce environmental impact (i.e., using recycled materials).	• Chapter 2, Project Description

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
AGENCIES (CONT.)		
Surfrider Foundation – San Francisco (Kyle Stanner and Mike Grizzle) (cont.)	Requests clarification on the beach nourishment plan, including whether triggers are included and how long before sand is replaced after a large swell event.	• Chapter 2, Project Description
	Asks whether the beach access points have been designed for the worst-case scenario (high tides, swells, storms).	• Chapter 2, Project Description
	Ask about risks and project measures to prevent hazardous waste releases and damage to wastewater infrastructure during construction.	• Appendix B, Section E.17, Hydrology and Water Quality • Appendix B, Section E.18, Hazards and Hazardous Materials
	Asks about use of native plant species and design for minimal runoff directly into water.	• Chapter 2, Project Description • Appendix B, Section E.17, Hydrology and Water Quality
	Asks about traffic effects on the Lower Great Highway and surrounding neighborhoods, and the locations of dedicated beach access parking beyond the Skyline coastal parking lot.	• Section 4.3, Transportation and Circulation • Chapter 2, Project Description
INDIVIDUALS		
Arthur Adams	Concerned about traffic routing and pedestrian safety once the Great Highway is closed. Recommends the project include a structure for pedestrian crossover at Sloat Boulevard, so that drivers can pass through without having to stop at many stop signs or traffic lights.	• Chapter 2, Project Description • Section 4.3, Transportation and Circulation
Jean Allan	EIR should address the impact of the project on recreational access to the beach including beach walking, and surfing and swimming along all Ocean Beach, including effects on or from motorized and non-motorized vessel access to Ocean Beach.	• Section 4.5, Recreation
	Concerned about sea level rise.	• Chapter 2, Project Description • Chapter 3, Plans and Policies • Appendix B, Sections E.16, Geology and Soils and E.17, Hydrology and Water Quality

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
INDIVIDUALS (CONT.)		
Jean Allan (cont.)	Concerned about transportation impacts, in particular access for residents out Sloat Boulevard and access to State Route 35 south along Skyline Boulevard.	• Section 4.3, Transportation and Circulation
Munzer Dajani	Concerned about closures of any area or street due to the project. May affect residents and tourists.	• Section 4.3, Transportation and Circulation
Max Ebizalerts	Concerned about the removal of traffic lanes; removal of these lanes will not allow for proper flow of traffic and will cause major increases in traffic on Sloat Boulevard and other roadways. Suggests at least one driving lane be retained.	• Section 4.3, Transportation and Circulation
	Proposed closure of the Great Highway at Sloat Boulevard will lead to increased emissions, pollution, and noise, which will impact nearby residential areas, the wildlife in and around Lake Merced, and animals at the zoo. How will these issues be addressed?	• Appendix B, Section E.8, Air Quality • Section 4.4, Noise and Vibration
	Relocating the public bathroom to northeast corner of Sloat Boulevard will cause safety and nuisance issues for nearby residences.	• Chapter 2, Project Description
Robert Hall	Recommends plantings for the new dunes and habitats consider biodiversity and native habitat. Also excited about the recreational components of the project.	• Chapter 2, Project Description
Dennis Holl	If the revetment is removed there will no longer be a barrier to stop the condition of no beach during the winter and concern that there will be no dry beach north of Sloat.	• Chapter 1, Introduction and Background • Chapter 2, Project Description • Appendix B, Section E.16 Geology and Soils
	Asks whether a stairway down the bluff will be included, concerned about safety of people accessing the beach, if there will be a dry beach to access, and suggests that warning signs should be in place around the eroding bluffs where landslides have occurred in the past.	• Chapter 2, Project Description • Section 4.5, Recreation • Appendix B, Section E.16 Geology and Soils
	Asks whether the plan provides a way to physically deposit sand on the beach, and why such activity is not occurring now.	• Chapter 2, Project Description
Andrea Holmquist	Closing the roadway will cause more traffic in neighborhoods and create problems driving to the beach.	• Section 4.3, Transportation and Circulation

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
INDIVIDUALS (CONT.)		
Andrea Holmquist (cont.)	Cleanliness and safety issues are not currently being maintained at the beach (garbage, graffiti, drugs, homeless). Concern over spending tax dollars on the project when currently cleaning and safety issues are not being addressed.	• Beyond scope of EIR
Katherine Howard	Asks what actions would be taken to protect marine mammals, fish, and seabirds that live and migrate through this area of Ocean Beach.	• Section 4.6, Biological Resources
	Concerned about protecting the nesting bank swallow colony, which is active in the spring, and the snowy plovers, gulls, and shorebirds.	• Section 4.6, Biological Resources
	Recommends that plants be replaced with plants that are climate- and habitat-appropriate.	• Chapter 2, Project Description
Paula Katz	New parking should be added at Sloat Boulevard where the new plaza and restroom would be, as the new recreational area will draw a lot of visitors every day and create a parking burden in the neighborhood.	• Section 4.5, Recreation • Chapter 2, Project Description
	Asks if the zoo supports the project as there will be a change in access to the zoo parking lot. Asks if the Zoo parking lot will be reduced.	• Chapter 2, Project Description • Section 4.3, Transportation and Circulation
	Asks what traffic routes will be used once the Great Highway closes. Concern about loss of scenic view when driving the Great Highway.	• Chapter 2, Project Description • Section 4.3, Transportation and Circulation • Section 4.2, Aesthetics
	Signs and literature should describe various ways to get to Skyline Boulevard once the Great Highway has closed.	• Chapter 2, Project Description
Steve Lawrence (9/16/2020)	Concern that the project has been delayed too long; construction will occur too close to the cliffs and that the weight of the equipment and environmental conditions in the area will cause damage to equipment and the cliffs, and the project will be further delayed.	• Appendix B, Section E.16, Geology and Soils
Steve Lawrence (9/30/2020)	Asks for additional information about the buried wall construction process.	• Chapter 2, Project Description
	Asks when will nesting birds be protected, where, and for how long, and concern about the effects of such protection on construction activities.	• Section 4.6, Biological Resources

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
INDIVIDUALS (CONT.)		
Steve Lawrence (9/30/2020) (cont.)	States that project construction overlaps with the Westside Pump Station Reliability project and asks how the overlap will be handled.	• Section 4.1.5, Approach to Cumulative Impact Analysis and Cumulative Projects •
Vy Ma	Encourages implementation of green infrastructure, such as permeable/porous pavement, tree wells, bioswales, wetlands, and rain gardens, which will protect vulnerable inland structures from stormwater runoff and coastal flooding/erosion.	• Chapter 2, Project Description • Appendix B, Section E.17, Hydrology and Water Quality
	Suggests implementing a Reef Ball Artificial Breakwater System in conjunction with or as an alternative to beach nourishment.	• Chapter 6, Alternatives
	Concern that dredged sand from the San Francisco Harbor may be a different form/mineral than sand on Ocean Beach and could affect the marine ecology of the beach.	• Section 4.6, Biological Resources • Appendix B, Section E.16, Geology and Soils • Section E.17, Hydrology and Water Quality
Sean McGrew	Recommends report include discussion of traffic effects due to the project, and whether traffic effects will increase car pollution.	• Section 4.3, Transportation and Circulation • Appendix B, Section E.8, Air Quality
Bill McLaughlin	Recommends project should include a parking lot closer to Sloat Boulevard.	• Chapter 2, Project Description
	The new crown (cap) for the buried wall may unnecessarily inhibit the ability to keep the wall and cap buried under the sand, cause enhanced erosion and create safe access issues. Recommends the original engineering proposal in the Ocean Beach Master Plan.	• Chapter 2, Project Description • Appendix B, Section E.16, Geology and Soils
	Recommends that the service road be located as far inland from the restoration zone as possible.	• Chapter 2, Project Description
Marlene O'Neill	Asks when the upper Great Highway will reopen and states that closure is creating a huge and dangerous impact on Lower Great Highway. The upper Great Hwy is a major road to cross the city and a beautiful tourist attraction. Asks whether the EIR can be retrieved online. Requests that local residential streets not be used as storage for the project.	• Section 4.3, Transportation and Circulation • Section 4.5, Recreation • Chapter 2, Project Description

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
INDIVIDUALS (CONT.)		
Kevin Parry	Recommends keeping Great Highway extension open to vehicle traffic as a scenic roadway and also to handle the traffic volume. Concerned about the traffic on Sloat/Skyline and the proposed roundabout at Sloat/Skyline.	• Chapter 2, Project Description • Section 4.1.5 Approach to Cumulative Impact Analysis and Cumulative Projects • Section 4.2, Aesthetics • Section 4.3, Transportation and Circulation • Chapter 6, Alternatives
Paul Petterson	Asks what will be done about the traffic impacts including traffic noise in the neighborhood of the Sloat Boulevard and Skyline Boulevard intersection.	• Section 4.3, Transportation and Circulation • Section 4.4, Noise and Vibration
	The project should include lots of free parking for all who enjoy using this part of the beach including for fishing and surfing.	• Chapter 2, Project Description
David Pilpel	Multiple meeting identification numbers were posted, two of which were wrong, and so another scoping meeting may be needed for anyone who used the wrong identification number.	• Chapter 1, Introduction and Background
	Recommends the report describe interagency project coordination.	• Chapter 1, Introduction and Background
	The project description should be clear, complete, finite, and stable.	• Chapter 2, Project Description
	All related projects, private and public, whether exempt or not exempt from CEQA, and whether approved or not yet approved but planned within the EIR time frame, should be discussed. Cumulative impacts of the project and related projects should be considered.	• Section 4.1.5 Approach to Cumulative Impact Analysis and Cumulative
	Historical features of existing facilities in the area should be considered.	• Appendix B, Section E.4, Cultural Resources
	Sea level rise, using a range of reasonable scenarios, should be considered.	• Chapter 2, Project Description • Chapter 3, Plans and Policies • Appendix B, Sections E.16, Geology and Soils and E.17, Hydrology and Water Quality

Table 1-2 Summary of Scoping Comments (Continued)

Commenter	Summary of Comment	CEQA Subject Area(s)
INDIVIDUALS (CONT.)		
David Pilpel (cont.)	Transportation impacts in the area, including Sloat and Skyline boulevards, should be considered.	• Section 4.3, Transportation and Circulation
	Requests to be informed about the project.	• EIR process
Richard Rothman	Recommends the report consider traffic at the San Francisco Zoo and Sloat Boulevard entrance, and at the intersection of Sloat Boulevard and State Route 35 (Skyline Boulevard).	• Section 4.3, Transportation and Circulation
	Report should consider the overall transportation effects in the city caused by the project.	• Section 4.3, Transportation and Circulation
Mari Sanei	Recommends that the view as you drive the Great Highway Extension at the south end of Ocean Beach be protected.	• Section 4.2, Aesthetics
Tom Shiosaka	Concerned with traffic safety and recommends that the project include a traffic plan.	• Section 4.3, Transportation and Circulation
Noreen Weeden	Questions about EIR scoping meeting and draft EIR publication date.	• EIR process

1.5.2 Draft EIR

The CEQA Guidelines and San Francisco Administrative Code chapter 31 encourage public participation in the planning and environmental review processes. The planning department provides opportunities for the public to present comments and concerns regarding this EIR and its appendices, including the initial study (Appendix B), throughout the environmental review process. These opportunities include a public review and comment period and a public hearing on the Draft EIR and initial study before the San Francisco Planning Commission.

The public review period for the Draft EIR and initial study is from December 9, 2021 through January 24, 2022. The planning commission will hold a public hearing on the Draft EIR and initial study during the 45-day public review and comment period to solicit public comment on the information presented in the Draft EIR and initial study. The public hearing will be held on January 6 at City Hall, Dr. Carlton B. Goodlett Place, Room 400, San Francisco, California, beginning at 12:00 p.m. or later (call 415.588.6422 the week of the hearing for a recorded message giving a more specific time). Due to COVID-19, the planning commission may hold required hearings remotely. Members of the public are encouraged to participate. Additional information may be found on the department's website at www.sfplanning.org.

The Draft EIR is available for public review and comment at https://sfplanning.org/environmental-review-documents and at the San Francisco Permit Center located at 49 South Van Ness Avenue, second floor. A USB or paper copy of the Draft EIR will be mailed upon request. Referenced materials are also available online (https://tinyurl.com/Ocean-Beach-EIR), and can be made available in other formats upon request.

Please contact the EIR coordinator, Julie Moore (call 628.652.7566 or email CPC.OceanBeachEIR@sfgov.org) for such requests.

Governmental agencies, interested organizations, and members of the public are invited to submit written comments on the Draft EIR and initial study during the public review period. Written comments may be submitted during the specified review period to:

> San Francisco Planning Department
> Attention: Julie Moore
> 49 South Van Ness Avenue, Suite 1400
> San Francisco, CA 94103
>
> or by email to:
> CPC.OceanBeachEIR@sfgov.org

Members of the public are not required to provide personal identifying information when they communicate with the planning commission. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the department's website or in other public documents.

1.5.3 Final EIR

Following the close of the Draft EIR public review and comment period, the planning department will prepare and publish a document entitled "Responses to Comments on the Draft EIR." This document will contain a copy of all written, email, and oral comments received on the Draft EIR, as well as the planning department's written responses to all substantive comments and any necessary revisions to the Draft EIR. Together, the Draft EIR and the response to comments document will constitute the Final EIR. Not less than 10 days prior to the planning commission hearing to consider certification of the Final EIR, the planning department will issue the Final EIR to persons commenting on the Draft EIR and to any board(s), commission(s), or department(s) that will carry out or approve the project. During an advertised public meeting, the planning commission will consider the documents and, if they are found adequate, will certify the Final EIR. Certification of the Final EIR by the planning commission represents that the document: (1) has been completed in compliance with CEQA; (2) was presented to the San Francisco Planning Commission and the commission reviewed and considered the information contained in the Final EIR prior to taking an approval action on the project; and (3) reflects the lead agency's independent judgment and analysis.

1.5.4 Project Approval and Adoption of Mitigation Monitoring and Reporting Program

The SFPUC and all responsible or trustee agencies will review and consider the Final EIR in their deliberations on whether to approve, modify, or deny the project or aspects of the project. If the SFPUC and responsible agencies approve the project, they will adopt CEQA findings that identify the project-related impacts and the mitigation measures or alternatives that have been adopted to reduce significant impacts. A mitigation monitoring and reporting program (MMRP) must be adopted as part of the adoption of the CEQA findings. The MMRP lists the mitigation measures included in the project as identified in the Final EIR, entities responsible for carrying out the measures, timing of implementation of the measures, and associated reporting requirements. If significant and unavoidable impacts would occur even with implementation of all identified mitigation measures, the SFPUC and all responsible or trustee agencies must adopt, as a condition of project approval, a statement of overriding considerations documenting how the benefits of project implementation outweigh its significant and unavoidable impacts on the environment.

1.6 Organization of the EIR

This EIR is organized as follows:

Consistent with CEQA Guidelines sections 15120 to 15132, this EIR describes the project, required approvals, and existing land use plans and policies applicable to the project; identifies potential environmental impacts of the project, mitigation measures for those impacts that would be significant, and cumulative adverse impacts to which the project could make a substantial contribution; discusses growth-inducing and significant unavoidable effects of the project; and evaluates alternatives to the project that could avoid or reduce significant impacts while still meeting most of the project's objectives.

- **Chapter S, *Summary*.** This chapter summarizes the project, identifies significant environmental impacts and mitigation measures, and describes the alternatives considered in this EIR, including the environmentally superior alternative. It also identifies areas of controversy and issues to be resolved.
- **Chapter 1, *Introduction and Background*.** This chapter describes the project background, purpose and organization of the EIR, and the environmental review process and public outreach efforts, and summarizes public scoping comments.
- **Chapter 2, *Project Description*.** This chapter describes the project (including project overview and project objectives), summarizes project components, and provides information about project construction and operation. The chapter also lists permits and approvals necessary for the construction and operation of the project.
- **Chapter 3, *Plans and Policies*.** This chapter summarizes applicable land use plans and policies of local, regional, state, and federal agencies; describes their relevance to the project; and identifies any project inconsistencies with those plans and policies.
- **Chapter 4, *Environmental Setting, Impacts, and Mitigation Measures*.** This chapter is divided into sections by environmental resource topic. Each section describes the environmental and regulatory setting, the criteria used to determine impact significance, and the approach to the analysis for that resource topic. It then presents analyses of potential environmental impacts as well as the project-specific mitigation measures that have been developed to address significant and potentially significant impacts. Each section also includes an evaluation of cumulative impacts with respect to that resource topic. The environmental resource topics discussed in Chapter 4 are (environmental resource topics with less-than-significant impacts are discussed in the initial study in Appendix B):
  - Aesthetics
  - Transportation and Circulation
  - Noise and Vibration
  - Recreation
  - Biological Resources
- **Chapter 5, *Other CEQA Considerations*.** This chapter discusses growth-inducing effects, identifies the significant environmental effects that cannot be avoided if the project is implemented, describes significant irreversible impacts, and presents any areas of controversy left to be resolved.

- **Chapter 6, *Alternatives*.** This chapter analyzes alternatives to the project, including the required No Project Alternative; compares their impacts to those of the project; and identifies the environmentally superior alternative. This chapter also summarizes the alternatives that were considered but eliminated from further analysis.
- **Chapter 7, *Report Preparers*.** This chapter lists the persons involved in preparation of this EIR.
- **Appendices.** The following appendices are included in this EIR:
  - Appendix A. Notice of Preparation
  - Appendix B. Initial Study (includes analysis of the following topics: land use and planning, population and housing, cultural resources, tribal cultural resources, air quality, greenhouse gas emissions, wind, shadow, utilities and service systems, public services, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy, agriculture and forestry resources, and wildfire)
  - Appendix C. SFPUC Standard Construction Measures
  - Appendix D. Transportation Analysis Supporting Documentation
  - Appendix E. Noise Analysis Supporting Documentation
  - Appendix F. Biological Resources Supporting Information
  - Appendix G. Air Quality Technical Memorandum and Health Risk Assessment
  - Appendix H. Coastal Process Analysis Report

CHAPTER 2
PROJECT DESCRIPTION

This chapter describes the Ocean Beach Climate Change Adaptation Project (the project) proposed by the City and County of San Francisco (the city). Chapter 1, Section 1.4, Project Background, provides project background information. As discussed, the city has implemented short-term actions for interim erosion protection and shoreline access during the development of the project analyzed in this EIR (the long-term improvements).

This chapter reviews the project's location, objectives, components, construction methods, construction schedule, and operations details. The chapter also identifies the regulatory actions and approvals that may be required for project implementation.

2.1 Project Overview

The city is proposing the project to improve the portion of Ocean Beach from Sloat Boulevard to Fort Funston known as "South Ocean Beach." The project is needed to address climate change-induced sea level rise, shoreline erosion, and severe coastal storm and wave hazards, which threaten city infrastructure, coastal access, recreational use, and public safety. As discussed in greater detail in Chapter 1, Introduction and Background, Ocean Beach is the visible portion of a much larger coastal sand and sediment system. It is an intensely energetic environment, frequently battered by powerful waves and storm surge. Currently, chronic erosion of the beach and bluffs by episodic coastal storms occurs at South Ocean Beach. Shoreline erosion has undermined and damaged National Park Service (NPS) beach parking lots – resulting in removal of one of two South Ocean Beach lots, stormwater drainage facilities, and the Great Highway, and threatens existing underground wastewater system infrastructure.

Since the 1990s, the city has responded to the erosion through implementation of a series of both hard shoreline armoring (e.g., construction of rock and rubble revetments) and soft shoreline protection measures (e.g., *beach nourishment*[1]). Erosion at South Ocean Beach is expected to continue and may accelerate in the future with climate change.[2] The proposed project design represents the city's long-term strategy for addressing climate change-related erosion challenges at South Ocean Beach, drawing upon ideas and information obtained through many years of community engagement, technical investigation, and interim management efforts. The terms of a 2014 legal settlement agreement[3] and a 2015 California Coastal Commission permit[4] establish timelines for developing and implementing a long-term shoreline management strategy for South Ocean Beach.

1 Beach nourishment refers to the process of adding sediment onto or adjacent to a portion of eroding beach.
2 SFPUC, Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems, February 15, 2018.
3 California Coastal Protection Network and City and County of San Francisco, 2014. Settlement Agreement and Mutual Release in the case *California Coastal Protection Network v. City & County of San Francisco*, Case No. CGC-11-513176.
4 California Coastal Commission, Coastal Development Permit 2-15-1537, Issued November 9, 2015.

To address these challenges, the city proposes a project design that is based upon the guiding principles of the Ocean Beach Master Plan[5] and the adopted policies of the Western Shoreline Plan (the city's certified local coastal program). The project would involve a combination of *managed retreat*,[6] beach nourishment, and shoreline protection strategies. Through these measures, the city aims to preserve and enhance public access, coastal recreation, and scenic resources at South Ocean Beach, while protecting critical wastewater system infrastructure from damage due to these coastal hazards. Each of these strategies as they pertain to the project is further discussed in the related subsections below.

Major project components, which are shown in **Figures 2-1a** and **2-1b**, include:

- Permanently closing the Great Highway between Sloat and Skyline boulevards[7] to public vehicular traffic, reconfiguring affected intersections and San Francisco Zoo parking access, and maintaining a service road to San Francisco Public Utilities Commission (SFPUC) facilities;
- Constructing a buried wall to protect existing wastewater infrastructure from shoreline erosion
- Removing pavement, rock and sandbag revetments, rubble, and debris from the beach, reshaping the bluff, and planting native vegetation; [8]
- Constructing a multi-use trail, beach access stairway, coastal access parking, and restrooms;
- Providing long-term beach nourishment (sand replenishment)

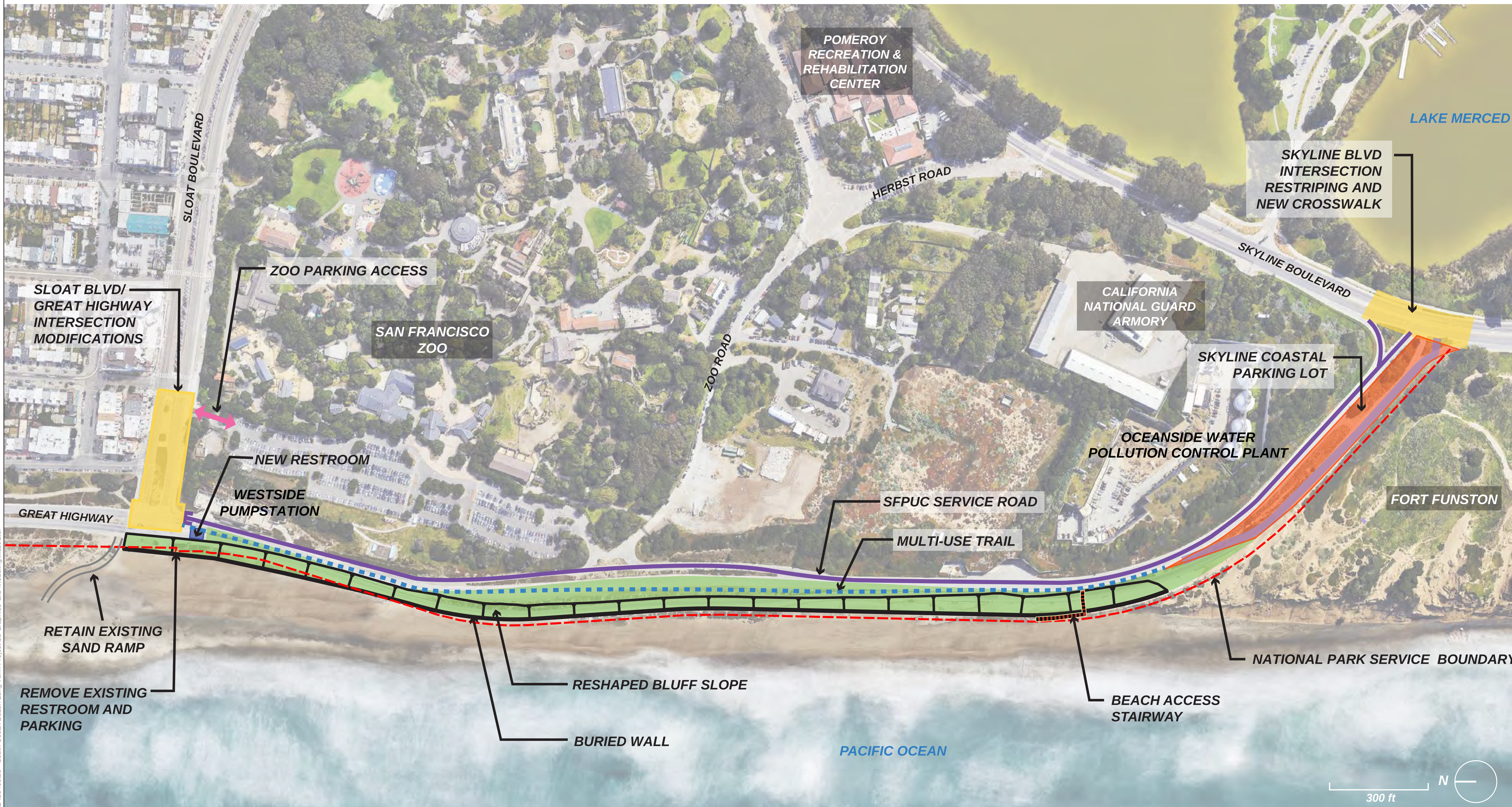
Section 2.4, Project Components, describes each of these project elements in detail.

2.2 Project Location

The project area generally encompasses the portion of San Francisco's Ocean Beach extending south from Sloat Boulevard to the northern edge of the Fort Funston bluffs; this portion is known as South Ocean Beach. The project area extends west to approximately 0.5 mile offshore of South Ocean Beach, and east along the Great Highway to Skyline Boulevard. The project area also includes a separate portion of Ocean Beach, north of Lincoln Way, where sand is harvested for placement south of Sloat Boulevard; this portion is known as North Ocean Beach. Figure 1-1 depicts the project location in San Francisco. Figures 2-1a and 1b show the project area at South Ocean Beach and North Ocean Beach, respectively. The parcels that could be affected by the project are Assessor's Parcel Numbers: 7281006, 7281007, 7281009, 7281010, 7282008, and 7282009. Property in the project area is under the ownership and management of various public agencies.

The majority of the project components are proposed along the Great Highway. The Great Highway is under San Francisco Recreation and Park Department (Rec and Park) jurisdiction. San Francisco Public Works (Public Works) performs sand removal along the Great Highway. The Golden Gate National Recreation Area (GGNRA), a unit of the NPS, owns and manages lands to the west of the Great Highway (e.g., parking lot, bluffs, and beach). Various city agencies own or manage properties to the east, such as those occupied by the San Francisco Zoo, the California Army National Guard, the Oceanside Water Pollution Control Plant (Oceanside Treatment Plant),

5 SPUR, AECOM, ESA PWA, Nelson\Nygaard, Sherwood Design Engineers, Phil D. King, PhD, 2012, Ocean Beach Master Plan, Prepared for State of California Coastal Conservancy, San Francisco Public Utilities Commission, and the National Park Service.
6 Managed retreat refers to the planned movement of people and assets away from areas of potential hazard.
7 Skyline Boulevard is also State Route 35 at this location.
8 Bluff reshaping would involve removing or grading portions of the bluff to create a more gently sloping shape.



Note: Project elements conceptual and not necessarily shown to scale. Long-term beach nourishment not shown.

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SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure 2-1a
Project Elements Proposed for South Ocean Beach

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SOURCE: ESA, 2020; Google Earth, 2020

Ocean Beach Climate Change Adaptation Project

Figure 2-1b
Project Elements Proposed for North Ocean Beach

the Westside Pump Station, and the Pomeroy Recreation and Rehabilitation Center. The project's onshore areas, all of which lie within the city's Western Shoreline Planning Area, are located within the coastal zone and classified as zoning districts P (Public) or RH-1D (Residential House, One Family Detached).

2.3 Project Objectives

The overarching purpose of the project is to implement a long-term coastal management strategy for South Ocean Beach that addresses shoreline erosion and climate-change-related sea level rise. The specific project objectives are to:

- Implement the city's local coastal program policies for the long-term management of South Ocean Beach, including managed retreat, beach nourishment, and sea level rise adaptation in compliance with Coastal Commission permit requirements
- Preserve and enhance coastal public access and recreation, habitat, and scenic quality at South Ocean Beach
- Protect the Lake Merced Tunnel and related wastewater system infrastructure from damage due to shoreline erosion, storm and wave hazards, and sea level rise in order to maintain current operational capacity and meet regulatory permit requirements
- Maintain vehicle access for:
  - SFPUC wastewater facility operations
  - San Francisco Zoo visitor parking lot
  - Emergency response personnel
  - Maintenance of public access trail
  - Long-term beach nourishment

2.4 Project Components

This section includes detailed descriptions of the five major project components identified in Section 2.1. Figures 2-1a and 2-1b show the locations and extents of specific project components. **Figure 2-2** presents a conceptual rendering of the main project elements.

2.4.1 Roadway and Intersection Modifications

The city would permanently close the Great Highway between Sloat and Skyline boulevards to public vehicular traffic to provide for both recreational open space and managed retreat. A portion of the Great Highway's northbound travel lanes would be retained or reconstructed as a service road as described further below. To accommodate the road closure, the city would reconfigure or restripe the intersections at Sloat Boulevard/Great Highway and Skyline Boulevard/Great Highway. In addition, it would reconfigure the Sloat Boulevard entrance to the San Francisco Zoo to accommodate both an entrance and an exit. As shown on **Figure 2-3**, the Great Highway's northbound lane currently provides access to the Oceanside Treatment Plant's west entrance, the Westside Pump Station's only entrance, and the zoo's only exit and one entrance lane. Access to the west entrance of the Oceanside Treatment Plant is essential for safety purposes. Conceptual diagrams of proposed project area roadway and intersection modifications are presented in **Figures 2-4 and 2-5**.

1 BEACH ACCESS	5 NATIVE PLANT REVEGETATION	9 SKYLINE COASTAL PARKING LOT
2 NEW MULTI-USE TRAIL & PLAZAS (OPEN SPACE)	6 SERVICE ROAD (ONE-WAY)	10 CROSSWALK
3 PLANTING & SEAT WALLS	7 BURIED WALL (BELOW GRADE)	11 BIKE TRAIL TO SKYLINE BOULEVARD
4 RESTROOM	8 MAINTENANCE ACCESS POINT	12 GATE TO SERVICE ROAD

N 0 600 Feet

SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure 2-2
Conceptual Rendering of Project Elements Proposed for South Ocean Beach

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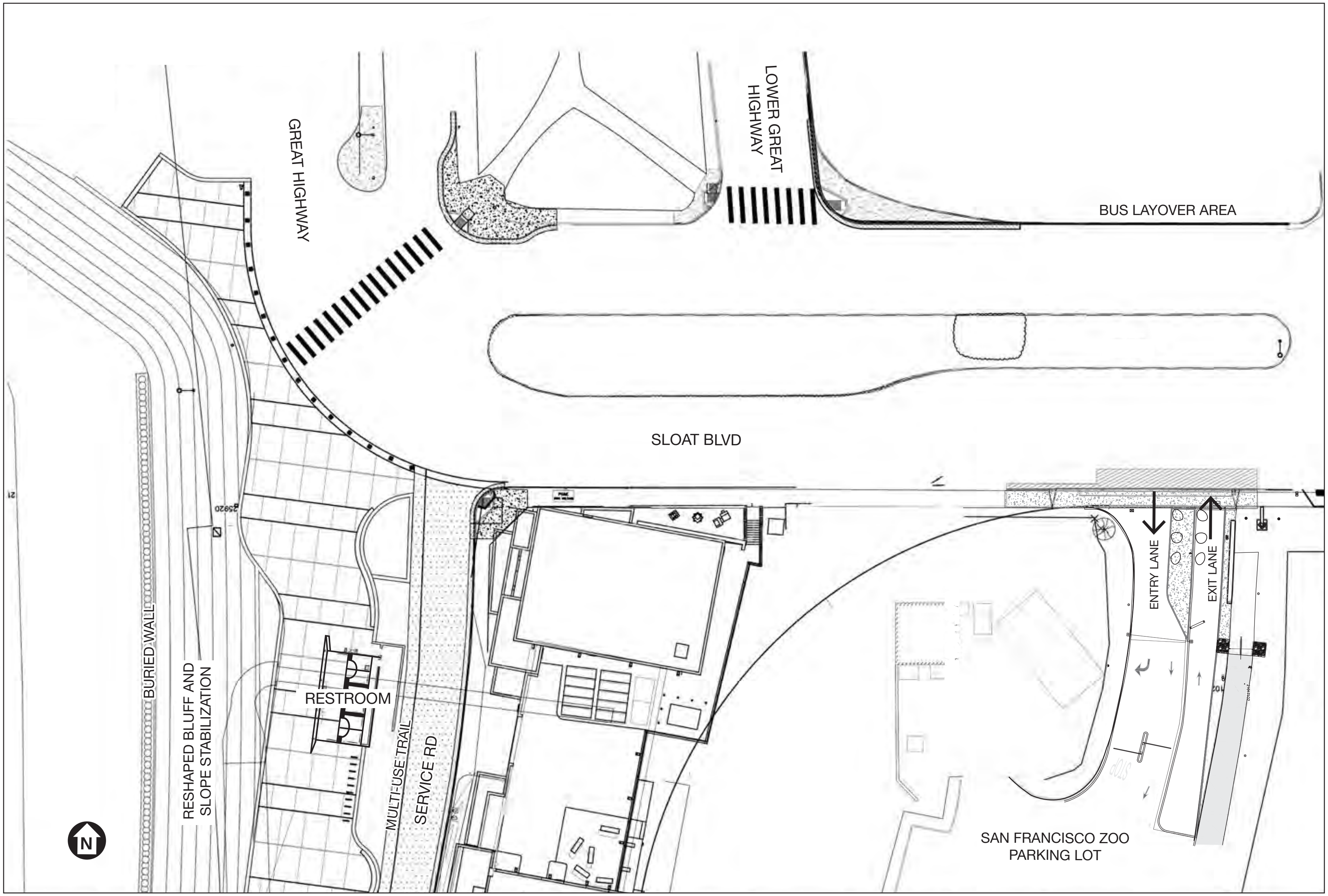
SOURCE: ESA, 2019; Google Earth, 2019

Ocean Beach Climate Change Adaptation Project

Figure 2-3
Project Location and Existing Roadway Configuration



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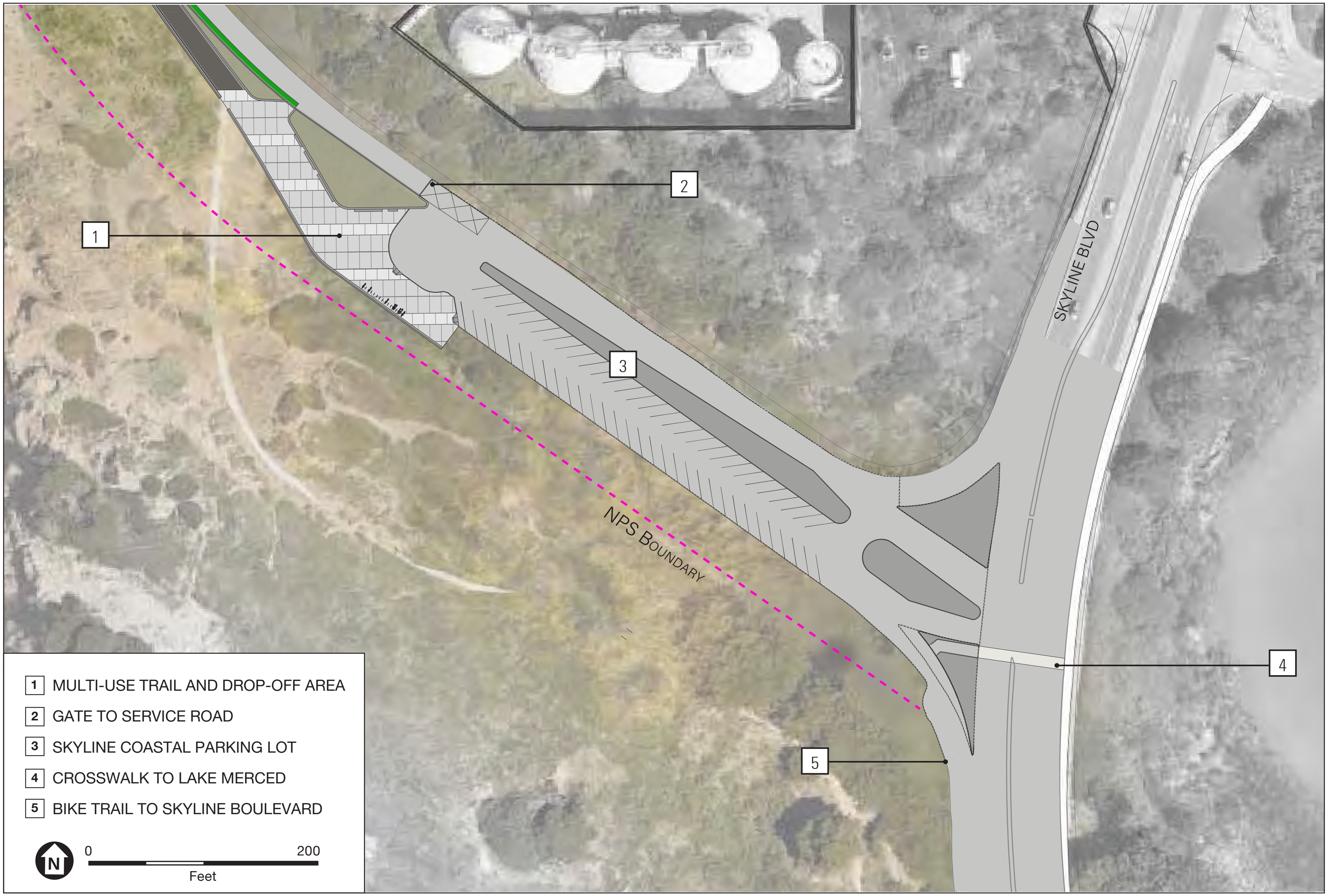
SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Ocean Beach Climate Change Adaptation Project

Figure 2-4
Road and Access Modifications: Great Highway and Sloat Boulevard



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SOURCE: San Francisco Public Utilities Commission Ocean Beach
Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Ocean Beach Climate Change Adaptation Project

Figure 2-5
Road and Access Modifications:
Great Highway and Skyline Boulevard

2.4.1.1 SLOAT BOULEVARD AND GREAT HIGHWAY

The city would reconfigure the Great Highway/Sloat Boulevard intersection to facilitate the changes in travel patterns resulting from the Great Highway closure and new service road. Figure 2-4 shows preliminary designs for roadway and access modifications at this intersection. The existing Great Highway generally has two southbound and two northbound lanes, with additional capacity in the southbound direction at the intersection with Sloat Boulevard to include a right-turn lane into the NPS parking lot and a left-turn lane onto Sloat Boulevard. The number of southbound lanes approaching the intersection would be reduced from four to two left-turn lanes, and pavement markings would be installed to guide southbound motorists turning eastbound (left) across the intersection. On Sloat Boulevard approaching the intersection, a U-turn lane and two right-turn lanes would be provided. The existing Great Highway southbound bicycle lane would curve to head east at Sloat Boulevard with a new curb and crosswalk. The eastbound approach from the NPS parking lot would be removed and the northbound approach would be removed/converted to a right-turn-only from the service road. The city would install raised elements (e.g., curbs) to separate the bikeways and the adjacent travel lanes and paint a diagonal crosswalk across the intersection. Traffic signals would also be modified to accommodate the intersection changes.

Following the intersection reconfiguration, the city would remove the southbound Great Highway travel lanes (south of Sloat Boulevard) and the adjacent approximately 35-space NPS parking lot and restrooms (and later construct a multi-use trail and new restrooms as described in Section 2.4.4, Public Access, Parking, and Restroom Improvements). The remains of broken stormwater pipes would also be removed from these areas. Existing streetlights on the west side of the Great Highway would be removed. The existing turnaround/ layover/bus stop for the Muni 23 Monterey would be relocated from the area west of the Sloat Boulevard/Great Highway intersection to the existing bus stop on the north side of Sloat Boulevard, west of 47th Avenue. The city would remove roadbed fill material in areas where the road and parking lot are removed. The project would retain or reconstruct a portion of the Great Highway's existing 30-foot-wide northbound lanes between Sloat and Skyline boulevards as a service road, as described below.

2.4.1.2 SERVICE ROAD

The Great Highway's existing eastern northbound travel lane would be retained in place or reconstructed east of the current road alignment to allow for more open space and to provide continued, restricted vehicle access to the Oceanside Treatment Plant, the Westside Pump Station and associated facilities for SFPUC operations (service road), long-term beach nourishment and maintenance activities, and emergency vehicles. The service road would be generally 15 feet wide with some areas wider (e.g., bulb-outs) to accommodate emergency vehicle access and turnaround. Traffic on the road would consist of approximately 35 trucks per day, along with about 100 vehicles per day. The service road may also be used as a bikeway. The remaining portion of the Great Highway's existing northbound travel lane would be removed and replaced with a multi-use trail to the west of the service road (described in Section 2.4.4, Public Access, Parking, and Restroom Improvements).

A physical barrier (e.g., bollards, curbs), or sand berms and landscaping, would be installed between the service road and the multi-use trail to avoid conflicts among the respective user groups. However, access spurs would be constructed between the service road and multi-use trail at multiple locations to enable vehicle and equipment access for maintenance and public safety purposes.

A portion of the Great Highway near Skyline Boulevard would be retained or reconstructed and remain open to the public for vehicle access to the proposed Skyline coastal parking lot, described in Section 2.4.4, Public Access, Parking, and Restroom Improvements, below. Gates would be installed at the western end of the publicly accessible portion of the road segment to restrict further access to authorized vehicles only (e.g., SFPUC and other city agencies' facilities operations and maintenance staff, authorized visitors, and emergency personnel). Public access by vehicle between the Skyline coastal parking lot and Sloat Boulevard would be prohibited.

A new stormwater management system would be installed alongside the service road to collect stormwater runoff. The stormwater management infrastructure would incorporate operational best management practices and low-impact design concepts as required by the stormwater management ordinance to the extent that is applicable to the site conditions and project specifics. The intersections, service road, and multi-use trail would be designed in accordance with applicable regulatory requirements to allow for safe bicycle and pedestrian access, service vehicle access, zoo access, continued emergency vehicle access, and passage of trucks required for sand removal activities and beach nourishment activities.

2.4.1.3 SKYLINE BOULEVARD AND GREAT HIGHWAY

As part of a separate project, the California Department of Transportation (Caltrans) – which owns the segment of Skyline Boulevard (also known as State Route 35) at its Great Highway intersection – plans to signalize the intersection prior to construction of the proposed project to address ongoing safety concerns. After Caltrans completes this work, restriping pavement, adding a crosswalk, or altering signal timing at the Great Highway/ Skyline Boulevard intersection would be implemented as part of the project (i.e., the Ocean Beach Climate Change Adaptation Project evaluated in this environmental impact report [EIR]). Figure 2-5 shows preliminary designs for roadway and access modifications at the Skyline Boulevard intersection with the Great Highway.

2.4.1.4 ZOO AUTOMOBILE ACCESS

The San Francisco Zoo's existing Sloat Boulevard vehicle entrance has two entrance lanes (no exit), while both a vehicle entrance and exit to the facility are provided from the Great Highway. The project proposes to modify the zoo's Sloat Boulevard entrance to provide both entrance and exit lanes as presented on Figure 2-4. The paved area would be restriped to allow for one inbound lane and one outbound lane and the access gate modified as needed. Signage and striping at the zoo driveway would also be added to direct safe pedestrian and bicycle crossings of the driveway. The zoo pump station access through the existing zoo main parking lot would be retained. The existing entrance and exit lanes and gate to the zoo parking lot from the northbound Great Highway would be closed but the roads would be retained for use by emergency vehicles. The Zoo Road entrance/exit off Herbst Road would continue to be available for use by zoo employees and deliveries only.

2.4.2 Buried Wall

The buried wall component of the project would involve the construction of a below-grade wall to protect the Lake Merced Tunnel and related wastewater system facilities from erosion and future sea level rise. The proposed wall would extend from Sloat Boulevard to approximately 3,200 feet to the south. The wall would be approximately 3 feet thick, set back as far from the shoreline as feasible, and buried under sand. To stabilize the bluff above the wall, the city would reshape the bluff face and construct a separate 3-foot-thick, gently sloping (3:1 horizontal to vertical slope) layer of cementitious material, composed of a *soil-cement mix*[9] or *controlled low strength material*[10] (slope stabilization). The slope stabilization would minimize erosion of the material overlying the tunnel and protect against scour behind the wall from wave runup and high surf conditions. **Figure 2-6** shows a typical cross-section of the proposed wall and slope stabilization. Following wall construction, the slope stabilization layer would be covered with a sand layer, as discussed below in Section 2.4.3, Debris and Revetment Removal, and Sand Placement and Revegetation.

The top of wall (i.e., pile cap) elevation would range from about +16 to +21 feet NAVD[11], while the top of slope stabilization would vary between about +30 and +50 feet NAVD. The wall and slope stabilization would be covered by sand (about 4 feet thick layer) at most times, and a minimum of 27 feet would be required between the wall and the Lake Merced Tunnel to allow for *tieback anchors*[12] to be installed. Under normal conditions, the wall and slope stabilization would remain buried. However, the wall and slope stabilization could be exposed after severe storms and high wave conditions when the beach and bluff can erode away rapidly. As discussed further in Section 2.4.5, Beach Nourishment, the project includes shoreline monitoring and sand replenishment to maintain the beach and slope stabilization cover.

The project includes additional design elements intended to protect the wall and the Lake Merced Tunnel in the event of beach or bluff erosion beyond or behind the wall. At the wall's northern and southern ends, the adjacent dune and bluff landforms would be graded and stabilized to allow a smooth transition into the existing grades. At the wall's southern terminus, the city would further stabilize the soil inland of the wall beneath the slope stabilization, and a small area seaward of the wall. This would be accomplished through deep soil mixing, in which augers mix cement with existing soil to replace approximately 30 percent of the existing soil with cement. In addition, where the wall alignment crosses the existing southwest ocean outfall, rather than drilling piles which would damage the outfall, the city would utilize a specialized design of deep soil mixing (soil and concrete mix) and slope protection (a combination of cementitious material with large rock) to minimize the loading on the outfall.

Given the changing coastal environment and the anticipated rate of sea level rise, the proposed buried wall would be designed to comply with the "SFPUC General Seismic Requirements for Design of New Facilities and Upgrade of Existing Facilities," which are based upon the latest California Building Code. The wall would be designed to accommodate sea level rise and storm events with a nominal service life of 50 years (until approximately 2075) but with the proposed beach nourishment it is expected to last until 2100. The city anticipates that reevaluation of the performance of the buried wall and beach nourishment program would be conducted to provide sufficient time to plan and implement additional adaptation measures, if determined necessary.

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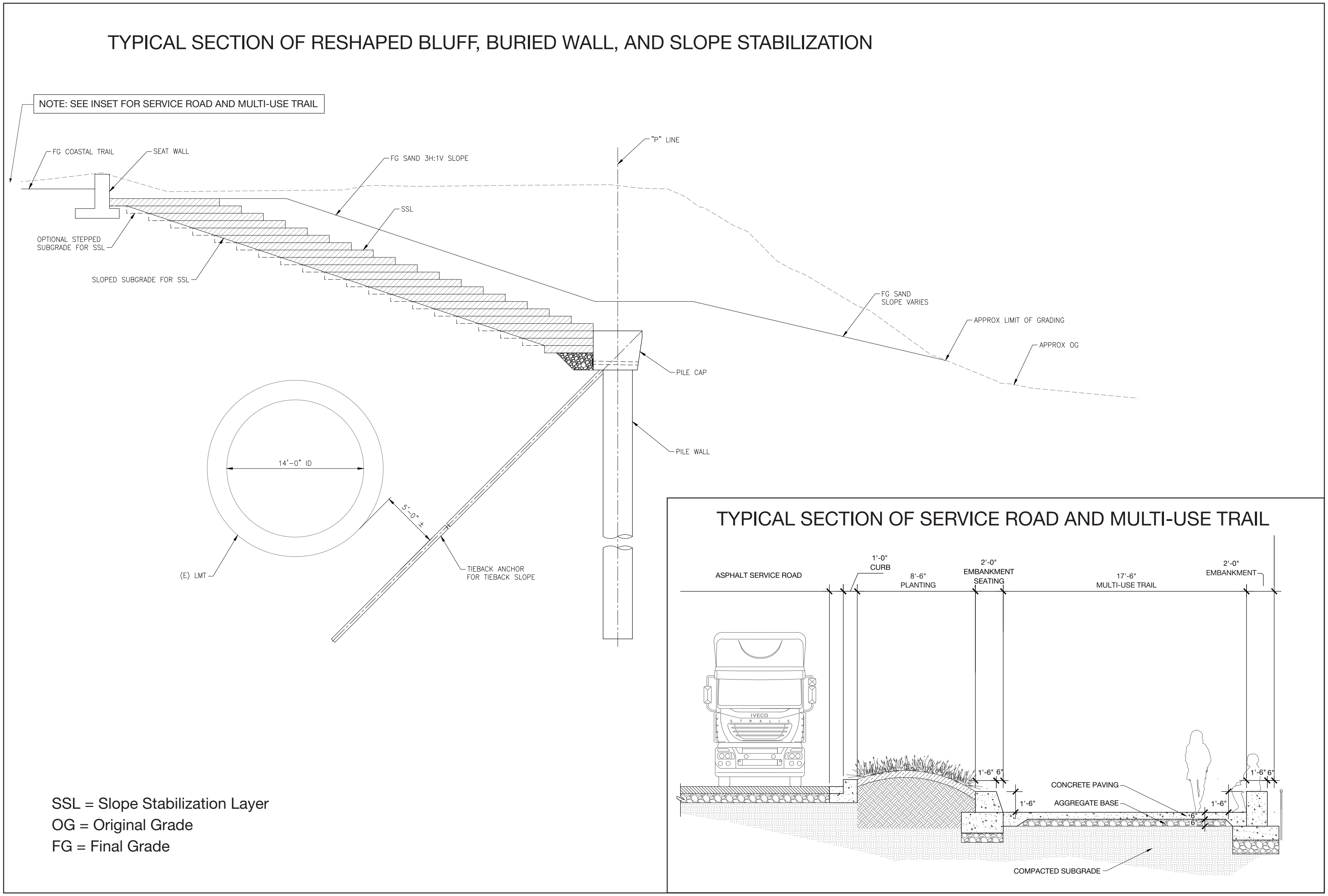
9 A soil-cement mix is a weak form of concrete formed by mixing in place the existing soils with a cementitious grout.

10 A controlled low strength material is a weak mixture of cement, aggregate, and water that flows easily.

11 NAVD refers to the North American Vertical Datum of 1988, a fixed reference for elevations, and is generally close to the mean lower low water tidal datum.

12 Tieback anchors are horizontal rods or cable systems that are used to provide added stability and reduce lateral displacement of retaining walls. The tiebacks are typically drilled at an angle through the retaining wall and into the underlying geologic formation.



SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure 2-6
Conceptual Cross Sections of Access Improvements Proposed for South Ocean Beach

2.4.3 Debris and Revetment Removal, and Sand Placement and Revegetation

Following buried wall construction, the city would remove the existing shoreline protection structures and debris, including rock and sandbag revetments and rubble, from the beach and bluff. It would then place a 4-foot-thick layer of sand over the slope stabilization. As represented in the cross-section shown in Figure 2-6, the reshaped bluff would provide a broad, publicly accessible open space area extending from the proposed service road and multi-use trail toward the beach.

The city would also plant native vegetation along the reshaped bluff. The vegetation would vary depending on elevation; lower elevation areas seaward of the buried wall would be planted with native vegetation that tolerates sand burial and storm overwash and grows rapidly, while higher elevation areas would be planted with native plants, including those appropriate for coastal dunes, that help cover and stabilize sand. Plants would be sourced from established nurseries in the region – plants proposed for installation on NPS lands would be sourced from NPS nurseries or nurseries that otherwise meet NPS native plant requirements. The city may install temporary irrigation to support the plants during their establishment period. The city may also implement other wind-erosion control measures to help keep the placed sand on the beach and bluff. These measures may include *sand fencing*[13] and placing a layer of coarse sand over the finer beach sand.

2.4.4 Public Access, Parking, and Restroom Improvements

The project would involve various and substantial changes to expand open space, public access, and recreational opportunities along the South Ocean Beach shoreline. A summary of these changes, by access mode, is presented below.

2.4.4.1 PEDESTRIAN AND CYCLIST ACCESS

MULTI-USE TRAIL

Pedestrian and cyclist access to and along South Ocean Beach would be provided via a new approximately 0.8-mile multi-use trail, accessible from the modified Sloat Boulevard/Great Highway intersection and the Skyline coastal parking lot as shown on Figure 2-2**.** The multi-use trail would vary from 15 feet wide up to 20 feet wide and include several waysides, or turnouts, with seating from which visitors could view the reconfigured bluff, beach, and ocean to the west.[14] Seating would also be available along an approximately 18-inch tall retaining wall (referred to generally as a “seat wall”) bordering the trail between beach access points (see *Beach Access Stairway and Sand Ramp,* below). The trail and turnouts would be designed to meet American Association of State Highway and Transportation Officials federal guidelines and the city’s requirements for complying with the Americans with Disabilities Act, as applicable. The trail would be located to the west of the proposed service road and would gently meander for much of the alignment. Barriers (e.g., bollards, curbs) would be installed between the service road and the multi-use trail where necessary to prevent user conflicts and would be consistent with the GGNRA’s Parkwide Site Furnishings Standards for the “Urban Beach Design Zone.” The new multi-use trail would close a gap in the California

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13 Sand fencing consists of wooden slats, plastic, or fabric attached to fence posts and is designed to reduce local wind speed and trap sand. Sand fencing on a beach or berm can assist in building additional berms and helps prevent sand from blowing onto roads and paths.

14 With the exception of beach access stairway which would extend onto NPS lands, all visitor amenities along the multi-use path would be located on city property.

Coastal Trail[15], while also providing connections to existing paths along the Great Highway north of Sloat Boulevard and around Lake Merced. It would also provide a connection to Fort Funston, via the future Fort Funston Coastal Trail extension, a separate NPS project. Access to and along the beach, including via the multi-use trail and beach access stairway, would be regulated in the same manner as other segments of Ocean Beach (discussed in greater detail below). A crosswalk would be installed on the service road between the western terminus of Zoo Road and the multi-use trail.

The new service road storm drain system described in Section 2.4.1.2, *Service Road*, would collect storm water runoff from the multi-use trail and service road. Lighting would be provided for users of the multi-use trail and service road. The minimal lighting along the multi-use trail would incorporate NPS best management practices for lighting, including only adding lighting where it is needed, shielding lights and directing them downward, and using lamps with warmer colors. Plantings along the multi-use trail would be native, climate-appropriate, locally adaptive, and non-invasive, and would require little water.

BEACH ACCESS STAIRWAY AND SAND RAMP

In addition to the new multi-use trail, the city, in coordination with the NPS, would construct a new beach access stairway connecting the trail and beach. The stairway would be located towards the south end of the project area, near the proposed Skyline coastal parking lot (see Figure 2-1a). Preliminary designs call for a six-foot-wide staircase with landings every 12 feet, descending from the top of bluff to an interim platform (larger in size than landings) located above the buried wall. From the interim platform, access to the beach would be provided by a second approximately 85-foot-long stairway extending north parallel to the buried wall. A conceptual diagram of the beach access stairway during typical winter conditions when the beach is low is presented in **Figure 2-7**. The stairs would be constructed of concrete and supported on concrete piers. The elevation difference between the beach and multi-use trail in the area of the beach access stairway would vary seasonally depending upon beach sand levels but would generally be about 40 feet. The existing beach access sand ramp at the northwestern corner of the Sloat Boulevard/Great Highway intersection would be retained for pedestrian and emergency vehicle access.

RESTROOM

The existing NPS public restroom at the western terminus of Sloat Boulevard would be removed as described in Section 2.4.1, Roadway and Intersection Modifications. The city would construct an approximately 1,080-square-foot new restroom approximately 30 feet south of the reconfigured Sloat Boulevard/Great Highway intersection, approximately 50 feet east (inland) of the existing NPS Sloat Boulevard restroom and east of the proposed buried wall. The new restroom would be a Rec and Park-owned structure that would be approximately 18 feet tall and designed and constructed in conformance with the Unified Federal Accessibility Standards, the Americans with Disabilities Act, and the State of California's Title 24 requirements.[16]

Timber slatting would be used in front of glass areas of the restroom, and lighting at the restroom would be shielded and minimal, similar to the existing restroom at the western terminus of Sloat Boulevard and consistent with the city's standards for bird-safe buildings. The new facility, which would be served by the city's water and wastewater systems and would include an outdoor foot wash station, would be subject to the city's civic design review process.

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15 California Coastal Trail information available at http://www.coastal.ca.gov/access/ca-coastal-trail/coastal-trail.html.
16 Title 24 of the California Code of Regulations is also known as the California Building Standards Code.

Typical Winter Low Beach

Typical Intermediate Beach

Typical Summer High Beach

DSM = Deep Soil Mixing

All elevations relative to mean sea level.

SOURCE: San Francisco Public Utilities Commission Ocean Beach Climate Change Adaptation Project - Long Term Improvements 65% Submittal, October 2021

Figure 2-7
Conceptual Diagram of Beach Access Stairway

2.4.4.2 TRANSIT ACCESS

The existing turnaround pattern and layover space for the Muni 23 Monterey bus route would be relocated inland away from areas vulnerable to erosion. The 23 Monterey would continue service to the existing last bus stop on the north side of Sloat Boulevard between Lower Great Highway and 47th Avenue. This stop would also serve as the layover space before the 23 Monterey turnaround, instead of the current layover location at the western terminus of Sloat Boulevard. As shown on **Figure 2-8**, the city would modify the 23 Monterey turnaround route to follow a clockwise loop along Lower Great Highway, Wawona Street, and 47th Avenue. The bus would then turn east onto Sloat Boulevard at the signalized 47th Avenue/Sloat Boulevard intersection before reaching its first return stop at the existing bus stop located just east of the San Francisco Zoo's main pedestrian entrance.

2.4.4.3 PARKING IMPROVEMENTS

The project requires removing the existing approximately 35-space NPS parking lot near the Sloat Boulevard/Great Highway intersection. The project includes a new surface parking lot near the Skyline Boulevard/Great Highway intersection, referred to as the Skyline coastal parking lot. The new paved public parking lot would have approximately 60 vehicle parking stalls and be located within the former Great Highway southbound lanes adjacent to the southern end of the project's multi-use trail. The parking lot would include stormwater low-impact design concepts as required by the stormwater management ordinance to the extent that is applicable to the site conditions and project specifics.

Vehicle access to the new lot would be via Skyline Boulevard. A parking pay station may be located within the lot to collect parking fees. Parking within the new lot would be allowed between 5 a.m. and midnight daily, consistent with the rules in parks under Rec and Park jurisdiction. A gate would be installed to restrict after hours parking. Accessible parking spaces would be included in conformance with the Americans with Disabilities Act. Bicycle parking stalls would also be included at the northern and southern termini of the trail.

2.4.5 Beach Nourishment

With erosion of sand placed over the wall and slope stabilization, portions of the wall would no longer be continuously buried, and the beach would narrow. To address this issue, the city proposes to implement a shoreline monitoring program and place sand when established triggers are met during annual monitoring.[17] The first trigger would be reached if the beach width were observed to be less than 50 feet over 500 or more total linear feet of beach. The second trigger would be reached if 500 feet or more total length of the buried wall were observed to be exposed. Sand placements would occur as soon as possible after the trigger is reached, generally within one year. Under the proposed beach nourishment program, the frequency of sand placement would be based upon annual monitoring results and sand availability. The proposed beach nourishment and monitoring program outlined below are described in greater detail in the Sand Management Plan and may be refined during consultation with the Coastal Commission for the coastal development permit.[18]

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17 The areas of measurements for sand placement triggers are those above the mean high water elevation.

18 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

SOURCE: MN+AGS JV,2019

Figure 2-8
Muni 23 Monterey Bus Route Turnaround and Layover Modifications

2.4.5.1 SHORELINE MONITORING PROGRAM

As part of the project, the SFPUC would prepare and implement a shoreline monitoring program. The primary purpose of the shoreline monitoring performed by SFPUC would be to assess whether the triggers related to beach width and/or wall exposure have been met such that beach nourishment is warranted. The monitoring program would be developed in coordination with the California Coastal Commission and National Park Service, and its implementation could be a condition of their respective project authorizations. Subject to agency review and approval, the monitoring program would likely identify performance objectives for the nourishment program, specify criteria against which performance would be evaluated, outline both qualitative and quantitative monitoring methods, and establish an implementation and reporting schedule. The qualitative monitoring would involve visual observations of beach width, wall exposure, and windblown sand (i.e., encroachment onto the multi-use trail) at South Ocean Beach. Quantitative monitoring would be conducted at both North Ocean Beach and South Ocean Beach. At North Ocean Beach, this monitoring would involve topographic surveys of the beach to assess sufficiency of sand supply in the event a placement is required. At South Ocean Beach, quantitative monitoring would involve topographic surveys of the beach and bluff to document beach width, wall exposure, and windblown sand conditions.[19] Under the monitoring program, annual reports would be prepared by summer of each year. These reports would present the results of observations and measurements over the monitoring period, summarize the occurrence of trigger actions, and determine whether a placement trigger has been reached. The reports would also include an assessment of project performance relative to the specified criteria and recommendations for adjustments, as warranted.

2.4.5.2 SAND SOURCES AND PLACEMENT METHODS

The city has identified two primary sand sources and placement methods. The first is the San Francisco Harbor – Main Ship Channel, which is regularly dredged by the U.S. Army Corps of Engineers (Corps) as part of that agency's ongoing federal navigation channels maintenance program.[20] Under the first option, referred to generally as the "large placement," a Corps dredge would pump up to 575,000 cubic yards of sand in a *slurry*[21] onto the beach, rather than disposing of it offshore. This potential option would require an extended/updated agreement with the Corps and federal approval.

The second primary source is North Ocean Beach (i.e., north of Lincoln Way). Under this option, referred to generally as the "small placement," the city would continue its practice of excavating and trucking excess sand from North Ocean Beach to South Ocean (referred to as *sand backpass*).[22,23] The small placement option would involve trucks dumping approximately 85,000 cubic yards of sand onto the beach and reshaped bluff at access points from the service road/multi-use trail and/or the sand ramp at Sloat Boulevard. In the event that sand from the Corps and North Ocean Beach is unavailable in a given year, the city would obtain a smaller

19 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

20 To provide deep-draft marine vessel access between the Pacific Ocean and San Francisco Bay, the Corps regularly dredges a sandbar located approximately 2 miles offshore of the Golden Gate. Commonly known as the main ship channel, the passage measures approximately 2,000 feet wide and 26,000 feet long, and is maintained at a depth of approximately 55 feet mean lower low water. Dredged material from the main ship channel generally consist of fine sand (median diameter range from 0.15 to 0.21 millimeters). Sand along Ocean Beach generally is classified as fine to medium sand (median diameter range from 0.21 to 0.45 millimeters) (U.S. Army Corps of Engineers, Environmental Assessment (with FONSI) and 404(b)(1) Analysis for Ocean Beach Storm Damage Reduction Beach Nourishment Project, San Francisco, San Francisco County, California, February 2021).

21 A slurry is a mix of sand and ocean water that can be transported via pipeline from an offshore dredge to the beach.

22 Sand backpassing has been performed at Ocean Beach since 2013 and occurred most recently in 2019.

23 Please see Chapter 1, Section 1.4.3, Ocean Beach Shoreline Modification Projects, for discussion of ongoing beach nourishment at South Ocean Beach.

volume of sand (~25,000 cubic yards) that meets NPS guidelines regarding sand grain size and quality from a commercial vendor. Sand removed along the Great Highway for maintenance north of Sloat Boulevard could also be placed at the South Ocean Beach project site.

2.4.5.3 LARGE SAND PLACEMENTS

The Corps presently dredges the main ship channel and transports the dredged material to a nearshore location near South Ocean Beach, commonly known as the Ocean Beach Demonstration Site (OBDS), where the material is dumped into the ocean.[24] The locations of the main ship channel and the OBDS are shown on Figure 1-2. In August to September 2021 the Corps placed approximately 380,000 cy of material dredged from the main ship channel on South Ocean Beach, instead of placement offshore at OBDS. With roughly 33 percent losses during placement, post placement surveys confirm 255,300 cubic yards of sand remained on the beach. The Corps and the city are considering placing dredged sand on the beach in the future and as such, future large sand placements are included in the operation and maintenance of the proposed project and analyzed in this EIR.[25]

The Corps' dredging and transport of dredged material to the OBDS, and to the larger Corps-proposed SF-17[26] beneficial use placement site, would continue independent of the project and, for that reason, these elements are not considered components of the project for purposes of this environmental analysis. Under the project's large sand placement scenario, rather than disposing of the dredged material at OBDS or SF-17, the dredge would anchor within the same area and pump the sand in a slurry onto the beach. Large sand placement would occur during the Corps dredging season of approximately between May and September. The city would coordinate with the NPS and the Corps to complete further environmental review in compliance with the National Environmental Policy Act (NEPA) needed for approval of large sand placement and determine the specific window for large sand placement within this timeframe. Accounting for material loss in transport of the sand between the dredge and the final placement location (assumed to be about 15 percent), up to 575,000 cubic yards of sand would be pumped from the dredge in order to achieve a target placed volume of up to 500,000 cubic yards. The large sand placement option would therefore involve two main components. The first is the offshore work operating the hopper dredge pumps to accommodate transport of the dredged material to the shore, rather than releasing it into the ocean. The second is the onshore work required to shape the sand into a large berm, or "sand embankment," along the shoreline.

OFFSHORE ACTIVITIES

Prior to the large sand placement, a tug would tow a slurry pipe to the South Ocean Beach project site from a port within San Francisco Bay. The tug would also be available to assist the dredge to attach the slurry pipe. On occasion, as rough weather warrants, the tug would be called out to help the dredge hold position. Upon completion of the sand placement event, the tug would transport the slurry pipe back to its home port location within San Francisco Bay.

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24 The Ocean Beach Demonstration Site is an offshore placement area within which the Corps places sediment dredged from the main ship channel as a demonstration site for beneficial use of dredged sediment for Ocean Beach nourishment. SF-17 is a Corps-proposed placement site in the process of being designated by the U.S. EPA, and generally encompasses the Ocean Beach Demonstration Site along with additional areas to the west. The placement area spans approximately 3.3 square miles; its eastern boundary is located approximately 0.35 mile offshore of Ocean Beach, while its western boundary is approximately 2 miles offshore.

25 Under the project, the beach profile would be substantially different than under existing conditions. As a result, the design of future Corps sand placements would not be the same as the 2021 placement.

26 The proposed SF-17 beneficial use placement site encompasses a portion of the OBDS and is in the process of being designated for disposal by the U.S. EPA.

The project would use an approximately 28-inch-diameter flexible steel pipeline to convey slurried sand between the dredge's nearshore anchorage site and the beach. The approximately 2,700-foot-long pipeline would be placed at a point on the high beach, cross the beach, and run along the ocean bottom to a mooring station where the hopper dredge would anchor. Weighted collars would be used, if necessary, to prevent the pipe from shifting. Buoy markers would be attached to the pipeline as appropriate, and movement of the pipeline would be monitored. The offshore end of the pipeline would be attached to a flexible rubber pipe floated from a buoy secured to the seabed. On the beach end of the pipeline, as each 100-foot section of sand embankment is completed, additional lengths of pipeline would be attached. When the pumping is completed, the pipe and anchors would be removed.

As mentioned, dredging and transiting between the main ship channel and OBDS or the proposed SF-17 would continue to occur independent of this project, and so are not addressed further. The dredge would anchor at a location approximately 0.5 mile offshore of South Ocean Beach. The dredge would connect to the slurry pipe extending between the anchorage and the beach and pump the dredged sand to the shore. Each load would be approximately 5,000 cubic yards, and up to 115 loads would be required to achieve the target volume. Off-shore dredging operations would be conducted 24 hours per day; pumping sand from the dredge vessel would occur intermittently (approximately one hour, every six hours, 24 hours per day) in between travel to and from the main ship channel.

ONSHORE ACTIVITIES

Onshore activities would primarily consist of the use of bulldozers, an excavator, and a loader to shape the sand into the designed embankment. Prior to initiating and during sand slurry pumping, bulldozers would create sand berms, or "toe berms." The toe berms would be located parallel to shore and measure approximately 100 feet long, 10 feet tall, and 20 to 30 feet wide. The purpose of these berms would be to contain the sand slurry as it comes out of the end of the pipeline and to minimize the loss of sand. A diffuser would be attached to the end of the sand slurry pipe to control sand deposition and to prevent the slurry water from scouring the surrounding area. The toe berm would help retain the water long enough for the sediment to settle out, and guide surface drainage toward the end of the berm structure where the water would drain to the ocean.

As the dredged material is pumped into the area behind the toe berm, it would be piled higher than the top of the berm and then be graded into an embankment. The dimensions of the final sand embankment would be determined based on future beach elevation, but could be approximately 30 feet tall, 80 feet wide at its crest, and 200 feet wide at the toe. The placed sand would have a slope of 4 feet of horizontal change for each 1 foot of vertical change. Placement of dredged material would most likely begin at the center of the placement footprint and progress northward and southward as the embankment is being constructed. For each load pumped ashore, earthmoving equipment would spend about five hours moving and shaping the placed sand and preparing to receive the next load. Onshore operations would, therefore, be expected to occur for about 18 hours per day. The embankment would be constructed over approximately eight weeks[27] at a rate of about 100 feet per day.

Given the wave climate and the fine grain size of sand, the slope of the embankment would start equilibrating immediately upon placement of sand, with some sloughing occurring. In areas with sloughing, equipment (such as a bulldozer or excavator or skid steer) could be needed to smooth, or groom, the areas. This grooming

27 This duration accounts for work stoppages due to tides, wave conditions, or unanticipated equipment repair and maintenance.

could be needed weekly for the first two months following completion of the sand embankment work. Grooming activities would be conducted by the NPS or SFPUC contractor during daylight hours. The proposed Skyline coastal parking lot and the beach would be used as the primary staging areas for large-scale placement activities (see Figure 2-1a). Equipment used for a given nourishment event would access the beach via the sand ramp located at the northwestern corner of the Sloat Boulevard/Great Highway intersection. The large sand placement would require approximately 12 workers each day of onshore activities. Construction equipment would be refueled in an area behind the toe berm along the beach.

These onshore activities would be administered from a portable office trailer measuring approximately 30 feet wide by 10 feet long by 10 feet tall and situated within the staging area or on the beach near the active work area. Up to four light towers would be used to illuminate the active work areas during nighttime project activities. The light towers and mobile office would each be powered by a small diesel generator (approximately 10 horsepower). The lighting would be directed downward and toward the active work and would use shields or baffles to ensure light is not directed above the horizon.

2.4.5.4 SMALL SAND PLACEMENTS

Under the small sand placement option, the city would continue its current practice of sourcing sand from areas of Ocean Beach north of Lincoln Way (North Ocean Beach) which, for the reasons explained in Chapter 1, Section 1.4, Project Background, has an abundance of sand. Small sand placement would occur between Labor Day and Memorial Day. The city would coordinate with NPS to determine the specific window for small sand placement within this timeframe. The area from which the sand would be excavated is shown on Figure 2-1b. Within the portion of this area on the beach, the city would excavate multiple areas measuring approximately 1,000 feet long, 150 feet wide, and 6 feet deep. As noted above, the small placement option would involve trucks dumping approximately 85,000 cubic yards of sand onto the beach and bluff.

For a given small placement event, the city would use excavators, loaders, and dozers to move and load sand from North Ocean Beach into 30-cubic-yard off-road dump trucks. Approximately 2,830 truckloads would be required to haul the 85,000 cubic yards of sand during a small sand placement. This equipment would be staged within the paved parking lot at the northwest corner of the Lincoln Way/Great Highway intersection, and within the proposed Skyline coastal parking lot. At North Ocean Beach, equipment would enter and exit the beach through an access point at the south end of the O'Shaughnessy Seawall near Lincoln Way. At South Ocean Beach, equipment required for nourishment activities would enter and exit the beach via the sand ramp located at the northwestern corner of the Sloat Boulevard/Great Highway intersection, and may conduct related maintenance activities from the multi-use trail.

The city would temporarily close the southbound lanes of the Great Highway between Lincoln and Sloat boulevards during construction hours to provide access for transporting the excavated sand from North Ocean Beach to South Ocean Beach via the Great Highway. The trucks would access the dump sites via the service road and multi-use trail, and/or along the beach via the sand ramp previously mentioned. Once the sand has been dumped, bulldozers and loaders would shape the placed sand into embankments similar to, but smaller in size and extent than, those described for the large sand placement. The small placements would require approximately 12 workers per day.

As explained above, North Ocean Beach would be monitored twice per year to confirm adequate sand supply for South Ocean Beach nourishment. Should the monitoring reveal insufficient North Ocean Beach sand supply or character (e.g., grain size), the city would consider purchasing the sand from a commercial vendor. For purposes of this EIR's analysis, it is assumed that the sand would be sourced from a nearby commercial supplier, such as Pier 94 Imports in San Francisco, if not available from North Ocean Beach.

In conjunction with yearly sand maintenance along the Great Highway at the intersections between Sloat Boulevard and Lincoln Way, the city, in coordination with the NPS, would relocate sand from the Great Highway and NPS land west of the Great Highway to South Ocean Beach areas needing supplemental sand. The activity would prevent windblown sand from affecting the Great Highway and clogging the storm drain system. The NPS and U.S. Fish and Wildlife Service require the sand movement to occur in the summer, and the process normally takes one to two weeks.

2.4.5.5 TYPE AND FREQUENCY OF SAND PLACEMENT

The type and frequency of sand placements would depend upon sand availability (i.e., Corps dredge and North Ocean Beach) and observed shoreline conditions (e.g., sea level rise and related erosion rates). In general, the project could involve three beach nourishment scenarios. Under the first scenario, the city would undertake both large and small sand placements. Under the second scenario, the city would undertake small placements only, without the use of Corps dredge sand. Under the third scenario, the city would undertake large placements only, without the small sand placements. Sand placements would occur generally in summer or fall.

In developing the project's Sand Management Plan, the city used a model to estimate the performance of the small and large sand placements in terms of frequency, among other parameters. The analysis considers a variety of factors, including sea level rise. The sea level rise amounts evaluated are based upon the Ocean Protection Council's (OPC) State of California Sea-Level Rise Guidance 2018 Update, projections for San Francisco by 2100, assuming a high greenhouse gas emissions scenario.[28] Specifically, for each of the 1,000 model runs performed for the small and large sand placements, respectively, a sea level rise projection value was selected. Per the OPC guidance, the values selected ranged between the 50 percent and 0.5 percent probability of occurrence, as well as the extreme H++ scenario (10.2 feet by 2100) which does not have an assigned probability of occurrence.[29]

The approximate average and range of sand placement frequencies under these scenarios is presented in **Table 2-1**. As the table shows, the average modeled placement frequencies would be about once every four to ten years, on average, depending upon the placement scenario. In general, with lower amounts of sea level rise in the near-term, less frequent placements would be required; whereas with greater amounts of sea level rise later in the century, more frequent sand placements would be required. The first sand placement would likely occur between two and eight years after completion of construction; for purposes of this EIR analysis it is assumed the first placement would occur five years after construction is complete. Under all scenarios, the city may need to undertake additional supplemental placements (via sand backpass from North Ocean Beach) of up to about 30,000 cubic yards as conditions warrant.

The small and large sand placements would respectively require approximately six to eight weeks of work along the shoreline per placement event. Once the sand placement is completed, the city might install wind-erosion control measures. These measures could include placing an additional thin layer of imported coarse

28 Ocean Protection Council, 2018. State of California Sea-Level Rise Guidance. California Ocean Protection Council, 2018 Update.

29 The OPC guidance includes probabilistic sea level rise projections which associate the likelihood of occurrence (probability) with various sea level rise heights and rates. These projections are based upon a range of greenhouse gas emissions scenarios. The H++ scenario represents an extreme sea level rise projection corresponding with the loss of the West Antarctic ice sheet, the probability of which is unknown.

sand on top of the embankment, installing sand fencing, and/or planting with native grasses. These measures would help stabilize the embankments and reduce the amount of sand blown from South Ocean Beach onto the multi-use trail and service road.

Table 2-1 Frequency and Duration of Sand Placements

Placement Scenario	Average[a]	Range (max - min)[a]	Duration[b]
Small sand placements only	4 years	3 to 5 years	6 weeks
Large sand placements only	10 years	9 to 16 years	8 weeks
Large and small sand placements	7 years	3 to 16 years	6 to 8 weeks

SOURCE: Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

NOTE:

[a] The first post-construction sand placement would likely occur about five years after construction is complete.

[b] Duration is approximate, accounts for work stoppages due to tides, wave conditions, or unanticipated equipment repair and maintenance.

To protect public safety, South Ocean Beach, the multi-use path, and the Skyline coastal parking lot would be closed for the duration of the sand placement work. Temporary fencing would be installed around the immediate work areas on the beach and staging areas, restricting public access to or through the beach during the work period. The restricted area would advance as earthmoving equipment progresses down the beach. Beach closure periods, if required, would be planned and coordinated with the NPS, and designed with notification, outreach, and signage to alert beach users ahead of planned closures.

2.4.5.6 BEACH WIDTHS WITH SAND PLACEMENT

The city's modeling for the Sand Management Plan also estimated the performance of the small and large sand placements in terms of maintaining a sandy beach. **Table 2-2** shows the modeled probability of various average beach widths for South Ocean Beach under the project for both the small and large sand placements, which represents the range of potential sand placement types and frequencies. The modeling results indicate that, under the project, South Ocean Beach would be wider than 50 feet at least 90 percent of the time over the lifetime of the project (modeled as 80 years).

Table 2-2 Modeled Probability Distribution of Beach Widths Over Time with Small and Large Sand Placements

	Beach Width Range	Small Sand Placements (85,000 cubic yards)	Large Sand Placements (500,000 cubic yards)
Average Percent of Time Beach Width Distribution (%)	Width < 25 feet	3 %	2 %
	25 feet < Width < 50 feet	6 %	4 %
	50 feet < Width < 80 feet	17 %	11 %
	80 feet < Width < 160 feet	68 %	57 %
	160 feet < Width < 230 feet	6 %	24 %
	Width > 230 feet	0 %	2 %

SOURCE: Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

2.5 Project Construction

This section describes project construction activities and phasing, schedule, access, and staging. Construction of the various project components would proceed as described below. Standard construction measures that would be implemented to reduce potential environmental effects during construction are also described. During the entirety of the construction period (i.e., phases 1 through 5 below), the portion of Ocean Beach south of Sloat Boulevard would be closed to the public.

2.5.1 Construction Activities and Phasing

A brief description of project construction activities specific to project components or groups of project elements is presented below. The work required for implementation of the project's beach nourishment program is addressed in Section 2.4.5, Beach Nourishment. Project construction activities would occur in phases and be sequenced as follows:

- **Phase 1:** Modify the Sloat Boulevard/Great Highway intersection, remove the NPS restroom, reconfigure San Francisco Zoo parking access, reroute the Muni 23 Monterey bus layover and turnaround, and permanently close the Great Highway
- **Phase 2:** Remove Great Highway southbound lanes, construct a buried wall, and stabilize the slope
- **Phase 3:** Remove revetments and rubble from the beach, place sand on the beach
- **Phase 4:** Remove or repurpose Great Highway northbound lanes; install the multi-use trail and service road; construct the Skyline coastal parking lot, new restroom, and beach access stairway, and install landscaping along the multi-use trail; and restripe the Great Highway/Skyline Boulevard intersection
- **Phase 5:** Install native landscaping along the reshaped bluff and temporary irrigation (as needed), initiate planting establishment maintenance and undertake site cleanup activities

Prior to commencement of construction, subsurface investigations (e.g., utilities exploration, geotechnical investigation) might be necessary to support final designs. This work could include cutting and restoring pavement, obtaining soil samples through coring or auguring, and/or vacuum excavation. This work would occur within developed, landscaped or disturbed areas, and would be limited to one week per location. Depending upon the nature of the investigation, some nighttime work might be required. Any nighttime lighting required for pre-construction or construction activities would be directed downward and toward the active work, and would use shields or baffles to ensure light is not directed above the horizon.

2.5.1.1 PHASE 1 – MODIFY SLOAT BOULEVARD/GREAT HIGHWAY INTERSECTION, RECONFIGURE ZOO ACCESS, PERMANENTLY CLOSE GREAT HIGHWAY

This first phase of construction work would occur over up to 12 months and involve roadway reconfiguration at the Great Highway/Sloat Boulevard intersection and zoo parking access to accommodate the permanent closure of the Great Highway south of Sloat Boulevard. During this phase, the city would also remove the existing restroom at the Sloat Boulevard terminus and reroute the Muni 23 Monterey. The Great Highway's existing lanes would be retained for construction vehicle access and SFPUC operations access during this construction phase but would not be open to the public.

2.5.1.2 PHASE 2 – CONSTRUCT BURIED WALL

The buried wall, consisting of a secant pile wall and grade beam, would be constructed in the second general construction phase. Buried wall construction would likely begin around the midpoint of the wall alignment and proceed simultaneously in both directions. Prior to wall construction, portions of the Great Highway's southbound lanes would be demolished, and the material would be hauled offsite. Construction of the buried wall would proceed continuously for approximately 25 months. An estimated 152,000 cubic yards of material would be excavated as part of buried wall construction. The city would also remove portions of an abandoned 4-inch gas pipeline and stormwater drainage pipelines that are within the area to be excavated.

EXCAVATION, SECANT PILE AND GRADE BEAM DRILLING AND CASTING

To construct the secant pile wall, two stages of pile drilling and concrete filling would be required – one for primary pile installation and the other for secondary pile installation. The primary piles would extend to approximately 60 feet below ground surface. The secondary piles would extend to approximately 100 feet below ground surface. A conceptual diagram of the wall is shown on **Figure 2-9**. Wall construction would proceed at a rate of approximately 50 feet per day.

Following pile construction, the excavated area behind the wall would be backfilled with improved soil (e.g., mixed with soil cement) to enhance soil strength immediately behind the wall. A trench would be excavated within the improved soil to the depth of the pile tops (ranging in depth from approximately 20 feet to a maximum depth of 40 feet below ground surface) and a grade beam measuring approximately 5 feet wide and 4 feet deep would be cast on top of the piles. Once complete, the top of the grade beam would be 15 to 25 feet below existing grade (however, as described in Section 2.5.1.3, *Phase 3 – Remove Revetments and Rubble, Place Sand on Beach*, the wall tops would be covered by at least 4 feet of graded sand once complete).

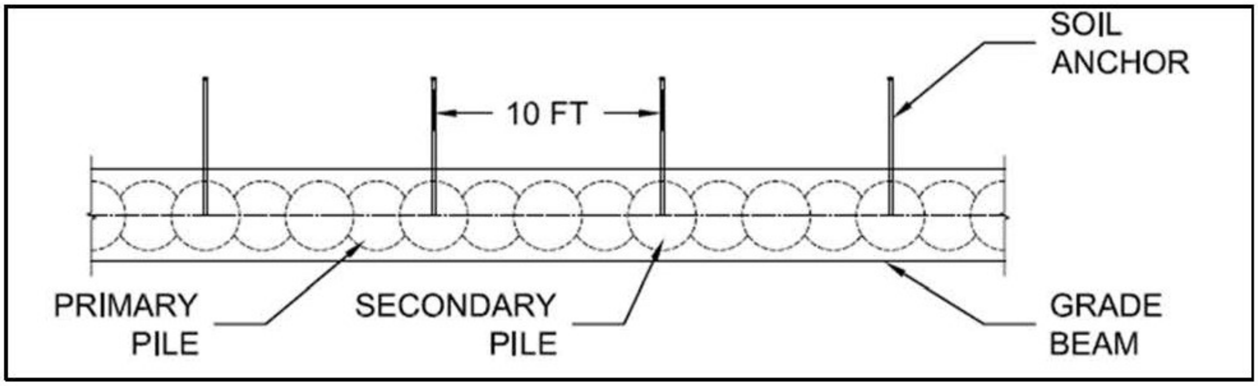
Excavation for the grade beam and tieback anchors (described below) may extend below groundwater. Groundwater pumped from the excavated areas would be discharged to the combined wastewater system via existing manholes on the Great Highway.

TIEBACK ANCHOR INSTALLATION

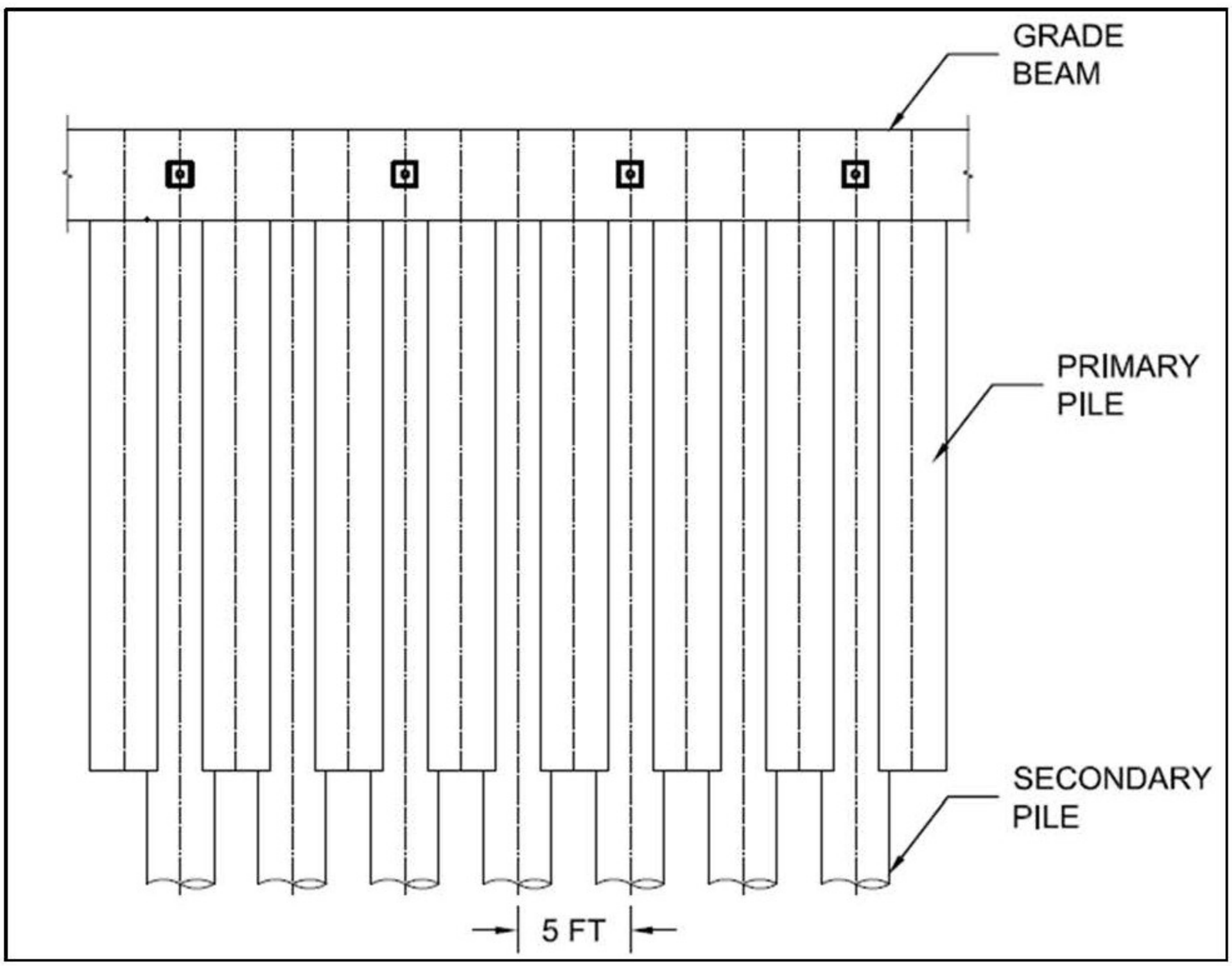
After the wall piles and grade beam have cured, soil anchors, also known as tieback anchors, would be installed through the grade beam and into the soil behind the wall to provide additional support to the buried wall. The tieback anchors would extend from the top of the buried wall to a position 10 to 15 feet below the Lake Merced Tunnel, as shown on Figure 2-6. The tieback anchors would be drilled along the buried wall at 10-foot intervals.

BACKFILL TRENCH AND SLOPE STABILIZATION

The excavated trench inland of the grade beam would be backfilled. The soil comprising the slope behind and above the wall would be strengthened with a soil cement to provide resistance to wave runup over the top of the wall (referred to generally in this EIR as the "slope stabilization"). The approximately 30,000 cubic yards of slope stabilization would be constructed using either a soil-cement mix, by mixing the existing soils with a cementitious grout in place; or a controlled low strength material, using a mixture of cement, aggregate, and water placed in sections with terraced wooden forms. The finished grade of the 3-foot-thick slope stabilization would be 3:1 horizontal to vertical. The constructed slope would extend from the top of the buried wall over and to the inland limit of the Lake Merced Tunnel. Any remaining excavated areas in the wall vicinity would be backfilled, either with material stored onsite for reuse or imported.



Typical Buried Wall Plan



Typical Buried Wall Side View

SOURCE: MN+AGS JV, Draft Conceptual Engineering Report, South Ocean Beach Coastal Erosion and Wastewater Infrastructure Protection Project, July 2019

Figure 2-9
Buried Wall Installation

2.5.1.3 PHASE 3 – REMOVE REVETMENTS AND RUBBLE, PLACE SAND ON BEACH

As segments of the buried wall and slope stabilization are completed, the city would begin to remove the existing boulder and sandbag revetments, along with the various rubble and debris, from the bluff and beach areas seaward of those segments. This work would be conducted intermittently over a period of approximately 18 months, using excavators working on the beach during low tide and when weather permits. A coffer dam would not be required; however, a temporary sand berm comprised of materials onsite could be constructed to allow for protection of the active construction area from ocean waves and tidal activity. The approximately 20,000 cubic yards of material requiring removal would be stockpiled within staging areas prior to being hauled offsite.

Construction of the buried wall and slope stabilization would require substantial excavation of the sandy bluff. The excavated materials would be sorted and stockpiled onsite. Once the wall and slope stabilization are constructed, bulldozers would move approximately 40,000 cubic yards of the stockpiled sandy material onto these constructed features. The reshaped bluff would include a minimum of 4 feet of graded sand over the slope stabilization.

2.5.1.4 PHASE 4 – INSTALL MULTI-USE TRAIL, SERVICE ROAD, AND PUBLIC PARKING LOT, CONSTRUCT BEACH ACCESS STAIRWAY AND RESTROOM, RESTRIPE GREAT HIGHWAY/SKYLINE BOULEVARD INTERSECTION

As the above-described bluff and beach work nears completion, the city would begin to construct various access improvements. This work would span roughly nine months. During this time, the city would demolish all or portions of the Great Highway's northbound travel lanes and install the dedicated service road and multi-use trail, and associated barriers, fencing, striping, traffic controls, landscaping and lighting. The plants selected would be native, climate-appropriate, locally adapted, and non-invasive, and would require low amounts of water. Temporary irrigation may be installed to establish plants within the project area. In addition, the newly vegetated landscape would undergo an actively monitored establishment period of up to five years to ensure the resilience and growth of the new plantings. The service road and multi-use trail would both be constructed of asphalt concrete pavement, capable of accommodating heavy truck traffic (e.g., regular vehicular traffic and haul trucks for sand placements) as well as bicycle and pedestrian usage.

Construction of the Skyline coastal parking lot would involve removing and/or repurposing portions of the remaining Great Highway travel lanes, clearing vegetation, light grading, paving and striping the new lot, installing lighting, signage, gates, bicycle parking and the portion of the multi-use trail on the southwest side of the lot. The city would also restripe portions of the Great Highway/Skyline Boulevard intersection, as needed, and add a crosswalk across Skyline Boulevard. During this time, the city would also begin construction of the restroom, beach access stairway and other access amenities (e.g., benches, trash receptacles, and signage). The beach access stairway would be composed of reinforced concrete and other durable material and supported on concrete piles. Construction of these amenities would be similar to that described for the buried wall.

2.5.1.5 PHASE 5 – REMOVE CONSTRUCTION DEBRIS AND WASTE, AND PLANT NATIVE VEGETATION

Upon completion of construction, all construction debris and waste would be removed from the area. Vegetation would be planted on the reshaped bluff. As with those described for phase 4, the plants would be native, locally adapted, drought tolerant, may require temporary irrigation, and their establishment would be monitored for success. This phase would take approximately six months to complete.

2.5.2 Construction Schedule

The city would construct the project over approximately four years, with an estimated construction period from 2023 to 2027. During this period, the city would close the entire construction area, including the Great Highway and beach, to the public. **Table 2-3** presents an overview of the proposed construction implementation sequence, by component. Construction would proceed up to seven days per week, except holidays, between 7 a.m. and 8 p.m. consistent with the city's noise ordinance. Some nighttime construction may be required for the buried wall, which would require the use of portable lights.

2.5.3 Construction Access, Staging, Equipment, and Workforce

As discussed, prior to commencement of work south of Sloat Boulevard, the portion of Great Highway between Sloat and Skyline boulevards would be closed. Traffic would be routed inland around the project area via Sloat and Skyline boulevards for the entire construction period. Construction vehicles would use the closed portion of the Great Highway to access the South Ocean Beach project site, and emergency vehicle access to the closed portion of the Great Highway would be maintained. The project would use local and regional roadways to haul construction materials. The Great Highway, Sloat Boulevard, and Skyline Boulevard would be the primary vehicle access routes for construction haul trucks and deliveries as shown on **Figure 2-10**. The Muni 23 Monterey bus layover and turnaround described in Section 2.4.4.2, *Transit Access*, would be relocated before the start of construction.

Multiple areas may be used for construction staging, including construction worker parking, as shown on **Figure 2-11**. The following potential construction staging areas may be used:

- The Great Highway's closed northbound and (until demolished) southbound lanes. SFPUC operations and maintenance staff would also use the Great Highway's northbound lanes to access the Westside Pump Station and Oceanside Treatment Plant during construction.
- The existing NPS parking lot at the western terminus of Sloat Boulevard (until removed).
- The closed area of Ocean Beach, intermittently during Phase 3 (revetment removal and initial sand placement). Work on the beach would be weather- and wave-condition-dependent.
- Available space within the Oceanside Treatment Plant, Westside Pump Station, and Zoo Pump Station.

If needed, temporary stockpiling of soil or trail/parking lot surfacing materials would occur within the project footprint and/or staging areas.

Equipment that is expected to be required for project construction is presented by project component in **Table 2-4**. Electrical grid power would be used for construction trailers. Most other construction equipment would be diesel powered. Diesel-powered generators may also be used, for example to support pumps dewatering excavated areas. The average number of construction workers estimated to be required onsite during a given construction phase would be about 50, and the maximum project workforce is estimated to be around 130 during a period when construction phases overlap.

Table 2-3 Project Construction Schedule

Construction Activity	2023	2024	2025	2026	2027
Phase 1: Modify Sloat Boulevard/Great Highway Intersection, remove NPS restroom, reconfigure San Francisco Zoo parking access, reroute Muni 23 Monterey bus layover and turn-around, permanently close Great Highway					
Phase 2: Remove Great Highway southbound lanes, construct a buried wall, and stabilize the slope					
Phase 3: Remove revetments and rubble from beach, place sand on beach					
Phase 4: Remove or repurpose Great Highway northbound lanes; install multi-use trail and service road; construct Skyline coastal parking lot, new restroom, and beach access stairways, install multi-use trail landscaping; restripe Great Highway/Skyline Boulevard intersection					
Phase 5: Install native landscaping and temporary irrigation, undertake site cleanup					

SOURCE: ESA, 2020; ESRI, 2020

Ocean Beach Climate Change Adaptation Project

Figure 2-10
Vehicle Access Routes for Construction Activities and Operational Sand Placement

SOURCE: ESA, 2019; Google Earth, 2019

Ocean Beach Climate Change Adaptation Project

Figure 2-11
Staging for Construction and Operational Sand Placement Activities

Table 2-4 Construction Assumptions for the Project

Construction Activity	Quantity of Material Import and Export (Haul Loads)[a]	Estimated Construction Equipment	Workers (Daily)	Estimated Construction Duration
Phase 1: Modify Sloat Boulevard/ Great Highway intersection, remove NPS restroom, reconfigure San Francisco Zoo parking access, reroute Muni 23 Monterey bus layover and turn-around, permanently close Great Highway	Export: 444 Import: 3,240 Vendor: 245	• Air Compressors • Crawler Tractors • Excavators • Forklift • Generators • Heavy Duty Breaker Hammer • Motor Grader • Front End Loader • Paving Equipment • Vibration Compactor • AC Roller • Pumps • Signal Boards • Tractors/Loaders/Backhoes • Water Trucks • Haul Trucks	50	12 months
Phase 2: Remove Great Highway southbound lanes, construct a buried wall, and stabilize the slope	Export: 6,500 Import: none Vendor: 4,310	• Air Compressors • Boring/Drill Rigs • Cement and Mortar Mixer • Concrete/Industrial Saw • Concrete pump • Cranes • Crawler Tractors • Excavators • Forklift • Generators • Heavy Duty Breaker Hammer • Motor Grader • Front End Loader • Pumps • Signal Boards • Tractors/Loaders/Backhoes • Water Trucks • Haul Trucks	60	25 months
Phase 3: Remove revetments and rubble from beach, place sand on beach	Export: 2,500 Import and Vendor: None	• Air Compressors • Cranes • Crawler Tractors • Excavators • Forklifts • Generators • Heavy Duty Breaker Hammer • Motor Grader • Front End Loader • Pumps • Signal Boards • Tractors/Loaders/Backhoes • Water Trucks • Haul Trucks	20	18 months
Phase 4: Remove or repurpose Great Highway northbound lanes; install multi-use trail and service road; construct Skyline coastal parking lot, new restroom, and beach access stairway; install multi-use trail landscaping; restripe Great Highway/ Skyline Boulevard intersection	Export: 484 Import: 89 Vendor: 890	• Air Compressors • Boring/Drill Rigs • Cranes • Concrete Pump • Crawler Tractors • Excavators • Forklifts • Generators • Motor Grader • Front End Loader • Paving Equipment • Vibration Compactor • AC Roller • Pumps • Signal Boards • Tractors/Loaders/Backhoes • Water Trucks	50	9 months
Phase 5: Install native landscaping and temporary irrigation, undertake site cleanup	Export: None Import: 89 Vendor: 860	• Air Compressors • Cranes • Crawler Tractors • Excavators • Forklifts • Generators • Motor Grader • Front End Loader • Signal Boards • Tractors/Loaders/Backhoes • Water Trucks	50	6 months

NOTE:

[a] Due to varied density and size of hauled materials, the volume of hauled loads ranges from 7 to 11 cubic yards per load.
[b] Vendor trucks in this context are any truck trips not importing or exporting soil, sand, or demolition debris

2.5.4 Site Preparation, Earthwork, and Haul Truck Trips

Site preparation could require removal of trees from the Great Highway median (near Skyline Boulevard) and could disturb trees along the zoo parking driveway at Sloat Boulevard. The project could remove approximately 17 and disturb approximately 3 trees, ranging in size from 4 inches to 15 inches in *diameter at breast height*.[30] Project demolition, revetment and rubble removal, and earthwork would require 100,600 cubic yards of material to be off-hauled. Depths of excavation would vary based upon project component and location. Approximately 76,000 cubic yards of excavated soil/sand would be reused within the project footprint. Project construction would require the import of approximately 34,000 cubic yards of material, including soil cement for the slope stabilization and concrete for the buried wall. Materials imported for use on NPS lands would meet applicable NPS earth materials management standards.[31] Wastes off-hauled from the project area would likely be disposed at the Republic Ox Mountain Landfill in Half Moon Bay (about 26 miles south of the project area).

2.5.5 SFPUC Standard Construction Measures

The SFPUC has adopted standard construction measures to reduce potential environmental effects during construction.[32] The standard construction measures apply to all SFPUC-sponsored projects and would be implemented for all project components. Presented in Appendix C of this EIR, these standard construction measures include seismic and geotechnical studies, air and water quality measures, traffic and noise control measures, hazardous materials measures, biological resources screening measures for special-status species and/or migratory birds, visual and aesthetic considerations, and cultural resources measures. In some cases, the SFPUC's standard construction measures would be supplemented or superseded by similar or additional NPS requirements for work on NPS lands, or by mitigation measures identified in this EIR.

2.6 Project Operations and Maintenance

This section describes project operations and maintenance activities. Such activities would generally include maintaining new project facilities and managing project landscaping. Beach nourishment operations are described in Section 2.4.5, Beach Nourishment.

Agencies with jurisdiction and/or oversight responsibility would operate and maintain project facilities, as is done under existing conditions and generally in a similar fashion. Operations and maintenance would be required for public access features (such as the restroom facility, trash enclosures, trails, signs, and lighting), the service road and parking lot, and the beach and bluff areas. Project components would be maintained by the city or NPS, as appropriate. No changes to city agency or NPS staffing levels are anticipated. Large sand placements would be conducted in conjunction with the Corps and would depend upon a future Corps maintenance dredging program that requires additional environmental review and regulatory approvals.

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30 Diameter at breast height, or DBH, is the tree diameter measured at 4.5 feet above the ground surface. ESA, Ocean Beach Climate Change Adaptation Project Tree Survey Memorandum, August 2021.

31 Golden Gate National Recreation Area, 2015. Standard Operating Procedures – Managing Earth Materials in the Golden Gate National Recreation Area, Procedure Number: 828. Effective date April 22, 2015.

32 SFPUC standard construction measures were originally adopted in August 2006 and were updated most recently as directed by the General Manager in July 2015.

2.6.1 Public Access, Parking, and Restrooms

Rec and Park would maintain the multi-use trail, restroom, and Skyline coastal parking lot. The Skyline coastal parking lot would be accessible between 5 a.m. and 12 a.m. daily. The multi-use trail would have posted open hours of 5 a.m. to 12 a.m. daily. Trash collection and restroom cleaning would be administered by Rec and Park. Occasionally, as conditions warrant, sand would be removed from the multi-use trail and service road using a front loader or vacuum. Rec and Park would provide temporary irrigation to plants during the plant establishment period, and conduct some replanting as needed.

2.6.2 Beach and Landscape Maintenance

The NPS does not regularly conduct beach maintenance at Ocean Beach (designated by the NPS as a Natural Zone management area).[33] Maintenance of the vegetation on the reshaped bluff would be minimal, as the plants would be native and adapted to project area conditions. However, some landscape maintenance may be needed after sand placement or erosion events. Replacement plants would be sourced from established nurseries in the region – replacement plants on NPS lands would be sourced from NPS nurseries or nurseries that otherwise meet NPS native plant requirements.

2.7 Intended Uses of this EIR and Required Actions and Approvals

This EIR is intended to provide information and describe the environmental consequences of the project in accordance with California Environmental Quality Act (CEQA) requirements for public disclosure and to assist public agency decision-makers in considering the approvals necessary for implementing the project. The permits and approvals anticipated to be required from federal, state, and local agencies are listed below. The city would also obtain any other regulatory approvals as required by law.

As a project partner and owner and manager of lands within the project area, the NPS's project involvement would include a project approval action, such as issuing a special use permit, as well as potential funding and management assistance for project elements. The Federal Highway Administration Federal Lands Access Program would approve the project components funded through its grant program. Accordingly, the Federal Highway Administration and the NPS will be lead agencies for separate federal environmental review processes under the National Environmental Policy Act (NEPA). Also, as noted above, large sand placements would require Corps and NPS involvement, and the SFPUC has initiated discussions with the Corps and NPS regarding developing an agreement for such placements. The following is a preliminary list of potential approvals needed for project construction and operation.

2.7.1 Federal

- National Park Service – Golden Gate National Recreation Area:
  - NEPA compliance for work that will affect adjacent NPS lands and resources, including work on NPS lands
  - Special use permit and/or other authorization for work within NPS land

[33] National Park Service, U.S. Department of the Interior, 2014. Golden Gate National Recreation Area and Muir Woods National Monument, General Management Plan. Available online at: https://www.nps.gov/goga/learn/management/index.htm. Accessed on August 23, 2019.

- Federal Highway Administration Federal Lands Access Program:
  - NEPA compliance for the multi-use trail and the Skyline coastal parking lot
  - Project approval for components funded through Federal Highway Administration grant program
- U.S. Army Corps of Engineers:
  - Clean Water Act section 404 and Rivers and Harbors Act Section 10 authorization and associated NEPA compliance, for revetment removal and work in jurisdictional waters
  - NEPA compliance and authorization for beneficial use of dredged sand
- National Oceanic and Atmospheric Administration National Marine Fisheries Service consultations:
  - Federal Endangered Species Act, section 7, for potential effects on chinook and coho salmon, green sturgeon, and steelhead, and designated critical habitat for green sturgeon and leatherback sea turtle
  - Marine Mammal Protection Act for potential effects on marine mammals
  - Magnuson-Stevens Fishery Conservation and Management Act for potential impacts on managed fish species and essential fish habitat, including those managed under the Pacific coast groundfish fisheries management plan (FMP), Pacific salmon FMP, and coastal pelagic FMP
- U.S. Fish and Wildlife Service: Federal Endangered Species Act section 7 consultation for potential effects on western snowy plover

2.7.2 State

- California Coastal Commission: Coastal Development Permit for development within the coastal zone
- California Department of Transportation: Encroachment permit for work within the State Route 35 (Skyline Boulevard) right-of-way
- California Office of Historic Preservation: National Historic Preservation Act section 106 consultation for potential effects on historic resources
- California Department of Fish and Wildlife: Fish and Game Code section 2081 permit for potential effects on bank swallow
- California State Lands Commission Lease: may be needed for beach access stairway and beach nourishment
- State Water Resources Control Board:
  - Stormwater General Construction Permit and Stormwater Pollution Prevention Plan for potential construction effects on water quality[34]
- San Francisco Regional Water Quality Control Board: Clean Water Act section 401 Water Quality Certification and/or a Porter-Cologne Water Quality Control Act Report of Waste Discharge for potential discharges to waters of the United States and waters of the state

[34] Applicable to areas that do not drain to the city's combined wastewater system.

2.7.3 Local

- San Francisco Planning Commission: Certification of the Final EIR, general plan referral
- San Francisco Public Utilities Commission:
  - Adoption of CEQA Findings and Mitigation Monitoring and Reporting Program
  - Approval of the project
- San Francisco Recreation and Parks Commission:
  - Adoption of CEQA Findings and Mitigation Monitoring and Reporting Program
  - Approvals of Rec and Park project components including closure of the Great Highway, the new Skyline coastal parking lot, multi-use trail, and service road, Sloat Boulevard entrance to San Francisco Zoo parking lot, and a memorandum of understanding (MOU) with the SFPUC for construction and operation of SFPUC components
- San Francisco Public Works: Approval of Sidewalk Changes and Street Improvement Permit
- San Francisco Municipal Transportation Agency: Approval of certain parking and traffic measures in accordance with the San Francisco Transportation Code; approval of bus route and stop changes; and approval of closure of the Great Highway
- San Francisco Board of Supervisors: Approval of the closure of the Great Highway to vehicular traffic
- Consultation and coordination with city agencies and departments, including without limitation Public Works, the Department of Building Inspection, the Department of Public Health, and the Municipal Transportation Agency, to ensure that soil disturbance and site mitigation, street vacation, street and sidewalk improvements, on-street parking modifications, and building construction comply with substantive requirements of the law

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CHAPTER 3
PLANS AND POLICIES

3.1 Introduction

In accordance with California Environmental Quality Act (CEQA) Guidelines Section 15125(d), this chapter provides a summary of City and County of San Francisco (city) and regional plans and policies that are applicable to the Ocean Beach Climate Change Adaptation Project (the project). To result in an impact under CEQA, a project's inconsistency with a relevant plan or policy must be related to a direct or indirect physical impact on the environment and result in a significant, adverse impact. The potential physical impacts on the environment that may result from an inconsistency with a plan or policy are discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, or in the initial study prepared for this project (Appendix B).

Plans and policies addressed in this chapter include:

- **City and County of San Francisco** – San Francisco General Plan, including Western Shoreline Area Plan; Sea Level Rise Action Plan; Better Streets Plan; Transit-First Policy; San Francisco Planning Code; Accountable Planning Initiative
- **San Francisco Public Utilities Commission (SFPUC)** – 2020 Strategic Plan
- **San Francisco Recreation and Parks Department (Rec and Park)** – Rec and Park Strategic Plan
- **Other Plans and Policies** – California Coastal Commission policies, State Lands Commission policies, National Park Service (NPS) policies

The determination of a project's consistency with an applicable local general plan, policy, or regional plan is ultimately made independent of the environmental review process by the project decision-makers when they decide whether to approve or disapprove a project. The analysis in this chapter is intended to provide decision-makers with a synopsis of relevant planning and policy considerations. The analysis presented is intended to supplement the decision-makers' own understanding of the various and often competing policy considerations.

3.2 City and County of San Francisco Plans and Policies

3.2.1 San Francisco General Plan

The San Francisco General Plan, adopted by the planning commission and the board of supervisors, is both a strategic and long-term document, broad in scope and specific in nature. The general plan is the embodiment of the city's collective vision for the future of San Francisco, and comprises a series of elements, each of which deal with a particular topic, that applies citywide. The general plan contains ten elements (Housing, Commerce and Industry, Recreation and Open Space, Community Facilities, Urban Design, Environmental Protection, Transportation, Air Quality, Community Safety, and Arts) that provide goals, policies, and objectives for the physical development of the city. In addition, a land use index cross-references the policies related to land use located throughout the general plan.

The general plan elements that are particularly relevant to planning considerations associated with this project include the Recreation and Open Space, Environmental Protection, Transportation, and Air Quality elements. The general plan also includes area plans that outline goals and objectives for specific geographic planning areas. Among these is the Western Shoreline Area Plan, which is applicable to the project area. In an area plan, "the more general policies in the General Plan elements are made more precise as they relate to specific parts of the city" (San Francisco General Plan, Introduction). The area plans contain specific policies and objectives that address land use and planning issues in the local context.

3.2.1.1 GENERAL PLAN ELEMENTS

RECREATION AND OPEN SPACE ELEMENT

The general plan's Recreation and Open Space Element addresses the character of the city's open spaces and calls for the preservation and enhancement of open spaces through community engagement. Objectives relevant to the project include:

Objective 1: Ensure a well-maintained, highly utilized, and integrated open space system

Objective 2: Increase Recreation and Open Space to Meet the Long-term Needs of the City and Bay Region

Objective 3: Improve Access and Connectivity to Open Space

The element explains that maintaining public access to the waterfront is integral to San Francisco's identity and creating continuous open spaces along the ocean and bay is one of the city's long-term goals. The project would expand the area of publicly accessible open space at Ocean Beach, improve public access to the waterfront, and provide connections to the regional hiking and biking trail system. As such, the project would not obviously conflict with general plan elements related to recreation and open space.

ENVIRONMENTAL PROTECTION ELEMENT

The general plan's Environmental Protection Element addresses the impact of urbanization on the natural environment, and emphasizes a balancing of environmental, economic, and social considerations in land use planning and development decisions. Objectives relevant to the project include:

Objective 3: Maintain and improve the quality of the bay, ocean, and shoreline areas

Objective 4: Assure that the ambient air of San Francisco and the bay region is clean, provides maximum visibility, and meets air quality standards

Objective 7: Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the city's citizens

Objective 8: Ensure the protection of plant and animal life in the city

Objective 9: Reduce transportation-related noise

The project would protect wastewater system infrastructure from exposure to coastal hazards, thereby protecting the quality of the ocean from accidental releases. However, as discussed in Appendix B, Section E.8, Air Quality, with mitigation, the project's air quality effects would be reduced to less-than-significant levels. Therefore, the project would not obviously conflict with general plan objectives 3 and 4 related to air and coastal water quality.

Project implementation could conflict with Objectives 7 and 8. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, the project requires modification of coastal bluffs that provide habitat for the protected bank swallow. As a result, project construction would result in significant impacts on the species that could not be reduced through feasible mitigation.

Project implementation could also conflict with Objective 9. The project's closure of the Great Highway between Sloat and Skyline boulevards would reroute the majority of the traffic using this segment to Sloat Boulevard between the Great Highway and Skyline Boulevard and to Skyline Boulevard between Sloat Boulevard and the Great Highway. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.4, Noise and Vibration, this increase in traffic volume would result in substantial traffic-related noise. The impact would be significant, and the feasibility of mitigation to reduce the impact is uncertain.

TRANSPORTATION ELEMENT

The general plan's Transportation Element addresses the nine aspects of the city-wide transportation system: general, regional transportation, congestion management, vehicle circulation, transit, pedestrian, bicycles, citywide parking, and goods management. The element seeks to balance the transportation system by recognizing the need for and accommodating necessary automobile travel, while also improving and promoting public transit, bicycling, and walking as alternatives to the single-occupant automobile and limiting parking capacity, among other measures. Objectives relevant to the project include:

> **Objective 8:** Maintain and enhance regional pedestrian, hiking and biking access to the coast, bay and ridge trails
>
> **Objective 11:** Establish public transit as the primary mode of transportation in San Francisco and as a means through which to guide future development and improve regional mobility and air quality.
>
> **Objective 18:** Establish a street hierarchy system in which the function and design of each street are consistent with the character and use of adjacent land

The project's multi-use trail would provide new and enhanced pedestrian and bicycle access and connectivity along the Coast Trail route. These transportation system modifications would modify the Great Highway in a manner consistent with the character and use of the adjacent recreational and open space lands. For these reasons, the project would not obviously conflict with Transportation Element objectives 8 or 18.

Objective 11 and related policies are guided by the city's Transit First policy, which was adopted by the Board of Supervisors in 1973.[1] The policy encourages multi-modalism and the use of transit and other alternatives to the single-occupant vehicle, among other transit-related priorities. The project would provide a more direct connection for pedestrians and cyclists between the Sloat Boulevard/Great Highway intersection

1 The Transit First Policy is codified in Section 8A.115 of the San Francisco Charter.

and areas to the south (including Lake Merced Trail and Fort Funston). As explained in Section 4.3, the project could increase travel times along some routes, but the overall effect on transit operations would not cause substantial delays. For these reasons, the project would not obviously conflict with Objective 11 or with the Transit-First Policy.

AIR QUALITY ELEMENT

The Air Quality Element focuses on adherence to regulatory air quality standards and the reduction of air pollution. Objectives applicable to the project include:

> **Objective 1:** Adhere to state and federal air quality standards and regional programs
>
> **Objective 5:** Minimize particulate matter emissions from road and construction sites

The project would generate emissions of dust and criteria air pollutants during construction and operation. However, as discussed in Appendix B, Section E.8, Air Quality, with adherence to applicable regulatory requirements related to dust and mitigation construction equipment emissions, the project's air quality effects would be reduced to less-than-significant levels and would not obviously conflict with these air quality objectives.

3.2.1.2 WESTERN SHORELINE AREA PLAN (LOCAL COASTAL PROGRAM)

The Western Shoreline Area Plan is an area plan within the general plan. The plan includes objectives and policies pertaining to land use and development along the city's western shoreline extending approximately 6 miles, from Point Lobos to Fort Funston, including the western portion of Golden Gate Park and Lake Merced. The Western Shoreline Area Plan also serves as the land use plan portion of the city's certified local coastal program.

As discussed in Chapter 1, Introduction and Background, the city has participated in several planning initiatives related to management of South Ocean Beach, including the Ocean Beach Master Plan process. The master plan has not been adopted by the city. However, in May 2018, the city obtained Coastal Commission certification of a local coastal program amendment addressing sea level rise and coastal erosion concerns within the plan area, as envisioned in the Ocean Beach Master Plan. As stated in Section 2.3, Project Description, one of the main project objectives is to implement the city's local coastal program policies for the long-term management of South Ocean Beach, including managed retreat, beach nourishment, and sea level rise adaptation.

The Western Shoreline Area Plan objectives applicable to the project include:

> **Objective 2:** Redesign the Great Highway to enhance its scenic qualities and recreational use
>
> **Objective 6**: Maintain and enhance the recreational use of San Francisco's Ocean Beach Shoreline
>
> **Objective 12:** Preserve, enhance, and restore the Ocean Beach shoreline while protecting public access, scenic quality, natural resources, critical public infrastructure, and existing development from coastal hazards

As presented in Section 2.4, Project Components, the project would remove a segment of the Great Highway and installing a multi-use trail, remove revetments and rubble from the beach, constructing a buried wall, and implement a beach nourishment program, among other actions. The project would also maintain zoo access and improve scenic quality of the Ocean Beach shoreline. As discussed more fully in Chapter 2, Project Description, and Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the project has been designed to minimize and mitigate impacts on environmentally sensitive habitat areas, scenic quality, and public recreation.

However, as explained Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, the project requires modification of coastal bluffs that provide habitat for the protected bank swallow, a potential environmentally sensitive habitat area. Project construction would result in significant impacts on the species' habitat that could not be reduced through feasible mitigation. For the reasons presented, overall the project would not conflict with the Western Shoreline Area Plan, however, it would not entirely avoid or mitigate impacts on bank swallow habitat which potentially conflicts with Policy 12.6.

3.2.2 Sea Level Rise Action Plan

Among other goals, the San Francisco Sea Level Rise Action Plan defines an overarching vision and set of objectives for future sea level rise and coastal flooding planning and mitigation in San Francisco. The plan provides the foundation and guidance to develop a city-wide sea level rise adaptation plan. The adaptation plan process will include adaptation strategy development and selection and set a planning framework that helps prioritize investments to best improve climate resilience while protecting economic and environmental values. The vision of the Sea Level Rise Action Plan is to make San Francisco a more resilient city in the face of immediate and long-term threats of sea level rise, by taking measures to protect and enhance public and private assets, natural resources, and quality of life for all.[2]

The Sea Level Rise Action Plan guiding principles include:

- Engage partners and stakeholders as owners and collaborators using an inclusive, equitable and community-based planning process
- Recognize regional interdependencies and promote regional collaboration
- Foster innovative, inter-disciplinary design approaches and solutions that increase resilience to sea level rise while enhancing San Francisco's treasured shoreline qualities
- Closely monitor evolving climate science and adapt approaches accordingly, as consistent with Capital Planning Committee guidance
- Develop and apply rigorous metrics to track progress for reducing vulnerabilities, risk, and impacts

The project is a sea level rise adaptation and managed retreat project, which has been designed to be resilient under future sea level rise scenarios. Therefore, the project would not obviously conflict with the Sea Level Rise Action Plan. Please see additional discussion under Section 3.2.3, San Francisco Sea Level Rise Guidance.

[2] City and County of San Francisco, San Francisco Sea Level Rise Action Plan Executive Summary, March 2016.

3.2.3 San Francisco Sea Level Rise Guidance

The San Francisco Sea Level Rise Guidance provides direction from the city's Capital Planning Committee to all department on how to incorporate sea level rise considerations into new construction, capital improvement, and maintenance projects.[3] The guidance provides a framework for evaluating sea level rise vulnerability and developing adaption strategies as part of the capital planning process. To help guide the initial vulnerability assessment, the city developed a mapping tool which shows areas of the city potentially inundated under an extreme sea level rise scenario (6.9 feet) plus a 100-year *storm surge* [4]in the year 2100.[5] Projects proposed for locations within the inundation zone are required to assess their adaptive capacity through completion of a sea level rise checklist.

The mapping tool shows the inundation zone boundary generally following the toe of the bluff along South Ocean Beach, and so the SFPUC completed the sea level rise checklist.[6] The checklist concludes portions of the proposed beach access stairway would be vulnerable to inundation during their functional lifespan (approximately 73 years) under both a likely (3.4 feet) and 1-in-200 chance (6.9 feet) scenarios. The document notes the stairway would be moderately sensitive to inundation – the inundation would have an impact, but the stairway would retain partial function while inundated and would recover quickly once inundation subsided. With respect to risk, the assessment indicates the level of damage and cost to repair would be low and the level of disruption would be moderate, meaning a disruption in service or function that does not threaten public health and safety. The checklist goes on to explain the project would have high capacity to adapt to inundation without additional capital investment, noting that the beach would respond to sea level rise and the project includes a robust nourishment program which would address beach loss.

While not reflected in the checklist, sea level rise was considered in the broader project design. The project's conceptual engineering report concludes that, due to the low elevation of the proposed buried wall, areas behind the wall could be subject to substantial scour under sea level rise scenarios with 1.9 to 6.9 feet plus a 100-year storm surge, if the slope at the crest were not protected. In response, a slope stabilization layer, which would be composed of a soil-cement mix[7] or controlled low strength material[8], was added to the design in order to protect the wall from such effects.[9] For these reasons, the project would not conflict with the city's Sea Level Rise Guidance.

3.2.4 Better Streets Plan

The San Francisco Better Streets Plan[10] was adopted in 2010 to support the city's efforts to enhance the streetscape and the pedestrian environment. Consisting of two major components, the Streetscape Master Plan and the Pedestrian Transportation Master Plan, the Better Streets Plan classifies the city's public

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3 City and County of San Francisco, Guidance for Incorporating Sea Level Rise into Capital Planning – Assessing Vulnerability and Risk to Support Adaptation. Adopted September 14, 2014, last updated January 3, 2020. Accessed July 13, 2021 at: *https://onesanfrancisco.org/sites/default/files/inline-files/San_Francisco%20SLR_Guidance%20SLRTC%20REV%20TO%20CPC%20Jan%202020.pdf*

4 Storm surge is the abnormal rise in sea level during a storm, measured as the height of the water above the normal predicted astronomical tide.

5 City and County of San Francisco, Interactive Mapping Tool: 108" Inundation Vulnerability Zone Line (Sea Level Rise + 100 year Flood Event).

6 City and County of San Francisco, Guidance for Incorporating Sea Level Rise Into Capital Planning in San Francisco – Sea Level Rise Checklist, November 2020. Prepared January 26, 2021 for Ocean Beach Climate Change Adaptation Project.

7 A soil-cement mix is a weak form of concrete formed by mixing in place the existing soils with a cementitious grout.

8 A controlled low strength material is a weak mixture of cement, aggregate, and water that flows easily.

9 MN + AGS JV, Ocean Beach Long-Term Improvements Project Conceptual Engineering Report, Prepared for SFPUC, September 2019.

10 City and County of San Francisco, San Francisco Better Streets Plan, adopted on December 7, 2010. Available at *http://www.sf-planning.org/ftp/BetterStreets/proposals.htm#Final_Plan*.

streets and rights-of-way and creates a unified set of standards, guidelines, and implementation strategies, which govern how the city designs, builds, and maintains its public streets and rights-of-way. Major concepts applicable to the project include (1) pedestrian safety and accessibility features, such as enhanced pedestrian crossings, corner or midblock curb extensions, pedestrian countdown and priority signals, and other traffic calming measures; and (2) universal pedestrian-oriented streetscape design with incorporation of street trees, sidewalk plantings, streetscape furnishing, street lighting, efficient utility location for unobstructed sidewalks, shared single surface for small streets/alleys, and sidewalk/median pocket parks. The project would provide new and enhanced pedestrian access to and along South Ocean Beach, it would not obviously conflict with the Better Streets Plan. Additional discussion of the project's implications for pedestrian circulation is presented in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.3, Transportation and Circulation.

3.2.5 San Francisco Planning Code

The San Francisco Planning Code governs land uses, densities, and the configuration of buildings within San Francisco. Permits to construct new buildings or to alter or demolish existing ones may not be issued unless a project conforms to the planning code or an exception is available under the code. The planning code requirements are specified for areas of San Francisco called "zoning use districts" (also known as "use districts"). In addition to use districts, the city has established height and bulk districts to further the purposes of the Urban Design Element of the general plan by placing upper limits on the allowed height and bulk of buildings in the city.

3.2.5.1 USE DISTRICTS

The project area is within a P (Public) use district. The P district designation allows public structures and uses of the City and County of San Francisco, and accessory non-public uses that comply with the standards provided in Section 211.1(c) of the San Francisco Planning Code. The project is intended to protect public utility facilities and would provide new structures (e.g., multi-use trail and restroom) for use by the public. Therefore, the project would not obviously conflict with the designated use district.

3.2.5.2 HEIGHT AND BULK DISTRICTS

The project area is within an Open Space District. In Open Space Districts, the height and bulk of buildings and structures are determined in accordance with the objectives, principles, and policies of the San Francisco General Plan, and no building or structure or addition thereto can be permitted unless in conformity with the general plan. The principal or exclusive purpose of land within the Open Space District is as open space, with future development of any character strictly limited. The project would replace parking and restroom facilities with facilities of similar height and bulk as existing facilities, and overall would retain the project area as open space. Therefore, the project would not obviously conflict with the applicable height and bulk district.

3.2.6 Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the San Francisco Planning Code to establish eight Priority Policies. These policies are: (1) preservation and enhancement of neighborhood-serving retail uses, (2) protection of neighborhood character, (3) preservation and enhancement of affordable housing, (4) discouragement of commuter automobiles, (5) protection of industrial and service land uses from commercial office development and enhancement of resident employment and business ownership, (6) maximization of earthquake preparedness, (7) landmark and historic building preservation, and (8) protection of open space. The Priority Policies, which provide general policies and objectives to guide certain land use decisions, contain some policies that relate to physical environmental issues.

Prior to issuing a permit for any project that requires an initial study under CEQA, and prior to issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the general plan, the city must find that the proposed project or legislation is consistent with the Priority Policies. In evaluating general plan consistency of the proposed project, the planning commission and/or planning department would make the necessary findings of consistency with the Priority Policies. The staff report for the planning commission will analyze the proposed project's consistency with general plan policies.

As described further in Chapter 2, Project Description, and Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the project does not propose and would not affect retail uses or employment opportunities, housing, or commercial office development; would not detract from earthquake preparedness; and would not result in loss of parks or open space. Project elements pertinent to commuter transit, neighborhood streets, and parking are addressed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.3, Transportation and Circulation; and those potentially affecting historic resources are discussed in Appendix B, Section E.4, Cultural Resources. For the reasons above and as addressed further in the in the referenced EIR topical sections, the project would not obviously conflict with policies of the Accountable Planning Initiative.

3.3 SFPUC 2020 Strategic Plan

The SFPUC's 2020 Strategic Plan[11] provides a framework for planning, managing, and evaluating SFPUC-wide performance, taking into account the long-term economic, environmental, and social impacts of the SFPUC's business activities. This plan consists of a "Durable Section" that contains goals, objectives, and performance indicators to implement the SFPUC's vision and values. The goals and objectives are then used to drive the plan's "Dynamic Section," which contains specific action items, targets, measures, and budgeting. The SFPUC uses the plan to evaluate its performance semiannually to help measure progress on an annual basis.

The project would provide public access and recreational opportunities, in a manner that is generally compatible with protection of water quality, public health and safety, biological resources, and other key elements of the SFPUC's vision and values as expressed in the 2020 Strategic Plan. However, as discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, implementation of the project could result in substantial adverse effects on special-status bird habitat. As a result, elements of the project could conflict with environmental objectives regarding habitat protection. Overall, however, the project would further the environmental objective to adapt to climate change and would not be inconsistent with the plan's objectives.

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[11] San Francisco Public Utilities Commission, 2020. Strategic Plan, August 2016. Available online at *https://www.sfpuc.org/about-us/policies-plans/agency-strategic-plan*, Accessed July 13, 2021.

3.4 Recreation and Parks Department Strategic Plan

The Rec and Park Strategic Plan[12] was updated in 2020 with the goal of restoring and rebuilding San Francisco's parks and recreation facilities, some of which have become worn down by heavy use, deferred maintenance, and lack of capital investment. The plan proposes strategic objectives with strategies and tactics for enhancing San Francisco's parks, facilities, and recreation programs. The plan also proposes a framework for organizational change to support the suggested improvements. The strategies of the plan are as follows:

- **Inspire Place.** Keep today's parks safe, clean, and fun; promote our parks' historic and cultural heritage; and build the great parks of tomorrow.
- **Inspire Play.** Promote active living, well-being, and community for San Francisco's diverse and growing population.
- **Inspire Investment.** Through community engagement, advocacy, and partnerships, cultivate more financial resources to keep San Francisco's parks and programs accessible for all.
- **Inspire Stewardship.** Protect and enhance San Francisco's precious natural resources through conservation, education, and sustainable land/facility management practices.
- **Inspire Our Team.** Encourage innovation and cultivate a connected, engaged, and aligned workforce that delivers outstanding service.

The plan's Inspire Stewardship strategy calls upon Rec and Park to assist in planning efforts toward Ocean Beach Master Plan implementation by completing a detailed design of a new multi-use trail between Sloat and Skyline boulevards. As the Great Highway is under its jurisdiction and as co-sponsor of the project, Rec and Park is leading design of the multi-use trail, restroom, and parking facilities between Sloat and Skyline boulevards. As, the project would increase and enhance public access and recreational opportunities to and along the Ocean Beach shoreline, it does not appear to conflict with the plan. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.5, Recreation, for additional discussion of the project's implications for public access and recreation.

3.5 State Plans and Policies

3.5.1 California Coastal Act

The California Coastal Act (Public Resources Code Section 30000 et seq.) was enacted by the state legislature in 1976 to provide long-term protection of the Pacific Ocean coastline for the benefit of current and future generations. The Coastal Act provides for the long-term management and protection of lands within California's Coastal Zone. The entire project area is located within the Coastal Zone. As explained in Section 3.2.1, San Francisco General Plan, the Western Shoreline Area Plan is the land use plan portion of the city's certified local coastal program and guides land use planning and development decision-making within the city's Coastal Zone consistent with the Coastal Act.

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12 San Francisco Recreation and Park Department, 2020. *https://sfrecpark.org/DocumentCenter/View/14771/Strategic-Plan-Update-2020*.

The Coastal Act contains numerous and broad policies intended to, among other objectives: protect, maintain, enhance and restore the quality of the Coastal Zone environment and its resources; assure orderly utilization of Coastal Zone resources in a manner that balances conservation, social, and economic interests; maximize public access to and along the coast and public recreational opportunities in the Coastal Zone; and assure priority for coastal-dependent and coastal-related development over other types of development on the coast. A coastal development permit is required for the project, and the project's consistency with the applicable policies of the city's certified local coastal program and the Coastal Act will be determined through the review and approval of the city's coastal development permit application.

Coastal Act policies particularly relevant to the project include:

- Sections 30210-30214. Public access
- Sections 30220-30221. Recreation
- Section 30235. Construction altering natural shoreline
- Section 30240. Environmentally sensitive habitat areas; adjacent developments
- Section 30251. Scenic and visual qualities
- Section 30253. Minimization of adverse impacts

For the reasons presented below, project would not obviously conflict with most Coastal Act policies. However, project construction could conflict with Section 30240, because it would not entirely avoid or mitigate impacts on bank swallow habitat, a potential *environmentally sensitive habitat area*.[13]

Coastal Act sections 30210 and 30211 call for the provision of maximum public access and recreational opportunities, and prohibit development that would interfere with the public's right under the California Constitution to access the sea and coastal beaches. Sections 30212 through 30214 further specify how public access should be provided in new coastal development, including that it should be provided from the nearest public roadway to the shoreline, that facilities should be geographically dispersed to avoid overuse of a single area, and that developments providing recreational opportunities are preferred. The project would exclude public access at South Ocean Beach for the duration of the four-year construction process and for periods of 6 to 8 weeks every 4 to 10 years on average during beach nourishment events for the life of the project. As such, the project would have temporary impacts on public access at South Ocean Beach.

Overall, the project would provide substantial improvements to public access and recreation facilities at South Ocean Beach by removing shoreline armoring and constructing new access facilities. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.5, Recreation, for a more detailed discussion of the project's public access and recreational facilities impacts.

Sections 30220 and 30221 require that waterfront land suitable for water-oriented or other recreational activities be protected for such uses, if the water-oriented recreational activities cannot be provided at inland locations and existing or foreseeable future recreational demand is not adequately provided for in the area. The project would provide new public recreational facilities (multi-use trail, beach access stairs, coastal

[13] The Coastal Act (Section 30107.5) defines *environmentally sensitive area* "as any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments."

parking) at South Ocean Beach. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.5, Recreation, for additional discussion of the project's recreational facilities impacts.

Section 30235 provides for approval of seawalls and other shoreline protection structures that might alter natural shoreline processes when such development is required to serve coastal-dependent uses, or when needed to protect existing structures or public beaches in danger from erosion, and when designed to avoid or minimize adverse impacts on shoreline sand supply. The project proposes to install a buried wall to protect existing wastewater infrastructure – the Lake Merced Tunnel and adjacent infrastructure – which is in danger of exposure to coastal hazards due to erosion. The project would minimize impacts on shoreline sand supply by removing existing and substantial shoreline revetments, placing clean sediment excavated during wall construction on the reshaped bluff and allowing it to naturally erode, and implementing a long-term beach nourishment program. Refer to Appendix B, Section E.16, Geology and Soils, for a more detailed discussion of the project's potential effects on coastal processes, including coastal erosion.

Section 30240 requires that *environmentally sensitive habitat areas* (ESHA) be protected against significant disruption of habitat value, and limits allowable uses within and adjoining such areas to those dependent upon and compatible with the continuance of the habitat. Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, includes an assessment of whether the project area contains ESHA. Specifically, within Section 4.6.2.2, under the subheading *Environmentally Sensitive Habitat Areas*, each of the project area's bluff, intertidal, beach, and dune habitats is evaluated for its ESHA potential.

While determinations regarding ESHA are ultimately made through the coastal development permit process, this EIR considers the bluffs historically inhabited by the breeding colony of the state-listed as threatened bank swallow to be potential ESHA because of its rarity and limited habitat area. As it would require modification of the bluff that contains a portion of this habitat, project construction could conflict with the Coastal Act's ESHA policy if the bank swallow habitat is determined to be ESHA through the coastal permit process. The other habitats considered (intertidal, beach, dune) were found not to be potential ESHAs, but also would be evaluated through the coastal development permit process. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, for additional discussion of the project's effects related to potential ESHA.

Section 30251 states the scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. As explained in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.2, Aesthetics, the project would improve the scenic and visual qualities of South Ocean Beach. Specifically, the project would remove rubble and revetments from the beach, place sand over a reshaped bluff, and install native plantings. These actions would improve the scenic quality of South Ocean Beach relative to existing conditions, and the project site would be more visually compatible with the character of adjacent shoreline areas as a result of the project. In addition, with construction of the multi-use path and beach access stairway, the project would establish new public vantage points from which the area's scenic and visual qualities would be visible. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.2 for a more detailed discussion of the project's potential effects on scenic and visual qualities of the area.

Section 30253 requires that new development minimize risks to life and property, neither create nor contribute significantly to erosion, and not involve the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs. As explained in Chapter 2, Project Description, the purpose of the project is to address shoreline erosion at South Ocean Beach which has undermined existing public infrastructure and presents an ongoing risk to life and property within the area. The project includes the construction of a buried wall and slope stabilization to protect critical wastewater infrastructure – the Lake Merced Tunnel – which is facing imminent threat of exposure to coastal hazards due to the erosion problem. To minimize the potential effects of the wall on the shoreline and shoreline processes, the wall would be located as close to the tunnel, both vertically and horizontally, as feasible, and the city would place sand over the wall and stabilize the slope to help maintain a sandy beach. Refer to Appendix B Section E.16, Geology and Soils, for a more detailed discussion of the project's potential effects on natural landforms.

3.5.2 California State Lands Commission, Public Trust Doctrine

The Public Trust Doctrine is a legal doctrine that governs the use of tidal and submerged lands, including former tidal and submerged lands that have been filled. The purpose of the Public Trust Doctrine is to ensure that land that adjoins the State of California's waterways or is actually covered by those waters remains committed to water-oriented uses. Uses of public trust land are generally limited to waterborne commerce; navigation; fisheries; water-oriented recreation, including commercial facilities that must be located on or adjacent to water; and environmental preservation and recreation, such as natural resource protection, wildlife habitat and study, and facilities for fishing, swimming, and boating. Ancillary or incidental uses that promote public trust uses or accommodate the public's enjoyment of public trust lands are also permitted, such as hotels, restaurants, and specialty retail. Because Ocean Beach is subject to tides, the State Lands Commission may have a claimed public trust easement between the mean high and low water marks of South Ocean Beach, where portions of the project are proposed. As the project would improve public access and water-oriented recreational opportunities to and along South Ocean Beach, it would not obviously conflict with the Public Trust Doctrine. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.5, Recreation, for a discussion of the project's effects relative to public access and recreation along the shoreline.

3.6 Federal Plans and Policies

3.6.1 National Park Service Management Policies

By enacting the NPS Organic Act of 1916 (Organic Act), Congress directed the U.S. Department of the Interior and the NPS to manage units "to conserve the scenery and the natural and historic objects and wildlife therein and to provide for the enjoyment of the same in such a manner and by such a means as will leave them unimpaired for the enjoyment of future generations."[14] The Organic Act prohibits actions that would impair park resources unless a law directly and specifically allows for these actions.[15]

NPS Management Policies 2006 (section 1.4) require analysis of potential environmental effects to determine whether proposed actions would impair a park's resources and values (which were defined by the Organic Act).[16] The fundamental purpose of the national park system, established by the Organic Act and reaffirmed

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[14] U.S. Congress, An Act to Establish a National Park Service and for Other Purposes, Public Law 64-235, August 15, 1916. Available online at: *https://www.nps.gov/foun/learn/management/upload/1916%20ACT%20TO%20ESTABLISH%20A%20NATIONAL%20PARK%20SERVICE-5.pdf*, accessed July 24, 2020.

[15] Ibid.

[16] National Park Service, Management Policies 2006 – The Guide to Managing the National Park System. August 31, 2006. Available online at: *https://www.nps.gov/policy/mp/policies.html*, accessed July 24, 2020.

by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the NPS the management discretion to allow impacts on park resources and values when necessary and appropriate to fulfill the purposes of the park. That discretion is limited by the statutory requirement that the NPS must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

An impact on any park resource or value may, but does not necessarily, constitute impairment. Impairment may result from visitor activities; NPS administrative activities; or activities undertaken by concessioners, contractors, and others operating in the park. Impairment may also result from sources or activities outside the park. An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified in the park's general management plan or other relevant NPS planning documents as being of significance.

An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.

The "park resources and values" that are subject to the no-impairment standard include:

- The park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- Appropriate opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing them;
- The park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and
- Any additional attributes encompassed by the specific values and purposes for which the park was established.

The management policies also address natural shoreline processes. The document states, “Where human activities or structures have altered the nature or rate of natural shoreline processes, the Service will, in consultation with appropriate state and federal agencies, investigate alternatives for mitigating the effects of such activities or structures and for restoring natural conditions.” Relatedly, for projects proposing beneficial use of dredged material for such mitigation purposes, the NPS reviews the proposal for consistency with its Beach Nourishment Guidelines. The guidelines set forth considerations, such as sediment properties, to guide the agency’s evaluation of whether beach nourishment should, or should not, take place in a park unit.[17]

The project elements proposed for Ocean Beach (e.g., revetments removal, buried wall installation, beach access stairway construction, beach nourishment) would be required to comply with the NPS management policies. As discussed in Chapter 1, Introduction and Background, and Chapter 2, Project Description, the project would restore and enhance the recreational opportunities, scenic views, and natural character of NPS lands – values underpinning the establishment of the Golden Gate National Recreation Area (GGNRA).[18] Implementing these improvements would require reshaping a segment of bluff seasonally inhabited by the state-listed-as-threatened bank swallow’s Fort Funston breeding colony. As discussed briefly above in Section 3.5.1, California Coastal Act, and more fully in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, considering the rarity of the habitat and its importance to the continuance of this special-status species, this EIR concludes the effect would be potentially significant, and no feasible mitigation exists to fully lessen or avoid the effect. The project’s effect on bank swallow habitat could conflict with specific management policy objectives. Overall, the project would substantially improve public access, recreational amenities, and the scenic and visual quality of the project area. For these reasons, the project overall would not obviously conflict with the overarching purpose and intent of the NPS Organic Act or NPS management policies. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Sections 4.2, Aesthetics, 4.5, Recreation, and 4.6, Biological Resources, for additional discussion of potential project effects on scenic and visual quality, public access and recreation, and biological resources, respectively. See also Appendix B Sections E.16, Geology and Soils, and E.17, Hydrology and Water Quality, for a more detailed discussion of the suitability of dredged material for beach nourishment.

3.6.2 Golden Gate National Recreation Area General Management Plan

In April 2014, the NPS published the Final General Management Plan/Environmental Impact Statement for the Golden Gate National Recreation Area and Muir Woods National Monument (GGNRA General Management Plan). The purpose of the plan is to provide comprehensive direction for resource preservation and visitor use and a basic foundation for decision-making for the GGNRA and Muir Woods National Monument for the next 20 years. The plan considers four management alternatives – three action alternatives and a no-action alternative. In its January 2015 Record of Decision, the NPS identified Alternative 1, Connecting People with the Parks, as its selected alternative. Under Alternative 1, park lands in San Francisco would be “managed to preserve and enhance a variety of settings and improve and expand the facilities that welcome and support visitors to the ‘National Park Next Door.’”[19]

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[17] NPS, 2012. National Park Service Beach Nourishment Guidance, Natural Resource Technical Report NPS/NRSS/GRD/NRTR-2012/581. September 2012.

[18] U.S. Congress, An Act to establish the Golden Gate National Recreation Area in the State of California, and for other purposes. Public Law 92-589- Oct. 27, 1972. Available online at: *https://uscode.house.gov/statutes/pl/92/589.pdf*, accessed July 24, 2020.

[19] National Park Service. *Final General Management Plan/Environmental Impact Statement for the Golden Gate National Recreation Area and Muir Woods National Monument.* April 2014. Available online at: *https://parkplanning.nps.gov/ document.cfm?parkID=303&projectID=15075&documentID=58777*. Accessed July 24, 2020.

With respect to Ocean Beach specifically, the GGNRA General Management Plan states:

> *The park would continue to participate in multiagency planning and implementation efforts following the 2012 Ocean Beach Master Plan, and other more detailed planning and implementation processes that would follow.*
>
> *The National Park Service would continue to work with the City of San Francisco, California Coastal Commission, and the U.S. Army Corps of Engineers to address coastal erosion, restore natural processes, and maximize protection of the beach for its natural and recreational values. The National Park Service could relocate park facilities from vulnerable locations and would work with municipalities to identify the most compatible and sustainable management of stormwater and wastewater facilities within their easement rights.*

To help guide park management decision-making across the GGNRA's over 80,000 acres of park lands, the plan establishes and designates for each park one or more management zones. Each zone defines a set of desired conditions for natural and cultural resources, visitor experience, and general levels of development. These desired conditions differ among management zones and reflect the overall focus of each particular zone. The plan identifies Ocean Beach as having the Natural Zone designation and the nearshore ocean areas as having the Scenic Corridor Zone designation. Within the Natural Zone, the plan calls for natural resources to be managed in a way that preserves and restores resource integrity while providing for various types of visitor experience, including opportunities to directly experience the natural resources primarily from trails and beaches. Within the Scenic Corridor Zone, the plan calls for preserving the ocean environment and accommodating public uses including surfing, boating, and recreational fishing, along with recommending that park managers protect the marine habitat, geologic resources and processes, and other natural features of the area.

As discussed in Chapter 1, Introduction and Background, and Chapter 2, Project Description, the project would implement elements of the Ocean Beach Master Plan within GGNRA lands. Project implementation would restore and enhance the recreational opportunities, scenic views, and natural character of NPS lands, consistent with GGNRA General Management Plan objectives for Ocean Beach. As explained briefly in Section 3.6.1, National Park Service Management Policies, and more fully in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, project construction would require removal of bank swallow habitat, which could conflict with specific GGNRA General Management Plan objectives related to preserving natural resource integrity. Overall, the project does not appear to conflict the primary management objectives identified in the GGNRA General Management Plan for Ocean Beach, as it addresses coastal erosion through the installation of a buried wall, relocates park facilities from vulnerable locations, restores natural processes by removing the rock revetments and creating a more natural shoreline profile, and maximizes recreational opportunities by expanding the area of publicly accessible open space and maintaining a sandy beach through ongoing beach nourishment. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Sections 4.5, Recreation, and 4.6, Biological Resources, for additional discussion of potential project effects on recreation and biological resources, respectively. See also Appendix B Section E.16, Geology and Soils, for a more detailed discussion of the project's potential effects on geologic resources and processes.

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CHAPTER 4
ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

4.1 Overview

This chapter provides an analysis of the physical environmental effects of implementing the Ocean Beach Climate Change Adaptation Project (the project) as described in Chapter 2, Project Description. This section presents the framework used in the individual environmental topic sections in this chapter as well as the basic assumptions used in the impact analyses, including the scope of analysis, the baseline conditions used to analyze impacts, the categories of impact significance, and the assumptions for the cumulative impact analyses. As discussed further below, for each environmental impact report (EIR) topic identified in Section 4.1.1, Scope of Analysis, the environmental setting is described, the impacts of the project are analyzed, and mitigation measures are recommended where necessary to address potentially significant impacts.

4.1.1 Scope of Analysis

4.1.1.1 INITIAL STUDY TOPICS

As described in Chapter 1, Introduction and Background, the San Francisco Planning Department determined that an EIR is required for the project in compliance with the California Environmental Quality Act (CEQA) and published a notice of preparation (NOP; see Appendix B). As part of the preparation of the EIR, the planning department identified several resource topics that could be adequately addressed in an initial study. The initial study prepared for this EIR (see Appendix B) concluded that many of the physical environmental impacts of the project would be less than significant, or that mitigation measures agreed to by the project sponsor and required as conditions of approval would reduce significant impacts to a less-than-significant level. CEQA does not require further assessment of the effects found not to be significant in the initial study; thus, those issues are not included in this chapter. The topics addressed in the initial study and not included in this chapter are listed in **Table 4.1-1**, below. Also shown are abbreviations for each environmental topic that are used in the naming of impact statements and mitigation measures as necessary. Please refer to the initial study in Appendix B for the impact analysis of the project with respect to these resource topics.

Table 4.1-1 Environmental Topics For Which Effects Were Found Not To Be Significant (Discussed in Appendix B)

Land Use and Land Use Planning (LU)	Greenhouse Gas Emissions (GG)	Hazards and Hazardous Materials (HZ)
Population and Housing (PH)	Wind (WI)	Mineral Resources (MN)
Cultural Resources (CR)	Shadow (SH)	Energy (EN)
Tribal Cultural Resources (TCR)	Utilities and Services Systems (UT)	Agriculture and Forest Resources (AG)
Air Quality (AQ)*[a]	Public Services (PS)	Wildfire (WF)
	Geology and Soils (GE)*[b]	

NOTE:
[a] Required Mitigation Measure M-AQ-2: Construction Emissions Minimization reduces effects to less than significant.
[b] Required Mitigation Measure M-GE-5: Paleontological Resources Monitoring and Mitigation Program reduces effects to less than significant.

4.1.1.2 EIR TOPICS

The environmental topics addressed in this chapter of the EIR are listed in **Table 4.1-2** below, with the abbreviations for each topic that are used in the naming of impact statements and mitigation measures shown in parentheses.

Table 4.1-2 EIR Environmental Topics and Sections (EIR Chapter 4)

4.2 Aesthetics (AE)	4.5 Recreation (RE)
4.3 Transportation and Circulation (TR)	4.6 Biological Resources (BI)
4.4 Noise and Vibration (NO)	

4.1.2 Format of Environmental Analysis

Each environmental topic section within Chapter 4 contains the following elements, based on the requirements of CEQA:

- **Introduction.** This subsection includes a brief description of the types of impacts that are analyzed, identifies issues raised during the scoping period, and provides a summary of any impacts that were scoped out in the initial study (that is, impacts that were determined to be less than significant or less than significant with mitigation measures agreed to by the SFPUC and required as conditions of approval).
- **Environmental Setting.** This subsection describes the existing, baseline physical environmental conditions in the project area at an appropriate level of detail to allow the reader to understand the impact analysis.
- **Regulatory Framework.** This subsection describes the relevant federal, state, and local regulatory requirements that are directly applicable to the environmental topic being analyzed.
- **Impacts and Mitigation Measures.** This subsection evaluates the potential for the project to result in adverse effects on the existing physical environment. The subsection begins with definition of the significance criteria used for evaluating environmental impacts, followed by the approach to analysis, a discussion of the impacts of the project and mitigation measures (if required), and a discussion of cumulative impacts.

  For each environmental topic section, this EIR assigns impacts a unique alphanumeric identifier that is comprised of that section's abbreviation and a number (see Tables 4.1-1 and 4.1-2), with all impacts for that topic sequentially numbered. For example, the abbreviation "BI" indicates biological resources impacts; the first biological resources impact is Impact BI-1, the second biological resources impact is Impact BI-2, and so on. The mitigation measure(s) that correspond with the impact are identified with an "M" in front of the same alphanumeric code. For example, Mitigation Measure M-BI-2a addresses Impact BI-2.

  Each environmental topic section discusses cumulative impacts immediately following the project-level impact analysis. The analysis of cumulative impacts considers the effects of the project together with those of other reasonably foreseeable future projects proposed by the San Francisco Public Utilities Commission (SFPUC) or other entities. This EIR presents an evaluation of cumulative impacts for each environmental topic based on the same setting, regulatory framework, and significance criteria as the project-level impacts. Additional mitigation measures are identified if the analysis determines that the project's contribution to a cumulative impact would be "cumulatively considerable" and therefore significant. Cumulative impacts are designated with a "C" in front of the code corresponding to the subject environmental topic; for example, the cumulative biological resources impact is designated Impact C-BI. See Section 4.1.5, Approach to Cumulative Impact Analysis and Cumulative Projects, below, for further discussion of the approach to the cumulative impact analyses.

4.1.3 Baseline Conditions for Evaluation of Impacts

CEQA Guidelines section 15125 provides that, in most cases, the environmental conditions at the time of publication of the NOP of the EIR constitute the appropriate baseline physical conditions by which the lead agency should evaluate project impacts. These baseline conditions are described in the Environmental Setting section of each Chapter 4 environmental topic section. The impact analysis identifies the conditions that are anticipated to occur with implementation of the project and compares those conditions against the baseline conditions to determine if the project would result in a significant environmental impact.

Between April 2020 and August 2021 the city temporarily closed the Great Highway to vehicular traffic between Sloat Boulevard and Lincoln Way to provide outdoor open space during the Covid-19 public health emergency. The San Francisco Municipal Transportation Agency (SFMTA) also implemented temporary traffic calming and diversion measures to address changed travel patterns in the Sunset neighborhood (e.g., signs, turn restrictions, stop signs, speed cushions). The Great Highway closure and associated temporary traffic calming and diversion measures remained in effect at the time of NOP publication in September 2020. This EIR generally uses the physical conditions in the project area at the time of NOP publication as the baseline conditions to evaluate construction, operational, and cumulative impacts of the project. However, at the time of the NOP publication, the Great Highway closure was understood to be temporary; therefore, the EIR considers a baseline condition with the Great Highway open to vehicular traffic.

4.1.4 Determination of Environmental Significance

The significance criteria used in this EIR are based on guidance from the Environmental Planning Division of the San Francisco Planning Department regarding the thresholds of significance used to assess the severity of the environmental impacts of the project; guidance is based on CEQA Guidelines Appendix G, with some modifications. Each section of Chapter 4 presents, before the discussion of impacts, the significance criteria used to analyze each environmental topic. As discussed in Chapter 2, Project Description, Section 2.5.5, SFPUC Standard Construction Measures, the SFPUC has adopted standard construction measures to reduce potential environmental effects during construction. The impact analysis assumes, where applicable, that the project would implement the required SFPUC standard construction measures. The categories used to designate impact significance are as follows:

- **No Impact.** A no impact conclusion is reached if there is no potential for impacts or the environmental resource does not occur within the project area or the area of potential effects.
- **Less than Significant.** This determination applies if the impact does not exceed the defined significance criteria or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws or regulations. No mitigation is required for impacts determined to be less than significant.
- **Less than Significant with Mitigation.** This determination applies if there is a potential for the project to result in an adverse effect that would or could meet or exceed the significance criteria, but feasible

mitigation is available that would reduce the impact to a less-than-significant level. An impact described as "potentially" significant indicates there is a potential for this impact to occur, but there is not enough project information or site-specific information to determine definitively whether or not it qualifies under the significance criteria as significant. Impacts identified as "potentially significant" are treated the same as significant impacts in this EIR.

- **Significant and Unavoidable with Mitigation.** This determination applies if the project would result in an adverse effect that would or could meet or exceed the significance criteria and there is feasible mitigation available to lessen the severity of the impact, but either the residual effect after implementation of the measure would remain significant or there is some uncertainty about the effectiveness of the mitigation measure.
- **Significant and Unavoidable.** This determination applies if the project would result in an adverse effect that would or could meet or exceed the significance criteria and for which there is no feasible mitigation available.

4.1.5 Approach to Cumulative Impact Analysis and Cumulative Projects

4.1.5.1 CEQA PROVISIONS REGARDING CUMULATIVE IMPACTS

Cumulative impacts, as defined in section 15355 of the CEQA Guidelines, refer to two or more individual effects that, when taken together, are "considerable" or that compound or increase other environmental impacts. A cumulative impact from several projects is the change in the environment that would result from the incremental impact of each project when added to those of other closely related past, present, or probable future projects. Section 15130 of the CEQA Guidelines provides the following pertinent guidance for cumulative impact analysis:

- An EIR shall discuss cumulative impacts of a project when the project's incremental effect is "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in connection with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary).
- An EIR should not discuss impacts that do not result in part from the project evaluated in the EIR.
- A project's contribution is less than cumulatively considerable, and thus not significant, if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact.
- The discussion of impact severity and likelihood of occurrence need not be as detailed as for effects attributable to the project alone.
- The focus of analysis should be on the cumulative impact to which the identified other projects contribute, rather than on attributes of the other projects that do not contribute to the cumulative impact.

CEQA Guidelines section 15130(b)(1) provides two approaches to a cumulative impact analysis. The analysis can be based (a) on a list of past, present, and probable future projects producing related or cumulative impacts; or (b) a summary of projections contained in a general plan or related planning document.

4.1.5.2 APPROACH TO CUMULATIVE IMPACT ANALYSIS IN THIS EIR

The cumulative impact analysis considers the effects of the project together with those of other past, present, or probable future projects proposed by the SFPUC or others. In Sections 4.2 through 4.6 of this chapter, and Appendix B, Initial Study, the cumulative impact analysis for each resource topic follows the analysis of the project-specific impacts. Each analysis of cumulative impacts is based on the same setting, regulatory framework, and significance criteria as the project-specific analysis. Additional mitigation measures are identified if the cumulative analysis determines that a significant cumulative impact could occur and the project's contribution to a significant cumulative impact would be considerable, even with project-level mitigation.

As permitted in CEQA Guidelines section 15130(b)(1), the analyses in this EIR employ the list-based approach, a projections approach, or a hybrid of the two as appropriate in the cumulative impact analysis. In the list-based approach, the analysis is based on a list of probable future projects that could result in related or cumulative impacts. A probable future project is defined as one that is "reasonably foreseeable," which is generally a project for which an application has been filed with the approving agency or that has approved funding. In the projections approach, projections contained in an adopted local, regional, or statewide plan, or related planning document, are summarized to describe or evaluate conditions contributing to the cumulative effect. Some other projects, such as certain improvements at the Oceanside Water Pollution Control Plant (Oceanside Treatment Plant), are also considered reasonably foreseeable because they have been included in the SFPUC's capital plan and it is reasonable to expect that they would be implemented, even if an application has not been filed and there is no approved funding at this time. The cumulative projects identified in the vicinity of the project are listed on **Table 4.1-3** (see p. 4.1-9).

As discussed above under Section 4.1.3, Baseline Conditions for Evaluation of Impacts, beginning in April 2020 the city temporarily closed the Great Highway between Sloat Boulevard and Lincoln Way to provide outdoor open space during the Covid-19 public health emergency. The San Francisco Municipal Transportation Agency (SFMTA) also implemented temporary traffic calming and diversion measures to address changed travel patterns in the Sunset neighborhood (e.g., signs, turn restrictions, stop signs, speed cushions). The Great Highway closure and associated temporary traffic calming and diversion measures remained in effect at the time of NOP publication in September 2020, and the Great Highway reopened to weekday vehicular traffic in August 2021. In the intervening period, the San Francisco County Transportation Authority (the transportation authority) worked with the SFMTA and other city agencies to study the potential for permanent closure of this segment of the Great Highway as part of a broader study of ways to increase the use of non-automobile modes of travel in the Outer Sunset and Parkside neighborhoods, known as the District 4 Mobility Study. The study explored four long-term configuration concepts of the Great Highway between Sloat Boulevard and Lincoln Way ranging from no closure, weekend closure, closure of southbound lanes, and full closure. This work identifies street and network changes that would complement each potential concept.

The SFMTA and San Francisco Recreation and Parks Department (Rec and Park) recommended additional study to evaluate two possible configurations of the Great Highway between Sloat Boulevard and Lincoln Way, with either full time, weekend, or seasonal closure:[1]

[1] San Francisco Municipal Transportation Agency, Item 3 Great Highway Staff Report, San Francisco Municipal Transportation Agency Board of Directors and Recreation and Park special joint meeting, June 10, 2021.

- **Full Promenade**. This configuration would close the Great Highway between Sloat Boulevard and Lincoln Way as a promenade across all lanes of the Great Highway, with no vehicular use other than emergency vehicle access and authorized construction vehicles for sand removal and backpassing.
- **Northbound Vehicular Travel**. In this configuration the southbound lanes would be used as a promenade and the northbound lanes would be restored to northbound vehicle use. This configuration would require signal changes at Great Highway/Lincoln Way to accommodate pedestrians crossing.

The city is currently implementing the full promenade closure on weekends only and collecting data, including the effects on the transportation system. The city has not yet selected the configuration or timing of a potential closure. Additional study, such as a pilot project to evaluate one of the potential configurations, could also be needed prior to any future decision-making regarding whether to propose the permanent closure of the Great Highway between Sloat Boulevard and Lincoln Way and other associated changes in the Sunset neighborhood and surrounding area. The city would base its decision on the results of these studies, funding availability, stakeholder engagement, and other considerations.

At the time of this EIR preparation, long-term decision-making about potential closure of this segment of the Great Highway is uncertain. The planning department considers projects with this level of uncertainty as speculative and does not typically consider them in CEQA analysis of cumulative impacts; however, for the reasons discussed below, this EIR evaluates whether the proposed project would result in significant cumulative environmental impacts both with and without the permanent closure of the Great Highway between Sloat Boulevard and Lincoln Way.

Although the city has not proposed permanent closure of the Great Highway between Lincoln Way and Sloat Boulevard at this time and may never propose this, the city temporarily closed this roadway segment for 16 months in 2020 and 2021 and, since August 2021, has been implementing a full promenade closure on weekends only. The project's permanent closure of the Great Highway between Sloat and Skyline boulevards would substantially alter vehicular circulation in the project vicinity. Moreover, certain project impacts may be different if combined with a permanent Great Highway closure between Sloat Boulevard and Lincoln Way, in any of the proposed configurations, such as traffic and noise impacts along Sloat Boulevard. Therefore, given the recent extended closure and planning initiatives exploring potential future closures, the department determined that this EIR should consider a permanent Great Highway closure between Sloat Boulevard and Lincoln Way in an additional cumulative impact analysis for selected topics where project-level or cumulative impacts would be altered by this cumulative scenario, such as noise, transportation, and health risk. However, because permanent closure is not proposed at this time and is uncertain for the reasons discussed above, the EIR presents the cumulative impacts of the project for each environmental topic without the permanent closure between Sloat Boulevard and Lincoln Way. By evaluating the project's cumulative impacts with and without the permanent closure between Sloat Boulevard and Lincoln Way, the EIR will best serve its primary function as an informational document to support informed decision-making. For purposes of analysis, the planning department conservatively assumes the full promenade closure configuration would be implemented full-time.

The cumulative projects are subject to independent environmental review and consideration by approving agencies. Consequently, it is possible that some of the projects will not be approved or will be modified prior to approval (e.g., as a result of the CEQA process).

Projects that are relevant to the cumulative analyses include those that could contribute incremental effects on the same environmental resources and would have similar environmental impacts as those identified for the project in this EIR. The following factors were used to determine an appropriate list of relevant projects to be considered in the cumulative analyses:

- **Similar Environmental Impacts.** A relevant project contributes to effects on the same environmental resources that are also affected by the project and would have similar or related environmental impacts as those discussed in this EIR (Sections 4.2 through 4.6 in this chapter and Appendix B, Initial Study).
- **Geographic Scope and Location.** A relevant project is located within the defined geographic scope for the cumulative effect. The geographic scope of cumulative projects depends on the environmental resource affected and is identified within each section. The geographic scope generally coincides with the physical environment described in the setting and could include the areas adjacent to the proposed construction activities that are within and adjacent to the project area. For some environmental topics, however, the geographic scope can extend farther, such as for the discussion of transportation in which the regional roadway network is relevant, or the evaluation of air quality effects in which the regional air basin is the appropriate geographic scope for the analysis.
- **Timing and Duration of Implementation.** The schedule of activities for a relevant project would need to coincide in timing with the effects of the project to result in cumulative impacts. For temporal impacts such as noise and transportation, the cumulative analyses consider the short-term cumulative effects of those projects with overlapping construction schedules as well as the long-term cumulative effects of those projects that would be in operation concurrently with the project and would affect the same environmental resources and sensitive receptors.

The cumulative analyses presented in Sections 4.2 through 4.6 and Appendix B, Initial Study, first consider whether there is an impact of the project that could result in adverse physical effects on the environment. If so, the cumulative analysis considers whether any of the relevant projects would result in related impacts or affect the same environmental resources as the project, resulting in a cumulative impact. If the cumulative impact is considered significant based on the identified significance criteria, the analysis considers whether the project’s contribution would be cumulatively considerable (significant) or not cumulatively considerable (less than significant). If the project’s contribution would be cumulatively considerable, mitigation measures are identified to reduce the project’s contribution to a less-than-cumulatively-considerable level (less than significant with mitigation). If there is no feasible mitigation to reduce the project’s contribution to a less-than-significant level, the project’s contribution to the cumulative impact is considered significant and unavoidable.

Table 4.1-3 lists the probable future projects that are considered in the cumulative analyses (based on the factors described above), and their locations are shown on **Figure 4.1-1** (see p. 4.1-12). The list includes projects that would be constructed in the general vicinity of the project, with the potential to result in cumulative impacts during construction. The list also includes projects that would be in operation concurrently with the project and that would have similar environmental impacts to the project operations, with the potential to result in cumulative operational impacts. As described above, the last project on the list, potential Great Highway Closure between Sloat Boulevard and Lincoln Way (referred to generally as “the Upper Great Highway closure project”), is only included in a second cumulative scenario and discussed where it would result in a different cumulative impact than without its implementation.

As discussed in Chapter 2, Project Description, Section 2.5.5, SFPUC Standard Construction Measures, the SFPUC has adopted standard construction measures to reduce potential environmental effects during construction. Because the standard construction measures apply to all SFPUC projects, the analysis of cumulative projects assumes that like the project, all SFPUC-sponsored projects would implement the standard construction measures.

Table 4.1-3 Projects Considered in Cumulative Impact Analysis

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Construction Dates
1	Fort Funston Trail Connection (NPS)	The Fort Funston trail connection would connect the existing trails in Fort Funston to a location near the Great Highway's existing southbound lanes. The project is intended to provide connection between Fort Funston and the Ocean Beach Climate Change Adaptation Project's multi-use trail along Ocean Beach.	2027
2	Westside Pump Station Reliability Improvements (SFPUC)[a]	The Westside Pump Station Reliability Improvements Project would involve underground utilities and aboveground improvements. The aboveground structures would include an electrical building to house new electrical equipment, pump facilities, and electrical switchgear.	2021-2023
3	Vista Grande Drainage Basin Improvement (City of Daly City)[b]	The Vista Grande project would alleviate flooding in the Vista Grande Drainage Basin by expanding the hydraulic capacity of the existing stormwater infrastructure to accommodate peak flows generated by the 25-year design storm. The project would involve improvements to stormwater conveyance infrastructure adjacent to and within Lake Merced, and extending beneath Fort Funston and onto the Fort Funston beach. The existing ocean outlet structure would be removed and replaced with a low-profile outlet structure set back nearer to the existing cliff face. Sea walls would be constructed to the north and south of the rehabilitated ocean outlet. Operational components of the project would include management of water surface elevations in Lake Merced and a lake management plan that would include water quality best management practices, including upstream improvements in the basin and additional actions.	2022-2027
4	Reconfiguration of the Sloat Boulevard and State Route 35 (Skyline Boulevard) Intersection (SFMTA)[c]	The intersection of State Route 35 (Skyline Boulevard) and Sloat Boulevard would be reconfigured either with a traffic signal or roundabout to improve safety for all road users, increase visibility of pedestrians, and improve or maintain transit and vehicle circulation at the intersection. This project is currently on hold pending the results of other circulation studies that would not be complete until after 2024.	After 2024
5A	Oceanside Treatment Plant Improvements - Biosolids Cake Hopper Reliability Upgrade (SFPUC)	The SFPUC would refurbish the three biosolids cake hoppers, including replacement of the discharge gates and actuators (type of gate to be determined by pilot study), load cells, and ultrasonic level instrumentation.	2026-2030
5B	Oceanside Treatment Plant Improvements - Seismic Retrofits (SFPUC)	To meet seismic reliability goals (provide treatment within 72 hours of an earthquake and provide life safety protection for occupied facilities), the SFPUC would undertake seismic and structural retrofits on the primary clarifiers, administration building, and pretreatment and solids building.	2026-2030
6	Signalization of State Route 35 (Skyline Boulevard) and Great Highway Intersection (Caltrans)	Caltrans would install a traffic signal at the intersection of the Great Highway and State Route 35.	2022

Table 4.1-3 Projects Considered in Cumulative Impact Analysis (Continued)

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Construction Dates
1	San Francisco Zoo Recycled Water Pipeline (SFPUC, San Francisco Zoo)[d]	The San Francisco Zoo Recycled Water Pipeline Project would convert the current groundwater supply and distribution system to a recycled water supply and distribution system, except for end uses that need to be converted to potable water (e.g., drinking water for animals). Recycled water would replace groundwater currently used to supply various uses including irrigation, cleaning and replenishment of surface water bodies, animal exhibit washdown and pool refilling, and general cleaning. A new recycled water pipeline would be installed connecting the zoo's groundwater reservoir to the existing Westside Enhanced Recycled Water Project distribution line. The project would also include a series of small retrofits including signage installation and tagging of fixtures. This project does not include landscaping, irrigation system retrofits, or cross-connection testing.	2023-2024
8	Lake Merced West Project - 520 John Muir Drive (Rec and Park)	The Lake Merced West Project would create a recreational facility on approximately 11 acres located at 520 John Muir Drive, on the southwest side of Lake Merced. The proposed recreation facility would offer an array of activities open to the public. The facility would include a restaurant, community building, skateboard park, boat dock and rentals, sport courts, and areas that could be used flexibly for a wide variety of uses such as picnics or larger gatherings.	2024-2026
9	Westside Force Main Reliability (SFPUC)[e]	A redundant force main would be installed between the Westside Pump Station and the Oceanside Treatment Plant. The approximately 2,765-linear-foot pipeline would run west from the Westside Pump Station and then south and parallel to the existing force main, either west of the existing force main within the paved outer northbound lane in the Great Highway or east of the existing force main within the east shoulder of the Great Highway, then turn east to connect to the headworks at the Oceanside Treatment Plant. Open cut construction would likely be required, with a trench depth ranging from approximately 3 feet near the Westside Pump Station to up to 60 feet near Oceanside Treatment Plant.	2027-2030
10	2700 Sloat Boulevard[f]	The project would demolish the existing Sloat Garden Center consisting of a commercial building, display areas, storage, and parking lot and construct a new residential development with ground floor commercial/retail and a basement. According to preliminary plans, the project could consist of three 8- to 12-story towers and provide between 213 and 283 residential units, a total of over 250 class 1 bicycle parking spaces, and no off-street parking spaces.	Unknown
11	*Potential Upper Great Highway Closure between Sloat Boulevard and Lincoln Way (Rec and Park/SFMTA)*	*This potential project could be proposed by Rec and Park and SFMTA following additional study. This project is included in a second program-level cumulative impact analysis for relevant topics. The analysis conservatively assumes permanent full closure of the Great Highway between Sloat Boulevard and Lincoln Way for a pedestrian and bicycle promenade.*	*Unknown*

Table 4.1-3 Projects Considered in Cumulative Impact Analysis (Continued)

Project No. on Map	Project Name (Project Sponsor or Jurisdiction)	Project Description	Construction Dates
	Only Considered in Additional Cumulative Scenario for Select Topics		

SOURCES:
[a] San Francisco Public Utilities Commission (SFPUC), Westside Pump Station Reliability Improvements, *https://www.sfpuc.org/construction-contracts/construction-projects/westside-pump-station-reliability-improvements*, accessed July 31, 2020.
[b] U.S. Department of the Interior, National Park Service, Record of Decision Vista Grande Drainage Basin Improvement Project Environmental Impact Statement, July 26, 2018.
[c] San Francisco Municipal Transportation Agency, *Sloat & Skyline Intersection Alternatives Analysis*, *https://www.sfmta.com/projects/sloat-skyline-intersection-alternatives-analysis*, accessed July 31, 2020.
[d] SFPUC, Water Enterprise FY 2021-2030 Capital Plan Summary, Water Appendix.
[e] SFPUC, Water Enterprise FY 2021-2030 Capital Plan Summary, Water Appendix.
[f] The San Francisco Planning Department issued Preliminary Project Assessments for two versions of this project in June 2020. Although a project application has not been submitted and future project plans could be different than described, this project is included on the cumulative projects list due to its scale and the infrequency of new development in the neighborhood. The timing of an application for a residential development is unknown, but is considered likely in the foreseeable future.

SOURCE: ESA, 2020; ESRI, 2020

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Figure 4.1-1
Cumulative Projects

4.2 Aesthetics

4.2.1 Introduction

This section describes the existing visual character of the project area and identifies the potential aesthetic resources impacts associated with implementation of the project. The analysis addresses the potential aesthetic effects from construction and operation of the project, including effects on scenic vistas, visual quality and character, scenic resources, and lighting environment. This section includes photographs to show existing visual conditions in the project area from various perspectives and photo simulations of visual conditions with implementation of the project. The impact analysis evaluates potential aesthetic impacts of the project and identifies mitigation measures to avoid or reduce significant adverse impacts, as appropriate.

4.2.2 Environmental Setting

Visual or aesthetic resources are generally defined as both the natural and built features of the landscape that contribute to the public's experience and appreciation of the environment. The physical aesthetic setting therefore encompasses any area in the project vicinity from which there are scenic public views that could be affected by the project. Depending on the extent to which a project's presence would alter the perceived visual character and quality of the environment, a visual or aesthetic impact may occur. This discussion defines key terms used in the aesthetics evaluation and describes the project area in terms of its scenic resources.

4.2.2.1 CONCEPTS AND TERMINOLOGY

Visual character is a general description of the visual attributes of a particular setting. The purpose of defining the visual character of an area is to provide the context within which the visual quality of a particular site or locale is most likely to be perceived by the viewing public. For urban areas, visual character is typically described on the neighborhood level, or in terms of areas with common land use, development intensity, and/or urban design features. For natural and open space settings, visual character is most commonly described in terms of areas with common landscape attributes (i.e., landform, vegetation, water features, etc.).

Visual quality is defined as the overall visual impression or attractiveness of a site or locale as determined by its aesthetic qualities (such as color, variety, vividness, coherence, uniqueness, harmony, and pattern).

Scenic vistas are locations from which the public can experience unique and exemplary views, typically from elevated vantage points that offer panoramic views of great breadth and depth.

Viewer exposure addresses the variables that affect the viewing conditions of a site. Viewer exposure considers some or all of the following factors: landscape visibility (the ability to see the landscape); viewing distance (i.e., the proximity of viewers to the project); viewing angle (whether the project would be viewed from a superior, inferior, or level line of sight); extent of visibility (whether the line of sight is open and panoramic to the project area or restricted by terrain, vegetation, and/or structures); and duration of view.

A *viewshed* is an area of land, water, or other urban or environmental element that is visible to the human eye from a fixed vantage point.

4.2.2.2 VISUAL STUDY AREA

The visual study area for the project includes all public areas from which project components would be visible. The project area is located along a coastal bluff on the edge of a mixed urban and open space environment often comprised of steep terrain. This location offers expansive views of Ocean Beach and the Pacific Ocean, as well as distant hills and views of San Francisco's distinctive built environment; however, topography, trees, shrubs, and buildings quickly restrict or block views of project components as viewers move away from the project site. Consequently, these elements generally limit the visual study area to publicly accessible locations within and immediately surrounding project components. For example, while components of the project are adjacent to Fort Funston, the only area of public use in Fort Funston from which project activities would be visible is the northern portion of Fort Funston beach.

The exact boundaries of the visual study area depend on site conditions (i.e., viewshed, structures, and vegetation) and are highly site-specific. Site visits were performed in November and December 2019, and March 2020 in order to further define and assess the visual study area and capture representative photographs documenting existing visual conditions of the project site. **Figure 4.2-1** provides a map showing the location and direction of photograph viewpoints that generally define the visual study area. **Figures 4.2-2**, **4.2-3**, **4.2-4**, and **4.2-5** present 13 representative publicly available views of the project site and adjacent areas, which are used to describe the project site's visual character in the next section.

VIEWS ALONG SLOAT BOULEVARD AND GREAT HIGHWAY INTERSECTION

Photos 5 through 8 on Figure 4.2-3 show the Sloat Boulevard zoo vehicle access and the Sloat Boulevard/Great Highway intersection from various viewpoints. As shown in Photo 5, Sloat Boulevard is framed by trees and shrubs along the zoo boundary to the south (left side) and residential structures to the north (right side) of the viewpoint, while paved city streets and sidewalks comprise the foreground and mid-views. The NPS public restroom is visible in the distance, but neither Ocean Beach nor the Pacific Ocean are visible from this vantage point due to vegetation, topography, and distance.

Continuing along Sloat Boulevard to its intersection with the Great Highway, the NPS public restroom and the Westside Pump Station are the only structures visible towards the southeast and southwest, respectively (Photos 6 and 7); these features are accompanied by small sandy, vegetated dunes in the foreground. From the east side of the intersection, views of the sandy beach are impeded by the bluff topography and intervening restroom structure and small adjacent sand dunes; however, the Pacific Ocean is visible in the distance. As viewed from the west side of the intersection, north of the NPS public restroom looking south (Photo 8), the Pacific Ocean and portions of the long stretch of South Ocean Beach where project work would occur are visible; however, the view is dominated and partially obstructed by manmade infrastructure in the mid-view, including the NPS public restroom, parking lot, and the Westside Pump Station, along with sand and dune vegetation in the foreground.

VIEWS FROM NORTH OCEAN BEACH AND SKYLINE BOULEVARD

Figure 4.2-4 depicts views from the northernmost and southernmost extents of the project area; namely, the area of North Ocean Beach from which sand would be excavated for small sand placements and the Great Highway/Skyline Boulevard intersection where the Skyline coastal parking lot would be constructed.

SOURCE: ESRI, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS Use Community

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Figure 4.2-1
Photo Location Map

Photo 1. View of South Ocean Beach, shortly after beach nourishment event, near the existing Sloat Boulevard parking lot, facing south.

Photo 2. View from South Ocean Beach nearing the rubble revetments, facing south.

Photo 3. View from the south end of South Ocean Beach, facing north.

Photo 4. View from a vehicle driving along the Great Highway, adjacent to the Oceanside Treatment Plant, as it bends away from the Pacific Ocean.

SOURCE: ESA, 2020

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Figure 4.2-2
Views of South Ocean Beach from Beach and Great Highway

Photo 5. View towards the Sloat Boulevard zoo entrance and the Great Highway, facing west.

Photo 6. View from the northeast corner of the Sloat Boulevard/Great Highway intersection, facing southwest.

Photo 7. View towards the Great Highway/Sloat Boulevard intersection and West Side Pump Station, facing southeast.

Photo 8. View towards the NPS restroom and parking lot, facing south.

SOURCE: ESA, 2020

Figure 4.2-3
Views of Sloat Boulevard/Great Highway Intersection and Infrastructure

Photo 9. View from the north end of the North Ocean Beach project area, facing south.

Photo 10. View from the south end of the North Ocean Beach excavation area, facing north

Photo 11. View from Lake Merced Trail as it approaches the Great Highway intersection, facing north.

SOURCE: ESA, 2020

Figure 4.2-4
Views of Project Area Limits: North Ocean Beach and Skyline Boulevard/Great Highway Intersection

Photo 12. Offshore view of north end of revetment near Westside Pump Station, facing east

Photo 13. Offshore view of revetments and bluffs, facing southeast

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: ESA, 2021

Ocean Beach Climate Change Adaptation Project

Figure 4.2-5
Views of South Ocean Beach Project Site from Offshore

As discussed in Chapter 1, Introduction and Background, Section 1.4.3, Ocean Beach Shoreline Modification Projects, the city currently obtains sand from North Ocean Beach for ongoing beach nourishment activities, known as backpass events; the excavated areas can be seen along the wide sandy beaches in Photos 9 and 10. Also prominent in these photographs is the O’Shaughnessy seawall, which forms the back beach and extends the length of the North Ocean Beach project area. Photo 9 presents a south-facing view along the shore with the seawall in the foreground and a wide, flat sandy beach in the middle- and background. Also visible in the very far distance is earthmoving equipment engaged in sand excavation and transport for the 2019 backpass event. Photo 10 depicts the north-facing view along the shore, with the 2019 backpass project excavated areas prominently visible in the fore- and middle-ground. Also visible from this vantage point are the O’Shaughnessy seawall and residential homes from the far western end of the Richmond neighborhood just beyond the beach, and with coastal bluffs and hills in the distance.

Moving to the southern end of the project area, the north-facing view towards the project area (Photo 11) represents what trail users traveling north along the Lake Merced Trail currently see as they approach the Skyline Boulevard/Great Highway intersection. As the photo shows, vegetation, topography, and roadway alignments near the intersection obscure views of the project area beyond those in the immediate intersection vicinity. The intersection with the Great Highway is dominated by a small median island with small trees and ground cover.

VIEWS OF SOUTH OCEAN BEACH FROM WATER

As shown in Photos 12 and 13 on Figure 4.2-5, positions offshore, such as on a boat or surfboard, provide panoramic views of Ocean Beach, of which the South Ocean Beach project site is a small component. The land presents as a wide but short band of sand, rubble, structures, and treetops in mid-range view between unbroken expanses of sky above and ocean in the foreground.

The wide strip of land visible from offshore is dominated by sandy bluffs and revetments below the sharp defining separation at the roadway top elevation. Facilities along the Great Highway are visible, although not dominant. A background of trees and hills in the distance is visible due to the line of bluff top.

Offshore recreationists are typically actively engaged in their activities and so may not take in this view for long durations.

VIEWS OF SOUTH OCEAN BEACH FROM LAND

The South Ocean Beach project area encompasses Ocean Beach and inland areas along nearby roadways. Due to the varied nature of the topography and existing infrastructure in this area, views of the site from beyond the project area tend to be short-range.

As shown in Photos 1 through 4 on Figure 4.2-2, due to the steep coastal bluff, views of South Ocean Beach are limited unless the viewer is on the beach or adjacent bluff itself (Photo 1). The bluffs of Fort Funston, while located adjacent to and at a higher elevation than the South Ocean Beach project site, do not provide views of the South Ocean Beach project site because no public trails are available on the bluffs where the site may be visible. When on South Ocean Beach (Photos 2 and 3), the depth of the view is vast, with panoramic views of the Pacific Ocean and distant hills in the background; however, the frame of view is confined by the bluff and the scene is dominated by foreground views of rubble and revetments along the beach and bluff, and fencing along the bluff top. When approaching South Ocean Beach along the Great Highway from Skyline Boulevard (Photo 4), the sandy beach is not visible. The view is comprised of ocean waters and coastal hills in the background, with fencing and a concrete barrier railing separating the currently useable lanes of the Great Highway from the unusable westernmost lane (that is unsafe due to coastal erosion).

Photos in **Figure 4.2-6** document the range of shore conditions that can occur at South Ocean Beach over the course of a year. Beach elevations fluctuate seasonally depending on the coastal processes discussed in Appendix B, Impact GE-3; for example, during the past five years, beach elevations near the photos in Figure 4.2-6 have varied from 1.4 to 5.8 feet NAVD 88, with an average elevation of 3.8 feet NAVD 88 (which is similar to the estimated elevation of the beach at the time Photo 3 [Figure 4.2-2] was taken).[1]

4.2.2.3 VISUAL CHARACTER

The project area comprises two locations along San Francisco's Pacific Ocean coastline. The first, where the main project activities would occur, is the portion of coastline between Sloat Boulevard and Fort Funston, generally referred to as "South Ocean Beach." The South Ocean Beach project area also includes locations of work activities on adjacent roadways (i.e., Great Highway, Sloat Boulevard, and Skyline Boulevard). The second location, where a smaller amount of work is proposed, is the stretch of coastline north of Lincoln Way generally referred to as "North Ocean Beach." The visual character of the project area and adjacent areas reflects the mix of urban, public utility, recreational, residential, and open space land uses in the vicinity, including Ocean Beach, the San Francisco Zoo, Lake Merced, urban development, and wastewater and transportation infrastructure. One can view both natural and built features such as vegetated hills, walking paths, the sandy beach, the ocean, public park and utility infrastructure, shoreline protection structures (i.e., rock and sandbag revetments), and residential and commercial buildings in close proximity and in the far distance.

4.2.2.4 VISUAL QUALITY

The visual quality of the project area is also generally high, defined by the dynamic contrast between built and natural environments and vivid colors from the city's architecture and from the ocean and dune vegetation. However, rock revetments and rubble along the beach, and fencing and a concrete barrier railing along the west side of Great Highway along South Ocean Beach (Figure 4.2-2), and to a lesser extent the large O'Shaughnessy seawall along North Ocean Beach (Figure 4.2-4), disrupt the continuity, texture, and integrity of scenic views and vistas to and along the coast, thereby detracting from the area's overall scenic quality.

SCENIC RESOURCES

Scenic resources include trees, rock outcroppings, and other unique landscape features that contribute to the visual character and scenic qualities of public views. The urban design element of the general plan contains objectives and policies to protect natural areas and features such as sand dunes; hills; cliffs; open spaces, including recreational resources; San Francisco Bay; and the Pacific Ocean, all of which contribute to the visual framework of the city. Scenic resources in the project vicinity include the Pacific Ocean, the beach and foredunes, mature trees and shrubs bordering portions of the Great Highway, the Fort Funston bluffs, and more distant hills to the north and east visible from some public locations in the project area.

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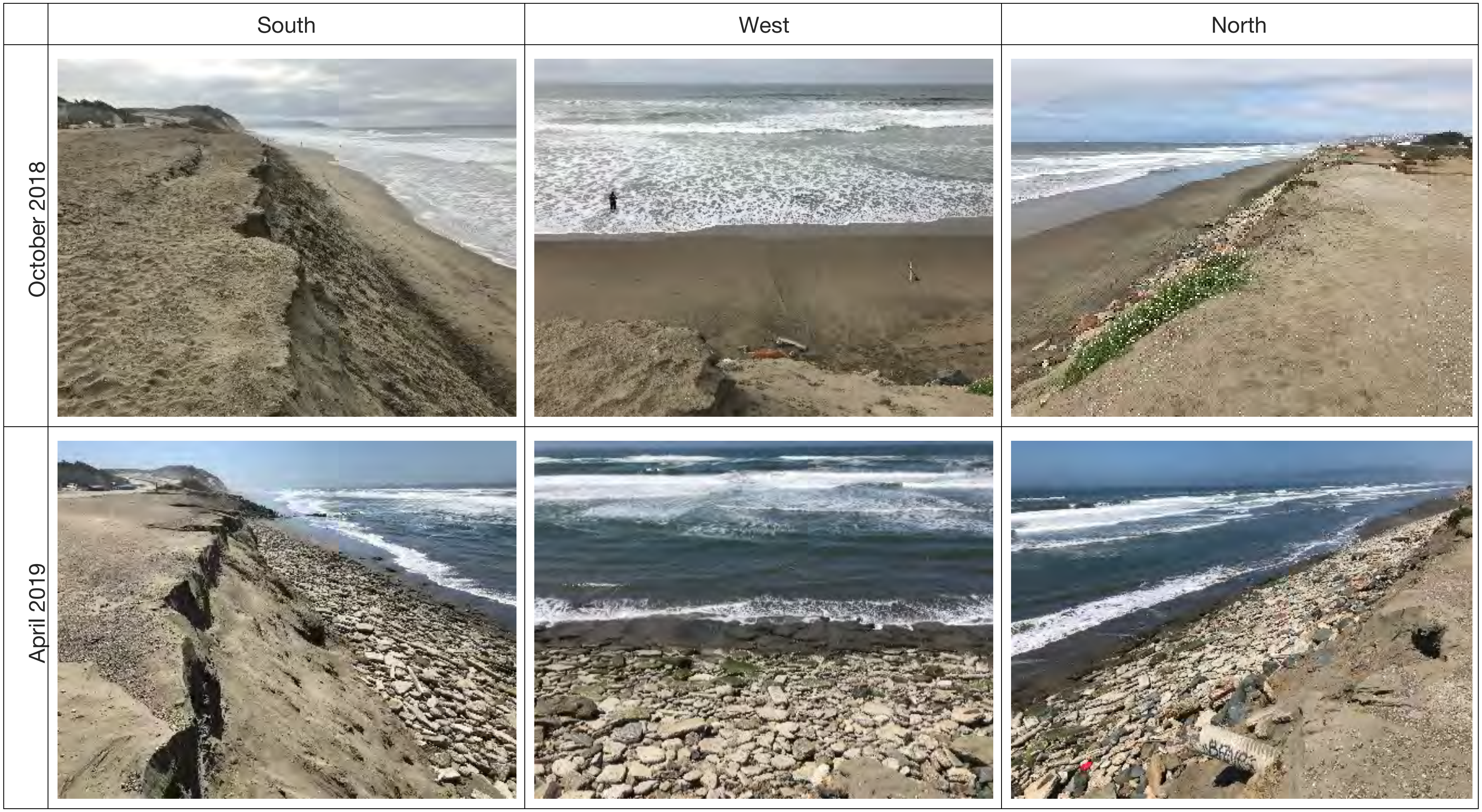
1 NAVD refers to the North American Vertical Datum of 1988, a fixed reference for elevations, and is generally close to the mean lower low water tidal datum.



NOTE: The photo shown in the lower left shows the southwest ocean outfall structure in the distance. This rock structure is often visible during low beach conditions of winter and spring.

SOURCE: ESA, Ocean Beach Short-Term Erosion Protection Measures Project 2018-2019 Monitoring Report, July 2019.

Figure 4.2-6
View of South Ocean Beach During Spring and Fall from Photopoint 14

The project area is not designated as a scenic area in the general plan or other regional plans, such as the Coastline Preservation and Recreation Plan.[2] There are no state designated scenic highways in San Francisco[3]; however, State Route 1 (S.R. 1) and S.R. 35 (also referred to as Skyline Boulevard at this location) are identified as eligible for designation as state scenic highways. S.R. 1 is located nearly 2 miles east of the project site at its closest point; views from this distance are obstructed by topography, vegetation, and residential development. S.R. 35 runs along the eastern edge of the project boundary, at its intersection with the Great Highway. Project activities associated with the installation and maintenance of the service road, Skyline coastal parking lot, and multi-use trail would be visible from the S.R. 35/Great Highway intersection. All other areas of the project site are screened from view by topography and trees.

SCENIC VISTAS

As noted previously, scenic vistas are typically available from public areas and offer panoramic views from elevated vantage points. The urban design element also includes objectives and policies to protect major views in the city, with particular emphasis on open space and water views, and calls for protection of overlooks and other viewpoints.[4] Scenic vistas of the project area include expansive views of the Pacific Ocean, beach, dunes, bluffs, and silhouettes of distant hills. Due to the size and accessibility of Ocean Beach, there are multiple locations from which the public may access scenic vistas. Notable locations in the project area providing representative scenic vista viewing opportunities include the NPS parking lot near the Sloat Boulevard/ Great Highway intersection (see Figure 4.2-2, Photo 1) and the O'Shaughnessy seawall and promenade (see Figure 4.2-4, Photos 9 and 10).

4.2.2.5 LIGHTING

Lighting in the immediate South Ocean Beach project area is limited along the beach and Great Highway south of Sloat Boulevard. Nighttime lighting is more prominent near the Sloat Boulevard/Great Highway intersection (**Figure 4.2-7**), sources of which include overhead streetlights along Sloat Boulevard and extending south along the western edge of Great Highway approximately 700 feet; traffic signals, security and wayfinding lighting at the Westside Pump Station, Oceanside Treatment Plant, and NPS public restroom; residential buildings along the north side of Sloat Boulevard; and headlights from passing cars. Fewer streetlights exist along the Great Highway near its Skyline Boulevard intersection than at its intersection with Sloat Boulevard. Along North Ocean Beach, sources of nighttime lighting include overhead streetlights along the east and west sides of the Great Highway, ballfield lighting at the Beach Chalet Athletic Fields, security and wayfinding lighting at the Beach Chalet, residential buildings along the north side of Fulton Street, and headlights from passing cars.

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2 California Department of Parks and Recreation, *California Coastline Preservation and Recreation Plan*, August 1971.
3 Caltrans, Scenic Highways, *https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways,* accessed June 8, 2020.
4 San Francisco Planning Department, San Francisco General Plan Urban Design Element, as amended through 2010.

SOURCE: ESA

Ocean Beach Climate Change Adaptation

Figure 4.2-7
Nighttime View of Sloat Boulevard/ Great Highway Intersection

4.2.3 Regulatory Framework

4.2.3.1 FEDERAL

GGNRA/MUIR WOODS NATIONAL MONUMENT GENERAL MANAGEMENT PLAN

The Golden Gate National Recreation Area/Muir Woods National Monument General Management Plan published in 2014 and adopted in 2015 requires that whenever possible, new facilities will be built in previously disturbed areas or in carefully selected sites with as small a construction footprint as possible and with a sustainable design.[5] The plan applies mitigation measures to the actions proposed within it, including those pertaining to visual resources. Those that may be relevant to management of Ocean Beach in relation to the project include:

- design, site, and construct facilities to avoid or minimize visual intrusion into the natural environment or landscape;
- limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements;
- shield all outdoor lighting to the maximum extent possible; and
- keep light on the intended subject and out of the night sky to the greatest degree possible.

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5 U.S. Department of the Interior, National Park Service, 2014 Golden Gate National Recreation Area and Muir Woods National Monument General Management Plan/Final Environmental Impact Statement Record of Decision, *https://www.nps.gov/goga/learn/management/upload/GOGA-GMP-ROD-w-all-APNDS_30JAN2015-3.pdf*, accessed June 12, 2020.

NATIONAL PARK SERVICE 2006 MANAGEMENT POLICIES

The National Park Service 2006 Management Policies are based upon underlying principles to ensure that they focus on current regulations, conservation of natural resources, balancing protection of park resources with their use, and a commitment to civic engagement and cooperation with other local, state, tribal, and federal entities.[6]

Section 4.10 of the document addresses visual resources relevant to the project, stating that the service, "will preserve, to the greatest extent possible, the natural lightscapes of parks, which are natural resources and values that exist in the absence of human-caused light." Specifically, it is outlined that the service will:

- restrict the use of artificial lighting in parks to those areas where security, basic human safety, and specific cultural resource requirements must be met;
- use minimal-impact lighting techniques; and
- shield the use of artificial lighting where necessary to prevent the disruption of the night sky, natural cave processes, physiological processes of living organisms, and similar natural processes.

NATIONAL PARK SERVICE BEST PRACTICES FOR OUTDOOR LIGHTING

The NPS recognizes the cultural and natural value of dark night skies. Maintaining and preserving dark sky viewsheds above many national park units is a high priority, for the benefit of park visitors and wildlife alike. In order to better manage natural lightscapes and minimize light pollution, the NPS recommends best practices for outdoor lighting, which are summarized below:

- use technologies to reduce unnecessary light and brightness, such as motion sensors or timers, which minimize the length of time a light is on; efficient, lower wattage bulbs; and amber-colored lights, which emit longer wavelengths and minimize sky brightness;
- choose to place lights only where necessary, and shield lights and direct them downward, shining light where it is needed but ensuring that light pollution does not shine above the horizon; and
- select the most energy efficient lamp and fixture.

4.2.3.2 STATE

SCENIC HIGHWAY PROGRAM

The state laws governing the Scenic Highway Program are found in the Streets and Highways Code, sections 260 through 263. Section 263 includes a list of highways that are either eligible for designation as state scenic highways or have been officially designated. As noted above, there are two eligible state highways and no officially designated state scenic highways in or near the project area. State highways identified as eligible may become officially designated through a process in which the local governing body applies to the California Department of Transportation (Caltrans) for scenic highway approval, adopts a corridor protection program, and receives notification that the highway has been officially designated a State Scenic Highway by the Caltrans director. Once officially designated, the adopted corridor protection program governs land

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6 National Park Service, Management Plan Policies 2006, *https://www.nps.gov/policy/MP_2006.pdf*, accessed June 12, 2020.

use, planning, and development decisions affecting scenic corridors identified in the plan. No corridor protection programs have been developed or adopted for eligible state highways in the project area.[7]

CALIFORNIA GREEN BUILDING CODE

The California Green Building Code includes mandatory requirements for exterior light sources to reduce the amount of light and glare that extends beyond a property. Non-residential mandatory measures contained in section 5.106.8, Light Pollution Reduction, require that exterior lights be shielded or meet "cutoff" lighting standards and meet specified backlight, uplight, and glare ratings designed to limit the amount of light that escapes beyond a site's boundary.

CALIFORNIA COASTAL ACT

The California Coastal Act (Pub. Res. Code §30000 et seq.) was enacted in 1976 to provide long-term protection of the state's 1,100-mile coastline for the benefit of current and future generations. The Coastal Act provides for the long-term management of lands within California's coastal zone boundary (defined in Pub. Res. Code §30103). The width of the coastal zone varies across the state. The entire project area is located within the coastal zone. The Coastal Act policy that is relevant to aesthetics that is applicable to the project is summarized below.

> **ARTICLE 6 – DEVELOPMENT**
>
> **Section 30251 Scenic and visual qualities**
>
> The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting. The project site is not designated in the California Coastline Preservation and Recreation Plan.[8]

4.2.3.3 LOCAL

SAN FRANCISCO GENERAL PLAN

URBAN DESIGN ELEMENT

The Urban Design Element of the San Francisco General Plan rates city streets as "excellent," "good," or "average" for the quality of their views. The portion of the Great Highway along South Ocean Beach is rated as having average-quality street views, with the exception of a small segment approaching Sloat Boulevard from the south, which is rated excellent. The portion of the Great Highway along the North Ocean Beach project area is also rated excellent. A small segment of Sloat Boulevard extending east from the Great

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7 Caltrans, Scenic Highways – Frequently Asked Questions, *https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways/lap-liv-i-scenic-highways-faq2,* accessed August 21, 2021.

8 California Department of Parks and Recreation, California Coastline Preservation and Recreation Plan, August 1971.

Highway is rated as having good-quality views, as is Skyline Boulevard at its intersection with the Great Highway.

The Urban Design Element also identifies streets that are important to the “perception” of San Francisco. A majority of San Francisco’s streets have pleasing views of the bay, the ocean, distant hills, or other parts of San Francisco. However, where good views are not available, streets can still function as open space for use by neighborhood residents and for landscaping to bring a sense of nature to the area. The Great Highway along South Ocean Beach, and Skyline and Sloat boulevards are identified as “Streets that Extend[s] the Effect of Public Open Space.”

The Urban Design Element also includes policies relevant to aesthetic resources throughout its City Pattern, Conservation, Major New Development, and Neighborhood Environment sections. The only policies directly relevant to the project are policy 1.1, directing that major views in the city should be recognized and protected, with particular attention to those of open space and water, and policy 1.2, directing that the existing street pattern, especially as it related to topography, be recognized, protected, and reinforced.

WESTERN SHORELINE AREA PLAN (LOCAL COASTAL PROGRAM)

As discussed in Chapter 3, Plans and Policies, the Western Shoreline Area Plan, an area plan within the city’s general plan, is the city’s certified local coastal program. The Western Shoreline Area Plan includes objectives and policies pertaining to open space in the area covered by the plan, which includes the city’s western shoreline from Fort Funston to Point Lobos. The project site is within the San Francisco Zoo, and Ocean Beach subareas of the plan, and adjacent to the Lake Merced and Fort Funston subareas. Specific policies relevant to aesthetic resources in the project area primarily concern maintaining Ocean Beach as a natural public beach area, improving and stabilizing the sand dunes, enhancing visitor facilities, developing and implementing managed retreat and adaptation plans, developing the shoreline responsibly, and limiting and minimizing impacts from shoreline protection devices.

ACCOUNTABLE PLANNING INITIATIVE

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the Planning Code[9] to establish eight priority policies, one of which is to protect parks and open space and their access to sunlight and vistas. Prior to issuing a permit for any project that requires an initial study under CEQA, or issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the San Francisco General Plan, the city is required to find that the project would be consistent with these priority policies.

SAN FRANCISCO PLANNING CODE

The San Francisco Planning Code is a part of the city’s Municipal Code and is periodically amended to include changes made by recent legislation. The code was adopted to a) guide, control, and regulate future growth and development in accordance with the city’s general plan; b) protect the character and stability of residential, commercial, and industrial areas within the city and promote their orderly and beneficial development; c) provide adequate light, air, privacy, safety, and convenience of access to property; d) prevent overcrowding the land; and e) regulate the location of buildings and the use of buildings and land

[9] City and County of San Francisco, San Francisco Planning Code, section 101.1*, https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_planning/0-0-0-17768*, accessed June 12, 2020.

adjacent to streets and thoroughfares.[10] The code outlines general plan consistency criteria, establishes zoning procedures and regulations, and defines boundaries and rules for the city's use districts, preservation districts, commercial districts, height and bulk districts, and many others. The entire project site lies within the city's Public (P) and Residential House, One Family Detached (RH-D) zoning districts and the Open Space (OS) height and bulk district.[11,12]

LOCALLY DESIGNATED ROADS

In 1938, San Francisco's Downtown Association created the 49-Mile Scenic Drive to highlight San Francisco's beauty and to promote the city as a tourist destination.[13] This scenic roadway includes the Great Highway along Ocean Beach and encircles Lake Merced on Skyline Boulevard John Muir Drive, and Lake Merced Boulevard. These streets are recognized for their aesthetic value.

SAN FRANCISCO PLANNING CODE 139 (STANDARDS FOR BIRD-SAFE BUILDINGS)

The San Francisco Planning Department adopted Standards for Bird-Safe Buildings in 2011, adding San Francisco Planning Code section 139.[14] These standards guide the use and types of glass and façade treatments, wind generators and grates, and lighting treatments. The standards impose requirements for bird-safe glazing and lighting in structures or at sites that represent a hazard to birds and provide information on educational and voluntary programs related to bird hazards. Among other requirements, the standards require that lighting must be shielded, and no uplighting is permitted. No event searchlights are permitted. Refer to Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, for additional information about the Standards for Bird-Safe Buildings.

4.2.4 Impacts and Mitigation Measures

4.2.4.1 SIGNIFICANCE CRITERIA

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, as modified by the San Francisco Planning Department. For the purpose of this analysis, the following criteria were used to determine whether implementing the project would result in a significant impact on aesthetic resources. Implementation of the project would have a significant effect on aesthetics if the project would:

- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.

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10 City and County of San Francisco Planning Code, section 101*, https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_planning/0-0-0-17760*, accessed June 12, 2020.

11 City and County of San Francisco Property Information Map - Zoning Districts, *https://sfplanninggis.org/pim/map.html?search=7281006&layers=Zoning%20Districts*, accessed November 23, 2021.

12 City and County of San Francisco Planning Code, Zoning Maps, Height & Bulk District ("HT") Maps, *https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_zoningmaps/0-0-0-441#JD_Height&BulkDistrictMaps*, *see maps for HT05 and HT13*, accessed June 12, 2020.

13 San Francisco Travel Agency, 2020, 49 Mile Scenic Drive, *https://www.sftravel.com/article/49-mile-scenic-drive*, accessed June 9, 2020.

14 San Francisco Planning Department, Standards for Bird-Safe Buildings, 2011, *http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*.

- In non-urbanized areas, substantially degrade the existing visual character or quality of the site and its surroundings.
- In urbanized areas, conflict with applicable zoning and other regulations governing scenic quality.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

4.2.4.2 APPROACH TO ANALYSIS

The visual quality impact analysis is based on field observations conducted by ESA in November and December 2019, and March 2020; review of project maps and drawings; aerial and ground-level photographs; simulations of the project within photographs; and review of a variety of data in the record, such as local planning documents. The analysis identifies potential temporary (short-term) and permanent (long-term) project impacts on scenic vistas, scenic resources, or the visual character and quality of a site as seen from public urban locales, recreational facilities, and open space areas. The analysis does not address views from Zoo Road, which is not a public road.

With respect to analysis of effects on aesthetic character and quality, San Francisco is considered an urbanized area, as defined in CEQA Guidelines section 15387, and as mapped by the U.S. Census.[15] As a result, impacts associated with degradation of existing visual character or quality may be evaluated according to their potential to conflict with applicable zoning and other regulations governing scenic quality. As discussed in Section 4.2.3, Regulatory Framework, there are federal, state, and local plans and policies relevant to visual resources that would apply to the project. The analysis below considers the potential for the project to conflict with these plans and policies.

However, because Ocean Beach is undeveloped, and as the project sites and adjacent areas include open water, bluffs and dunes, and vegetation which contributes to the visual character of the area, this analysis also considers the potential for the project to substantially degrade the existing visual character or quality of public views of the site and its surroundings. Impacts to visual quality are generally assessed by estimating the amount of visual change introduced by project components, the degree to which adverse visual changes may be visible to surrounding viewer groups, and the general sensitivity of viewer groups.

CONSTRUCTION IMPACTS

The evaluation of temporary visual impacts considers whether project construction activities could substantially degrade the existing visual character or quality of the site or surrounding area, including potential impacts on scenic vistas, scenic resources, and the lighting environment.

OPERATIONAL IMPACTS

Permanent visual impacts are assessed based on the project's potential to substantially alter scenic resources (by removing trees and other landscaping), alter the urban recreation or open space landscape in a manner that would adversely affect the visual character or quality of the area, or create excessive glare or nighttime lighting that would adversely affect those sensitive to the effects of light and glare. Impacts from

[15] U.S. Census Bureau, 2010 Census – Urbanized Area Reference Map for San Francisco-Oakland, California. *https://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/ua78904_san_francisco--oakland_ca/DC10UA78904.pdf*, accessed July 31, 2020.

operations activities that would cause changes to areas of the project site of which no public views exist, or where excessive lighting from the project would not reach, are considered less than significant.

4.2.4.3 IMPACT EVALUATION

CONSTRUCTION IMPACTS

As explained in Section 4.2.4.2, *Approach to Analysis*, San Francisco is considered an urbanized area, but also includes open water, bluffs and dunes, and vegetation which contributes to the visual character of the area. As a result, this EIR considers the potential for project construction to conflict with applicable zoning and other regulations governing scenic quality (Impact AE-2), as well as its potential to substantially degrade the existing visual character or quality of public views of the site and its surroundings (Impact AE-1). No construction activity is proposed for North Ocean Beach. Potential operational effects of ongoing sand excavation at North Ocean Beach and beach nourishment activities at South Ocean Beach are addressed in Impact AE-4.

Impact AE-1: Project construction would not substantially adversely affect a scenic vista, degrade the existing visual character or quality of public views of the site or its surroundings, or damage scenic resources. (*Less than Significant*)

This impact examines whether implementation of the project could cause construction-related impacts on scenic vistas, scenic resources, or the existing visual character of the South Ocean Beach project area and vicinity. The project's effect on a scenic vista would be considered substantial if it would appreciably damage or remove the visual qualities that make the view unique, unobstructed, and/or exemplary. A project is considered to substantially degrade the visual character or quality of a site if it would have a strongly negative influence on the public's experience and appreciation of the visual environment. Visual changes are considered in the context of public views of the site and locale's visual sensitivity; or how noticeable the changes might be to public views, based on the distance from a viewer, the nature of the changes, and the duration that a particular view would be available to the viewer.

Scenic vistas of the project area include expansive views of the Pacific Ocean, beach, dunes, bluffs, and silhouettes of distant hills. The South Ocean Beach portion of the project area also offers views of these scenic resources (e.g., ocean, beach, dunes, and mature vegetation) from other less expansive vantage points, including from the beach, Sloat Boulevard, and the Great Highway. The visual character of the area includes a mix of large-scale built and natural features, including the Westside Pump Station, Oceanside Treatment Plant (although most of the plant is underground and not visible from the Great Highway), Great Highway, and the scenic resources identified. The visual quality is generally high, defined by the contrast between the built and natural environment; however, the rock revetments and rubble along the beach and fencing and railing along the highway detract from the area's overall scenic quality.

Over the four-year construction period, the Great Highway and beach between Sloat Boulevard and Fort Funston would be closed to the public. During this period, the public would not have access to viewpoints within this portion of project area that offer scenic vistas from the top of bluff, or other scenic views from the Great Highway and beach. Due to the relatively small scale of the work area relative to the expansiveness of the area's scenic vistas, and considering the number of scenic vista viewing opportunities along Ocean Beach and Fort Funston that would remain publicly available during construction, the project would not substantially adversely affect a scenic vista.

Closure of the Great Highway and South Ocean Beach between Sloat Boulevard and Fort Funston would limit viewer exposure to nearfield views of construction activities and associated aesthetic effects. Most of the construction activities and equipment would not be visible from public streets or other public vantage points on land. For instance, the project site is screened from view from within the San Francisco Zoo by topography and trees. However, as previously noted, areas beyond the closed segment of the project area would remain publicly accessible and would continue to provide views to and through the project area towards these resources, as well as those in the vicinity of Lake Merced. As a result, the public's experience of the site's visual character and scenic quality could still be affected, including those of travelers (i.e., pedestrians, cyclists, motorists) and beachgoers.

Travelers whose views of the project area could be affected include those approaching the Sloat Boulevard/Great Highway intersection, including along the existing Great Highway multi-use path from the north; travelers approaching the Skyline Boulevard/Great Highway intersection, including along the Lake Merced multi-use path and Skyline Boulevard (eligible for designation as a state scenic highway [S.R. 35]); travelers along the retained Great Highway northbound travel lane (e.g., SFPUC staff and other authorized or emergency personnel going to nearby wastewater infrastructure); and visitors to the beach up- and down-coast of the project area. From these vantage points, travelers might be able to view construction equipment and associated activities. Generally, the views of travelers passing by along area roadways or trails are defined by motion as they focus on their travel path. While they would have some views of project construction activities, these views would be fleeting and indirect, and partially obstructed by topography, vegetation, and fencing. As a result, impacts on passersby would not be substantial.

Similarly, the views of surfers or boaters offshore are generally defined by their activities, although offshore vantage points may provide longer or more direct views of the South Ocean Beach project site. Surfers may take in fleeting views of the shore while waiting to catch waves, or while riding waves. Boaters are typically farther offshore and would generally be focused on fishing or sailing or other activities, but may also take in views of the shoreline and may be able to see the South Ocean Beach project site. Due to the exposed nature of the shoreline, boaters do not typically drop anchor along Ocean Beach. While South Ocean Beach construction activities may be visible from offshore, construction equipment and activities would not substantially interrupt the relative dominance of the sky and ocean in the field of view.

Visitors to the beach up- and down-coast from construction activities may experience longer and more direct views of the work, depending upon where the work is located. Currently, near and mid-range views from the north include the NPS public restroom and parking lot, the Westside Pump Station, and associated vehicular traffic, including trucks and earthmoving equipment associated with the periodic placement of sand as part of the city's ongoing beach nourishment activities (Figure 4.2-3, Photo 8). Beach-level near- and mid-range views of the project area from the south are restricted by the high bluff, and generally include the wet sand, bluff, bluff-top safety barriers, and rubble and revetments (Figure 4.2-2, Photo 3). Also periodically visible from this vantage is earthmoving equipment associated with ongoing beach nourishment activities. The disturbance area and equipment would be larger and more numerous, respectively, than that commonly occur with the city's ongoing beach nourishment activities; however, they would be seen from a distance given the closure of construction work areas to public access. Given the presently diminished visual quality of the project work area (e.g., due to revetments, rubble, bluff-top fencing, and cement k-rails [Figure 4.2-2]) and the closure of the work areas during construction, the project would not substantially alter the project site's visual character or quality relative to existing conditions.

In summary, during construction, locations within the project area that provide scenic vistas and other high-quality scenic views would be closed to the public. Immediately adjacent areas would remain publicly accessible and would continue to offer such viewing opportunities, including views into and through the project area to surrounding scenery; thus, visitors to adjacent areas would be exposed to views of construction activities, but would also be able to view the area’s large-scale defining aesthetic features (e.g., the beach and Pacific Ocean) through such activities. Given current site conditions (including daily Great Highway vehicular traffic, as well as the periodic trucks and earthmoving equipment associated with the city’s beach nourishment activities), ongoing maintenance operations of existing facilities in the area, and the scale of the work relative to the landscape elements contributing to the area’s aesthetic character and high scenic quality – namely the beach, shoreline, and Pacific Ocean – project construction would not substantially affect scenic vistas, the visual character or scenic quality of public views, nor damage any scenic resources. Travelers along the area’s roads and paths might be exposed to views of project construction activities. However, as these travelers would be in motion, focused primarily upon their path of travel, the effect on the character and quality of views from those vantage points would be indirect and fleeting. For these reasons, project construction impacts related to these criteria would be ***less than significant***.

Mitigation: None required.

Impact AE-2: Project construction would not conflict with applicable zoning and other regulations governing scenic quality. (*Less than Significant*)

As explained in Section 4.2.4.2, *Approach to Analysis*, San Francisco is considered an urbanized area, as a result, this analysis considers the project’s potential to conflict with applicable zoning or other local, state, or federal regulations governing scenic quality. The relevant policies discussed in Section 4.2.3, Regulatory Framework, focus on the long-term conservation and enhancement of the areas visual resources and scenic quality, rather than short-term changes from construction activities.

Further, as discussed under Impact AE-1 above, construction activities would not result in substantial adverse effects on scenic vistas, visual character or quality of public views, or scenic resources and would therefore not substantially degrade the scenic quality of the area as a whole. Project construction would also require the use of artificial lighting for safety during nighttime construction. However, as discussed further in Impact AE-3, the work would be temporary and include controls that would shield and otherwise protect against lighting impacts on the night sky. Project construction impacts related to this criterion would, therefore, be ***less than significant***.

Mitigation: None required.

Impact AE-3: Project construction would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. (*Less than Significant*)

Construction for the project would take place mainly during daylight hours, consistent with the city's noise ordinance; however, some nighttime construction may be required for the buried wall, which would require the use of temporary portable lights. This potential temporary construction lighting would occur only along the portion of the bluff that runs directly adjacent to the Great Highway, beginning at Sloat Boulevard and running south for approximately 0.5 mile. As illustrated in Figure 4.2-7 and described in Section 4.2.2.4, sources of nighttime lighting in this area are few, generally limited to traffic signals, security and wayfinding lighting, and streetlights, and are concentrated around the Sloat Boulevard/Great Highway intersection. The portion of the Great Highway south of Sloat Boulevard would be closed to the public during construction of the buried wall and would therefore not impede the ability of local recreationists to take in nighttime dark skies in the area. Further, there are applicable requirements and guidelines focused on minimizing nighttime construction lighting. As described in Chapter 2, Project Description, the SFPUC would implement Standard Construction Measure 8 (Appendix C), which requires all nighttime construction lighting to be shielded to prevent spillover lighting effects. In addition, the project would incorporate NPS best practices for outdoor lighting which recommend lights be placed only where necessary, and be shielded, directed downward, and used with warm-colored, energy-efficient bulbs.

A project's light or glare effects would be considered substantial if day or nighttime public views of the area were disrupted or obscured as a result of new sources of light or glare in comparison with existing conditions. Nighttime lighting for project construction would be limited to areas closed to the public, would be minimized by Standard Construction Measure 8 and the NPS outdoor lighting best practices, discussed above, and project construction equipment would not create substantial light or glare that would adversely affect daytime views. Therefore, aesthetic impacts associated with light and glare during construction would be ***less than significant***.

Mitigation: None required.

OPERATIONAL IMPACTS

As explained in Section 4.2.4.2, *Approach to Analysis*, San Francisco is considered an urbanized area, but the project area and its surroundings also include open water, beach, bluffs and dunes, and vegetation which contributes to the visual character of the area. As a result, this EIR considers the potential for project operations to substantially degrade the existing visual character or quality of public views of the site and its surroundings (Impact AE-4), as well as its potential to conflict with applicable zoning and other regulations governing scenic quality (Impact AE-5). To support this analysis, visual simulations were created for viewpoints from either end of the South Ocean Beach study area, facing north and south (see Figure 4.2-1 for visual simulation locations).

Impact AE-4: Project operation would not substantially adversely affect a scenic vista, degrade the existing visual character or quality of public views of the site or its surroundings, or damage scenic resources. (*Less than Significant*)

As noted for Impact AE-1, scenic vistas of the project area include expansive views of the Pacific Ocean, beach, dunes, bluffs, and silhouettes of distant hills. The project area also offers views of these scenic resources from other less expansive vantage points, including from the beach, Sloat Boulevard, and the Great Highway. The visual character of the area includes a mix of large-scale built and natural features. The visual quality is generally high, defined by the contrast between the built and natural environment; however, the rock revetments and rubble along the beach and fencing and railing along the highway detract from the area's overall scenic quality.

Implementation of the project would create new opportunities for visitors to access scenic vista points within the project area, would enhance the visual character and quality of public views within and across the project area, and would not damage scenic resources.

Installation of the multi-use trail, associated turnouts and seating, and constructing new beach access stairs would provide visitors with new opportunities to access locations within the project area from which they could access scenic vistas of the Pacific Ocean and distant hills, as well as the beach, dunes and bluff free of revetments and debris. Existing adjacent vista points, such as those located to the north of the existing NPS public restroom and parking lot, along the west side of the Great Highway, would remain and offer enhanced views to the south.

As can be seen in the visual simulations presented on **Figures 4.2-8 (a and b) and 4.2-9 (a and b)** the South Ocean Beach project area's visual quality would be improved through removal of Great Highway travel lanes, replacing the existing NPS public restroom with a restroom at an inland location, removing the NPS parking lot, removing the existing debris and rubble revetments from the beach and bluff, and reshaping and planting the bluff. Views from other locations would be similarly improved through removal of the safety fencing and concrete barrier railing located along the western edge of the Great Highway.

As depicted in Photo 4 in Figure 4.2-2 and Photos 6 through 8 in Figure 4.2-3, under current conditions the area directly adjacent to South Ocean Beach along the Great Highway prominently features various infrastructure, including a public restroom, sidewalks, lighting structures, major roads, concrete barrier railing, the Oceanside Treatment Plant, and the Westside Pump Station. Along the beach, the rubble and revetments are dominant landscape features which strongly influence the visual character of the site and diminish its overall visual quality. The proposed beach access stairs would introduce a new structural element to the shoreline south of the existing 2010 emergency riprap revetment (refer to Figure 2-7). The visibility of the stairs would vary depending on the time of year and amount of sand on the beach partially covering the stairs. The stairs would be significantly smaller than the existing riprap revetment. The project's new restroom and parking facilities would not differ greatly in height, bulk, or finish from features that currently exist within the project area. Therefore, the project's new aboveground structural elements would not degrade the general visual character or quality of the area's public views.

The project would improve the views depicted in Figure 4.2-2 (Photos 1 through 4), with scenic resources, beach, and shoreline featuring more prominently due to removal of the Great Highway and safety railings and rubble and revetments along the eroding bluff, as well as installation of the multi-use trail (refer to the visual simulation presented in Figure 4.2-8b). Views depicted in Figure 4.2-3 (Photos 5 through 8) would become more expansive, with the location of the new public restroom inland from the NPS public restroom current location and with removal of the NPS parking lot and tall Great Highway street light structures (refer to the visual simulation presented in Figure 4.2-8b).

Construction of the multi-use trail and Skyline coastal parking lot would require removal of approximately fifteen trees and low-lying vegetation from the Great Highway median near the Skyline Boulevard intersection (Figure 4.2-4, Photo 11). Removal of the trees and vegetation in the median would only be visible from the roadway in the immediate vicinity of the intersection. With construction of the multi-use trail and parking lot, the view depicted in Photo 11 (Figure 4.2-4) from Skyline Boulevard and the Lake Merced multi-use path would be altered slightly, as travelers would see the parking lot entrance/exit, which would modify the orientation of pavement and vegetated median slightly from the existing intersection with the Great Highway.

As shown on Figure 2-5, in Chapter 2, Project Description, upon completion of construction, a new median at this location would be planted with trees and shrubs similar to the one that exists now, and the amount of pavement at this intersection would remain roughly the same as the existing Great Highway travel lanes. The new landscape elements would be similar in appearance to those under current conditions, and changes noted above would appear subordinate to the other existing scenic resources that define the area's visual quality (i.e., the steep, vegetated coastal bluffs and Lake Merced). As also explained above, travelers approaching the intersection would be in motion, focused primarily upon their path of travel, and so any effect on the character and quality of views from those vantage points would be indirect and fleeting.

Maintenance of project facilities and landscape features, such as trash collection and cleaning, would be completed in a manner similar to that which occurs under existing conditions within the project area and adjacent areas along Ocean Beach. Landscape maintenance may occur intermittently, but it would generally include sand removal, hand pruning, and watering, which could require the use of maintenance trucks. This work would be short term in nature and would not be visually disruptive or affect the overall visual character of the area, given its current use as a popular and busy outdoor public recreation space.

Portions of the buried wall could become exposed due to shoreline erosion. As discussed in Chapter 2, Project Description, Section 2.4.5, Beach Nourishment, the project would include annual monitoring of beach width and placement of sand (beach nourishment) to maintain beach width and to cover any portions of the buried wall that may be exposed. However, the full wall may be exposed an estimated four times over an 80-year time period, and portions of the wall could be visible more frequently for periods of up to approximately one year.[16]The buried wall would be uniform in appearance, as opposed to the rubble and debris on the beach under existing conditions, and it would be similar in appearance to existing periodically exposed walls nearby (e.g., the Taraval seawall). Additionally, exposure of the wall would not impede scenic vistas of the Pacific Ocean or longshore views of Ocean Beach, the landscape elements that contribute to the area's aesthetic character and high scenic quality.

A coastal process study prepared for the EIR, which is included in Appendix H and summarized in Appendix B (Impact GE-3), examines potential effects on adjacent upcoast (i.e., Middle Ocean Beach) and downcoast (i.e., Fort Funston) shorelines across multiple project scenarios. The study concludes that the project would not result in substantial changes in erosion. Thus, the project would not substantially change the vegetated dunes to the north or the coastal bluffs to the south, each of which contribute to the area's scenic quality.

Beach nourishment activities, whether involving large or small sand placements, would require the use of large, highly visible earthmoving equipment at either the North Ocean Beach and/or South Ocean Beach project areas. In either case, South Ocean Beach and associated public accessways would be closed to public access for the four to six weeks required to complete the sand placement activities. As a result, for the same reasons described in Impact AE-1 for construction, public views of this work would be restricted to locations outside of the project site, largely limited to passersby and beachgoers. However, during temporary closures, nearby areas would continue to provide the public opportunities for ocean views. The presence of the sand-moving equipment and activities would not differ substantially from similar activities ongoing at these locations under existing conditions, wherein the beach is closed for two to three weeks to allow for the transport and placement of sand from North Ocean Beach to South Ocean Beach. In the case of sand excavation and loading at North Ocean Beach associated with the small sand placement, viewers are currently exposed to the periodic presence of earthmoving equipment and excavated areas under ongoing backpassing operations (see Photos 9 and 10 in Figure 4.2-4).

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[16] Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, *2020.* Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

SOURCE: ESA, 2021

Ocean Beach Climate Change Adaptation Project

Figure 4.2-8a
Existing View - Great Highway/Sloat Boulevard Intersection
Looking South

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SOURCE: ESA, 2021

Ocean Beach Climate Change Adaptation Project

Figure 4.2-8b
Rendering of Project View - Great Highway/Sloat Boulevard Intersection
Looking South

SOURCE: ESA, 2021

Ocean Beach Climate Change Adaptation Project

Figure 4.2-9a
Existing View - South Ocean Beach
Looking North

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: ESA, 2021

NOTE: Beach elevations fluctuate seasonally; along this part of the beach, elevations have varied between 1.4 and 5.8 feet NAVD 88, with an average elevation of 3.8 feet NAVD 88 which is similar to the elevation shown. Beach access stairs located to the south and east of this viewer location, to the right of the visible frame.

Ocean Beach Climate Change Adaptation Project

Figure 4.2-9b
Rendering of Project View - South Ocean Beach Looking North

In the case of small sand placements at South Ocean Beach, viewers are similarly currently exposed to the periodic presence of equipment placing sand from sand backpassing operations. In the case of the large sand placement, a dredge would be used to pump sand onto South Ocean Beach and would be anchored approximately 0.5 mile offshore. However, viewers are presently exposed to similarly sized dredges in the same general area, which periodically dispose of dredged material at a location approximately 0.5 mile offshore. Onshore activities during large sand placements would also be similar to ongoing sand backpassing operations and small sand placement activities. As described above, large equipment would be present on the beach for up to eight weeks while the sand is placed. During both small and large sand placements, the beach, multi-use trail, and Skyline coastal parking lot would be closed for the duration of the sand placement work, and for the same reasons described for construction in Impact AE-1, the effects on visual resources, scenic vistas, or public views would be minimized.

In summary, project implementation would create new opportunities for visitors to access scenic vista points within the project area, would enhance the visual character and quality of public views within and across the project area, and would not damage scenic resources. Facility and landscape maintenance and beach nourishment activities required for project operations would appear similar to those ongoing under existing conditions, would be temporary, would not preclude views of the landscape elements that contribute to the area's aesthetic character and high scenic quality (e.g., the beach and Pacific Ocean) in adjacent areas, and therefore would not substantially alter the visual character of the area, or damage public scenic vistas or existing visual resources. For these reasons, the impact would be ***less than significant***.

Mitigation: None required.

Impact AE-5: Project operation would not conflict with applicable zoning and other regulations governing scenic quality. (*Less than Significant*)

As discussed for Impact AE-2, as San Francisco is an urbanized area, this analysis considers the project's potential to conflict with applicable zoning or other local, state, or federal regulations governing scenic quality. The relevant policies discussed in Section 4.2.3, Regulatory Framework, focus on the long-term conservation of the area's visual resources and scenic quality. Applicable federal and state regulations are general, calling for preserving and enhancing scenic and visual qualities, including preservation of the dark night sky; maintaining views to and along the coast; avoiding or minimizing nighttime lighting impacts, minimization of natural landform alteration; and ensuring visual compatibility of new development. The Western Shoreline Area Plan includes more specific policies designed to achieve the objectives set forth in federal and state policies.

As noted in Section 4.2.3, and described more fully in Chapter 3, Plans and Policies, the Western Shoreline Area Plan encourages enhancement of recreational use, appearance, and access to and along the shoreline. The plan's coastal hazards objective and associated policies call for preserving, enhancing, and restoring the beach and shoreline while protecting public access, scenic quality, natural resources, critical public infrastructure, and existing development from coastal hazards. Other general plan policies relevant to visual resources at the project site generally state that public views and vistas should be protected. Specifically, views from the Great Highway/Sloat Boulevard intersection, Great Highway/Skyline Boulevard intersection, and the Great Highway along North Ocean Beach are designated as aesthetically valuable; this list includes any roadways eligible for listing as state scenic highways.

The project would remove shoreline armoring, rubble, roadbed fill, pavement, and other existing features from a highly modified (i.e., not natural) bluff and beach that currently diminish the project area's visual quality. By reshaping and planting the bluff, and replacing the existing road with a multi-use trail, the project would help preserve views and vistas along South Ocean Beach, while enhancing the area's overall visual quality. Each of the applicable Western Shoreline Area Plan policy objectives would be advanced by the project. Further, many of the project elements carry out the specific actions called for in the Western Shoreline Plan's coastal hazards policies.

The project would replace existing and introduce new sources of lighting in upland areas, along the Great Highway intersections with Sloat and Skyline boulevards, and along the multi-use trail. Implementation of large sand placements under the project's beach nourishment program would also require the use of artificial lighting for safety during nighttime work along the beach. As discussed further in Impact AE-6, new permanent sources of lighting would comply with the city's Green Building Code and Design Standards for Bird-Safe Buildings, as well as the NPS best practices for outdoor lighting, and lighting associated with ongoing beach nourishment would be completed in compliance with construction contract specifications that protect against lighting impacts on the night sky.

There are no elements of operational project components that conflict with allowed uses in the Public zoning or Open Space height and bulk districts, or with other state or federal policies. The project's operational effects related to zoning and other applicable regulations concerning scenic resources would, therefore, be ***less than significant***.

Mitigation: None required.

Impact AE-6: Project operation would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. (*Less than Significant*)

Lighting would be installed for users of the multi-use trail, service road, public restroom, and Skyline coastal parking lot. Lighting for the public restroom would be similar to that of the existing NPS public restroom at the western terminus of Sloat Boulevard, an intersection that is also lighted under current conditions (see Figure 4.2-7). Further, the restroom would be designed to meet the city's Design Standards for Bird-Safe Buildings, and lighting would be shielded and required to meet other lighting and glare specifications in compliance with the NPS best practices for outdoor lighting and the Green Building Code. Lighting from the new structure would therefore not substantially differ from the lighting produced by the existing restroom and intersection.

Lighting for the multi-use trail, service road, and Skyline coastal parking lot would similarly occur mainly within areas of existing nighttime lighting (e.g., near the Great Highway's Sloat Boulevard and Skyline Boulevard intersections), but would also introduce new sources of lighting for the multi-use trail and service road along a segment of South Ocean Beach between these two intersections where no substantial permanent lighting presently exists (from approximately 600 feet north of the Great Highway zoo entrance to Skyline Boulevard). The project would add minimal lighting along the multi-use trail, including at trail junctions (e.g., where Zoo Road meets the trail). The increase in permanent lighting would not substantially affect nighttime views, as it would be shielded, directed downward, and would use warm-colored, energy-efficient bulbs in compliance with the NPS best practices for outdoor lighting. The installed lighting would also be offset by decreases in other sources of light and glare that would result from the project. For instance, the existing streetlights that run approximately 600 feet south of Sloat Boulevard on the west side of the Great Highway would be removed as part of the project. Further, the project would permanently close and remove the southern portion of the Great Highway, thereby substantially reducing the amount of vehicular traffic and associated nighttime lighting (and daytime reflectivity and glare) within this area. The project does not otherwise involve structures or finishes that would create substantial glare or that would be substantially different from existing infrastructure at the site.

During large sand placements, pump-ashore activities could occur 24 hours per day. This would require the nighttime operation of heavy equipment along the beach and multi-use trail and/or service road. The nighttime work would introduce new, temporary sources of nighttime lighting during the four- to six-week large sand placement. The work would be performed by a U.S. Army Corps of Engineers (Corps) contractor who would be required to implement environmental protection measures during construction in compliance with the construction contract specifications. These specifications require the contractor to direct all lights downward and to use shields or baffles to ensure light is not directed above the horizon, as well to follow the NPS best practices for outdoor lighting whenever possible, including measures intended to minimize nighttime lighting impacts. [17] As during current beach nourishment activities, the beach between Sloat Boulevard and Fort Funston would be closed to public access during this period, as would the multi-use trail. During this work, beach and trail users outside the work areas would be exposed to nighttime lighting. Such effects would be temporary, change by day, as the work would proceed at a rate of roughly 140 feet per day, and would be infrequent (approximately once every ten years).

The project's operational lighting would be limited, and new permanent fixtures would be located within similarly lighted areas and would be shielded, directed downward, and would meet other brightness and glare specifications as mentioned above, in compliance with the Green Building Code, Design Standards for Bird-Safe Buildings, and the NPS best practices for outdoor lighting. The project's operational lighting for large sand placements would be temporary, localized, largely screened from view, and would comply with contract specifications designed to reduce lighting impacts. Therefore, aesthetic impacts associated with light and glare during operation of the project would be ***less than significant***.

Mitigation: None required.

4.2.4.4 CUMULATIVE IMPACTS

Impact C-AE-1: Implementation of the project, in combination with the cumulative projects, would not substantially degrade the existing visual character of public views of the site or its surroundings. (*Less than Significant*)

Section 4.1.3, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis used throughout this EIR and summarizes the cumulative projects in the vicinity of the project. The geographic scope of the cumulative analysis includes all projects that would be located within the publicly accessible viewshed of the project. The cumulative project sites do not need to be visible simultaneously with the project site from one fixed vantage point, but for an impact to occur, the sites must be visible in the same general vicinity as a viewer looks around or travels about. As stated above, the visual setting of the project

[17] United States Army Corps of Engineers, West Coast Hopper Maintenance Dredging 2021, Project Manual, Section 01 57 20.00 82 Environmental Protection.

site is defined by diverse topography, its location at the edge of the city along the Pacific Ocean, a steep grade between street level and South Ocean Beach, and a mix of urban development and open space in the area. Therefore, the geographic scope of cumulative aesthetic impacts extends about 1,000 feet in all directions from the South Ocean Beach and North Ocean Beach project areas. This encompasses potential views of project components from Skyline and Sloat boulevards, the San Francisco Zoo, Golden Gate Park, Fort Funston Beach, Ocean Beach, and the Great Highway. Due to the topography in the area, most views of the project site are much shorter-range.

Projects that could have a cumulative aesthetic impact in combination with the project include the following (refer to Table 4.1-3 and Figure 4.1-1 for descriptions and locations of the following projects):

- Fort Funston Trail Connection
- Westside Pump Station Reliability Improvements
- Oceanside Treatment Plant Improvements (Projects 5A and 5B)
- Signalization of State Route 35 (Skyline Boulevard) and Great Highway Intersection
- The San Francisco Zoo Recycled Water Pipeline Project
- Westside Force Main Reliability Project
- 2700 Sloat Boulevard

Construction Impacts

As discussed above, the project could cause temporary construction-related impacts on scenic vistas, scenic resources, and the existing visual character of the South Ocean Beach project area and vicinity. These include impacts resulting from closure of the project area to public access during the construction period, the presence of large earthmoving equipment and associated ground disturbance. In addition, the project's construction activity would introduce new sources of light and glare into the project area during the construction period.

Of the projects listed above, four are estimated to have construction schedules that overlap with construction of the project: the Westside Pump Station Reliability Improvements, the Oceanside Treatment Plant Improvements, the San Francisco Zoo Recycled Water Pipeline Project, and the Westside Force Main Reliability Project. Construction activities for the Oceanside Treatment Plant Improvements would occur inside the Oceanside Treatment Plant. As a result, this work would be shielded from public view. The San Francisco Zoo Recycled Water Pipeline project includes installation of a pipeline, construction of which would occur entirely within the zoo, largely screened from the proposed project's viewshed by topography, vegetation, and the zoo's boundary fencing.

The Westside Pump Station Reliability Improvements include underground utilities, which would be screened from public view by the existing pump station infrastructure, as well as a new aboveground electrical building on the southeast corner of the Sloat Boulevard/Great Highway intersection. This work is anticipated to begin in 2021 and last approximately 30 months; therefore, the final approximately 6 months of work would overlap with the beginning of Phase 1 of the proposed project. However, Phase 1 construction activities involve only reconfiguration of the Sloat Boulevard/Great Highway intersection and zoo parking access on Sloat Boulevard, and removal of the existing NPS public restroom. These activities would require minimal heavy construction equipment, earthmoving activities, or new sources of light and glare and therefore, the combination of the project with the overlapping final months of work on the Westside Pump Station Reliability Improvements would not create a significant cumulative impact affecting aesthetic resources.

The Westside Force Main Reliability Project involves trenching for a new pipeline along the existing eastern northbound lane of the Great Highway or its eastern shoulder, between the Westside Pump Station and the Oceanside Treatment Plant, and work is planned to occur from 2027 to 2030. The segment of Great Highway between Sloat Boulevard and Fort Funston would be closed to public access beginning in 2023 under the proposed project, and the eastern northbound lane of the Great Highway would become the service road (closed to public access). Equipment for the trenching work would be similar in nature and scale to that present for proposed project activities but shifted to the east and to a later timeframe (e.g., removal of the Great Highway southbound lanes, installation of the multi-use trail and service road). As discussed under Impact AE-1, views of this segment of the Great Highway are not visible from the beach or from Skyline Boulevard due to intervening topographic features (e.g., steep bluffs, vegetation), and views for passersby on Sloat Boulevard are indirect and partially obstructed by topography and existing structures (e.g., the NPS public restroom). Therefore, the combination of project activities with the Westside Force Main Reliability trenching would not create a significant cumulative impact affecting aesthetic resources.

While project construction could result in temporary aesthetic effects, those projects within the cumulative scenario would either not have construction schedules that overlap with that of the project, or would not have effects that add to potential aesthetic impacts of the project. As a result, the effects of the project construction, in combination with those of the projects in the cumulative scenario, would have a ***less than significant*** effect with respect to scenic vistas, scenic resources, aesthetic character, and lighting and glare.

Operational Impacts

As explained within the discussions of project operational effects, the project would create new opportunities for visitors to access scenic vista points within the project area while improving those existing beyond, would enhance the visual character and quality of public views within and across the project area, and would not damage scenic resources. While the project would introduce new permanent and temporary sources of light and glare into the project area, they would be of low intensity and not substantially change the lighting environment.

Most of the projects in the cumulative scenario would not change the visual character or quality of the project area viewshed once construction is complete. The cumulative projects within the geographic scope of analysis would mainly occur within the confines of existing facilities, such as those anticipated for the Oceanside Treatment Plant, Westside Pump Station, and zoo, or would involve only minor changes to streetlights, signage, and markings. As the former would occur within enclosed areas, associated changes on visual resources would largely be screened from public view. As for the latter, the changes would be minor and not appear conspicuous or otherwise substantively impact the area’s visual character, quality, or lighting environment.

Those projects that have potential to influence visual resources or visual character include the 2700 Sloat Boulevard Project and the Signalization of State Route 35 (Skyline Boulevard) and Great Highway Intersection Project. The 2700 Sloat Boulevard Project would include demolishing the existing Sloat Garden

Center and constructing an 85-foot-tall, mixed residential and commercial development.[18] The new development would meet all zoning, density, and height requirements for the area and would be consistent with the urban residential visual character that dominates the north side of Sloat Boulevard.

The Signalization of State Route 35 (Skyline Boulevard) and Great Highway Intersection Project would introduce a minor new source of lighting and vertical elements. Because traffic signals are extremely common throughout San Francisco, including along Skyline Boulevard both north and south of its intersection with the Great Highway, the project would not substantially alter the visual character or scenic quality of the site or its surroundings. Nor would the addition of a signal appreciably change the nighttime lighting environment, as lights presently exist at this location, as do signals at other nearby locations along this road.

For the reasons discussed above, the project in combination with other foreseeable projects in the vicinity would have a ***less-than-significant*** cumulative impact on the existing visual character or quality of public views of the site or its surroundings, damage scenic resources, or introduce substantial new sources of light or glare that would adversely affect day or nighttime views in the area.

Mitigation: None required.

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[18] This project is conservatively included in the cumulative analysis, although the timing of its development is unknown, as there is a reasonable likelihood of an application being filed and overall neighborhood awareness of this project. Analysis of its contribution to the cumulative aesthetics impact is based on preliminary project designs and unknown construction schedule that may overlap given the potential for overlap due to the long duration of construction of the proposed Ocean Beach Climate Adaptation project.

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4.3 Transportation and Circulation

4.3.1 Introduction

This section presents existing transportation and circulation conditions in the study area and analyzes potential project-level and cumulative impacts on transportation and circulation during construction and operation of the Ocean Beach Climate Change Adaptation Project (the project). Transportation and circulation topics consist of walking, bicycling, driving hazards, transit, emergency access, vehicle miles traveled (VMT), and commercial and passenger loading. Supporting detailed technical information is included in Appendix D of this EIR.

4.3.2 Environmental Setting

The transportation study area encompasses those locations near the South Ocean Beach project site where the project could potentially affect transportation and circulation. The study area is generally bounded by the Great Highway to the west, Skyline Boulevard to the east and south, and Wawona Street (just north of Sloat Boulevard) to the north (see Figure 2-3). A portion of North Ocean Beach (north of Lincoln Way) would serve as a source for harvesting of sand for placement south of Sloat Boulevard. However, because the project would not change the transportation network in North Ocean Beach and haul truck access to the sand harvesting source at the North Ocean Beach project site would be from a single driveway on the Great Highway, the transportation setting in the northern part of the project area is focused on roadway, bicycle and pedestrian facilities on the Great Highway.

Counts of vehicles and people walking and bicycling were conducted in May, July, and October 2019.[1] All of the data collection occurred prior to the onset of changes resulting from the COVID-19 pandemic (e.g., prior to closure of the Great Highway between Lincoln Way and Sloat Boulevard to vehicles, reduction in public transit service, and reduction in peak period travel by all modes). Descriptions of transportation conditions are based on field surveys and observations conducted on multiple days in November 2019 and September and October 2020.[2]

4.3.2.1 REGIONAL AND LOCAL ROADWAYS

The closest regional roadways to the project area, including on- and off-ramps, are described below and shown on Figure 1-1. The existing local roadways in the transportation study area are also described, including their geographic extent and their San Francisco General Plan,[3] Better Streets Plan, Key Walking Street, and High Injury Corridor designation. For the existing streets adjacent to the project area, the

1 CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Final, February 2021.
2 LCW Consulting, Field Survey Notes. 2020.
3 City road designations within the San Francisco General Plan include (listed in the order of potential vehicle capacity) freeways, major arterials, transit conflict streets, secondary arterials, recreational streets, collector streets, and local streets. Each of these roadways has a different potential capacity for mixed-flow traffic and changes that might alter traffic patterns on the given roadway. The general plan also identifies certain Transit Preferential Streets from among the city's various roadways, each of which is identified as a Primary Transit Street-Transit Oriented, Primary Transit Street-Transit Important, or Secondary Transit Street. The Pedestrian Network classifies streets throughout the city. It identifies streets that have been developed primarily for use by people walking and includes the Citywide Pedestrian Network Streets and Neighborhood Pedestrian Streets. City and County of San Francisco, San Francisco General Plan, 2007, Transportation Element, *http://generalplan.sfplanning.org/I4_Transportation.htm#TRA_REG_5_4*, accessed August 17, 2020.

number of travel lanes and any potentially or observed vehicle-to-vehicle hazardous conditions are noted. Information on the number of vehicles on roadway segments in the vicinity of the project is also presented.

REGIONAL ROADWAYS

Interstate 280 (I-280) is a generally north-south freeway that connects San Francisco with the peninsula and the South Bay. Near the project area, I-280 is a six- to eight-lane freeway, and the closest access to and from I-280 is located at John Daly Boulevard/Junipero Serra Boulevard, which is about 3 miles southeast of the project area.

State Route 1 (S.R. 1) is a major north-south route that generally travels along the California coast. Within the vicinity of the project area, S.R. 1 connects the Golden Gate Bridge to I-280 via Park Presidio Drive, 19th Avenue, and Junipero Serra Boulevard. Along 19th Avenue and Park Presidio Drive, S.R.1 is a six-lane arterial. To the south, it becomes Junipero Serra Boulevard and transitions into a six-lane freeway before reaching John Daly Boulevard.

State Route 35 (S.R. 35) is a two- to four-lane roadway that runs from S.R. 1 at 19th Avenue in San Francisco to State Route 17 (S.R. 17) on the peninsula (i.e., south of Los Gatos). In the project vicinity, the roadway runs north-south on Skyline Boulevard and east-west on Sloat Boulevard between Skyline Boulevard and 19th Avenue.

LOCAL ROADWAYS

Great Highway (also known by locals as "Upper Great Highway" between Lincoln Way and Sloat Boulevard) is a north-south arterial that extends between Point Lobos Avenue and Skyline Boulevard. In general, the Great Highway has two travel lanes each way, and is designated as a bicycle route. The San Francisco General Plan identifies the Great Highway as a recreational street.[4] The Great Highway is also part of the San Francisco Green Connections Network.[5] The segment of the Great Highway south of Sloat Boulevard is sometimes referred to as the "Great Highway Extension."

Lower Great Highway is a north-south roadway that extends between Lincoln Way and Sloat Boulevard and is parallel to the Great Highway to the east. The Lower Great Highway has one travel lane each way. East-west roadways terminate at the Lower Great Highway as *T intersections.*[6] At seven intersections on the Lower Great Highway (i.e., at Vicente, Taraval, Rivera, Pacheco, Noriega, Lawton, and Judah streets), pedestrian pathways continue west across the median between the Lower Great Highway and the Great Highway, and signalized crossings for people walking and bicycling are provided across the Great Highway.

4 Within the general plan, a recreational street is defined as a special category of street whose major function is to provide for slow pleasure drives and bicyclist and pedestrian use: more highly valued for recreational use than for traffic movements. The order of priority for recreational streets should be to accommodate: 1) pedestrians, hiking trails or wilderness routes, as appropriate; 2) bicyclists; 3) equestrians; and 4) automobile scenic driving. This should be slow and consistent with the topography and nature of the area. There should be adequate parking outside of natural areas.

5 The San Francisco Planning Department's Green Connections project aims to increase access to parks, open spaces, and the waterfront by envisioning a network of "green connectors" – city streets that will be upgraded incrementally over the next 20 years to make it safer and more pleasant to travel to parks by walking, biking, and other forms of active transportation.

6 A T intersection is an intersection where two roadways meet in a perpendicular manner and one roadway does not continue across the other road, forming a "T" shape.

47th Avenue is a north-south roadway that extends between Lincoln Way and Sloat Boulevard and has one travel lane each way. Between Vicente and Wawona streets, the L Taraval light rail line travels southbound to its *terminal*[7] on Wawona Street between 46th and 47th avenues.

Skyline Boulevard is a north-south arterial that extends between Sloat Boulevard and Bear Creek Road on the peninsula (i.e., south of Los Gatos), and is part of S.R. 35. In the project vicinity, Skyline Boulevard has two travel lanes each way and Skyline Boulevard is designated as a bicycle route. The San Francisco General Plan identifies Skyline Boulevard as a major arterial. Skyline Boulevard between John Muir and Lake Merced boulevards is part of the regional Bay Area Ridge Trail.[8]

Sunset Boulevard is a north-south roadway that extends between Lincoln Way and Lake Merced Boulevard and has three travel lanes each way. Sunset Boulevard is designated in the San Francisco General Plan as a secondary arterial. Sunset Boulevard between Pacheco and Moraga streets, Ulloa Street, and Lake Merced Boulevard is included as part of the Vision Zero High Injury Network.[9] On the west side of Sunset Boulevard between Ocean Avenue and Lake Merced Boulevard there is an off-street multi-use path. Sunset Boulevard between Wawona Street and Lake Merced Boulevard is part of the regional Bay Area Ridge Trail.

Sloat Boulevard is an east-west arterial that runs between the Great Highway and West Portal Avenue/Junipero Serra Boulevard. In the project vicinity, Sloat Boulevard has two travel lanes in each direction. Side streets intersecting with Sloat Boulevard are generally controlled by stop signs, while the intersections of Sloat Boulevard at the Great Highway, at 47th Avenue and at 45th Avenue are signalized. Between Skyline Boulevard and 19th Avenue, Sloat Boulevard is part of S.R. 35. In the project vicinity, Sloat Boulevard has a bicycle lane in each direction.

Sloat Boulevard is designated in the San Francisco General Plan as a secondary arterial between the Great Highway and Skyline Boulevard, as a major arterial east of Skyline Boulevard, and as a Neighborhood Network Connection Street east of 45th Avenue. Sloat Boulevard between the Great Highway and 43rd Avenue is also designated as a Key Walking Street.[10] Between 45th Avenue and Skyline Boulevard, Sloat Boulevard is included as part of the Vision Zero High Injury Network.[11]

VEHICULAR COUNTS/TRAFFIC CONDITIONS

Intersection turning movement counts were collected on Tuesday, July 9, 2019 during the weekday p.m. (4 p.m. to 6 p.m.) peak period and on Saturday, July 27, 2019 during the weekend midday period (12 p.m. to 4 p.m.).[12] Appendix D of this EIR contains a summary of the vehicular traffic volumes by movement at the study intersections. **Table 4.3-1** summarizes the existing weekday p.m. peak and weekend midday peak hour traffic hour volumes for the approaches at the study intersections that would be most affected by

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7 A bus or light rail terminal is defined as the point where a transit route starts or ends, where vehicles stop, turn, or reverse and wait before departing on their return journey.

8 Bay Area Ridge Trail information is available at *https://ridgetrail.org*.

9 See Section 4.3.2.2, *Walking Conditions*, for additional description of the Vision Zero High-Injury Network.

10 As part of the city's WalkFirst project, the San Francisco Planning Department determined the Key Walking Streets network. This map is intended to eventually update the San Francisco General Plan's Transportation Element. Key Walking Streets are characterized by street segments in close proximity to significant pedestrian generators such as schools, parks, tourist activities, and shopping districts. The WalkFirst project is a multi-agency effort to improve pedestrian safety and walking conditions, encourage walking as a mode of transportation, and enhance pedestrian connections to key destinations. Information is available at *https://default.sfplanning.org/Citywide/WalkFirst/phase3/WalkFirst_Key_Walking_Streets.pdf*, accessed August 17, 2020.

11 See Section 4.3.2.2, *Walking Conditions*, for additional description of Vision Zero High-Injury Network.

12 CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Technical Memorandum Final, February 2021.

implementation of the project.[13] As shown in the table, traffic volumes on streets adjacent to and near the South Ocean Beach project site are generally greater during the weekday p.m. peak hour than the weekend midday peak hour. On the segment of the Great Highway between Sloat and Skyline boulevards, peak hour traffic volumes in both directions of travel are about 2,385 vehicles during the weekday p.m. peak hour, and slightly lower during the weekend midday peak hour with about 2,247 vehicles per hour.

Table 4.3-1 Existing Weekday P.M. Peak Hour and Weekend Midday Peak Hour Vehicle Counts

Study Intersection	Intersection Approach Volumes				Intersection Total Volumes
	Northbound	Southbound	Eastbound	Westbound	
WEEKDAY P.M. PEAK HOUR[a]					
Great Highway/Sloat Boulevard	1,071	1,295	42	275	2,683
47th Avenue/Sloat Boulevard[b]	--	50	479	248	777
Skyline Boulevard/Sloat Boulevard	957	6	513	825	2,301
Skyline Boulevard/Great Highway[b]	1,813	673	1,273	--	3,759
WEEKEND MIDDAY PEAK HOUR[c]					
Great Highway/Sloat Boulevard	1,200	985	70	532	2,787
47th Avenue/Sloat Boulevard[b]	--	69	570	386	1,025

SOURCE: CHS Consulting Group, 2021.

NOTES:

a The peak hour is the 60 minutes during which the highest volume of vehicles was observed. At the intersections of the Great Highway/Sloat Boulevard and 47th Avenue/Sloat Boulevard the weekday p.m. peak hour is between 4 p.m. and 5 p.m., while at the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway the weekday p.m. peak hour is between 5 p.m. and 6 p.m.

b The intersections of 47th Avenue/Sloat Boulevard and Skyline Boulevard/Great Highway are T intersections, and "--" indicates the approach that does not exist.

c At the intersection of the Great Highway/Sloat Boulevard the weekend midday peak hour is between 2:15 p.m. and 3:15 p.m., while at the intersection of 47th Avenue/Sloat Boulevard the weekend midday peak hour is between 12 p.m. and 1 p.m.

Vehicular access to the San Francisco Zoo on-site parking lots is provided on Sloat Boulevard (entrance only) located about 300 feet east of the Great Highway, and on the section of the Great Highway between Sloat and Skyline boulevards, about 0.25 mile south of Sloat Boulevard (entrance and exit – via northbound Great Highway). During the weekday p.m. peak hour, about 21 vehicles entered via the Sloat Boulevard driveway and 30 vehicles entered and 183 vehicles exited via the Great Highway driveway (total of 51 inbound and 183 outbound vehicles during the weekday p.m. peak hour). During the weekend midday peak hour, about 63 vehicles entered via the Sloat Boulevard driveway and 178 vehicles entered and 185 vehicles exited via the Great Highway driveway (total of 241 inbound and 185 outbound vehicles during the weekend midday peak hour).

Near the South Ocean Beach project site, the intersections of the Great Highway/Sloat Boulevard and 47th Avenue/Sloat Boulevard are signalized and the intersection of Skyline Boulevard/Sloat Boulevard is all-way stop sign-controlled; however, the westbound through movement does not stop, and the eastbound right northbound right movements are *slip*[14] right-turn lanes. At the T intersection of Skyline Boulevard/Great Highway the eastbound left-turn, northbound left-turn, and southbound through

13 The peak hour traffic volume is the volume of vehicles during the peak 60 minutes of the two-hour or longer period during which the highest volume of vehicles was observed.

14 A slip lane is short segment of road that allows vehicles to bypass a controlled access (e.g., stop sign or signal) intersection or highway.

movements are stop sign-controlled; the northbound through movement does not stop, and slip ramps are provided for the southbound and eastbound right-turn movements.

Field observations of the study intersections conducted in November 2019 and September and October 2020 did not identify any unusual or potentially hazardous conditions. At the intersection of the Great Highway/Sloat Boulevard, vehicle queues on the westbound approach of Sloat Boulevard to the intersection occasionally extended beyond the intersection of the Lower Great Highway (about 80 feet east of the Great Highway), and southbound vehicles making a right turn from the Lower Great Highway onto westbound Sloat Boulevard were delayed, but the queues did not result in hazardous conditions. No vehicle conflicts were observed at the unsignalized intersection of Skyline Boulevard/Great Highway during field surveys in November 2019 and October 2020. Separately, the California Department of Transportation (Caltrans) reviewed collision and traffic volume data and determined that this intersection meets traffic *signal warrants*.[15,16] Caltrans will implement a project to reconfigure the travel lanes and signalize this intersection before the proposed project's construction activities start.[17]

4.3.2.2 WALKING CONDITIONS

This subsection describes the absence, discontinuity, or presence of facilities for people walking[18] within the transportation study area. It also identifies any potentially or observed existing hazardous conditions at locations where people walk and describes the number of people walking at adjacent study intersections.

In the project vicinity, neither the Great Highway nor Skyline Boulevard are intended for people walking and neither roadway provides pedestrian facilities such as sidewalks and crosswalks. Shoulders are present along both roadways, but the shoulders are narrow or discontinuous in some locations. On the east side of Skyline Boulevard there is a path around Lake Merced. The intersections of the Great Highway/Sloat Boulevard and 47th Avenue/Sloat Boulevard include pedestrian countdown signals, but do not include *leading pedestrian intervals*.[19] Americans with Disabilities Act (ADA)-compliant curb ramps and crosswalks in the *continental design*[20] are provided at the intersection of 47th Avenue/Sloat Boulevard, while at the intersection of the Great Highway/Sloat Boulevard single curb ramps located outside of the bounds of the marked crosswalks are provided and the center median on Sloat Boulevard extends into the crosswalk across Sloat Boulevard.

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15 A signal warrant is a condition that an intersection must meet to justify a signal installation. There are different warrants, which examine factors such as the volume of vehicles, bicyclists, and pedestrians; the signal system; collision statistics; and the geometric/physical configuration of the intersection. Even if a signal warrant is or is not met under the strictest interpretation, the determination to signalize an intersection could be made based upon the state or city traffic engineer's professional judgment of intersection operations.

16 California Department of Transportation, 2020, Notice of Exemption - State Route 35 Signals at Skyline/Great Highway Project. *https://files.ceqanet.opr.ca.gov/262949-2/attachment/-yfLiBWwp8zhgatXsPyBEduQJ8k8es6R_dmuMWU_hMhrDR9e4hBMqRweYdrg3jIi0vjrne0hyIBZOoo80*, accessed November 11, 2020.

17 Ibid.

18 People walking includes people with disabilities who may or may not require personal assistive mobility devices (e.g., wheelchairs, walkers, crutches, canes).

19 A leading pedestrian interval is a signal phase at signalized intersections that typically provides pedestrians a three- to five-second head start when entering an intersection with a corresponding green signal in the same direction of travel. For vehicle drivers, the leading pedestrian intervals make it easier to see people walking in the intersection and reinforce their right-of-way over turning vehicles.

20 Crosswalks with a continental design have parallel markings that are the most visible to drivers. Use of continental design for crosswalk marking also improves crosswalk detection for people with low vision and cognitive impairments.

In the vicinity of the North Ocean Beach project site, an approximately 20-foot-wide pedestrian promenade is provided on the west side of the Great Highway north of Lincoln Way. At the signalized intersection of the Great Highway/Lincoln Way continental pedestrian crosswalks and pedestrian signals are provided.

Both the Great Highway and Sloat Boulevard are identified as a park edge street in the Better Streets Plan. Streets with this designation have a minimum sidewalk width of 12 feet and a recommended sidewalk width of 24 feet. The Great Highway between Sloat and Skyline boulevards is a divided highway and does not have any pedestrian entrances/exits fronting directly onto the street except for the SFPUC Oceanside Treatment Plant and Westside Pump Station. Sidewalks are not provided on the Great Highway, with the exception of the sidewalk adjacent to the Westside Pump Station (about 7 feet in width). Near the project area, the sidewalks on Sloat Boulevard are generally 12 feet wide on the north side of the street and between 12 and 22 feet wide on the south side of the street and meet the Better Streets Plan minimum sidewalk width. However, on the north side of the street between the Great Highway and the Lower Great Highway, the sidewalk is 7 feet wide, and on the south side of the street between the Great Highway and the entrance to the zoo the sidewalk is about 8 feet wide; these sidewalk widths do not meet the minimum sidewalk width specified in the Better Streets Plan.

Sloat Boulevard between 45th Avenue and Skyline Boulevard is designated on the Vision Zero High-Injury Network. Vision Zero is a City and County of San Francisco (city) policy adopted in 2014 that aims to reduce severe and fatal injuries to people walking, bicycling, and driving, through traffic safety investments where most severe or fatal injuries are concentrated.

On Sloat Boulevard between the Great Highway and Skyline Boulevard, continental crosswalks are present at the signalized intersections of Sloat Boulevard at the Great Highway and at 47th and 45th avenues, and continental crosswalks and *yield lines*[21] are provided at the unsignalized intersections of Sloat Boulevard at 46th, 43rd, and 41st avenues. At the intersection of Skyline Boulevard/Sloat Boulevard, pedestrian crosswalks across Sloat Boulevard between the center median and the raised islands that channelize the travel lanes are provided on the west side of the intersection. At this intersection, pedestrian crosswalks crossing Skyline Boulevard and the northbound right-turn slip lane on the south and crossing 39th Avenue on the north are also provided. Pedestrian crossings across Sloat Boulevard at 42nd and 44th avenues are not provided (i.e., median parking and fence block access for all modes across Sloat Boulevard). On Skyline Boulevard between Sloat Boulevard and the Great Highway, a pedestrian crosswalk is provided at the signalized intersection of Skyline Boulevard/North Herbst Road/Lake Merced Boulevard and a continental crosswalk with yield lines and red flashing lights is provided at South Herbst Road.

Table 4.3-2 presents counts of the number of people crossing within a given crosswalk at the intersections adjacent to and near the South Ocean Beach project site. The number of people crossing at the study intersections is low during the weekday p.m. peak hour, and substantially greater during the weekend midday peak hour. The greatest numbers of people crossing were counted at the intersection of 47th Avenue/Sloat Boulevard, which is the closest signalized intersection to the San Francisco Zoo entrance.

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[21] Yield lines are roadway surface markings consisting of solid white triangles pointing toward approaching vehicles extending across approach lanes to inform drivers where they should stop or yield when approaching an intersection. These yield lines enhance safety for people crossing when a driver yields to a person walking in a crosswalk but the drivers in the adjacent lane cannot see the person because of the stopped vehicle.

Table 4.3-2 Existing Weekday P.M. Peak Hour and Weekend Midday Peak Hour Counts of People Walking within Crosswalks

Study Intersection	North Crosswalk	South Crosswalk	East Crosswalk	West Crosswalk	Total
WEEKDAY P.M. PEAK HOUR[a]					
Great Highway/Sloat Boulevard	4	5	1	2	12
47th Avenue/Sloat Boulevard[b]	14	3	24	63	104
Skyline Boulevard/Sloat Boulevard	15	11	2	10	38
Skyline Boulevard/Great Highway[b]	0	0	59	0	59
WEEKEND MIDDAY PEAK HOUR[c]					
Great Highway/Sloat Boulevard	37	25	3	27	92
47th Avenue/Sloat Boulevard[b]	38	42	28	144	252

SOURCE: CHS Consulting Group, 2021

NOTES:

[a] At the intersections of the Great Highway/Sloat Boulevard and 47th Avenue/Sloat Boulevard the vehicle weekday p.m. peak hour is between 4 p.m. and 5 p.m., while at the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway the weekday p.m. peak hour is between 5 p.m. and 6 p.m.

[b] At the T intersection of 47th Avenue/Sloat Boulevard the south crosswalk counts reflect people walking on the sidewalk on the south side of Sloat Boulevard, while at Skyline Boulevard/Great Highway the east crosswalk counts reflect people walking on the pedestrian pathway around Lake Merced.

[c] At the intersection of the Great Highway/Sloat Boulevard the vehicle weekend midday peak hour is between 2:15 p.m. and 3:15 p.m., while at the intersection of 47th Avenue/Sloat Boulevard the weekend midday peak hour is between 12 p.m. and 1 p.m.

In general, the conditions for people walking are satisfactory. Both the Great Highway and Sloat Boulevard are each about 110 feet curb-to-curb, resulting in a wide intersection with long pedestrian crossing distances. During field observations conducted in November 2019 and September and October 2020, crosswalks and sidewalks were observed to be operating with normal walking speeds and adequate space to bypass other people walking. No substantial safety or right-of-way conflicts between people walking and bicyclists, buses, or other vehicles were observed on streets near the South Ocean Beach project site.

4.3.2.3 BICYCLING CONDITIONS

This subsection describes the facilities for people bicycling within the transportation study area, such as the presence, absence or discontinuous nature of bicycle lanes, and identifies any potentially or observed existing hazardous conditions at locations where people bicycle. In addition, it describes the number of people bicycling in the project vicinity.

Bicycle facilities are typically classified as class I, class II, class III, or class IV facilities.[22] Class I bikeways are bike paths with exclusive rights-of-way for use by people bicycling or people walking. Class II bikeways are striped within the paved areas of roadways and established for the preferential use of people bicycling in separated bicycle lanes. Separated bicycle lanes provide a striped, marked, and signed lane that is buffered from vehicular traffic. These facilities, which are located on roadways, reserve 4 to 5 feet of space for bicycle traffic exclusively. Class III bikeways are signed bicycle routes that allow people bicycling to share travel lanes with vehicles and may include a shared-lane marking. A class IV bikeway is an exclusive bicycle facility

[22] California Streets and Highway Code section 890.4. *https://codes.findlaw.com/ca/streets-and-highways-code/shc-sect-890-4.html*.

that is separated from vehicular traffic by a buffer zone (also referred to as a cycle track). The separation from vehicular traffic could be by grade separations, flexible posts, inflexible physical barriers, or on-street vehicular parking. **Figure 4.3-1** presents the bicycle network in the transportation study area. As shown on the figure, the streets adjacent to and near the South Ocean Beach project site have the following bicycle facilities:

- **Great Highway** has a class III bicycle route designation in both directions of travel between Lincoln Way in the north and Skyline Boulevard (its southern terminus), and bicyclists share the roadway with automobiles or use the shoulders. Between Lincoln Way and Point Lobos Avenue there is a bicycle lane (class II facility) in each direction, except for the segment between Balboa Street and just north of the Cliff House where a protected bikeway (class IV facility) is provided in the northbound (uphill) direction and where bicyclists share the travel lane with vehicles in the southbound direction. North of Sloat Boulevard, an off-street multi-use path (class 1 facility) is also provided within the median between the Great Highway and the Lower Great Highway (i.e., to the east of the Great Highway).
- **Skyline Boulevard** has a class III bicycle route designation in both directions of travel, and bicyclists share the roadway with automobiles or use the shoulders. Skyline Boulevard between John Muir and Lake Merced boulevards is part of the Bay Area Ridge Trail (i.e., the Lake Merced to Stern Grove Trail).[23] An off-street multi-use path (class I facility) is provided around Lake Merced, including along Skyline Boulevard and John Muir Boulevard on the west side of Lake Merced.
- **Sloat Boulevard** has class II bicycle lanes in both directions of travel for the portion of Sloat Boulevard between the Great Highway and 22nd Avenue. East of 22nd Avenue, Sloat Boulevard is a designated route (i.e., class III facility). Sloat Boulevard between 45th Avenue and Skyline Boulevard is designated on the Vision Zero High-Injury Network for people bicycling.

There are eight bicycle racks located on the north side of Sloat Boulevard between 46th and 47th avenues (i.e., adjacent to 2898 Sloat Boulevard).

Counts of people bicycling were conducted during the weekday p.m. and weekend midday peak periods in July 2019 and are presented in **Table 4.3-3**. The number of people bicycling near the South Ocean Beach project site is generally low—fewer than 15 bicyclists in any one direction of travel—but more bicyclists were observed during the weekend midday peak hour than during the weekday p.m. peak hour.

Near the South Ocean Beach project site, the Great Highway, Sloat Boulevard, and Skyline Boulevard are generally flat, with some changes in grades toward the south, facilitating bicycling in the area. No safety hazards or right-of-way conflicts between bicyclists, people walking, buses, or other vehicles on streets nearby the South Ocean Beach project site were observed during field surveys conducted in November 2019 and September and October 2020.

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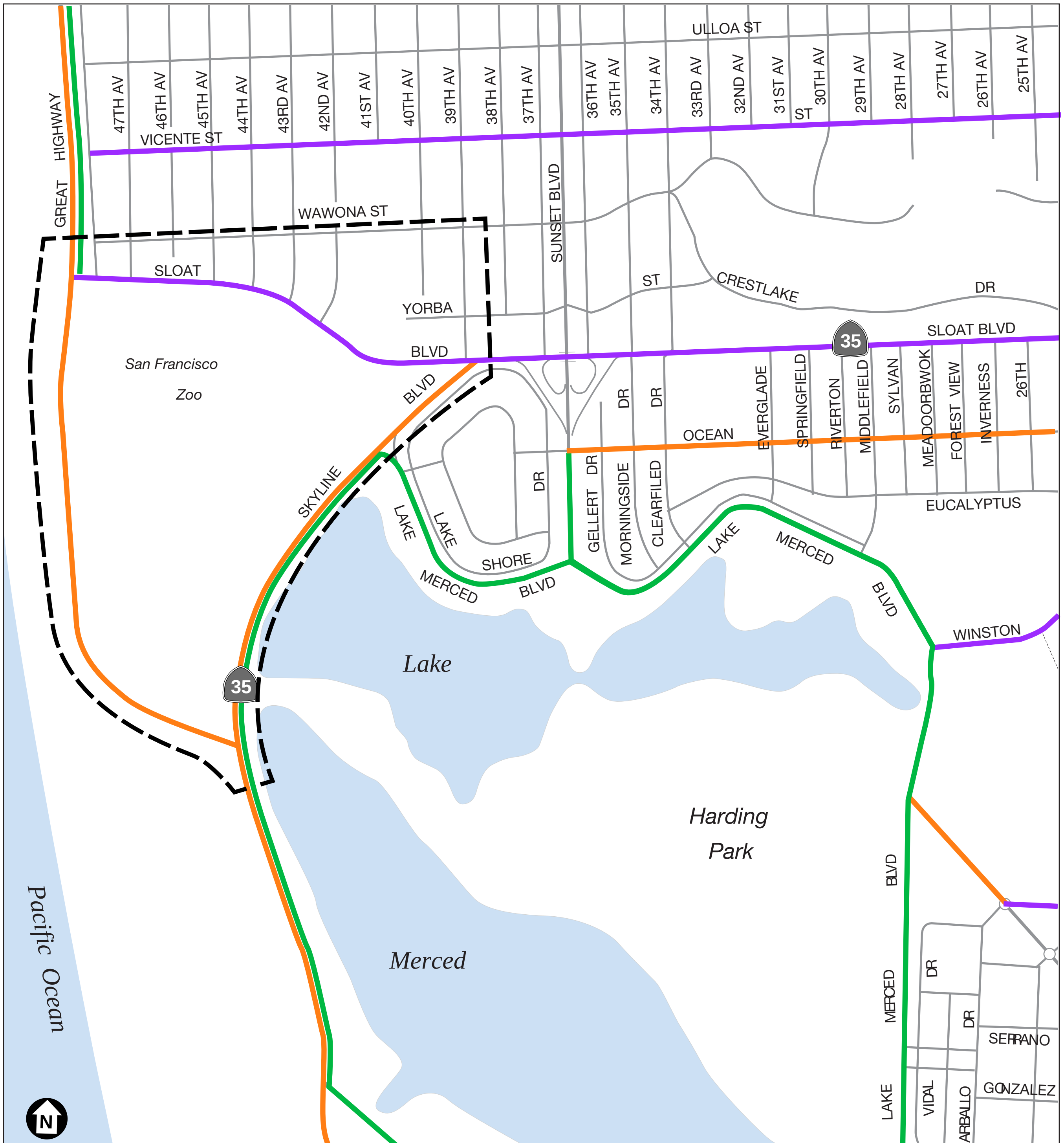
23 Bay Area Ridge Trail map, available at *https://ridgetrail.org/lake-merced-to-stern-grove/*.



Class I Trail

Class II Bicycle Lane

Class III Bicycle Route

Transportation Study Area

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: SFMTA San Francisco Bike Map

Ocean Beach Climate Change Adaptation Project

Figure 4.3-1
Existing Bicycle Route
Network in Project Vicinity

Table 4.3-3 Existing Weekday P.M. Peak Hour and Weekend Midday Peak Hour Counts of People Bicycling

Study Intersection	Northbound Approach	Southbound Approach	Eastbound Approach	Westbound Approach	Intersection Total
WEEKDAY P.M. PEAK HOUR[a]					
Great Highway/Sloat Boulevard	1	9	0	3	13
47th Avenue/Sloat Boulevard[b]	--	2	4	5	11
Skyline Boulevard/Sloat Boulevard	5	0	5	9	19
Skyline Boulevard/Great Highway[b]	2	2	4	--	8
WEEKEND MIDDAY PEAK HOUR[c]					
Great Highway/Sloat Boulevard	9	10	8	6	33
47th Avenue/Sloat Boulevard[b]	--	2	13	12	27

SOURCE: CHS Consulting Group, 2021

NOTES:

a At the intersections of the Great Highway/Sloat Boulevard and 47th Avenue/Sloat Boulevard the vehicle weekday p.m. peak hour is between 4 p.m. and 5 p.m., while at the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway the weekday p.m. peak hour is between 5 p.m. and 6 p.m.

b The intersections of 47th Avenue/Sloat Boulevard and Skyline Boulevard/Great Highway are T intersections, and "—" indicates the approach that does not exist.

c At the intersection of the Great Highway/Sloat Boulevard the vehicle weekend midday peak hour is between 2:15 p.m. and 3:15 p.m., while at the intersection of 47th Avenue/Sloat Boulevard the weekend midday peak hour is between 12 p.m. and 1 p.m.

4.3.2.4 PUBLIC TRANSIT CONDITIONS

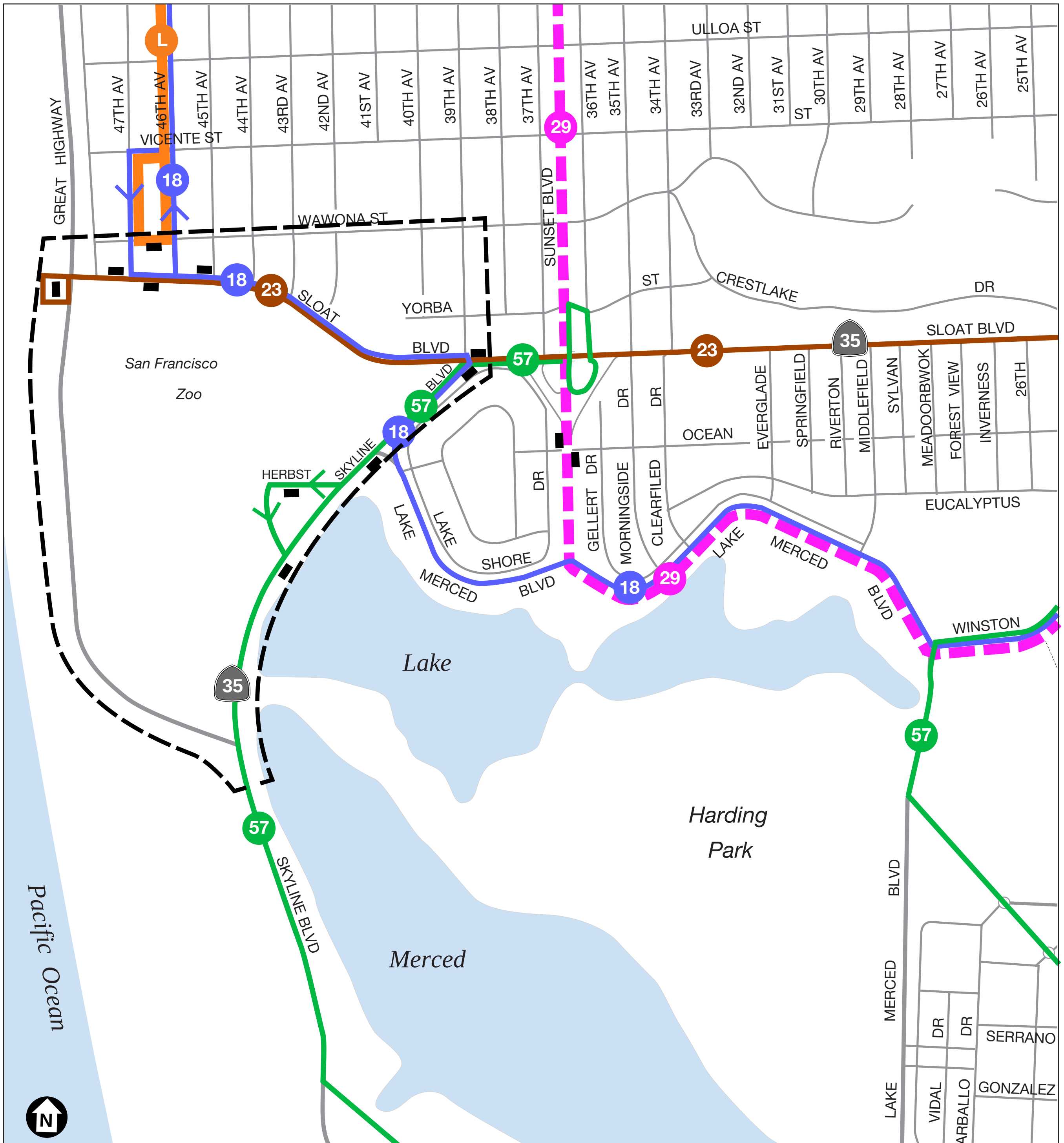
This subsection describes the local and regional public transit service in the transportation study area, including geographic extent, scheduled frequency, and transit stop proximity to the project area.

Local service in San Francisco is provided by the San Francisco Municipal Railway (Muni), the transit division of the San Francisco Municipal Transportation Agency (SFMTA). Muni bus routes and light rail lines can be used for access to regional transit operators. **Figure 4.3-2** presents the existing transit network serving the transportation study area and identifies the nearest stops for local bus routes and light rail lines. Muni operates the 23 Monterey, the 18 46th Avenue, and the 57 Parkmerced bus routes within the transportation study area. The 23 Monterey route runs along Sloat Boulevard and has a terminal and *layover*[24] on the west side of the Great Highway at Sloat Boulevard, while the 18 46th Avenue and the 57 Parkmerced generally run north-south through the transportation study area. In addition to these bus routes, the L Taraval light rail line runs southbound on 47th Avenue to its terminal on Wawona Street.

Table 4.3-4 presents information for each Muni route that operates within the transportation study area, including *service frequencies*[25] for the a.m. and p.m. peak periods, general hours of operation, and neighborhoods served. During field surveys of the South Ocean Beach project site conducted in November 2019, no conditions that would result in potentially hazardous conditions for buses operating on Skyline and/or Sloat boulevards (i.e., conditions in which vehicles could potentially collide with a transit vehicle) were observed.

24 A layover is a waiting period included in the schedule at the end of a trip. A layover typically takes place at a transit terminus.

25 The service frequency is the number of minutes between buses or trains on a particular bus route or light rail line.



Muni Metro Rail - Frequency 10 Minutes or Less

Muni Bus - Frequency every 10-20 Minutes

Muni Bus - Frequency every 20-30 Minutes

Nearest Stop to Project Site

Transportation Study Area

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: SFMTA Muni Routes and Stops Map

Ocean Beach Climate Change Adaptation Project

Figure 4.3-2
Existing Muni Transit Network in Project Vicinity

Table 4.3-4 Existing Muni Routes in Project Vicinity

Bus Route/ Light Rail Line	Frequencies (in minutes) A.M. Peak Period	Frequencies (in minutes) P.M. Peak Period	General Hours of Weekday Operation (First and last trips)	Neighborhoods Served
18 46th Avenue	20	20	5 a.m. – 1 a.m.	Golden Gate Park, Lakeshore, Ocean View, Outer Richmond, Outer Sunset, Parkside, Seacliff
23 Monterey	20	20	5 a.m. – 1 a.m.	Bayview, Bernal Heights, Diamond Heights, Excelsior, Glen Park, Lakeshore, Outer Mission, Parkside, West of Twin Peaks
57 Parkmerced	20 – 30	20 – 30	5 a.m. – 1 a.m.	Lakeshore, Ocean View, Parkside, West of Twin Peaks
L Taraval Light Rail	8	8	5 a.m. – 1 a.m.	Castro/Upper Market, Chinatown Downtown/Civic Center, Financial District, Lakeshore, Mission, Noe Valley, Parkside, South of Market, Twin Peaks, West of Twin Peaks, Western Addition

SOURCE: SFMTA, https://www.sfmta.com/getting-around/muni/routes-stops, LCW Consulting, 2020.

NOTES:

[a] Frequencies represent wait times between transit vehicles.
[b] The a.m. peak period for Muni service is between 7 a.m. and 10 a.m., and the p.m. peak period is between 3 p.m. and 7 p.m.
[c] The L Taraval & Wharf Owl bus route operates every 30 minutes between 1 a.m. and 5 a.m.

From the project area, access to regional transit service providers is via Muni service. Regional transit providers include Bay Area Rapid Transit (BART), Golden Gate Transit, and San Mateo County Transit District (SamTrans). BART operates heavy rail regional trains; the closest station (Daly City) is located approximately 3 miles southeast of the South Ocean Beach project site and can be reached via the 57 Parkmerced bus route. Golden Gate Transit is bus service that connects the North Bay to San Francisco; it primarily serves downtown and can be reached via the L Taraval light rail line at the terminal station on Wawona Street between 46th and 47th avenues (one block north of Sloat Boulevard). The nearest SamTrans bus route is the Route 122 that connects the South San Francisco BART station with the Stonestown Galleria shopping center and the San Francisco State University campus. SamTrans Route 122 runs to the east of the South Ocean Beach project site along Lake Merced Boulevard and Winston Drive. Connections to the SamTrans Route 122 are provided via the Muni 18 46th Avenue bus route.

4.3.2.5 EMERGENCY ACCESS CONDITIONS

The nearest fire stations to the South Ocean Beach project site are Station 19 located at 390 Buckingham Way at Winston Street (about 1.5 mile southeast of the project site), Station 18 located at 1935 32nd Avenue at Ortega Street (about 1.6 miles northeast of the project site), and Station 40 located at 2155 18th Avenue at Rivera Street (about 2 miles northeast of the project site). The South Ocean Beach project site is within the Taraval District police station service area (station located at 2345 24th Avenue).

Emergency vehicle access to the SFPUC Oceanside Water Pollution Control Plant (Oceanside Treatment Plant) and Westside Pump Station facilities is via the Great Highway, while access to the San Francisco Zoo is via the Great Highway and Sloat Boulevard. South Ocean Beach is accessible by vehicle via the sand ramp located at the terminus of Sloat Boulevard at the Great Highway.

During field surveys of the South Ocean Beach project site conducted in November 2019 and September and October 2020, observations did not identify any emergency vehicles or conditions that would impede emergency service providers (e.g., physical barriers that could restrict emergency vehicle access, inadequate turning radii at intersections).

4.3.2.6 VEHICLE MILES TRAVELED

Vehicle miles traveled (VMT) per person (or per capita) is a measurement of the amount and distance that a resident, employee, or visitor drives, accounting for the number of passengers within a vehicle. In general, higher VMT areas are associated with more air pollution, including greenhouse gas emissions, and energy usage than lower VMT areas. Many interdependent factors affect the amount and distance a person might drive. In particular, the built environment affects how many places a person can reach within a given distance, time, and cost, using different ways of travel (e.g., private vehicle, public transit, bicycling, walking, etc.). Typically, low-density development located at great distances from other land uses and in areas with few options for ways of travel provides less accessibility to places a person can reach than a location with high density, a mix of land uses, and numerous ways of travel. Therefore, low-density development typically generates more VMT compared to a similarly sized development located in an urban area.

Given these travel behavior factors, on average, persons living or working in San Francisco result in lower amounts of VMT per person than persons living or working elsewhere in the nine-county San Francisco Bay Area region. In addition, on average, persons living or working in some areas of San Francisco result in lower amounts of VMT per person than persons living or working elsewhere in San Francisco. The city displays different amounts of VMT per capita geographically through transportation analysis zones.[26] The San Francisco County Transportation Authority's San Francisco Chained Activity Modeling Process (SF-CHAMP) travel demand model is used to estimate existing and future year average daily VMT per capita for residential, office, and retail land use types for the transportation analysis zones in the city.

The project is an infrastructure project that does not include transportation features that would generate new travel demand (e.g., highway widening, substantial parking structure). Therefore, existing VMT per capita is not presented. Although the study area includes some of the highest VMT per person in San Francisco, it remains within the lowest VMT per person in the Bay Area region.

4.3.2.7 COMMERCIAL VEHICLE AND PASSENGER LOADING CONDITIONS

The existing commercial vehicle and passenger loading conditions in the vicinity of the South Ocean Beach project site were assessed qualitatively during field observations conducted in November 2019 and September 2020. There are no on-street commercial or passenger loading zones adjacent to the project site along the Great Highway. On the south side of Sloat Boulevard there is a 30-foot-long passenger loading zone directly east of the driveway entrance to the San Francisco Zoo (about 320 feet east of the Great

[26] Planners use these zones as part of transportation planning models for transportation analyses and other planning purposes. The zones vary in size from single city blocks in the downtown core and multiple blocks in outer neighborhoods to even larger zones in historically industrial areas such as the Hunters Point Shipyard area.

Highway) and a 105-foot-long passenger loading zone between 46th and 47th avenues (about 550 feet east of the Great Highway, and east of the Muni bus stop). During field observations conducted in November 2019, no conflicts between passenger loading activities and people bicycling or driving, or transit operations on Sloat Boulevard were observed.

Commercial loading and unloading activities for uses near the South Ocean Beach project site such as the San Francisco Zoo and the Sloat Garden Center generally occur within the facility/business sites, and no commercial loading activities were observed occurring within bicycle lanes or travel lanes (i.e., double parking) during field observations conducted in November 2019.

4.3.2.8 PARKING CONDITIONS

In implementing Appendix G of the CEQA Guidelines, which no longer includes parking in and of itself as a checklist question, the San Francisco Planning Department considers the change in parking supply and demand in the context of the criterion of whether the project would “conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadways, bicycle and pedestrian facilities.”

The planning department’s transportation impact analysis guidelines[27] include screening criteria for projects that would not result in a substantial parking deficit. The project qualifies as an active transportation/rightsizing project and other minor transportation project pursuant to the Senate Bill 743 (SB 743) checklist, indicating that the project would not result in a substantial parking deficit and thus would not result in secondary effects related to potentially hazardous conditions or interfere with accessibility for people walking, bicycling, or inadequate access for emergency vehicles, or substantial delay to public transit. Thus, the transportation impact analysis does not consider the adequacy of parking in determining the significance of project impacts under CEQA. Parking is not discussed further in this EIR.

4.3.3 Regulatory Framework

The following summarizes relevant state, regional, and local transportation regulations applicable to the project, along with relevant transportation plans and policies.

4.3.3.1 FEDERAL

NATIONAL PARK SERVICE MANAGEMENT POLICIES

The National Park Service (NPS) management policies, described in Chapter 3, Plans and Policies, Section 3.6.1, National Park Service Management Policies, provide the framework for managing the national park system, including transportation access to and within the parks. The NPS management policies promote transit and non-motorized modes, such as walking and bicycling, as modes of access to and moving within the parks. They also include provisions for promoting alternative transportation systems and enhancing the quality of the roadway and trail systems.

27 San Francisco Planning Department, Transportation Impact Analysis Guidelines, October 2019. *https://sfplanning.org/news/transportation-impact-analysis-guidelines-update, accessed November 9, 2020*.

GOLDEN GATE NATIONAL RECREATION AREA, GENERAL MANAGEMENT PLAN

The Golden Gate National Recreation Area (GGNRA) General Management Plan, described in Chapter 3, Plans and Policies, Section 3.6.2, Golden Gate National Recreation Area General Management Plan, provides comprehensive direction for resource preservation and visitor use and a basic foundation for decision-making for the GGNRA and Muir Woods National Monument for the next 20 years. The GGNRA General Management Plan includes strategies to improve nonmotorized transportation access to and within park sites. Examples of transportation management tools include separate bicycle and pedestrian facilities, improved intersection design to enhance access and safety, a system of multi-use trails and paths, improved wayfinding and signs, and traffic-calming measures.

4.3.3.2 STATE

CEQA SECTION 21099(B)(1) (SENATE BILL 743)

CEQA section 21099(b)(1) required that the State Office of Planning and Research develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that upon certification of the revised guidelines for determining transportation impacts pursuant to section 21099(b)(1), automobile delay, as described solely by level of service or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

In January 2016, the Office of Planning and Research published for public review and comment a Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA recommending that transportation impacts for projects be measured using a VMT metric.[28,29] In January 2019, changes to the CEQA statutes and guidelines went into effect, including a new section 15064.3 that states that VMT is the most appropriate measure of transportation impacts and that includes updated criteria for analyzing transportation impacts.

CALTRANS RESPONSIBILITIES

The California Department of Transportation (Caltrans) manages interregional transportation, including management and construction of the California highway system. In addition, Caltrans is responsible for permitting and regulating the use of state roadways. Caltrans facilities that are likely to be used by construction workers and construction vehicles as access routes to the proposed worksites include I-280, S.R. 1, and S.R. 35 (see Figure 1-1).

Caltrans construction practices require temporary traffic control planning "during any time the normal function of a roadway is suspended."[30] Caltrans also requires that permits be obtained for transportation of oversized loads and transportation of certain materials, and for construction-related traffic disturbance. Project-related construction and maintenance vehicles would use state roadways as access routes for construction workers,

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28 California Office of Planning and Research, Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, Implementing Senate Bill 743 (Steinberg, 2013), *January 20, 2016.*

29 California Office of Planning and Research, Technical Advisory on Evaluating Transportation Impacts in CEQA. December 2018. *https://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf*

30 Caltrans, California Manual on Uniform Traffic Control Devices, 2014 Edition, Revision 5 (March 20), *https://dot.ca.gov/programs/safety-programs/camutcd*.

and some project construction activities (i.e., crosswalk striping across Skyline Boulevard) would occur on a state highway (S.R. 35); therefore, Caltrans encroachment permits would be required. In addition, the SFPUC or its contractor would acquire permits from Caltrans to allow oversized vehicles (by weight, height, length, or width) needed to transfer certain construction equipment (e.g., cranes) to the project sites via state highways.

CALIFORNIA COASTAL ACT

The California Coastal Act, described in Chapter 3, Plans and Policies, Section 3.5.1, California Coastal Act, was enacted by the state in 1976 to provide long-term protection of the Pacific Ocean coastline and includes policies to maintain and enhance public access to the coast. The act includes policies for maximum access for all people and distribution of public facilities, including parking lots and facilities, wherever appropriate and feasible (policies 30210 and 30212.5).

4.3.3.3 LOCAL

SAN FRANCISCO PUBLIC WORKS CODE CONSTRUCTION WORK REQUIREMENTS

The San Francisco Public Works Code section 724 requires that a property owner obtain a street space occupancy permit from public works for occupying any part of the fronting street or sidewalk for any purpose, including building construction operations. Section 724 also establishes requirements for the temporary occupation of the public-right-of way including, but not limited to, clearances for traffic-signal equipment, notice to all impacted fronting property owners, pedestrian clearances, construction worker parking plans in certain use districts, debris management, and clearances for San Francisco Fire Department equipment. Further, section 724 requires lights, barriers, barricades, signs, cones, and other devices to ensure pedestrian and traffic safety.

Public works code section 2.4.20 addresses permits to excavate. For a permit for major work or excavation that will affect the public right-of-way[31] that is 30 consecutive calendar days or longer, contractors are required to submit for public works review a contractor parking plan, including a proposal to reduce parking demand in the project site vicinity.

San Francisco Public Works Order No. 167,840,[32] identifies requirements related to the placement of various types of barricades at construction sites, such as A-frames, barrier caution tapes, fencing, and barricades around crosswalks. These requirements are intended to protect pedestrians near construction sites consistent with all local, state, and federal codes, including the Americans with Disabilities Act and the California Building Code, title 24.

SAN FRANCISCO REGULATIONS FOR WORKING IN SAN FRANCISCO STREETS (BLUE BOOK)

The San Francisco Regulations for Working in San Francisco Streets (also known as the “blue book”) contains regulations that are prepared and regularly updated by the SFMTA, under the authority derived from the San Francisco Transportation Code, to serve as a guide for contractors working in San Francisco streets. The manual establishes rules and guidance so that work can be done safely and with the least possible

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31 The public corks code section 2.4.4 defines “major work” as any reasonably foreseeable excavation that will affect the public right-of-way for more than 15 consecutive calendar days.

32 San Francisco Public Works. 2008. Guidelines for the Placement of Barricades at Construction Sites (Order No. 167,840). Online at http://sfpublicworks.org/sites/default/files/Guidelines_for_Placement_of_Barricades_0.pdf, accessed June 24, 2020.

interference with pedestrians, bicycle, transit, and vehicular traffic. The manual also contains relevant general information, contact information, and procedures related to working in the public right-of-way when it is controlled by agencies other than the SFMTA.

In addition to the regulations presented in the manual, all traffic control, warning, and guidance devices must conform to the California Manual on Uniform Traffic Control Devices.[33] Furthermore, contractors are responsible for complying with all applicable city, state, and federal codes, rules, and regulations. The party responsible for setting up traffic controls during construction is responsible if such controls do not meet the guidance and requirements established by this manual and any applicable state requirements.

SAN FRANCISCO PUBLIC UTILITIES COMMISSION STANDARD CONSTRUCTION MEASURES

The SFPUC would implement standard construction measures for the project including the following measure applicable to traffic:

> 4. TRAFFIC: All projects will implement traffic control measures sufficient to maintain traffic and pedestrian circulation on streets affected by construction of the project. Traffic control measures may include, but not be limited to, flaggers and/or construction warning signage of work ahead; scheduling truck trips during non-peak hours to the extent feasible; maintaining access to driveways, private roads, and off-street commercial loading facilities by using steel trench plates or other such method; and coordination with local emergency responders to maintain emergency access. For projects in San Francisco, the measures will also, at a minimum, be consistent with the requirements of San Francisco Municipal Transportation Agency (SFMTA)'s blue book. Any temporary rerouting of transit vehicles or relocation of transit facilities would be coordinated with the applicable transit agency, such as SFMTA Muni Operations in San Francisco. All Projects will obtain encroachment permits from the applicable jurisdiction for work in public roadways.

TRANSIT-FIRST POLICY

In 1973, the San Francisco Board of Supervisors declared that public transit be given priority over other vehicles on San Francisco streets. In 1998, the San Francisco voters amended the city charter (charter article 8A, section 8A.115) to include a transit-first policy. The San Francisco General Plan incorporates the policy and the policy requires all city boards, commissions, and departments to implement principles that, among others, encourage the use of public rights-of-way by people walking, bicycling, and riding public transit above the use of the personal automobile.

VISION ZERO

In 2014, the San Francisco Board of Supervisors adopted a resolution to implement an action plan to reduce traffic deaths to zero by 2024 through engineering, education, and enforcement (resolution 91-14). Numerous San Francisco agencies responsible for the aforementioned aspects of the action plans adopted similar resolutions. In 2017, the board of supervisors amended the transportation and urban design elements of the San Francisco General Plan to implement Vision Zero (ordinance 175-17).

[33] Caltrans, California Manual of Uniform Traffic Control Devices, 2014, Revision 5. *https://dot.ca.gov/programs/safety-programs/camutcd/camutcd-rev5*.

SAN FRANCISCO GENERAL PLAN

The Transportation Element of the San Francisco General Plan is composed of objectives and policies that relate to the nine aspects of the city-wide transportation system: general, regional transportation, congestion management, vehicle circulation, transit, pedestrian, bicycles, city-wide parking, and goods management. The Transportation Element, which references the city's Transit-First Policy in its introduction, contains objectives and policies that are directly pertinent to consideration of the project, including objectives related to prioritizing sustainable modes of travel and designing streets for walking and bicycling, along with designation of the Great Highway as a recreational street. In addition, the vehicle circulation plan states that the design capacity of the Great Highway should be reduced substantially to correspond with its recreational function, with emphasis on slow pleasure traffic, bicycles, and safe pedestrian crossings.

The San Francisco General Plan also includes the Western Shoreline Area Plan, which provides objectives and policies to preserve and enhance San Francisco's coastal zone, which includes the Ocean Beach and the Great Highway areas. Transportation policies include improving public transit access to the coast, redesigning the Great Highway to enhance its recreational use and provide a multi-use pathway for people walking and bicycling, improving pedestrian and bicycle safety, and improving public accessibility to Ocean Beach.

BETTER STREETS PLAN, POLICY, AND REQUIREMENTS

In 2006, the San Francisco Board of Supervisors adopted the Better Streets Policy. Since then, the board has amended the policy several times, including in 2010 to reference the Better Streets Plan. The Better Streets Plan creates a unified set of standards, guidelines, and implementation strategies to govern how San Francisco designs, builds, and maintains its pedestrian environment. The San Francisco Planning Code (section 138.1) requires certain new development projects to make changes to the public right-of-way, such that it is consistent with the Better Streets Plan.

4.3.4 Impacts and Mitigation Measures

4.3.4.1 SIGNIFICANCE CRITERIA

San Francisco Administrative Code chapter 31 directs the planning department to identify environmental effects of a project using as its base the environmental checklist form set forth in Appendix G of the CEQA Guidelines. As it relates to transportation and circulation, Appendix G asks whether the project would:

- Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b) [which sets forth requirements for evaluating a project's VMT];
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses; or
- Result in inadequate emergency access.

The planning department uses significance criteria to facilitate the transportation analysis and address the Appendix G checklist. The planning department separates the significance criteria into two categories: construction and operation.

CONSTRUCTION

Project construction would have a significant effect on the environment if it would require a substantially extended duration or intense activity; and the effects would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with accessibility for people walking or bicycling or substantially delay public transit.

OPERATION

The operational impact analysis addresses the following five significance criteria. A project would have a significant effect if it would:

- Create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations;
- Interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access;
- Substantially delay public transit;
- Cause substantial additional VMT or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network; or
- Result in a loading deficit and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit.

4.3.4.2 APPROACH TO ANALYSIS

The following summarizes the methodology and results for the project's travel demand under project and cumulative conditions. In addition, the following summarizes the methodology for analyzing, and any quantitative thresholds of significance for determining, transportation impacts under project conditions. The travel demand and impact analysis methodologies use the data and guidance within the planning department's Transportation Impact Analysis Guidelines (2019). If the methodology differs from that in the guidelines, the differences are summarized.

ANALYSIS PERIODS

In San Francisco, the weekday p.m. peak period is typically the period when the most overall travel happens and is the standard period of analysis. The project construction-related and operations impact assessment includes daily and/or p.m. peak hour analysis periods. The p.m. peak hour was defined as the 60-minute period with the highest traffic volume between 4 p.m. and 6 p.m.

PROJECT TRAVEL DEMAND AND RESULTS

Project travel demand refers to the number, type, and common destinations of new trips that people would take to and from the project area. The methodology and results of estimating the travel demand associated with project construction activities, as well as operations and maintenance activities, are detailed below.

Travel demand for project construction was based on preliminary construction information provided by the SFPUC.[34]

Construction Travel Demand

Construction-related travel demand for the project was estimated on a daily basis and for the p.m. peak hour. Each of the project construction activities would generate various types of vehicle trips: construction workers traveling to and from the work area, haul trucks associated with the transfer and disposal of excavated materials, haul trucks importing backfill materials, and delivery trucks bringing materials and equipment to the work area. See Appendix D for more information about construction vehicle trips.

Construction Schedule

Construction activities are expected to generally occur over a single shift primarily during daytime hours (7 a.m. to 3:30 p.m.), five days a week, on normal (non-holiday) weekdays (Monday through Friday). However, consistent with the city's noise ordinance, it is possible that at times construction could proceed up to seven days a week, except holidays, between 7 a.m. and 8 p.m. In addition, some nighttime construction may be required for the buried wall component of the project.

The city would construct the project over approximately four years, with an anticipated construction period from 2023 to 2027. Project construction would occur in five phases and would be sequenced as follows (see Chapter 2, Project Description, Section 2.5.1, Construction Activities and Phasing, for details):

- **Phase 1**: Modify the intersection of the Great Highway/Sloat Boulevard; remove the NPS restroom; relocate the Muni 23 Monterey bus terminal, layover, and turnaround; and permanently close the Great Highway south of Sloat Boulevard
- **Phase 2**: Remove the Great Highway southbound lanes, construct a buried wall, and stabilize the slope
- **Phase 3**: Remove revetments and rubble from the beach, place sand on the beach
- **Phase 4**: Remove or repurpose the Great Highway northbound lanes; install the multi-use trail and service road; construct the Skyline coastal parking lot, new restroom, and beach access stairs, and install landscaping along the multi-use trail; and restripe the intersection of Skyline Boulevard/Great Highway
- **Phase 5**: Install landscaping along the reshaped bluff and temporary irrigation (as needed) and undertake site cleanup activities.

Project Daily Vehicle Trips During Construction

Table 4.3-5 summarizes the total and average daily trucks required for hauling materials by construction phase by purpose (i.e., export hauls, import hauls, vendor deliveries). As shown in Table 4.3-5, during the four-year construction period, the number of daily construction trucks traveling to and from the work area would vary, depending on the phase and type of construction activity. The greatest number of construction vehicle trips (export, import, and vendor haul trips) would occur during phase 2 over a 25-month period, with an average of 28 trucks per day and an average of 60 construction workers on site on a daily basis.

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34 San Francisco Public Utilities Commission, 2020. Resource Allocation Responses to Request for Information (RFI) 6. June 9, 2020.

Table 4.3-5 Total and Average Daily Construction Trucks and Average Daily Construction Workers by Phase[a]

Construction Trucks/Workers	Phase 1 Modify Intersection (12 months)	Phase 2 Construct Buried Wall (25 months)	Phase 3 Remove Revetments (18 months)	Phase 4 Install Trail/ Parking Lot (9 months)	Phase 5 Landscape Dunes (5 months)	Total
TOTAL TRUCKS						
Export Trucks[b]	444	6,500	2,500	484	0	9,928
Import Trucks[c]	3,240	0	0	89	89	3,418
Vendor Trucks[d]	245	4,310	0	890	860	6,305
Total trucks	**3,929**	**10,810**	**2,500**	**1,463**	**949**	**19,651**
AVERAGE DAILY TRUCKS[e]						
Export Trucks	3	15	14	4	0	--
Import Trucks	17	0	0	1	1	--
Vendor Trucks	2	13	0	6	9	--
Total average daily trucks	**22**	**28**	**14**	**11**	**10**	**--**
AVERAGE DAILY CONSTRUCTION WORKERS						
Workers	50	60	20	50	50	--

SOURCES: San Francisco Public Utilities Commission, 2020; LCW Consulting, 2020. (see Appendix D)

NOTES:

[a] Due to rounding, numbers in columns may not add to totals.
[b] Export trucks include removal of excavated materials (e.g., bus stop, restrooms, revetments, rock, roadway).
[c] Import trucks include deliveries of clean fill for slope protection and grading.
[d] Vendor trucks include deliveries of construction materials (e.g., concrete piles, steel, asphalt).
[e] Average daily trucks were calculated by dividing the total trucks during the phase by the number of production work days (i.e., total work days taking delays such as weather into account) during the phase.

As shown in Chapter 2, Project Description, Table 2-3, Project Construction Schedule, the construction phases would overlap. For purposes of a conservative transportation analysis, a representative day of analysis during the maximum overlap period was developed based on the construction worker and truck data. The representative weekday is when the maximum construction truck and worker trips are expected to occur. Based on an analysis of the anticipated number of construction trucks and workers and the duration of each of the five phases, the peak of construction activities would occur during a six-month period between November 2025 and April 2026 when phases 2, 3 and 4 would overlap, with approximately 53 trucks traveling to and from the site per day and 130 construction workers on site per day. For the remainder of the 49-month construction period, the daily construction trucks and workers would be less. **Table 4.3-6** presents information on the daily numbers of construction workers and trucks for the peak construction period by phase during the peak six months of construction activity.

Table 4.3-6 Average Daily Number of Construction Trucks and Workers During Period of Maximum Overlap of Construction Phases[a]

Phase	Trucks	Workers	Total
Phase 2	28	60	88
Phase 3	14	20	34
Phase 4	11	50	61
Total	**53**	**130**	**183**

SOURCES: San Francisco Public Utilities Commission, 2020; LCW Consulting, 2020 (see Appendix D).

NOTES:

[a] Daily number of trucks and construction workers traveling to or from the site.
[b] The number of construction workers assumes a single shift and that all construction workers would travel to the work area by auto (single occupancy).

Construction Trip Distribution

Prior to assigning the construction vehicles to the roadway network, the number of daily construction trucks and workers presented in Table 4.3-6 were multiplied by two to reflect an inbound and outbound trip for each vehicle. The analysis conservatively assumes that construction workers would all drive to the South Ocean Beach project site in single-occupant vehicles (i.e., no carpools, no transit).

The daily construction trucks and workers were distributed to the roadway network based on information provided by the SFPUC on the general origin or destination of the type of export or import materials, vendor location, and anticipated residence of construction workers. In general, the primary destination of export trucks would be the South Bay, the primary origin of import trucks for slope protection and grading materials would be San Francisco, and the primary origin of vendor trucks would be the North Bay and South Bay. Construction workers would be primarily drawn from San Francisco, the North Bay, and the South Bay, with somewhat fewer workers from the East Bay. **Figure 4.3-3** graphically presents the routes for construction vehicles entering and leaving the project work area, and these routes were used to distribute the daily and p.m. peak hour construction vehicle trips. Construction vehicles would have access to the South Ocean Beach project site from the Great Highway in the north and from Skyline Boulevard in the south. Sloat Boulevard would be used for construction vehicles destined to and from the north via 19th Avenue, the South Bay and East Bay via Ocean Avenue and I-280, and destinations within San Francisco. Skyline Boulevard would be used for construction vehicles destined to and from the South Bay and East Bay via John Daly Boulevard, S.R. 35, S.R. 1, and I-280.

Diversion of Existing Vehicle Trips During Construction

In addition to creating the temporary increase in construction truck and worker vehicles that would travel to and from the work area, the project would close the segment of the Great Highway between Sloat and Skyline boulevards during its first construction phase and permanently. The inbound and outbound vehicular access to the San Francisco Zoo from the Great Highway would be relocated to the reconfigured Sloat Boulevard driveway located about 300 feet east of the Great Highway. This driveway is currently an inbound-only entrance and would be reconfigured to allow for inbound and outbound travel.

Changes in traffic volumes on transportation study area roadways due to the closure of the Great Highway south of Sloat Boulevard, combined with the project construction traffic presented above, were used in the assessment of potentially hazardous conditions and impacts on transit service during the project construction period.

SFO\12xxxx\D120468.23 - South Ocean Beach Long Term Project\05 Graphics-GIS-Modeling\Illustrator

SOURCE: ESA, 2020; ESRI, 2020

Ocean Beach Climate Change Adaptation Project

Figure 4.3-3
Vehicle Access Routes for Construction Activities and Operational Sand Placement

The project's closure of the Great Highway between Sloat and Skyline boulevards would result in a diversion of existing vehicle trips to other parallel streets. To continue south of the closed portion of the Great Highway, southbound traffic on the Great Highway would be forced to make a left turn onto Sloat Boulevard and then turn right onto Skyline Boulevard. Vehicles traveling northbound on Skyline Boulevard south of the Great Highway would continue to travel northbound, turn left onto Sloat Boulevard at the intersection of Skyline Boulevard/Sloat Boulevard, and then turn right onto the Great Highway at the intersection of Great Highway/Sloat Boulevard to continue north. Instead of this reroute, some vehicles may instead divert to other roadways to the east (e.g., Sunset Boulevard, 19th Avenue).

To estimate the number of vehicles that would divert to other roadways, actual traffic counts for conditions when the Great Highway between Sloat and Skyline boulevards was closed due to sand buildup were compared to vehicle volumes when the Great Highway was open to determine the level of diversions to other streets to the east.[35] Based upon this comparison, during the p.m. peak hour approximately 27 percent of the existing northbound and southbound through traffic on the Great Highway segment between Sloat and Skyline boulevards would reroute to other parallel streets to the east and would not travel on the Great Highway approaching Sloat Boulevard, on Sloat Boulevard, or on Skyline Boulevard. The remaining 73 percent of northbound and southbound through traffic on the Great Highway would reroute via Sloat and Skyline boulevards, as described above.

As noted above, existing vehicles entering and exiting the San Francisco Zoo via the Great Highway would also reroute to Sloat Boulevard because the project would permanently close the zoo parking access on the Great Highway during its first construction phase.

Project Weekday P.M. Peak Hour Traffic Volumes During Construction

Table 4.3-7 summarizes the following traffic volumes for the transportation study area for the weekday p.m. peak hour:

1. Existing conditions traffic volumes;
2. Traffic volumes during construction that reflect rerouting of existing traffic due to closure of the Great Highway between Sloat and Skyline boulevards and zoo parking access during the first construction phase;
3. Project construction vehicle trips, including trucks; and
4. Project construction traffic volumes that reflect rerouting (#2 above) and project construction vehicle trips (#3 above).

The number of construction truck trips that would occur during the p.m. peak hour was estimated by assuming that 25 percent of the daily trucks would travel to and from the site during the p.m. peak hour. This is a conservative estimate, as typically construction trucks would travel to and from the site during a four-hour period in the morning. The number of construction worker trips that would occur was estimated by assuming that all construction workers would leave the work area during the p.m. peak hour. This is also a conservative estimate, as a typical daytime work shift would be between 7 a.m. and 3:30 p.m. and would not overlap with the p.m. peak hour of vehicle travel in the vicinity of the work area.

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[35] CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Technical Memorandum Final, February 2021.

Table 4.3-7 Weekday P.M. Peak Hour Traffic Volumes During Period of Maximum Overlap of Construction Phases

Roadway Segment and Direction of Travel	Existing Volumes	Project Construction Conditions			
		Rerouted Traffic Volumes	Project Construction Truck Trips	Project Construction Worker Trips	Rerouted Traffic + Construction Trips
1. GREAT HIGHWAY NORTH OF SLOAT BOULEVARD[a]					
Northbound	880	693	0	11	**704**
Southbound	1,295	1,001	0	0	**1,001**
2. GREAT HIGHWAY SOUTH OF SLOAT BOULEVARD[a]					
Northbound[d]	1,071	6	6	66	**78**
Southbound	1,314	0	6	0	**6**
3. SLOAT BOULEVARD EAST OF GREAT HIGHWAY[a]					
Eastbound	443	1,062	6	55	**1,123**
Westbound	275	754	6	0	**760**
4. GREAT HIGHWAY WEST OF SKYLINE BOULEVARD[b]					
Eastbound	1,273	0	8	64	**72**
Westbound[f]	990	1	8	0	**9**
5. SKYLINE BOULEVARD NORTH OF GREAT HIGHWAY[b]					
Northbound	884	1,694	0	0	**1,694**
Southbound	673	1,638	0	0	**1,638**
6. SKYLINE BOULEVARD SOUTH OF GREAT HIGHWAY[b]					
Northbound	1,813	1,694	8	0	**1,702**
Southbound	1,880	1,638	8	64	**1,710**

SOURCES: San Francisco Public Utilities Commission, 2020; LCW Consulting, 2020; CHS Consulting Group, 2021. (see Appendix D).

NOTES:

a Roadway segments at the intersection of the Great Highway/Sloat Boulevard.
b Roadway segments at the intersection of Skyline Boulevard/Great Highway.
c Reflects project closure of the Great Highway between Sloat and Skyline boulevards during its first construction phase, and associated rerouting of traffic volumes due to the closure. About 27 percent of the existing northbound and southbound through traffic on the Great Highway segment between Sloat and Skyline boulevards was assumed to reroute to other parallel streets to the east and would not travel on the Great Highway approaching Sloat Boulevard, on Sloat Boulevard, or on Skyline Boulevard. The remaining 73 percent of through traffic was assumed to reroute to Sloat Boulevard between the Great Highway and Skyline Boulevard, and to Skyline Boulevard between Sloat Boulevard and the Great Highway. In addition, San Francisco Zoo visitors entering and exiting the zoo parking lots via the Great Highway were assumed to reroute to the reconfigured San Francisco Zoo access on Sloat Boulevard east of the Great Highway.
d Construction trucks would typically travel to and from the site during a four-hour period in the morning. As a conservative assumption, the transportation analysis assumed that 25 percent of the daily construction trucks would travel to and from the site during the p.m. peak hour.
e Construction activities are expected to generally occur on a single shift primarily during daytime hours (7 a.m. to 3:30 p.m.). It was conservatively assumed that all construction workers would depart during the p.m. peak hour.
f Existing volumes for conditions with closure of the Great Highway reflect the inbound and outbound vehicle trips to the SFPUC Oceanside Treatment Plant and Westside Pump Station facilities. During project construction vehicular access to these facilities would be maintained.

Operational Travel Demand

Following project implementation, operations and maintenance activities conducted by the SFPUC, San Francisco Recreation and Park Department (Rec and Park), NPS, SFMTA, and Caltrans in the transportation study area would be similar to existing conditions. However, additional landscape maintenance may be needed to maintain access for people walking and bicycling and for emergency vehicles via the service road, although this would vary with conditions (e.g., amount of windblown sand on multi-use trail and service road).

Additionally, the project would permanently close the Great Highway between Sloat and Skyline boulevards, including the zoo parking access. The operational travel demand uses the same rerouting assumptions as those used for the construction travel demand.

Table 4.3-8 presents the weekday p.m. peak hour volumes at the study locations for conditions after completion of construction.

Table 4.3-8 Weekday P.M. Peak Hour Traffic Volumes during Operations

Roadway Segment/Direction of Travel	Existing Conditions	Project Conditions[a,b]
1. GREAT HIGHWAY NORTH OF SLOAT BOULEVARD[c]		
Northbound	880	693
Southbound	1,295	1,001
2. GREAT HIGHWAY SOUTH OF SLOAT BOULEVARD[c]		
Northbound	1,071	6
Southbound	1,314	0
3. SLOAT BOULEVARD EAST OF GREAT HIGHWAY[c]		
Eastbound	443	1,062
Westbound	275	754
4. GREAT HIGHWAY WEST OF SKYLINE BOULEVARD[d]		
Eastbound	1,273	26
Westbound	990	34
5. SKYLINE BOULEVARD NORTH OF GREAT HIGHWAY[d]		
Northbound	884	1,707
Southbound	673	1,655
6. SKYLINE BOULEVARD SOUTH OF GREAT HIGHWAY[d]		
Northbound	1,813	1,711
Southbound	1,880	1,651

SOURCE: CHS Consulting Group, 2021.

NOTES:

[a] Project traffic volumes do not include vehicle trips associated with sand placement for beach nourishment. Initial sand placement could occur as early as two years following construction; after that, beach nourishment would occur about once every four to 10 years, on average.

[b] Reflects permanent closure of the Great Highway between Sloat and Skyline boulevards during the first construction phase, and associated rerouting of traffic volumes due to the closure. About 27 percent of the existing northbound and southbound through traffic on the Great Highway segment between Sloat and Skyline boulevards was assumed to reroute to other parallel streets to the east and would not travel on the Great Highway approaching Sloat Boulevard, on Sloat Boulevard, or on Skyline Boulevard. The remaining 73 percent of through traffic was assumed to reroute to Sloat Boulevard between the Great Highway and Skyline Boulevard, and to Skyline Boulevard between Sloat Boulevard and the Great Highway. In addition, San Francisco Zoo visitors entering and exiting the zoo parking lots via the Great Highway were assumed to reroute to the reconfigured San Francisco Zoo access on Sloat Boulevard east of the Great Highway.

[c] Roadway segments at the intersection of the Great Highway/Sloat Boulevard.

[d] Roadway segments at the intersection of Skyline Boulevard/Great Highway.

In addition to the reroute of existing traffic on the Great Highway between Sloat and Skyline boulevards, as described in Chapter 2, Project Description, Section 2.4.5, Beach Nourishment, the project includes shoreline monitoring and subsequent sand placement when established triggers are reached. Two primary sand sources and placement methods have been identified for beach nourishment: large placement using sand dredged by the U.S. Army Corps of Engineers from the San Francisco Harbor Main Ship Channel, and small placement using excavated excess sand from North Ocean Beach or from a commercial vendor.

Large sand placements would primarily involve piping sand from an offshore dredge to the South Ocean Beach project site; however, use of bulldozers and excavators would be required to shape the sand into the designed embankment. Small sand placements would involve transfer of sand from North Ocean Beach to the South Ocean Beach project site via the Great Highway in 30-cubic-yard articulated off-road dump trucks. Once the sand is dumped, bulldozers and loaders would shape it. If not available from North Ocean Beach, the sand would be sourced from a nearby commercial supplier, such as Pier 94 Imports in the Bayview neighborhood, and would be transported to the site by truck via I-280 and local streets. The frequency and type of sand placement would depend on the sand availability and observed shoreline conditions. In general, sand placements would occur about once every four to 10 years, on average (see Chapter 2, Project Description, Section 2.4.5.5, *Type and Frequency of Sand Placement*, for additional details). Small sand placement would involve between 400 to 2,830 truckloads of sand, with up to 94 truckloads per day over a six-week period, depending on the volume of sand needed and availability.

CONSTRUCTION IMPACT ANALYSIS METHODOLOGY

Project-level construction impacts are analyzed in Impact TR-1. The impact analysis assesses if the project would require a substantially extended construction duration or intense construction activity and, if so, the analysis assesses the effects of construction activities on people walking, bicycling, or driving, and riding public transit and on emergency vehicle operators.

The construction-related information used for the analysis is based on current project specifications, including construction durations. Project construction would generate vehicle traffic (i.e., construction workers' vehicles, equipment, and trucks) traveling to and from the worksites and staging areas on area roads. All project elements would generate daily commute trips by construction workers. Truck traffic would include vehicle trips to deliver materials and equipment to the site and to haul excavated materials, revetment and rubble removed from the beach, demolition debris, and vegetation away from the site. The evaluation addresses the staging and duration of construction activities, estimated daily worker and truck trips, truck routes, and roadway and/or sidewalk closures.

OPERATIONAL IMPACT ANALYSIS METHODOLOGY

The impacts of the project's transportation network changes following completion of construction (operational impacts) are analyzed in Impacts TR-2 through TR-6. The following describes the methodology for analysis of operational impacts, by significance criterion.

Potentially Hazardous Conditions

As used in this section, the term *hazard* refers to a project-generated vehicle potentially colliding with a person walking, bicycling, or driving or with a public transit vehicle such that serious or fatal physical injury could result, accounting for the aspects described below. Human error or non-compliance with laws, weather conditions, time of day, and other factors can affect whether a collision could occur. However, for purposes of CEQA, hazards refer to engineering aspects of a project (e.g., speed, turning movements, complex designs, substantial distance between street crossings, sight lines) that may cause a greater risk of collisions that result in serious or fatal physical injury than a typical project. This analysis focuses on hazards that could reasonably stem from the project itself, beyond collisions that may result from aforementioned non-engineering aspects or the transportation system as a whole.

Therefore, the methodology qualitatively addresses the potential for the project to exacerbate an existing or create a new potentially hazardous condition to people walking, bicycling, or driving, or public transit operations. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and project changes to the public right-of-way in relation to the presence of people walking, bicycling, or driving.

Accessibility

The methodology qualitatively addresses the potential for the project to interfere with accessibility for people walking or bicycling or to result in inadequate emergency access. The methodology accounts for the number, movement type, sightlines, and speed of project vehicle trips and project changes to the public right-of-way in relation to the presence of people walking and bicycling or to emergency service operator facilities.

Public Transit Delay

The planning department uses a quantitative threshold of significance and qualitative criteria to determine whether the project would substantially delay public transit. For individual routes, if the project would result in transit delay greater than or equal to four minutes, then it might result in a significant impact.[36] For individual Muni routes with *service headways*[37] less than eight minutes, the planning department may use a threshold of significance less than four minutes. For individual surface routes operated by regional agencies, if the project would result in transit delay greater than one-half headway, then it might result in a significant impact. The planning department considers the following qualitative criteria for determining whether that delay would result in significant impacts due to a substantial number of people riding transit switching to riding in private or for-hire vehicles: transit service headways and ridership, origins and destinations of trips, availability of other transit and modes, and competitiveness with private vehicles.

Impacts of the project on Muni transit operations were measured in terms of increases to transit travel times during the weekday p.m. peak hour using the following factors:

- ***Traffic congestion delay***—Traffic congestion associated with increases in traffic slows down transit vehicles and results in increased transit travel times. Traffic congestion delays are calculated by summing the average vehicular delay caused by the project at each intersection along the transit routes within the transportation study area. The increase in total route segment delay is equal to the increase in travel time associated with traffic generated by the project.
- ***Transit reentry delay***—Transit vehicles typically experience delays after stopping to pick up and drop off passengers while waiting for gaps in adjacent street traffic in order to pull out of bus stops. As traffic volumes on the adjacent streets increase, reentering the flow of traffic becomes more difficult and transit vehicles experience increased delays. Transit reentry delay is calculated using empirical data in

36 The threshold uses the adopted Transit-First Policy, City Charter section 8A.103 percent on-time performance service standard for Muni. The charter considers transit vehicles arriving more than four minutes beyond a published schedule time as late.

37 A service headway is the number of minutes between buses or trains on a particular bus route or light rail line.

the 2000 Highway Capacity Manual. Total transit reentry delay for each route is calculated as the sum of transit reentry delay at each stop within the transportation study area.

The transit delay analysis assumes that the intersection of Skyline Boulevard/Great Highway will be signalized by Caltrans as part of a separate project, and that the project would undertake any remaining signal timing modifications necessary to facilitate safe pedestrian and bicycle connection across Skyline Boulevard between the proposed multi-use trail and the existing trail around Lake Merced.

VMT Analysis

The methodology for VMT analysis follows CEQA section 21099(b)(1), CEQA Guidelines section 15064.3, a California Office of Planning and Research technical advisory for assessing transportation impacts, and the planning department's Transportation Impact Analysis Guidelines (2019).

The planning department has developed screening criteria to identify types, characteristics, or location of projects and a list of transportation projects that would not typically result in significant transportation impacts under the VMT metric.[38] If a project would result in additional VMT, but meets the screening criteria for development projects related to VMT per capita[39] or falls within the types of transportation projects identified by the California Office of Planning and Research that would not likely lead to a substantial or measurable increase in VMT (i.e., induced automobile travel), then a detailed VMT analysis is typically not required for a project.

The project is not a land development project and would not generate additional VMT per capita. Therefore, the screening criteria for development projects is not applicable to this project.

The project is a public infrastructure project with transportation components and thus the planning department assessed whether the project would result in significant impacts by causing substantial additional automobile travel. A transportation project can lead to additional vehicle travel on the roadway network, such as by the addition of through lanes on existing or new highways. A transportation project with such characteristics would substantially induce automobile travel if it would generate more than approximately 2 million VMT per year. This threshold is based on the fair share VMT allocated to transportation projects statewide in 2014 and required to achieve California's long-term greenhouse gas emissions reduction goal of 40 percent below 1990 levels by 2030.[40]

Reducing roadway capacity will generally reduce VMT. The planning department uses a list of transportation components that would not likely lead to a substantial or measurable increase in VMT and would not exceed this quantitative threshold of significance. If a project fits within the following general types of projects (including combinations of types), then the planning department generally presumes that VMT impacts would be less than significant:

- Active Transportation, Rightsizing (also known as a "Road Diet"), and Transit Projects:
  - Reduction in the number of through lanes.

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38 San Francisco Planning Department, San Francisco Transportation Impact Analysis Guidelines, Appendix L Vehicle Miles Traveled (VMT)/Induced Automobile Travel, Attachment A Screening Criteria (SB743 Checklist), October 2019.

39 VMT per capita is calculated as the total annual miles of vehicle travel divided by the total population in a given area.

40 San Francisco Planning Department, Transportation Impact Analysis Guidelines, October 2019, Appendix L Vehicle Miles Traveled (VMT)/Induced Automobile Travel, October 2019.

  - Infrastructure projects, including safety and accessibility improvements, for people walking and bicycling.
- Other Minor Transportation Projects:
  - Rehabilitation, maintenance, replacement, and repair projects designed to improve the condition of existing transportation assets (e.g., highways, roadways, bridges, culverts, tunnels, transit systems, and bicycle and pedestrian facilities) and that do not add additional motor vehicle capacity.
  - Installation, removal, or reconfiguration of traffic lanes that are not for through traffic, such as left-, right-, and U-turn pockets, or emergency breakdown lanes that are not used as through lanes.
  - Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features.
  - Timing of signals to optimize vehicle, bicycle, or pedestrian flow on local or collector streets.
  - Addition of transportation wayfinding signage.
  - Removal of off-street or on-street parking spaces.

In addition, because the project would reroute existing vehicles to other roadways, the assessment also quantified the additional VMT that vehicles must travel due to the project's closure of the Great Highway between Sloat and Skyline boulevards and compared that assessment to CEQA section 21099(b)(1). The additional VMT generated by the project was estimated by multiplying the number of daily vehicles that would reroute to Sloat and Skyline boulevards by the additional distance these vehicles would travel. The additional estimated daily VMT was then annualized to approximate the total additional VMT per year. This VMT per year was then compared to the threshold of 2 million VMT per year to determine whether the project would result in a significant VMT impact due to the closure of the Great Highway and associated reroute of vehicles.

Commercial and Passenger Loading

The methodology assesses the potential for convenient off- and on-street commercial freight and passenger loading facilities to meet the project's loading demand. None of the project components would generate new commercial or passenger loading trips, with the exception of deliveries of sand during the periodic beach nourishment (small sand placements).

If convenient (i.e., on-site or on-street commercial yellow zones or white passenger zones) commercial freight and passenger loading facilities meet the estimated demand, the analysis is complete. If convenient loading facilities do not meet the demand (i.e., the demand for loading spaces cannot be accommodated within the supply and would therefore result in a loading deficit), then the methodology qualitatively addresses the potential for the project to exacerbate an existing or create a new potentially hazardous condition for people walking, bicycling, or driving, or to substantially delay public transit.

CUMULATIVE CONDITIONS

Section 4.1.5, Approach to Cumulative Impact Analysis and Cumulative Projects, describes the overall approach used in this EIR to conduct the cumulative analysis; refer to Table 4.1-3 and Figure 4.1-1 for descriptions and locations of potential cumulative projects in the vicinity of the project. The cumulative conditions analysis for transportation topics uses a list-based approach. In addition, for the reasons discussed in Section 4.1.5, this section presents a second cumulative analysis of transportation and circulation conditions which could occur if the city were to approve closure of the Great Highway between

Sloat Boulevard and Lincoln Way.[41] The discussion of cumulative transportation impacts assesses whether the project, in conjunction with overall city-wide growth and other cumulative projects, would significantly affect the transportation network and, if so, whether the project's contribution to the cumulative impact would be considerable.

4.3.4.3 IMPACT EVALUATION

Impact TR-1: Construction of the project would require a substantially extended duration, but the secondary effects would not create potentially hazardous conditions for people walking, bicycling, driving, or riding transit; or interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit. (*Less than Significant*)

The transportation-related construction impact analysis herein first presents an overview of the types of transportation impacts that could result from construction activities, a description of the traffic control plan that would be developed and implemented to manage construction activities, and project-specific construction data used in the impact analysis. This is followed by an assessment of the project construction activities for each component of the significance criteria, including construction duration and intensity and then impacts related to potentially hazardous conditions, accessibility, and delays to public transit.

Summary of Construction Activities and Standard Construction Measures Considered in the Analysis

General construction activities result in temporary conditions, and usually do not result in permanent changes to the transportation circulation network. Construction-related vehicles traveling to and from the project construction work area would share the surrounding roadways with other vehicles, as well as with bicyclists and people walking. In general, increased construction traffic from any project could result in potential conflicts between construction trucks (which have slower speeds and wider turning radii than automobiles) and automobiles, bicyclists, and people walking. In addition, construction activities from any project could result in physical obstructions or temporary or permanent changes to the public right-of-way that could interfere with emergency access or accessibility for people walking, bicycling, driving, or riding transit; create hazardous conditions; or result in delays to transit.

As part of the SFPUC's standard construction measures, described above in Section 4.3.3, Regulatory Framework, the SFPUC or its contractor would prepare and implement a traffic control plan that conforms to the SFMTA's blue book. The elements of the traffic control plan would include circulation and detour routes, advance warning signage, construction truck routes, maintenance of pedestrian and bicycle access and circulation (including detour routes, as appropriate), designation of sufficient staging areas, scheduling and monitoring of construction vehicle movement, and coordination with public service providers such as fire, police, schools, hospitals, and transit. The traffic control plan would serve to inform city, state, and federal agencies of project construction and to minimize temporary transportation effects in the vicinity of the construction area. Consistent with SFPUC standard construction measures, prior to implementation, the SFMTA would review the traffic control plan, including its procedures to minimize localized construction impacts on the transportation network.

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41 San Francisco Municipal Transportation Agency, Item 3 Great Highway Staff Report, San Francisco Municipal Transportation Agency Board of Directors and Recreation and Park special joint meeting, June 10, 2021.

As part of the first construction phase, the project would permanently close the Great Highway, and temporarily close the portion of Ocean Beach south of Sloat Boulevard to the public for the duration of construction. As part of the Great Highway closure, the San Francisco Zoo access from the Great Highway would be closed and the intersection of the Great Highway/Sloat Boulevard and zoo access driveway on Sloat Boulevard would be reconfigured to reflect the permanent conditions as well as provide construction vehicle access to the work area. Construction staging (e.g., staging of construction vehicles, staging of construction materials, construction worker parking, and delivery and haul trucks) would occur on site within the closed portion of the Great Highway, the NPS parking lot at the western terminus of Sloat Boulevard, and the closed portion of Ocean Beach, within available space at the Oceanside Treatment Plant, Westside Pump Station, and the Zoo Pump Station (see Figure 2-11 in Chapter 2, Project Description). Staging locations would change depending on the construction activity and as construction on project components within the work area proceeds. Figure 4.3-3 depicts the anticipated construction haul and delivery routes to and from the work area. Construction trucks would primarily use arterial roadways such as Sloat Boulevard, Skyline Boulevard, and 19th Avenue to travel between the regional facilities (e.g., I-280) and the project work area.

During the construction period, the number of construction trucks traveling to and from the work site would vary depending on the phase and the type of construction activity. The peak construction traffic would occur over a six-month period when phases 2, 3, and 4 would overlap. During this overlap period, there would be approximately 53 trucks traveling to and from the work site per day, and 130 construction workers on site per day (see Table 4.3-6). On a daily basis during the overlap period there would be an average of about 88 construction trucks and workers accessing the work area from the north via Sloat Boulevard), and 95 construction trucks and workers accessing the work area from the south via Skyline Boulevard.

During the weekday p.m. peak hour during the overlap period there would be an average of about 77 construction truck and worker trips traveling to and from the work area from the north via Sloat Boulevard (see segment 2, Great Highway south of Sloat Boulevard, in Table 4.3-7), and 80 construction truck and worker trips traveling to and from the work area from the south via Skyline Boulevard (see segment 4, Great Highway south of Sloat Boulevard, in Table 4.3-7). This is a conservative estimate of the number of trips during the weekday p.m. peak hour because construction workers would typically leave the work site prior to 4 p.m. and construction truck trips would travel to and from the site primarily during a four-hour period in the morning. During the morning when most construction truck trips would occur, traffic volumes on Sloat and Skyline boulevards are lower than during the p.m. peak hour.

Construction Duration and Intensity

Construction of the project would occur over a four-year period between 2023 and 2027, which is considered an extended duration.

Construction of the project would not be considered intense as it relates to the transportation network. The majority of the construction activities would occur within the closed portion of the Great Highway, and interaction between construction activities and the adjacent transportation network would primarily be limited to trucks and construction worker vehicles accessing the South Ocean Beach project site at the intersections of the Great Highway/Sloat Boulevard or at Skyline Boulevard/Great Highway. Furthermore, during the peak period of construction, there would be approximately 53 trucks traveling to and from the site per day, and 130 construction workers on site per day. This would not be considered a substantial increase in daily vehicles on area roadways given the existing daily volume of vehicles.

Impacts Related to Potentially Hazardous Conditions during Construction

The project's closure of the Great Highway between Sloat and Skyline boulevards during the first phase of construction would result in rerouting of traffic that would otherwise use this segment of the Great Highway to travel north-south and connect with Skyline Boulevard. In addition, the San Francisco Zoo entrance/exit on the Great Highway would be closed and all inbound and outbound vehicle trips would be rerouted to the zoo driveway on Sloat Boulevard that would be reconfigured for inbound and outbound access.

Table 4.3-7 presents the p.m. peak hour traffic volumes during construction. During the p.m. peak hour there would be about 1,200 additional vehicles on Sloat Boulevard between the Great Highway and Skyline Boulevard, and 1,800 additional vehicles on Skyline Boulevard between Sloat Boulevard and the Great Highway. South of the closed portion of the Great Highway, traffic volumes would decrease from existing conditions, as approximately 27 percent of vehicles traveling on the Great Highway north of Sloat Boulevard are anticipated to divert to other north-south arterials to the east such as 19th Avenue and Sunset Boulevard.

The rerouted volumes would be accommodated within the existing two-lane configuration in each direction along both Sloat and Skyline boulevards. The project would not modify the configuration of the Skyline Boulevard/Sloat Boulevard intersection and therefore would not create potentially hazardous conditions.

Truck access into and out of the construction work area via Sloat Boulevard, which has two travel lanes and a bicycle lane in each direction, would be left-turn-in and right-turn-out. As noted above, the SFPUC would implement a traffic control plan as part of the project that would be consistent with the SFMTA's blue book regulations effective at the time of project construction. As appropriate, the traffic control plan would include placement of flaggers at the site driveway to facilitate truck access between Sloat Boulevard and the work area across the sidewalk and bicycle lane and detour people walking away from the work area (e.g., restrict pedestrian access to the south side of Sloat Boulevard at the Great Highway). Thus, construction activities would not create potentially hazardous conditions for people driving, walking, or bicycling elsewhere on Sloat Boulevard.

Truck access into and out of the construction work area via Skyline Boulevard would be conducted at the intersection of Skyline Boulevard/Great Highway, which is planned to be signalized by Caltrans prior to project construction. On Skyline Boulevard, there are no dedicated pedestrian facilities on the west side of the street (i.e., adjacent to the Great Highway), with only a shoulder provided. Skyline Boulevard is designated as a bicycle route, where bicyclists and drivers share the travel lane. Striping of a crosswalk across Skyline Boulevard would not be of substantial duration, and during restriping vehicle and bicycle travel on Skyline Boulevard would be maintained. As appropriate, the traffic control plan would include placement of flaggers at the intersection to facilitate truck access between the closed portion of the Great Highway and Skyline Boulevard. Thus, construction activities would not create potentially hazardous conditions for people driving, walking, or bicycling on Skyline Boulevard.

Prior to start of construction, the terminal and layover for the Muni 23 Monterey bus route would be permanently relocated to the existing bus stop on the north side of Sloat Boulevard between the Lower Great Highway and 47th Avenue. During project planning, several options for relocation of the terminal/layover and rerouting for the turnaround were identified and reviewed with SFMTA transit operations staff, and the proposed location for the terminal/layover and reroute were identified by SFMTA staff as consistent with SFMTA policies. The relocated terminal and layover would be located across the street and to the east of the South Ocean Beach project site. Thus, construction activities would not create potentially hazardous conditions for people riding transit.

Impacts Related to Accessibility during Construction

During construction, emergency vehicle access to the closed portion of the Great Highway would be maintained; however, emergency access to the San Francisco Zoo during construction of the project would primarily be via the existing driveway to the zoo on Sloat Boulevard and via Herbst and Zoo roads on the southern end of the zoo property. Temporary travel lane closures on the Great Highway north of Sloat Boulevard, on Sloat Boulevard, or on Skyline Boulevard would not be required, except during reconfiguration and/or restriping of the intersections of the Great Highway/Sloat Boulevard and Skyline Boulevard/Great Highway. Project construction therefore would not interfere with emergency vehicle access.

With the exception of the sidewalk on the east side of the Great Highway south of Sloat Boulevard providing pedestrian access to the Westside Pump Station, there are no public sidewalks or pathways for people walking along the portion of the Great Highway that would be closed during construction. Sidewalks on Sloat Boulevard would not be affected, with the exception of temporary closures during reconfiguration of the Great Highway/Sloat Boulevard intersection and when construction trucks and vehicles are moving across the Sloat Boulevard sidewalk when modifications to the San Francisco Zoo entrance/exit are being constructed.

The Great Highway between Sloat and Skyline boulevards is designated as a bicycle route, and during construction the traffic control plan would provide a bicycle detour route that directs bicyclists to travel on Sloat Boulevard (class II bicycle lanes) to reach Skyline Boulevard (class III bicycle route). The existing bicycle lanes on Sloat Boulevard would not be affected during project construction. Thus, construction activities would not interfere with accessibility for people walking or bicycling on Sloat and Skyline boulevards.

The permanent changes to the terminal/layover for the 23 Monterey bus route as described above would increase the travel distance for some people taking transit (about 400 feet east of the existing terminal stop on Sloat Boulevard west of the Great Highway) and may be an inconvenience to some people taking transit and walking to the beach, but would not substantially interfere with accessibility for people walking to ride transit. As part of the pedestrian detours, appropriate pedestrian signs, including but not limited to “Bus Stop Moved” and “Beach Closed,” would be posted.

Impacts Related to Potential Transit Delays during Construction

The project would relocate the terminal/layover for the 23 Monterey bus route during the first construction phase. This relocation would not substantially change the distance the 23 Monterey bus route would travel, and therefore this relocation of the terminal/layover would not result in a significant delay to operations of the 23 Monterey bus route.

The project’s closure of the Great Highway during the first phase of construction would reroute vehicles to other streets, primarily to Sloat and Skyline boulevards, and vehicle delays on the following segments would increase during the peak periods: Sloat Boulevard between the Great Highway and Skyline Boulevard and Skyline Boulevard between Sloat Boulevard and the Great Highway. In general, on these segments of Sloat and Skyline boulevards, the average vehicle delay would increase for all approaches at signalized intersections and for movements subject to stop signs at unsignalized intersections. Thus, travel times for the Muni 18 46th Avenue, 23 Monterey, and 57 Parkmerced bus routes, which run along portions of Sloat and Skyline boulevards, would also increase. During the weekday p.m. peak hour, the travel times on these bus routes would increase by up to one-and-a-half minutes. However, the increase in weekday p.m. peak hour transit travel times would not exceed the planning department's four-minute threshold of significance for transit impacts, and therefore would not represent a substantial increase in transit delay. See Impact TR-4 for analysis of effects on transit delay due to the permanent closure of the Great Highway between Sloat and Skyline boulevards and other permanent circulation changes included in the project.

Summary

Many project construction activities would not result in significant transportation impacts. For other construction activities, the SFMTA blue book regulations and the SFPUC standard construction measures require maintaining pedestrian circulation and implementing construction safety measures for people walking, bicycling, and driving. With implementation of these regulations and standard construction measures, project construction would not result in potentially hazardous conditions for people walking, bicycling, driving, or riding public transit, or interfere with emergency access or accessibility for people walking, and bicycling during construction. The project's construction-related transportation impacts would, therefore, be ***less than significant.***

Mitigation: None required.

Impact TR-2: Operation of the project would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations. (*Less than Significant*)

Summary of Transportation Network Changes

The following project changes to the transportation network were assessed to determine whether they would create potentially hazardous conditions for people walking, bicycling, or driving, or for public transit operations after completion of construction activities:

- Permanent closure of the Great Highway between Sloat and Skyline boulevards.
- Reconfiguration of travel lanes and restriping of the intersection of the Great Highway/Sloat Boulevard (see Chapter 2, Project Description, Figure 2-4):
  - Reconfiguration of the southbound travel lanes to remove the existing left-turn-only lane in the median and right-turn-only lane at the curb, and reconfiguration of the two existing through lanes as left-turn-only lanes. Thus, reconfiguration would reduce the number of southbound lanes at the intersection from four to two, and pavement markings would be installed to guide southbound motorists turning eastbound across the intersection.
  - Reconfiguration of the median and travel lanes in the westbound approach. The median would be narrowed, and a U-turn lane and two right-turn lanes would be provided. The bicycle lane would be relocated to the curb (currently it is between the right-turn lane and the through-right lane).
  - Removal of the eastbound and northbound approaches.
  - Installation of protected bicycle lanes through the intersection in the southbound direction and on the westbound approach. Raised elements, to be determined, would be provided between the bikeways and the adjacent travel lanes.

  - Installation of a diagonal continental crosswalk for people walking, and *sharrows*[42] for bicyclists.
  - Modification of the curb ramp on the median between the Great Highway and Lower Great Highway to facilitate bicycle access onto the median.
  - Traffic signal modifications, including hardware such as location of signal heads and pedestrian and/or bicycle signals and signal timing changes to reflect permitted movements by drivers and people walking and bicycling.

- Removal of the last stop and layover for the Muni 23 Monterey bus route currently located at the western terminus of Sloat Boulevard and relocation to the north side of Sloat Boulevard between the Lower Great Highway and 47th Avenue. The modified turnaround route for the eastbound trip would follow a clockwise loop along the Lower Great Highway, Wawona Street, and 47th Avenue. The bus would then turn left onto eastbound Sloat Boulevard at the signalized intersection of 47th Avenue/Sloat Boulevard and reach its first return (i.e., eastbound) stop at the existing bus stop located just east of the San Francisco Zoo's main pedestrian entrance.
- Installation of a one-way northbound restricted-access service road on a portion of the closed portion of the Great Highway (i.e., between Skyline and Sloat boulevards) to provide continued, restricted vehicle access to the Oceanside Treatment Plant, the Westside Pump Station, and associated facilities for SFPUC operations, emergency access, long-term beach nourishment, and maintenance activities. The southern end of the service road would be gated or have some other controlled access mechanism, and access would be restricted to authorized vehicles only, including SFPUC staff, Rec and Park staff, maintenance, authorized visitors, and emergency personnel. Egress from the service road at the intersection of the Great Highway/Sloat Boulevard would be stop sign-controlled.
- Installation of a 15- to 20-foot-wide multi-use trail in the alignment of the portion of the Great Highway to be removed (i.e., between Skyline and Sloat boulevards) for people walking and bicycling, with an access control mechanism between the trail and the service road, and a crosswalk across the service road to connect the zoo parking lot with the multi-use trail.
- Closure of the existing 35-space NPS parking lot on the beach side south of the intersection of the Great Highway/Sloat Boulevard and installation of a Skyline coastal parking lot with 60 spaces within the existing paved area of the closed Great Highway located adjacent to the southern end of the multi-use trail (i.e., west of Skyline Boulevard).
- Reconfiguration of the intersection of Skyline Boulevard/Great Highway to reflect the change in permissible vehicle movements (see Chapter 2, Project Description, Figure 2-5), and to establish a pedestrian and bicycle crossing across Skyline Boulevard that would connect the multi-use trail to the trail around Lake Merced. Caltrans would signalize this intersection prior to project construction (see Chapter 2, Project Description, Section 2.4.1.3, *Skyline Boulevard and Great Highway*).
- Changes in vehicle access to the zoo parking areas, including closure of the entrance/exit on the Great Highway and modification of the entrance on Sloat Boulevard to serve as both an inbound and outbound driveway with right-turn-in and right-turn-out movements only.

See Chapter 2, Project Description, Figure 2-1a, for an illustration of the project components, including the transportation network changes. The project infrastructure components that would not affect the public

[42] Sharrows, also referred to as shared lane markings, are pavement markings within the travel lane that are intended to help bicyclists better position themselves in a shared travel lane and to alert drivers to the presence of bicyclists. The standard shared lane marking is the bike-and-chevron sharrow.

rights-of-way (e.g., the buried wall, storm drain system) are not discussed in the analysis below. The design of the reconfigured driveway and street network changes would be consistent with Better Streets Plan guidelines, and would undergo review by the city's Transportation Advisory Staff Committee. The project would not include any design features that would cause potentially hazardous conditions.

Potentially Hazardous Conditions Impacts Related to Walking and Bicycling

In general, compared to existing conditions, the project would enhance conditions for people walking and bicycling. The following describes different impacts for people walking and bicycling at different study area locations.

The segment of the Great Highway between Sloat and Skyline boulevards is currently a bicycle route that is signed for shared use by vehicles and bicyclists, while no facilities are provided for people walking (with the exception of the sidewalk adjacent to the Westside Pump Station). The project's multi-use trail along this segment would provide a paved pathway and bicyclists would no longer need to share the travel lane with vehicles. The 15- to 20-foot-wide multi-use trail would enhance walking and cycling conditions over existing conditions. It would be designed consistent with the Rec and Park trail design guidelines, SFMTA multi-use trail advisories, and GGNRA's Parkwide Site Furnishing Standards for the "Urban Beach Design Zone." Northbound bicyclists would also be able to share the service road with vehicles.

At the intersection of the Great Highway/Sloat Boulevard, the project would add a diagonal continental crosswalk and sharrows for people crossing between the trail and the reconfigured beach-side terminus of Sloat Boulevard. The project would also modify curb ramps to facilitate access by people walking and bicycling, and add protected bicycle lanes through the intersection in the southbound direction and on the westbound approach. In addition, the project would add a stop sign-controlled vehicle exit from the service road at this intersection and restrict vehicles to right turns only, so that exiting vehicles would not conflict with people walking and bicycling across the intersection within the diagonal crosswalk and sharrow crossing.

Caltrans would reconfigure and signalize the intersection of Skyline Boulevard/Great Highway in advance of this project's Great Highway closure. The project would undertake supplemental striping, including a crosswalk across Skyline Boulevard, and signal timing changes, as necessary, to connect the new pedestrian and bicycle facilities on the west side of Skyline Boulevard with the existing path around Lake Merced on the east side. Compared to existing conditions, these changes would enhance safety for people walking and bicycling.

The project's closure of the Great Highway between Sloat and Skyline boulevards would reroute vehicles to Sloat Boulevard, between the Great Highway and Skyline Boulevard, and to Skyline Boulevard, between Sloat Boulevard and the Great Highway. The rerouted traffic volumes would be accommodated within the existing two-lane configuration in each direction along both Sloat and Skyline boulevards.[43] Thus, this change would not create potentially hazardous conditions for bicyclists. Class II bicycle lanes are provided on Sloat Boulevard. Traffic volumes on the affected section of Skyline Boulevard (a class III bicycle route) would be similar to those on Skyline Boulevard south of the Great Highway. In addition, bicyclists heading north and south would be able to use the new multi-use trail (a class I facility) on the closed portion of the Great Highway. The project would not modify the configuration of the intersection of Skyline Boulevard/Sloat Boulevard and therefore would not create potentially hazardous conditions. In addition, pedestrian crosswalks are provided at multiple locations at signalized and unsignalized intersections on Sloat and

[43] CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Final, February 2021.

Skyline boulevards, and these crosswalks would continue to accommodate people walking across Sloat and Skyline boulevards.

Therefore, for the reasons described above, the project would not create potentially hazardous conditions for people walking or bicycling.

Potentially Hazardous Conditions Impacts Related to Driving and Public Transit Operations

In general, compared to existing conditions, the project would not substantially change conditions for people driving or for public transit. The project's street network changes would accommodate various vehicle types, including trucks and buses. The proposed conceptual plan for project changes to the intersection of Skyline Boulevard/Great Highway has undergone initial review by Caltrans and the SFMTA, while the proposed conceptual plan for project changes to the intersection of the Great Highway/Sloat Boulevard has undergone initial review by city agencies. Final design of the intersection of the Great Highway/Sloat Boulevard would be subject to approval by the SFMTA, Rec and Park, Public Works, and the fire department so that the streets are designed consistent with city and state policies and design standards, as applicable, including the Better Streets Plan and the California Manual of Uniform Traffic Control Devices. The following describes different impacts on people driving and public transit operations at different study area locations.

The project's closure of the Great Highway between Sloat and Skyline boulevards would result in the reconfiguration of the two intersections on either end of this segment of the Great Highway, i.e., at Sloat Boulevard and at Skyline Boulevard. The closure and reconfigurations would not create potentially hazardous conditions.

Table 4.3-8 presents the p.m. peak hour traffic volumes during operation. During the p.m. peak hour, the project would increase volumes on Sloat Boulevard east of the Great Highway to 1,062 eastbound and 754 westbound (1,816 total vehicles), an increase of about 1,100 vehicles during the p.m. peak hour. The rerouted volumes would be accommodated within the existing two travel lane configuration in each direction along Sloat and Skyline boulevards. The project would not modify the configuration of the Skyline Boulevard/Sloat Boulevard intersection and therefore would not create potentially hazardous conditions at this intersection for people driving or for Muni transit operations (e.g., the 18 46th Avenue, 23 Monterey, and 57 Parkmerced bus routes, which all travel through this intersection).

The project's reconfigured intersection of Skyline Boulevard/Great Highway would provide access to and from the proposed 60-space Skyline coastal parking lot and SFPUC facilities via a new one-way northbound restricted-access service road. At the northern end of the service road, at the project's reconfigured intersection of the Great Highway/Sloat Boulevard, the proposed service road would be stop sign-controlled and exiting vehicles would be subject to right-turn-only restrictions. Daily traffic volumes on the service road would be low, up to about 150 vehicles per day and six vehicles during the p.m. peak hour, and vehicles would exit the service road when southbound Great Highway traffic flow is stopped on a red light and people walking and bicycling are crossing diagonally across the intersection to the north of the proposed driveway. Thus, vehicles exiting the service road would not conflict with other vehicles traveling on the Great Highway or Sloat Boulevard. Therefore, the reconfiguration of the intersection would not create potentially hazardous conditions.

The project would remove the entrance/exit to the zoo on the Great Highway and modify the entrance to the zoo on Sloat Boulevard to serve as both an inbound and outbound driveway (i.e., right-turn-in and right-turn-out). The entrance would be reconfigured to one inbound and one outbound lane, and adequate on-site queuing within the zoo would be required to accommodate the peak volume of inbound vehicles (i.e., about 81 inbound vehicles during the weekday p.m. peak hour and 271 inbound vehicles during the weekend midday peak hour) without affecting eastbound bicycle travel on Sloat Boulevard or causing vehicles to back up into the intersection. Because the reconfigured access would accommodate vehicles entering and leaving the San Francisco Zoo, it would not create potentially hazardous conditions for driving or public transit operations on Sloat Boulevard.

The project's relocation of the Muni 23 Monterey's final stop and layover to the expanded bus stop on the north curb of Sloat Boulevard between 47th Avenue and the Lower Great Highway, and the around-the-block modified turnaround route following the Lower Great Highway, Wawona Street, and 47th Avenue, would not introduce any unusual or unsafe bus maneuvers that could create potentially hazardous conditions for transit operations.

Therefore, for the reasons described above, the project would not create potentially hazardous conditions for people driving or transit operations.

Potentially Hazardous Conditions Impacts Related to Beach Nourishment

Operations associated with sand placement and removal of wind-blown sand from the multi-use trail and service road were reviewed because these activities would result in temporary changes to the circulation conditions for vehicles and people walking and bicycling.

The sand placements would be conducted in a manner like that of prior, ongoing, and planned beach nourishment activities; sand would either be trucked in or deposited on the beach from offshore (see Chapter 2, Project Description, Section 2.4.5, Beach Nourishment), and the activities would typically occur about once every four to 10 years over a period of four to six weeks. The city would also periodically remove wind-blown sand from the multi-use trail and service road, and deposit it along the reshaped bluff and beach, as is currently done with sand removed from the Great Highway, which typically takes two to three days. Sand placement activities that involve trucking of sand from North Ocean Beach or other sources would introduce changes in traffic movements at the North Ocean Beach and South Ocean Beach work areas, including at the intersections of the Great Highway/Skyline Boulevard and Skyline Boulevard/Great Highway.

The sand placement activities would require authorization from the NPS, among other federal and state agencies, and preparation and implementation of a traffic control plan that would include measures such as circulation and detour plans, advance warning signage, truck routes, maintenance of pedestrian and bicycle access, and monitoring of construction vehicle movements. Removal of wind-blown sand on the multi-use trail and/or service road would be conducted within the South Ocean Beach project site (i.e., sand would be removed from the multi-use trail or service road and placed onto the beach) or via the sand ramp near the Great Highway/Sloat Boulevard intersection. Because the sand placement activities would be temporary and short-term, and haul truck circulation at and between the North Ocean Beach and South Ocean Beach work areas would be subject to permitting and a traffic control plan, the beach nourishment and associated maintenance activities would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations.

Summary

Overall, the project would enhance conditions for people walking and bicycling compared to existing conditions, would accommodate vehicles rerouted as a result of the closure of the Great Highway south of Sloat Boulevard, and would not substantially affect transit operations on Sloat and Skyline boulevards. Thus, for the above reasons, the project would not create potentially hazardous conditions for people walking, bicycling, or driving, or for public transit operations, and the project's impacts related to potentially hazardous conditions would be ***less than significant***.

Mitigation: None required.

Impact TR-3: Operation of the project would not interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access. (*Less than Significant*)

The project would not involve any substantial changes to the street network that would interfere with walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access. Proposed street network changes include roadway and intersection modifications resulting from permanent closure of the Great Highway between Sloat and Skyline boulevards and new facilities that would enhance accessibility for people walking and bicycling.

Impacts Related to Walking and Bicycling

With implementation of the project, the Great Highway between Sloat and Skyline boulevards would be permanently closed and a new multi-use trail accessible from Sloat Boulevard on the north and the proposed Skyline coastal parking lot on the south would be constructed. The multi-use trail would connect to the new beach access stairway and sand ramp and be located to the west of the proposed one-lane service road that would be provided to maintain restricted vehicle access to the Oceanside Treatment Plant, the Westside Pump Station, and associated facilities for SFPUC operations; long-term beach nourishment and maintenance activities; and emergency vehicles. The multi-use trail would improve the pedestrian and bicycle network and enhance accessibility, compared to existing conditions.

The new multi-use trail would provide connections between the beach, the existing path along the Great Highway north of Sloat Boulevard, and the path around Lake Merced. The intersection of the Great Highway/ Sloat Boulevard would be reconfigured as shown on Figure 2-4 in Chapter 2, Project Description, and described in the discussion of Impact TR-2, above, to remove the vehicle movements that would no longer be permitted, to provide protected bicycle lanes (e.g., by using a raised curb), and to install a crosswalk in the continental design and a bicycle crossing designated with sharrows, as well as curb ramps for people walking and bicycling. The crosswalk would connect the existing path within the median between the Great Highway and the Lower Great Highway and the proposed multi-use trail within the closed portion of the Great Highway, and bicycle lanes on Sloat Boulevard. The project would provide pedestrian and/or bicycle signals at the crossing**.** Caltrans will signalize the intersection of Skyline Boulevard/Great Highway and provide a controlled crossing to the path around Lake Merced. In addition, the project would add a crosswalk on the service road to provide safe passage between the zoo parking lot and the multi-use trail, and new beach access stairway and the sand ramp (located west of the intersection of the Great Highway/Sloat Boulevard) connecting the trail and the beach would be provided.

The project's relocation of the Muni 23 Monterey route's last stop and layover from the terminus of Sloat Boulevard to the existing bus stop on the north side of Sloat Boulevard between the Lower Great Highway and 47th Avenue would result in additional walking distance for riders destined to the beach, but would not interfere with accessibility for people walking.

Overall, the project's transportation network changes would enhance accessibility for people walking and bicycling compared to existing conditions. For the reasons described above, the project would not interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas.

Impacts Related to Emergency Access

The project would not introduce any design features or street network changes that would substantially change emergency vehicle travel in the project vicinity. Emergency access routes to the project area would remain like existing conditions, and project components were designed to maintain access for emergency response personnel.

The project's permanent removal of the southbound travel lanes and one of the two northbound travel lanes of the Great Highway between Sloat and Skyline boulevards, and the project's reconfiguration of the existing easternmost northbound travel lane to a service road, would not affect emergency access to the area. The project's new service road would be approximately 15 feet wide and would provide continued restricted vehicle access to the Oceanside Treatment Plant, the Westside Pump Station, and associated facilities for SFPUC operations; long-term beach nourishment and SFPUC and Rec and Park maintenance activities; and emergency vehicle access to the SFPUC facilities, the multi-use trail, and the San Francisco Zoo. With implementation of the project, emergency access to the San Francisco Zoo would be possible from the service road and the existing Great Highway zoo entrance/exit, which would be closed to the public but accessible by emergency vehicles. In addition, emergency access would be maintained from Sloat Boulevard in the north and Herbst Road and Zoo Road in the south.

The project's new service road and multi-use trail along the same segment would be designed in accordance with applicable regulatory requirements and NPS and Rec and Park trail design guidelines to allow for continued service vehicle and emergency vehicle access. The existing "sand ramp" emergency vehicle access to the beach at the northwestern corner of the intersection the Great Highway/Sloat Boulevard would remain. Other project transportation features such as reconfiguration of the intersection of the Great Highway/Sloat Boulevard, relocation of the 23 Monterey bus route layover, and the new Skyline coastal parking lot would not interfere with emergency access. The project's public street network changes under city jurisdiction would be required to undergo more detailed design and review by multiple city agencies included in the city's Transportation Advisory Staff Committee and the Recreation and Park Commission. Therefore, project operation would not result in inadequate emergency access.

Overall, for the reasons described above, the project would not interfere with accessibility of people walking or bicycling, or result in inadequate emergency access, and the project's impacts related to accessibility would be ***less than significant***.

Mitigation: None required.

Impact TR-4: Operation of the project would not substantially delay public transit. (*Less than Significant*)

The project is not a development project and would not generate new vehicle trips. However, the project's closure of the Great Highway between Sloat and Skyline boulevards would reroute the majority of the traffic using this segment to Sloat Boulevard between the Great Highway and Skyline Boulevard and to Skyline Boulevard between Sloat Boulevard and the Great Highway. In addition, the project would modify vehicular access to the San Francisco Zoo parking and would relocate the western terminal and layover for the 23 Monterey bus route to Sloat Boulevard between the Lower Great Highway and 47th Avenue.

Table 4.3-9 presents the transit travel delay analysis for the weekday p.m. peak hour conditions for the Muni 18 46th Avenue, 23 Monterey, and 57 Parkmerced bus routes (see Figure 4.3-2) under project conditions. As shown, the project's greatest transit delays would be approximately one-and-a-half minutes. This level of delay is well below four minutes, the amount at which a project might result in a significant impact.

Table 4.3-9 Muni Transit Travel Time Analysis – Project Conditions – Weekday P.M. Peak Hour

Muni Route	Frequency (in minutes)	Travel Time Increase (min:sec)	
		Inbound	Outbound
18 46th Avenue[b]	20	1:37	1:12
23 Monterey[c]	20	1:15	0:16
57 Parkmerced[d]	20 - 30	0:11	1:35

SOURCES: CHS Consulting Group, 2021; LCW Consulting, 2020 (see Appendix D).

NOTES:

a The transit delay analysis, including transit delay at the intersection of Skyline Boulevard/Sloat Boulevard as a percentage of total and net-new transit delay, is provided in Appendix D.
b The Muni 18 46th Avenue route's inbound direction is toward the Outer Richmond, and the outbound direction is toward Stonestown.
c The Muni 23 Monterey route's inbound direction is toward the Bayview, and the outbound direction is toward the San Francisco Zoo.
d The Muni 57 Parkmerced route's inbound direction is toward West Portal, and the outbound direction is toward the Outer Sunset.

The project's effects on each of these Muni bus routes would be as follows:

- **18 46th Avenue** – The 18 46th Avenue bus route travels on Sloat Boulevard between 47th Avenue and Skyline Boulevard, and on Skyline Boulevard between Sloat and Lake Merced boulevards. During the p.m. peak hour, the project's increase in transit delay would be about one minute 37 seconds in the inbound direction (northbound on Skyline Boulevard and westbound on Sloat Boulevard) and one minute 12 seconds in the outbound direction (eastbound on Sloat Boulevard and southbound on Skyline Boulevard). These increases would primarily be from vehicles rerouting along Sloat and Skyline boulevards due to the Great Highway closure, which would increase the re-entry time for buses to merge back into the traffic flow, and delays at the unsignalized intersection of Skyline Boulevard/Sloat Boulevard. The additional travel time for the 18 46th Avenue would not result in a transit delay that would exceed four minutes.
- **23 Monterey** – The project would relocate the last stop and layover for the 23 Monterey route from the terminus of Sloat Boulevard to the existing bus stop on the north side of Sloat Boulevard between 47th Avenue and the Lower Great Highway (i.e., the stop before last in the westbound direction of the route). This existing stop is 70 feet in length and would be extended by 40 feet by removing the two on-street parking spaces between the bus stop and 47th Avenue. For the trip eastbound toward the Bayview

under project conditions, a bus leaving the layover would follow a clockwise loop around the block before turning left from southbound 47th Avenue to eastbound Sloat Boulevard. Considering the close proximity to the existing layover location and the short length of turnaround rerouting, the proposed bus layover location, turnaround routing, and removal of the final stop at the terminus of Sloat Boulevard would not change operations in a way that would substantially delay the 23 Monterey bus route.

The reroute of vehicles due to the closure of the Great Highway would increase transit travel times for the 23 Monterey. During the p.m. peak hour, the project's increase in transit delay for the 23 Monterey route would be about one minute 15 seconds in the inbound direction (eastbound on Sloat Boulevard) and 16 seconds in the outbound direction (westbound on Sloat Boulevard). The increase in the outbound (westbound on Sloat Boulevard) direction would be less because the westbound through vehicles travel through the intersection of Skyline Boulevard/Sloat Boulevard without stopping (i.e., no stop sign control and no merging with traffic from other movements such as the northbound left turn onto westbound Sloat Boulevard). The increases in transit travel times would primarily be due to additional vehicles on Sloat Boulevard, resulting in increases in re-entry time for buses to merge back into the traffic flow and increased delays at the intersection of Skyline Boulevard/Sloat Boulevard. The relocation of the layover and associated changes to bus routing and the increased vehicles on Sloat Boulevard would not result in a transit delay that would exceed four minutes.

- **57 Parkmerced** – In the vicinity of the project area, the 57 Parkmerced bus route travels on Sloat Boulevard between Skyline Boulevard and 36th Avenue, and on Skyline Boulevard between Sloat Boulevard and John Muir Drive. The 57 Parkmerced route does not travel on Sloat Boulevard along the segment between the Great Highway and Skyline Boulevard. However, the 57 Parkmerced travels through the unsignalized intersection of Skyline Boulevard/Sloat Boulevard and along the segment of Skyline Boulevard which would experience increased delays. During the p.m. peak hour, the project's increase in transit delay for the 57 Parkmerced route would be about 11 seconds in the inbound direction (westbound on Sloat Boulevard and southbound on Skyline Boulevard) and one minute 35 seconds in the outbound direction (northbound on Skyline Boulevard to eastbound on Sloat Boulevard). These increases would primarily be due to additional vehicles on Skyline Boulevard resulting in increases in re-entry time for buses to merge back into the traffic flow and delays at the intersection of Skyline Boulevard/Sloat Boulevard for the inbound direction of travel for the 57 Parkmerced route. These additional travel times for the 57 Parkmerced would not result in a transit delay that would exceed the four minutes.

For the reasons described above, operation of the project would not substantially delay transit, and the project's transit delay impacts would be ***less than significant.***

Mitigation: None required.

Impact TR-5: Operation of the project would not substantially induce automobile travel but may cause substantial additional vehicle miles traveled due to rerouting of vehicular traffic. (*Significant and Unavoidable*)

The project is an infrastructure project to address coastal erosion and climate change-related sea level rise and includes a shoreline monitoring and beach nourishment program that would continue the ongoing shoreline monitoring and erosion management activities along South Ocean Beach. Once construction is completed, the project would not generate new substantial permanent travel demand (i.e., the project is a non-trip inducing infrastructure project).

However, the project may cause substantial additional VMT by altering the transportation network. Specifically, the proposed closure of the Great Highway between Sloat and Skyline boulevards and the resulting vehicle diversions may cause substantial additional VMT. This additional VMT due to the reroute of existing vehicles was quantified as part of the analysis.

The following analyzes the project's impacts in accordance with CEQA, state technical advisory, and the planning department's transportation impact analysis guidelines.

CEQA Statute and Guidelines and State Technical Advisory

The project is generally consistent with CEQA statute, guidelines, and state technical advisory for projects that would not have substantial VMT impacts.

CEQA section 21099(b)(1) required that the State Office of Planning and Research develop revisions to the CEQA Guidelines establishing criteria for determining the significance of transportation impacts of projects that "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses."

Consistent with CEQA section 21099(b)(1), the project would "promote":

- The reduction of greenhouse gas emissions – the project would meet applicable California and local building codes, provide onsite facilities for recycling and composting, meet the city's green building requirements, and preserve and enhance coastal public access and recreation at South Ocean Beach; and
- The development of multimodal transportation networks – the project would install protected bicycle lanes, continental crosswalks, and other features that would enhance multimodal conditions for a variety of travelers in the area (see Impact TR-2).

In January 2019, changes to the CEQA guidelines went into effect, including a new section 15064.3 that stated that VMT is the most appropriate measure of transportation impacts and that included updated criteria for analyzing transportation impacts. CEQA guidelines section 15064.3(b)(2) identified criteria for analyzing transportation projects. Those criteria stated, "For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements."

The State Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA (December 2018) provided advice and recommendations to lead agencies for analyzing transportation impacts in CEQA, including the effects of transportation projects on vehicle travel. The technical advisory identified types of transportation projects and their likely effects on vehicle travel. According to the technical advisory, projects that would likely lead to a measurable and substantial increase in vehicle travel generally include:

- "Addition of through lanes on existing or new highways, including general purpose lanes, high occupancy vehicle lanes, peak period lanes, auxiliary lanes, or lanes through grade-separated interchanges"

According to the technical advisory, projects that would not likely lead to a measurable and substantial increase in vehicle travel generally include:

- "Rehabilitation, maintenance, replacement, and repair projects designed to improve the condition of existing transportation assets … and that do not add additional motor vehicle capacity"
- "Reduction in number of through lanes"

In addition, the technical advisory states:

> "Transit and active transportation projects generally reduce VMT and therefore are presumed to cause a less-than-significant impact on transportation. This presumption may apply to all passenger rail projects, bus and bus rapid transit projects, and bicycle and pedestrian infrastructure projects."
>
> "Reducing roadway capacity (for example, by removing or repurposing motor vehicle travel lanes) will generally reduce VMT and therefore is presumed to cause a less-than-significant impact on transportation. Generally, no transportation analysis is needed for such projects."

Thus, the technical advisory focuses on vehicle travel methodology from roadway expansion projects or projects that increase roadway capacity.

The December 2018 technical advisory does not identify quantifiable thresholds of significance for these types of transportation projects; instead, the advisory provides guidance for lead agencies to establish their own thresholds of significance.

Transportation Impact Analysis Guidelines

The planning department's transportation impact analysis guidelines identify the criteria, methodology, and thresholds of significance for assessing VMT impacts under the review of the department. The guidelines are consistent with the CEQA statute and guidelines, and expand upon the State Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA.

For infrastructure projects, the guidelines identify a threshold of significance of approximately 2 million VMT per year, which is set at a level to meet the greenhouse gas emission reduction goal of 40 percent below 1990 levels by 2030 set forth in California Senate Bill 32.[44] A project that results in more than 2 million VMT per year may indicate a significant impact as a result of a substantial increase in VMT.[45] The guidelines describe circumstances that may result in significant impacts related to VMT; none of these circumstances apply to the project.

As shown below, the project would not have the potential to substantially induce automobile travel but may cause substantial additional VMT from redistributed vehicular travel.

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[44] This estimate is based on the methodology outlined by Governor's Office of Planning and Research, Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA, January 20, 2016, page III:31, which gave a more specific estimate of 2,075,220 VMT per year.

[45] As noted in the Section 4.3.4.2, Approach to Analysis, the approximately 2 million VMT per year threshold would be different, and likely higher, if the department were able only to assess fair share VMT allocated to transportation projects in the Bay Area region, based on the latest draft Plan Bay Area 2050.

Induced Additional Automobile Travel

The project's proposed changes to the transportation network are active transportation/rightsizing and minor transportation-type projects that do not substantially induce automobile travel. In addition, the project would not increase physical roadway capacity in congested areas or add new roadways to the network (i.e., a type of project that would induce additional automobile travel).

In addition, the closure of the existing 35-space NPS parking lot on the beach side of the Great Highway and construction of a Skyline coastal parking lot with up to 60 spaces within the existing paved area of the closed Great Highway adjacent to the southern end of the multi-use trail would not substantially increase parking supply so as to change the means of travel to the beach or result in a substantial increase in vehicle travel.

Therefore, the project features that would alter the transportation network would not substantially induce additional automobile travel.

Increase in Vehicle Miles Traveled

The proposed project would not include features that would typically result in substantial increased VMT such as addition of through lanes on existing or new roadways or reduction in vehicular travel times. However, because the project would reroute existing vehicular travel to other roadways (i.e., create travel route changes), the planning department quantified the additional distance that rerouted vehicles would travel due to the project's closure of the Great Highway between Sloat and Skyline boulevards. As described in Section 4.3.4.2, Approach to Analysis, based on an assessment of traffic volumes for conditions when the Great Highway was closed between Sloat and Skyline boulevards due to sand buildup, approximately 27 percent of the existing northbound and southbound through traffic on the Great Highway segment between Sloat and Skyline boulevards would reroute to other parallel streets to the east and would not travel on the Great Highway approaching Sloat Boulevard, on Sloat Boulevard, or on Skyline Boulevard. The remaining 73 percent of northbound and southbound through traffic on the Great Highway would reroute via Sloat and Skyline boulevards, and these traffic volumes were used to estimate the additional distance that rerouted vehicles would travel.

Thus, the permanent closure of the Great Highway south of Sloat Boulevard would reroute approximately 14,600 northbound/southbound vehicles daily to eastbound/westbound Sloat Boulevard between the Great Highway and Skyline Boulevard, and to northbound/southbound Skyline Boulevard between Sloat Boulevard and the Great Highway. These rerouted vehicles would travel an additional 0.46 mile compared to existing conditions. Thus, the Great Highway closure south of Sloat Boulevard would increase total daily VMT by 6,716 miles or approximately 2.45 million VMT per year.[46] This potential increase in VMT is conservative; the actual increased VMT may be less as that increase may not occur every day over an entire year and numerous studies have shown that projects that reduce the number of through lanes result in less or no changes to VMT due to people taking fewer vehicle trips, among other factors.[47] However, the projected increase of 2.45 million VMT annually would exceed the planning department's current threshold of 2 million VMT per year and therefore is conservatively determined to be a significant impact.

The determination is conservative because the actual increased VMT may be less and the approximately 2 million VMT per year threshold would be different if the department were able only to assess fair share VMT

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[46] ESA, Ocean Beach Climate Change Adaptation Project – Air Quality Technical Memorandum, February 2021.

[47] For some studies, refer to San Francisco Planning Department, Transportation Impact Analysis Guidelines, October 2019, Appendix L Vehicle Miles Traveled (VMT)/Induced Automobile Travel, Attachment C, October 2019.

allocated to transportation projects in the Bay Area region, based on the latest draft Plan Bay Area 2050.[48] The threshold would be different, and likely higher, in the Bay Area region because the region has a lower daily VMT per capita than the statewide average[49] and a greater population than all but one region in the state.[50] Thus, the region may have a greater fair share budget to allocate to individual transportation projects than the statewide average fair share budget.

Summary

The project fits within the types of projects identified by CEQA section 21099(b)(1), the State Office of Planning and Research's technical advisory and the planning department's transportation impact analysis guidelines as a project that would likely not create substantial additional VMT. However, because the project would exceed the planning department's threshold of significance, it is conservatively determined that the project may substantially increase VMT. Therefore, this EIR conservatively concludes the impact would be significant.

No feasible mitigation measures are available for the VMT impact. The substantial additional VMT is caused by the project's closure of the Great Highway between Sloat and Skyline boulevards and associated vehicular travel redistribution. This roadway closure is a key component of the project that is needed to accommodate the shoreline changes for long-term coastal management, including managed retreat, sea level rise adaptation, and to preserve and enhance coastal public access and recreation, habitat, and scenic quality at South Ocean Beach. Therefore, its removal from the project would not be feasible.

Common strategies to reduce VMT increases from transportation projects may involve: investing in travel alternatives to solo driving such as walking, bicycling, transit and carpooling; and pricing policies that raise the cost of driving and parking. However, these mitigation strategies would be infeasible for this project to implement or would not reasonably be expected to reduce the project's VMT impact for the following reasons:

- **Walking/Bicycle-related:** The project would install features that would enhance conditions for people walking and bicycling in the area, but such enhancements are unlikely to result in substantial mode shifts for people who otherwise drive through the project area (i.e., the vehicles that would be detoured onto Sloat and Skyline boulevards due to the Great Highway closure).
- **Transit-related:**
  - No regional transit service exists along the Great Highway and Skyline Boulevard. Thus, the project would not be able to increase frequency on an existing transit line that would be like the existing vehicular travel patterns to substantially shift people who would otherwise drive through the area from auto to transit.

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48 Note: currently, it is not reasonably feasible to provide a direct comparison between the state's regional targets for the Bay Area and the VMT estimates in the EIR. The state targets are between the years 2005 and 2035 and based on complex modeling conducted by the regions.

49 The existing Bay Area region daily VMT per capita is 20.4, in the year 2015. The existing statewide VMT per capita average is 24.6, averaged between the years 2015 and 2018. Sources: Metropolitan Transportation Commission & Association of Bay Area Governments, Plan Bay Area 2050 Draft EIR, June 2021, Table 3.15-11, *https://www.planbayarea.org/draftEIR*, and California Air Resources Board, 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goal, January 2019, *https://ww2.arb.ca.gov/sites/default/files/2019- 01/2017_sp_vmt_reductions_jan19.pdf*.

50 The existing Bay Area region population was 7,571,000 in the year 2015, the second largest metropolitan transportation organization in the state. Source: California Air Resources Board, Final Environmental Analysis, Prepared for the Proposed Update to the SB 375 GHG Emissions Reduction Targets, March 9, 2018, Appendix E, *https://www.arb.ca.gov/cc/sb375/appendix_e_feb2018.pdf?_ga=2.181886119.1630335037.1555684671-223600865.1491835512*.

- Access to regional transit service, such as to the BART Daly City station and to SamTrans Route 122 at Stonestown Galleria shopping center, from the northwest portion of San Francisco is already possible via existing Muni service (i.e., Muni 57 Parkmerced and 18 46th Avenue bus routes). The project would not be able to increase the frequency of existing Muni, BART, and SamTrans lines to a level sufficient to substantially shift the mode of travel for people who would otherwise drive through the area from auto to transit.
- It would be infeasible for this project implement a new regional transit service that would mirror the existing vehicular travel patterns to substantially shift people who would otherwise drive through the area from auto to transit to less-than-significant levels. For example, a new regional transit service along the Great Highway/Skyline Boulevard corridor that would provide transit travel times that are competitive to solo driving would require multiple express routes with frequent service connecting various San Francisco and South Bay destinations, while covering long distances. Development of such new intercounty transit service would be beyond SFPUC's control and would require coordination and participation between multiple jurisdictions and transit agencies. In addition, such a new transit service would require funding commitments well beyond the fair share of this project's impact.

- **Carpooling:** it would be infeasible for the project to implement HOV lanes. According to California state law,[51] the goals of preferential highway lanes such as High Occupancy Vehicle (HOV) or carpool lanes are to reduce congestion and improve air quality on the State Highway System. HOV lanes may provide an incentive to use ridesharing and public transportation by providing faster travel via a less congested lane than the adjacent mixed-flow travel lanes. Implementation of carpool lanes typically involves converting one of three or more travel lanes to a HOV lane or constructing an additional lane on the inside shoulder of a two-lane highway. Neither the Great Highway nor Sloat Boulevard west of Skyline Boulevard are on the State Highway System and therefore are not eligible as candidates for implementation of HOV lanes. Although Skyline Boulevard is a state facility (S.R. 92), no substantial traffic congestion currently exists to warrant the conversion of an existing travel lane to a HOV lane that may lead to substantially shift people who drive through the area from single occupancy vehicle trips to shared vehicle trips.
- **Pricing strategies:** it would be infeasible for the project to implement pricing strategies on area roadways or areawide.
  - Pricing strategies that raise the cost of driving to result in a shift from auto to other travel modes are typically applied to limited-access (e.g., freeways) congested roadways and congested city center/downtown areas. Pricing tolls on entire roadways such as toll roads and bridges and pricing on separated lanes within a highway such as express toll lanes or high occupancy toll lanes, would not be applicable to the project because the Great Highway, Sloat Boulevard and Skyline Boulevard are not limited-access congested roadways. Instead, these roadways provide local access to residential and recreational uses in the area as well as serve as a travel route to and from the South Bay. Implementation of pricing on these roadways may divert vehicles to other roadways in the area (e.g., Lower Great Highway) and local residential streets, rather than result in a shift from auto to other modes.
  - Pricing strategies involving *cordon charges*[52] and areawide charges, such as in downtown areas, would also not be applicable for through travel along the Great Highway/Skyline Boulevard corridor.

51 California Vehicle Code 21655.5
52 Cordon pricing involves charging a fee for users to enter or drive within a congested area.

> The project area is on the edge of the city's street grid, not downtown. While theoretically a new fee could fund other travel options (e.g., regional transit service) that would be like the existing vehicular travel patterns to substantially shift people from auto to other modes, it is infeasible for this project to implement such a program. Development of such a new charge would be beyond SFPUC's control and would require coordination and participation between multiple jurisdictions and transit agencies.

Because no feasible mitigation measures are available to avoid or minimize this impact, the project impacts related to VMT would therefore be ***significant and unavoidable.***

Impact TR-6: Operation of the project would not result in a commercial or passenger loading deficit. (*Less than Significant*)

Implementation of the project would not remove any existing on-street commercial or passenger loading zones. On-street passenger loading activities for the San Francisco Zoo would continue to occur within the two passenger loading zones located on the south side of Sloat Boulevard east of the vehicular entrance/exit for the zoo. Access to the zoo for deliveries and other loading activities would continue to occur via Zoo Road, and inbound and outbound vehicle access for the zoo would be provided via Sloat Boulevard. Access for deliveries and removal of screening and grit for the Oceanside Treatment Plant, the Westside Pump Station, and associated facilities for SFPUC operations would be provided via the new restricted access service road on the closed portion of the Great Highway. Therefore, implementation of the project would not result in a loading deficit (i.e., if the loading demand cannot be accommodated within the loading facilities) for existing uses.

None of the project components would generate new commercial vehicle or passenger loading trips following completion of construction, with the exception of sand deliveries during the periodic beach nourishment for small sand placements. As noted above, sand placements would occur approximately once every four to 10 years, on average. Sand placements would require approximately four to six weeks of work along the shoreline per placement event and could require closure of the Skyline coastal parking lot for the duration of sand placement work. The sand deliveries would be accommodated within the closed portions of the beach and therefore would not result in a loading deficit during these activities.

For the reasons described above, operation of the project would not result in a loading deficit, and the project's loading impacts would be ***less than significant.***

> **Mitigation:** None required.

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4.3.4.4 CUMULATIVE IMPACTS

Existing and probable future projects listed in Section 4.1, Overview, Table 4.1-3, could contribute to cumulative impacts related to transportation and circulation. The geographic context for the analysis of cumulative transportation impacts generally includes the sidewalks and roadways adjacent to the project area, and the local roadway and transit network within 0.5 mile of the project area. Project construction is expected to begin in 2023 and end in 2027, and would occur in the same time frame and vicinity as other planned and proposed projects that would use the same roadways for access to work sites (e.g., Skyline Boulevard, Sloat Boulevard).

Based on the schedule information for the cumulative projects presented in Table 4.1-3, there are 12 cumulative projects that could potentially overlap with project construction or operations. However, two of these projects—the Vista Grande Drainage Basin Improvement Project and the Lake Merced West Project—are not located in the immediate vicinity of the project area and would not contribute to cumulative transportation and circulation conditions. The nine remaining projects that could potentially overlap with project construction and/or operations include the five SFPUC projects (Westside Pump Station Reliability Improvements, Oceanside Treatment Plant Improvements - Biosolids Cake Hopper Reliability Upgrade, Oceanside Treatment Plant Improvements - Seismic Retrofits, San Francisco Zoo Recycled Water Pipeline Project, and Westside Force Main Reliability Project), the changes to the intersections of Skyline Boulevard/Sloat Boulevard by the SFMTA and Skyline Boulevard/Great Highway by Caltrans, the Fort Funston Trail Connection Project, and the 2700 Sloat Boulevard residential development project.[53]

The last project in Table 4.1-3 is the Potential Upper Great Highway Closure between Sloat Boulevard and Lincoln Way (referred to generally as the Upper Great Highway project). This potential project is assessed in a second cumulative scenario and conservatively assumes full permanent closure of the Great Highway between Sloat Boulevard and Lincoln Way. The analysis considers whether, with the addition of this cumulative project, the project's cumulative impact conclusions for the first scenario (i.e., without this cumulative project) would change.

Impact C-TR-1: The project, in combination with the cumulative projects, would not result in significant construction-related transportation impacts. (*Less than Significant*)

Project construction may overlap with the construction of other projects in the geographic scope. Figure 4.1-1 in Section 4.1, Overview, presents the cumulative projects considered in the analysis. These projects may result in increases in construction worker vehicles and construction trucks, may use the same construction access routes to regional facilities, and may result in temporary travel lane closures.

Cumulative Analysis

During the overlap period, construction vehicles associated with the SFPUC Westside Pump Station Reliability Improvements, the SFPUC San Francisco Zoo Recycled Water Pipeline Project, and the SFPUC Westside Force Main Reliability Project would access the work areas via the closed portion of the Great Highway, while construction vehicles associated with the two Oceanside Treatment Plant Improvement projects would access the work areas via Skyline Boulevard. The NPS Fort Funston Trail Connection Project would be constructed after the proposed Skyline coastal parking lot is completed (i.e., during phase 4 of the project) and therefore construction activities would not substantially overlap. As with the project, construction managers of SFPUC projects considered in the cumulative analysis would be required to comply with the SFPUC standard construction measures and coordinate with various city departments, such as the SFMTA and Public Works, and coordinate any temporary sidewalk, bicycle route, and travel lane closures to develop traffic control plans that would address construction-related vehicle routing, traffic

[53] The 2700 Sloat Boulevard project is conservatively included in the cumulative analysis, although the timing of its development is unknown, as there is a reasonable likelihood of an application being filed and overall neighborhood awareness of this project. Analysis of its contribution to the cumulative transportation impacts is based on preliminary project designs and unknown construction schedule that may overlap given the potential for overlap due to the long duration of construction of the proposed Ocean Beach Climate Change Adaptation project.

control, and pedestrian and bicyclist movements adjacent to the construction area for the duration of construction overlap. SFPUC standard construction specifications require contractors to coordinate with other contractors working in the area. Thus, the traffic control plans for the SFPUC projects would be coordinated, similar to the ongoing coordination activities for the multiple concurrent construction projects at the Oceanside and Westside facilities. The traffic control plans would help maintain the safety of public streets for vehicles, bicyclists, and people walking.

Given the limited number of projects in the immediate vicinity of the project area that would overlap with project construction and with the implementation of traffic control plans for SFPUC projects and requirements contained within the SFMTA blue book that would be applicable to all cumulative projects, construction activities of cumulative projects would result in ***less-than-significant*** cumulative construction-related transportation impacts.

Cumulative Analysis with the Upper Great Highway Project

In the event that the Upper Great Highway project were to overlap with construction of the project and other cumulative projects, construction conditions would be similar to those identified above. The Upper Great Highway project would not involve substantial construction as the existing roadway would remain in place for people walking and bicycling, and only minor changes to the transportation network along the Great Highway would be made to accommodate the closure. Therefore, cumulative construction-related transportation impacts would be similar to those discussed above, and would be ***less than significant***.

Impact C-TR-2: The project, in combination with the cumulative projects, would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations. (*Less than Significant*)

Cumulative Analysis

Most future cumulative projects listed in Table 4.1-3 and illustrated on Figure 4.1-1 in Section 4.1, Overview, are infrastructure upgrades that would not generate new trips during operations or change the transportation network. Cumulative transportation network projects include the Fort Funston Trail Connection Project, and reconfiguration and/or signalization at the intersections of Skyline Boulevard/Sloat Boulevard by the SFMTA and Skyline Boulevard/Great Highway by Caltrans. The intersection improvements would be made to improve safety for all road users. The Fort Funston Trail Connection Project would provide for a safe connection for people walking and bicycling between trails within Fort Funston and the project's multi-use trail along South Ocean Beach.

Under cumulative conditions, trips by people walking, bicycling, or driving on the surrounding street network would increase due to the nearby development projects such as the residential development proposed at 2700 Sloat Boulevard, and growth elsewhere in the city and region. This increase would be expected to lead to an increase in the potential for conflicts between people driving and people walking, people bicycling, and public transit operations. However, a general increase in cumulative travel by all modes, in and of itself, would not be considered a potentially hazardous condition. Cumulative projects, including the project, would be designed consistent with city policies and design standards, including the Better Streets Plan and Vision Zero, and therefore would not create potentially hazardous conditions. Thus, cumulative impacts related to potentially hazardous conditions would be ***less than significant***.

Cumulative Analysis with the Upper Great Highway Project

If implemented, the Upper Great Highway project would likely improve conditions for people walking and bicycling along or across the Great Highway between Sloat Boulevard and Lincoln Way, compared to existing conditions. The existing roadway would remain in place; however, the intersections of the Great Highway with Lincoln Way and with Sloat Boulevard would be reconfigured slightly to reflect the changes to permitted vehicle movements (i.e., vehicles would no longer be permitted to travel along or across the Great Highway between Lincoln Way and Sloat Boulevard). The design of these reconfigured intersections would be consistent with city policies and design standards and would not result in potentially hazardous conditions. Therefore, cumulative impacts related to potentially hazardous conditions would be similar as discussed above and would be ***less than significant***.

Impact C-TR-3: The project, in combination with the cumulative projects, would not interfere with accessibility of people walking or bicycling to and from the project area and adjoining areas, or result in inadequate emergency access. (*Less than Significant*)

Cumulative Analysis

Overall, cumulative development and transportation projects listed in Table 4.1-3 and illustrated on Figure 4.1-1 in Section 4.1, Overview, would enhance the transportation network for all modes and would promote accessibility for people walking and bicycling within and through the study area by conforming to the requirements of the Better Streets Plan, Transit-First Policy, and Vision Zero, and by adhering to planning principles that emphasize providing convenient connections and safe routes for people walking and bicycling. With the exception of the project and the Fort Funston Trail Connection Project, none of the known cumulative projects would change vehicular, pedestrian, or bicycle circulation in the project vicinity. The Caltrans signalization, and subsequent project modifications at the intersection of Skyline Boulevard/Great Highway, would provide a crossing across Skyline Boulevard and would enhance accessibility for people walking and bicycling. None of the cumulative projects would interfere with emergency access. In addition, prior to finalizing the design and dimensions of any proposed transportation network changes under city jurisdiction, fire department and the police department staff would review and approve streetscape modifications, as required through the city's Transportation Advisory Staff Committee review process, so that emergency vehicle access is acceptable. The SFMTA would coordinate internal city agency review of Caltrans' signalization of the intersection of Skyline Boulevard/Great Highway. Under cumulative conditions, there would be a projected increase in vehicles on study area streets; however, the increase would not impede travel or access for people walking or bicycling, or for emergency vehicles. Thus, cumulative impacts related to accessibility would be ***less than significant***.

Cumulative Analysis with the Upper Great Highway Project

If implemented, the Upper Great Highway project would likely enhance accessibility for people walking and bicycling along or across the Great Highway between Lincoln Way and Skyline Boulevard, compared to existing conditions. If needed, emergency vehicles would be able to travel within the roadway to respond to incidents within the closed section of the Great Highway between Sloat Boulevard and Lincoln Way; thus, the Upper Great Highway project would not hinder emergency access. Therefore, cumulative impacts related to accessibility would be similar as discussed above, and would be ***less than significant***.

Impact C-TR-4: The project, in combination with the cumulative projects, would not substantially delay public transit. (*Less than Significant*)

Cumulative Analysis

Most future cumulative projects listed in Table 4.1-3 and illustrated on Figure 4.1-1 in Section 4.1, Overview, are SFPUC infrastructure upgrades at the existing Oceanside and Westside facilities that would not generate new trips or change the transportation network. The 2700 Sloat Boulevard residential development project would not change vehicular circulation or increase p.m. peak hour vehicle trips in the project vicinity to substantially delay public transit (since 2700 Sloat Boulevard would generate only about 60 new vehicle trips during the weekday p.m. peak hour).[54]

Proposed transportation network improvements at the intersection of Skyline Boulevard/Sloat Boulevard in the form of either signalization or a roundabout would be designed to accommodate the three Muni bus routes currently traveling through this intersection (i.e., the 18 46th Avenue, 23 Monterey, and 57 Parkmerced). These improvements would reduce vehicle delays at this intersection and transit travel times compared to project conditions presented in Impact TR-4 above. The signalization by Caltrans and subsequent project modifications at the intersection of Skyline Boulevard/Great Highway would not substantially change intersection operations or transit travel times on Skyline Boulevard.

The combined effect of the additional vehicles associated with the 2700 Sloat Boulevard project, changes in vehicle circulation associated with the project, and the improvements at the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway is that the transit travel times under cumulative conditions would be less than those identified for project conditions in Impact TR-4. Thus, under cumulative conditions, transit delay increases would not be substantial, and as a result, cumulative transit impacts would be ***less than significant***.

Cumulative Analysis with the Upper Great Highway Project

In the event that the Upper Great Highway project is implemented, vehicles traveling on the Great Highway would divert to other roadways, primarily to Sunset Boulevard, but also to 19th Avenue and other parallel north-south roadways. Because detailed analyses of the Upper Great Highway project have not been conducted by other agencies (e.g., Rec and Park, SFMTA or SFCTA), the analysis of this additional cumulative scenario is a good faith effort that considers the best available information.[55] Potential cumulative transit delay impacts to the 28 19th Avenue, 23 Monterey, 57 Parkmerced, 18 46th Avenue, and 29 Sunset Muni bus routes are discussed below.

Under the cumulative scenario with Upper Great Highway closure, the number of vehicles on Sloat Boulevard between the Great Highway and Skyline Boulevard and on Skyline Boulevard between Sloat Boulevard and the Great Highway would decrease compared to cumulative conditions without the Upper Great Highway project. Consequently, transit travel times for Muni routes that travel on these segments of Sloat Boulevard and Skyline Boulevard (i.e., 18 46th Avenue, 23 Monterey, and 57 Parkmerced bus routes)

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54 Based on the Transportation Study Determination Request for the 2700 Sloat Boulevard project (April 2020), preliminary travel demand calculations estimated 63 new vehicle trips generated by the project during the p.m. peak hour, which would be less than the screening criteria of 300 project vehicle trips during the peak hour used by the planning department to determine if transit routes traveling through the project study area are likely to be significantly delayed by a proposed project.

55 LCW Consulting, Ocean Beach Climate Change Adaptation Project, Transit Delay Assessment for Additional Cumulative Scenario – Technical Memorandum, August 25, 2021, Appendix D.

would also decrease compared to existing plus project and cumulative conditions without the Upper Great Highway project.

However, the Upper Great Highway project could increase vehicle congestion on surrounding roadways by diverting vehicles from the Great Highway to other roadways. Based on an assessment of cumulative conditions, there would not be a significant cumulative transit delay impact on the 28 19th Avenue route because the Upper Great Highway project would not reroute a substantial number of vehicles to 19th Avenue such that a significant cumulative transit delay impacts could occur. In addition, there would not be a significant cumulative transit delay impact on the 18 46th Avenue route because the vehicle diversions from the proposed project are not projected to occur along the 18 46th Avenue route. Thus, under this cumulative scenario, vehicles rerouted from the Great Highway would not result in significant cumulative transit delay impacts on the 18 46th Avenue or 28 19th Avenue bus routes. If the Upper Great Highway project is implemented, the proposed project could, however, cumulatively add more than four minutes of transit delay to the 29 Sunset route. This would exceed the planning department's four-minute transit delay threshold of significance. Thus, the analysis conservatively assumes a significant cumulative transit delay impact on the 29 Sunset route. The project's contribution to the cumulative transit delay impact on the 29 Sunset bus route was estimated based on the length of the project's Great Highway closure and potential additional congestion on Sunset Boulevard from diverted vehicles. The analysis estimated that the additional transit delay associated with the rerouted vehicles would be limited given that Sunset Boulevard has three travel lanes in each direction, a 30 miles per hour speed limit and traffic signal coordination, and low existing traffic volumes compared to the available travel lane capacity that indicates that additional vehicles could be accommodated in both directions. In addition, buses stopping on Sunset Boulevard would not experience reentry delay because bus stops are within the travel lanes (i.e., buses do not need to wait for gaps in traffic to access the travel lane when departing a bus stop). Segments of Sunset Boulevard where traffic congestion would substantially affect transit travel times would likely be limited to the area directly north and south of Sloat Boulevard.[56] Based on the assessment above, the project's contribution to the significant cumulative transit delay impact on the 29 Sunset route would not be cumulatively considerable; therefore, the project would have a ***less-than-significant*** cumulative transit delay impact.

Impact C-TR-5: The project, in combination with the cumulative projects, would not substantially induce automobile travel, but could result in a cumulatively considerable contribution to a significant cumulative impact related to additional vehicle miles traveled. (*Significant and Unavoidable*)

VMT by its very nature is largely a cumulative impact. As discussed in Impact TR-5, the project does not include land use development and would not generate additional VMT per capita. The transportation features of the project are consistent with the general types of active transportation and other minor transportation projects that would not substantially induce automobile travel, such as the Fort Funston Trail Connection Project and the planned changes to the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway.

However, the project would reroute vehicles to Sloat Boulevard between the Great Highway and Skyline Boulevard, and to Skyline Boulevard between Sloat Boulevard and the Great Highway. This shift would result

[56] LCW Consulting, Ocean Beach Climate Change Adaptation Project, Transit Delay Assessment for Additional Cumulative Scenario – Technical Memorandum, August 25, 2021, Appendix D.

in an increase in VMT that would exceed the planning department's threshold of 2 million VMT per year,[57] which would be a significant impact. For this reason, the project would also have a significant cumulative VMT impact with or without the implementation of the Upper Great Highway project[58] and the project's contribution would be considerable. As discussed in Impact TR-5, there are no mitigation measures that would avoid or minimize the impact, and therefore the cumulative VMT impacts would be ***significant and unavoidable***.

Impact C-TR-6: The project, in combination with the cumulative projects, would not result in significant commercial or passenger loading impacts. (*Less than Significant*)

Cumulative Analysis

Cumulative infrastructure and transportation network projects listed in Table 4.1-3 and illustrated on Figure 4.1-1 in Section 4.1, Overview, would not generate loading demand. Only the 2700 Sloat Boulevard residential development on the block bounded by Wawona Street, 46th Avenue, 45th Avenue, and Sloat Boulevard would generate commercial vehicle and passenger loading demand in the geographic scope. Under cumulative conditions, the freight and passenger loading activities associated with the 2700 Sloat Boulevard residential development would occur on site or on-street in the vicinity of that site (i.e., on Wawona Street) and would not combine with the project's loading activities associated with beach nourishment.

As discussed under Impact TR-6, the project's sand deliveries during the intermittent beach nourishment activities would be accommodated within identified areas on the proposed service road and multi-use trail, and would not contribute to impacts from other nearby cumulative development projects, such as the 2700 Sloat Boulevard residential development discussed above. No other cumulative development projects have been identified that would contribute to either commercial vehicle or passenger loading demand in the geographic scope. Thus, cumulative projects would not result in a substantial loading deficit and cumulative loading impacts would be ***less than significant***.

Cumulative Analysis with the Upper Great Highway Project

In the event that the Upper Great Highway project between Sloat Boulevard and Lincoln Way project is implemented, cumulative loading conditions would remain similar as discussed above. There are no commercial vehicle or passenger loading zones on the segment of the Great Highway between Lincoln Way and Sloat Boulevard and the roadway closure would not generate new loading demand. Because the roadway on this segment of the Great Highway would remain in place, the intermittent haul truck travel for beach nourishment between North Ocean Beach and South Ocean Beach could occur. However, beach nourishment would only occur every four to 10 years, on average, and would not result in substantial loading impacts. Therefore, cumulative loading impacts would be similar as discussed above, and would be ***less than significant***.

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57 As noted in the Section 4.3.4.2, Approach to Analysis, the approximately 2 million VMT per year threshold would be different, and likely higher, if the department were able only to assess fair share VMT allocated to transportation projects in the Bay Area region, based on the latest draft Plan Bay Area 2050.

58 In the event the Upper Great Highway Project is implemented, the additional distance that vehicles would be required to travel may also exceed 2 million VMT per year, a significant cumulative impact. While the project's contribution would still be considerable, the proportion of the increase attributable to the project would be less than without the Upper Great Highway Project.

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4.4 Noise and Vibration

4.4.1 Introduction

This section describes the existing noise environment in the project site, evaluates the potential construction-related and operational noise and vibration impacts associated with implementation of the project, and identifies mitigation measures to avoid or reduce potential adverse impacts. Noise and vibration topics consist of temporary or permanent increases in ambient noise levels, generation of excessive groundborne vibration or noise, and exposure to excessive noise levels near airports. Supporting detailed technical information is included in Appendix E. Project-related noise and vibration effects on biological resources are discussed in Section 4.6, Biological Resources.

4.4.2 Environmental Setting

4.4.2.1 SOUND FUNDAMENTALS

Sound is characterized by parameters that describe the rate of *oscillation* (frequency) of sound waves, the distance between successive troughs or crests in waves, the speed that they travel, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize how loud a sound is, and the decibel (dB) scale is used to quantify sound intensity. Because the human ear is not equally sensitive to all sound frequencies, human response is factored into sound descriptions in a process called *A-weighting*, expressed as *dBA*. The dBA, or A-weighted decibel, refers to a scale of noise measurement that reflects the different frequencies that humans can hear. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3 dBA change is considered a perceptible difference while a 5 dBA change is considered readily noticeable. A 10 dBA increase in the level of a continuous noise represents a perceived doubling of loudness.[1]

NOISE DESCRIPTORS

Noise is generally defined as sound that is loud, disagreeable, unexpected or unwanted. Variations in noise exposure over time are typically expressed in terms of a steady-state energy level (called Leq) that represents the acoustical energy of a given measurement, or alternatively as a statistical description of what sound level is exceeded over some fraction (10, 50, or 90 percent) of a given observation period (i.e., L10, L50, L90). Leq (24) is the steady-state acoustical energy level measured over a 24-hour period. Lmax is the maximum, instantaneous noise level registered during a measurement period. Because people in residential areas are more sensitive to unwanted noise intrusion during the evening and at night, an artificial 5 dBA increment is added to evening noise levels (7 to 10 p.m.) and an artificial 10 dBA increment is added nighttime noise levels (10 p.m. to 7 a.m.) to form a 24-hour noise descriptor called the *Community Noise Equivalent Level* (CNEL). Another 24-hour noise descriptor, called the *day-night noise level* (Ldn), is similar to CNEL, but Ldn does not add the evening 5 dBA penalty between 7 p.m. and 10 p.m. In practice, Ldn and CNEL

1 California Department of Transportation (Caltrans), Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol pp. 2-44 to 2-45, September 2013, *http://www.dot.ca.gov/env/noise/docs/tens-sep2013.pdf*, accessed October 9, 2020.

usually differ by less than 1 dBA at any given location from transportation noise sources.[2] **Table 4.4-1** presents representative noise sources and their corresponding noise levels in dBA at varying distances from the noise sources.

Table 4.4-1 Representative Environmental Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	110	Rock band
Jet fly-over at 100 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck going 50 mph at 50 feet		Food blender at 3 feet
	80	Garbage disposal at 3 feet
6.5-foot wave breaking at shoreline	78	
Noisy urban area during daytime		
Gas lawnmower at 100 feet	70	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban area during daytime	50	Dishwasher in next room
Quiet urban area during nighttime	40	Theater, large conference room (background)
Quiet suburban area during nighttime		
	30	Library
Quiet rural area during nighttime		Bedroom at night, concert hall (background)
	20	
		Broadcast/recording studio
	10	
	0	

SOURCE: California Department of Transportation (Caltrans), *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013, p. 2-20; Bolin, Karl, & Abom, M. (2010) *Airborne Sound Generated by Sea Wavers*, Journal of Acoustical Society of America, 127(5);2771-9.

2 Caltrans, Technical Noise Supplement (TeNS) to the Traffic Noise Analysis Protocol, September 2013, p. 2-48, *http://www.dot.ca.gov/env/noise/docs/tens-sep2013.pdf,* accessed October 9, 2020.

HEALTH EFFECTS OF ENVIRONMENTAL NOISE

The World Health Organization is a recognized source of current knowledge regarding health impacts, including those generated by noise. According to the World Health Organization, one health effect is sleep disturbance, which can occur when continuous indoor noise levels exceed 30 dBA (Leq) or when intermittent interior noise levels reach or exceed 45 dBA (Lmax), particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the World Health Organization criteria suggest that acceptable nighttime ambient noise levels should be 45 dBA (Leq) or below, and short-term events should not generate noise in excess of 60 dBA (Lmax). The World Health Organization also notes that maintaining noise levels within the recommended levels during the first part of the night helps people to fall asleep.[3]

Other potential health effects of noise identified by the World Health Organization include decreased performance on complex cognitive tasks, such as reading, attention, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, or shorter-term exposure to very high noise levels, for example, exposure several times a year to a concert with noise levels at 100 dBA). Noise can also disrupt speech intelligibility at relatively low levels; for example, in a classroom setting, a noise level as low as 35 dBA can disrupt clear understanding. Finally, noise can cause annoyance and can trigger emotional reactions like anger, depression, and anxiety. The World Health Organization reports that during daytime hours, few people are seriously annoyed by activities with noise levels below 55 dBA, or moderately annoyed by activities with noise levels below 50 dBA.

Vehicular traffic and continuous sources of machinery and mechanical noise contribute to unhealthy ambient noise levels. Short-term noise sources, such as large vehicle audible warnings, the crashing of material being loaded or unloaded, car doors slamming, and engines revving, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and annoyance. The effect of noise on receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels at night can disturb sleep.

VIBRATION AND GROUNDBORNE NOISE

Groundborne noise refers to noise generated by vibrations from outside a structure but experienced inside the structure. Groundborne noise can be a problem in situations where the primary airborne noise path is blocked, such as in the case of a subway tunnel passing near homes or other noise-sensitive structures. Vibration is an oscillatory motion through a solid medium. Typically, groundborne vibrations generated by man-made activities attenuate rapidly with the distance from the source of the vibration. Vibration is typically measured by peak particle velocity (PPV) in inches per second (in/sec). With the exception of long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. High levels of vibration can damage fragile buildings or interfere with

3 World Health Organization, *Guidelines for Community Noise*, April 1999, Chapter 3, p. 46.

sensitive equipment. Depending on the age of the structure and type of vibration (transient, continuous, or frequent intermittent sources), vibration levels as low as 0.5 to 2.0 in/sec PPV can damage a structure.[4]

Typical sources of groundborne vibration in San Francisco are large-scale construction projects that involve pile driving, vibratory construction equipment, or underground tunneling. Vibration is also caused by transit vehicles in the subway system, including Muni light-rail vehicles, historic streetcars, and Bay Area Rapid Transit (BART) trains. In general, such vibration is only an issue when there are sensitive receptors located nearby. Since rubber tires and suspension systems mitigate vibrations, rubber tire vehicles such as Muni buses, trucks, and automobiles rarely create substantial vibration absent a bump in the road surface.[5]

4.4.2.2 EXISTING CONDITIONS

EXISTING NOISE SOURCES

The project site generally encompasses the portion of San Francisco's Ocean Beach extending south from Sloat Boulevard to the northern edge of the Fort Funston bluffs, and the Great Highway from Sloat Boulevard to Skyline Boulevard, along with a portion of Ocean Beach north of Lincoln Boulevard where sand is harvested for placement south of Sloat Boulevard. The primary noise sources on and near the project site consist of vehicular traffic on the Great Highway, Sloat Boulevard, and Skyline Boulevard. Secondary noise sources include wave action of the Pacific Ocean on the western project extent, and vehicular traffic on Herbst Road. Animals within the San Francisco Zoo can contribute occasional intermittent noise.

EXISTING GROUNDBORNE NOISE AND VIBRATION SOURCES

There are no known sources of existing groundborne noise or vibration near the project site. The L Taraval light rail train (approximately 370 feet north of the project site) operates at the surface and generates some surface vibration in its immediate vicinity. Given its distance and surface location, the L Taraval line is not considered a substantial source of groundborne noise or vibration in the project site vicinity.[6] There is no machinery or activity at the adjacent zoo, wastewater treatment plant, and residential uses that generate substantial vibration in the project site vicinity.

AMBIENT NOISE MEASUREMENTS

Three long-term sound level measurements were conducted around the project site on December 9 through 16, 2019, as indicated on **Figure 4.4-1**. Additionally, four short-term noise measurements were also collected on December 5, 2019 at locations indicated on Figure 4.4-1.[7] The measured sound levels and the sources of sound monitored are shown in **Table 4.4-2**.

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4 Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013, Table 9, p. 23, *http://www.dot.ca.gov/env/noise/docs/tens-sep2013.pdf*, accessed January 22, 2019.

5 U.S. Department of Transportation (U.S. DOT), Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment Manual, September 2018, p. 116, *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed January 22, 2019.

6 U.S. DOT, FTA, Transit Noise and Vibration Impact Assessment Manual, September 2018, section 4.3, Noise Screening Procedure, pp. 33–36 (noise 175 feet with intervening buildings) and 136 (vibration 150 feet for residential), *https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf*, accessed October, 9 2020.

7 The sound level surveys were conducted using Larson Davis Model LxT2 sound level meters which were calibrated prior to use and operated according to the manufacturer's specifications.

SOURCE: ESA, 2019; Google Earth, 2019

Figure 4.4-1
Noise Measurement Locations

Table 4.4-2 Existing Noise Environment in the Project Site Vicinity

Location	Date and Time Period	Daytime Leq dB	Nighttime Leq dB	L90	Ldn	Noise Sources
LT-1 2700 block Great Highway at Sloat Boulevard Residential	12/9/19 – 12/16/19 24-hour measurements	64-71	58-63	52	67-71	Vehicular traffic on Great Highway and Sloat Boulevard.
LT-2 2700 block 41st Avenue at Sloat Boulevard Residential	12/9/19 – 12/16/19 24-hour measurements	66-68	59-61	46	68-69	Vehicular traffic on 41st Avenue and Sloat Boulevard. MUNI Bus service on Sloat Boulevard.
LT-3 Skyline Boulevard behind Pomeroy Recreation and Rehabilitation Center	12/9/19 – 12/16/19 24-hour measurements	72-76	64-67	45	73-76	Vehicular traffic Skyline Boulevard. MUNI Bus service on Skyline Boulevard.
ST-1 Great Highway and Fulton Street across from existing active beach sand extraction activity.	12/5/19 1:04 p.m. to 1:25 p.m.	63.9	NA	57	NA	Vehicular traffic on Great Highway and Fulton Street. Sand excavation on Ocean Beach approximately 300 feet away.
ST-2 300 Block Lakeshore Drive Residential	12/5/19 11:41 a.m. to 12:02 p.m.	69.8	NA	58	NA	Vehicular traffic on Skyline Boulevard and Sloat Boulevard.
ST-3 Herbst Road between Pomeroy Recreation and Rehabilitation Center and San Francisco Zoo	12/5/19 10:40 a.m. to 11:01 a.m.	59.1	NA	49	NA	Limited vehicular traffic on Herbst Road and distant traffic on Skyline Boulevard.
ST-4 Herbst Road between Pomeroy Recreation and Rehabilitation Center and Armory Drive	12/5/19 11:05 a.m. to 11:26 a.m.	58.7	NA	55	NA	Limited vehicular traffic on Herbst Road and distant traffic on Skyline Boulevard.

NOTES:
[a] Daytime hours are 7 a.m. to 10 p.m.
[b] Nighttime hours are 10 p.m. to 7 a.m.

SENSITIVE RECEPTORS

Some land uses (and associated users) are considered more sensitive to ambient noise levels than others due to the types of activities typically involved with the land use and the amount of noise exposure (in terms of both exposure duration and insulation from noise). In general, occupants of residences, schools, daycare centers, hotels, hospitals, places of worship, and nursing homes are considered to be sensitive receptors (i.e., persons who are sensitive to noise based on their specific activities, age, health, etc.).

Existing noise-sensitive receptors in the project vicinity within 900 feet[8] of the project site are composed of residences, two hotels, and the Pomeroy Recreation and Rehabilitation Center,[9] as listed below in **Table 4.4-3**, and their locations are shown on **Figure 4.4-2**. There are no existing hospitals or skilled nursing facilities within 900 feet of the project site. There are, however, residential land uses within 900 feet of the North Ocean Beach sand harvesting area.

Table 4.4-3 Existing Noise-Sensitive Receptors within 900 Feet of the Project Site and Along Primary Roadways Accommodating Rerouted Vehicular Traffic

Type of Sensitive Receptor	Location	Minimum Distance from Project Site Boundaries	Representative Monitoring Location
NORTH OF PROJECT SITE			
Residential	2100 through 2700 blocks of Great Highway	25 - 900 feet	LT-1
Residential	2600 and 2700 blocks of 46th Avenue	700 – 900 feet	LT-1
Residential	2600 and 2700 blocks of 47th Avenue	430 - 900 feet	LT-1
Residential	700 and 800 block of La Playa Street	350 – 900 feet	ST-1
EAST OF PROJECT SITE			
Residential	2800 and 2900 blocks of Sloat Boulevard	50 - 900 feet	LT-1 and LT-2
Hotel	2828 Sloat Boulevard	300	LT-1
Hotel	2600 Sloat Boulevard	900	LT-2
Pomeroy Recreation and Rehabilitation Center	207 Skyline Boulevard	1,200 feet[a]	LT-3, ST-3 and ST-4
Residential	300 and 400 block of Lakeshore Drive	2,200 feet[b]	ST-2
Residential	2150 to 2550 Sloat Boulevard	2,200 feet[b]	LT-2

SOURCE: ESA, 2020; Google Earth (Imagery Date 6/2016) for parcel data (address and distance to the site).

NOTES:

a Although this receptor is greater than 900 feet from project work areas, it is included because it is about 500 feet west of a segment of Skyline Boulevard that would accommodate vehicular traffic rerouted due to the Great Highway closure. Therefore, operational traffic noise impacts are analyzed for these existing sensitive receptors, even though it is likely they are too far away to hear project construction noise.

b Although these receptors are greater than 900 feet from project work areas, they are included because they are about 75 feet from segments of Sloat Boulevard and Skyline Boulevard that would accommodate vehicular traffic rerouted due to the Great Highway closure.

8 This distance was selected because typical construction noise levels can affect a sensitive receptor at a distance of 900 feet if there is a direct line-of-sight between a noise source and a noise receptor (i.e., a piece of equipment generating 85 dBA would attenuate to 60 dBA over a distance of 900 feet). An exterior noise level of 60 dBA will typically attenuate to an interior noise level of 35 dBA with the windows closed and 45 dBA with the windows open.

9 The Pomeroy Recreation and Rehabilitation Center is identified as a sensitive receptor because it hosts school programs and provides overnight respite care.

SOURCE: ESA, 2020; Google Earth, 2020

Figure 4.4-2
Sensitive Receptors in the Project Vicinity

4.4.3 Regulatory Framework

4.4.3.1 FEDERAL

In 1972, the Noise Control Act (42 United States Code section 4901 et seq.) was passed by congress to promote limited noise environments in support of public health and welfare. It also established the United States Environmental Protection Agency (U.S. EPA) Office of Noise Abatement and Control to coordinate federal noise control activities. U.S. EPA established guidelines for noise levels that would be considered safe for community exposure without the risk of adverse health or welfare effects, which are summarized in **Table 4.4-4**.

Table 4.4-4 Summary of Noise Levels Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety

Effect	Level	Area
Hearing loss	< 70 dBA[a] (Leq, 24 hour)	All areas
Outdoor activity interference and annoyance	< 55 dBA (Ldn)	Outdoor residential areas and farms as well as other outdoor areas where people spend varying amounts of time and places where quiet is a basis for use
Outdoor activity interference and annoyance	< 55 dBA (Leq, 24 hour)	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	< 45 dBA (Ldn)	Indoor residential areas
Indoor activity interference and annoyance	< 45 dBA (Leq, 24 hour)	Other indoor areas with human activities, such as schools, etc.

SOURCE: U.S. EPA, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974, http://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.pdf, accessed January 23, 2019.

NOTE:

[a] Yearly average equivalent sound levels in decibels; the exposure period that results in hearing loss at the identified level is 40 years.

U.S. EPA found that to prevent hearing loss over the lifetime of a receptor, the yearly average Leq should not exceed 70 dBA, and the Ldn should not exceed 55 dBA in outdoor activity areas or 45 dBA indoors to prevent interference and annoyance.[10] In 1982, noise control was largely passed to state and local governments.

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under Code of Federal Regulations title 40, part 205, subpart B. The federal truck pass-by noise standard is 80 dBA at 50 feet from the vehicle pathway centerline, under specified test procedures. These requirements are implemented through regulatory controls on truck manufacturers. There are no comparable standards for vibration, which tend to be specific to the roadway surface, the vehicle load, and other factors.

While the Transit Noise and Vibration Impact Assessment of the Federal Transit Administration (FTA) is developed for determining significant noise and vibration impacts for transit projects and is not a regulation,

[10] U.S. Environmental Protection Agency (U.S. EPA), Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974.

it is one of the few federal sources that suggest both a methodology and criteria for assessing construction noise impacts. The FTA noise impact criteria used to assess construction impacts are identified in **Table 4.4-5**. These criteria are absolute contribution values from construction activity and are independent of existing background noise levels. If the FTA criteria (presented in Table 4.4-5) are exceeded, adverse noise impacts could occur.

Table 4.4-5 Construction Noise Impact Criteria

Land Use	Maximum 1-Hour dBA Leq	
	Day	Night
Residential	90	80
Commercial	100	100
Industrial	100	100

SOURCE: Federal Transit Administration (FTA), 2006.

NOTES: dBA = A-weighted decibels; Leq = average or constant sound level; Day = 7 a.m. to 10 p.m.; Night = 10 p.m. to 7 a.m.

2006 NATIONAL PARK SERVICE MANAGEMENT POLICIES

National Park Service (NPS) Management Policies 2006 describe applicable soundscape management policies. These policies are designed in accordance with the Organic Act of 1916 and strive to manage national parks in a way that will preserve them for the enjoyment of future generations. The policies state that the NPS will preserve, to the greatest extent possible, the natural soundscapes of parks.[11]

The policies state that the "NPS will restore to the natural condition wherever possible those park soundscapes that have become degraded by unnatural sounds (noise), and will protect natural soundscapes from unacceptable impacts. Using appropriate management planning, superintendents will identify what levels and types of unnatural sound constitute acceptable impacts on park natural soundscapes."[12] The frequencies, magnitudes, and durations of acceptable levels of unnatural sound will vary throughout a park, being generally greater in developed areas.

DIRECTOR'S ORDER 47 – SOUNDSCAPE PRESERVATION AND NOISE MANAGEMENT

NPS Director's Orders are one of several types of written guidance created for the proper management of national parks. The key directive from Director's Order 47 is that where natural soundscape conditions are currently not affected by inappropriate noise sources, the objective must be to maintain those conditions. Where the soundscape is found to be degraded, the objective is to facilitate and promote progress toward the restoration of the natural soundscape. There are instructions and requirements outlined in Director's Order 47.[13]

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11 The Golden Gate National Recreation Area (GGNRA), a unit of the NPS, owns and manages lands to the west of the Great Highway including areas for which project work is proposed (e.g., NPS parking lot and restroom, bluffs, and beach).

12 National Park Service, Management Policies, 2006, page 56, *http://www.nps.gov/policy/mp2006.pdf*, accessed October 15, 2020.

13 National Park Service, Director's Order #47: Soundscape Preservation and Noise Management, approved by Robert Stanton, Director, December 2000, *http://www.nps.gov/policy/DOrders/DOrder47.html*, accessed October 15, 2020.

4.4.3.2 STATE

NOISE

The 2016 California Building Code (California Code of Regulations title 24, part 2) requires that walls and floor/ceiling assemblies separating dwelling units from each other, or from public or service areas, have a sound transmission class (STC) of at least 50, meaning they can reduce noise by a minimum of 50 dB.[14] Building Code section 1207.4, Allowable Interior Noise Levels, also specifies a maximum interior noise limit of 45 dBA (Ldn or CNEL) in habitable rooms, and requires that common interior walls and floor/ceiling assemblies meet a minimum STC rating of 50 for airborne noise. It also sets an interior performance standard of 45 dBA from exterior noise sources.

VIBRATION

There are no state regulations related to construction-induced vibration. However, the California Department of Transportation (Caltrans) consolidated vibration criteria from various sources for assessing the potential damage to structures from ground vibration induced by construction equipment, and they are included in their Transportation and Construction Vibration Guidance Manual[15] and summarized in **Table 4.4-6**. As indicated in this table, the building damage criteria for continuous vibration sources is about half of the criteria for transient sources.

Table 4.4-6 Vibration Guidelines for Potential Damage to Structures

Structure Type and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings	0.2	0.1
Historic and some old buildings	0.5	0.25
Older residential structures	0.5	0.3
New residential structures	1.0	0.5
Modern industrial/commercial buildings	2.0	0.5

SOURCE: Caltrans, *Transportation and Construction Vibration Guidance Manual*, September 2013.

NOTES:

in/sec = inches per second; PPV = peak particle velocity

a Transient sources create a single, isolated vibration event, such as blasting or drop balls.
b Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, crack-and-seat equipment, vibratory pile drivers, and vibratory compaction equipment.

14 State Building Code section 1207.2.
15 Caltrans, Transportation and Construction Vibration Guidance Manual, September 2013, Table 19, p. 27, *http://www.dot.ca.gov/env/noise/docs/tcvgm-sep2013.pdf*, accessed October 9, 2020.

4.4.3.3 LOCAL

SAN FRANCISCO GENERAL PLAN

The Environmental Protection Element of the San Francisco General Plan contains Land Use Compatibility Guidelines for Community Noise for determining the compatibility of various land uses with different noise levels (see **Table 4.4-7**). These guidelines, which are similar to the state guidelines set forth by the Governor's Office of Planning and Research, indicate maximum acceptable noise levels for various land uses. Although this table presents a range of noise levels that are considered compatible or incompatible with various land uses, the maximum *satisfactory* noise level is 60 dBA (Ldn) for residential and hotel uses; 63 dBA (Ldn) for school classrooms, libraries, churches, and hospitals; 70 dBA (Ldn) for playgrounds, parks, office uses, retail commercial uses, and noise-sensitive manufacturing/communications uses; and 77 dBA (Ldn) for other commercial uses such as wholesale, some retail, industrial/manufacturing, transportation, communications, and utilities.

The Environmental Protection Element includes the following objectives and policies that pertain to noise: impose traffic restrictions to reduce transportation noise; discourage changes in streets which will result in greater traffic noise in noise-sensitive areas; minimize impact of noise on affected areas; promote site planning, building orientation and design, and interior layout that lessen noise intrusion; promote the incorporation of noise insulation materials in new construction; construct physical barriers to reduce noise transmission from heavy traffic carriers; and promote land uses that are compatible with various transportation noise levels.

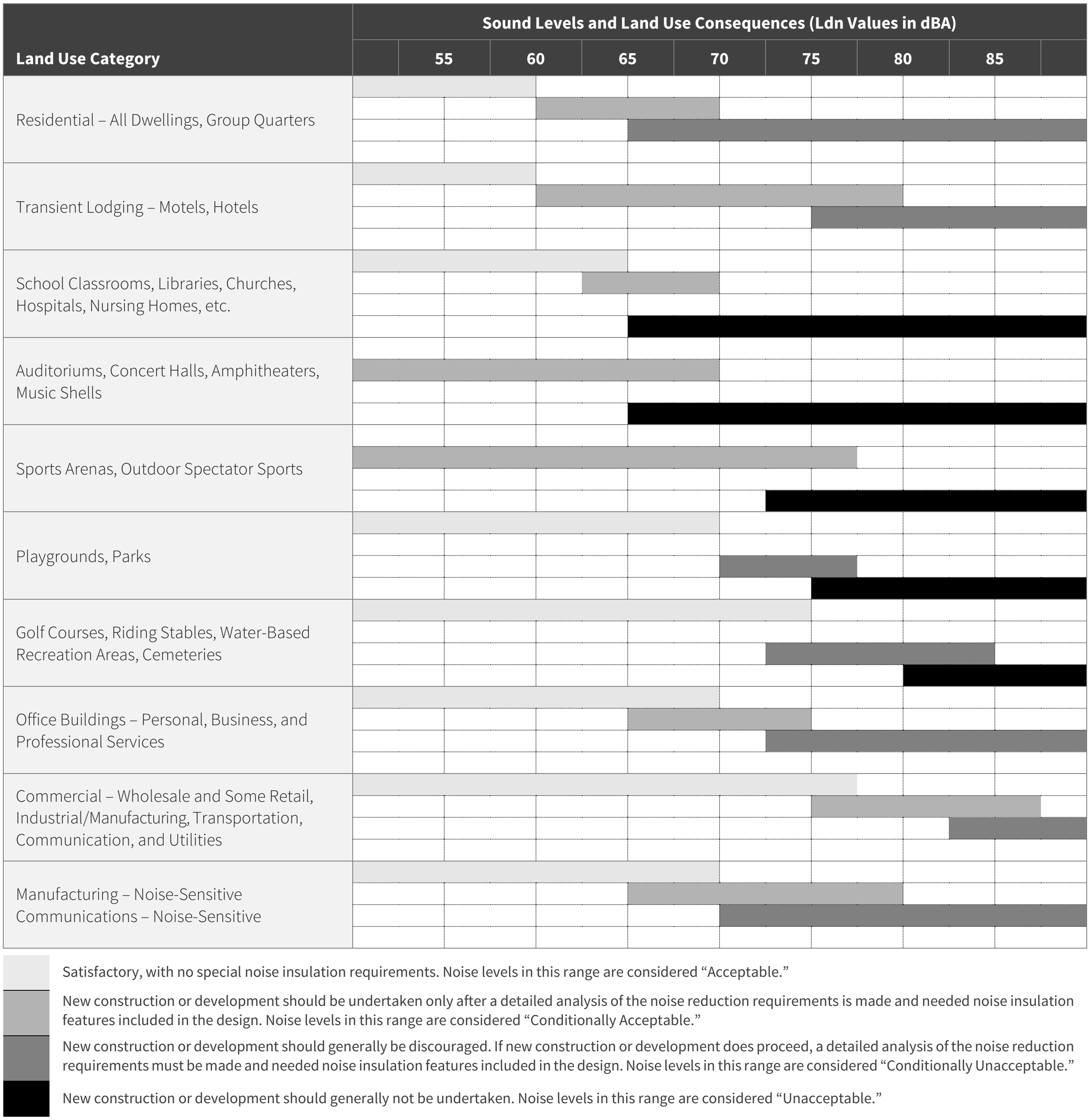
SAN FRANCISCO NOISE ORDINANCE

In San Francisco, regulation of noise is addressed in San Francisco Police Code article 29 (noise ordinance), which states the city's policy is to prohibit unnecessary, excessive, and offensive noises from all sources subject to police power. Noise ordinance section 2900 makes the following declaration with regard to community noise levels: "It shall be the policy of San Francisco to maintain noise levels in areas with existing healthful and acceptable levels of noise and to reduce noise levels, through all practicable means, in those areas of San Francisco where noise levels are above acceptable levels as defined by the World Health Organization's Guidelines on Community Noise."

Noise ordinance article 29, sections 2907 and 2908, regulate construction equipment and construction work at night, while section 2909 provides for limits on any machine, or device, music or entertainment, or any combination of such sources. Sections 2907 and 2908 are enforced by San Francisco Public Works (Public Works), and section 2909 is enforced by the San Francisco Department of Public Health. Summaries of these and other relevant sections are presented below.

Noise ordinance section 2907(a) limits noise from construction equipment to 80 dBA when measured at a distance of 100 feet from such equipment, or an equivalent sound level at some other convenient distance. Exemptions to this requirement include impact tools with approved mufflers, pavement breakers, and jackhammers with approved acoustic shields, and construction equipment used in connection with emergency work. Noise ordinance section 2908 prohibits nighttime construction (between 8 p.m. and 7 a.m.) that generates noise exceeding the ambient noise level by 5 dBA at the nearest property line unless approved by the city. Because it is generally accepted that standard outdoor construction activities cannot be regularly performed without increasing the nighttime ambient noise level by at least 5 dBA, city approval is generally required for all outdoor nighttime construction work pursuant to section 2908.

Table 4.4-7 San Francisco Land Use Compatibility Chart for Community Noise



SOURCE: San Francisco Planning Department, *San Francisco General Plan*, Environmental Protection Element, adopted on June 27, 1996, *http://www.sf-planning.org/ftp/General_Plan/I6_Environmental_Protection.htm#ENV_TRA_11*, accessed January 23, 2019.

Noise ordinance section 2909 generally prohibits fixed mechanical equipment noise and music in excess of 5 dBA more than the ambient noise level from residential sources, 8 dBA more than the ambient noise level from commercial sources, and 10 dBA more than the ambient noise level on public property at a distance of 25 feet or more. Specifically, section 2909 (c) generally prohibits noise from being produced by any machine or device, or any combination of same, on public property, which exceeds noise level more than ten dBA above the local ambient at a distance of twenty-five feet or more, unless the machine or device is being operated to serve or maintain the property.

The standards in section 2909(d) state that no fixed noise source may cause noise level in any residence to exceed 45 dBA between the hours of 10 p.m. to 7 a.m. and 55 dBA between the hours of 7 a.m. to 10 p.m., with windows open except where building ventilation is achieved through mechanical systems that allow windows to be closed.

4.4.4 Impacts and Mitigation Measures

4.4.4.1 SIGNIFICANCE CRITERIA

San Francisco Administrative Code Chapter 31 directs the department to identify environmental effects of a project using as its base the environmental checklist form set forth in CEQA Guidelines Appendix G. As it relates to noise and vibration, Appendix G asks whether the project would result in:

- Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies
- Generation of excessive groundborne vibration or groundborne noise levels
- For a project located within the vicinity of a private airstrip or an airport land use plan area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels

The project site is not within the vicinity of a private airstrip or an airport land use plan area.[16] Therefore, the project would not result in the long-term exposure of people residing or working in the area to excessive airport-related noise levels, and these criteria are not discussed further in this EIR.

4.4.4.2 APPROACH TO ANALYSIS

CONSTRUCTION IMPACTS

A general estimate of the project's construction equipment and schedule were provided by the San Francisco Public Utilities Commission (SFPUC) and are presented in Appendix E. An approximate estimate of construction noise levels was conducted for the purpose of this analysis based on the general assessment approach recommended by the FTA.[17] The FTA's general construction noise assessment approach recommends assessing the two noisiest pieces of construction equipment operating concurrently at the center

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16 San Francisco International Airport, 2019 Noise Exposure Map, August 13, 2015, *https://media.flysfo.com/media/sfo/noise-abatement/sfo_p150_2019-nem-36x24-plot-signed_ada.pdf*, accessed January 23, 2019.

17 The FTA does not publish a software noise model; as such, FHWA's model was used and impacts assessed using FTA's methodology for assessing impact.

of the project site. However, for the purpose of conducting a conservative analysis and given the expansive work areas involved with the project, equipment noise was assumed to occur at the work areas closest to a given sensitive receptor, instead of at the center of the site.

The estimated construction noise levels resulting from the project at the nearby off-site sensitive receptors were then analyzed against three criteria to assess the magnitude of noise impact. First, predicted noise levels from each piece of construction equipment proposed to be used are compared to the construction noise standards established in section 2907 of the city's noise ordinance addressing construction noise to determine whether operation of this equipment would be within the allowable noise level standards.

As noted above, San Francisco Noise Ordinance section 2907(a) states that it shall be unlawful for any person, including the City and County of San Francisco, to operate any powered construction equipment, regardless of age or date of acquisition, if the operation of such equipment emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment. Impact equipment such as pile drivers and hoe rams are exempt from this standard. Consequently, for construction phases that involve use of a hoe ram, this analysis applies the general assessment criteria of the FTA, which establish criteria for residential land uses of 90 dBA during daytime hours and 80 dBA during nighttime hours. For all other land uses the criterion is 100 dBA, during the daytime or nighttime. San Francisco Planning Department (planning department) also evaluates whether construction noise would result in an increase of 10 dBA over existing noise levels ("ambient + 10 dBA") at sensitive receptors, which generally represents a perceived doubling of loudness. The quantitative criteria above are only part of the evaluation of construction noise. The evaluation also considers the duration and intensity of any quantitative noise exceedance. Consistent with FTA and Federal Highway Administration methodology, this increase in construction noise is assessed relative to an hourly Leq and also accounts for equipment percentage uses as inventoried by the Federal Highway Administration (FHWA).

The project may involve nighttime shift work and nighttime construction impacts are assessed based on its potential to result in sleep disturbance at nearby residential uses (increase interior noise levels above 45 dBA).

GROUNDBORNE VIBRATION LEVELS AND CRITERIA

Groundborne vibration levels resulting from construction activities at the project site were estimated using data published by Caltrans in its Transportation and Construction Vibration Guidance Manual (2013). Vibration from construction equipment is analyzed at the surrounding buildings and compared to the applicable Caltrans building damage criteria to determine whether construction activities would generate vibration at levels that could result in building damage as shown in Table 4.4-6.

OPERATIONAL IMPACTS

OPERATIONAL ROADWAY NOISE LEVELS

Roadway noise levels were calculated for selected study roadway segments near the project site based on information provided in the traffic operations analysis technical memorandum for the project,[18] and existing and cumulative traffic volumes for the local roadways. The street segments selected for analysis are expected to be most directly impacted by project-related traffic, which, for the purpose of this analysis,

[18] CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Final, February 2021.

include the Great Highway, Sloat Boulevard, and Skyline Boulevard that also run in front of the identified noise-sensitive receptors (i.e., residences in proximity to the project site and the Pomeroy Recreation and Rehabilitation Center). These streets, when compared to roadways located further away from the project site, would experience the greatest percentage increase in traffic generated by the project.

Project-generated traffic would result in a significant noise impact if the project increases the ambient noise levels by 5 dBA Ldn where noise levels are within the city's "satisfactory" category per the general plan's land use compatibility chart for community noise which, as an example, is 60 dBA Ldn for residential uses but 63 dBA for hospitals and schools. If existing or resulting with project noise levels are above the "satisfactory" category, project-generated traffic noise that results in an increase of 3 dBA Ldn would be considered significant. Because the ambient noise levels along roadways near the project site with residential or other noise-sensitive uses (Pomeroy Rehabilitation Center) exceed 60 dBA Ldn, the significance threshold used to analyze project-generated traffic noise for these segments is 3 dBA. For sections of Skyline Boulevard that are within the satisfactory category for adjacent land uses, the applicable significance threshold used to analyze project-generated traffic noise for this project is 5 dBA.

OPERATIONAL STATIONARY SOURCE NOISE LEVELS

For the purpose of determining whether periodic beach nourishment activities of the project would result in the exposure of persons to, or would generate noise levels that exceed established noise standards, the project's forecasted stationary operational noise levels are evaluated and compared to the criteria established in San Francisco Noise Ordinance section 2909(c) and 2909(d).

GROUNDBORNE VIBRATION LEVELS AND CRITERIA

Groundborne vibration from operational activities at the project site would result from off-road equipment and trucks used in sand transport and placement activities. These vibration levels are assessed using the same methodology described above for construction-related vibration.

CUMULATIVE IMPACTS

Section 4.1.5, Approach to Cumulative Impact Analysis and Cumulative Projects, describes the overall approach used in this EIR to conduct the cumulative analysis; refer to Table 4.1-3 and Figure 4.1-1 for a description and location of potential cumulative projects in the vicinity of the project. The cumulative analysis for noise and vibration uses a list-based approach to analyze the effects of the project in combination with other projects in the immediate vicinity. The cumulative analysis considers whether the effects of project implementation, in combination with other cumulative projects, would cause a significant, adverse cumulative impact, and if so, whether the project's contribution to the cumulative impact would be considerable. Both conditions must apply a project to result in a significant cumulative impact. If so, then mitigation measures are identified to reduce the project's contribution. Two cumulative scenarios are examined for operational traffic noise (Impact C-NO-3) – one with and one without the Potential Upper Great Highway Closure between Sloat Boulevard and Lincoln Way.

4.4.4.3 IMPACT EVALUATION

CONSTRUCTION IMPACTS

Impact NO-1: Project construction would not cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors above levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Less than Significant*)

Construction of the project would require the use of heavy equipment during all five phases of project construction. The overall construction timeline is approximately 48 months; some of the construction phases would overlap in time. Construction activities would also involve the use of smaller power tools, generators, and other lesser sources of noise.

During each phase of construction, there would be a different mix of equipment. Thus, construction activity noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of use of the various pieces of construction equipment. The proposed construction phases and durations are:

- Phase 1 – Modify Sloat Boulevard/Great Highway Intersection, Reconfigure Zoo Access, Permanently Close Great Highway – 12 months
- Phase 2 – Construct Buried Wall – 25 months
- Phase 3 – Remove Revetments and Rubble, Place Sand on Beach, and Stabilize Slope – 18 months
- Phase 4 – Install Multi-Use Trail, Service Road, and Public Parking Lot, Construct Beach Access Stairs and Restroom, Restripe Great Highway/Skyline Boulevard Intersection – nine months
- Phase 5 – Remove Construction Debris and Waste, and Plant Dune Vegetation – six months

Daytime Construction Noise

Table 4.4-8 shows the hourly noise levels (L_{max}) produced by various types of common construction equipment based on a reference distance of 50 feet between the equipment and noise receptor as well as the 100-foot distance dictated by the city's noise ordinance. It should be noted that L_{max} noise levels associated with the construction equipment would only be generated when equipment is operated at full power. Typically, the operating cycle for a piece of construction equipment would involve 1 or 2 minutes of full power operation followed by 3 or 4 minutes at lower power settings. The L_{max} noise levels shown in Table 4.4-8 would, therefore, be expected to only occur occasionally throughout the construction day.

According to section 2907 of the city's noise ordinance, it is prohibited to operate any powered construction equipment (non-impact) if the operation of such equipment emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment. As can be seen from Table 4.4-8, the list of construction equipment provided by the project sponsor would operate within the constraints of the noise ordinance standards except for concrete saws and hoe rams. Hoe rams, as impact equipment, are exempt from this restriction. Therefore, exceedance of the noise ordinance limit resulting from use of hoe rams would not constitute noise ordinance violations.

Table 4.4-8 Maximum Noise Levels from Construction Equipment

Construction Equipment	Noise Level at 50 Feet (dB, L_{max})	Noise Level at 100 Feet (dB, L_{max})
Air Compressors	78	72
Backhoes	78	72
Bore/Drill Rigs	84	78
Cement and Mortar Mixers	79	73
Concrete/ Industrial Saws	90	83[a]
Cranes	85	79
Concrete Pump	81	75
Crawler Tractor	84	78
Excavator	81	75
Forklifts	83	78
Generator Sets	81	75
Hoe Ram	90	84
Grader	85	79
Loader	79	73
Paving Equipment	77	71
Vibratory Compactor	83	77
Roller	80	74
Pumps	81	75
Signal Boards	73	67
Water Trucks	79	73

SOURCE: Federal Highway Administration, *Roadway Construction Noise Model User's Guide*, 2006.

NOTE:

[a] Concrete saws are generally used for relatively detailed demolition work, such as opening up a specific area of roadway or sidewalk. As such, the duration and frequency of their use is usually not extensive.

Concrete saws are not exempt from compliance with the noise ordinance. However, they are generally used for relatively detailed demolition work, such as opening up a specific area of roadway or sidewalk. Thus, the duration and frequency of their use is usually not extensive. Under the project, the use of concrete saws in the vicinity of sensitive receptors would be brief (approximately one to two days at a time within a given location) and not more than two weeks of consecutive daily use. As a result, the project's use of concrete saws would not result in a substantial temporary increase in ambient noise levels.

A conservative estimate of construction noise levels was conducted using the general assessment approach recommended by the FTA and the construction equipment for the project's construction phases as provided by the SFPUC. The two noisiest pieces of construction equipment associated with each construction phase were assumed to operate at full power simultaneously at the closest location to a sensitive receptor.

The highest noise levels associated with Phase 1 through Phase 3 would include equipment operation and haul truck loading, for which the two noisiest pieces of equipment would be hoe rams and either a concrete saw (Phase 2) or a crawler tractor (Phases 1 and 3). Concrete saws may be used for roadside and median improvements in Phase 1. However, as stated above, because of the limited duration and frequency of concrete saw use for intersection improvements, the analysis of Phase 1 construction impacts focuses on other noisy equipment that would operate for longer duration over several consecutive days. Phase 4 would involve construction of the restroom for which the two noisiest pieces of equipment would be the use of a crane and a grader. Phase 5 would involve debris removal and landscaping for which the two noisiest pieces of equipment would also be a crane and a grader.

During construction of the project, the nearest off-site sensitive receptors to the approximately 4,370-linear foot stretch of work areas would be residences at the corner of Sloat Boulevard and Great Highway (also known as Lower Great Highway). Work for the intersection improvements in Phase 1 would occur within approximately 60 feet of these receptors. Other residential areas along 46th and 47th avenue would be more distant and experience lower noise levels through attenuation with distance and intervening structures. Construction work for the remaining phases would be farther away, with the closest work areas approximately 280 feet away from these same receptors.

During project construction, the noise levels experienced at the nearest off-site receptors would vary depending on the distance from the construction equipment within the site to the receptor. Although the existing noise levels in the area are somewhat elevated (see Table 4.4-2), the addition of construction noise at the nearest off-site receptors to the east could be substantially noticeable during Phase 1 activities for intersection improvements at times when equipment is operating in close proximity (60 feet from receptors). While the intersection improvements are expected to take 12 months to construct, work involving use of hoe rams and concrete saws in proximity to a given residence are expected to occur over two weeks or less.

Table 4.4-9 shows the estimated construction noise level contributions that would occur at the nearest off-site sensitive uses during construction of each phase of the project, as well as the resultant noise level (the contribution from construction activity added to the existing noise environment). The estimated noise levels at the off-site sensitive receptors were calculated using the FHWA's Roadway Noise Construction Model, and were based on the concurrent operation of the two noisiest equipment identified for each phase.

As shown in Table 4.4-9, the estimated daytime construction noise levels generated by the project would range from 68 to 83 dBA L_{eq} at the nearest residential properties. While construction noise levels may occasionally result in an increase of greater than 10 dBA[19] over existing ambient levels during Phase 1 at the nearest residential receptors at the corner of Great Highway/Sloat Boulevard during the intersection improvements, noise levels would not exceed the FTA's 90 dBA criteria for daytime construction noise at a residential receptor. Construction noise during all other phases (phases 2-5) would not result in an increase of greater than 10 dBA over existing levels at the nearest receptors or exceed the FTA's 90 dBA criteria for daytime construction noise at a residential receptor.

Project construction activities would exceed the 10 dBA criteria for less than two weeks out of the total 48 month construction period. Because the intersection modification activities occurring within 60 feet of the receptor would mostly consist of concrete work for intersection modifications at Lower Great Highway and Sloat Boulevard, the duration during which noise would be more than 10dBA over ambient would be two weeks or less. Therefore, due to the limited duration of improvements closest to receptors on the 2700 block of Great Highway and 2900 block of Sloat Boulevard during construction of Phase 1, the project's construction activities would result in a ***less-than-significant*** construction noise impact from a temporary increase in noise levels and would not exceed standards established in the local general plan or noise ordinance.

[19] An increase of 10 dBA over existing noise levels represents a perceived doubling of loudness.

Table 4.4-9 Exterior Noise at Off-Site Sensitive Uses from Project Construction

Construction Phase and Duration	Nearest Off-Site Sensitive Land Uses Location	Approximate Distance to Project Site (ft.)	Existing Monitored Noise level (dBA L_{eq})	Estimated Construction Noise Level (dBA L_{eq})	Resultant Noise Level (Existing + Construction) (dBA L_{eq})	Increase over Ambient (dBA L_{eq})
Phase 1: Intersection Modifications – 12 months	2788 Great Highway	60	64	83	83	+19
Phase 2: Construct Buried Wall– 25 months	2788 Great Highway	280	64	71	72	+8
Phase 3: Revetment Removal/Sand Application– 18 months	2788 Great Highway	280	64	70	71	+7
Phase 4: Restroom and Parking Lot Construction– 9 months	2788 Great Highway	280	64	67	68	+4
Phase 5: Debris Removal/Dune Landscaping– 6 months	2788 Great Highway	280	64	67	68	+4
Nighttime Equipment (Buried Wall with drill rig and crane)	2788 Great Highway	280	58	64	65	+7

NOTE:
[a] The approximate distances are measured from the nearest edge of the construction activity (excluding restriping of roadways and bike lanes) to the nearest sensitive-receptor property line.
[b] Shaded cells indicate noise increase in excess of applicable significance threshold.

Nighttime Construction Noise

Noise ordinance section 2908 prohibits nighttime (8 p.m. to 7 a.m.) construction noise in excess of 5 dBA over ambient at the nearest property line, unless a permit has been granted. Because it is generally accepted that standard outdoor construction activities cannot be regularly performed without increasing the nighttime ambient noise level by at least 5 dBA, city approval is generally required for all outdoor nighttime construction work pursuant to section 2908.

The SFPUC's construction phasing schedule indicates that most equipment would operate only during daytime hours. However, the analysis assumes a few pieces of small noise-producing construction equipment would be operable 24-hours per day, and that wall construction during phase 2 activities may require nighttime construction work.

While the project may require the use of traffic signal boards (which are powered by small generators) and de-watering pumps to operate 24-hours a day, these small support equipment would generate minimal noise and would not contribute meaningfully to other existing background noise in an urban area.

Heavy equipment used for construction of the buried wall may also be active during nighttime hours. **Table 4.4-10** shows the predicted interior noise levels at the nearest sensitive receptors during nighttime construction work. Nighttime work on the buried wall would involve a drill rig and support crane. As indicated in Table 4.4-10, at its northernmost extent, this nighttime construction of the buried wall could generate noise levels of up to 65 dBA. Assuming a typical 25 dB reduction from exterior noise to interior noise levels with closed windows, interior noise levels during the closest activity would be 40 dBA, which would be below the generally accepted interior noise level of 45 dBA required to prevent sleep disturbance, consistent with section 2909(d) of the Police Code. Therefore, nighttime construction noise impacts would be ***less than significant***.

Table 4.4-10 Interior Noise at Off-Site Sensitive Uses from Nighttime Construction

Construction Phase and Duration	Nearest Off-Site Sensitive Land Uses Location	Approximate Distance to Project Site (ft.)	Existing Monitored Noise level (dBA L_{eq})	Estimated Construction Noise Level (dBA L_{eq})	Resultant Noise Level (Existing + Construction) (dBA L_{eq})	Estimated Interior Noise level (dBA L_{eq})
Nighttime Equipment (Buried Wall with drill rig and crane)	2788 Great Highway	280	58	64	65	40

NOTE:
[a] The approximate distances are measured from the nearest edge of the construction activity (excluding restriping of roadways and bike lanes) to the nearest sensitive-receptor property line.
[b] Interior noise level estimates assume a 25 dB reduction from exterior noise to interior noise levelsresulting from closed windows in this analysis because this is the typical attenuation rate for most buildings and because construction activities are temporary.

Construction Truck Hauling Impacts

Vehicle routes for construction activities would include Skyline Boulevard and Sloat Boulevard. Over the 48-month construction period, more than half of the project's approximately 20,000 truck trips would occur during Phase 2 when maximum average haul and vendor truck trips are anticipated to be up to 28 truck trips per day. Spread across the proposed minimum 8.5-hour workday, maximum hourly truck trips would be four per hour. As a worst-case analysis all truck trips were assigned to Great Highway, Sloat Boulevard, and

Skyline Boulevard. The maximum increase in noise levels that would result from the addition of construction truck trips would be an increase of 0.8 dBA along Sloat Boulevard between 47th Avenue and Skyline Boulevard. Such an increase would be less than the 3 dBA increase associated with a significant increase in roadway noise and the construction noise impact with regard to haul truck operations would be ***less than significant***.

Mitigation: None required.

Impact NO-2: Construction of the project would not generate excessive groundborne vibration or groundborne noise levels. (*Less than Significant*)

Construction activities that would occur within the project site would include grading and excavation, which would have the potential to generate low levels of groundborne vibration. As such, any existing structures and uses located within 100 feet of the project site could be exposed to the generation of excessive groundborne vibration or groundborne noise levels related to construction activities. The results from vibration can range from no perceptible effects at the lowest vibration levels, to low rumbling sounds and perceptible vibrations at moderate levels, to structural damage at the highest levels. No pile-driving activities would be required for construction of the project.

As shown in **Table 4.4-11**, construction vibration levels could reach as high as approximately 0.21 inch-per-second PPV at 25 feet from the source, depending on the type of construction equipment in use. Construction activity that would occur closest to existing structures would be road and access modifications to the intersection of Great Highway and Sloat Boulevard. Specifically, construction of a new median and bike protection structures at the western extent of Sloat Boulevard would require construction work as close as 60 feet from existing residence at 2788 Great Highway. These vibration levels would be below the building damage thresholds of 0.5 PPV for the closest non-historic structure and below 0.3 PPV for older residential buildings. The nearest historic structure to project work areas is the 1920's-era restroom located near the western terminus of Wawona Street ("Wawona restroom"), approximately 300 feet from the proposed construction areas and outside of the area of potential effects as it relates to cultural resources.[20] Also as indicated in Table 4.4-11, vibration levels would be below the building damage thresholds (0.25 PPV) for the closest historic structure. As such, groundborne vibration effects at off-site structures during project construction with respect to building damage would not exceed the identified criteria of 0.3 PPV for older residential structures and 0.25 PPV for historic buildings. The project's impact with regard to generation of excessive groundborne vibration or groundborne noise levels would be ***less than significant***.

Table 4.4-11 Vibration Source Levels for Construction Equipment

	Approximate PPV (in/sec)		
Equipment	25 Feet (reference)	60 Feet	900 Feet
Vibratory Compactor	0.21	0.080	0.004
Caisson Drill and Hoe Ram	0.089	0.034	0.0017
Loaded Trucks	0.076	0.029	0.0015

SOURCE: FTA, 2018.

20 ESA, Ocean Beach Climate Change Adaptation Project Historic Resources Evaluation Report, October 2020.

Mitigation: None required.

4.4.4.4 OPERATIONAL IMPACTS

Impact NO-3: Project operations would cause a substantial permanent increase in ambient noise levels at noise-sensitive receptors, above levels existing without the project, in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Significant and Unavoidable with Mitigation*)

Operation of the project could affect noise levels in the project vicinity through two primary sources. First, beach nourishment activities would result in periodic operation of trucks and off-road equipment to place sand on the beach. Second, the closure of Great Highway south of Sloat Boulevard would result in a re-distribution of vehicular traffic that could affect roadside noise levels along roadways that would receive additional traffic volumes.

Noise from Beach Nourishment Activities

The project proposes to implement a shoreline monitoring program and placement of sand as deemed needed per the results of annual monitoring. Under the proposed beach nourishment program, the city would place sand at a regular interval unless shoreline monitoring reveals it is not needed. Monitoring would continue during years between those of anticipated placements. In such years, the city would undertake additional sand placements, if shoreline monitoring reveals the need. The city has identified two primary sand sources and placement methods, referred to as the “large sand placement” and the “small sand placement,” each of which is described and analyzed below. Additional details regarding the types, frequencies, and durations of placement activities are provided in Section 2.4.5, Beach Nourishment.

Large Sand Placements

The primary offshore noise sources under the large sand placement would be operation of the dredge pumps, and operation of a tugboat to assist with slurry pipe deployment connection to the dredge. The primary noise sources for onshore activities include two bulldozers, an excavator, and a loader to shape the sand. Other noise sources include a small diesel generator which would be used to power the light towers and mobile office. Construction would take approximately eight weeks.

Noise estimates for the large sand placements assume simultaneous operation of one truck, two bulldozers, one loader, one excavator, and a pump on the dredge. Noise levels when activity would be at the closest point to receptors across Great Highway at a distance of 365 feet from off-road equipment and 1,000 feet from the dredge, were calculated to be 66 dBA, Leq. Addition of this noise level to the existing monitored noise level of 64 dBA, Leq results in a noise level of 68 dBA. This would be an increase of 4 dBA over the existing daytime Leq and 14 dBA over the 24-hour L_{90}. However, because the dune structure would be constructed at a rate of about 140 feet per day, these increased noise levels would only occur for approximately three working days after which the work areas would be 785 feet or more away from the receptors.

For noise sources on public property, noise ordinance section 2909(c) prohibits noise levels in excess of 10 dBA above ambient at a distance of 25, unless the noise source is being operated to serve or maintain the property. As the purpose of the project is maintenance of the public beach, operation of off-road equipment for beach nourishment would be exempt from the restrictions of section 2909(c).

Section 2909(d), prohibits any fixed noise source that may cause the noise level measured inside any sleeping or living room in any dwelling unit located on residential property to exceed 45 dBA between the hours of 10 p.m. to 7 a.m. or 55 dBA between the hours of 7 a.m. to 10 p.m. with windows open except where building ventilation is achieved through mechanical systems that allow windows to remain closed. Because the project would not result in the operation of any new fixed noise sources, operation of off-road equipment for beach nourishment would be exempt from the restrictions of section 2909(d).

For these reasons, the temporary impacts of operational noise from beach nourishment activities under the large placement option would not be a substantial prolonged noise impact. The operational noise impact of the large sand placements would, therefore, be ***less than significant***.

Small Sand Placements

For a given small placement event, the city would use excavators, loaders, and dozers to move and load sand from North Ocean Beach into 30-cubic-yard articulated off-road dump trucks. The city would transport the excavated sand from North Ocean Beach to South Ocean Beach via the Great Highway. The trucks would access the placement sites via the sand ramp previously mentioned. Once dumped, bulldozers and loaders would shape the placed sand into dune structures of a shape similar to, but smaller in size and extent, than those described for the large sand placement. Small sand placements would occur during the daytime, generally between the hours of 7 a.m. and 8 p.m.

For the small placement, trucks would be used to transport material along the Great Highway. Transport of 85,000 cubic yards of sand using 30-cubic-yard articulated off-road dump trucks would require approximately 2,833 truck trips over the approximately 4 to 6 weeks of activity, which would result in 135 trips per day or about 11 truck trips per hour over the 12-hour workday. Trucks travelling public roadways would not be subject to the restrictions of the city's noise ordinance. Noise estimates for the small sand placements assume simultaneous operation of one truck, two bulldozers, and one loader. The addition of 11 heavy duty trucks trips per hour would contribute 51 dBA to the hourly Leq at receptors along the 2700 block of Great Highway and 58 dBA to receptors closest to the Great Highway, south of Balboa Avenue. Both of these locations (LT-1 and ST-1 in Table 4.4-2) have existing daytime noise levels of 64 dBA. Addition of truck noise under the small placement option would increase noise levels along these stretches of the Great Highway by less than 1 dBA which would be a less than the applicable 3 dBA increase along this roadway where residential noise exposure exceeds 60 dBA, Ldn. Consequently, the temporary impacts of operational noise from beach nourishment activities under the small placement option would also not be a substantial prolonged noise impact and the operational noise impact of the small sand placements would also be ***less than significant***.

Noise from Traffic Re-distribution

The closure of Great Highway south of Sloat Boulevard would result in a re-distribution of vehicular traffic to Sloat and Skyline boulevards. This re-distribution would result in additional traffic volumes on those streets, which would increase roadside noise levels. A transportation study[21] that predicts the resulting roadway volumes at several intersections in the area was used to estimate the potential for roadside noise impacts associated with the re-distribution of traffic.

21 CHS Consulting Group, Ocean Beach Climate Change Adaptation Project Traffic Operations Analysis, Final, February 2021.

As shown in **Table 4.4-12**, project implementation would result in traffic noise increases of up to 6.2 dBA on local roadways near the project site. Of the nine roadway segments examined, traffic noise increases would exceed the 3 dBA threshold along segments of Sloat Boulevard and Skyline Boulevard, resulting in a roadway noise increase at sensitive receptors along these stretches of roadway and a potentially significant operational transportation noise impact. As discussed in section 4.4.2.1, a 3 dBA change is considered a perceptible difference, and a 5 dBA change is considered readily noticeable.

Table 4.4-12 Peak Hour Traffic Noise Levels in the Vicinity of the Project

Roadway Segment	Receptor Land Use Type	Compatibility Standard	Existing (dBA, L_{eq})	Applicable Significance Threshold	Existing Plus Project (dBA, L_{eq})	Difference between Existing Plus Project and Existing (dBA)
Great Highway between Vicente Street and Sloat Boulevard	Residential	60	69.7	3 dBA increase in an area >60 dBA Ldn	68.6	-1.1
Sloat Boulevard between Great Highway and 47th Avenue	Residential	60	64.9	3 dBA increase in an area >60 dBA Ldn	68.8	3.9
Sloat Boulevard between 47th Avenue and Skyline Boulevard	Residential	60	63.9	3 dBA increase in an area >60 dBA Ldn	70.0	6.2
Sloat Boulevard between Skyline Boulevard and Sunset Boulevard	Residential	60	68.6	3 dBA increase in an area >60 dBA Ldn	69.5	0.9
Skyline Boulevard between Sloat Boulevard and North Herbst Road	Residential	60	70.7	3 dBA increase in an area >60 dBA Ldn	74.1	3.4
Skyline Boulevard between South Herbst Road and Harding Road	Rehabilitation Facility	65	70.7	3 dBA increase in an area >65 dBA Ldn	74.1	3.4
North Herbst Road between Skyline Boulevard and Armory Drive	Rehabilitation Facility	65	51.6	5 dBA increase in an area <65 dBA Ldn	51.6	0.0
South Herbst Road between Skyline Boulevard and Armory Drive	Rehabilitation Facility	65	57.4	5 dBA increase in an area <65 dBA Ldn	57.4	0.0

SOURCE: ESA, 2020.

NOTES:

[a] Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the algorithms of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

[b] The analysis considered the vehicle mix based on the traffic operations analysis technical memorandum – cars 97 percent, medium trucks two percent, and heavy trucks one percent, except for Herbst Road with cars 95 percent, medium trucks two percent, and heavy trucks three percent. Traffic speeds for all vehicle classes were set at 35 miles per hour (mph), except for Skyline Boulevard (45 mph) and Herbst Road (25 mph).

[c] Shaded cells indicate noise increase in excess of applicable significance threshold.

A variety of potential mitigation measures were considered by the planning department, Public Works, SFPUC and SFMTA to reduce roadside noise levels along Sloat and Skyline boulevards and assessed for feasibility. Some measures, such as erection of sound walls or paving with engineered asphalt[22] were determined to be infeasible, while others, such as traffic calming measures, were found to be potentially feasible.

While the potentially feasible measures would not, individually, reduce noise levels to less-than-significant levels, multiple measures in combination could reduce noise impacts to less than significant. **Mitigation Measure M-NO-3: Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan** calls for the city to verify the realized change in noise level through monitoring and develop and implement a traffic noise reduction plan that includes a combination of feasible traffic calming measures, such as speed limit reductions and street redesigns, sufficient to achieve specified performance standards and reduce the significant roadway noise impact along Sloat and Skyline boulevards.

Mitigation Measure M-NO-3: Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan

To reduce roadside noise increases attributable to rerouted traffic resulting from the project, prior to the project's closure of the Great Highway, the SFPUC shall prepare and implement a Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan for Sloat and Skyline boulevards, as described further below. The goal of the Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan is to reduce roadway noise level increases sufficient to achieve a performance standard of a less than 3 dBA increase over existing ambient traffic noise levels along: a) Sloat Boulevard between Great Highway and 47th Avenue; b) Sloat Boulevard between 47th Avenue and Skyline Boulevard; and c) Skyline Boulevard between Sloat Boulevard and Harding Road. The Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan shall include the following elements:

Part I – Noise Monitoring

- Noise monitoring shall be conducted along the three segments of Sloat Boulevard and Skyline Boulevard listed above prior to and after intersection closure to empirically verify the amount of noise reduction required to meet the performance standard of less than 3dBA increase over existing ambient traffic noise. Noise monitoring shall consist of one-week-long 24-hour measurements collected at three, six, and nine months prior to closure of the Great Highway between Sloat and Skyline boulevards, and three, six, and nine months after the roadway closure. A noise monitoring plan shall be approved by the Environmental Review Officer (ERO), or its designee, prior to noise monitoring.

Part II - Noise Reduction

- If noise monitoring indicates that the project has resulted in an increase of traffic noise levels of 3 dBA or greater relative to pre-closure conditions, within the three, six, or nine months after post-closure noise monitoring completion, the SFPUC, in consultation with SFMTA, Public Works, the planning department, and a qualified noise consultant, shall identify measures that would achieve the required performance standard (a noise level increase less than 3 dBA) on the affected roadway segments. The proposed traffic noise reduction measures must be described in a Traffic Re-Distribution Noise Reduction Plan that shall be submitted to the ERO for review and approval. The noise reduction measures may include, but are not limited to: speed limit

22 San Francisco Public Works, Bureau of Engineering, *Rubberized Hot Mix Asphalt Summary Report*, May 25, 2021.

reductions, installation of new traffic signals, and street redesign (e.g., lane reduction, speed tables, or other traffic calming features).

- The SFPUC shall confer with Caltrans with respect to elements of the Traffic Re-Distribution Noise Reduction Plan that may require implementation on Skyline Boulevard, which is outside the jurisdiction of the city.
- With the exception of measures within Caltrans' jurisdiction whose implementation is beyond the city's control, the SFPUC, in consultation with SFMTA and Public Works, shall implement noise reduction measures identified in the Traffic Re-Distribution Noise Reduction Plan within 24 months of ERO approval of the Plan. This timeline may be extended, with ERO approval, if the PUC identifies separate projects or other circumstances that may reduce traffic noise levels on the affected roadway segments (such as other changes to the transportation network or implementation of other traffic calming measures in the vicinity).
- Within 6 months of noise reduction measure implementation, the SFPUC shall: (1) demonstrate to the ERO that implementation of the noise reduction measures has achieved the required performance standard; or (2) identify adjustments or alternative measures proposed to achieve the standard, along with an implementation and monitoring schedule.

Speed limit reductions can result in approximately 1 dBA of noise reduction on an average basis (Leq/day-night average sound level [DNL]) for each 5-mile per hour (mph) reduction in average speed. Speed limits on Sloat Boulevard between the Great Highway and 47th Avenue, and 47th Avenue and Skyline Boulevard are currently posted as 35 mph. Skyline Boulevard, as a state highway (State Route 35), is under the control of Caltrans and changes in speed limits along this stretch of roadway would be outside of the jurisdiction of the City and County of San Francisco. Therefore, a requirement to consult with Caltrans has been included in Mitigation Measure M-NO-3.

New traffic signals along the segments identified above have the potential to reduce noise level impacts from the project. Through careful spacing and signal timing coordination, new traffic signals would help to slow vehicle speeds and calm traffic, especially if signals are timed to reduce vehicles from stopping frequently. However, traffic signals would still inevitably result in some source of vehicle noise due to the engine sounds associated with vehicles stopping at red lights and accelerating at green lights.

Methods of street redesign may include traffic calming measures, such lane reductions. Traffic calming strategies can reduce speed variations and encourage low, constant speeds if designed appropriately. A roadway lane reduction ("road diet") could potentially reduce traffic volumes and speeds by diverting vehicles onto nearby roadways and thereby reduce traffic noise on Sloat and Skyline boulevards; however, this could increase volumes and noise levels on adjacent residential roadways on which diverted traffic would be travelling.

Potential changes in the transportation network or implementation of other traffic calming measures in the project vicinity could affect the need for reducing vehicular traffic noise along these roadways in the future. For example, potential closure of the Upper Great Highway between Sloat Boulevard and Lincoln Way would redistribute vehicle traffic and reduce vehicular noise along most of the affected roadway segments (refer to Impact C-NO-3 below). Caltrans proposes to install a traffic signal at the intersection of Skyline Boulevard and the Great Highway, and SFMTA may install a traffic signal or roundabout at the intersection of Sloat and Skyline boulevards; these projects could also reduce vehicular traffic noise on the affected roadways.

The above elements of the Traffic Re-Distribution Noise Reduction Plan would require consultation and approval by the ERO, SFMTA, Public Works, and Caltrans. Measures such as traffic signals and redesign of city streets involve a planning process, public outreach, and could represent a significant capital expense. To date, no funding has been identified for traffic noise mitigation. The potential exists for some portions of funding to be provided through the City's Vision Zero safety program for segments of Sloat Boulevard which are in a high injury corridor. However, future capital funding for implementation of Mitigation Measure M-NO-3 is uncertain. Further, changes along Skyline Boulevard would be outside the jurisdiction of the city and under Caltrans jurisdiction. Therefore, due to the uncertainty regarding the traffic noise mitigation, the impact is considered ***significant and unavoidable with mitigation***.

Significance after Mitigation: Significant and Unavoidable.

Impact NO-4: Operation of the project would not generate excessive groundborne vibration or groundborne noise levels (*Less than Significant*)

Operational activities that would occur within the project site would include off-road equipment and trucks used in sand transport and placement activities, which would have the potential to generate low levels of groundborne vibration. As such, any existing structures uses located within 100 feet of the project sand placement areas could be exposed to the generation of excessive groundborne vibration or groundborne noise levels related to construction activities.

As shown in Table 4.4-11, construction vibration levels could reach as high as approximately 0.21 inch-per-second PPV at 25 feet from the source, depending on the type of equipment in use. Operational activity that would occur closest to existing structures would be sand placement by bulldozers approximately 80 feet from the new restroom to be constructed. The vibration levels from bulldozer operations would be 0.025 PPV which would be below the building damage thresholds (0.5 PPV) for this closest non-historic structure. The nearest historic structure to project work areas is the Wawona restroom which is approximately 300 feet from the proposed construction areas but outside of the area of potential effects as it relates to cultural resources.[23] Vibration levels would be below the building damage thresholds (0.25 PPV) for the closest historic structure. As such, groundborne vibration effects at off-site structures during project operations with respect to building damage would not exceed the identified criteria of 0.5 PPV for new structures or the Caltrans criterion for historic buildings (0.25 PPV). The project's impact with regard to operational generation of excessive groundborne vibration or groundborne noise levels would be ***less than significant***.

Mitigation: None required.

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4.4.4.5 CUMULATIVE IMPACTS

Projects listed in Table 4.1-3, Projects Considered in Cumulative Impact Analysis, could contribute to cumulative impacts related to noise and vibration. Project construction is expected to begin in 2023 and end in 2027, which is within the same time frame and vicinity as other planned and proposed projects that would use the same roadways for access to work sites (e.g., Skyline Boulevard, Sloat Boulevard). These projects

[23] ESA, Ocean Beach Climate Change Adaptation Project Historic Resources Evaluation Report, October 2020.

may result in increases in construction noise and construction trucks may use the same or similar construction access routes to regional facilities.

Based on the schedule information for the cumulative projects presented in Table 4.1-3, there are 11 cumulative projects that could potentially overlap with project construction and operations. However, two of these projects – the Vista Grande Drainage Basin Improvement Project and the Lake Merced West Recreational Facility -- are not located in the immediate vicinity of the project site and would not contribute to cumulative noise and vibration conditions. Thus, of the 11 projects included in Table 4.1-3, nine projects nearby the project site could potentially overlap with project construction and operations. These nine projects include the five SFPUC projects (Westside Pump Station Reliability Improvements, the Oceanside Treatment Plant Biosolids Cake Hopper Reliability Upgrade, the Oceanside Treatment Plant Seismic Retrofit, the San Francisco Zoo Recycled Water Pipeline Project, and the Westside Force Main Reliability Project), the changes to the intersections of Skyline Boulevard/Sloat Boulevard by the SFMTA, the Fort Funston Trail Connection project, and, potentially, the 2700 Sloat Boulevard residential development project.[24]

CONSTRUCTION

Impact C-NO-1: The project, in combination with the cumulative projects, would result in significant construction-related noise impacts. (*Less than Significant with Mitigation*)

Cumulative Transportation Noise

The construction of the project over its approximately four-year construction period between 2023 and 2027 may overlap with the construction of other projects in the vicinity. During the overlap period, the SFPUC Westside Pump Station Reliability Improvements, the SFPUC San Francisco Zoo Recycled Water Pipeline Project, the SFPUC Westside Force Main Reliability Project, and the NPS Fort Funston Trail Connection Project would be accessed by their individual construction vehicle trips via the closed portion of the Great Highway south of the proposed project site. Because the majority of project traffic would access the site from the north and east due to this closure, construction from these cumulative projects would, therefore, not impact the same roadways or receptors as needed for construction of the project. Construction vehicle trips associated with the Oceanside Treatment Plant Improvement Project would access that project's site via Skyline Boulevard. Similarly, other SFPUC projects considered in the cumulative analysis would require coordination with various city departments, such as SFMTA and Public Works, to coordinate construction-related vehicle routing for the duration of construction overlap. SFPUC standard construction specifications require contractors to coordinate with other contractors working in the area.

As explained in Section 4.3, Transportation and Circulation, the SFPUC would coordinate traffic among SFPUC projects with overlapping construction schedules. As also explained in that section, per the SFPUC's standard construction measures, the project would be required to prepare and implement a project-specific traffic control plan. Hence, cumulative impacts related to cumulative construction traffic are not anticipated because 1) most other cumulative projects would use different roadways to access their projects thus avoiding

[24] This project is conservatively included in the cumulative analysis as there is a reasonable likelihood of an application being filed, although the timing of its development is unknown. Analysis of its contribution to the cumulative noise impact is based on preliminary project designs and unknown construction schedule that may overlap given the potential for overlap due to the long duration of construction of the proposed Ocean Beach Climate Adaptation project.

impacts to the same receptors and 2) required coordination will minimize traffic congestion and reduce the likelihood of roadway noise impacts from cumulative traffic.

Cumulative Construction Equipment Noise During Daytime Hours

Cumulative projects would also contribute noise from operation of construction equipment. The three cumulative SFPUC projects in the vicinity of the existing Oceanside Treatment Plant, as well as the changes to the intersections of Skyline Boulevard/Sloat Boulevard and Skyline Boulevard/Great Highway, and the Fort Funston Trail Connection project are all over 2,000 feet from receptors analyzed for the project, and this distance is sufficient to render their contribution to noise at these receptors to a negligible level.

The 2700 Sloat Boulevard residential development project would occur approximately 700 feet from the construction activities associated with the project and has preliminarily proposed to construct new 85-foot-tall, approximately 250,000-gross-square-foot residential development with ground floor commercial/retail and a basement. Details on the duration, phasing, and methods of construction for this project are not presently available; however, it is conservatively assumed to overlap with project construction for this analysis. Sensitive receptors midway between this project and the proposed project would be the Westerly Condominiums at 2800 Sloat Boulevard, approximately 300 feet from the nearest location of the 2700 Sloat project and 650 feet from Phase 2 and 3 work of the proposed project. As discussed in Impact NO-1, above, the proposed project would only generate noise from Phase 1 work for a limited period of time and construction noise impacts at the nearest receptors on Sloat Boulevard would be less than significant. As shown in Table 4.4-9, more persistent construction activity of Phases 2 and 3 of the proposed project would result in noise levels being increased by 7 to 8 dBA, when construction is 280 feet to the west. Noise levels at the Westerly Condominiums which are twice this distance would be approximately 6 dBA less, resulting in a nominal increased noise contribution from the proposed project of about 2 dBA. Therefore, a construction noise contribution from the project at 2700 Sloat Boulevard would have to be more than 7 dBA over existing levels at a distance of 300 feet for a cumulative construction noise impact to occur. However, because the construction techniques and equipment to be used for the 2700 Sloat Project have not been developed, the potential exists for a significant cumulative significant construction noise impact. Given that construction of the proposed project would contribute approximately 2 dBA to this potential impact, the project's contribution is be considered cumulatively considerable.

The Westside Pump Station Reliability Improvements Project and the Westside Force Main Reliability Project would each be approximately 230 feet from the nearest receptor impacted by construction of the proposed project. The CEQA analysis performed for the former project[25] determined that noise associated with excavations of this project would not adversely affect nearby residences, zoo and Ocean Beach visitors, would be attenuated by existing traffic noise, and would be intermittent and short term. The Westside Force Main Reliability Improvements Project has not been evaluated under CEQA. However, given the nature and location of the project, its noise effects would be similar to those of the Westside Pump Station Reliability Improvements. The nearest sensitive receptor to these projects' work would be the same as for the proposed project, the residences at the corner of Lower Great Highway and Sloat Boulevard. Construction of the Westside Pump Station Reliability Project would only overlap with the proposed project during the last six months of its planned phasing. As a result, the vast amount of the noisier activities such as excavation work would reasonably have been completed and additional contributions to the construction noise impact of the proposed project would be less than significant. The Westside Force Main Reliability Project's construction

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[25] CEQA Categorical Exemption Determination, *Westside Pump Station Reliability Upgrades Project; 2016-014160ENV*; January 30, 2020.

schedule would involve greater overlap with the proposed project schedule. Given the linear nature of the project, with project work extending between the south side of the Westside Pump Station and the Oceanside Treatment Plant, construction noise within a perceptible range of sensitive receptors would only be expected for a similarly brief period of time (i.e., six months), and resulting in similar contribution to cumulative noise impacts.

However, as discussed above, because of the lack of specificity with respect to the cumulative project at 2700 Sloat Boulevard and the contribution of the proposed project, the cumulative daytime construction impact is conservatively considered to be significant and the contribution of the proposed project to be cumulatively considerable during Phase 2 and Phase 3 construction. For these reasons, the proposed project's daytime construction noise, in combination with that of other projects in the cumulative scenario, would result in a potentially significant impact with respect to generation of a substantial temporary increase in ambient noise levels, and the project's contributions to these noise levels could be considerable. **Mitigation Measure M-C-NO-1** is identified to reduce the proposed project's contribution to potential cumulative impacts by establishing a mechanism for SFPUC to implement a project-specific construction noise control plan.

Mitigation Measure M-C-NO-1: Cumulative Construction Noise Control Measures

If exterior construction of the northern end of the buried wall for the proposed project is determined to overlap with that of nearby adjacent project(s) (2700 Sloat Boulevard Project, the Westside Pump Station Reliability Improvements Project, or the Westside Force Main Reliability Project), the SFPUC or contractor shall submit a project-specific construction noise control plan to the ERO or the ERO's designee for approval. Exterior construction for purposes of the proposed project and the nearby cumulative projects includes construction including the following activities; heavy-duty construction equipment for excavation, grading, foundation and shoring, and construction of building shells. The construction noise control plan shall be prepared by a qualified acoustical engineer, with input from the construction contractor, and include all feasible measures to reduce construction noise. The construction noise control plan shall identify noise control measures to meet a performance target of construction activities not resulting in a noise level greater than 90 dBA and 10 dBA above the ambient noise level at noise sensitive receptors. The SFPUC shall ensure that requirements of the construction noise control plan are included in contract specifications. If nighttime construction is required, the plan shall include specific measures to reduce nighttime construction noise. The plan shall also include measures for notifying the public of construction activities, complaint procedures, and a plan for monitoring construction noise levels in the event complaints are received. The construction noise control plan shall include the following measures to the degree feasible, or other effective measures, to reduce construction noise levels:

- Use construction equipment that is in good working order, and inspect mufflers for proper functionality
- Select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures)
- Use construction equipment with lower noise emission ratings whenever possible, particularly for air compressors
- Prohibit the idling of inactive construction equipment to no more than five minutes

- Locate stationary noise sources (such as compressors) as far from nearby noise sensitive receptors as possible, muffle such noise sources, and/or construct barriers around such sources and/or the construction site
- Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (as determined by the acoustical engineer) immediately adjacent to neighbors or other noise-sensitive properties
- Enclose or shield stationary noise sources from neighboring noise-sensitive properties with noise barriers to the extent feasible. To further reduce noise, locate stationary equipment in pit areas or excavated areas, if feasible
- Install temporary barriers, barrier-backed sound curtains and/or acoustical panels around working powered impact equipment and, if necessary, around the project site perimeter. When temporary barrier units are joined together, the mating surfaces shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that completely closes the gaps, and dense enough to attenuate noise

The construction noise control plan shall include the following measures for notifying the public of construction activities, complaint procedures and monitoring of construction noise levels:

- Designation of an on-site construction noise manager for the project
- Notification to neighboring noise sensitive receptors within 300 feet of the project construction area at least 30 days in advance of high-intensity noise-generating activities (e.g., pier drilling, pile driving, and other activities that may generate noise levels greater than 90 dBA at noise sensitive receptors) about the estimated duration of the activity
- A sign posted on-site describing noise complaint procedures and a complaint hotline number that shall always be answered during construction
- A procedure for notifying the planning department of any noise complaints within one week of receiving a complaint
- A list of measures for responding to and tracking complaints pertaining to construction noise. Such measures may include the evaluation and implementation of additional noise controls at sensitive receptors (residences, hospitals, convalescent homes, schools, churches, hotels and motels, and sensitive wildlife habitat)
- Conduct noise monitoring (measurements) at the beginning of major construction phases (e.g., demolition, grading, excavation) and during high-intensity construction activities to determine the effectiveness of noise attenuation measures and, if necessary, implement additional noise control measures

With implementation of Mitigation Measure M-C-NO-1, the project's contribution to a cumulative daytime construction noise impact would not be cumulatively considerable (less than significant with mitigation).

Cumulative Construction Equipment Noise During Nighttime Hours

It is unknown to what degree the 2700 Sloat Boulevard Project, the Westside Pump Station Reliability Improvements Project, or the Westside Force Main Reliability Project would require nighttime construction work and, consequently, it is possible that some nighttime work would be required for some activities, such as limited concrete pours. While it is unlikely that such nighttime activities of these projects and the proposed project would occur simultaneously, it is conservatively assumed for purposes of this cumulative analysis that such a scenario could occur. The duration of nighttime concrete pours is usually limited to one or two single nights which, for the purposes of assessing construction noise impacts, would not be considered to be a substantial duration. The project's nighttime noise contribution could contribute to nighttime noise impacts from work on either the 2700 Sloat Boulevard Project, the Westside Pump Station Reliability Improvements Project or the Westside Force Main Reliability Project. However, given that the duration of nighttime noise work for these cumulative projects, if required, would likely be no more than one or two nights for concrete pours, and the duration of the nighttime noise impact identified for the proposed project would occur within an approximately 4-week window during the Phase 2 nighttime construction period, the potential for a cumulative nighttime construction noise impact would be ***less than significant***.

Significance after Mitigation: Less than significant.

Impact C-NO-2: The project, in combination with the cumulative projects, would not generate excessive groundborne vibration or groundborne noise levels (*Less than Significant*)

With regard to the potential for a cumulative vibration-related damage impact to occur, because vibration impacts are based on instantaneous PPV levels, worst-case ground-borne vibration levels from construction are generally determined by whichever individual piece of equipment generates the highest vibration levels. Unlike the analysis for average noise levels, in which noise levels of multiple pieces of equipment can be combined to generate a maximum combined noise level, instantaneous peak vibration levels do not combine in this way. Vibration from multiple construction sites, even if they are located close to one another, would not be expected to combine to raise the maximum PPV. For this reason, the cumulative impact of construction vibration from multiple construction projects located near one another would generally not combine to further increase vibration levels. In essence, vibration effects are highly localized. Due to their distances, vibration effects resulting from construction of the proposed project would not be expected to combine with vibration effects from cumulative projects including 2700 Sloat Boulevard (700 feet away) and SFPUC Westside Pump Station Reliability Improvements Project and Westside Force Main Reliability Project (230 feet away). The cumulative effect, therefore, ***would be less than significant***.

Mitigation: None required.

OPERATION

Impact C-NO-3: The project, in combination with the cumulative projects, would result in a cumulatively considerable contribution to significant cumulative impacts related to a permanent increase in ambient noise levels at noise-sensitive receptors, above existing levels, in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. (*Significant and Unavoidable with Mitigation*)

Cumulative Analysis

As discussed in Impact NO-3 above, the project would have a significant and unavoidable operational noise impact resulting from the increased traffic volumes on Sloat Boulevard and Skyline Boulevard from rerouted traffic. The majority of cumulative projects would not generate substantive additional operational vehicle trips. The cumulative 2700 Sloat Boulevard residential development project would construct a new 85-foot-tall, 252,627 gross square foot residential development which would generate 553 additional daily vehicle trips or about 53 p.m. peak hour trips[26] that would be distributed onto Sloat Boulevard and Skyline Boulevard. The addition of the vehicle trips associated with the 2700 Sloat Boulevard project, while relatively small, would exacerbate the project-level impact described in Impact NO-3 and the combined effects of the proposed project's roadside noise impact and that of the 2700 Sloat Boulevard project along these two roadways would be a significant cumulative impact. The proposed project would contribute the vast majority of the peak hour vehicle trip increases along Sloat Boulevard (1,043 trips) of the cumulative 1,096 trips (95%). Therefore, the proposed project's contribution to that significant increase would be cumulatively considerable, a significant impact.

As described above in Impact NO-3, Mitigation Measure M-NO-3: Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan has been identified as potentially capable of reducing project operational traffic noise, but the city's ability to implement the measure in a timely and full manner remains uncertain. Therefore, the project's contribution to the cumulative operational traffic noise impact would also be ***significant and unavoidable***.

Significance after Mitigation: Significant and Unavoidable.

Cumulative Analysis with the Potential Upper Great Highway Closure

In the event that the Potential Upper Great Highway Closure between Sloat Boulevard and Lincoln Way (referred to generally as the Upper Great Highway project) is implemented, all vehicles currently traveling on the Great Highway between Lincoln Way and Skyline Boulevard would reroute to other roadways.[27] **Table 4.4-13** presents the roadside noise levels that would result from this traffic redistribution and the proposed project. As shown in Table 4.4-13, implementation of the Upper Great Highway project and proposed project would result in a traffic noise increase of 3.0 dBA on Sloat Boulevard between 47th Avenue and Skyline Boulevard, while traffic noise increases along all other roadway segments would be less than the 3 dBA threshold. While significant, this 3 dBA noise increase would be less than that of the project alone (6.2 dBA).

Consequently, with implementation of the Upper Great Highway project, the proposed project's significant noise increases along one segment of Sloat Boulevard and two segments of Skyline Boulevard would be reduced to less than significant (less than a 3 dBA increase). While project noise increases would be reduced, the cumulative increase on Sloat Boulevard between 47th Avenue and Skyline Boulevard would be at the 3 dBA threshold and therefore represent a significant cumulative impact. Under this cumulative scenario, the contribution of redistributed traffic from the proposed project to the cumulative traffic noise impact on Sloat Boulevard between 47th Avenue and Skyline Boulevard would be cumulatively considerable, a significant impact.

As also described above in Impact NO-3, Mitigation Measure M-NO-3: Noise Monitoring and Traffic Re-Distribution Noise Reduction Plan has been identified as potentially capable of reducing project operational traffic noise, but the city's ability to implement the measure in a timely and full manner remains uncertain. Therefore, the project's contribution to the cumulative operational traffic noise impact would also be ***significant and unavoidable***.

Significance after Mitigation: Significant and Unavoidable.

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[26] Trips calculated using the Travel Demand Tool of the San Francisco County Transportation Authority available at *https://sftraveldemand.sfcta.org/*
[27] San Francisco County Transportation Authority, Spreadsheet on Upper Great Highway Traffic Volume Diversions 20210521, May, 2021.

Table 4.4-13 Peak Hour Traffic Noise Levels in the Vicinity of the Project with Full Great Highway Closure

Roadway Segment	Receptor Land Use Type	Compatibility Standard	Existing (dBA, L_{eq})	Applicable Significance Threshold	Existing Plus Project + GH Closure (dBA, L_{eq})	Difference between Existing Plus Project + GH Closure and Existing (dBA)
Great Highway between Vicente Street and Sloat Boulevard	Residential	60	69.7	3 dBA increase in an area >60 dBA Ldn	0	-69.7
Sloat Boulevard between Great Highway and 47th Avenue	Residential	60	64.9	3 dBA increase in an area >60 dBA Ldn	65.6	0.7
Sloat Boulevard between 47th Avenue and Skyline Boulevard	Residential	60	63.9	3 dBA increase in an area >60 dBA Ldn	66.8	3.0[d]
Sloat Boulevard between Skyline Boulevard and Sunset Boulevard	Residential	60	68.6	3 dBA increase in an area >60 dBA Ldn	70.1	1.5
Skyline Boulevard between Sloat Boulevard and North Herbst Road	Residential	60	70.7	3 dBA increase in an area >60 dBA Ldn	72.8	2.1
Skyline Boulevard between South Herbst Road and Harding Road	Rehabilitation Facility	65	70.7	3 dBA increase in an area >60 dBA Ldn	72.8	2.1
North Herbst Road between Skyline Boulevard and Armory Drive	Rehabilitation Facility	65	51.6	5 dBA increase in an area <65 dBA Ldn	51.6	0.0
South Herbst Road between Skyline Boulevard and Armory Drive	Rehabilitation Facility	65	57.4	5 dBA increase in an area <65 dBA Ldn	57.4	0.0

SOURCE: ESA, 2021.

NOTES:

a Road center to receptor distance is 15 meters (approximately 50 feet) for all roadway segments. Noise levels were determined using the algorithms of the Federal Highway Administration (FHWA) Traffic Noise Prediction Model.

b The analysis considered the vehicle mix based on the traffic operations analysis technical memorandum – cars 97 percent, medium trucks two percent, and heavy trucks one percent, except for Herbst Road with cars 95 percent, medium trucks two percent, and heavy trucks three percent. Traffic speeds for all vehicle classes were set at 35 miles per hour (mph), except for Skyline Boulevard (45 mph) and Herbst Road (25 mph).

c Shaded cells indicate noise increase in excess of applicable significance threshold.

d Differences in noise levels presented in the table account for rounding and thus may appear to vary by up to 0.1 dBA.

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4.5 Recreation

4.5.1 Introduction

This section discusses the existing recreation setting of the Ocean Beach Climate Change Adaptation Project (the project), evaluates potential impacts on recreational resources that could result from implementation of the project, and identifies mitigation measures to reduce or avoid impacts, as appropriate. For the purpose of this assessment, recreational resources are generally defined as the natural and built features that people use for recreation (e.g., beach, fields, trails, and playgrounds), including facilities associated with the recreational resource that enable recreation, such as parking facilities and restrooms. The analysis addresses publicly accessible recreational resources within approximately 0.3 mile of the project area, including the beach and shoreline, parks, bicycle routes, surfing and fishing locations, and designated recreational trails. This section also describes regulations pertinent to the project.

4.5.2 Environmental Setting

The project includes activities at the northern and southern ends of Ocean Beach, which are both surrounded by multiple recreational areas, including the overall 3.5-mile-long Ocean Beach, Fort Funston, San Francisco Zoo, Lake Merced, and Golden Gate Park.

Most of the public open space and recreational areas that could be affected by the project are managed by the National Park Service (NPS) as part of the Golden Gate National Recreation Area (GGNRA). These include Ocean Beach and Fort Funston. The San Francisco Recreation and Park Department (Rec and Park) leases the San Francisco Zoo to the San Francisco Zoological Society, and manages Lake Merced, Golden Gate Park, and the Great Highway multi-use path.[1] Refer to **Table 4.5-1** for a brief description of recreational resources within 0.3 mile of the project area and the jurisdiction within which they fall.

4.5.2.1 GOLDEN GATE NATIONAL RECREATION AREA

The GGNRA, established by Congress in 1972, is the largest national park unit in an urban area in the United States. The GGNRA lands are located in Marin, San Francisco, and San Mateo counties. Upwards of 20 million people per year visit this recreation area, which includes visitor destinations such as Alcatraz Island, Muir Woods, Crissy Field, the Presidio, Marin Headlands, Fort Funston, and Ocean Beach, which is described in detail below. The GGNRA operates under NPS policies and guidelines, in accordance with the 2015 General Management Plan.

1 San Francisco Recreation and Parks Department, About Us, *https://sfrecpark.org/388/About-Us*, accessed May 26, 2020.

Table 4.5-1 Recreational Resources in the Project Area

Resource	Location	Activities / Facilities	Jurisdiction
RECREATIONAL FACILITIES			
Ocean Beach	The Great Highway between Point Lobos Avenue and Sloat Boulevard.	Walking, picnicking, sunbathing, jogging, swimming, surfing, fishing, restrooms, parking facilities	GGNRA
San Francisco Zoo	The Great Highway between Skyline and Sloat boulevards.	Animal exhibits, animal conservation, food cafes, restrooms, children's petting zoo and play area	San Francisco Recreation and Park Commission and Zoological Society (via lease from Rec and Park)
Lake Merced and surrounding area	Southwest San Francisco between Lake Merced Boulevard and Skyline Boulevard.	Boating, fishing, bird and nature watching, picnicking, bicycling	Managed for recreation by Rec and Park under terms of 1950 SFPUC and Rec and Park resolutions, and a 2013 Memorandum of Understanding (MOU)
TPC Harding Park	Surrounded by Lake Merced and Lake Merced Boulevard.	Golf	Rec and Park, managed by TPC Harding Park
Golden Gate Park	Western San Francisco; bounded on the west by the Great Highway, on the north by Fulton Street, on the east by Stanyan Street, and on the south by Lincoln Way.	Field sports, horseback riding, golf, flycasting, museums, gardens, playgrounds, bicycling, trail activities, boating, natural areas	Rec and Park
Pomeroy Recreation and Rehabilitation Center	Between Skyline Boulevard and Herbst Road west of Lake Merced.	Adult day programs, children and teen programs, vocational services, respite services, swim lessons	SFPUC (landowner), managed by Pomeroy Center
RECREATIONAL TRAILS			
Great Highway Multi-Use Path	Extends 3 miles along the eastern side of the Great Highway between Sloat Boulevard and Balboa Street.	Paved walking, running, bicycle trail	Rec and Park

Table 4.5-1 Recreational Resources in the Project Area (Continued)

Resource	Location	Activities / Facilities	Jurisdiction
RECREATIONAL TRAILS (CONT.)			
California Coastal Trail	**North and Middle Ocean Beach**. Extends 3 miles along the western side of the Great Highway between Sloat Boulevard and Balboa Street. Paved sections include those between Balboa Street and Lincoln Way and between Noriega Street and Santiago Street. Unpaved sections, referred to as the Ocean Beach Dunes Trail, exist between Lincoln Way and Noriega Street and between Santiago Street and Sloat Boulevard.	Paved and unpaved walking and running	GGNRA
	Fort Funston. The Coastal Trail in Fort Funston (also called the Sunset Trail) extends 1 mile and loops back on the Funston Horse Trail. The trail system is bounded to the west by the Pacific Ocean, to the north by the Great Highway, and to the east by Skyline Boulevard.	Paved walking, running, bird watching	GGNRA
Lake Merced Multi-Use Path	Extends 4 miles around the perimeter of Lake Merced with main access points at Sunset Boulevard, John Muir Drive, Skyline Boulevard, and Lake Merced Boulevard	Paved walking, running, bicycle trail; access to network of informal trails around Lake Merced	SFPUC (landowner), managed for recreation by Rec and Park under terms of 1950 SFPUC and Rec and Park resolutions, and a 2013 Memorandum of Understanding (MOU)
BICYCLE ROUTES			
Illinois Street to the Great Highway (Route 60)	Extends east to west from Illinois Street and Cesar Chavez Street to Portola Drive; zigzags from Dewey Boulevard to Taraval Street, Ulloa Street, and finally to Vicente Street to the Great Highway.	Designated class II bicycle facility along Dewey Drive, Taraval Street, and Ulloa Street; designated class III bicycle facility along Illinois Street, Portola Drive, and Vicente Street	San Francisco Municipal Transportation Agency (SFMTA)
Lake Merced Boulevard/ John Muir Drive/ Skyline Boulevard Connector (Route 885)	Circles Lake Merced; consists of parts of Routes 85, 86, 91, and 95; in clockwise direction, Route 885 follows Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard back to Lake Merced Boulevard; in counterclockwise direction, route runs along Middlefield Drive, Gellert Drive, Clearfield Drive, Ocean Avenue, and pathway west of Sunset Boulevard to Lake Merced Boulevard	On-street loop route that provides a guide for bicyclists who wish to circle Lake Merced; designated Class I and Class III bicycle facilities	SFMTA/Rec and Park

OCEAN BEACH

Ocean Beach stretches about 3.5 miles along San Francisco's Pacific Ocean shore, from Point Lobos to Fort Funston. Public access to Ocean Beach is available at various locations along the Great Highway, including via numerous trails and crosswalks from the Great Highway multi-use path as well as from several parking areas west of the Great Highway. Ocean Beach attracts around 3 million people annually for a variety of recreational activities, including walking, surfing, fishing, picnicking, and jogging.[2] Ocean Beach is open year-round with no entrance fees.[3]

North Ocean Beach[4] is generally a wide sandy beach. Along the O'Shaughnessy seawall at North Ocean Beach, 28 stairways or ramps enable pedestrian access to the beach. Two large public parking areas,[5] one at the north end of Ocean Beach across from Balboa street, and the other west of Golden Gate Park, are available to beachgoing visitors.

Middle Ocean Beach, the longest stretch of beach extending south from Lincoln Boulevard to Sloat Boulevard, is generally narrower than North Ocean Beach but is also a wide sandy beach. Middle Ocean Beach is accessible to the public via numerous informal trails extending west from the unpaved segment of the California Coastal Trail west of the Great Highway (see Section 4.5.2.5 for additional information about the California Coastal Trail). Crosswalks across the Great Highway at approximately every other block connect the Great Highway multi-use trail, Outer Sunset neighborhood, and associated public transportation to Middle Ocean Beach. Street parking is available along the Lower Great Highway, from which beachgoers can walk to the Great Highway multi-use trail and crosswalks to Middle Ocean Beach.

South Ocean Beach[6] is much narrower than North Ocean Beach. Under current conditions, access to and along portions of South Ocean Beach is constrained due to erosion-related narrowing of the beach, asphalt and rubble from the Great Highway and roadbed, and rock revetments constructed to protect wastewater system infrastructure. Public access to South Ocean Beach is available via a "sand ramp" and informal trails from the NPS parking lot at the western terminus of Sloat Boulevard. Beachgoers may also reach South Ocean Beach from trails in Fort Funston, to the south. The NPS parking lot includes public restroom facilities. In addition to public parking in the NPS parking lot, public parking is available along Sloat Boulevard and other nearby streets.

All stretches of Ocean Beach can provide opportunities for surfing, depending on seasonal wave conditions affected by tides, local winds, *wave climate*, and sand bar characteristics.[7] Sand bars at Ocean Beach change seasonally in response to strong tidal currents at the Golden Gate, local longshore and cross-shore currents generated by waves, and offshore refraction, shoaling, and spreading effects (refer to Appendix B Section E.16, Geology and Soils, for additional information about sand bars at Ocean Beach). Surfing occurs within the zone of breaking waves, typically between 20 and 300 yards from the shoreline at South Ocean Beach (between Sloat Boulevard and the Fort Funston Bluffs). Conditions vary within this surf zone and surfers position themselves depending on the wave characteristics and depth of water. By late winter or

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2 San Francisco General Plan, Recreation and Open Space Element, April 2014.
3 Golden Gate National Parks Conservancy (GGNPC), 2020, Ocean Beach, *http://parksconservancy.org/visit/park-sites/ocean-beach.html*, accessed May 29, 2020.
4 "North Ocean Beach" refers to the portion of Ocean Beach north of Lincoln Boulevard.
5 The Balboa and O'Shaughnessy parking lots between Ocean Beach and the Great Highway are under Rec and Park jurisdiction.
6 "South Ocean Beach" refers to the portion of Ocean Beach south of Sloat Boulevard.
7 "Wave climate" refers to the height, period, and direction for storm waves, ocean swell, wind waves, and long wave "surge" and tsunamis.

early spring the sand bars and associated surfing locations become more distinct at an "inside" sand bar approximately 20 to 50 yards offshore and an "outside" sand bar approximately 150 to 300 yards offshore. Rip currents (localized seaward flowing currents) scour deeper areas through these bars, with some consistency in location year-to-year. Depending on wave size, opportunities for beginning, intermediate, or advanced surfers are available at these surfing locations.

FORT FUNSTON

Fort Funston, part of the GGNRA, is a former harbor defense installation featuring 200-foot-high sandy bluffs, with a network of trails for hiking or horseback riding. The approximately 160-acre park experiences high visitor use as a result of its diverse recreational attractions, including horseback riding, surfing, wildlife viewing, historical sites, hang gliding, and dog walking.[8] A 2009 study estimated that Fort Funston received approximately 556,000 visits that year, with a slight seasonal variation in visitation, with May through September having the highest visitation levels.[9]

Numerous trails including the Horse Trail, Battery Davis Trail, Sunset Loop Trail (also known as the California Coastal Trail within Fort Funston), Chip Trail, and Funston Trail can be reached from the Fort Funston parking lot, a large paved lot located at the top of the bluffs off of Skyline Boulevard. In addition to a parking lot, portable toilets are currently available, and planning efforts are underway for the construction of a new restroom facility at the parking lot. Beachgoers can reach the beach from a sand ladder from the Fort Funston segment of the Coastal Trail at the southwestern corner of the parking lot (approximately 1 mile south of the project area) and from the Funston Beach Trail north of Battery Davis (approximately 0.5 mile south of the project area). The Coastal Trail in Fort Funston currently terminates approximately 150 feet south of the proposed Skyline coastal parking lot. A trail connection to the proposed Skyline coastal parking lot and multi-use trail is planned (refer to project 1 in Table 4.1-3 in Section 4.1, Overview), but no formal access to the Great Highway or Skyline Boulevard currently exists at this location.

4.5.2.2 SAN FRANCISCO ZOO

The San Francisco Zoo occupies 100 acres along Sloat Boulevard between the Great Highway and Skyline Boulevard, generally east of the project area. The San Francisco Recreation and Park Commission and the San Francisco Zoological Society oversee zoo operations in partnership.[10] The zoo houses more than 250 animal species and is typically open year-round from 10 a.m. to 5 p.m.[11] During fiscal year 2014-2015, the zoo hosted over 957,000 visitors.[12] San Francisco Zoo parking is accessible via two entrance lanes (no exit) from Sloat Boulevard, and both entrance and exit lanes from the northbound lanes of the Great Highway. An additional entrance for zoo staff and deliveries is from Herbst Road on the east side of the zoo.

4.5.2.3 LAKE MERCED

Lake Merced is a 368-acre freshwater lake within a larger 614-acre city-owned property in southwest San Francisco, located about 100 feet east of the project area at the Skyline Boulevard and Great Highway

8 NPS, 2013. GGNRA Draft Dog Management Plan/Supplemental Environmental Impact Statement.

9 Industrial Economics, Inc., 2011. Assessment of Visitor Activities at Six Sites Within Golden Gate National Recreation Area. *http://www.nps.gov/goga/parkmgmt/upload/GGNRA-Visitor-Activities-Report-12-20-11-FINAL.pdf*

10 San Francisco Zoo & Gardens, Associations, 2020, *http://www.sfzoo.org/about/associations.html, accessed May 29, 2020*.

11 San Francisco Zoo & Gardens, *About the Zoo*, 2020, *http://www.sfzoo.org/about/about-the-zoo.html*, accessed May 29, 2020.

12 San Francisco Zoological Society, Annual Report 2014-2015, *http://www.sfzoo.org/pdf/financialstatement/SFZ-AnnualReport2014.pdf.*

intersection (its nearest point).[13] The San Francisco Public Utilities Commission (SFPUC) maintains Lake Merced as a non-potable emergency water supply for the city to be used for firefighting or sanitation purposes if no other water sources are available. While the SFPUC manages Lake Merced, Rec and Park manages the lake's recreational areas pursuant to a 1950 resolution and 2013 Memorandum of Understanding (MOU) giving Rec and Park management of the surface of the Lake Merced tract for recreational purposes.

The paved multi-use Lake Merced Trail encircles the lake and is accessible from multiple points around the lake. A land mass (occupied by TPC Harding Park Golf Course, Harding Road, and the main Lake Merced Park entrance) divides the lake into North Lake and South Lake, both of which are used year-round by rowing clubs. Lake Merced hosts several special events annually, including races and walks around the perimeter of the lake and boating races. TPC Harding Park is a golf course with one 18-hole course and one nine-hole course. The golf course is open to the public and periodically hosts tournaments, including the 2020 PGA Championship. The main entrance to the lake and golf course is at Harding Road and Skyline Boulevard. The entrance area includes restrooms, a boathouse, shoreline access points, three floating docks, three stationary docks, a par course, boat launch ramp, and picnic tables with post barbecue grills.

4.5.2.4 GOLDEN GATE PARK

Golden Gate Park is owned by the city and administered by Rec and Park. The 1,017-acre park is bounded on the west by the Great Highway (along Ocean Beach), on the north by Fulton Street, on the east by Stanyan Street, and on the south by Lincoln Way. The main body of Golden Gate Park is over 3 miles long and 0.5 mile wide. Golden Gate Park is open year-round and comprises 680 acres of forest; 130 acres of meadows, fields, and open areas; 33 acres of lakes; and 15 miles of drives. The wide variety of outdoor attractions and recreational facilities, including museums, gardens, stadiums, soccer fields, baseball diamonds, and children's playgrounds, attract 13 million visitors annually. In the vicinity of the North Ocean Beach project site (within 0.3 mile), Golden Gate Park contains multiple active recreational areas, including the Beach Chalet Athletic Fields, the Golden Gate Park golf course, and the Golden Gate Park 45th Avenue playground.

4.5.2.5 RECREATIONAL TRAILS

GREAT HIGHWAY MULTI-USE PATH

The Great Highway multi-use path is a paved trail located east of the Great Highway and west of the Lower Great Highway. The trail extends approximately 3 miles north to south from Balboa Street to Sloat Boulevard. The multi-use path is separated from the Great Highway, but intersecting trail segments exist at numerous locations along the path, providing connectivity to the beach to the west and neighborhoods to the east. Rec and Park maintains the path and the surrounding open space.

CALIFORNIA COASTAL TRAIL

The California Coastal Trail project seeks to provide a continuous interconnected public walking and hiking trail as close to the ocean as possible along the entire California coastline. While first envisioned by the legislature in 1972, implementation of the coastal trail concept remains a work in progress with approximately 50 percent of the coast connected by a continuous trail system. The coastal trail is not a single

[13] San Francisco Recreation and Parks Department, Parks and Facilities, Lake Merced, 2020, *https://sfrecpark.org/Facilities/Facility/Details/Lake-Merced-349*, accessed May 29, 2020.

designated pathway spanning the length of California's coastline, but is instead envisioned as a series of trails that may be parallel and available for different modes of travel that, overall, provide continuous connection along the coast. The trail system may overlap with other existing trail designations, incorporating or becoming a component of these other trails, and may take many forms, including informal footpaths, paved sidewalks, separated bicycle paths, or the shoulder of a road.[14]

As described below, pedestrian trails to the north and south of the South Ocean Beach project site are part of the California Coastal Trail. While California Coastal Trail is mapped in the city's Transportation Element as being adjacent to the Great Highway along South Ocean Beach, it is not identified as a recreational trail in this section because the available road shoulder is limited due to ongoing erosion and pedestrian access does not safely connect to any areas to the south (this applies to the Great Highway at the South Ocean Beach project site, between Sloat and Skyline boulevards).

CALIFORNIA COASTAL TRAIL ALONG NORTH AND MIDDLE OCEAN BEACH

The California Coastal Trail segment that runs along North Ocean Beach and Middle Ocean Beach extends from Balboa Street to Sloat Boulevard, providing views of the beach and ocean. Paved sections include those between Balboa Street and Lincoln Way and between Noriega Street and Santiago Street. Unpaved sections, referred to as the Ocean Beach Dunes Trail, exist between Lincoln Way and Noriega Street and between Santiago Street and Sloat Boulevard.

CALIFORNIA COASTAL TRAIL IN FORT FUNSTON

Within Fort Funston, the California Coastal Trail is a paved multi-use path that is also called the Sunset Trail. The trail extends north for one mile to the north end of the park and loops back on the Funston Horse Trail, displaying views of the Pacific Ocean, coastal bluffs, and remnants of the fort, which included heavy military weaponry housings. The path is used for walking, running, and bird watching.

LAKE MERCED MULTI-USE PATH

The Lake Merced multi-use path is a paved trail that extends approximately 4 miles along the perimeter of Lake Merced. Main vehicular access to the trail is from four parking areas: (1) at the end of Sunset Boulevard, (2) along Lake Merced Boulevard near the southern tip of the lake, (3) along John Muir Drive near the southern tip of the lake, and (4) along Skyline Boulevard at the main entrance to Harding Park. In addition to these parking areas, there is street parking on Lake Merced Boulevard and John Muir Drive. Further, numerous informal trails branch off of the multi-use path, providing access to the lake's shoreline. These informal trails are located near the Lake Merced Boulevard parking area and near Middlefield Drive and Lake Merced Boulevard.

4.5.2.6 BICYCLE ROUTES

The San Francisco Municipal Transportation Agency (SFMTA) classifies bicycle routes in the project area as *class I, II, III, or IV* facilities.[15] Class I bicycle facilities are designated bicycle paths separated from roads with exclusive right-of-way for use by bicyclists or pedestrians. Class II bicycle facilities are bicycle lanes striped within the paved areas of roadways for preferential use by bicycles. Class III bicycle facilities are signed bicycle routes that allow cyclists to share streets with vehicles. Class III facilities may consist of a variety of

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14 California Coastal Conservancy, Completing the California Coastal Trail, January 2003. *https://www.coastal.ca.gov/access/coastal-trail-report.pdf*
15 The State of California defines bicycle facilities in California Streets and Highway Code section 890.4.

features, including streets with wide curb lanes (travel lane width closest to the curb is at least 14 feet wide), *sharrows*,[16] traffic-calming measures, or simply streets signed as bicycle routes. Class IV bicycle facilities, commonly referred to as cycle tracks or protected bikeways, are bicycle facilities that are separated from traffic by parked cars, safe-hit posts, transit islands or other physical barriers.

ILLINOIS STREET TO THE GREAT HIGHWAY (ROUTE 60)

Route 60 is comprised of both class II and class III segments, beginning at Illinois Street and Cesar Chavez Street and traveling westbound toward Laguna Honda Boulevard and Dewey Boulevard. From Dewey Boulevard, Route 60 follows Taraval Street, Forest Side Avenue, Ulloa Street, and 15th Avenue to connect to Vicente Street and west to Ocean Beach.[17]

LAKE MERCED BIKE PATH (ROUTE 885)

Route 885 is a class I on-street loop route that provides a guide for bicyclists who wish to circle Lake Merced. Route 885 consists of parts of Routes 85, 86, 91, and 95. In the clockwise direction, Route 885 follows Lake Merced Boulevard, John Muir Drive, and Skyline Boulevard back to Lake Merced Boulevard. In the counter-clockwise direction, Route 885 deviates from the lake at the north end and is routed via the streets that are used for both northbound and southbound Route 85: Middlefield Drive, Gellert Drive, Clearfield Drive, Ocean Avenue, and the path just west of Sunset Boulevard back to Lake Merced Boulevard.[18]

4.5.3 Regulatory Framework

4.5.3.1 FEDERAL

TITLE 36 OF THE CODE OF FEDERAL REGULATIONS (PARKS, FORESTS, AND PUBLIC PROPERTY)

Title 36 of the Code of Federal Regulations provides for the proper use, management, government, and protection of persons, property, and natural and cultural resources within areas under the jurisdiction of the NPS. These regulations are used to fulfill the statutory purposes of units of the National Park System, which are: to conserve scenery, natural and historic objects, and wildlife, and to provide for the enjoyment of those resources in a manner that would leave them unimpaired for the enjoyment of future generations.

GGNRA/MUIR WOODS NATIONAL MONUMENT GENERAL MANAGEMENT PLAN

The Golden Gate National Recreation Area/Muir Woods National Monument General Management Plan published in 2014 and adopted in 2015 identifies management zones within the legislative boundaries of the GGNRA and Muir Woods National Monument, including Ocean Beach and the nearshore ocean environment. Management zones define a set of desired conditions for natural and cultural resources, visitor experience, and general levels of development in each zone. The project components within the GGNRA are in the Natural Zone (for components on Ocean Beach) and the Scenic Corridor Zone (for components within the tidelands and submerged lands up to 0.25 mile offshore).

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16 Sharrows are shared roadway bicycle pavement markings within a traffic lane.

17 San Francisco Municipal Transportation Agency (SFMTA), San Francisco Bike Network Map, *https://www.sfmta.com/maps/san-francisco-bike-network-map*, accessed May 29, 2020.

18 Ibid.

In the Natural Zone, the management objective is to participate in multiagency efforts to knit the unique assets and experiences of the Ocean Beach corridor into a seamless and welcoming public landscape, planning for environmental conservation, sustainable infrastructure, and long-term stewardship. The NPS would continue to work with other agencies to address coastal erosion, restore natural processes, and maximize protection of the beach for its natural and recreational values. The plan anticipates the NPS would relocate park facilities from vulnerable locations and would work with municipalities to identify the most compatible and sustainable management of stormwater and wastewater facilities within their easement rights. Improving trail connections between Ocean Beach to Fort Funston and other park lands including Lake Merced is also a priority identified in the plan. The plan calls for the area south of the O'Shaughnessy seawall to be managed in a way that protects shorebirds and allows natural coastal and marine processes to occur, while providing for a variety of compatible recreational activities. The plan also envisions visitors having the opportunity to be immersed in a natural environment and being able to seek areas where they can experience natural sounds, tranquility, closeness to nature, and a sense of remoteness and self-reliance. Visitor use is to be managed to ensure that activities and their intensities are compatible with protecting resource integrity.

In the Scenic Corridor Zone, the NPS would preserve the ocean environment and accommodate public uses including surfing, boating, and recreational fishing. The plan calls upon park managers to protect the marine habitat, geologic resources and processes, and other natural features of the area.

NATIONAL PARK SERVICE 2006 MANAGEMENT POLICIES

The 2006 NPS management policies state that the purpose of NPS interpretive and educational programs is to provide memorable educational and recreational experiences that will (1) help the public understand the meaning and relevance of park resources, and (2) foster development of a sense of stewardship. The programs do so by forging a connection between park resources, visitors, the community, and the National Park System. Specific policies that are most likely to be applicable to the project are summarized as follows:[19]

> ***Section 8.2: Visitor Use.*** Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks, and the NPS will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of American society. Any park closures or restrictions must be consistent with applicable laws, regulations, and policies, and require a written determination by the superintendent that such measures are needed to protect public health and safety; prevent unacceptable impacts on park resources or values; carry out scientific research; minimize visitor use conflicts; or otherwise implement management responsibilities. In addition, any restrictions imposed will be fully explained to visitors and the public. Visitors will be given appropriate information on how to keep adverse impacts to a minimum, and how to enjoy the safe and lawful use of the parks.

> ***Section 8.2.2: Recreational Activities.*** The NPS management policies outline the management guidelines for activities within national parks. For recreational activities, the NPS will manage them according to the criteria established for visitor use of the parks. Examples of the broad range of recreational activities that take place in parks include, but are not limited to, boating, camping, bicycling, fishing, hiking, horseback riding and packing, outdoor sports, picnicking, mountain and

[19] National Park Service, Management Policies 2006 – The Guide to Managing the National Park System. August 31, 2006. *https://www.nps.gov/policy/mp/policies.html*, accessed July 24, 2020.

rock climbing, etc. Many of these activities support the federal policy of promoting the health and personal fitness of the general public, as set forth in Executive Order 13266.

4.5.3.2 STATE

The California Coastal Act (Public Resources Code section 30000 et seq.) was enacted in 1976 to provide long-term protection of the state's 1,100-mile coastline for the benefit of current and future generations. The California Coastal Act provides for the long-term management of lands within California's Coastal Zone boundary (defined in Public Resources Code section 30103). The width of the Coastal Zone varies across the state. The entire project area is located within the Coastal Zone. California Coastal Act sections related to recreation that are applicable to the project are summarized as follows:

ARTICLE 2 – PUBLIC ACCESS

Section 30210. In carrying out the requirement of Section 4 of Article X of the California Constitution (which prohibits landowners from preventing public access to a navigable water in the state), maximum access shall be conspicuously posted and recreational opportunities shall be provided for all people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212. Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects (which does not include most replacement, repair, or reconstruction activities) except where it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources; adequate access exists nearby; or agriculture would be adversely affected. A dedicated accessway shall not be required for public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway. Public facilities shall be distributed when feasible throughout an area so as to mitigate against the impacts of overcrowding or overuse by the public of any single area.

Section 30213. Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

Section 30214. The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, considerations such as topographic and geologic site characteristics, the capacity of the site to sustain use and at what level of intensity, and the appropriateness of limiting public access depending on such factors as the fragility of the natural resources in the area.

ARTICLE 3 – RECREATION

Section 30220 - Protection of certain water-oriented activities. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

> ***Section 30221 - Oceanfront land; protection for recreational use and development.*** Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

4.5.3.3 LOCAL

SAN FRANCISCO GENERAL PLAN

RECREATION AND OPEN SPACE ELEMENT

The general plan provides general policies and objectives to guide land use decisions. The Recreation and Open Space Element of the general plan is composed of several sections, each addressing land use decision guidelines for a certain aspect of the city's recreation and open space system. The plan sections are (1) The Regional Open Space System, (2) The Citywide Open Space System, (3) The Shoreline, (4) The Neighborhoods, and (5) Downtown. Refer to Chapter 3, Plans and Policies, for additional discussion of the general plan.

WESTERN SHORELINE AREA PLAN (LOCAL COASTAL PROGRAM)

As discussed in Chapter 3, Plans and Policies, the Western Shoreline Area Plan is an area plan within the city's general plan and is the city's certified local coastal program. The Western Shoreline Area Plan includes objectives and policies pertaining to the plan area overall, as well as policies specific to the plan's 10 subareas. The project area is within the Zoo and Ocean Beach subareas of the plan. Objectives and policies relevant to recreation address issues such as preserving and enhancing recreational facilities associated with Ocean Beach, including extending the California Coastal Trail between Middle Ocean Beach and Fort Funston and Lake Merced by constructing a multi-use public access pathway along the shoreline between Sloat Boulevard and Skyline Boulevard; enhancing zoo connectivity to existing and proposed recreational resources in the coastal zone; improving access to Ocean Beach via public transit and increased parking for beach users in the Great Highway corridor; developing a beach nourishment program for Ocean Beach; and implementing sea level rise adaptation and managed retreat measures in a manner that avoids, minimizes, and mitigates impacts on public access and recreation. Refer to Chapter 3, Plans and Policies, for additional discussion of the Western Shoreline Area Plan.

SEA LEVEL RISE ACTION PLAN

The San Francisco Sea Level Rise Action Plan aims to establish overarching goals and a set of guiding principles for short- and long-term sea level rise planning that will drive city-wide adaptation planning to protect and enhance the city's public and private assets, natural resources, and quality of life for all its residents. The plan discusses the impact of shoreline erosion on recreational opportunities and access, and emphasizes the need for innovative, inter-disciplinary design approaches that increase resilience to sea level rise while enhancing the city's shoreline qualities, including recreational access. Refer to Chapter 3, Plans and Policies, for additional discussion of the action plan.

ACCOUNTABLE PLANNING INITIATIVE

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the San Francisco Planning Code[20] to establish eight priority policies, one of which is to protect parks and open space and their access to sunlight and vistas. Prior to issuing a permit for any project that requires an initial study under CEQA, or issuing a permit for any demolition, conversion, or change of use, and prior to taking any action that requires a finding of consistency with the general plan, the city is required to find that the project would be consistent with these priority policies.

REC AND PARK STRATEGIC PLAN

The 2020 Rec and Park Strategic Plan outlines objectives and strategies for restoring and enhancing San Francisco's parks, facilities, and recreation programs. Sixteen stated objectives supporting five overarching strategies focus on increasing and improving recreational facilities, programs, and access; protecting natural and park resources; and increasing connectivity between and investment in recreation infrastructure. The plan's Inspire Stewardship strategy calls upon Rec and Park to assist in planning efforts toward Ocean Beach Master Plan implementation by completing a detailed design of a new multi-use trail between Sloat and Skyline boulevards, and Rec and Park is leading design of many key project features in this area. Refer to Chapter 3, Plans and Policies, for additional discussion of the strategic plan.

4.5.4 Impacts and Mitigation Measures

4.5.4.1 SIGNIFICANCE CRITERIA

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, as modified by the San Francisco Planning Department. For the purpose of this analysis, the following questions were used to determine whether implementing the project would result in a significant impact on recreational resources. Implementation of the project would have a significant effect on recreational resources if the project would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated; or
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

APPROACH TO ANALYSIS

The impact analysis evaluates the project-related activities in the project area for their potential to affect identified recreational resources in the vicinity. The analysis evaluates specific recreational impacts in the context of public availability of similar, alternative recreational resources to accommodate displaced users of the project area's recreational resources during construction and operation. The analysis also considers whether project operation would attract new users to nearby recreational facilities.

The project would result in a significant impact if the temporary closures of South Ocean Beach during project construction and during beach nourishment would cause increased use of other nearby recreational

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[20] City and County of San Francisco, San Francisco Planning Code, section 101.1, 2015. *http://library.amlegal.com/nxt/gateway.dll/California/planning/planningcode?f=templates$fn=default.htm$3.0$vid=amlegal:sanfrancisco_ca$anc=JD_Planning*,accessed on October 29, 2015.

facilities (e.g., Central and North Ocean Beach) such that substantial physical deterioration of those facilities would occur or be accelerated. Effects on recreational opportunities or experience are discussed only in the context of their being caused by the physical degradation of recreational facilities or resources. Section 4.3, Transportation and Circulation, addresses potential construction traffic impacts on pedestrians and bicyclists.

Due to the nature of the project, the following criterion is not analyzed in this section for the reasons described below:

- ***Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.*** The project would involve the construction of a new multi-use trail and replacement of existing restrooms and beach access parking; thus the project includes construction of recreational facilities, the construction of which could cause adverse physical effects on the environment. The impacts that could result from the construction and operation of recreational facilities are addressed in the corresponding topical sections of this EIR (i.e., Sections 4.2 through 4.6) and initial study (Appendix B, Initial Study, Sections E.1 through E.22).

4.5.4.2 IMPACT EVALUATION

Impact RE-1: Project construction and operation would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (*Less than Significant*)

Construction Impacts

Project construction would require the closure of 0.5-mile long South Ocean Beach for approximately four years. During this period, existing San Francisco Zoo parking access from Sloat Boulevard would be modified to provide continued zoo patron access. Users of South Ocean Beach, including walkers, joggers, wildlife viewers, anglers, and others, would be displaced and would be expected to seek similar recreational opportunities at alternative destinations nearby (such as along Middle Ocean Beach and Fort Funston beach areas) and within the broader western San Francisco/San Mateo counties area. While the beach would be closed, offshore areas would remain accessible to swimmers and surfers who enter the water from adjacent beach locations, such as north of Sloat Boulevard, and paddle to the area offshore of South Ocean Beach. Surfer access to the outer and inner sandbars offshore of South Ocean Beach, when present, would be available from adjacent beach areas. However, the beach closure would be expected to deter some swimmers and surfers from using South Ocean Beach, and this analysis assumes these people would swim and surf at other locations.

As described in Section 4.5.2, Environmental Setting, the region hosts multiple recreation areas and facilities that provide similar recreational opportunities for many recreational activities. These include the approximately 3 miles of Ocean Beach north of the South Ocean Beach project site and approximately 3 miles of beach south of the South Ocean Beach project site. Each of these areas would remain open during project construction, as would numerous other regional parks and open space areas. In addition to beaches north and south of South Ocean Beach, the Great Highway multi-use trail and coastal trail would be available to displaced walkers, joggers, and other recreationists. During the construction period nearby recreational areas and facilities would in turn experience increased use, similar to that which occurs and has been accommodated during periodic project area closures for beach nourishment under existing conditions, but for a longer period of time.

Given the nature of the recreational activities within the project area (i.e., mainly beach-oriented activities), the effects on the receiving parks would similarly be those associated with beach-oriented recreation and would likely include increased wear on beach access trails, parking facilities, and restrooms. Receiving parks and recreational areas such as Middle Ocean Beach, North Ocean Beach, and Fort Funston could see increases in visitation, which could result in accelerated wear and more frequent maintenance of recreational support facilities, including trails, parking areas, and restrooms.

As discussed in Section 4.5.2, Environmental Setting, more than a dozen public access points to Middle Ocean Beach and North Ocean Beach, which constitute approximately 3 miles of the 3.5-mile-long Ocean Beach, are available to the public from the Great Highway multi-use trail, the Outer Sunset neighborhood, nearby public transit, and adjacent public parking areas. Middle Ocean Beach and North Ocean Beach are wider than South Ocean Beach and therefore can also accommodate more beachgoers per length of beach than can South Ocean Beach. Given the number and extent of recreational areas in the project vicinity and the temporary nature of the project area's closure, the increased use of other local or regional recreation resources that may be attributable to project construction would not result in substantial physical deterioration of recreational resources, or otherwise result in physical degradation of existing recreational resources. As discussed in Appendix B, Section E.3, Population and Housing, the project would not directly or indirectly induce population growth during construction such that substantial physical deterioration of recreational facilities would occur or be accelerated.

For these reasons, the potential impact of project construction on these other recreational resources would be ***less than significant***.

Operations Impacts

The project would improve recreational opportunities on and around South Ocean Beach by removing rock and rubble from the beach and bluff that create hazards for beach users and obstruct access; implementing beach nourishment to maintain a broad, sandy beach; and installing a new multi-use trail and new beach access stairs. These improvements would meet the project's objective of preserving and enhancing coastal public access and recreation. The project would establish better connectivity between segments of the coastal trail system, which may attract additional local and regional users who wish to walk or bike along the project's new paths, visit the beach, or use the new connection between the Lake Merced multi-use path and the Great Highway multi-use path. The project would also maintain visitor access to automobile parking and public restrooms. As discussed in Appendix B, Section E.3, Population and Housing, the project would not directly or indirectly induce population growth during operation. Thus, the project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.

Sand Placements

As summarized in Chapter 1, Introduction and Background, under existing conditions sand placements at Ocean Beach have occurred every one to three years since 2013. During these sand placements the city temporarily closes portions of North Ocean Beach and South Ocean Beach for periods of roughly two to three weeks. Similar temporary closures of North Ocean Beach and South Ocean Beach would occur during proposed small sand placements. During large sand placements, South Ocean Beach would be closed for approximately four to six weeks, but North Ocean Beach would be unaffected. Middle Ocean Beach, constituting over half of the total length of Ocean Beach, would remain unaffected during sand placements. Similar to existing conditions and conditions during the four-year construction period, during sand placements the approximately 3 miles of Ocean Beach north of the South Ocean Beach project site and approximately 3 miles of beach south of the South Ocean Beach project site would remain open to the public.

Similar to project construction, during large sand placements and associated closure of South Ocean Beach, offshore areas would remain accessible to swimmers and surfers who enter the water from adjacent beach locations. A dredge would anchor approximately 0.5 mile offshore and a 28-inch diameter pipeline would run along the ocean bottom between the dredge and the beach to convey a slurry of sand and water to the beach. The pipeline would likely remain submerged without additional weights. However, if needed, weighted collars could be used to prevent the pipeline from shifting, and buoy markers would be attached to the pipeline. Given the dredge anchorage location beyond the surf break, and considering the pipeline would be submerged and marked, it is unlikely that surfing or other offshore recreational users would be displaced during large sand placements; however, the sand placement activities would be expected to deter some swimmers and surfers from using South Ocean Beach, and this analysis assumes these people would swim and surf at other locations.

Several large recreational areas are available for similar recreational activities immediately north and south of the South Ocean Beach project site. Project area closures would be of limited duration (i.e., four to six weeks every four to ten years). Similar closures for beach nourishment presently occur every one to two years. For these reasons, visitor displacement during the project's beach nourishment activities would not result in the substantial physical deterioration of other nearby recreational resources.

Shoreline Modification

The project would involve substantial changes to the South Ocean Beach shoreline. As discussed in Appendix B, Initial Study (Impact GE-3), shoreline modifications (e.g., construction of shoreline protection) can alter existing coastal processes, resulting in impacts on adjacent coastal areas. For example, an exposed seawall can change wave energy dissipation and the rate of sand transport locally, thereby affecting adjacent beach and sand bar conditions. Similarly, beach nourishment projects can alter offshore sand bar geometry by changing sand transport rates and patterns through the surf zone. Such changes could have impacts on beach width and surfing conditions.

Beach Access and Recreation Resources

As noted previously, Ocean Beach is a popular recreational destination where visitors regularly enjoy walking, jogging, fishing, surfing, and picnicking, among other activities.[21] The amount of dry sandy beach available for such activities along South Ocean Beach varies considerably by season and location. Beach width along South Ocean Beach typically ranges from 50 feet to 200 feet. However, during spring when the beach width is typically narrowest, shoreline monitoring conducted during 2018, 2019, and 2020 documented portions of South Ocean Beach with essentially no measurable dry sandy beach.[22,23,24] Under

21 San Francisco General Plan, Recreation and Open Space Element, April 2014.

22 ESA, Ocean Beach Short-term Erosion Protection Measures Project – 2018-2019 Monitoring Report. Prepared for San Francisco Public Utilities Commission. July 2019;

23 ESA, Ocean Beach Short-term Erosion Protection Measures Project – 2019-2020 Monitoring Report. Prepared for San Francisco Public Utilities Commission. June 2020.

24 ESA, Ocean Beach Climate Change Adaptation Project, Short-term Improvements, Erosion Protection Measures: 2020-2021 Monitoring Report. Prepared for San Francisco Public Utilities Commission. October 2021.

the project, the city would remove the existing shore protection structures, rubble and debris, and construct a buried wall along an alignment that is inland of the existing backshore location. Through these managed retreat actions, the city would widen the beach along the entire project shoreline – in some areas by more than 100 feet (e.g., through removal of the 2010 emergency riprap revetment). As discussed in Chapter 2, Section 2.4.5, Beach Nourishment, as placed sand erodes, the beach would narrow and portions of the proposed wall would no longer be continuously buried. To address this issue, the city would implement a shoreline monitoring program and place sand when established triggers are met during annual monitoring.[25] Sand placements would occur as soon as possible after the trigger is reached, generally within one year.

The effectiveness of the project's small and large sand placements at maintaining a sandy beach was analyzed as part of the project's Sand Management Plan development. The results of the analysis are presented in Table 2-2. As the table shows, under the project with the small sand placements, average beach width would be 50 feet or greater about 91 percent of the time, and with the large sand placements it would be 50 feet or greater about 94 percent of the time.[26] Thus, on average, the beach would be wider with the project.

Surfing

Ocean Beach is characterized by a linear bar-trough system, comprising two sand bars extending approximately parallel to shore in a north-south orientation, each with a deep trough on the inland side of the bar.[27] As summarized in Section 1.4.3, Ocean Beach Shoreline Modification Projects, and described further in Appendix B (Impact GE-3) and Appendix H, the South Ocean Beach shoreline has been highly modified over the past 150 years. During periods of large swells or low beach (i.e., typically during winter and spring months), waves interact with the site's hardened shoreline, resulting in wave energy reflecting offshore which may degrade surfing conditions. In contrast, during periods of smaller swells or high beach (i.e., typically during the summer and fall months), as well as following sand backpass events, a greater amount of the revetment and rubble is buried in sand and there is less interaction between the waves and shoreline protection which has been observed to temporarily improve surfing conditions.

Under the project, the city would remove the existing shore protection structures, rubble and debris, and construct a buried wall along an alignment that is inland of the existing backshore location. Through these managed retreat actions, the city would widen the beach along the entire project shoreline – in some areas by more than 100 feet (e.g., through removal of the 2010 emergency riprap revetment). The proposed wall would be buried initially and have a crest elevation that is considerably lower than the existing ground surface elevation along the proposed alignment. By setting the shore back and widening the beach, the project would substantially reduce or avoid the types of wave interactions with shore protection structures that occur under existing conditions. As a result, sand bars would be expected to form in more natural configurations, with increased definition and persistence throughout the year.

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25 The first trigger would be reached if the beach width were observed to be less than 50 feet over 500 or more total linear feet of beach. The second trigger would be reached if 500 feet or more total length of the buried wall were observed to be exposed. The areas of measurements for sand placement triggers are those above the mean high water elevation.

26 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

27 Hansen, J.E. and Barnard, P.L., 2010. Sub-weekly to interannual variability of a high-energy shoreline. Coastal Engineering, 57(11-12), pp.959-972.

While the wall would be buried initially, over time as beach recession continues with shore erosion the wall would become exposed, similar to conditions that periodically occur along the Taraval seawall.[28] During periods of wall exposure, there would be opportunity for wave interactions with the hard structure, which could contribute to localized beach scour and the types of effects on sand bars (and surfing conditions) described above for existing conditions. However, unlike existing conditions, the incidence and extent of the proposed wall exposure would be substantially reduced. As described in EIR Chapter 2, Section 2.4.5, the city would develop and implement a shoreline monitoring program. The program would be a requirement of the Coastal Commission and National Park Service approvals, and would include triggers for sand placement, criteria for evaluating project performance, and annual reporting regarding program effectiveness and whether adjustments are needed. Modeling performed in support of the project's sand placement program estimates approximately four full wall exposure events over the project's lifetime (modeled as 80 years). Partial wall exposures would be more frequent, and would also be addressed through sand placements, if a trigger were reached.[29]

The effects of sand placements on sand bars would generally be restorative – increasing the amount of sediment available for mobilization by waves, reducing reflection and scour, and allowing for more natural bar configurations. However, depending upon the shape of the sand placement and its position on the beach, the constructed sand embankments could also interact with waves. While the reflected energy would be similar to that occurring with a hard structure (e.g., revetment or wall), the effects are expected to be temporary. Waves reflecting off a steep constructed sand berm would *refract* [30]and spread such that the reflected wave heights would be negligible in the vicinity of offshore sand bars. Wave interactions with a steep sand berm could also result in the formation of *scarps* – near-vertical seaward facing cuts, or cliffs, in the constructed sand embankment. These features can be over 10 feet tall, extend for hundreds of feet along the shore, and persist for several months.[31] Thus, scarp formation can influence nearshore coastal processes, in addition to presenting a public safety hazard. As discussed in EIR Chapter 2, as part of the project the city would smooth, or groom, the slope of the placed sand after initial wave exposure and erosion as needed to prevent scarp formation.

In summary, the project would reduce the incidence of interactions between waves and hard structures that contribute to rip current formation and associated bar effects, resulting in the formation and persistence of more natural sand bars. The proposed buried wall would eventually become exposed which, through wave interaction during large swells, could contribute to localized beach scour in front of the wall and through sand bars. However, because the wall would be located farther landward of the current shoreline structures and lower in elevation, the frequency of such interactions would be considerably lower than under existing conditions. During such events, as under existing conditions at the project site and offshore of the Taraval seawall, the remaining sand bars would continue to support the formation of surfable waves. The duration

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28 Constructed in the early 1940s, the Taraval seawall extends approximately 665 feet along the back of the beach between Santiago and Taraval streets, roughly 0.5 mile north of the South Ocean Beach project site. The wall is set back from the shoreline and is covered in sand most of the year, but portions of the buried wall are periodically exposed, typically during winter storms when beach elevations are low. In subsequent summer and fall months, when beach elevations recover, the wall typically becomes fully buried again.

29 Moffatt & Nichol, AGS, McMillen Jacobs, CHS Consulting Group, and San Francisco Public Works, 2020. Sand Management Plan – Ocean Beach Climate Adaptation Project, Long-term Improvements. Prepared for San Francisco Public Utilities Commission. July 2020.

30 Refraction in ocean waves is the bending of a wave as it travels over different depths.

31 ESA, Ocean Beach Short-term Erosion Protection Measures Project – 2019-2020 Monitoring Report. Prepared for San Francisco Public Utilities Commission. June 2020.

of such effects under the project would be temporary, limited to approximately 12 months, on account of the proposed shoreline monitoring and beach nourishment program.

For these reasons, with project implementation, beach access and associated recreational opportunities would not be diminished, large numbers of beachgoers and surfers would not be displaced to other beaches, and overcrowding and physical deterioration of other beach facilities would not result. Project effects on recreational facilities would, therefore, be less than significant.

Summary

The project would increase the amount of publicly accessible recreational amenities and open spaces available to city residents and visitors. Thus, the project would accommodate public use of the proposed facilities at South Ocean Beach, and may serve to lessen the intensity of use at neighborhood and regional parks with similar recreational facilities by providing an alternative recreational destination. Long-term shoreline modifications would not displace large numbers of beachgoers or surfers. For these reasons, project operation would have a ***less-than-significant*** impact related to physical deterioration of recreational facilities.

Mitigation: None required.

4.5.4.3 CUMULATIVE IMPACTS

Impact C-RE-1: Implementation of the project, in combination with the cumulative projects, would not increase the use of existing neighborhood or regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. (*Less than Significant*)

Section 4.1.5, Approach to Cumulative Impact Analysis and Cumulative Projects, describes the overall approach to the cumulative analysis used throughout this EIR and summarizes the cumulative projects in the vicinity of the project. The geographic scope for the analysis of potential cumulative impacts on recreational resources encompasses the recreational facilities and trails in the vicinity of project area, generally within 0.3 mile. This includes Ocean Beach, the San Francisco Zoo, Fort Funston, the northwestern area of Lake Merced, and the bicycle routes and walking and hiking trails associated with these resources.

As discussed in Impact RE-1, project construction and operation would have a less-than-significant impact on recreational resources. The project would temporarily affect South Ocean Beach access, associated beach access parking, and beach restrooms during project construction and would intermittently affect South Ocean Beach access thereafter during sand placements. Areas of North Ocean Beach would be temporarily closed during small sand placements. If other recreational resources in the project vicinity would be closed concurrently with the project's construction or operation closure of South Ocean Beach or North Ocean Beach, beach users may be displaced to a limited number of recreational areas such that those remaining recreational areas could be physically degraded.

The Vista Grande Drainage Basin Improvement Project (City of Daly City), under construction from 2022 to 2027, could have a cumulative recreational resources impact in combination with the project. The Vista Grande Drainage Basin Improvement Project would temporarily close a small portion (approximately 4.5 acres) of Fort Funston during construction, which would overlap with construction of the project from

2023 to 2027. However, the vast majority of the publicly accessible portions of Fort Funston (approximately 85 acres) would remain open to the public during the construction period. Moreover, as summarized in Section 4.5.2, Environmental Setting, many recreational facilities in the geographic scope would remain available for use by beach users displaced from South Ocean Beach (in particular, the remainder of Ocean Beach would be available for swimmers, surfers and other beach users), such that the combined temporary closures would not result in a substantial cumulative impact related to recreational facilities. The cumulative project would not permanently close recreational facilities in the project vicinity.

For the reasons presented, the effects of the project, in combination with the cumulative projects, would be ***less than significant***.

Mitigation: None required.

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4.6 Biological Resources

4.6.1 Introduction

This section presents the existing conditions for terrestrial and marine biological resources that occur or have the potential to occur within the project area or in the immediate vicinity. Regulations and guidelines relevant to biological resources are discussed, followed by an analysis of the potential project-level and cumulative impacts on biological resources during construction and operation of the Ocean Beach Climate Change Adaptation Project (the project). The section also identifies mitigation measures that would avoid or reduce significant adverse impacts. **Appendix F** provides additional supporting information on biological resources.

4.6.2 Environmental Setting

4.6.2.1 STUDY AREAS AND DATA SOURCES

This section identifies project study areas for both terrestrial and marine biological resources. **Figure 4.6-1** depicts the generalized study areas for the terrestrial and marine biological resources considered in this analysis.

For the purposes of this California Environmental Quality Act (CEQA) assessment, the terrestrial study area includes the landward project construction and operations areas (i.e., North Ocean Beach, South Ocean Beach, the Great Highway, staging areas, and access roads, unless otherwise stated). In addition, a 15- to 50-foot buffer area relevant to each biological resource was considered in order to assess potential impacts. This terrestrial study area is a subset of the area evaluated in the project biological resources assessment[1] included in Appendix F.

The marine study area includes the Ocean Beach intertidal and shallow subtidal habitat within the project construction and operations areas, as well as the nearshore, coastal open water habitat of the Pacific Ocean out to 0.5 mile offshore. The purpose of including the nearshore and coastal open water habitat in the marine study area is to account for potential impacts from beach nourishment (operational activities).

Information on natural communities, plant and animal species, and sensitive biological resources was obtained from regional databases, plans, and reports relevant to the project, including the California Department of Fish and Wildlife Natural Diversity Database,[2] the California Native Plant Society Electronic Inventory,[3] the U.S. Fish and Wildlife Service Information for Planning and Consultation (IPaC),[4] standard

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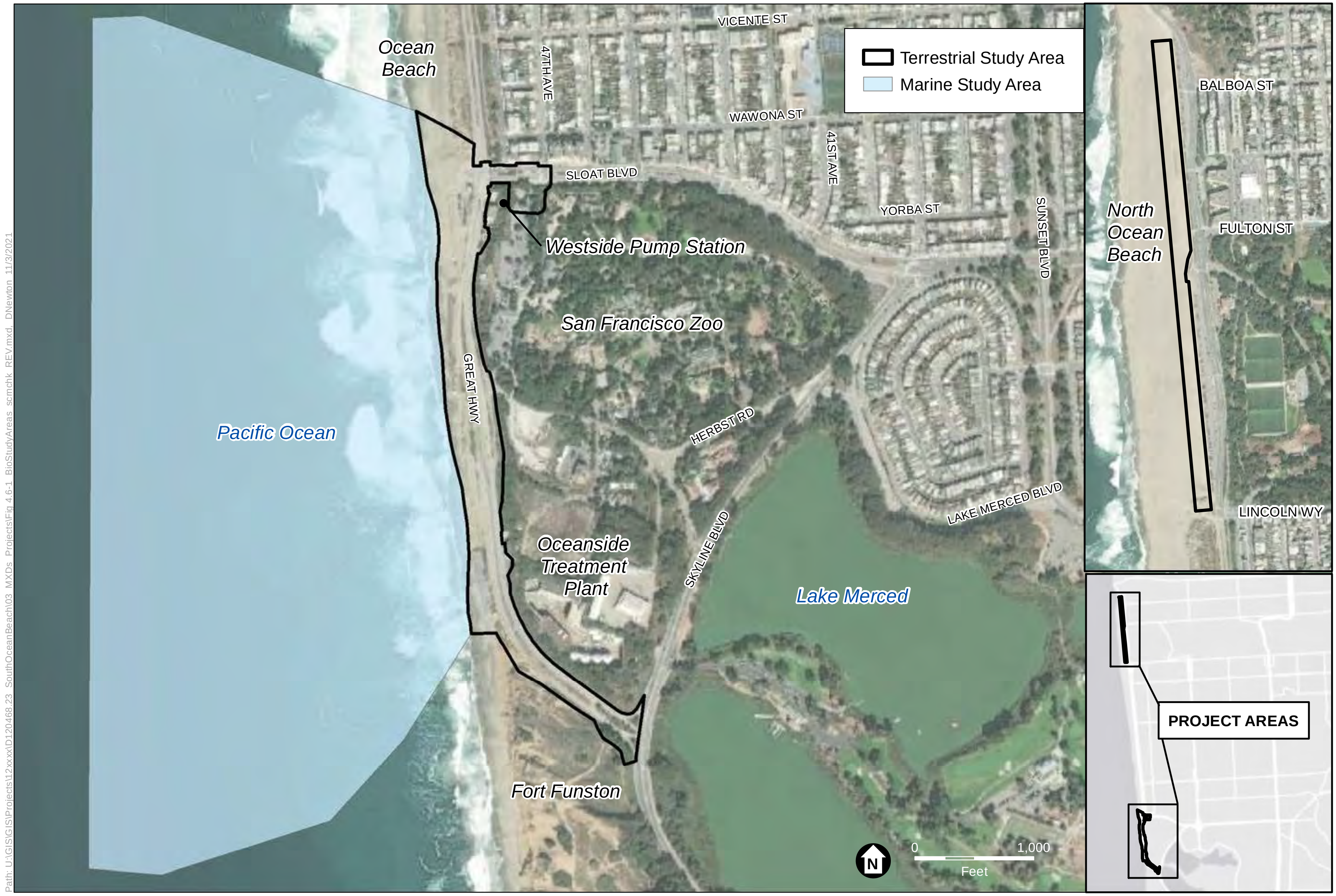
1 BioMaAS, 2021. Ocean Beach Climate Change Adaptation Project Biological Resources Assessment, prepared for the San Francisco Public Utilities Commission, November 2021.

2 California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB) Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, accessed May 29, 2020.

3 California Native Plant Society (CNPS), Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles*, http://www.rareplants.cnps.org/result.html?adv=t&quad=3712274:3712264,* accessed June 15, 2020.

4 U.S. Fish and Wildlife Service (USFWS), My Project, IPaC Trust Resource Report and Official Species List of Federally Endangered and Threatened Species that may occur in the Ocean Beach Long-Term Improvements Project location, and/or may be affected by the proposed project, accessed July 20, 2020.



SOURCE: ESA, 2021

Ocean Beach Climate Change Adaptation Project

Figure 4.6-1
Biological Resources Study Areas

biological literature, and biological reports and studies on coastline locations in the project vicinity. A biological resources assessment was also prepared for the project to characterize existing conditions, assess habitat quality, assess the likelihood for potential presence of special-status species, and document the presence of sensitive natural communities. Rare plant surveys were also performed in support of the assessment. An aquatic resources delineation of the project area was conducted to identify potential federal and state jurisdictional wetlands and waters (Appendix F).[5]

4.6.2.2 PROJECT SETTING

As discussed in Chapter 2, Project Description, Section 2.2, Project Location, the project area consists of two locations on Ocean Beach: North Ocean Beach and South Ocean Beach.

Excavation of sand for small nourishment events under the project would occur at North Ocean Beach north of Lincoln Way. Sand accumulates on North Ocean Beach as a result of the ocean currents and tides within the San Francisco littoral cell. The portion of Ocean Beach where sand excavation would occur under the project is located west of the O'Shaughnessy seawall, Golden Gate Park, and the Outer Richmond neighborhood, and south of Sutro Heights open space.

Most project activities would occur along the portion of Ocean Beach from Sloat Boulevard to Fort Funston known as South Ocean Beach. A complex history of shoreline development and natural coastal processes have converged at South Ocean Beach, resulting in substantial beach and bluff erosion that has undermined beach parking lots, the Great Highway, and stormwater drainage facilities and threatens existing wastewater system facilities. Existing conditions at South Ocean Beach include: chronic, ongoing erosion of the beach and bluffs by episodic coastal storms; variable degrees of exposure to erosion due to presence of differing materials along the beach; and a narrow beach.[6] Additionally, past and ongoing management actions by the City and County of San Francisco (the city) to slow shoreline erosion, such as placement of riprap, rock and sandbag revetments, and ongoing beach nourishment, are notable elements of the South Ocean Beach project site's setting.

San Francisco's western shoreline area, including the project area, was historically and primarily sand dunes and coastal scrub habitats. These habitats have been altered and/or largely removed in the course of various and substantial developments, including roads, parking lots, restrooms, residential neighborhoods, Golden Gate Park, the O'Shaughnessy seawall, Westside Pump Station, Oceanside Water Pollution Control Plant (Oceanside Treatment Plant), San Francisco Zoo, and shoreline armoring, among others. As a result, sand dune habitat within the city boundaries has been substantially reduced; under current conditions, sand dunes and native sand dune vegetation are generally limited to protected areas such as those within Fort Funston (south of the project area) and in the Presidio. Today, native dune vegetation within the project area is either the result of restoration efforts or consists of remnant naturally occurring native plant communities that have been severely degraded by human disturbance and the introduction of invasive vegetation.

The subsections that follow describe vegetation communities and wildlife habitats, including both terrestrial and marine communities; sensitive natural communities; wetlands and other waters; terrestrial wildlife movement corridors; special-status and otherwise protected terrestrial and marine species; critical habitat that occurs within the project area or nearby vicinity; and environmentally sensitive habitat areas (ESHA).

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5 ESA, 2021. Aquatic Resources Delineation for the Ocean Beach Climate Change Adaptation Project, prepared for the San Francisco Public Utilities Commission, March 2021.

6 SFPUC, Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems, February 15, 2018.

VEGETATION COMMUNITIES AND WILDLIFE HABITATS

Natural communities are assemblages of plant and wildlife species that occur together in the same area and are defined by species composition and relative abundance. The biological resources assessment characterizes vegetation of the terrestrial study area to the alliance level according to *A Manual of California Vegetation.*[7] For the purposes of this CEQA assessment, vegetation alliances mapped in support of the project's biological resources assessment have been summarized into the following terrestrial vegetation communities, which are described below: Beach, Disturbed Dune Mat, and Developed/Landscaped/Ruderal. In addition, intertidal and subtidal zones and open water habitats have been added for discussion as marine communities. **Figures 4.6-2a through 4.6-2d** depict these communities where present within the terrestrial study area.

TERRESTRIAL COMMUNITIES

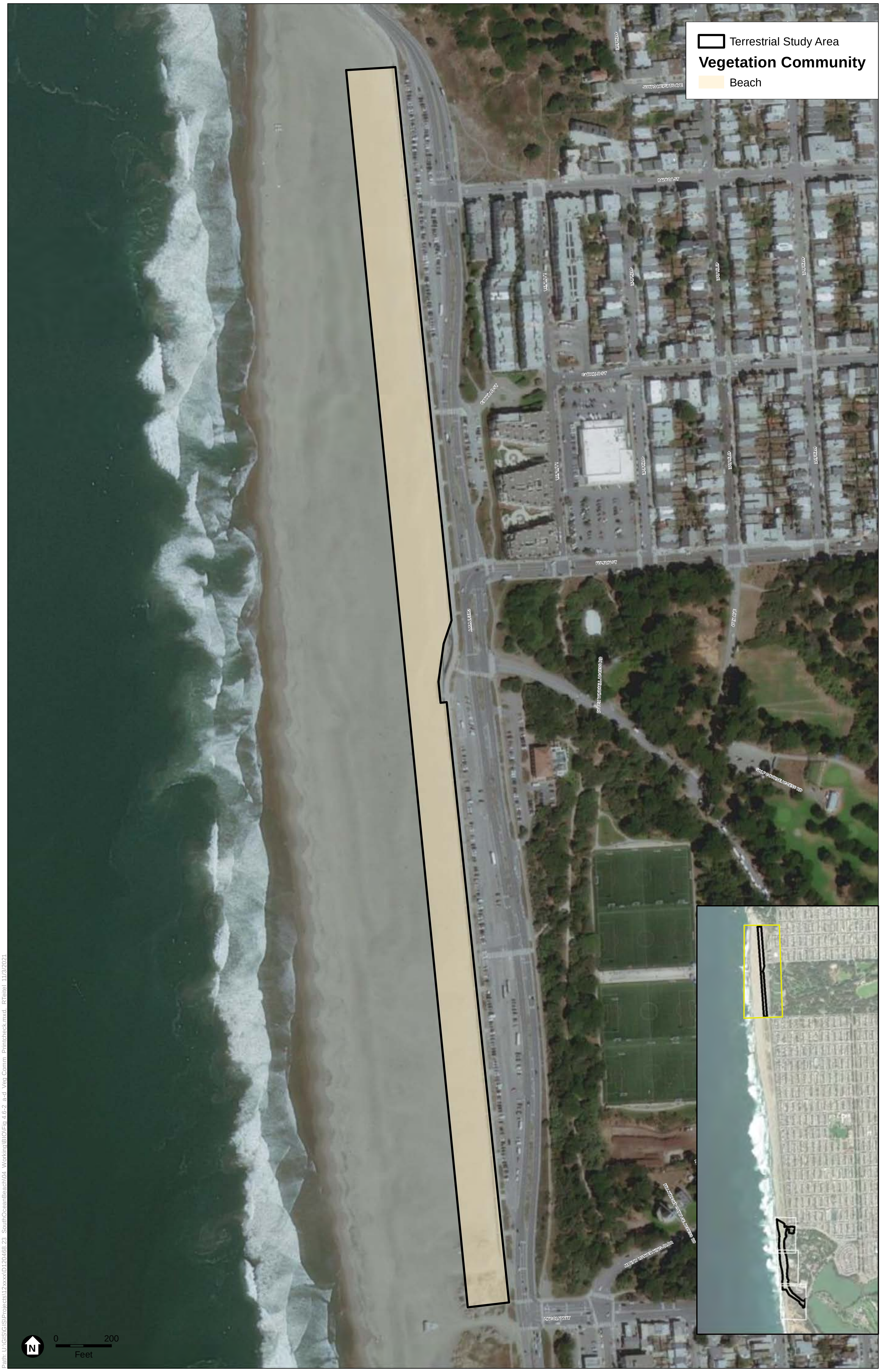
Beach

This community consists of the bare sandy beach habitat of Ocean Beach between the mean high tide line landward to the first vegetated dune crest. These areas consist of barren sand, without vegetation, due to regular disturbance by public access, wind and occasional wave action. This community is present within the North Ocean Beach project site, north of Lincoln Way, where sand excavation would occur for small sand placement events, and within the South Ocean Beach project site, between Sloat Boulevard and Fort Funston, where large and small sand placements would occur. Project construction activities west of the Great Highway would primarily occur within this community. Western gull (*Larus occidentalis*), California gull (*L. californicus*), common raven (*Corvus corax*), and American crow (*C. brachyrhynchos*) are often observed loafing or scavenging drift debris and litter on the sand within this community. Western snowy plover (*Charadrius nivosus nivosus*), a federally listed threatened species and California species of special concern, seasonally occupy this community north of the main construction site on South Ocean Beach and within the North Ocean Beach borrow site during the non-breeding season (between July and May). When present on Ocean Beach, snowy plover are typically concentrated within the National Park Service (NPS)-designated Snowy Plover Protection Area, between Stairwell 21 and Sloat Boulevard, where they can be observed resting in shallow depressions and among driftwood or foraging small invertebrates from wrack debris deposited at the high tide line.[8] This species is discussed in more detail within the Special-Status Terrestrial Animals section, below, and within Appendix F.

Disturbed Dune Mat

This community features a combination of native and nonnative species occupying foredunes landward of the bare, sandy beach or upland areas among existing infrastructure with sandy soils throughout much of the terrestrial study area. Dominant species include native yellow sand verbena (*Abronia latifolia*) and beach burr (*Ambrosia chamissonis*) with nonnative, invasive ice plant (*Carpobrotus edulis*; ice plant), sea fig (*C. chilensis*), sea rocket (*Cakile maritima*), and some European beachgrass (*Ammophila arenaria*). Dense mats of ice plant occur among native dune flora in a complex mosaic where this community is present in the terrestrial study area, interspersed with bare sandy areas and nonnative grasses. Ice plant, which can spread from seed or individual nodes (stems), is considered a highly invasive species by the California Invasive Plant Council. This species is prolific in coastal habitats of California where it readily forms dense mats that

7 California Native Plant Society (CNPS). 2019. A Manual of California Vegetation Online. *http://vegetation.cnps.org/*. Accessed May 29, 2019.
8 National Park Service, 2006. *Protecting the Snowy Plover.* U.S. Department of the Interior, Golden Gate National Recreation Area. Revised October.



SOURCE: BioMaAS, 2020

Ocean Beach Climate Change Adaptation Project

Figure 4.6-2a
Vegetation Communities of the Terrestrial Study Area

SOURCE: BioMaAS, 2020

Ocean Beach Climate Change Adaptation Project

Figure 4.6-2b
Vegetation Communities of the Terrestrial Study Area

SOURCE: BioMaAS, 2020

Ocean Beach Climate Change Adaptation Project

Figure 4.6-2c
Vegetation Communities of the Terrestrial Study Area

SOURCE: BioMaAS, 2020

Ocean Beach Climate Change Adaptation Project

Figure 4.6-2d
Vegetation Communities of the Terrestrial Study Area

increase soil organic matter over time, creating more suitable conditions for other nonnative species, such as annual grasses, to populate and degrade native dune environments.[9] Sea fig is considered moderately invasive by the California Invasive Plant Council and is less common in the terrestrial study area than ice plant. This species can also spread quickly from seed and node fragments; although, sea fig mats are not as dense as ice plant.[10]

Native plant diversity and abundance varies in this community throughout the terrestrial study area, but most areas are disturbed and comprise a mix of native and nonnative grasses and forbs and a low cover of mostly native shrubs. There is a higher concentration of native yellow sand verbena and beach burr in the southern portion of the terrestrial study area, closer to Fort Funston, where this dune mat community is slightly less disturbed by ice plant and sea fig. A typical assemblage of native herbaceous dune flora within this community includes evening-primrose (*Camissoniopsis cheiranthifolia* ssp. *cheiranthifolia*), beach strawberry (*Fragaria chilensis*), seaside daisy (*Erigeron glaucus*), and coast buckwheat (*Eriogonum latifolium*). Other native grasses and herbs that are less abundant but present in the terrestrial study area include red fescue (*Festuca rubra*), spike bent grass (*Agrostis exarta*), common yarrow (*Achillea millefolium*), live forever (*Dudleya farinosa*), Heermann's bird's-foot trefoil (*Acmispon heermannii* var. *orbicularis*), strigose bird's-foot-trefoil (*Acmispon strigosus*), California poppy (*Eschscholzia californica*), sandmat (*Cardionema ramosissimum*), rattlesnake weed (*Daucus pusillus*), lizard-tail (*Eriophyllum staechadifolium*), Pacific seaside plantain (*Plantago maritima*), and thrift sea pink (*Armeria maritima* ssp. *californica*). Native shrubs that sporadically occur in this community include silver dune lupine (*Lupinus chamissonis*), coastal sagewort (*Artemisia pycnocephala*), tree lupine (*Lupinus arboreus*), and coyote brush (*Baccharis pilularis* ssp. *pilularis*). Vegetated dune communities within the terrestrial study area support northern alligator lizard (*Elgaria coerulea*), southern alligator lizard (*Elgaria multicarinata*), western fence lizard (*Sceloporus occidentalis*), and gopher snakes (*Pituophis catenifer*); small rodents such as deer mouse (*Peromyscus maniculatus*), vagrant shrew (*Sorex vagrans*), and California vole (*Microtus californicus*); and a variety of birds including white-crowned sparrow (*Zonotrichia leucophrys*), Bewick’s wren (*Thryomanes bewickii*), American robin, common bushtit (*Psaltriparus minimus*), house finch, and mourning dove (*Zenaida macroura*).[11]

Developed/Landscaped/Ruderal

Developed and landscaped areas within and adjacent to the terrestrial study area include roads, buildings, parking lots, paved surfaces, existing facilities, and landscaping. These areas support a variety of ornamental trees and shrubs, nonnative grasses, and *ruderal* (opportunistic, weedy) species that tolerate sandy soils. Monterey cypress (*Hesperocyparis macrocarpus*), a native tree that is not locally native, is the most common species in this habitat; nonnative ngaio tree, blue gum (*Eucalyptus globulus*), blackwood acacia (*Acacia melanoxylon*), pride of Madeira, pink melaleuca (*Melaleuca nesophila*), and plume acacia (*Albizia lophantha*) are also represented. Other trees that are less common in this habitat include native Monterey pine (*Pinus radiata*) and Catalina ironwood (*Lyonothamnus floribundus* ssp. *asplenifolius*), along with nonnative New Zealand Christmas tree (*Metrosideros excelsa*) and peppermint tree (*Agonis flexuosa*). The understory of this habitat consists of litter and sparse vegetation in dense canopy areas. In more open canopy areas and on edges, the vegetation is similar to dune mat (disturbed) vegetation but in some areas supports more nonnative grasses.

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9 California Invasive Plant Council, 2020. *Carpobrotus edulis*. California Invasive Plant Council, 2006-2020. *https://www.cal-ipc.org/plants/profile/carpobrotus-edulis-profile/*

10 California Invasive Plant Council, 2020. *Carpobrotus chilensis*. California Invasive Plant Council, 2006-2020. *https://www.cal-ipc.org/plants/paf/carpobrotus-chilensis-plant-assessment-form/*

11 Russell, Will, Jennifer Shulzitski, and Asha Setty, 2009. Evaluating Wildlife Response to Coastal Dune Habitat Restoration in San Francisco, California. Ecological Restoration, Vol. 27, No. 4, pp. 439-448, December.

The understory also sometimes supports the nonnative, invasive species Cape ivy (*Delairea odorata*) and English ivy (*Hedera helix*). Beneath the ornamental stand of trees near the zoo staging area, California blackberry (*Rubus ursinus*) vines are sporadically present.

Developed portions of the terrestrial study area provide limited, low quality habitat for wildlife because they are predominantly hardscape and highly disturbed (ruderal) or maintained landscaped areas. Landscaped and ruderal areas can still provide cover, foraging, and nesting habitat for a variety of bird species as well as reptiles and small mammals, especially those that are tolerant of disturbance and human presence. Birds commonly found in such areas include nonnative species such as house sparrow (*Passer domesticus*) and European starling (*Sturnus vulgaris*), as well as birds native to the area, including American robin (*Turdus migratorius*), house finch (*Haemorhous mexicanus*), and western scrub jay (*Aphelocoma californica*). Other wildlife expected in urban landscaped areas of the terrestrial study area include Norway rat (*Rattus norvegicus*), striped skunk, Virginia opossum, and raccoon.

MARINE COMMUNITIES

Intertidal and Subtidal Zones

The *intertidal*[12] and beach habitat of Ocean Beach supports communities of *benthic* (bottom-dwelling) invertebrates, *plankton* (drifting organisms in the water column), fish, birds, and marine mammals.[13,14] The intertidal and *subtidal*[15] habitats at Ocean Beach are mostly outside of the project footprint except during large sand placement of dredged material. Importantly, while some placement could occur within intertidal and subtidal areas, the majority of the sand and dredge material would be placed in the upland foredune environment of Ocean Beach and would passively deposit into the intertidal and subtidal environments through wave and tidal action.

The intertidal and subtidal zones adjacent to Ocean Beach are mainly composed of sandy substrates and other soft-bottom material.[16] In the shallower sand and mud bottom, the benthic fauna includes various assemblages of polychaete worms, crustaceans (amphipods, crabs, and ostracods), mollusks (pelecypods, gastropods, and scaphopods), and echinoderms (starfish, brittle stars, heart urchins, sea cucumber, and sea pens). Other marine invertebrates that may be present include nematodes, coelenterates, echiuridans, and rhychocoels.[17] The amphipods, polychaetes, and flies of the intertidal zone provide food for shorebirds. South Ocean Beach has a long, wide intertidal zone which provides ample foraging opportunity for a wide variety of shorebirds.[18] In comparison with other National Park Service beaches in the region, South Ocean Beach is among those with the greatest shorebird abundance and species richness.[19] Shorebird species that frequent this habitat in abundance during migration or overwinter within the terrestrial study area include

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12 The intertidal environment is the marine area within the range of tidal influence.

13 McCormick, Susan J. 1992. The Seasonal Intertidal and Nearshore Fish and Invertebrate Communities of Ocean Beach, San Francisco: Final Report. Prepared for Environmental Science Associates, San Francisco, California, May.

14 Fong, Darren, et al. 2000. Inventory of Benthic Invertebrates in Sandy Intertidal and Beach Habitats, Ocean Beach, San Francisco, CA. Golden Gate National Recreation Area, Division of Resource Management and Planning. February.

15 The subtidal environment is any marine area that occurs at depths below the low tide line, including deeper open water habitats.

16 SFPUC, Southwest Ocean Outfall Regional Monitoring Program, Sixteen-Year Summary Report, 1997-2012, April 2014.

17 Ibid.

18 Gulf of the Farallones National Marine Sanctuary (GFNMS) and Farallones Marine Sanctuary Association (FMSA), 2006. Beach Watch 2006 Annual Report, 2006.

19 Ibid.

sanderling (*Calidris alba*), willet (*Tringa semipalmata*), western sandpiper (*Calidris mauri*), marbled godwit (*Limosa fedoa*), and whimbrel (*Numenius phaeopus*), among others.[20]

Seasonal *epibenthic*[21] surveys conducted in late winter and fall off Ocean Beach showed arthropods, such as crabs, dominated the intertidal and subtidal habitat. In the benthic surveys,[22] echinoderms, mainly sand dollar (*Dendraster exentricus*), were the dominant species. The surveys found that the most characteristic *infaunal*[23] species of the beach and intertidal habitat are great beach hopper (*Orchistoidea corniculata*), mole crab (*Emerita analoga*), Pismo clam (*Tivela stultorum*), razor clam (*Siliqua patula*), short-spined starfish, a nephtyid polychaete worm (*Nephtys californensis*), and various species of jellyfish.[24]

Intertidal and subtidal habitat consisting of natural hardscape features is limited within the marine study area. Bathymetric mapping[25] data provided by the U.S. Army Corps of Engineers (Corps) for the marine environment offshore of Ocean Beach suggest a lack of large rocky outcroppings, as are commonly found in other coastal California environments. The nearest large natural hardscape outcroppings are found at Seal Rock and Mussel Rock, which are approximately 3 miles north and 5 miles south of the project area, respectively. Natural hardscape features like these can support a diverse assemblage of marine fish and invertebrates including the federally protected black abalone. Expansive rocky substrate is required to support black abalone, as sand-bottom environments do not provide suitable habitat or food resources to support the species.[26,27]

Open Water

The ocean area off the coast at Ocean Beach provides habitat to 50 to 100 species of fish in a given period. Fish sampling conducted 3 to 4 miles offshore of Ocean Beach shows species of sharks, skates, ratfish, midshipman (*Porichthys* sp.), pipefish (Syngnathidae), poachers, sculpins, surfperch, goby, ling cod (*Ophiodon elongates*), snailfish (*Liparis* sp.), rockfish, halibut, sole, flounder, and turbot (*Scophthalmus maximus*).[28] Other surveys have found demersal fish species such as speckled sanddab (*Citharichthys stigmaeus*), redtail surfperch (*Amphistichus rhodoterus*), English sole (*Parophrys vetulus*), shiner surfperch (*Cymatogaster aggregate*), and Pacific sanddab (*Citharichthys sordidus*).[29] The life history and potential occurrence of special-status marine species, including marine mammals, are discussed in detail within Appendix F.

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20 Ibid.
21 Epibenthic refers to organisms that live on, or just above, the bottom sediment of the marine environment.
22 U.S. Army Corps of Engineers, Five-Year Programmatic Environmental Assessment and 404(b)(1) Analysis for San Francisco Main Ship Channel Operations and Maintenance Dredging Fiscal Year 2012-2016, January 2013.
23 Infaunal refers to marine animals that live in the substrate of the aquatic environment.
24 U.S. Army Corps of Engineers, Five-Year Programmatic Environmental Assessment and 404(b)(1) Analysis for San Francisco Main Ship Channel Operations and Maintenance Dredging Fiscal Year 2012-2016, January 2013.
25 Mapping of the depths of landforms below sea level.
26 National Oceanic and Atmospheric Administration (NOAA), Final Rulemaking to Designate Critical Habitat for Black Abalone, Federal Register 76 (208): 66805-66844, October, 2011.
27 Micheli, F., O. Shelton, S. Bushinsky, A. Chiu, A. Haupt, K. Heiman, C. Kappel, M. Lynch, R. Martone, R. Dunbar, and J. Watanabe, Persistence of Depleted Abalones in Marine Reserves of Central California, Biological Conservation 141 (4): 1078-1090, 2008.
28 Ibid.
29 Ibid.

Numerous species of waterbird occur in the open water marine habitat offshore of South Ocean Beach. These species include a mix of migrant, wintering, and breeding species, such as brown pelican (*Pelecanus occidentalis californicus*), double-crested cormorant (*Phalacrocorax auritus*), surf scoter (*Melanitta perspicilllata*), black oyster catcher (*Haematopus bachmani*), red-throated loon (*Gavia stellata*), Pacific loon (*Gavia pacifica*), common murre (*Uria aalge*), western grebe (*Aechmophorus occidentalis*), Clark's grebes (*A. clarkii*), and a variety of gulls and terns.[30]

SENSITIVE NATURAL COMMUNITIES

A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, state, or federal agencies and therefore given special regulatory recognition. Most sensitive natural communities are given special consideration because they perform important ecological functions, such as maintaining water quality and providing essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species and therefore are considered sensitive from a botanical standpoint. For example, the California Department of Fish and Wildlife identifies sensitive natural communities in its California Natural Diversity Database because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. One criterion for a sensitive natural community is a database global rank of G1, G2, or G3 or a state rarity rank of S1, S2, or S3.[31,32,33]

Field surveys supporting the biological resources assessment documented the sensitive natural community yellow sand verbena – beach burr dune mat (*Abronia latifolia – Ambrosia chamissonis* Herbaceous Alliance) among ice plant mats (*Mesembryanthemum* spp. - *Carpobrotus* spp. Herbaceous Semi-Natural Alliance) within the disturbed dune mat vegetation community of the terrestrial study area. This alliance has a state rarity ranking of S3 due to its limited distribution in the state, making it vulnerable to extirpation. The yellow sand verbena – beach burr dune mat alliance is limited to small patches of native dune plants among prolific mats of ice plant. The alliance has a greater concentration of native species in the southern portion of the study area near Fort Funston. See Figures 4.6-2a through 4.6-2d for the distribution of disturbed dune mat vegetation community.

This sensitive dune alliance supports common native dune flora, locally significant plants, and special-status plants. Although most of the dune habitat in the terrestrial study area is highly disturbed and the quality of

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30 eBird: Ocean Beach--Seawatch across from Oceanside Water Pollution Plant Hotspot, *https://ebird.org/hotspot/L1022599,* accessed June 15, 2020.

31 Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, A Manual of California Vegetation, Second Edition, California Native Plant Society and California Department of Fish and Game, Sacramento, 2009.

32 California Department of Fish and Wildlife, California Natural Diversity Database, Rarefind 5 printout and geographic information system database for the San Francisco North and San Francisco South 7.5-minute topographic quadrangles, accessed September 10, 2020.

33 California Department of Fish and Wildlife, Natural Diversity Database, Special Animals List, Periodic publication, July 2020, p. iii:
G1 = Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 = Imperiled—At high risk of extirpation in the state due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
S3 = Vulnerable—At moderate risk of extirpation in the state due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

these remnant dunes in terms of native plant diversity and abundance is variable, some of this dune habitat is suitable for special-status dune plants, particularly where larges patches of native dune plants occur.

No sensitive natural communities are known or described from the marine study area.

WETLANDS AND OTHER WATERS

The Corps, Regional Water Quality Control Board, California Department of Fish and Wildlife, and California Coastal Commission regulate wetlands and other waters that meet the respective agencies' criteria for defining wetland or water features. Three definitions of "wetland" are considered for purposes of this project, one administered by the Corps under the federal Clean Water Act (federal wetlands and other waters), one administered by the State Water Resources Control Board and San Francisco Bay Regional Water Quality Control Board under the Porter-Cologne Water Quality Control Act (state wetlands and other waters), and one administered by the California Coastal Commission under the California Coastal Act (wetlands and other waters in the Coastal Zone). See Section 4.6.3, Regulatory Framework, below, for agency definitions of "wetlands" and a description of federal and state regulations applicable to wetlands and other waters.

An aquatic resources delineation of the study areas was performed to identify wetlands and waters subject to federal and state regulation.[34] The delineation identified the Pacific Ocean as a traditional navigable water and therefore a water of the United States under section 404 of the federal Clean Water Act and section 10 of the River and Harbors Act.[35] The Pacific Ocean is also regulated as a water of the state under the Porter-Cologne Water Quality Control Act and subject to regulation under the California Coastal Act.

No potential wetlands meeting federal or state definitions for the Corps, Regional Water Quality Control Board, or California Coastal Commission were identified in the aquatic resources delineation. These types of wetlands are therefore not discussed further in this analysis.

TERRESTRIAL WILDLIFE MOVEMENT CORRIDORS

Wildlife movement corridors are considered an important ecological resource by the California Department of Fish and Wildlife and U.S. Fish and Wildlife Service and under CEQA. Movement corridors may provide favorable locations for wildlife to travel between different habitat areas such as foraging sites, breeding sites, cover areas, and preferred summer and winter range locations. They may also function as dispersal corridors allowing animals to move between various locations within their range.

Contiguous beaches along the western fringe of the San Francisco Peninsula may serve as a coastal corridor for wildlife movement between open space habitats connected to the coast, such as Lands End and the nearby western terminus of Golden Gate Park, which are connected by North Ocean Beach. Aside from Fort Funston, other open space areas connected to South Ocean Beach within the terrestrial study area provide marginal or limited habitat value for wildlife, as urban development generally abuts the narrow coastline. The lack of cover on much of Ocean Beach also limits use of the beach for native terrestrial mammals that

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34 Environmental Science Associates, 2021. Ocean Beach Climate Change Adaptation Project Aquatic Resources Delineation. Prepared for the San Francisco Public Utilities Commission, January 2021.

35 The term "waters of the United States," as defined in the Code of Federal Regulations under the Navigable Waters Protection Rule (33 Code of Federal Regulations Part 328), includes: (1) territorial seas and navigable waters; (2) perennial and intermittent tributaries that, in a typical year, contribute surface water flow to such [territorial seas and navigable] waters; (3) certain lakes, ponds, and impoundments of jurisdictional waters; and (4) wetlands adjacent (hydrologically connected in a typical year through surface water [includes connections resulting from normal flooding]) to other jurisdictional waters.

reside in the western portion of the city. For these reasons, wildlife traffic within the study area may be limited to species using the intertidal and unvegetated beach shoreline habitat on a transient basis; these species mainly consist of a variety of shorebirds that forage in these environments. The terrestrial study area does not provide a connection between different habitat areas; rather, the study area offers the same or similar habitat opportunity for local wildlife as surrounding development does.

SPECIAL-STATUS SPECIES

A number of species known to occur in either the marine or terrestrial study areas are protected under federal and/or state endangered species laws, have been designated as species of special concern by the California Department of Fish and Wildlife, or are afforded certain protection through regulatory means such as the California Fish and Game Code. Species recognized under these terms are collectively referred to as *special-status species*. For the purpose of this EIR, special-status species are those that meet any of the following criteria:

1. Species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 Code of Federal Regulations 17.12 [listed plants], 17.11 [listed animals], and various notices in the Federal Register [proposed species]).

2. Species that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (61 Code of Federal Regulations 40, February 28, 1996).

3. Species listed or proposed for listing by the state as rare, threatened, or endangered under the California Endangered Species Act (14 California Code of Regulations 670.5).

4. Species described by the California Department of Fish and Wildlife as species of special concern.[36]

5. Species designated as fully protected by the state, most of which are also listed as either endangered or threatened.

6. Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code section 1900 et seq.).

7. Species that meet the definitions of rare and endangered under CEQA. CEQA Guidelines section 15380 provides that a plant or animal species may be treated as “rare or endangered” even if not on one of the official lists.

8. Plants considered to be “rare, threatened or endangered in California” under the California Rare Plant Ranking system, which includes Rank 1A, 1B, 2A, and 2B plant species.[37]

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[36] A California species of special concern is one that meets the following criteria, 1) has been extirpated from the state entirely or (for birds) during its primary or breeding season; 2) Federally listed as threatened or endangered and; meets the state definition of threatened or endangered but has not been formally listed; 3) is undergoing or has experienced serious population declines or range restrictions that put it at risk of becoming threatened or endangered; and 4) has naturally small populations susceptible to high risk from any factor that could lead to declines that would qualify it for threatened or endangered status.

[37] California Rare Plant Ranking system rankings are defined in detail in Section 4.6.3, Regulatory Framework.

Lists of special-status plant and animal species assessed for their potential to occur within the terrestrial study area were compiled based on data contained in the California Department of Fish and Wildlife Natural Diversity Database[38] and the California Native Plant Society Inventory of Rare and Endangered Plants[39] for the San Francisco North and South United States Geological Survey (USGS) 7.5-minute topographical quadrangles, U.S. Fish and Wildlife Service Official Species List and CalIPaC Trust Report,[40] and the list of locally significant plants for San Francisco County.[41] Marine special-status species were compiled from the U.S. Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Wildlife listings, Federal Register notifications, and assorted published and non-published literature relevant to the marine study area. Several additional species were identified based on the findings of technical reports and environmental literature.

Tables 4.6-1 and **4.6-2** identify special-status plant and terrestrial animal species that have a moderate or higher potential to occur within the terrestrial study area. **Table 4.6-3** identifies special-status fish and marine mammal species and California coast fish species managed under the Magnuson-Stevens Act that have a moderate or higher potential to occur within the marine study area. Each species' legal or protective status, habitat requirements, blooming period (for plants), and life stage or seasonal presence (for fish) are also described within the tables. Appendix F provides more detailed descriptions for the species with a moderate or higher potential to occur in the project area (as listed within Tables 4.6-1, 4.6-2, and 4.6-3) and contains expanded tables (Tables F-1 through F-4) that list all species considered for their potential presence in the study areas, including special-status plant and animal species determined to have low potential to occur and/or determined to be absent from the study areas, as well as animal species without special status but included on other federal, state, or other entity species-focused conservation lists. Figure F-1 in Appendix F identifies the locations of regional special-status species occurrences as reported in the California Natural Diversity Database within 5 miles of the project area.

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38 California Department of Fish and Wildlife, California Natural Diversity Database (CNDDB) Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, accessed May 29, 2020.

39 California Native Plant Society (CNPS), Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, *http://www.rareplants.cnps.org/result.html?adv=t&quad=3712274:3712264,* accessed June 15, 2020.

40 U.S. Fish and Wildlife Service (USFWS), My Project, IPaC Trust Resource Report and Official Species List of Federally Endangered and Threatened Species that may occur in the Ocean Beach Long-Term Improvements Project location, and/or may be affected by the proposed project, July 20, 2020.

41 Wood Biological, Locally Significant Plant Species of San Francisco County, prepared by Mike Wood, July 4, 2015, *http://cnps-yerbabuena.org/wp-content/uploads/SF-locally-significant-plants_2015-07-04_sorted-alphabetically.pd*f, accessed February 20, 2018.

Table 4.6-1 Special-Status Plant Species that may occur in the Terrestrial Study Area

Common Name ***Scientific Name***	**Federal Status**	**State Status**	**CRPR**	**Habitat Description / Blooming Period**	**Potential to Occur in the Study Area**
PLANTS					
San Francisco spineflower *Chorizanthe cuspidata var. cuspidata*	--	--	Rank 1B.2	Sandy terraces and slopes of coastal bluff scrub, coastal dunes, coastal prairie, and coastal scrub. April – July	**Moderate.** Occurs south of the terrestrial study area near the northern boundary of Fort Funston among other native dune species and nonnative, invasive ice plant. Was not identified within the terrestrial study area during 2019/2020 rare plant surveys. Suitable habitat is present in disturbed dune mat vegetation with a dominance of native dune species along the southern project area boundary with Fort Funston.

SOURCE: CNPS, 2021

NOTES:

Other Special Status species unlikely to occur in the project area are described in Appendix F.

The terrestrial study area includes the terrestrial construction and operations areas and a 15- to 50-foot buffer.

For the "Potential to Occur in the Study Area" column, definitions are as follows:

Moderate = Habitat is marginally suitable (i.e., of low or moderate quality) or the study area is within the known range of the species, even though the species was not observed during biological surveys.

California Rare Plant Rank (CRPR):

Rank 1A = Plants presumed extirpated in California and either rare or extinct elsewhere.
Rank 1B = Plants rare, threatened, or endangered in California and elsewhere.
Rank 2A = Plants presumed extirpated in California, but more common elsewhere.
Rank 2B = Plants rare, threatened, or endangered in California, but more common elsewhere.

An extension reflecting the level of threat to each species is appended to each rarity category as follows:

.1 – Seriously endangered in California.
.2 – Fairly endangered in California.
.3 – Not very endangered in California.

Table 4.6-2 Special-Status Animal Species that may occur in the Terrestrial Study Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat Description / Blooming Period	Potential to Occur in the Study Area
SPECIES LISTED OR PROPOSED FOR LISTING				
BIRDS				
Western snowy plover *Charadrius nivosus nivosus*	FT	CSC	Sandy beaches, salt pond levels, and shores of alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Present (no nesting potential).** Overwinters on Ocean Beach, generally present between July and May. Concentrated presence within the NPS designated protection area between Stairwell 21 and Sloat Boulevard (present within the North Ocean Beach borrow site).
American peregrine falcon *Falco peregrines anatum*	FD	CD, CFP	Woodlands, coastal habitats, riparian areas, coastal and inland waters, human-made structures that may be used as nest or temporary perch sites.	**Moderate (unlikely to nest).** May hunt birds on Ocean Beach within the study area. No known nest sites within the study area; typical cliff features for nesting are not present within the study area, though the species could nest on buildings or structures.
Brown pelican *Pelecanus occidentalis californicus* (nesting colony/ communal roosts)	FD	CD, CFP	Pelagic forager along ocean and bay shorelines whose breeding range extends from the Channel Islands south to Mexico.	**Present (no nesting potential).** Forages in the Pacific Ocean offshore of the study area; typically present from May through November.
Bank swallow *Riparia riparia* (nesting)	--	CT	Vertical banks and cliffs with sandy soil, near water. Nests in holes dug in cliffs and river banks.	**Present (potential to nest).** Breeding colony located in the vertical bluffs above Ocean Beach across from the Oceanside Treatment Plant and south of the study area within the bluffs below Fort Funston; referred to generally as the "Fort Funston colony." Species is present during the breeding season, which spans April through July, according to the 1992 California Department of Fish and Wildlife Bank Swallow Recovery Plan and the National Park Service 2019 and 2020 Bank Swallow Monitoring Reports. Nesting was not documented within the project area in 2020 and 2021.
OTHER SPECIAL-STATUS SPECIES				
BIRDS				
Western burrowing owl *Athene cunicularia* (overwintering burrow sites)	--	CSC	Open grasslands with low or no vegetation where existing rodent burrows occur for occupation.	**High (no nesting potential).** One individual was documented overwintering within the riprap revetment west of the Oceanside Treatment Plant within the project area, and one individual was documented beneath the staircase and walkway at Noriega Street and the Great Highway, north of the project area. No suitable nesting or foraging habitat is present in the study area.

Table 4.6-2 Special-Status Animal Species that may occur in the Terrestrial Study Area (Continued)

Common Name *Scientific Name*	Federal Status	State Status	Habitat Description / Blooming Period	Potential to Occur in the Study Area
OTHER SPECIAL-STATUS SPECIES (CONT.)				
BIRDS (CONT.)				
San Francisco common yellowthroat *Geothlypis trichas sinuous*	--	CSC	Forages in various marsh, riparian and upland habitats. Nests on or near the ground in concealed locations.	**Moderate (unlikely to nest).** Suitable dense riparian and wetland habitat for nesting is not present in the study area but is located within Lake Merced to the east. This species may occur in the study area while foraging.
MAMMALS				
Western red bat *Lasiurus blossevillii*	--	CSC	Roosts primarily in trees, 2 to 40 feet above ground, from sea level up through mixed conifer forests. Prefers habitat edges and mosaics with trees that are protected from above and open below with open areas for foraging.	**Moderate (potential to establish maternity roosts).** Suitable roosting habitat for this species is available in the matures trees around the San Francisco Zoo and along the west shoreline of Lake Merced. May forage over the dune vegetation communities of the project area. Detected at Fort Funston during acoustic monitoring between 2004 and 2005.

SOURCES: GGNRA, 2013; Fellers, Gary M, 2005; CDFW, 1992; CDFW, 2021; NPS, 2019; NPS, 2020; NPS, 2021; USFWS, 2021.

NOTES:

Other Special Status species unlikely to occur in the project area are described in Appendix F.

The terrestrial study area includes the terrestrial construction and operations areas and a 15- to 50-foot buffer.

For the “Potential to Occur in the Study Area” column, definitions are as follows:

Present = Species was observed during reconnaissance or focused surveys of the terrestrial study area.

High = Species is expected to occur, habitat meets species requirements and is of moderate or high quality, and the study area is within the known species range.

Moderate = Habitat is marginally suitable (i.e., of low or moderate quality) or the study area is within the known range of the species, even though the species was not observed during biological surveys.

Federal: U.S. Fish and Wildlife Service (USFWS)

FE = Listed as “endangered” under the FESA
FT = Listed as “threatened” under the FESA
FPD = Proposed delisted
FD = Delisted

State: California Department of Fish and Wildlife (CDFW)

CE = Listed as “endangered” under the CESA
CT = Listed as “threatened” under the CESA
CD = Delisted
CSC = CDFW designated “species of special concern”
CFP = CDFW designated “fully protected”

Table 4.6-3 Special-Status Fish and Marine Mammal Species Present or with Potential to occur in the Marine Study Area

Common Name *Scientific Name*	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area	Time Period Present in Study Area Waters
SPECIES LISTED OR PROPOSED FOR LISTING					
FISH					
Green Sturgeon (Southern Distinct Population Segment [DPS]) *Acipenser medirostris*	FT	CSC	Marine and estuarine environments and Sacramento River; all of San Francisco Bay-Delta	**Moderate.** There are little data on green sturgeon presence in coastal waters. This species may forage in or near the study area but its distribution in ocean waters is essentially unknown. Spawning only occurs in the upper Sacramento River watershed for the southern DPS, but fish are known to frequent coastal waters along the Pacific Coast to a depth of approximately 110 meters.	Year-round
Longfin Smelt *Spirinchus thaleichthys*	FC	CT	Anadromous estuarine species occupying the middle or bottom of the water column in salinities between 15 and 30 parts per trillion.	**Moderate.** This species is documented to inhabit the deep channels of Central San Francisco Bay for most of the year. Seasonally observed within the offshore environment including potentially in the waters adjacent to the project area.	Year-round
MARINE MAMMALS					
California Sea Lion *Zalophus californianus*	MMPA	--	Coastal waters off California; ranges from the Farallon Islands off San Francisco to the San Benito Islands off Baja California.	**Moderate**. Common within San Francisco Bay and the nearshore coastal environment.	Seasonal
Harbor Seal *Phoca vitulina richardii*	MMPA	--	Common along the California coast and within San Francisco Bay.	**Moderate**. Common within San Francisco Bay and the nearshore coastal environment.	Year-round
Harbor Porpoise *Phocoena phocoena*	MMPA	--	Common along the California coast and occasionally observed within San Francisco Bay.	**Moderate**. Common within San Francisco Bay and the nearshore coastal environment.	Year-round
Killer Whale (Southern Resident DPS) *Orcinus orca*	FE, MMPA	--	Transient species observed throughout coastal California waters, ranging from Alaska to Costa Rica.	**Moderate**. Presence and occurrence can be common but unpredictable	Year-round
Humpback Whale (Central American DPS) *Megaptera novaeangliae*	FE, MMPA	--	Cosmopolitan species comprised of distinct feeding groups. Whales migrate from winter calving and mating areas to California coast in summer and fall period.	**Moderate**. Presence and occurrence along the California coast confined to summer period; May through September.	Seasonal

Table 4.6-3 Special-Status Fish and Marine Mammal Species Present or with Potential to occur in the Marine Study Area (Continued)

Common Name *Scientific Name*	Federal Status	State Status	Habitat Description	Potential to Occur in the Study Area	Time Period Present in Study Area Waters
SPECIES LISTED OR PROPOSED FOR LISTING (CONT.)					
MARINE MAMMALS (CONT.)					
Humpback Whale (Mexico DPS) *Megaptera novaeangliae*	FT, MMPA	--	Most humpbacks that feed in California and Oregon waters in summer originate from the threatened Mexico DPS, while a much smaller fraction originate from the endangered Central American DPS.	**Moderate**. Presence and occurrence along the California coast confined to summer period; May through September.	Seasonal
Gray Whale (Eastern North Pacific DPS) *Eschrichtius robustus*	FDR, MMPA	--	Gray whales are found mainly in shallow coastal waters in the North Pacific Ocean. Most commonly encountered great whale along the California coast.	**Moderate**. Occurrence along the California coast typically confined to the winter migration period; most commonly December through February.	Seasonal
CALIFORNIA COAST FISH SPECIES MANAGED UNDER THE MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT					
Fisheries Management Plan				**Potential to Occur in the Study Area**	**Time Period Present in Study Area Waters**
Coastal Pelagic (2 Species)*				**Moderate**	Seasonal
Pacific Groundfish (15 Species)*				**Low-Moderate, Moderate**	Seasonal

SOURCES: National Oceanic and Atmospheric Administration (NOAA), 2019; NOAA, 2015; NOAA, 2020; San Francisco Public Utilities Commission (SFPUC), April 2014; Huff, D., Lindley, S., Ranking, P, Mora, E., 2011; Tenera, 2014; Boehlert & Mundy, 1987; PFMC, 2005.

NOTES:

Other Special Status species unlikely to occur in the project area are described in Appendix F.

For the "Potential to Occur in the Study Area" column, definitions are as follows:

High = Suitable foraging or spawning/rookeries/birthing habitat is present and/or the species has been documented to be present throughout the year and/or in substantial numbers.

Moderate = Suitable foraging or spawning//rookeries/birthing habitat is present and/or the species has been documented to be present for part of the year

MMPA = Marine Mammal Protection Act

* = See Appendix F, Table F-4, for the individual species protected under the Coastal Pelagic and Pacific Groundfish management plans with potential to occur in the marine study area.

Federal: National Marine Fisheries Service (NMFS)
FT = Listed as "threatened" under the FESA
FC = Candidate for listing under the FESA
FDR = Federally Delisted

State: California Department of Fish and Wildlife (CDFW)
CT = Listed as "threatened" under the CESA
CSC = CDFW designated "species of special concern"

SPECIAL-STATUS PLANTS

Most of the special-status plant species identified in Appendix F, Table F-1 were determined to have no potential or low potential to occur in the terrestrial study area. For the special-status plant species whose suitable habitat is present in the study area, many were determined to be absent following rare plant surveys conducted in 2019 and 2020 in support of the biological resources assessment.[42] Surveys followed California Department of Fish and Wildlife[43] and California Native Plant Society protocol[44] and were timed to

[42] BioMaAS, 2021. Ocean Beach Climate Change Adaptation Project Biological Resources Assessment, prepared for the San Francisco Public Utilities Commission, November 2021.

[43] California Department of Fish and Wildlife, 2018. Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities, March 20, 2018. *https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=18959&inline*

[44] California Native Plant Society, 2001. CNPS Botanical Survey Guidelines. December 9, 1983; revised June 2, 2001. *https://cnps.org/wp-content/uploads/2018/03/cnps_survey_guidelines.pdf*

span the blooming/identification periods for all special-status plant species with potential to occur in the study area. One special-status plant, San Francisco spineflower (*Chorizanthe cuspidata cuspidata*), was identified within the greater biological resources assessment study area during these surveys but was not identified within the portion of the study area that would be directly disturbed during project construction. Records of this species closest to the project area are located near the northern boundary of Fort Funston within the disturbed dune mat vegetation community that borders the Great Highway southbound lanes.[45] For detailed information on this species and its presence in the study area, see Appendix F.

The following native species were observed in low abundance within disturbed dune mat or dune scrub communities in the terrestrial study area and are considered locally significant: yellow sand verbena, Heermann's bird's-foot trefoil, spike bent grass, beach burr, silver dune lupine, and Pacific seaside plantain.[46] None of these species, however, are abundant in the study area, as the disturbed dune mat community is heavily infiltrated with nonnative species, and while locally significant, these species are not afforded protection under CEQA as they are not considered rare, endangered, or threatened, or assigned a state listing that indicates they may become endangered or threatened in the foreseeable future throughout all or a significant portion of their range. Locally significant plant species are not discussed further in this document.

SPECIAL-STATUS TERRESTRIAL ANIMALS

Many of the special-status terrestrial animals listed in Appendix F, Table F-2 have no or low potential to occur in the terrestrial study area due to the absence of suitable habitat that is required by the animal species or necessary for their survival. Only special-status species known to occur within the study area or those determined to have at least a moderate potential to occur in the study area were considered in the impact analysis (see Table 4.6-2 for terrestrial animal species determined present or with a moderate or higher potential to occur). Several special-status birds are known to occupy the study area periodically throughout the year, including western snowy plover, American peregrine falcon (*Falco peregrines anatum*), bank swallow (*Riparia riparia*), brown pelican, San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), and western burrowing owl (*Athene cunicularia hypugaea*), some of which breed locally. Special-status bat species western red bat (*Lasiurus blossevillii*) was determined potentially present and could establish maternity roosts in the study area; these roosts would be protected under the California Fish and Game Code. Each of these species is described in detail in Appendix F. Bank swallow are also described under *Environmentally Sensitive Habitat Areas*, below.

SPECIAL-STATUS MARINE SPECIES

Special-Status Marine Mammals

A number of species of marine mammals are found offshore of Ocean Beach; however, only Pacific harbor seals, California sea lions, harbor porpoises, and recently, the bottlenose dolphin (*Tursiops truncates*) are sighted year-round. The bottlenose dolphin, however, was determined to have low potential for occurrence in the marine study area. No other *cetacean species*[47] that use the Central California coast as a migration corridor were determined likely to occur within the marine study area, given its proximity to the shoreline. Additionally, no known rookeries or haul-outs are present within the marine study area.

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45 Golden Gate National Recreation Area, 2013. Rare Plant Monitoring Data, Fort Funston, San Francisco, CA.

46 California Native Plant Society (CNPS). 2015. Locally Significant Plant Species of San Francisco County, version dated July 4, 2015. Yerba Buena Chapter of CNPS. *http://cnps-yerbabuena.org/exploring/locally-significant/*

47 A cetacean species is a marine mammal of the order *Cetacea*; a whale, dolphin, or porpoise.

Essential Fish Habitat

Under the Magnuson-Stevens Fishery Conservation and Management Act (see Section 4.6.3, Regulatory Framework, Section 4.6.3.1, *Federal*, below), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), National Marine Fisheries Service, Fishery Management Councils, and federal agencies are required to cooperatively protect essential fish habitat for commercially important fish species such as Pacific coast groundfish, Pacific salmon, highly migratory species, and coastal pelagic fish and squid. As defined by the U.S. Congress, essential fish habitat includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The waters off Ocean Beach are designated as essential fish habitat for fish managed under four fisheries management plans: the Pacific Coast Groundfish fisheries management plan, the Coastal Pelagic Species fisheries management plan, the Pacific Coast Salmon fisheries management plan, and the West Coast Highly Migratory Species fisheries management plan (see Table 4.6-3 and Table F-4 of Appendix F). Fish species present along the Central California coast that are likely to occur within the marine study area and that are included in fishery management plans prepared by regional fishery management councils under the Magnuson-Stevens Fishery Conservation and Management Act are listed in Table F-4.

CRITICAL HABITAT

The terrestrial study area is not located within designated critical habitat for any listed species.[48] Critical habitat for green sturgeon and leatherback sea turtle is designated along the California coastline waters of the Pacific Ocean within the marine study area. Additionally, critical habitat for humpback whale and southern resident killer whale is proposed in these waters.

GREEN STURGEON

Critical habitat is designated for green sturgeon along the California Pacific coastline. This designation includes the coastal marine habitat off California from Monterey Bay, north and east to include waters in the Strait of Juan de Fuca, Washington, and extends from mean higher high water to a depth of 358 feet.[49] This designation includes the marine study area.

LEATHERBACK SEA TURTLE

Critical habitat is also designated along the California Pacific coastline for leatherback sea turtles and includes portions of the marine study area.[50] Within Central California, critical habitat includes the area bounded by Point Sur north along the shoreline following the line of extreme low water to Point Arena extending outward to a depth of 656 feet.[51]

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48 USFWS Critical Habitat For Threatened and Endangered Species portal, *https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77,* accessed June 15, 2020.

49 NOAA, Final Rulemaking to Designate Critical Habitat for the Threatened Southern Distinct Population Segment of North American Green Sturgeon, Federal Register, Vol. 74, No. 195, October 9, 2009.

50 National Marine Fisheries Service, 2012. Final Biological Report. Final Rule to Revise the Critical Habitat Designation for Leatherback Sea Turtles. Prepared by NOAA's National Marine Fisheries Service. January*http://www.nmfs.noaa.gov/pr/pdfs/species/leatherback_criticalhabitat_biological.pdf.*

51 National Marine Fisheries Service, 2012. Final Biological Report. Final Rule to Revise the Critical Habitat Designation for Leatherback Sea Turtles. Prepared by NOAA's National Marine Fisheries Service. January.*: http://www.nmfs.noaa.gov/pr/pdfs/species/leatherback_criticalhabitat_biological.pdf.*

SOUTHERN RESIDENT KILLER WHALE

Although they are primarily found in northern Washington State, southern resident killer whales are known to travel as far south as Central California. Satellite tagging, opportunistic sighting, and acoustic recording data suggest that killer whales spend nearly all of their time on the continental shelf, within 21 miles of shore in water less than 656 feet deep. Designated critical habitat includes marine waters between the depth contours of 20 feet and 656 feet. The marine study area overlaps with a portion of this proposed critical habitat.[52]

PROPOSED CRITICAL HABITAT FOR HUMPBACK WHALE

Both the Central America and Mexico distinct population segments of humpback whale feed off the Pacific Coast of the United States from California to Alaska. Proposed critical habitat for these populations includes the waters of all Pacific Coast shorelines. The open water habitat within the marine study area overlaps with a small portion of the proposed designated critical habitat for humpback whales.

ENVIRONMENTALLY SENSITIVE HABITAT AREAS

California Coastal Act section 30107.5 defines an environmentally sensitive habitat as “any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.” For a resource to be determined an ESHA, it must retain three qualities: (1) the area contains rare species or habitat, which may include globally rare but locally abundant resources that have experienced historical decline; (2) the species or habitat is especially valuable, such as being unusually pristine, supporting species at the edge of their range, or otherwise special nature; and (3) the species or habitat in question is vulnerable to human disturbance or degradation.

The City and County of San Francisco’s local coastal program briefly addresses ESHAs in the Western Shoreline Area Plan. The plan notes that ESHAs may be associated with coastal bluffs, dunes, beach, and intertidal areas, but does not identify specific locations or resources as ESHA. Within the marine and terrestrial study areas, coastal bluffs that provide bank swallow nesting habitat, foredunes, beach and intertidal areas, and areas with vegetation characterized as disturbed dune mat are discussed below as to whether they may constitute ESHA. The final determination of whether the project area contains ESHA will be made by the planning commission or the coastal commission through consideration of the coastal development permit required for the project and may differ from the conclusion presented here.

BANK SWALLOW NESTING AREAS - FORT FUNSTON COLONY

Sandy bluffs at South Ocean Beach and Fort Funston seasonally host bank swallow while they breed and nest in burrows excavated into the bluff face. This local breeding area, referred to as the Fort Funston colony, is one of few coastal breeding locations in California for the state-listed threatened species which makes the breeding location especially valuable.

Bank swallows require sheer, firm but friable sand or gravel substrate within which burrows are excavated for nesting. These conditions are typically found in coastal bluffs or river banks subject to some continual erosion that maintains the near-vertical slope. Occurrence records in the California Natural Diversity

52 NOAA, 2021. Revision of Critical Habitat for the Southern Resident Killer Whale Distinct Population Segment. Prepared by National Oceanic and Atmospheric Administration. Federal Register, Vol. 86, No. 145.

Database include 12 coastal bank swallow breeding locations presumed *extant* (still active), including the Fort Funston colony.[53] Of the total extant records for bank swallow breeding locations in California, the coastal breeding areas make up 4 percent of the records; the vast majority of breeding locations are documented throughout the interior of the state along rivers or around lakes with suitable steep banks and friable soils for burrowing.[54] With the exception of one (presumed) extant[55] breeding location in Long Beach, all of the remaining coastal breeding locations are documented in Northern California between Monterey Bay and the Smith River mouth.[56] The nearest coastal breeding areas to the Fort Funston colony are located between Pescadero and Monterey, between 32 and 83 miles south of the project area.

The NPS has monitored the Fort Funston bank swallow breeding colony since 1993 and has consistently tracked use of different bluff spans since 2000, which collectively span approximately 3,290 linear feet of bluff habitat above South Ocean Beach and below Fort Funston (**Figure 4.6-3**).[57] One nesting area of the colony is located in the Ocean Beach bluffs above the 2010 emergency riprap revetment, across the Great Highway from the Oceanside Treatment Plant (see Figure 1-5 in Chapter 1, Introduction and Background). The NPS identifies this segment of the Fort Funston colony as designated monitoring area B – Revetment which spans approximately 500 linear feet. Bank swallows first occupied this portion of bluff face after the revetment was placed in 2010. Area B provides a smooth, vertical bluff face for bank swallows to establish burrows and has hosted the greatest number of the colony's burrows annually between 2011 and 2019.[58]

Burrow abundance within the boundaries of the historical nesting location (monitoring areas A, B and 1 through 4) has declined overall since 2007 (247 burrows recorded), with the lowest burrow count recorded in 2019 (88 burrows) until no active burrow nests were recorded in 2020 and 2021.[59,60,61,62] Recently, bank swallows have nested in coastal bluffs beyond the historical boundaries of the Fort Funston colony. In 2019, 2020 and 2021, bank swallow nesting was documented within the bluffs above Phillip Burton Memorial Beach, approximately 1 mile south of the historical nesting area.[63,64] 2020 marked the first year bank swallows did not nest within the boundaries of the Golden Gate National Recreation Area since NPS monitoring began.[65,66]

In 2020 and 2021, the colony did not nest at South Ocean Beach or the adjacent Fort Funston bluffs; the colony exclusively nested within the bluffs at Phillip Burton Memorial Beach in 2020 (44 burrows) and 2021 (41 burrows).

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53 California Department of Fish and Wildlife, California Natural Diversity Database, Biogeographic Data Branch, Commercial Version, accessed July 14, 2020.
54 Ibid.
55 While the occurrence record for this breeding location is considered extant within the California Department of Fish and Wildlife Natural Diversity Database, additional documentation that this breeding colony is currently active was not found during research in support of this analysis. A review of Google Earth imagery suggests this coastal bluff habitat has been developed with shoreline protection measures; therefore, it is possible that the southernmost coastal breeding colonies are located adjacent to Monterey Bay.
56 California Department of Fish and Wildlife, California Natural Diversity Database, Biogeographic Data Branch, Commercial Version, accessed July 14, 2020.
57 National Park Service, 2019. Bank Swallow Monitoring at Fort Funston, Golden Gate National Recreation Area, 2019 NPS Report.
58 Ibid.
59 Ibid.
60 National Park Service, 2020. *2020 Bank Swallow Summary Report*.
61 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.
62 National Park Service, 2021, Email from Bill Merkel (NPS) to Jonathan Mates-Muchin (SFPUC) re: Bank Swallow Nesting 2021. November 17, 2021.
63 Ibid.
64 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.
65 National Park Service, 2020. *2020 Bank Swallow Summary Report*.
66 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.

SOURCE: NPS, 2019; NPS, 2020; NPS, 2021

Ocean Beach Climate Adaptation Project

Figure 4.6-3
Bank Swallow Nesting Areas

The 2010 emergency riprap revetment was placed on Ocean Beach at this location as a temporary, emergency response following a severe El Niño storm season that caused substantial coastal bluff erosion and threatened critical wastewater system infrastructure. A 2010 study assessing the effects on the bank swallow colony from placement of the revetment documented that soils sampled above the revetment were more stable than the soils south of the project area, the concern being that the continual shear erosion of the bluff face required to support the colony would be prevented by the revetment shoreline protection.[67] Since placement of the revetment, erosion of the bluffs above the revetment has slowed but the bluff face has remained vertical and continued to host bank swallows while nesting through 2019.[68]

The NPS monitoring data documents a downward trend in the Fort Funston colony's abundance of burrow nests since 2007 when bluffs contained a maximum of 294 burrows; no burrows were documented within the designated monitoring areas in 2020 and 2021, which was unprecedented.[69,70,71] While the cause of the downward trend is uncertain, as bank swallows have shifted their nesting locations within the colony monitoring areas over time, it may indicate that the bluff habitat has degraded and is now less suitable as a breeding and nesting location than when monitoring began. Opportunistic selection of suitable bluff habitat for breeding and rearing young in a given year is characteristic bank swallow behavior – such as when bank swallow began using the area above the revetment after riprap stabilized the bluff face in 2010. The close proximity of the 2020 and 2021 nesting locations above Phillip Burton Memorial Beach, 1 mile south of the historical nesting area, is further evidence of this behavior.

The bank swallow nesting location in the bluffs above Ocean Beach may constitute an ESHA because it (1) supports a rare species, (2) is one of few active and established coastal breeding locations for this species in the state, and (3) may be vulnerable to degradation from natural erosion and human interference. However, the historical nesting location's proximity to the Great Highway and unrestricted exposure to the public on Ocean Beach indicates that the species is not particularly sensitive to human disturbance, even while breeding and rearing young. The nesting records in 2019, 2020, and 2021 in the bluffs above Phillip Burton Memorial Beach indicate there is suitable bluff habitat beyond the historical limits of the colony to support the threatened species population while breeding and nesting. Continued monitoring of use within both the historical colony boundaries and at this new location may reveal the colony extent is larger than previously understood and more ephemeral in where nesting sites are selected in a given year. If bank swallows continue to demonstrate preference for nesting in suitable bluff habitat above Phillip Burton Memorial Beach or generally beyond the historical limits of the Fort Funston colony, individual nesting areas within the historical nesting location (including the project area) may be less rare or valuable than previously understood. Continued monitoring by the park service could help understand how important the historical Fort Funston colony nesting location (and specifically designated monitoring area B that is within the project area) is to the continued breeding and nesting of bank swallows locally. Due to this uncertainty, this EIR conservatively considers the bluffs above Ocean Beach within the project area, where bank swallow have historically nested, to be a potential ESHA.

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67 Etchell, Sandra, 2010. Fort Funston Bank Swallow Colony Analysis for Incidental Take Permit, Great Highway at Ocean Beach Repair Project, San Francisco, San Francisco County. Prepared for Robert Chew Geotechnical, Inc. and the City and County of San Francisco, Department of Public Works, September, 2010.

68 National Park Service, 2019. Bank Swallow Monitoring at Fort Funston, Golden Gate National Recreation Area, 2019 Report.

69 Ibid.

70 National Park Service, 2020. 2020 Bank Swallow Summary Report.

71 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.

INTERTIDAL ZONE AND BEACH

The intertidal zone and beach habitat of the marine and terrestrial study areas support the special-status species western snowy plover and green sturgeon. The intertidal zone provides benthic invertebrate forage for western snowy plover and a wide variety of other non-special-status shorebird species who seasonally occupy or use Ocean Beach as a stop-over location during migration. Western snowy plover seasonally occupy North Ocean Beach while overwintering, primarily within the NPS-designated Snowy Plover Protection Area, a small area of unvegetated, sandy beach which overlaps the project area on North Ocean Beach. Green sturgeon also feed on benthic invertebrates of the intertidal zone and may be present year-round; however, their presence within the marine study area would likely be temporary during migration between freshwater spawning habitat and the Pacific Ocean. Critical habitat for green sturgeon extends into the intertidal zone of the marine study area, as does essential fish habitat for the California coast species managed under the Magnuson-Stevens Fisheries Conservation Act, including coastal pelagic, pacific groundfish, pacific coast salmon, and highly migratory species (see Table F-4, in Appendix F-1). While these habitats generally play an important role in supporting the species identified, the project area does not contain habitat characteristics or support uses by these species that are especially rare or valuable and which are particularly vulnerable to human disturbance, such as nesting or spawning habitat areas. Moreover, the extent of intertidal and beach habitats supporting these species within the project area is small relative to that which exists in the immediate area and along the greater California coastline. These habitats are currently used by the public without many restrictions, except for the plover protection area, and continue to host the species in question, suggesting they are not easily disturbed or degraded by human activities. For these reasons, this EIR does not consider the intertidal zone and beach habitats of the marine and terrestrial study areas to constitute ESHAs.

DUNE HABITAT

Dune habitat occurs throughout the terrestrial study area inland of the intertidal zone and beach habitats where exposed sandy soils crest at the limit of wave reach and transition into mats of dune vegetation. Traditional foredune habitat contains undulating, varied topography which forms parallel to the shoreline as windblown sand accumulates among low-growing vegetation adapted to the harsh coastal environment.[72] Within the study area, topography at the transition from beach to dune habitat is varied and includes areas with gradual sandy slopes, riprap revetments, or steeply sloped, near vertical bluff. Most of the study area's dune habitat can be characterized as a narrow band of highly constrained, plateaued foredunes with disturbed dune mat vegetation between the beach, riprap or bluff edge and the Great Highway infrastructure. The vegetation community within these areas is described as disturbed because of the characteristic barren patches of sand among predominant mats of invasive ice plant with some other common, native dune associates. This same assemblage of dune plants is present among developed portions of the study area, including the roadway medians and shoulders of the Great Highway and Sloat Boulevard; however, these areas cannot be characterized as traditional dune habitat because they do not contain dune characteristics beyond sandy soil and vegetation associates.

Unrestricted pedestrian access through areas supporting disturbed dune mat vegetation in the study area allows for continual disturbance from trampling. This vegetation community is composed of two, intermixed alliances, including ice plant mat (*Mesembryanthemum* spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance) and yellow sand verbena – beach burr dune mat (*Abronia latifolia – Ambrosia chamissonis*

[72] Newkirk, Sarah, et al., 2018. *Toward Natural Shoreline Infrastructure to Manage Coastal Change in California.* Prepared for California's Fourth Climate Change Assessment, August.

Herbaceous Alliance). *Abronia latifolia – Ambrosia chamissonis* Herbaceous Alliance is identified as a sensitive natural community by California Department of Fish and Wildlife. The yellow sand verbena – beach burr dune mat alliance, in the absence of invasive ice plant, is more likely to support special-status dune plants within the study area, such as San Francisco spineflower. This alliance, with its greater abundance of native dune flora is concentrated near the project area boundary with Fort Funston where foredunes are broader at the Great Highway curve east toward Skyline Boulevard (see Figure 4.6-2d). As discussed, San Francisco spineflower has not been documented within the project area but has potential to occur within this dune community where higher concentrations of other native dune flora are present.

Dynamic and evolved coastal dunes are generally rare in the state, are vulnerable to human disturbance, and can support unique or rare flora and fauna. An advanced coastal dune system contains many geomorphic expressions of wind velocity and sand deposition. These systems are broad enough to contain established foredunes with sparse to moderate, low-growing salt-tolerant vegetation, and secondary dunes which occur at relatively higher elevations landward of foredunes. Secondary dunes may include unvegetated *blowouts*[73] or parabolic ("u" or "v"-shaped) dunes and transgressive (mobile or migratory) dune fields and sand drifts. Secondary dunes, where vegetated, typically support a higher diversity of plant species (including some shrubs) with greater vegetative cover because of the distance from shore, muted wave and wind influence, and greater organic soil depth and quality. Because of the existing infrastructure within the study area, dunes landward of Ocean Beach are prevented from evolving beyond foredunes and consequently provide limited habitat opportunity for dune associated plant and animal species endemic to coastal California.

Rare dune fauna, such as the globose dune beetle (*Coelus globosus*), is not supported by dune habitat of the study area.[74] Concentrations of native dune flora in the study area may support the special-status plant San Francisco spineflower, but this species is not extant within the project area. Ice plant mats (*Mesembryanthemum* spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance) which dominate the disturbed dune mat community within the study area is not a vegetation alliance recognized as a sensitive natural community by CDFW.[75] As shown in Appendix F-2 Figures 3A – 3I, disturbed dune mat vegetation of the study area is sparse between the beach and Great Highway and largely disconnected and patchy among existing development inland of the Great Highway. Although these areas contain dune vegetation, they do not function as part of a large, dynamic, dune system which provides high habitat value to a diversity of plant and animal species.

Dune habitat of the study area is not vulnerable to human disturbance or especially valuable as it is already significantly degraded by existing development and uses, is of largely disconnected and patchy distribution and stunted development, is dominated by invasive ice plant, and not known to support rare dune flora or fauna. For these reasons, this EIR does not consider dune habitat within the terrestrial study areas to constitute an ESHA.

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73 Blowouts are depressions, typically caused by wind erosion of bare sand.

74 This species' distribution consists of foredune and sand hummocks immediately bordering the coast from Bodega Head, Sonoma County south to the vicinity of Ensenada, Baja California Norte, including tall the channel islands except San Clements. Globose dune beetle is erratically distributed within this range, especially within the north. Populations are recorded from the west of the Point Reyes Peninsula, Marin County, Sant Cruz County, several localities at Monterey Bay, Monterey County, and Pismo Beach, and San Luis Obispo County. Intensive collecting has not yielded specimens from intermediate points, including San Francisco County. Doyen, John T., 1976. Biology and Systems of the Genus Coelus (Coleoptera: Tentyriidae), Journal of the Kansas Entomological Society, Vol. 49, No. 4 (Oct., 1976), pp 595-624.

75 California Department of Fish and Wildlife, 2020. California Natural Community List. September 9, 2020. Available at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=153398&inline

4.6.3 Regulatory Framework

4.6.3.1 FEDERAL

FEDERAL ENDANGERED SPECIES ACT

The federal Endangered Species Act (16 U.S. Code section 1531 et seq.) designates threatened and endangered animal and plant species and provides measures for their protection and recovery. The term *endangered* refers to species, subspecies, or distinct population segments that are in danger of extinction through all or a significant portion of their range. The term *threatened* refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

The "*take*" of listed plant or wildlife species, defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct," is prohibited without first obtaining a federal permit. *Harm* includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage (i.e., harm) the habitat of listed wildlife species require approval from the U.S. Fish and Wildlife Service or National Marine Fisheries Service; collectively, these entities administer the act. Take of listed species can be authorized through either the section 7[76] consultation process (for actions by federal agencies) or the section 10 permit process (for actions by non-federal agencies). Federal agency actions include activities on federal land or that are conducted by, funded by, or authorized by a federal agency (including issuance of federal permits and licenses).

The federal Endangered Species Act also generally requires determination of critical habitat for listed species. The Secretary of the Interior (or the Secretary of Commerce, as appropriate) formally designates critical habitat for certain federally listed species and publishes these designations in the Federal Register. Critical habitat is defined as the specific areas that are essential to the conservation of a federally listed species and that may require special management consideration or protection. Designated and proposed critical habitat is present within the Pacific Ocean and the waters of the marine study area.

MIGRATORY BIRD TREATY ACT

The federal Migratory Bird Treaty Act (16 United States Code, section 703, Supp. I, 1989) generally prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs, and nests, except as provided by the statute. This act authorizes the Secretary of the Interior to regulate the taking of migratory birds. It further provides that it is unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill or attempt to take, capture, or kill any migratory bird, or any part, nest or egg of any such bird…"

MARINE MAMMAL PROTECTION ACT

The Marine Mammal Protection Act of 1972, as amended, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the harassment, hunting, capture, or

[76] Under section 7, the federal lead agency must consult with the U.S. Fish and Wildlife Service to ensure that the proposed action would not jeopardize endangered or threatened species or destroy or adversely modify designated critical habitat. If a project "may affect" a listed species or designated critical habitat, the lead agency is required to prepare a biological assessment evaluating the nature and severity of the expected effect. The U.S. Fish and Wildlife Service then issues a biological opinion determining whether (1) the proposed action may either jeopardize the continued existence of one or more listed species or result in the destruction or adverse modification of critical habitat, or (2) the proposed action would not jeopardize the continued existence of any listed species or result in adverse modification of critical habitat.

killing of any marine mammal. The primary authority for implementing the act belongs to the U.S. Fish and Wildlife Service and National Marine Fisheries Service.

FEDERAL REGULATION OF WETLANDS AND OTHER WATERS

Federal jurisdictional waters include wetlands and other waters. Wetlands are ecologically complex habitats that support a variety of both plant and animal life. Under normal circumstances, the federal definition of wetlands requires the presence of three identification parameters: wetland hydrology, hydric soils, and hydrophytic vegetation. Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for the three wetland parameters.

The regulations and policies of various federal agencies (e.g., Corps, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service) mandate that the filling of wetlands be avoided unless it can be demonstrated that there is no practicable alternative to filling. The Corps has primary federal responsibility for administering regulations that concern wetlands and other waters in the project area under the statutory authority of the Clean Water Act (section 404) and the Rivers and Harbors Act (sections 9 and 10).

Section 404 of the federal Clean Water Act (33 United States Code 1251–1376) prohibits the discharge of dredged or fill material into waters of the United States, including wetlands, without a permit from the Corps. The jurisdiction of the Corps in tidal waters under section 404 extends to the high tide line or high tide mark, simply indicating a point on the shore where water reaches a peak height at some point each year. The Clean Water Act prohibits the discharge of any pollutant without a permit. Implicit in the act definition of *pollutant* is the inclusion of dredged or fill material regulated by section 404 (22 United States Code 1362). The discharge of dredged or fill material typically means adding into waters of the United States materials such as concrete, dirt, rock, pilings, or side-cast material for the purpose of replacing an aquatic area with dry land or raising the elevation of an aquatic area. Activities typically regulated under section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur.

Pursuant to section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 United States Code section 403), the Corps regulates the construction of structures in, over, or under, excavation of material from, or deposition of material into *navigable waters*. Navigable waters under the act are those “subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce” (33 Code of Federal Regulations section 3294). In tidal areas, the limit of navigable water under section 10 is the elevation of mean high water mark; in nontidal waters, it is the ordinary high water mark. Larger streams, rivers, lakes, bays, and oceans are examples of navigable waters regulated. The act prohibits the unauthorized obstruction or alteration of any navigable water (33 United States Code section 403).

MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Magnuson-Stevens Fishery Conservation and Management Act (16 United States Code 1801–1884) of 1976, as amended in 1996 and reauthorized in 2007, applies to fisheries resources and fishing activities in federal waters. Federal waters extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

The Magnuson-Stevens Fishery Conservation and Management Act defines *essential fish habitat* as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The act, as amended through 2007, sets forth a number of new mandates for the National Marine Fisheries Service, regional fishery management councils, and federal action agencies to identify essential fish habitat and to protect important marine and anadromous fish habitat. The act provided the National Marine Fisheries Service with legislative authority to regulate fisheries in the United States and established eight regional fishery management councils that manage the harvest of the fish and shellfish resources in these waters. The councils, with assistance from the National Marine Fisheries Service, are required to develop and implement fishery management plans, which include the delineation of essential fish habitat for all managed species.

A fisheries management plan is developed to achieve specified management goals for a fishery and is comprised of data, analyses, and management measures. Essential fish habitat that is identified in a management plan applies to all fish species managed by that plan, regardless of whether the species is a protected species or not. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under section 305(b), in conjunction with required section 7 consultation under the federal Endangered Species Act, to consult with the National Marine Fisheries Service regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to the National Marine Fisheries Service's recommendations.

The waters off Ocean Beach are designated as essential fish habitat for fish managed under four fisheries management plans: the Pacific Coast Groundfish fisheries management plan, the Coastal Pelagic Species fisheries management plan, the Pacific Coast Salmon fisheries management plan, and the West Coast Highly Migratory Species fisheries management plan (see Table 4.6-3 and Table F-4 of Appendix F).

COASTAL ZONE MANAGEMENT ACT

Coastal Zone Management Act section 307 (16 United States Code section 1456(c)) mandates that federal agency activities be "consistent to the maximum extent practicable with the enforceable policies of approved state management programs," and that this consistency be documented and coordinated with the state. A federal agency ensures consistency of its proposed actions with state management programs by submitting a consistency determination to the relevant state agency. After receipt of the consistency determination, the state agency informs the federal agency of its concurrence with, or objection to, the federal agency's consistency determination.

The California Coastal Commission is the state agency charged with administering the federal act within the California Coastal Zone. Within the commission's areas of concern, the Coastal Zone consists of all areas located within the commission's jurisdiction, which extends 3 miles seaward and inland generally 1,000 yards (but can extend up to 5 miles) from the mean high tide line. Any federal activity that affects any natural resources (including wetlands and other waterbodies), land uses, or water uses within commission's area of concern will be subject to the consistency requirement. Obligations under the act must be met through the federal consistency determination process that is outlined in the act's Federal Consistency Regulations, 71 Federal Regulation 787-831 at 15 Code of Federal Regulations 930. The commission and the California Coastal Act are further discussed in Section 4.6.3.2, *State*, below.

NATIONAL PARK SERVICE REGULATIONS AND POLICIES

NPS regulations and policies, including the Organic Act of 1916, Management Policies 2006,[77] and the Natural Resource Management Reference Manual 77, direct the NPS to provide for the protection of park resources. The Organic Act directs the NPS to conserve "wildlife" unimpaired for future generations and is interpreted to mean that native animal and plant life is to be protected and perpetuated as part of a park unit's natural ecosystem.

The guiding document Management Policies 2006 states that the NPS "will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems." The term *plants and animals* refers to all five of the commonly recognized kingdoms of living things and includes such groups as flowering plants, ferns, mosses, lichens, algae, fungi, bacteria, mammals, birds, reptiles, amphibians, fishes, insects, worms, crustaceans, and microscopic plants or animals.[78] The document directs the NPS to achieve this by:

- Preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur;
- Restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and
- Minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.[79]

Section 4.1 of Management Policies 2006 states, "natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The park service will not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems." Management Policies 2006 section 4.4.2.3 states that the NPS will survey for, protect, and strive to recover all species native to NPS units that are listed under the federal Endangered Species Act, and proactively conserve listed species and prevent detrimental effects on these species. Management Policies 2006 section 4.4.2.3 also states, "[the park service will] manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible."[80]

NPS Management Policies section 4.8.1.1 addresses natural shoreline processes. The document states, "Where human activities or structures have altered the nature or rate of natural shoreline processes, the Service will, in consultation with appropriate state and federal agencies, investigate alternatives for mitigating the effects of such activities or structures and for restoring natural conditions." The project's proposed beneficial use of dredged material may be found consistent with applicable NPS law and policies to protect beach resources if performed for the purposes set forth in section 4.8.1.1 and according to NPS

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[77] NPS, 2006. Management Policies. Washington, DC. *www.nps.gov/policy/mp2006.pdf* Accessed June 15, 2020.
[78] Ibid.
[79] Ibid.
[80] Ibid.

Beach Nourishment Guidelines,[81] and only after adequate analysis under the National Environmental Policy Act (NEPA). Disposal of dredged material in a park unit requires the issuance of a Special Use Permit by GGNRA or agency agreement with a federal agency such as the Army Corps of Engineers.

GOLDEN GATE NATIONAL RECREATION AREA/MUIR WOODS NATIONAL MONUMENT GENERAL MANAGEMENT PLAN

The Golden Gate National Recreation Area/Muir Woods National Monument General Management Plan,[82] published in 2014 and adopted in 2015, identifies management zones for lands under their authority for which they establish management objectives. Ocean Beach within the terrestrial study area is included in the Natural (Resources) Zone. The management objective for the Natural Zone is to:[83]

> *…retain natural, wild, and dynamic characteristics and ecological functions. Natural resources would be managed to preserve and restore resource integrity while providing for backcountry types of visitor experiences. Visitors would have opportunities to directly experience the natural resources primarily from trails and beaches. Visitor use would be managed to preserve resources and their associated values and could involve controlled access by means of fencing off sensitive areas. Modest facilities that support management and visitor use within this zone, such as a trailhead, could be placed on the periphery of the zone.*

The plan's management objectives relevant to Ocean Beach are further described in Chapter 3, Plans and Policies, Section 3.6.2, Golden Gate National Recreation Area General Management Plan.

Open waters of the marine study area are included in the Scenic Corridor Zone. The management objective for offshore areas designated within the Scenic Corridor Zone includes the following: "The park would preserve the ocean and bay environment and accommodate public uses including surfing, boating, and recreational fishing. Park managers would protect the marine habitat, geologic resources and processes, and other natural features of the area."[84]

4.6.3.2 STATE

CALIFORNIA ENDANGERED SPECIES ACT

Under the California Endangered Species Act, the California Department of Fish and Wildlife has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code section 2070). The department also maintains a list of candidate species, which are species formally under review for addition to either the list of endangered species or the list of threatened species.

The California Endangered Species Act prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. *Take* in the context of this regulation means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill a listed species (California Fish and Game Code section 86). The take prohibitions also apply to

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[81] NPS, 2012. National Park Service Beach Nourishment Guidance, Natural Resource Technical Report NPS/NRSS/GRD/NRTR-2012/581. September 2012.
[82] NPS, 2014. Golden Gate National Recreation Area/Muir Woods National Monument Final General Management Plan/Environmental Impact Statement.
[83] Ibid.
[84] Ibid.

candidates for listing under the California Endangered Species Act. However, section 2081 of the act allows the department to issue permits for the minor and incidental take of species by an individual or permitted activity listed under the act.

In accordance with the requirements of the California Endangered Species Act, an agency reviewing a project within its jurisdiction must determine if any state-listed endangered or threatened species could be present in the project area. The agency also must determine if the project could have a potentially significant impact on such species. In addition, the department requires informal consultation on any project that could affect a candidate species.

CALIFORNIA NATIVE PLANT PROTECTION ACT

State listing of plant species began in 1977 with the passage of the California Native Plant Protection Act (California Fish and Game Code sections 1900–1913), which directed the California Department of Fish and Wildlife to carry out the legislature's intent to "preserve, protect, and enhance endangered plants in this State." The act gave the California Fish and Game Commission the power to designate native plants as endangered or rare and to require permits for collecting, transporting, or selling such plants. The California Endangered Species Act expanded on the original native plant protection act and enhanced legal protection for plants. The California Endangered Species Act established threatened and endangered species categories and grandfathered all rare animals—but not rare plants—into the act as threatened species. Thus, three listing categories for plants are employed in California: rare, threatened, and endangered.

CALIFORNIA RARE PLANT RANKINGS

The California Department of Fish and Wildlife works in collaboration with the California Native Plant Society and botanical experts to maintain an Inventory of Rare and Endangered Plants, and the similar Special Vascular Plants, Bryophytes, and Lichens List. The plant species on these lists may meet the CEQA definition of rare or endangered. As the trustee agency for the plants and wildlife of California, ecological communities, and the habitat upon which they depend, the department advises public agencies during the CEQA process to help ensure that the actions they approve do not significantly affect such resources. The department often advises that plant species with an appropriate California Rare Plant Rank in the inventory be properly analyzed by the lead agency during project review to ensure compliance with CEQA.

SENSITIVE NATURAL COMMUNITIES

The California Department of Fish and Wildlife's Natural Heritage Division identifies sensitive natural communities, which are those that are naturally rare and those whose extent has been greatly diminished through changes in land use. The California Natural Diversity Database tracks 135 such natural communities in the same way that it tracks occurrences of special-status species: information is maintained on each site for the natural community's location, extent, habitat quality, level of disturbance, and current protection measures. The department is mandated to seek the long-term perpetuation of the areas in which these communities occur. Although there is no statewide law that requires protection of special-status natural communities, CEQA requires consideration of the potential impacts of a project on biological resources of statewide or regional significance.

CALIFORNIA FISH AND GAME CODE

FULLY PROTECTED SPECIES

Certain species are considered fully protected, meaning that the California Fish and Game Code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. Fully protected amphibians and reptiles, fish, birds, and mammals are listed in California Fish and Game Code sections 5050, 5515, 3511, and 4700, respectively.

PROTECTION OF BIRDS AND THEIR NESTS

Under California Fish and Game Code section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Migratory non-game birds are protected under section 3800, whereas other specified birds are protected under section 3505. California Fish and Game Code section 3513 adopts the federal definition of migratory bird take, which is defined by the Secretary of the Department of the Interior under provisions of the Migratory Bird Treaty Act. Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds.

MARINE LIFE MANAGEMENT ACT

OVERVIEW

Within California, most of the legislative authority over fisheries management is provided by the Marine Life Management Act. This law directs the California Department of Fish and Wildlife and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well as license aquaculture operations. The department, through the commission, is the state's lead biological resource agency and is responsible for enforcement of the state's endangered species regulations and the protection and management of all state biological resources.

NEARSHORE FISHERY MANAGEMENT PLAN

The California Department of Fish and Wildlife prepared the Nearshore Fishery Management Plan in 2002. The management plan establishes a hierarchical framework within which adjustments to the management of the nearshore fishery can be made in a responsible and timely manner in order to meet the 1999 Marine Life Management Act mandate for adaptive management. Of the 19 species addressed in the management plan, six have a life stage with some potential to occur in the marine study area: black-and-yellow rockfish (*Sebastes chrysomelas*), blue rockfish (*Sebastes mystinus*), gopher rockfish (*Sebastes carinatus*), grass rockfish (*Sebastes rastrelliger*), kelp rockfish (*Sebastes atrovirens*), and kelp greenling (*Hexagrammos decagrammus*).

STATE REGULATION OF WETLANDS AND OTHER WATERS

The state's authority in regulating activities in wetlands and waters in the project area resides primarily with the State Water Resources Control Board. The state board, acting through the San Francisco Bay Regional Water Quality Control Board under Clean Water Act section 401, must certify that a Corps Clean Water Act section 404 and Rivers and Harbors Act section 10 permit action meets state water quality objectives. Any condition of water quality certification is then incorporated into the Corps' section 404/10 permit authorized for the project.

On April 2, 2019, the State Water Resources Control Board adopted the following definition of state wetlands, which became effective May 28, 2020:

> *An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.*

The Water Code defines "water of the state" broadly to include "any surface water or groundwater, including saline waters, within the boundaries of the state." "Waters of the state" includes all "water of the U.S."

The State Water Resources Control Board and the Regional Water Quality Control Boards also have jurisdiction over waters of the state under the Porter-Cologne Water Quality Control Act. The state and regional boards evaluate proposed actions for consistency with the regional board's Basin Plan, and authorize the discharges of dredged or fill material to waters of the state by issuing waste discharge requirements or, in some cases, a waiver of discharge requirements. The San Francisco Bay Regional Water Quality Control Board has a policy of no net loss of wetlands and typically requires mitigation for all impacts on wetlands before it will issue a water quality certification. Dredging, filling, or excavation of isolated waters constitutes a discharge of waste to waters of the state, and prospective dischargers are required to submit a report of waste discharge to the Regional Water Quality Control Board.

CALIFORNIA COASTAL ZONE

OVERVIEW

Within California's Coastal Zone, the California Coastal Commission has authority to regulate development according to the provisions of the California Coastal Act. The Coastal Zone extends 3 miles seaward (boundary of state jurisdiction) and generally from 1,000 yards to 5 miles inland from the mean high tide line of the sea.[85] In order to carry out the policies of the Coastal Act, each of the 73 cities and counties in the Coastal Zone is required to prepare a local coastal program for the portion of its jurisdiction within the Coastal Zone and to submit the program to the commission for certification. Once the commission certifies a local coastal program, the local government gains authority to issue most coastal development permits. The commission generally retains permit authority over tidelands, submerged lands and public trust lands. Only the commission can grant a coastal development permit for development in areas of its retained jurisdiction.

California Coastal Act policies of primary relevance to biological resources and applicable to the project are:

- Section 30230 Marine resources; maintenance
- Section 30231 Biological productivity; water quality
- Section 30233 Diking, filling or dredging; continued movement of sediment and nutrients
- Section 30240 Environmentally sensitive habitat areas; adjacent developments

85 California Coastal Commission, Maps Coastal Zone Boundary, *https://www.coastal.ca.gov/maps/czb/,* accessed February 8, 2021.

San Francisco's local coastal program, the Western Shoreline Area Plan, is discussed further below in Section 4.6.3.3, *Local*. Portions of the project area located west of the Great Highway are within lands under retained jurisdiction of the commission.

4.6.3.3 LOCAL

SAN FRANCISCO GENERAL PLAN

The Environmental Protection Element of the San Francisco General Plan contains the following objectives and policies related to biological resources protection that are relevant to the project:

GENERAL

Objective 1: Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

***Policy 1.1*:** Conserve and protect the natural resources of San Francisco.

***Policy 1.2*:** Improve the quality of natural resources.

***Policy 1.3*:** Restore and replenish the supply of natural resources.

***Policy 1.4*:** Assure that all new development meets strict environmental quality standards and recognizes human needs.

BAY, OCEAN, AND SHORELINES

Objective 3: Maintain and improve the quality of the bay, ocean, and shoreline areas.

***Policy 3.1*:** Cooperate with and otherwise support regulatory programs of existing regional, state, and federal agencies dealing with the Bay.

***Policy 3.2*:** Promote the use and development of shoreline areas consistent with the General Plan and the best interest of San Francisco.

LAND

Objective 7: Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

FLORA AND FAUNA

Objective 8: Ensure the protection of plant and animal life in the City.

***Policy 8.1*:** Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

***Policy 8.2*:** Protect the habitats of known plant and animal species that require a relatively natural environment.

***Policy 8.3*:** Protect rare and endangered species

WESTERN SHORELINE AREA PLAN (LOCAL COASTAL PROGRAM)

The Western Shoreline Area Plan of the San Francisco General Plan is the land use plan portion of San Francisco's certified local coastal program and sets forth policies and objectives governing development in the city's coastal zone. The plan specifies objectives and policies for various locations where project components occur within the plan area, specifically for the Great Highway, Ocean Beach, and the San Francisco Zoo. In addition, there are policies related to coastal hazards, concerning managed retreat, sea level rise adaptation, beach nourishment, shoreline development, and shoreline protection devices. With certification of the local coastal program in 1986, the city obtained authority for issuance of coastal development permits for development activities within its coastal zone boundary. Today, most coastal development permits are issued by the San Francisco Planning Commission pursuant to San Francisco Planning Code section 330 et seq. This plan is further described in Chapter 3, Plans and Policies, Section 3.2.1.2, *Western Shoreline Area Plan (Local Coastal Program)*.

SAN FRANCISCO PUBLIC WORKS CODE

The San Francisco's Urban Forestry Ordinance (San Francisco Public Works Code article 16) protects street trees, significant trees, and landmark trees under San Francisco Public Works jurisdiction, regardless of species. Permits are required for planting or removing street trees and significant trees, and protection measures are required for these trees if construction work would occur within the trees' *drip lines*.[86]

SAN FRANCISCO PLANNING CODE SECTION 139 (STANDARDS FOR BIRD-SAFE BUILDINGS)

The San Francisco Planning Department adopted Standards for Bird-Safe Buildings in 2011, adding San Francisco Planning Code section 139.[87] These standards guide the use and types of glass and façade treatments, wind generators and grates, and lighting treatments. The standards impose requirements for bird-safe glazing and lighting in structures or at sites that represent a hazard to birds and provide information on educational and voluntary programs related to bird hazards. The standards define two types of bird hazards: location-related hazards and feature-related hazards.

Location-related hazards are buildings located inside of, or within a clear flight path of less than 300 feet from, an *urban bird refuge*.[88] In such locations, bird-safe treatments are required for new buildings; for additions to existing buildings; or for existing buildings in which 50 percent or more of the glazing within the *bird collision zone* is to be replaced.[89] The standards require implementation of the following treatments for façades facing, or located within, an urban bird refuge:

- No more than 10 percent untreated glazing is allowed on building façades within the bird collision zone.
- Lighting must be shielded, and no uplighting is permitted. No event searchlights are permitted.
- Sites are not permitted to use horizontal access windmills or vertical access wind generators that do not appear solid.

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86 The drip line is the area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.
87 San Francisco Planning Department, Standards for Bird-Safe Buildings, 2011, *http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*.
88 An urban bird refuge is defined in the Standards for Bird-Safe Buildings as any area of open space 2 acres or larger that is dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, water features, or wetlands; open water; and some green rooftops.
89 The bird collision zone is that portion of the building that begins at grade and extends upward for 60 feet.

Feature-related hazards include building- or structure-related features that are considered potential "bird traps" regardless of location (e.g., glass courtyards, transparent building corners, or clear glass walls on rooftops or balconies). These features must be fully treated (100 percent) with bird-safe glazing.

4.6.4 Impacts and Mitigation Measures

4.6.4.1 SIGNIFICANCE CRITERIA

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, as modified by the San Francisco Planning Department. For the purpose of this analysis, the following criteria were used to determine whether implementing the project would result in a significant impact on biological resources. Implementation of the project would have a significant effect on biological resources if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or
- Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.

4.6.4.2 APPROACH TO ANALYSIS

OVERVIEW

Impacts on biological resources are identified and evaluated based on the following: relevant CEQA and local standards, policies, and guidelines; the likelihood that special-status species, sensitive habitats, wetlands and waters, and wildlife corridors are present within the terrestrial study area or the marine study area (as described above in Section 4.6.2, Environmental Setting); and the potential effects that project construction, operation, and maintenance might have on these resources where they are present within the project area. The analysis identifies both direct impacts on individual species and impacts resulting from habitat modification, and considers the longevity (short term and temporary or long term and/or permanent) of the potential impact on the biological resource. Special-status resources that were determined to have a low or no potential to occur in the study areas (individual animal species as presented in Appendix F, Tables F-1, F-2, F-3 and F-4) are not considered in the impact analysis.

Due to the nature of the project, the following criterion is not analyzed in this section for the reasons described below:

- ***Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.*** No adopted habitat conservation plan, natural community conservation plan, or approved local, regional, or state conservation plan protecting biological resources covers the terrestrial study area or marine study area; thus, there would be *no impact*.

4.6.4.3 IMPACT EVALUATION

The impact analysis addresses construction-related and operational impacts as follows:

- Impact BI-1: Special-status plants
- Impact BI-2: Bank swallow
- Impact BI-3: Western snowy plover
- Impact BI-4: Other special-status birds
- Impact BI-5: Special-status marine species
- Impact BI-6 Sensitive natural communities and jurisdictional wetlands and waters
- Impact BI-7: The movement of native resident or migratory wildlife species or established migratory corridors.
- Impact BI-8: Nesting birds
- Impact BI-9: Special-status bats or bat maternity roosts
- Impact BI-10: Conflicts with any local policies or ordinances
- Impact C-BI-1: Cumulative construction-related biological resources impacts
- Impact C-BI-2: Cumulative operation-related biological resources impacts

SPECIAL-STATUS PLANTS

Impact BI-1: Construction and operation of the project would not result in substantial adverse effects on special-status plants. *(Less than Significant)*

Botanical surveys performed in 2019 and 2020 in support of the project did not identify any special-status plants within the terrestrial study area. San Francisco spineflower, a California Rare Plant Rank 1B.2 species, is present in the disturbed dune mat vegetation community of Fort Funston, south of the project area.[90,91] This annual species was not documented within the project area during appropriately timed botanical surveys. Individual spineflower plants were observed in Fort Funston within 50 feet of the project area boundary in disturbed dune mat vegetation on the bluff plateau foredunes south of the Great Highway. The microhabitat where San Francisco spineflower plants occur within and around Fort Funston consists of gaps

90 BioMaAS, 2021. Ocean Beach Climate Change Adaptation Project Biological Resources Assessment, prepared for the San Francisco Public Utilities Commission, November 2021.

91 Golden Gate National Recreation Area, 2013. Rare Plant Monitoring Data, Fort Funston, San Francisco, CA.

in dune vegetation with loose sandy soil and few other plant associates, where topography is relatively flat or slightly undulating. Occasionally, spineflower plants are present beneath dense canopies of taller dune scrub species; however, they are conspicuously absent from blowouts, where wind erosion and/or pedestrian traffic create inhospitable conditions for plant establishment.

The southern grading limits for construction of the buried wall, bluff reshaping, and road realignment occur within steep portions of the bluff face or along the road shoulder, where dune habitat is sparsely vegetated with ice plant and sea rocket. Bluff topography and high quantities of sand accretion at this location create conditions not typically supportive of San Francisco spineflower; therefore, direct impacts on individual plants during construction at this location are not expected.

Indirect impacts on San Francisco spineflower could occur during construction through degradation of the disturbed dune mat vegetation community along the southern project area boundary with Fort Funston if work were to introduce or spread nonnative and invasive species through equipment or access or pedestrian trampling. Implementation of San Francisco Public Utilities Commission (SFPUC) standard construction measure 7, Biological Resources, would protect against indirect impacts on San Francisco spineflower plants outside of the project area at Fort Funston through placement of exclusion fencing at the project disturbance limits prior to construction and separation of project activities from the rare plant population. A qualified biologist or botanist would establish the exclusion fence alignment such that disturbance is limited to the project area during construction.

During project operation, large and small sand placement events are not expected to result in direct or indirect impacts on San Francisco spineflower because suitable habitat for this species does not occur within the North Ocean Beach excavation area or sand placement locations on South Ocean Beach.

With implementation of standard construction measure 7 during construction, the potential project-related impacts on San Francisco spineflower would be ***less than significant***.

Mitigation: None required.

SPECIAL-STATUS BIRDS

Impact BI-2: Construction of the project would, but operation of the project would not, have a substantial adverse effect on bank swallows. (*Significant and Unavoidable with Mitigation*)

As summarized in Section 4.6.2, Environmental Setting, above, a breeding colony of bank swallow, a state-listed threatened species, seasonally inhabits the bluffs above Ocean Beach across from the Oceanside Treatment Plant. The bluffs where bank swallow excavate burrows to breed and nest, which may constitute an ESHA under the California Coastal Act (see section 4.6.2.2), extends south of the project area into Fort Funston. The bank swallow breeding colony is referred to as the “Fort Funston colony” although the full extent of the bluffs historically used by the colony includes approximately 3,290 linear feet (just over 0.5-mile)of bluffs north and south of the Fort Funston boundary. A portion of the historical breeding area, approximately 500 feet long, is located in the bluffs above the 2010 emergency riprap revetment within the project area).[92] Records of the Fort Funston colony document bank swallows using the bluffs while breeding

92 The National Park Service-designated monitoring area for the Fort Funston colony begins approximately 250-feet north of the 2010 emergency riprap revetment and extends approximately 0.6-mile south along the bluffs to the Panama Point beach access sand ramp.

and rearing their young since 1905. Bank swallow typically occupy the bluffs from April through July before migrating to Central and South America where they winter.[93] More recently, bank swallows were documented exclusively nesting in bluffs above the Philip Burton Memorial Beach in 2020 and 2021, approximately 1 mile to the south of the historical Fort Funston colony nesting location.[94,95] A discussion of bank swallow ecology and distribution in the project area is provided in Appendix F.

Construction

Nesting Bank Swallow

Construction activities, especially those that involve heavy machinery, may adversely affect bank swallow breeding, nesting, or rearing young, should project activities be conducted within 650 feet of active burrow nests between April 1 and August 1 when bank swallow typically are present. Project construction activities and an increased human presence within the South Ocean Beach project site during construction are expected to generate noise, vibration, and visual disturbances that could adversely affect bank swallow foraging, roosting (resting), breeding, and nesting behaviors within the Fort Funston breeding colony. See Section 4.4, Noise and Vibration, Impact NO-1 (Construction Noise), Impact NO-2 (Vibration), and NO-3 (Operations Noise) for a discussion of noise- and vibration-generating activities associated with project implementation. Project construction activities may cause visual disturbance, alter the ambient noise environment, or introduce short-term loud noise events, resulting in avoidance response (flushing). Both long- and short-term loud noises can affect bird foraging and roosting by temporarily disturbing these behaviors and may deter bird use of an area (including for nesting) if such noises persist over the long term. Noise disturbance generally falls into two main categories: impulse and continuous. Impulse disturbances often occur during demolition activities due to single actions like blasts, or multiple actions like jackhammers and heavy-duty breaker (impact) hammers causing underground vibration, like what may be required for deconstructing the Great Highway and demolishing the existing restroom facility. Continuous noise includes typical construction work area activities and roadway noise. Bird disruption from visual or noise disturbance varies, but typically birds will avoid disturbed areas and move to more preferable environments that provide similar habitat characteristics. The Fort Funston colony is accustomed to varying levels of ambient noise and habitat disturbances from existing human activities in the project vicinity, such as traffic along the Great Highway and recreational activities on Ocean Beach, including running and walking, surfing, fishing, and off-leash dogs. Construction-associated noise or increased human activity on the South Ocean Beach project site proximate to the bank swallow colony during construction, could result in behavioral alterations including the temporary avoidance of work areas by foraging bank swallows during construction. Such temporary alteration of behavior during construction would not be substantially adverse, especially considering the abundant shoreline and open water foraging areas available at nearby Lake Merced.

Typical noise levels for some construction activities anticipated during project construction, such as removal of the Great Highway roadbed, bluff reshaping, buried wall construction, and pile drilling, would temporarily exceed ambient levels near the project site (see Section 4.4, Noise and Vibration, Impact NO-1 [Construction Noise]). Construction activities that would substantially alter the noise environment proximate to the bluffs could disrupt bank swallows attempting to nest, disrupt parental foraging activity, or displace mated pairs from their burrow nest site. Though nest disturbance is considered unlikely to occur due to the ambient noise and existing human activities, the added noise, visual disturbance, and a general increase in activity

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93 National Park Service, 2007. Bank Swallow Monitoring at Fort Funston, Golden Gate National Recreation Area 1993-2006. March 23, 2007.
94 National Park Service, 2020. 2020 Bank Swallow Summary Report.
95 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.

associated with construction near the southern terminus of the project area on South Ocean Beach could indirectly affect nesting efforts in the portion of the colony within the project area and south into Fort Funston.

The loss or disruption of an active bank swallow burrow nest site would be a significant impact under CEQA. Nest (or burrow) abandonment or mortality to eggs and chicks as a result of project activities would also be considered significant impacts. Implementation of **Mitigation Measure M-BI-2a: Nesting Bank Swallow Protection Measures**, would avoid or minimize potential project-related impacts on bank swallows while they are present on South Ocean Beach during the nesting season by having a qualified biologist conduct preconstruction nesting surveys of suitable bluff habitat within 650 feet of project activities on South Ocean Beach and restricting activities within 650 feet of any active nest sites until young have fledged and burrows are no longer in use. Implementing **Mitigation Measure M-BI-2b, Worker Environmental Awareness Program Training**, would further reduce potential impacts on this species by requiring all project personnel to attend an environmental awareness training prior to beginning work to educate workers on sensitive resources within and surrounding the project area, regulations protecting them, general protection measures and protocols to be implemented during project construction and operation, and consequences of non-compliance with project-specific protection measures.[96] Through implementation of these protection measures, the project impact on nesting bank swallows would be less than significant.

Mitigation Measure M-BI-2a: Nesting Bank Swallow Protection Measures

This measure applies to construction activities and small sand placements.

Nesting bank swallows, their eggs and their nests, and their young shall be protected during construction and during sand placement events through the implementation of the following measures:

a. If construction or beach nourishment activities within 650 feet of the bluffs used by the Fort Funston bank swallow colony are conducted during bank swallow nesting season (nesting is from April 1 to August 1), a qualified wildlife biologist shall conduct preconstruction surveys for nesting bank swallow within seven days prior to the start of construction, beach nourishment activities, and prior to reinitiating construction at this location after any construction breaks of 14 days or more.
b. If active bank swallow nest sites are located during the preconstruction nesting surveys, a 650-foot no-disturbance buffer shall be established around the burrow nest site and all project work shall halt within the buffer until a qualified biologist determines the nest is no longer in use.

Mitigation Measure M-BI-2b: Worker Environmental Awareness Program Training

This measure applies to construction activities and small sand placements.

A project-specific Worker Environmental Awareness Program training shall be developed by a qualified biologist for the project and attended by all construction personnel prior to beginning on-site work. As part of the training, brochures may be given to provide reference material to contractors. The training may be provided by the qualified biologist or by designated SFPUC staff

[96] While the worker awareness mitigation is being introduced here, in the context of potential construction effects on nesting bank swallow, it is also relied upon to address potential effects associated with other construction and operations activities (Impact BI-8 and BI-9). Thus, the measure has been crafted to address a commensurately broad range of potentially affected biological resources within the project area.

trained by the biologist to provide this training, using the materials developed by the qualified biologist, and may be administered via a video-recorded training produced specifically for the project by a qualified biologist. A more in-depth environmental training may be developed and provided for contractor supervisors in leadership roles. The environmental training shall generally include but not be limited to education about the following:

a. Applicable state and federal laws, environmental regulations, project permit conditions, and penalties for non-compliance;
b. Special-status species with potential to occur on or in the vicinity of the project sites, avoidance measures, and a protocol for encountering such species including a communication chain;
c. Preconstruction surveys and biological monitoring requirements associated with each phase of work and at each project site as biological resources and protection measures will vary depending on project component location and the corresponding land managers (see f, below);
d. Known sensitive resource areas in the project vicinity that are to be avoided and/or protected, as well as approved project work areas, access roads, and staging areas;
e. Best management practices and their location at various project sites for erosion control and species exclusion, in addition to general housekeeping requirements; and
f. Specific requirements sanctioned by the National Park Service (NPS) that the project must comply with while working on NPS-managed lands.

Bank Swallow Habitat Removal

Project construction, specifically the removal of the 2010 emergency riprap revetment and reshaping of the bluff face across from the Oceanside Treatment Plant and south to the project area boundary with Fort Funston, would permanently remove approximately 500 feet of bluff habitat historically used by the Fort Funston bank swallow colony for breeding and rearing young. Removal of this bluff habitat could reduce the suitable coastal breeding habitat available for bank swallows locally if they do not occupy bluffs south of the project area within Fort Funston or suitable bluffs farther down the coast following construction, as documented during the 2019, 2020, and 2021 seasons. This loss of bank swallow breeding habitat, which may constitute an environmentally sensitive habitat area, or ESHA, under the California Coastal Act (see section 4.6.2.2), would be a potentially significant impact.

It is possible that bank swallows concentrated their nesting burrows within area B (above the 2010 revetment) between 2011 and 2019 because it provided the most suitable habitat for the colony at that time. Overall abundance of burrows within the historical nesting area has steadily declined since 2007 which may indicate swallows have been finding suitable bluff habitat elsewhere along the coast for some time. Bank swallows returning to the area to breed following project construction could attempt to establish burrows in the Fort Funston bluffs and farther south of the project area in locations with vertical sandy bluff substrate. Bank swallow nesting records at Phillip Burton Memorial Beach (approximately 1 mile south of the project area boundary) in 2019, and exclusively in 2020, and 2021 are evidence that suitable bluff habitat is present for bank swallows outside of the 0.5-mile bluff span historically used by the species above South Ocean Beach and within Fort Funston; however, the capacity and sustainability of this location as a replacement for loss of the 500 feet of bluff habitat in the revetment area B span is unknown because nesting at this location has only been documented since 2019, whereas nesting within the project area or Fort Funston bluffs has been observed consistently since 1993, and as far back as 1905, until 2020.[97]

Based on the available evidence, it is not feasible to fully mitigate impacts on the loss of historic nesting sites, particularly for breeding colonies in coastal bluffs. Because of the ephemeral nature of bank swallow colonies, which select bank or bluff locations that best exhibit their breeding habitat requirements in a given year, habitat creation or enhancement implemented as mitigation cannot be a guaranteed replacement for removal of proven suitable, previously occupied habitat. The preferred strategy recommended in the bank swallow recovery plan is avoidance of impacts on active bank swallow nesting habitat.[98] Because the majority of bank swallow nesting colonies in California are located along rivers, the recovery plan focuses on strategies to be implemented within riverine systems rather than those that may be suitable to offset impacts on coastal nesting habitat.

Creation of bank swallow habitat in both natural and artificial substrate has had limited success in California and is generally considered cost prohibitive as a mitigation strategy due to the ongoing maintenance necessary to provide the required habitat elements for this species in the long term (e.g., vertical or near-vertical banks/bluffs of sufficient heights to deter predators).[99] Examples of habitat enhancement or creation as a mitigation strategy for impacts on this species' habitat in California are documented for riverine colonies rather than coastal colonies. Experimental nesting sites constructed on the Sacramento River between 1987 and 1989 to determine if created sites were effective and feasible mitigation for affected bank swallow breeding habitat proved difficult to maintain at the regularity needed to ensure that suitable habitat characteristics were present year after year. While these enhanced bank sites were used by swallows for nesting, once maintenance of the habitat (annual contouring the bank face to a vertical or near-vertical slope, clear of vegetation and with fresh soils) stopped, swallows no longer selected the sites for breeding.[100,101] Similar challenges would be expected in maintaining enhanced coastal bluff sites to attract bank swallows; however, the additional influence of natural coastal processes eroding the bluff face further complicates the situation at the project site.

Artificial sites constructed above the river bank consisting of soil mounds were never well used, and those that were occupied experienced heavy predation by herons and egrets; therefore, artificial sites are not recommended mitigation for impacts on natural habitat.[102] Another example of created habitat along the Sacramento River consisted of 100 burrows mechanically drilled into the river bank in 1986; however, this site failed to attract bank swallows to nest.[103] The inefficacy of this attempt at habitat creation was attributed to bank swallows not previously occupying that bank location.[104]

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97 National Park Service, 2019. Bank Swallow Monitoring at Fort Funston, GGNRA, 2019 NPS Report.
98 Ibid.
99 California Department of Fish and Game, 1992. Recovery Plan: Bank Swallow (*Riparia riparia*). Prepared by Nongame Bird and Mammal Section, Wildlife Management Division, Section Report 93.02. December 1992.
100 Bank Swallow Technical Advisory Committee, 2013. Bank Swallow (*Riparian riparia*) Conservation Strategy for the Sacramento River Watershed, California. Version 1.0. *www.sacramentoriver.org/bans/. June 2013.*
101 Garrison, B. A. 1998. Bank Swallow (*Riparia riparia*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. *http://www.prbo.org/calpif/htmldocs/riparian_v-2.html*.
102 Bank Swallow Technical Advisory Committee, 2013. Bank Swallow (*Riparian riparia*) Conservation Strategy for the Sacramento River Watershed, California. Version 1.0. *www.sacramentoriver.org/bans/*. June 2013.
103 Garrison, B. A. 1998. Bank Swallow (*Riparia riparia*). In The Riparian Bird Conservation Plan: a strategy for reversing the decline of riparian-associated birds in California. California Partners in Flight. *http://www.prbo.org/calpif/htmldocs/riparian_v-2.html*.
104 Ibid.

Regardless of whether bank swallows would actively nest within the boundaries of Fort Funston and coastal areas farther south of the project area, because the project requires removal of the 2010 emergency riprap revetment and reshaping of the remnant bluff at a location within a portion of the historic nesting location, and because there are no proven mitigation strategies or opportunities to replace or otherwise compensate for lost local bank swallow breeding habitat, the resulting permanent impact on bank swallow breeding habitat at this location would be significant and unavoidable.

While no feasible mitigation exists to fully address the direct project effect on bank swallow habitat, **Mitigation Measure M-BI-2c, Bank Swallow Educational Signage and Protective Fencing**, is recommended to avoid or minimize future disturbance or impact on the remaining suitable bluff habitat for nesting bank swallow. This measure would require the SFPUC, in coordination with Rec and Park and the National Park Service, to develop, produce, and install educational signs informing the public of the bank swallow colony. The measure calls for one educational kiosk or signs describing the history of the bank swallow colony and uniqueness of the coastal bluff habitat that supports annual nesting to be permanently installed within the Skyline coastal parking lot or along the multi-use trail. In addition, under the mitigation measure, the SFPUC would produce semi-permanent educational signs that could be located near the active nesting locations annually to inform the public of the sensitive nesting area. Semi-permanent fencing installed at a setback from the bluff edge above nesting locations (on National Park Service managed lands) would also be required under this measure. This fencing would restrict public access to the bluff top immediately above remaining suitable habitat at Fort Funston and/or active nesting locations in a given year. Restricting public access to the bluff top above suitable habitat top would avoid or minimize erosion of remaining bluff habitat from vegetation trampling above or and other disturbance resulting from attempts to access the beach through a known nesting area. Implementation of the measure would require the SFPUC to coordinate with Rec and Park regarding a kiosk and signage proposed on lands under its management, and enter into an agreement with the park service to implement the signage and fencing on lands under its management. Although the measure would inform and caution the public as to sensitive nesting areas and restrict public access with the intent to protect bank swallow habitat, the project impact on bank swallow habitat is considered ***significant and unavoidable with mitigation*** because of the uncertainty of sufficient impact offset and because the implementation of the mitigation measure relies on an agreement with a third party and is not within the project sponsors' control.

Mitigation Measure M-BI-2c: Bank Swallow Educational Signage and Protective Fencing

During the construction period and prior to project completion, the SFPUC, with the oversight of the planning department, shall implement the following:

a. Develop and produce one, permanent educational kiosk or signage to be installed in the Skyline coastal parking lot or along the multi-use trail. Educational content, sign design and structure shall be coordinated with the San Francisco Recreation and Parks Department and the National Park Service (NPS).

b. Develop and produce semi-permanent educational signs that shall be installed on NPS property along bluff top access points at Fort Funston near the bank swallow nesting locations to alert the public of the sensitive nesting area. The SFPUC and NPS shall enter into an agreement for the one-time development and production of the semi-permanent signs that the NPS shall install at its discretion as long as the bank swallow are listed as special-status and nesting within NPS-managed lands.

c. Install semi-permanent fencing at a setback from the bluff edge above suitable nesting habitat to restrict public access above sensitive nesting areas. The SFPUC and NPS shall enter into an agreement for the one-time development and production of the semi-permanent fencing that the NPS shall design and install at its discretion as long as the bank swallow are listed as special-status and nesting within NPS-managed lands.

Operation

Nesting Bank Swallow

Following project construction and removal of the bank swallow nesting location within the project area, the northernmost limits of the Fort Funston bank swallow breeding colony would be located within the Fort Funston bluffs south of the project area. Noise and visual disturbance from sand placement at the southern limits of the project area could disrupt bank swallow nesting within adjacent bluff habitat. **Mitigation Measure M-BI-2a, Nesting Bank Swallow Protection Measures** and **Mitigation Measure M-BI-2b, Worker Environmental Awareness Program Training**, would avoid or minimize potential impacts of small sand placements on nesting bank swallow in suitable bluff habitat south of the project area in Fort Funston. Similarly, for large sand placements, the Corps would require its construction contractors to monitor the work areas for active bank swallow nesting habitat, and establish a buffer zone and associated work restrictions around any active nesting areas.[105] With implementation of these mitigation measures, the potential project operation-related impacts (beach nourishment at South Ocean Beach) on nesting bank swallows would be less than significant.

Bank Swallow Habitat

As discussed, location and abundance of bank swallow burrows varies from year-to-year. The National Park Service has documented burrow nest sites at adjacent Fort Funston bluffs between 1993 and 2019. Between 2005 and 2019, the National Park Service documented the highest number of burrow nest sites within the northernmost 1,500 feet of Fort Funston bluff habitat, located in monitoring areas 1 (North End to Gap) and 2 (Gap to Gunmount) (see Figure 4.6-3).[106] Bank swallows were not documented nesting anywhere within the historical nesting areas in 2020 and 2021, but instead were documented south of Fort Funston at Phillip Burton Memorial Beach.[107,108]

A coastal engineering study, which is included as Appendix H, was prepared to evaluate potential project effects on coastal processes including project influence on the rate of erosion within this segment of the Fort Funston bluffs. The study models shoreline erosion under several project scenarios at 100 feet, 600 feet, and 1,100 feet down coast of South Ocean Beach, which captures the northernmost span of bluff habitat within Fort Funston. As discussed in the technical report, the study area encompasses the alongshore extent of anticipated end effects, generally on the order of one to two wave lengths, or approximately 1,000 feet. The study concludes that under project scenarios with nourishment (i.e., project with small and large sand placements) erosion along adjacent shoreline segments would be slightly reduced, while for project scenarios with wall exposure (i.e., project with partial and full wall exposure) erosion would be similar to the rate of erosion that would be expected for a similar storm season without the project. The study concludes

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[105] U.S. Army Corps of Engineers, 2021. West Coast Hopper Maintenance Dredging 2021 Project Manual, Section 01 57 20.00 82, Environmental Protection, Part 3.7 Protection of Fish and Wildlife. February 19, 2021

[106] National Park Service, 2019. Bank Swallow Monitoring at Fort Funston, Golden Gate National Recreation Area, 2019 NPS Report.

[107] National Park Service, 2020. 2020 Bank Swallow Summary Report.

[108] National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.

that the project would not appreciably alter shoreline erosion rates and that the Fort Funston bluffs would be expected to erode at a similar rate under the project as without the project. Thereby, the future availability of suitable bluff habitat for bank swallow in Fort Funston would not be adversely impacted by project implementation.

While the analysis suggests the erosion rates could vary, depending upon project conditions at the site (e.g., nourished or exposed), on balance the anticipated erosion of bluffs within Fort Funston would not be substantially different than under existing conditions. Therefore, operation of the project would have a less-than-significant effect on suitable bank swallow breeding habitat within Fort Funston.

In summary, construction and operation impacts on nesting bank swallows would be reduced to a less-than-significant level with implementation of mitigation measure M-BI-2a which prohibits construction-related activities and operational beach nourishment activities within 650 feet of active bank swallow nesting, M-BI-2b which requires worker environmental training, and Corps contract specifications for protection of bank swallow nesting habitat, as applicable. Installation of a kiosk, signage, and fencing as required under mitigation measure M-BI-2c would avoid or minimize future impacts to adjacent bank swallow nesting habitat. However, the potential impact on bank swallows from construction of the buried wall and bluff reshaping would eliminate bank swallow breeding habitat within the project site, the ability of mitigation to fully offset the habitat loss is uncertain, and implementing the identified mitigation relies on outside parties. For these reasons, the project impact would be ***significant and unavoidable with mitigation***. Project operations would have a less-than-significant effect with mitigation on bank swallow breeding habitat within portions of the colony south of the project site.

Significance after Mitigation: Significant and Unavoidable with Mitigation.

Impact BI-3: Construction and operation of the project would not have a substantial adverse effect on western snowy plover. (*Less than Significant*)

Construction

Overwintering western snowy plovers are present on Ocean Beach from approximately July to May, outside of their breeding period. Individuals are generally found within the designated Snowy Plover Protection Area, located between Stairwell 21 (near the Beach Chalet) and Sloat Boulevard, which is not within the South Ocean Beach project site but is within the North Ocean Beach project site, where sand would be sourced during project operation for small sand placement events. Because snowy plover is not known to use the South Ocean Beach project site, construction of the project is not expected to result in adverse effects on this species while it is overwintering. Nevertheless, as part of SFPUC's standard construction measure 7, Biological Resources, a qualified biologist would survey all project sites and immediately surrounding areas to determine whether biological resources may be affected, and would identify for SFPUC implementation any additional biological resources protection measures necessary to comply with applicable local, state, and federal requirements (e.g., exclusion fencing, work buffer zones, monitoring).

Operation

During ongoing project operation, through the small sand placement events, the city would continue its current practice of sourcing the sand from North Ocean Beach for beach nourishment along South Ocean Beach. Excavation equipment and hauling trucks would access the beach from the south end of the

O’Shaughnessy Seawall near Lincoln Way. The area identified for access overlaps with the north end of the NPS designated Snowy Plover Protection Area on Ocean Beach, between Stairwell 21 and Sloat Boulevard.

As a condition of the coastal development permit issued to the city for previous sand excavation activities on North Ocean Beach in 2016, 2018, and 2019, biological monitoring has been conducted for western snowy plover to ensure equipment access and excavation did not adversely affect or otherwise alter their foraging or resting behavior. Monitoring reports indicate that snowy plover were never observed within the equipment access route or excavation area that is also proposed for use under the project and that no flushing events in response to equipment or excavation activities occurred. Rather, snowy plovers were consistently observed foraging in wetted sand south and west of the work area, farther into the designated protection area, and did not appear to be disturbed by the construction equipment and excavation activities to the north and east. Based on these observations, and with implementation of standard construction measure 7, potential adverse effects on the species from project operation would be less than significant.

Beach nourishment at South Ocean Beach under project operation would not substantially affect the abundance and diversity of invertebrates within the intertidal zone, where western snowy plover and other avian species forage among beach wrack for crabs, polychaetes, amphipods, sand hoppers, flies, beetles, clams, and ostracods. The location on Ocean Beach where western snowy plover overwinter is concentrated between Lincoln Way and Sloat Boulevard, north of the area where beach nourishment would occur. Potential impacts on the invertebrate intertidal community would have to be concentrated within this area such that foraging opportunity was significantly reduced and plovers were forced to overwinter elsewhere. As discussed in Appendix B, Section E.16, Geology and Soils, redistribution of sand along the shoreline from South Ocean Beach nourishment events would be variable, but would generally move south and offshore away from the snowy plover protection area. For this reason, and considering the volume of sand proposed for placement is small relative to the area and volume of sand along the shoreline between Lincoln Way and Sloat Boulevard, the likelihood of placed sand accreting within the portion of Ocean Beach where plover overwinter such that the intertidal invertebrate community would be substantially reduced is negligible. See Impact BI-5 for a detailed discussion of potential project impacts on the local intertidal invertebrate community.

For these reasons, the project impact on western snowy plover would be ***less than significant***.

Mitigation: None required.

Impact BI-4: Construction and operation of the project would not have a substantial adverse effect on other special-status or sensitive birds. (*Less than Significant*)

Several other special-status birds are known residents of or seasonally occupy the terrestrial project areas or forage in the Pacific Ocean where offshore project activities would occur. These include western burrowing owl, brown pelican, and San Francisco common yellowthroat. Other non-special-status birds (considered sensitive because of their inclusion on the California Department of Fish and Wildlife’s Watch List) that could nest or otherwise occupy the terrestrial or marine project areas include double-crested cormorant, California gull, long-billed curlew, and Cooper’s hawk.

Western burrowing owl may be present in the project area while overwintering, outside of its breeding period. One western burrowing owl has been documented on Ocean Beach within the 2010 emergency riprap revetment across from the Oceanside Treatment Plant, and another individual has been documented beneath a staircase across the Great Highway from Noriega Street. With implementation of the SFPUC’s standard construction measure 7, Biological Resources, noise or visual disturbance from project activities is not expected to substantially disturb overwintering western burrowing owl should they be present during construction or operational events on Ocean Beach. Under the measure, which would be a requirement of the construction contract, a qualified biologist would inspect the Ocean Beach work areas prior to the start of construction or prior to operational sand placement events if conducted during the time of year when western burrowing owl are typically present. If western burrowing owl are found near work areas, the biologist would establish a no-work protective buffer (e.g., 100 to 250 feet) around the owl's observed overwintering location until the owl is no longer present. Through application of these avoidance and minimization measures, the project impact on overwintering western burrowing owl during construction and operation would be less than significant.

Double-crested cormorant and California gull regularly forage on South Ocean Beach and brown pelican use offshore waters for foraging outside of their breeding season. Construction and operations activities, both onshore and offshore, would deter these species' use of the project area for foraging. Because of the abundant similar terrestrial and marine foraging habitat in the vicinity of the project, such disturbances to foraging behavior during project construction or operation would not be substantially adverse. The same conclusion applies to long-billed curlew that forage in the project area. Considering the temporary nature of the work and small size of the construction and operation disturbance areas relative to the available foraging habitat along the regional coastline, the impact would be ***less than significant***.

Potential impacts on other special-status birds that nest in the project area, such as San Francisco common yellowthroat, are addressed in the broader nesting birds impact discussion within Impact BI-8.

Mitigation: None required.

SPECIAL-STATUS MARINE SPECIES

Impact BI-5: Construction and operation of the project would not have a substantial adverse effect on special-status marine species. (*Less than Significant*)

Construction

This section analyzes potential project impacts on special-status marine species during the construction phase. Project components including modifications to the Great Highway and other adjacent roadways and improvements to public access (including the construction of additional parking facilities and restrooms) would occur entirely within the terrestrial environment and have no potential to affect marine resources. Construction activities that occur within or adjacent to the marine study area, and therefore may affect special-status species, are discussed below.

Hydroacoustic Impacts

Construction of the buried wall would not require in-water work. As buried wall construction activities would occur above the high tide line and would not directly affect the marine environment, there is limited potential for impact on marine species or habitat from this activity. The drilling required for the installation of the secant piles is unlikely to generate elevated underwater noise levels in the adjacent marine environment. While pile installation in water-adjacent habitats (e.g., shorelines, riverbanks) has been demonstrated to, in certain cases, generate deleterious sound levels within neighboring open water habitat, this is primarily a concern with impact hammer use – a construction technique which the project would not utilize.[109] Noise from drilling is generated principally through the action of the drill bit on the target surface; the noise is then propagated through surrounding substrate and into the adjacent water column. Because rock propagates noise more efficiently than unconsolidated sediment, the amount of noise created by drilling is more dependent on the degree of consolidation of impacted substrate than the size of the drill.[110,111] While there is little empirical data on the underwater noise generated during drilling, a 2012 study on the hydroacoustic effects of drilling in support of steel pile installation found that drilling did not cause exceedance of existing background underwater noise levels.[112]

Most of the substrate in the marine study area is composed of soft sediment, which is likely to produce much lower sound levels than other marine regions where large amounts of exposed bedrock are common.[113,114] Additionally, the gradual slope of Ocean Beach into the subtidal environment increases the distance over which sound energy must travel before coming into contact within the water column. Thus, special-status fish that may occur in the intertidal and shallow subtidal environment of Ocean Beach are unlikely to be exposed to elevated underwater noise levels from secant pile installation. Additionally, any marine mammals within the marine study area would likely occur in even deeper environments, farther offshore. As such, any underwater noise generated from onshore drilling activities would likely occur below a threshold of concern and have limited impact on special-status marine species. Therefore, any impacts resulting from construction of the buried wall, including hydroacoustic impacts from drilling on marine species and habitat, are expected to be ***less than significant***.

Water Quality Impacts

As segments of the buried wall are completed, the city would begin to remove the existing bluff and beach areas, the existing boulder and sandbag revetments, and various rubble and debris. This work would be conducted over a period of approximately 18 months and would require excavators working from the beach. Within the intertidal environment, excavators would only work during falling or low tides, so as to minimize direct contact with the water. A coffer dam would not be required; however, a temporary sand berm comprised of materials on site could be constructed to allow for protection of the active construction area from ocean waves and tidal activity. While most of the construction in support of the debris removal and bluff reshaping would occur outside of the marine environment, temporary increases in turbidity may occur as a result of earthwork and initial sand placement during construction within beach areas that could be inundated during high tides.

Typically, minor in-water activities of this magnitude cause only temporary resuspension of sediments and negligible effects. Sediment composition along the intertidal environment of Ocean Beach is mainly comprised of a coarse-grained, sandy material.[115] The presence of this substrate suggests that increases in turbidity would last only a short period of time, as denser sand settles more rapidly than fine-grained

[109] Caltrans, Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Final Report, prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2015.
[110] Ibid.
[111] Applied Physical Sciences, Mitigation of Underwater Pile Driving During Offshore Construction: Final Report, prepared for the Department of Interior, January 2010.
[112] Caltrans, Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Final Report, prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2015.
[113] Andersson M.H., S. Andersson, J. Ahlsen, B.L. Andersson, J. Hammar, L.K.G Persson, J. Pihl, P. Sigray, and A. Wikstrom, A framework for regulating underwater noise during pile driving, Swedish Environmental Protection Agency, 2017.
[114] AGS, Inc., South Ocean Beach Coastal Erosion and Wastewater Infrastructure Protection, Geotechnical Data Report, prepared for San Francisco Public Utilities Commission, 2020.
[115] Ibid.

material. Sediment suspension caused by wave action, storms, tides, and winds typical throughout the project site and surrounding area would generally overshadow any temporary increase in turbidity caused by in-water construction work. Previous studies have demonstrated that marine organisms are accustomed to sediment resuspension levels greater than those generated by even high-impact construction activities such as dredging.[116,117] Turbidity impacts from the project would occur far below the levels generated under a small dredging operation. Additionally, marine organisms native to the intertidal portion of Ocean Beach are adapted to a dynamic system in which sediment suspension due to wind and wave action is common. As such, water quality impacts in the marine environment from construction would be ***less than significant***. For a detailed discussion on the potential project impacts on marine water quality, see Appendix B, Section E.17, Hydrology and Water Quality.

Operation

Impacts of Sand Placements on Special-Status Marine Species and Habitat

Beach nourishment programs are often viewed as "softer," or less ecologically damaging, approaches to addressing coastal erosion compared to permanent, hard-structure options like seawalls.[118,119] However, nourishment programs have also been documented as disruptive to sandy beach invertebrate communities.[120] Benthic invertebrates play an important role in nutrient cycling, breaking down organic matter and providing coastal water with nutrient impacts essential for phytoplankton growth.[121] As such, impacts at these lower trophic levels can have cascading effects, causing reduced predation success for shorebirds, benthic fish species, and other intertidal beach organisms.[122] Reductions in benthic foraging success for shorebirds and fish have been observed to result from beach nourishment activities.[123,124]

Numerous studies have demonstrated that recovery of sandy beach invertebrates begins almost immediately after cessation of sand placement.[125,126] Recovery occurs via two mechanisms—one by animals that migrate to the affected area from surrounding habitat, and the other from recruitment[127] from plankton. Sandy beaches normally have higher invertebrate abundance in spring and summer coincident with recruitment

116 Anchor Environmental, Literature Review of Effects of Suspended Sediments due to Dredging Operations, prepared for the Los Angeles Contaminated Sediments Task Force, 2003.

117 Pennekamp, J., Epskamp, R., Rosenbrand W., Mullie, A., Wessel, G., Arts, T., Deibel, I., Turbidity caused by Dredging; Viewed in Perspective. Terra et Aqua, 64, 10-17, 1996.

118 Hanson, H., Brampton, A., Capobianco, M., Dette, H.H., Hamm, L., Laustrup, C., Lechuga, A. Spanhoff, R, Beach Nourishment Projects, Practices, and Objectives: A European Overview, Coastal Engineering 47, 81-11, 2002.

119 Cooke, B.C., Jones, A.R., Goodwin, I.D., Bishop, M.J., Nourishment Practices on Australian Sandy Beaches: A Review, Journal of Environmental Management 113, 319-327, 2012.

120 Schlacher, T.A., Noriega, R., Jones, A., Dye, T., The effects of beach nourishment on benthic invertebrates in eastern Australia, Science of the Total Environment, 435-436, 411-417, 2012.

121 Schlacher, T.A., Schoeman, D.S., Dugan, J., Lastra, M. Jones, A., Scapini, F., McLachlan, A., Sandy Beach Ecosystems: key features, sampling issues, management challenges and climate change impacts, Marine Ecology, 29, 70-90, 2008.

122 Leewis, L., van Bodegom, P.M., Rozema, J., Janssen, G.M., Does beach nourishment have long-term effects on intertidal microinvertebrate species abundance? Estuarine, Coastal, and Shelf Science, 113, 172-181, 2012.

123 Wilber, D., Clarke, D., Ray, G., Burlas, M., Response of surf zone fish to beach nourishment operations on the northern coast of New Jersey, USA, Marine Ecology Progress Series, 250, 231-246, 2003.

124 Peterson, C.H., Bishop, M.J., Johnson, G.A., D'Anna, L.M., Manning, L.M., Exploiting beach filling as an unaffordable experiment: Benthic intertidal impacts propagating upwards to shorebirds, Journal of Experimental Marine Biology and Ecology, 338, 205-221, 2006.

125 Leewis, L., van Bodegom, P.M., Rozema, J., Janssen, G.M., Does beach nourishment have long-term effects on intertidal microinvertebrate species abundance? Estuarine, Coastal, and Shelf Science, 113, 172-181, 2012.

126 Rosov, B., Bush, S., Briggs, T., Elko, N., The State of Understanding the Impacts of Beach Nourishment Activities on Infaunal Communities, Shore and Beach, 84 No.3, 2016.

127 Within a community, recruitment is the process by which new individuals are added to a population, whether by birth and maturation or by immigration.

and movement patterns of dominant species between the shallow subtidal and beach habitat.[128] Consequently, the timing of project sand placements may influence the speed of recovery times. Recovery (e.g., species, abundance, biomass) periods on the order of weeks have been reported with projects completed in winter–early spring prior to the onset of the spring–early summer peak recruitment period.[129] Complete recovery may take several months if construction is completed in summer–fall and recruitment is delayed until the next season. Nevertheless, colonization of the sands would begin almost immediately and the development of the invertebrate prey base would proceed naturally via the two mechanisms mentioned above, and full recovery would be anticipated well in advance of the next sand placement.

Direct impacts from beach nourishment on special-status marine species in the form of harassment or mortality are unlikely to occur. Special-status fish and marine mammals are unlikely to be present within the intertidal environment of Ocean Beach, even during migration periods, and any individual that happened to be present would possess the ability to flee the marine environment. Rather, impacts from beach nourishment may take the form of a reduction in the abundance and diversity of the marine invertebrate community present within the intertidal environment of Ocean Beach. These impacts may result in temporarily reduced intertidal foraging success for marine species and would occur in environments designated as critical habitat and protected under multiple fisheries management plans.

The waters off Ocean Beach are designated as essential fish habitat as covered under the Pacific coast groundfish, Pacific salmon, highly migratory species, and coastal pelagic fisheries management plans. Table F-4 in Appendix F shows fish species covered under these plans along with their relative likelihood to occur in the waters off Ocean Beach. Species covered under the Pacific groundfish fisheries management plan are the most likely to occur within the marine study area and may use the intertidal environment for foraging. These species are mostly benthic and feed, in part, on the range of taxa comprising the intertidal invertebrate community at Ocean Beach. As discussed above, nourishment programs similar to the one proposed have been observed to affect invertebrate abundance and cause the exclusion of species that rely on these species as a food source from the areas affected.[130] However, benthic fish species would have access to ample unaffected intertidal habitats adjacent to the project site. Additionally, as discussed above, the intertidal environment would recolonize rapidly from adjacent undisturbed habitat. Therefore, impacts on groundfish foraging habitat would be limited in both magnitude and duration.[131]

The intertidal environment of Ocean Beach is also designated as critical habitat for leatherback sea turtle and green sturgeon. The primary constituent elements essential to the conservation of leatherback sea turtle along the California coast require the maintenance of adequate prey, primarily species of jellyfish. Jellyfish may be affected if there is a reduction in invertebrate abundance as a result of nourishment actions. Similarly, green sturgeon critical habitat is also designated within the intertidal environment of Ocean Beach. Unlike leatherback sea turtles, green sturgeon may occasionally stray into the intertidal environment of Ocean Beach to forage on intertidal invertebrates. Consistent with that behavior, one of the primary constituent elements for green sturgeon critical habitat is the maintenance of available prey items including benthic invertebrates and fish. As discussed throughout, impacts from nourishment may cause a temporary reduction in abundance of intertidal invertebrates within the project site. As with essential fish

128 Ibid.
129 Ibid.
130 Wilber, D., Clarke, D., Ray, G., Burlas, M., Response of surf zone fish to beach nourishment operations on the northern coast of New Jersey, USA, Marine Ecology Progress Series, 250, 231-246, 2003.
131 Rosov, B., Bush, S., Briggs, T., Elko, N., The State of Understanding the Impacts of Beach Nourishment Activities on Infaunal Communities, Shore and Beach, 84 No.3, 2016.

habitat groundfish species, green sturgeon would have access to large expanses of unaffected intertidal habitats adjacent to the project site.

Under the small sand placement option, all sand would be transported from an existing source and the transport would occur entirely in the upland environment. As such, ***no impact*** on marine species or habitat from the transport of sand under the small placement option would be expected.

Under the large placement option, transport of the dredge sand slurry material has the potential to cause impacts on the marine environment. The large placement option would require the anchoring of a dredge vessel offshore to facilitate the transfer of material between the ship and the beach, and may require weighted collars that straddle the pipeline so that it sits on the ocean floor. These activities would cause temporary impacts on the benthic environment through the placement of anchors on the sea floor.

As described above in Section 4.6.2.2, *Project Setting*, under Vegetation Communities and Wildlife Habitats, Marine Communities, no expansive benthic hardscape habitat is expected to occur within the marine study area. As such, no species associated with that habitat would be crushed or otherwise negatively affected through anchor and pipeline placement. The placement of the anchor and pipeline may cause temporary suspension of sediments; however, this sediment suspension would affect a negligible area relative to the surrounding subtidal environment and would dissipate rapidly. Sediment resuspension from these activities would be temporary and of a similar magnitude to that described above for construction impacts. While in place, the anchor and pipeline would also temporarily exclude organisms from small portions of benthic habitat. However, the vast amount of available benthic habitat adjacent to anchor and pipeline locations would limit the impact of this activity to a negligible level. Additionally, the placement of the anchor and pipeline would be temporary. Overall, impacts from dredge vessel mooring and pipeline placement on the marine environment would be ***less than significant***.

Ultimately, beach nourishment activities under the large sand placement option may result in the temporary loss of the intertidal benthic invertebrate community, which could indirectly cause the disruption of marine fish and avian foraging behavior, including for the special-status marine species discussed above. It is anticipated that this temporary disruption may occur over the entire beach nourishment area. However, due to the large amount of available habitat adjacent to the nourishment site, special-status marine species would have ample access to adjacent unaffected habitat. Additionally, this proximity to unaffected habitat would allow for the rapid recolonization of the benthic, intertidal environment by marine invertebrates post-nourishment. Thus, when factoring in the expected recovery rates of invertebrate populations, this potential disruption to both the invertebrate community and their predators is considered to be less than significant. Direct impacts of turbidity on benthic invertebrates and marine fish are also expected to be less than significant, for two reasons. First, because of the physical nature of the material (i.e., sand as opposed to finer silt material), most of it would settle out quickly and not create lasting turbidity plumes. Additionally, temporary sediment increases would likely be confined to the intertidal environment, where organisms are adapted to sediment resuspension from natural wind and wave action. Thus, impacts from project operation on marine special-status species and habitat are considered ***less than significant***.

Mitigation: None required.

SENSITIVE NATURAL COMMUNITIES AND JURISDICTIONAL WETLANDS AND WATERS

Impact BI-6: Construction and operation of the project would not have a substantial adverse effect on the California Department of Fish and Wildlife-designated sensitive natural communities or jurisdictional wetlands or waters (*Less than Significant*)

No marine sensitive natural communities are present within the marine study area, such as kelp forests, eelgrass or oyster beds, or coral reefs, which possess unique or special ecological value and are particularly sensitive to disturbance. As such, ***no impacts*** on sensitive marine communities would result from project construction or operations. The following discussion reviews potential impacts in the terrestrial study area.

Sensitive Dune Vegetation and Dune Habitat

Project implementation would not substantially affect sensitive dune vegetation. The disturbed dune mat vegetation community of the terrestrial study area contains small assemblages of native dune plants elemental to the sensitive natural community yellow sand verbena – beach burr dune mat alliance. This sensitive dune vegetation alliance has a state rarity ranking of S3 due to its limited distribution in the state and the diversity of special-status plant species that often occur there. Within the study area (i.e., the project construction and operations areas with an additional 15- to 50-foot buffer), these areas support common native dune flora and, to a varying degree depending on presence of invasive or nonnative species, locally significant plant species. Within disturbed dune mat vegetation of the study area there is great variation in the abundance and diversity of native plants among nonnative and invasive species which consist primarily of ice plant, sea fig and annual grasses. While portions of the disturbed dune mat community within the terrestrial study area may contain areas where native dune plants are dominant, or even host a few locally significant plants, the vast majority of this vegetation community is comprised of ice plant mats among bare sandy areas.

Ice plant and sea fig are the two dominant species within the disturbed dune mat vegetation community of the project area. The California Invasive Plant Council identifies ice plant and sea fig to be highly and moderately invasive species, respectively, known to rapidly occupy dune environments and displace native vegetation. The northern portion of the South Ocean Beach project site where the disturbed dune mat community occurs is in a highly degraded state as a result of regular foot traffic and the abundance of ice plant mats, whereas the southern portion of the project site near Fort Funston is less disturbed and contains a higher abundance and diversity of the native dune flora associated with the yellow sand verbena – beach burr dune mat alliance. Yellow sand verbena is generally uncommon in the study area, but it was observed in the northern part of Fort Funston. This area is also adjacent to (north of) active Fort Funston restoration sites that contain naturally occurring and planted native dune flora.[132] The northern-most portion of Fort Funston, closest to the project area, contains some of the highest quality dune habitat within the park as a result of extensive nonnative and invasive plant removal, propagation and planting of native dune plants, and restrictions on pedestrian access within restored areas.[133]

Project construction would permanently disturb large areas of the disturbed dune mat community bordering the Great Highway and within highway medians, bordering the NPS parking lot, and among the rock

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[132] BioMaAS, 2021. Ocean Beach Climate Change Adaptation Project Biological Resources Assessment, prepared for the San Francisco Public Utilities Commission, November 2021.

[133] Russell, Will, et. al., Evaluating Wildlife Response to Coastal Dune Habitat Restoration in San Francisco, California. Ecological Restoration, Vol. 27, No. 4, 2009.

revetments. As described in the Environmental Setting discussion of Environmentally Sensitive Habitat Areas (Section 4.6.2.2), while these fragmented areas contain sandy soils with disturbed dune mat vegetation, they are not part of an evolved, complex and dynamic dune system that meets the criteria of an ESHA. These areas are small and generally flat, lacking the dynamic topography and variation in dune structure (e.g., blowouts, parabolic or transgressive secondary dunes) typical of an advanced dune system that would consequently be more likely to support native dune flora and fauna, such as the sensitive yellow sand verbena - beach burr dune mat alliance. Although the disturbed dune mat vegetation community within the study area contains some small areas of native dune flora, these areas are not characteristic of the sensitive yellow sand verbena - beach burr dune mat alliance because most of them are densely populated with invasive ice plant and sea fig, and lacking other native dune ecosystem qualities or benefits that makes this alliance sensitive.

Small and large sand placement events during project operation would not adversely affect the sensitive yellow sand verbena – beach burr dune mat alliance, as sand excavation activities on North Ocean Beach and sand placement activities on South Ocean Beach would occur in areas of Ocean Beach with little or no dune vegetation. The access route from the Great Highway to the North Ocean Beach excavation area at Lincoln Way traverses some disturbed dune mat vegetation that is dominated by ice plant and does not have the presence or diversity of native species characteristic of this sensitive dune alliance and is not characterized as dune habitat qualifying as ESHA. Therefore, project construction and operation would have a ***less-than-significant*** impact on the sensitive natural community yellow sand verbena – beach burr dune mat alliance.

Jurisdictional Wetlands and Other Waters

Construction

An aquatic resources delineation prepared for the project identified the Pacific Ocean as the only jurisdictional water within the study area subject to federal or state regulatory authority. The Pacific Ocean is a navigable water of the United States and is therefore considered jurisdictional waters of the United States regulated by the Corps under section 404 of the Clean Water Act up to the high tide line, and under section 10 of the Rivers and Harbors Act to the mean high water mark. Section 404 of the federal Clean Water Act prohibits dredging or filling other waters unless it can be demonstrated that such a discharge will not degrade the chemical, physical, and biological integrity of federal waters. These waters also are regulated by the Regional Water Quality Control Board under section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act as waters of the state and by the California Coastal Commission under the Coastal Act. California's Porter-Cologne Act establishes a comprehensive program to protect water quality in the state.

Excavation of the existing bluff face, construction of the buried wall, and bluff reshaping would require heavy machinery access and operation on South Ocean Beach. These components would be constructed primarily outside of the jurisdictional boundaries of waters of the United States and state such that permanent impacts from fill of jurisdictional waters would not occur. Removal of the revetments would require equipment access and excavation below the mean high water mark within regulated waters. Temporary impacts on the Pacific Ocean during construction on Ocean Beach could result in impacts on water quality from accidental release of deleterious material and sedimentation. As described in Chapter 2, Project Description, Section 2.7, Intended Uses of this EIR and Required Actions and Approvals, to comply with relevant laws, regulations and policies the SFPUC would be required to obtain permits and authorizations from the federal and state agencies with jurisdiction over the Pacific Ocean. Similar to existing authorizations from these agencies for ongoing erosion management and shoreline maintenance activities along Ocean Beach, these permits and authorizations would include requirements for implementation of standard and project-specific construction measures to protect water quality.[134] These measures could include, although would not be limited to, scheduling work to avoid high tides; avoiding or minimizing any contact of equipment, debris, or excavated materials with ocean water; and conducting any refueling or maintenance activities in a dedicated area in a controlled and contained area with drainage and spill control features. As discussed in Appendix B, Section E.17, Hydrology and Water Quality, federal and state laws and regulations require that discharges of potential pollutants to jurisdictional waters of the United States or state must comply with water quality standards. The city would be required by federal and state law to protect water quality, and would implement project-specific construction measures specified in a stormwater pollution prevention plan prepared for the project consistent with state and federal regulations and enforced by the State Water Resources Control Board and the Regional Water Quality Control Board. The stormwater pollution prevention plan would include best management practices for avoiding or minimizing water quality impacts through management of hazardous materials used during construction, non-stormwater management, erosion and sediment control, and run-on and runoff control. The project would also be subject to SFPUC's standard construction measure 3, Water Quality, which requires implementation of measures to prevent discharges of sediments and other pollutants to storm drains and surface waters. As discussed in Impact BI-5, sediments released during construction on Ocean Beach would quickly settle and would not result in turbid conditions beyond those naturally generated from wave action on the existing sandy environment, and therefore localized impacts on the marine environment would be less than significant. Implementation of best management practices to comply with federal and state law and regulations, and implementation of the SFPUC's standard construction measure 3, would reduce the potential for impacts on water quality of the Pacific Ocean during project construction to ***less than significant***.

Operation

Large sand placement events would require temporary fill of the Pacific Ocean, a jurisdictional other water, during conveyance of sand slurry from the dredge vessel to South Ocean Beach. During large sand placement events, as described in Chapter 2, Project Description, Section 2.4.5.3, *Large Sand Placements,* a temporary 28-inch-diameter pipeline connection would be established between the beach and an offshore dredge vessel containing the dredged sand. The approximately 2,700-foot-long pipeline would sink to the sea floor under its own weight. Weighted collars would be used, if necessary, to prevent the pipe from shifting. Buoy markers would be attached to the pipeline. Sand would be pumped through the pipeline onshore where heavy equipment would shape the sand into sand embankments. Once the sand placement is completed, the pipeline and dredge vessel anchor would be removed. Large and small sand placement events would also require the construction of sand berms on South Ocean Beach, construction of which may encroach into jurisdictional waters.

The large sand placement event activities would not result in the permanent fill of jurisdictional waters from the pipeline as all material placed in the marine environment would be removed upon completion of the slurry transfer. Temporary placement of fill (the slurry pipeline) on the ocean floor would be subject to review by regulatory agencies with retained jurisdiction over the Pacific Ocean where this work would occur. As explained in Impact BI-5, these activities would not result in substantial adverse effects on the marine environment. As also discussed above, project activities resulting in the placement of fill or other disturbance to jurisdictional waters would require permit approval from the Corps, a water quality certification and/or compliance with waste discharge requirements from the Regional Water Quality Control Board, and approval from the California Coastal Commission through a coastal development permit. These permits and

[134] U.S. Army Corps of Engineers, 2017. Department of Army Nationwide Permit approval letter, September 9, 2017. San Francisco Regional Water Quality Control Board, 2017. Water Quality Certification for the South Ocean Beach Short-Term Coastal Erosion Protection Measures Project in the City of San Francisco, June 14, 2014. California Coastal Commission, 2015. Coastal Development Permit, June 9, 2015.

authorizations would condition project activities related to nourishment events to protect ocean water quality, including by requiring sediments proposed for placement meet applicable public and environmental health standards, and through restrictions on equipment staging and operations, among others. As discussed for project construction, above, the operations phase would also comply with federal and state laws and regulations requiring that discharges of potential pollutants to jurisdictional waters of the United States or state must comply with water quality standards. The city and Corps (for large sand placements) would be required by federal and state law to protect water quality, and would implement project-specific measures during sand placement events consistent with state and federal regulations and enforced by the State Water Resources Control Board and the Regional Water Quality Control Board. As with the construction phase, project operations would also be subject to SFPUC's standard construction measure 3, Water Quality, which requires implementation of measures to prevent discharges of sediments and other pollutants to surface waters, and the Corps' contractor specifications which include specific water quality protection measures. Implementation of best management practices to comply with federal and state law and regulations, and implementation of the SFPUC's standard construction measure 3 and Corps specifications, as applicable, would reduce the potential for impacts on water quality of the Pacific Ocean during project operation to ***less than significant***

Both large and small nourishment events would involve the beneficial use of natural sand for the purposes of maintaining a broad sandy beach at the base of the bluff. Under either placement option, it is estimated that, through natural coastal erosion and shoreline processes, the sand placed on the beach would return to the marine environment over the course of about four to 10 years, depending upon placement volumes (see Chapter 2, Project Description, Section 2.4.5.5, *Type and Frequency of Sand Placement*). As discussed in Impact BI-5, the settlement of sand would not have substantial direct adverse effects on marine species, habitat, or water quality. Comparing the San Francisco main ship channel grain size distribution to the South Ocean Beach median grain sizes indicates that the ship channel material is slightly finer than the material within the swash zone of the South Ocean Beach site.[135] This observation is consistent with a recent Corps conclusion, stating that, "the MSC [Main Shipping Chanel] material is generally consistent with or slightly finer than the grain size range of material reported along Ocean Beach by the U.S. Geological Survey."[136] It is noted that sediments in the swash zone tend to be coarser than a composite across the active beach profile through the surf zone; therefore, the native sediment grain size at the project location may be finer than available Ocean Beach data suggest. Poor matching in grain size between donor and nourishment sites may result in increased erosion rates, elevated turbidity levels, and longer recovery times for benthic invertebrates.[137,138] These impacts are felt mostly acutely when donor sediments contain large amounts of silt and clay, relative to the nourishment site.[139] Importantly, a 2018 Corps analysis of the sediment composition within main ship channel found that the material is comprised of over 95 percent sand. Similar results were recorded during 2002 and 2010 sampling events which found the channel material to be 98 percent and 97 percent sand, respectively.[140] It should be noted that the San Francisco main ship channel

135 Sediment sampling by the U.S. Geological Survey indicated that the mean grain size in most of the San Francisco main ship channel falls in the fine-sand range (0.15 to 0.21 millimeters [mm]) with fine to medium sand (0.25 to 0.35 mm) for the majority of sand occurring along Ocean Beach.
136 USACE, 2020. Environmental Assessment for Ocean Beach Storm Damage Reduction Beach Nourishment Project, San Francisco, San Francisco County, California. December 2020.
137 Rakocinski, C.F., Heard, R.W., LeCroy, S.E., McLelland, J.A. and T. Simons. 1996. Responses by macrobenthic assemblages to extensive beach restoration at Perdido Key, Florida, U.S.A. Journal of Coastal Research 12: 326-353.
138 McLachlan, A. and A.C. Brown, 2006. The Ecology of Sandy Shores. 2006.
139 Atlantic States Marine Fisheries Commission, 2002. Beach Nourishment: A Review of the Biological and Physical Impacts. ASMFC Habitat Management Series #7. November 2002.
140 Edward Keller, U.S. Army Corps of Engineers, 2021. Personal email communication, April 5, 2021.

is a high-energy environment, with continual wave action creating a dynamic environment, which prohibits the sustained settlement of fine grained material. Thus, it is not anticipated that the slight difference in grain size between the donor material and placement location would result in increased rates of erosion or depressed recovery rates for benthic invertebrates. As such, impacts from project operation on jurisdictional waters are considered ***less than significant***.

Mitigation: None required.

WILDLIFE CORRIDORS OR WILDLIFE NURSERY SITES

Impact BI-7: Construction and operation of the project would not interfere substantially with the movement of any native resident or migratory wildlife species or established migratory corridors. (*Less than Significant*)

Terrestrial Biological Resources

Construction Effects of Night Lighting on Resident and Migratory Wildlife

The San Francisco Peninsula is located along the Pacific Flyway, a main north-south travel corridor for migrating birds extending from Alaska to Patagonia. Birds frequently stop over in desirable habitats to forage and rest within San Francisco, on San Francisco Bay, and along the Pacific Ocean shoreline throughout their migration. Open space areas on the western side of the San Francisco Peninsula such as Lake Merced, Fort Funston, and Ocean Beach serve as stopover locations for migrating birds. Given the lack of cover, few terrestrial mammals and no migratory animals other than birds and marine species occur in the project area. For this reason, construction on South Ocean Beach would not result in a substantial adverse effect on movement of common, urban wildlife.

Construction of the buried wall on South Ocean Beach may require periods of nighttime construction. Nighttime illumination of project work areas and staging areas could temporarily affect birds in flight or stopping over to rest within the South Ocean Beach project site during migration if nighttime illumination of work areas were significantly above baseline conditions. The buried wall construction footprint is bordered to the east by the northbound lanes of the Great Highway and to the west by South Ocean Beach and does not provide cover habitat. Therefore, the project's potential nighttime impacts on birds would be limited to birds resting or moving along South Ocean Beach in flight. Existing nighttime lighting in the project area is limited to street and parking lot lighting near the Great Highway/Sloat Boulevard intersection, along the west side of the Great Highway, and on the east side near the Oceanside Treatment Plant entrance, providing a baseline for artificial nighttime lighting within the project area. The existing lighting on the west side of the Great Highway would be removed under the project. Introduction of temporary nighttime illumination during portions of the construction period would not be expected to appreciably change the lighted environment from the baseline, as it would focus the lighting on active construction areas during the duration of nighttime work. The illuminated area would be limited by the rate at which the buried wall is constructed, approximately 50 feet per week, and work would not occur at a single location along the wall alignment for more than two weeks.

The SFPUC's standard construction measure 8, Visual and Aesthetic Considerations, Project Site, requires that nighttime lighting be directed away from residential areas and have shields to prevent light spillover effects. Shields preventing light spillover from nighttime work areas would minimize spillover into nearby beach habitat where birds may be roosting and minimize lighting of the night sky such that migrating birds would be unaffected. The project would also implement NPS best management practices for outdoor artificial lighting in open spaces, including using artificial lights only where and when needed, shielding and directing lights downward to avoid light shine above the horizon, and selecting lower wattage bulbs and lamps with warmer colors to minimize sky brightness and insect draw. Implementation of these practices would avoid or minimize potential adverse effects of artificial lighting on South Ocean Beach during necessary nighttime construction and would be in keeping with the NPS practice of protecting dark night skies. While birds and common urban wildlife using Ocean Beach to rest or to travel along the western shoreline of the San Francisco Peninsula may avoid work areas during periods of nighttime construction, such activity would not substantially alter use of the beach open space as a coastal corridor due to the focused area and activity requiring artificial illumination on a given night during the project construction period. The impact of the project on wildlife movement during construction would be less than significant.

Operation Effects of Night Lighting on Resident and Migratory Wildlife

As discussed in Section 4.2, Aesthetics (Impact AE-6), the existing nighttime lighting of the project area is concentrated at the northern and southern ends of the Great Highway near the Sloat Boulevard and Skyline Boulevard intersections, as well as lights at the entrance to the Oceanside Treatment Plant (Figure 4.2-6). This concentration of artificial lighting at these specific locations under existing conditions, rather than consistent lighting along the entire length of the highway, results in stretches of highway that are not well lit.

The multi-use path, service road, Skyline coastal parking lot, and new restroom would involve new and relocated sources of nighttime lighting within the project area. The minimal lighting along the multi-use trail would incorporate NPS best management practices for lighting, including only adding lighting where it is needed, shielding lights and directing them downward, and using lamps with warmer colors. Lighting at the Skyline coastal parking lot and new restroom would be similar to existing nighttime lighting near the Skyline intersection and at the existing restroom facility. The project would introduce new sources of lighting along the access road for approximately 600 feet between the Great Highway zoo entrance and Skyline Boulevard where none currently exists. As explained further in Section 4.2, Aesthetics (Impact AES-6), the project would not appreciably change the lighted environment relative to baseline conditions; the increase in permanent lighting would not be substantial, and would be offset by decreases in other sources of nighttime light that would result from the project, such as the removal of street lights along the west side of the Great Highway near Sloat Boulevard and loss of vehicle lights along the former public roadway. For these reasons, replacement and introduction of some new, permanent artificial night lighting within the project area is not expected to significantly disrupt bird migration along the Pacific Flyway during operations.

Nighttime lighting associated with large sand placement events during project operation would not substantially disrupt wildlife movement. Illumination of the large sand placement operations would be necessary during nighttime work. Up to four light towers would be used to illuminate the active work areas during nighttime sand placement activities on South Ocean Beach. The lighting would be directed downward and toward the active work and would use shields or baffles to ensure light is not directed above the horizon. Large sand placements would occur about once every 10 years, generally in the summer or fall and would require approximately six to eight weeks of work along the shoreline per placement event. The timing of these sand placement events could overlap with fall migration of birds along the Pacific Flyway but, as described below, sand placements are not expected to substantially disrupt avian movement. Similar to the construction impacts discussed above, with nighttime lighting shielded and directed down toward work areas, and with implementation of NPS best management practices for artificial night lighting to protect dark night skies, the impact to migratory birds using the Pacific Flyway and other birds roosting in the vicinity of the work areas on South Ocean Beach at night during large sand placements would be less than significant.

Sand Fencing, Infrastructure and Wildlife Movement

Following construction of the buried wall and bluff reshaping, sand fencing (wooden slat, plastic, or fabric) may be utilized on the constructed sand foredunes and slopes to the beach to prevent wind erosion of placed material. Sand fencing would also create additional sand berms by reducing ground-level wind speed and trapping sand. Periodic placement of sand fencing during operation would not result in an adverse effect on wildlife movement. As explained above, Ocean Beach does not provide optimal conditions for terrestrial wildlife movement due to the lack of cover and is not used as a migratory corridor for any terrestrial animal other than birds. While some terrestrial animals (e.g., southern alligator lizard, western fence lizard, or deer mouse) may occupy dunes where the sand fencing is placed, fencing would be permeable to these small species. Placement of sand fencing would not present a hazard for migrating birds in flight or while stopping over because fencing would be readily visible. Therefore, potential impacts of the project on migratory wildlife or wildlife movement from placement of sand fencing during operation would be less than significant.

The project includes installation of a new seat wall west of the pedestrian trail and above the reshaped bluff and constructed sand embankment. The seat wall would aid in dune creation, similar to the existing k-rail (concrete barrier) located west of the Great Highway. The seat wall would be continuous along the trail except at the central beach access, across from Zoo Road, and the southern beach access, across from the Oceanside Treatment Plant. Terrestrial animals that currently access the beach and foredune habitat from Fort Funston or developed areas west of the Great Highway would continue to do so after project implementation due to the similar design of the seat wall to the existing k-rail barrier and similar or improved beach accessibility. Project implementation and installation of new features along the shoreline would not substantially alter accessibility for wildlife movement through the project area; the impact would be less than significant.

No additional impacts on native resident or migratory terrestrial wildlife corridors are expected to occur under operation of the project. The impact would be ***less than significant***.

Marine Biological Resources

Construction

The marine environment offshore of Ocean Beach is an important migration corridor for many anadromous fish and marine mammals. Three Chinook salmon and two steelhead runs spawn in freshwater tributaries to San Francisco Bay and within the Sacramento and San Joaquin river watersheds. Other salmonids, including Coho salmon, with no spawning habitat in the San-Francisco Bay-Delta may still use the waters of the marine study area as a migration corridor. Non-salmonid anadromous fish species including green sturgeon and Pacific lamprey also spawn in freshwater tributaries to the San Francisco Bay-Delta before migrating to the Pacific Ocean and may temporarily occur within the marine study area during migration periods. Other migratory fish species including longfin smelt and Pacific herring are known to seasonally move between San Francisco Bay and the waters of the California coast. In addition to special-status fish species, many species of marine mammals use the waters of coastal California as a migration corridor between Mexico and Canada. The migratory patterns and life-history requirements of individual special-status species are discussed within Appendix F.

As discussed under Impact BI-5, project construction would occur primarily above the high tide line and would have little direct impact on the marine environment. The limited impacts that may occur would be confined to small portions of the intertidal beach environment. This proximity to the shoreline would substantially limit the potential for project impacts on migratory marine species. There may be brief periods in which green sturgeon may enter the intertidal environment to forage for benthic invertebrates; however, this is unlikely because special-status fish species, including green sturgeon, that migrate along the nearshore California coast occupy waters deeper than those found in the intertidal portions of Ocean Beach. Marine mammal species migrating along the California coast use waters much deeper than those potentially affected by project construction. Additionally, no haulouts or rookeries are present within the project vicinity. Given the low probability of occurrence of migratory species within the intertidal environment of Ocean Beach, and limited potential for impacts on the marine environment due to project construction, any interference with the migratory pathways of marine species from project construction would be ***less than significant***.

Operation

As discussed under Impact BI-5, impacts from operation of the project would extend farther into the open water habitats adjacent to the project area than those expected from project construction. As such, project operation would have greater potential to affect the migratory corridors of marine species. Operational impacts on marine migratory corridors may result from activities associated with the conveyance of dredge sand for placement on Ocean Beach. These impacts include temporary water quality impacts from anchor and pipeline placement and removal, which may cause the exclusion of migrating marine species from small amounts of benthic habitat. However, given the low magnitude and temporary nature of these disturbances, in conjunction with the vast amount of open water habitat available adjacent to the pipeline, any impacts on migratory wildlife corridors due to the anchor and pipeline would be ***less than significant***.

Relatedly, the sand from the project’s large and small sand placements could also affect marine migratory corridors during nourishment activities. Beach nourishment impacts on the intertidal marine community are discussed in detail above under Impact BI-5. These events could result in indirect impacts on the foraging success of special-status marine species if the benthic invertebrate community were severely affected by nourishment actions. However, migrating fish species with potential to occur within the project area are primarily salmonids and would likely occur at depths greater than those affected during beach nourishment operations. Additionally, any marine mammals migrating within the open water habitat adjacent to the project area would be at depths greater than would be affected by the project. As such, the impact on marine migratory corridors due to the project’s sand placements would be ***less than significant***.

Mitigation: None required.

Impact BI-8: Construction and operation of the project would not have a substantial adverse effect on nesting birds or result in an increase in bird collisions with project features. (*Less than Significant*)

Construction

Construction activities would produce noise and visual disturbance that could adversely affect nesting bird species within 0.25 mile of the project area during the nesting season (February 1 – August 31). As discussed under Impact BI-2, the same construction-related activities generating noise above ambient conditions that could disrupt nesting bank swallows on South Ocean Beach could also affect other passerine (perching) and raptor species nesting in the project area, including other special-status birds with potential to nest in the project area (San Francisco common yellowthroat). These activities would primarily include deconstructing the Great Highway, demolishing the existing restroom facility, and constructing the buried wall, which would produce both short-term loud noises (e.g., hoe ram) and continuous noise (e.g., construction equipment supporting these activities). An increase in human presence and large equipment beyond baseline conditions (e.g., existing traffic along the Great Highway and recreational users on Ocean Beach) may also cause visual disturbance and adversely affect nesting efforts and active nests if present in the project area where work is occurring.

Construction activities that would substantially alter the noise environment could disrupt birds attempting to nest, disrupt parental foraging activity, or displace mated pairs with territories in the project area. These adverse effects may occur over several nesting seasons, given the long buildout period for the project. Direct impacts on birds or their nests could result from vegetation removal, tree trimming or removal, ground-disturbing activities (excavation, grading, pile installation, reshaping work), demolition of the restroom building, and the Great Highway roadbed removal. The loss or disruption of an active nest occupied by a bird species protected by the federal Migratory Bird Treaty Act or California Fish and Game Code would be considered a significant impact. Nest abandonment and mortality to eggs and chicks would also be considered significant impacts. Thus, the loss of any active nest by, for example, removing a tree or shrub containing an active nest or causing visual, noise, or vibratory disturbance that leads to nest abandonment is prohibited under federal and state law.

Through compliance with all local, state, and federal requirements for protection of nesting and migratory birds and through implementation of the SFPUC's standard construction measure 7, Biological Resources, the project would avoid potential impacts on nesting birds. A qualified biologist would conduct a survey of the project site(s) for active nests during nesting season and would establish protective measures around active nests, such as restricting certain construction activities in buffer zones during the time of year when and where birds are breeding and nesting. Buffers would be determined by considering the bird species, whether the nest has a visual line of sight from work activities, and the types of work activities in process. A qualified biologist would monitor the active nest to confirm the buffer is sufficient to avoid impacts and would increase or decrease the buffer as necessary. The buffer would be maintained until the birds fledge. Based on the highly urbanized setting and the existing levels of urban development, the need for expansive buffer distances is not anticipated. The impact would therefore be ***less than significant***.

Operation

Nesting Birds

Following project construction, the project area would provide similar, if not improved, suitable habitat and nesting opportunity for birds in landscaped trees and shrubs and among ground vegetation planted on the reshaped bluff, and between the multi-use trail and service road. Although the abundance and quality of habitat for nesting birds would depend on vegetation type (e.g., tree, shrub, grasses, forbs) and species selected (e.g., native or ornamental), the project would revegetate areas largely characterized as the disturbed dune mat vegetation community, with a dominance of ice plant and sea fig, which provided limited habitat value to nesting birds. Use of the project area by the public would not be substantially different from current conditions or affect how nesting birds occupy suitable habitat areas. Implementation of small and large sand placement events would not substantially disrupt nesting within either the North Ocean Beach or South Ocean Beach project sites, as the beach and foredune communities are not widely used for nesting by local resident or migratory species. Noise and visual disturbances generated during sand excavation and placement are not expected to substantially disrupt nesting efforts in the vicinity of this work, as vegetative habitat suitable for nesting at these locations would be buffered and obscured by the reshaped bluff topography. Disturbance to birds nesting in vegetation proximate to the sand excavation and placement locations is expected to be temporary, and limited to potential nesting sites in vegetation proximate to the equipment access routes to and from sand excavation and placement locations, where equipment would be closest to vegetation suitable for nesting, located east of the reshaped bluff on South Ocean Beach and east of the O'Shaughnessy Sea Wall on North Ocean Beach. Potential impacts on nesting birds due to project operations would therefore be ***less than significant***.

Aerial Avian Collisions

Ocean Beach and associated disturbed dune mat of the project area, as well as the inland landscaped vegetation and mature trees in the vicinity of the San Francisco Zoo, provide valuable foraging and cover opportunities for resident birds within the larger urban setting of western San Francisco. Although of more limited value, landscaping planted on the reshaped bluff and along the multi-use trail and service road would provide similar habitat for local birds. Migratory birds traveling along the Pacific Flyway could also use these habitats to forage, rest, and replenish energy stores during spring and fall migrations. Most native and migratory birds are protected from "take" under the Migratory Bird Treaty Act, as discussed in Section 4.6.3.1, *Federal*.

The project includes replacement of a restroom facility near the western terminus of Sloat Boulevard with a new building. Open space, even in highly urbanized areas, attracts avifauna, and buildings constructed within or adjacent to open space habitat, such as native dune vegetation or landscaping that could be used for foraging, roosting, or rest by birds *on the wing* (in flight), pose the risk of bird collisions, particularly if the design contains exterior reflective surfaces or artificial night lighting. The restroom design and lighting would be similar to the existing restroom, which is a small one-story structure that has minimal reflective surfaces or nighttime lighting that could pose a risk of bird collisions. Thus the project would not substantially alter existing conditions. As a new building located within 300 feet of an *Urban Bird Refuge*,[141] the restroom building would comply with the city's adopted Standards for Bird-Safe Buildings[142] (San Francisco Planning Code section 139) and would incorporate specific design elements into the development to avoid or minimize avian collisions with the restroom building. The project's adherence to the city's standards for bird-safe buildings would avoid or minimize the adverse effects of avian collisions during project operation; therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact BI-9: Construction and operation of the project could have a substantial adverse effect on special-status bats or bat maternity colonies. (*Less than Significant with Mitigation*)

Construction

Western red bat, a California species of special concern, and several non-special-status bat species, including silver-haired bat, hoary bat, little brown bat, and fringed myotis, have each been detected south of the project area within Fort Funston.[143] These species may forage insects within the project area over

[141] As defined in planning code section 139, an Urban Bird Refuge includes open spaces 2 acres and larger dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, or wetlands, or open water.
[142] San Francisco Planning Department, Standards for Bird-Safe Buildings, 2011, *http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*.
[143] Fellers, Gary M. 2005. Acoustic Inventory and Monitoring of Bats at Golden Gate National Recreation Area. USGS.

disturbed dune mat vegetation and beach and intertidal open space habitats. Nighttime construction-associated noise or vibration, or increased human activity during general construction, could result in behavioral alterations including the temporary avoidance of work areas by foraging bats during construction. Such temporary alteration of behavior during construction would be a less-than-significant impact due to the abundant similar foraging habitat available along the regional coastline.

Little brown bat and fringed myotis use cracks and crevices within buildings to establish maternity roosts. The existing restroom facility is the only building in the project area that would be directly affected (demolished) under the project. This building does not provide optimal roost habitat due to the regularity of human presence in the building and lack of architectural features, such as rooftop vents, that would allow entry into the building eaves where roosts would be protected and hidden from view. In addition, there is no indication the existing facility is currently being used by bats for roosting. Signs of an active bat roost include odor, staining, and guano exiting the roost. Biological surveys conducted for the project in 2019 and 2020 documented no such evidence of bats using the restroom building for roosting. Therefore, demolition of this building is not expected to adversely affect special-status bats or bat maternity roosts.

The mature trees located at the zoo entrance on Sloat Boulevard, along with stands of Monterey cypress trees within the median near the Great Highway/Skyline Boulevard intersection and trees south of the intersection, provide suitable roosting habitat for western red bat and the common bat species named above. Each of these species could establish maternity or hibernation roosts within tree cavities, beneath bark, or among dense foliage of project area trees. Maternity roosts are roosts occupied by pregnant females or females with non-flying young. Non-breeding roosts are day roosts without pregnant females or non-flying young. Hibernacula are roost sites used by bats to overwinter cold weather periods until temperatures warm. Destruction of an occupied non-breeding bat roost resulting in the death of special-status bats, disturbance that causes the loss of a maternity colony of bats (resulting in the death of young), or destruction of a hibernation roost would be considered a significant impact (although bats generally do not hibernate in the Bay Area due to sufficiently high temperatures year round).

Construction of the project could require trimming or removal of median trees and shrubs near the Great Highway/Skyline Boulevard intersection for the Skyline coastal parking lot, a tree near the bus layover on Sloat Boulevard, and trees in the median of the zoo's Sloat Boulevard entrance. Tree trimming could result in direct mortality of or indirect disturbance to roosting bats (e.g., bats avoid routine foraging or fail to return to a maternity roost due to an increase in human presence and construction activity within the project area), if present. Mortality of special-status bats resulting from direct actions such as destruction of an occupied day or maternity roost, or indirect actions, such as elevated noise or vibration that causes roost or young abandonment, attributable to project construction would be a significant impact. Additionally, common (non-special-status) bats may establish maternity roosts in these same locations; disturbance that results in roost abandonment and mortality of young bats not yet able to fly, even in common species, would also be a significant impact. Implementation of **Mitigation Measure M-BI-9**, **Avoidance and Minimization Measures for Special-Status Bats and Maternity Roosts**, would reduce potential impacts on the special-status western red bat and common bat maternity roosts to a less-than-significant level by requiring preconstruction surveys and implementing minimization and avoidance measures if potential special-status bat roosting habitat or active maternity roosts of special-status or common bats are found.

Mitigation Measure M-BI-9: Avoidance and Minimization Measures for Special-Status Bats and Maternity Roosts

A qualified biologist experienced in the identification of special-status bats shall conduct a preconstruction survey for special-status bat species habitat in advance of any tree trimming or removal to identify signs of potential bat habitat, including maternity colonies and any active roost sites. Identified bat maternity colonies shall be avoided, if possible. Should potential maternity colonies or active bat roosts be found in trees but cannot be avoided, SFPUC shall ensure the following measures are implemented:

a. Trim trees or install bat exclusion devices when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of the bat maternity roosting season (approximately April 15 to August 15) if a maternity roost is present, and outside the months of winter torpor (approximately October 15 to February 28, or as determined by a qualified biologist experienced in the identification of special-status bats).

b. If tree trimming is not feasible during the periods when bats are active, and bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the tree trimming, a qualified biologist shall delineate a no-disturbance buffer around these roost sites until they are no longer in use as maternity or hibernation roosts or the young are capable of flight.

c. Based on the professional opinion of a qualified biologist, buffer distances may be adjusted around roosts depending on the level of surrounding ambient activity (e.g., if the subject tree is adjacent to a busy road) or if an obstruction, such as a large sand dune, is within the line-of-sight between the roost and construction.

d. A biologist experienced in the identification of special-status bats shall be present during tree trimming and removal if bat roosts are present. Project activities shall disturb trees with roosts only when no rain is occurring or is not forecast to occur for three days and when daytime temperatures are at least 50 degrees Fahrenheit.

e. Under the supervision of the qualified biologist, trim trees containing or suspected to contain roost sites over two days. On the first day, branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws. The following day, branches or limbs containing roost sites shall be trimmed with chainsaws, under the supervision of the biologist.

Operation

Beach nourishment under project operation is not expected to adversely affect special-status bats or bat maternity colonies because these activities would be limited to project sites on North and South Ocean Beach and the Pacific Ocean. None of these locations or their respective habitats provide suitable habitat for bat maternity colonies. As discussed above, western red bat and other common bat species may forage insects over beach and intertidal areas, behavior which could be disrupted during sand placement events. Similar to the discussion of project operations on special-status marine bird and shorebird foraging activity (see Impact BI-4), such disturbance would not be substantially adverse because of the temporary nature of the work and small size of the disturbance areas relative to the similar available foraging habitat in the project vicinity. Therefore, the project operational impact on special-status bats would be ***less than significant***.

Significance after Mitigation: Less than Significant

LOCAL PLANS AND POLICIES

Impact BI-10: Construction and operation of the project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (*Less than Significant*)

As discussed in detail in Chapter 3, Plans and Policies, the project would not conflict with policies and objectives of the San Francisco General Plan that address Ocean Beach and the Coast Trail. Also of relevance is the Chapter 3 discussion of project consistency with the Sea Level Rise Action Plan, which contains elements addressing protection of natural resources and coastal resources, some of which also concern biological resources. While the project would not necessarily advance the policies of the general plan related to biological resources (provided in Section 4.6.3.3, *Local*, San Francisco General Plan) the project does not obviously conflict with those objectives or policies. As discussed in Impact BI-8, the project would comply with the San Francisco Planning Code section 139 through incorporation of bird-safe building standards for the new restroom building design.

The Western Shoreline Area Plan includes one policy related to the protection of biological resources of Ocean Beach: Policy 6.2, Improve and stabilize the sand dunes where necessary with natural materials to control erosion. Under the project, the reshaped bluff face above the buried wall would include measures to prevent wind displacement of the introduced sand. As discussed in Chapter 2, Project Description, Section 2.4.3, Debris and Revetment Removal, and Sand Placement and Revegetation, these measures may include wooden slat, plastic, or fabric sand fencing to prevent sand displacement and shape additional dune berms, and placement of a layer of coarse sand over the finer sand used within the reshaped bluff. Plantings on the bluff face would be native, climate-appropriate, locally adaptive, and non-invasive, and would require little water. As the policy specifies use of natural materials to prevent dune erosion, the use of coarse sand or native plantings to stabilize the reshaped buff face would not be in conflict with the plan.

The project's public access and parking improvements might require trimming or removal of mature trees. Trees that may be affected by the project during construction are located on city-owned land. Therefore, trees that could be affected by the project would be subject to San Francisco Public Works Code article 16, section 808, if designated street or significant trees. The code defines significant trees as those measuring 20 feet or greater in height, having a canopy width of 15 feet or greater, or having a trunk diameter that is 12 inches or greater when measured at 4.5 feet above the ground. Street trees are any tree growing within the public right-of-way and any tree growing on land under Public Works' jurisdiction. A tree survey prepared for the project identified one street tree within the study area on the north side of Sloat Boulevard.[144]

Compliance with the city's tree protection policy for significant trees, which would be required as part of the city's project approval process, would adequately protect trees to be retained during construction and result in public notice of trees identified for removal in accordance with the substantive requirements of the code. Thus, the project would not conflict with the tree protection ordinance and the impact would be less than significant.

[144] Environmental Science Associates, Memo to Karen Frye, San Francisco Public Utilities Commission, from Liz Hill and Joe Sanders, Environmental Science Associates, Subject: Ocean Beach Climate Change Adaptation Project Tree Survey Memorandum, August 11, 2021.

No other conflict with adopted local policies or ordinances protecting biological resources is expected with project implementation. Thus, impacts related to conflict with policies or plans protecting biological resources would be ***less than significant***.

Mitigation: None required.

4.6.4.4 CUMULATIVE IMPACTS

CONSTRUCTION

Impact C-BI-1: The project, in combination with the cumulative projects, would not result in significant construction-related biological resources impacts. (*Less than Significant*)

The geographic scope of potential cumulative impacts on biological resources encompasses the species occurrences, habitats, and sensitive natural communities within the project terrestrial and marine study areas, as well as biologically linked areas sharing the San Francisco coastline or occurring in the southwestern portion of San Francisco where the project is located. Table 4.1-3 in Section 4.1.5.2, *Approach to Cumulative Impact Analysis in this EIR*, provides a description of projects considered in the cumulative analysis. Unless otherwise exempt, all of the cumulative projects that would involve physical environmental effects are subject to CEQA review and, consistent with CEQA requirements, would be required to implement measures or project modifications to avoid or mitigate significant environmental effects, as feasible.

Terrestrial Biological Resources

The project would have an effect on terrestrial biological resources that inhabit the project area and surrounding vicinity. Short-term construction impacts considered above in Impacts BI-1, BI-2, BI-3, BI-4, BI-6, BI-7, BI-8, and BI-9 include potential disturbance to special-status plants, nesting bank swallow and their breeding habitat, western snowy plover and other special-status birds, sensitive natural community yellow sand verbena – beach burr dune mat alliance, other waters of the United States, and wildlife movement/wildlife corridors, nesting birds and roosting bats. The cumulative projects could affect the sensitive natural community yellow sand verbena – beach burr dune mat alliance and/or the San Francisco spineflower. Like the project, development of the identified cumulative projects is likely to have limited effects on nesting birds and roosting bats. This is due to the similarity of beach, dune, or developed/landscaped/ruderal habitat conditions in these areas, and the related opportunity for nesting birds and roosting bats within this geographic area. Any of the cumulative projects that include night work requiring night lighting adjacent to open space could disrupt wildlife movement, similarly to the project. All the projects listed above would be required to comply with applicable regulatory requirements protecting these biological resources and project-specific mitigation measures (where applicable), similar to those of the project.

San Francisco Spineflower

As explained in Impact BI-1, project construction at the southern terminus of the South Ocean Beach project site adjacent to Fort Funston could result in indirect (habitat degradation) effects on San Francisco spineflower. Direct impacts are not expected, as the project site does not provide suitable habitat for the plant but does abut higher quality dune habitat within Fort Funston where this species is present. As discussed, potential impacts would be avoided or minimized through implementation of the SFPUC's standard construction measure 7, Biological Resources. Construction of the following cumulative projects could also adversely affect San Francisco spineflower through direct displacement, trampling, or indirect habitat degradation should these plants occupy respective project development areas where suitable habitat for this species is known to occur: Fort Funston Trail Connection, Vista Grande Drainage Basin Improvement Project, Oceanside Treatment Plant Improvements, and Westside Force Main Reliability Project (see Figure 4.1-1 in Section 4.1.5.2, *Approach to Cumulative Impact Analysis in this EIR*). These projects would be located either proximate to disturbed dune mat vegetation known to support or with potential to support San Francisco spineflower (Fort Funston Trail Connection, Oceanside Treatment Plant Improvements, and Westside Force Main Reliability Project), or within similar disturbed dune habitat of Fort Funston (Vista Grande Drainage Basin Improvement Project) where this plant is less populous and therefore the potential for adverse effects on individuals is less likely or severe. The Oceanside Treatment Plant roof and north portion of Fort Funston where the trail connection would occur contain higher quality dune scrub vegetation with a greater dominance of native dune species where San Francisco spineflower is likely more abundant. The projects described in the Oceanside Treatment Plant Improvements may include development of or disturbance to small areas of existing vegetation on the roof where this plant is known to occur and the Fort Funston Trail Connection may displace individual San Francisco spineflower plants; but neither of these projects would substantially reduce or alter the supportive habitat for this species at these project locations. For these reasons, the combination of the residual project effects on San Francisco spineflower with anticipated effects of the cumulative projects would be ***less than significant***.

Nesting Bank Swallow and Other Nesting Birds

As explained in Impact BI-2 and BI-8, project construction would result in noise and visual disturbance that could adversely affect bank swallow and other birds nesting in the project area. As discussed, the potential project impacts on nesting birds would be reduced to la less than significant level with mitigation (bank swallow) and with implementation of the SFPUC's standard construction measure 7, Biological Resources (other nesting birds). The cumulative projects located nearby the bluffs where bank swallow nest include the Fort Funston Trail Connection and the Vista Grande Drainage Basin Improvement Project. The trail connection would occur on the dune terrace above and east of the bluffs where bank swallow nest. The NPS would implement measures during construction to avoid impacts on nesting bank swallows, such as seasonal avoidance or through use of hand tools in place of heavy equipment. The Vista Grande Drainage Basin Improvement Project would use a portion of Fort Funston for staging and access to the existing underground tunnel that connects the Vista Grande Canal to an outlet on the beach. The portion of beach where work on the outlet would occur is south of the historical nesting area monitored by the NPS and does not provide suitable bluff nesting habitat for bank swallows; therefore, impacts on nesting bank swallow from the Vista Grande Drainage Basin Improvement Project are not expected. The project would permanently remove vertical bluff habitat above South Ocean Beach occupied annually by the Fort Funston bank swallow breeding colony and considered a potential environmentally sensitive habitat area. The project impact on bank swallow breeding habitat is significant and unavoidable with mitigation. No other project considered in the cumulative analysis would contribute to a cumulative impact on bank swallow breeding habitat.

Many of the identified cumulative projects would generate noise and/or create visual disturbance during construction, which could affect other nesting birds. Further, some of these projects may require tree and/or vegetation removal that could cause nest failure or abandonment if active bird nests are present. While the project and several of the cumulative projects listed above could affect nesting birds, the combined effect would not be substantial. This is because most of the cumulative projects are within developed locations in the western portion of the city with little habitat for nesting birds to occupy. Projects that would require tree or vegetation removal—activities that present a higher risk to nesting birds should this work occur during the nesting season—would be required to comply with regulations protecting birds and their nests from direct impacts, as would the project. The SFPUC projects in the cumulative scenario would be subject to the same standard construction measures as the project, which protect biological resources (standard construction measure 7). Further, birds nesting within San Francisco are accustomed to a baseline level of noise and visual disturbance and thus have a higher tolerance for some construction activities, making it less likely such indirect disturbances would contribute to nest failure. Therefore, the combined effect on other nesting birds due to the project and the cumulative projects would be ***less than significant***.

Western Snowy Plover

None of the cumulative projects would involve potential adverse effects on western snowy plover within the project area; the species could be encountered during construction of the Vista Grande project, approximately 0.75 mile to the south. As explained under Impact BI-3, project construction would not adversely affect western snowy plover as they are not known to overwinter within the South Ocean Beach project site. Therefore, the effects of the project construction, in combination with those of other projects in the cumulative scenario, would not result in a significant cumulative impact on western snowy plover.

Other Special-Status Birds

As explained under Impact BI-4, the project would not result in substantial adverse effects on other special-status birds (or common birds) foraging or overwintering in the project area during construction (or operation) due to the abundant similar foraging habitat along the regional coastline relative to the project construction and operations areas, the temporary nature of the disturbance, and the avoidance and minimization measures implemented under the SFPUC's standard construction measure 7, Biological Resources (for overwintering western burrowing owl). In the cumulative scenario, the only project that could contribute to a cumulative effect on these same other special-status birds is the Vista Grande Drainage Basin Improvement Project, because of work on the existing ocean outlet located in the intertidal zone and on the beach below Fort Funston where some of these same species could forage. No adverse effects on western burrowing owl are anticipated from this project. Similar temporary disturbance to suitable marine and terrestrial foraging habitat for double-crested cormorant and California gull would occur during project construction, but the combined effect would not be substantial given the small construction footprint associated with the ocean outlet work area relative to the abundant beach and intertidal foraging habitat in the region. Further, the timeline of these two projects' construction (and operation) when potential impacts on foraging habitat would result do not overlap. For these reasons, the combined effect on other special-status birds foraging habitat due to the project and the cumulative projects would be ***less than significant***.

Yellow Sand Verbena – Beach Burr Dune Mat Alliance Sensitive Natural Community

As explained in Impact BI-6, the project impact on yellow sand verbena – beach burr dune mat alliance would be less than significant. Cumulative projects located in proximity to this sensitive community could result in similar direct impacts through development. Cumulative projects with potential to affect the yellow sand verbena – beach burr dune mat alliance include the same projects identified as having potential to affect San Francisco spineflower. The Westside Force Main Reliability Project and the Vista Grande Drainage Basin Improvement Project would be located in or adjacent to highly disturbed dune mat habitat without much native dune flora that might qualify as the sensitive vegetation alliance. As discussed above, the Oceanside Treatment Plant roof and north portion of Fort Funston contain high quality dune vegetation that is more likely to be characteristic of the yellow sand verbena – beach burr dune mat alliance. The Oceanside Treatment Plant Improvements may include development of or disturbance to small areas of existing vegetation on the roof which could adversely affect this sensitive natural community if present; however, the project would not substantially reduce or alter the roof's supportive habitat for this sensitive alliance. Similarly, as the alignment of the Fort Funston Trail Connection could be designed to meander around areas of high quality native dune vegetation, it is unlikely that development of this project would directly affect this sensitive natural community if it is present in the area. Potential indirect impacts from trail users introducing nonnative or invasive species would be confined to a small buffer area along the trail alignment and would not be expected to substantially degrade the overall habitat quality in this area. For these reasons, the combined effects of the project and cumulative projects on the yellow sand verbena – beach burr dune mat alliance would be ***less than significant***.

Jurisdictional Other Waters

Impact BI-6 explains how project construction would not result in permanent placement of fill within the Pacific Ocean but could result in short-term and temporary equipment access and excavation within federal and state jurisdictional boundaries. When equipment is operating on the beach, the project would avoid or minimize potential water quality impacts on the Pacific Ocean through implementation of the SFPUC's standard construction measure 3, Water Quality, and other best management practices as outlined in the project-specific stormwater pollution prevention plan as required by law, and as required by the permits and authorizations from federal and state agencies with regulatory authority over the Pacific Ocean. Of the cumulative projects considered, only the Vista Grande Drainage Basin Improvement Project would result in impacts on the Pacific Ocean, either through the direct placement of fill or through indirect impacts on water quality.[145] Like the project, the Vista Grande project would be required to obtain and comply with water quality regulations and regulatory permits that specify measures to avoid and minimize potential direct and indirect impacts, and to compensate for any unavoidable impacts on jurisdictional waters. For these reasons, the combined effects on regulated waters due to the project and the cumulative projects would be ***less than significant***.

Wildlife Movement and Migration Corridors

As discussed under Impact BI-7, construction of the project could result in impacts on migratory birds due to artificial lighting during night work. These impacts would be less than significant with implementation of the SFPUC's standard construction measure 8, Visual and Aesthetic Considerations, Project Site, and through application of NPS best management practices for outdoor artificial lighting in open spaces. Cumulative projects on Ocean Beach, including the Westside Pump Station Reliability Improvements Project and the Vista Grande Drainage Basin Improvement Project, may also require night work and night lighting that could result in similar impacts on birds in flight or using the beach as a stopover during migration, should that lighting spill over into adjacent habitat areas or be directed skyward. Other city projects would be required to comply with the same or similar measures for shielding nighttime lighting as the project, and these measures which would reduce the incremental effect of those projects. The remaining cumulative effect of night lighting on resident and migratory wildlife would be ***less than significant*** due to the temporary nature of nighttime work for the projects that would require night lighting and the localized effects on Ocean Beach and Fort Funston habitat where these projects would occur.

[145] Discussion of cumulative impacts on water quality and placement of fill in the Pacific Ocean is included in the marine biological resources analysis under Impact C-BI-2, below.

Special-Status Bats and Protected Roosts

As explained in Impact BI-9, project construction would include tree trimming or removal and demolition and/or construction activities that generate noise and increase human activity above pre-project conditions, which could have a substantial adverse effect on special-status bats and/or maternal roosts, if present; these impacts would be reduced to a less-than-significant level with mitigation. Cumulative projects that also involve tree removal or demolition of buildings or structures that provide suitable roosting habitat for bats could result in similar impacts as the project. While the project and some of the cumulative projects listed above could affect special-status bats and/or bat maternity roosts if present, the combined effect would not be substantially adverse. Of the cumulative projects considered, only the Vista Grande Drainage Basin Improvement Project is located in an area that contains potentially suitable habitat for bat maternity roosts and would trim or remove trees. Artificial structures that do not have human occupants and that might attract bats to establish maternity roosts are scarce in the western portion of the city, and few if any of the cumulative projects involve building demolition that could directly affect roosts if present. Therefore, the risk of cumulative projects substantially affecting special-status bats and/or bat maternity roosts is low and, combined with the residual effect of the project after mitigation, the resulting impact on bats would be ***less than significant***.

Summary

In summary, adverse effects on San Francisco spineflower, nesting bank swallow and other nesting birds, the sensitive natural community yellow sand verbena – beach burr dune mat alliance, jurisdictional waters, avian migration, and special-status bats or maternal roosts could occur under construction of the project or the cumulative projects. The project would substantially affect bank swallow breeding habitat; however, no other project considered in the cumulative analysis would result in an impact on bank swallow breeding habitat such that a cumulative impact would result. After mitigation, through compliance with applicable local, state, and federal regulations protecting these resources, and through participation in the permitting process for project impacts on regulated waters, the cumulative impact on these terrestrial biological resources would be ***less than significant***.

Marine Biological Resources

Cumulative projects that involve in-water construction and that, in combination with the project, have the potential to result in significant cumulative impacts on marine resources are limited to the Vista Grande Drainage Basin Improvement Project. The in-water construction activities that would occur under the project and the identified cumulative project would primarily include small infrastructure improvements within the intertidal environment. As such, the potential impacts described above for the project are similar to those that can be expected to occur with implementation of the nearby Vista Grande Drainage Basin Improvement Project.

Potential cumulative impacts would be the same as the construction impacts identified under Impact BI-5, Impact BI-6, and Impact BI-7 and may include temporary increases in underwater noise, alterations to existing intertidal habitat, and temporary impacts on water quality through sediment resuspension or spill of deleterious material in the Pacific Ocean. These effects would be localized, temporary, and not expected to overlap geographically or temporally. These combined effects of the project and the Vista Grande Drainage Basin Improvement Project would not result in a significant cumulative impact on marine biological resources. Therefore, the combined effects on marine resources associated with construction of the project and cumulative projects would be ***less than significant***.

Mitigation: None required.

OPERATION

Impact C-BI-2: The project, in combination with the cumulative projects, would not result in significant operation-related biological resources impacts. (*Less than Significant*)

Terrestrial Biological Resources

Operational impacts on terrestrial biological resources were considered in Impacts BI-1, BI-2, BI-3, BI-4, BI-6, BI-7, BI-8 and BI-9, which analyzed potential impacts on the special-status plant San Francisco spineflower, nesting bank swallow, western snowy plover, other special-status birds, the sensitive natural community yellow sand verbena – beach burr dune mat alliance, wildlife movement, other nesting birds, special-status bats and protected roosts, and avian collisions.

San Francisco Spineflower

As explained under Impacts BI-1 and BI-6, project operation would result in less-than-significant impacts on San Francisco spineflower and the sensitive natural community yellow sand verbena – beach burr dune mat alliance. The sand excavation area and access route on North Ocean Beach and the nourishment location on South Ocean Beach do not contain dune habitat supportive of the spineflower or sensitive dune vegetation alliances; rather, these work areas are mostly bare sandy beach with some ice plant where the beach transitions to foredune habitat. The only cumulative project that could result in operational impacts on San Francisco spineflower or the yellow sand verbena – beach burr dune mat alliance would be the Fort Funston Trail Connection. Potential impacts on these resources from direct trampling or habitat degradation from introduction of nonnative or invasive plant species could occur through public use of the Fort Funston trail connection project. The cumulative impact on the San Francisco spineflower rare plant population and yellow sand verbena – beach burr dune mat alliance from operation of these projects would be less than significant because the project's operational locations are not known to support these resources and the area of potential effect for the Fort Funston trail connection project is reasonably assumed to be limited to a relatively small *verge*, or narrow area beyond the footprint of the trail alignment which could be disturbed by trail users stepping off or meandering from the trail, would not result in a substantially adverse effect on these resources. Therefore, the cumulative impact would be ***less than significant***.

Nesting Bank Swallow

As discussed under Impact BI-2, sand placement on South Ocean Beach could disrupt bank swallow nesting efforts within the Fort Funston colony adjacent to (south of) the project area if sand placement were to occur within 650 feet of active nest burrows during nesting season. This impact would be reduced to a less-than-significant level through mitigation. The only other cumulative project in proximity to the bank swallow colony is the Fort Funston Trail Connection on the bluffs above the northernmost segment of the colony. Given its inland location, use of the trail system on the bluffs above the bank swallow colony would not be expected to result in substantial noise or visual disturbance that would adversely affect nesting within the colony. Therefore, the effects of project operations in combination with those of the cumulative projects, would be ***less than significant***.

Bank Swallow Habitat

As explained in Impact BI-2, the coastal engineering study concluded implementation of the project would not have a substantial adverse effect on adjacent shoreline erosion when compared with the no-project scenario such that the potential project impacts on habitat characteristics of the remaining suitable bluff habitat in Fort Funston for breeding bank swallow would be less than significant. No other project in the cumulative scenario would contribute to a cumulative impact on bank swallow habitat through operations. Therefore, the cumulative impact on bank swallow habitat would be ***less than significant***.

Western Snowy Plover

As explained in Impact BI-3, biological monitors observing ongoing equipment access and excavation of sand from North Ocean Beach have not identified adverse effects on overwintering western snowy plover within the designated protection area or within the work area; therefore, this same activity under project operation during small sand placement events is expected to result in less-than-significant impacts on western snowy plover. No other project in the cumulative scenario would contribute to a cumulative impact on western snowy plover through operations. Therefore, the combined impact on overwintering western snowy plover that would result from project operation and operation of the cumulative projects would be ***less than significant***.

Other Special-Status Birds

Impact BI-4 explains that sand placement events under project operation would result in less-than-significant impacts to other special-status and sensitive birds foraging or overwintering on South Ocean Beach. No other project in the cumulative scenario would contribute to a cumulative impact on brown pelican, double-crested cormorant, California gull, long-billed curlew or western burrowing owl during project operation, and therefore the cumulative impact would be ***less than significant***.

Wildlife Movement and Migration Corridors

Impact BI-7 explains how permanent nighttime lighting under the project would not be substantially different from existing conditions with the balance of removing some existing light sources and introducing other new light sources within the project area. Nighttime lighting associated with large sand placement events during project operation would result in less-than-significant impacts on migratory birds traveling along the Pacific Flyway or using Ocean Beach to rest during migration. Impact BI-7 also explains how periodic placement of sand fencing within created dunes and installation of the new seat wall along the pedestrian path would not substantially restrict terrestrial wildlife movement or present a flight hazard to migrating birds. No other project in the cumulative scenario includes placement of fencing on the beach or foredune area or obstructs access to the beach. The cumulative impact would be ***less than significant***.

Other Nesting Birds

As explained under Impact BI-8, the project would result in less-than-significant impacts on birds attempting to nest in suitable habitat east of the excavation areas on North Ocean Beach and east of the sand placement locations on South Ocean Beach. No other project in the cumulative scenario would contribute to a cumulative impact on nesting birds proximate to the North Ocean Beach excavation area or South Ocean Beach sand placement locations through operations. Therefore, the cumulative impact on nesting birds would be ***less than significant***.

Bird Collisions

Also discussed under Impact BI-8 is the potential increased risk of bird collisions with buildings, which was determined to be less than significant because the building that would be replaced by the project is small and short (one story), and the project would be designed to minimize avian risks resulting from collision with structures. The other cumulative projects within San Francisco would also be required to comply with the protection measures specified in the city's *Standards for Bird-Safe Buildings*, which would minimize other projects' effects related to bird collisions. Therefore, the long-term cumulative impact on birds resulting from collisions would be ***less than significant***.

Special-Status Bats and Protected Roosts

As explained under Impact BI-9, project operation would not adversely affect bat maternity colonies because suitable roosting habitat is not present within the operational project sites on North and South Ocean Beach. While western red bat foraging behavior over the beach and intertidal shoreline could be temporarily disrupted during sand placement events, the impact would be less-than-significant because of the abundant similar foraging habitat along the regional coastline and temporary nature of the disturbance. No other cumulative projects would contribute to a cumulative impact through project operation on special-status bats; therefore, the cumulative impact would be ***less-than-significant***.

Marine Biological Resources

The project's operational impacts on marine biological resources are identified under Impacts BI-5, BI-6, and BI-7; they include temporary impacts on benthic habitats and marine species migration from dredge vessel anchoring and pipeline placement, temporary impacts on water quality through sediment resuspension in support of these activities, potential impacts on the intertidal invertebrate community following nourishment activities, and temporary fill of jurisdictional waters. Of the cumulative projects examined, none would result in impacts that could combine geographically with the project's operational effects. Therefore, cumulative impacts resulting from in-water work, and the cumulative impact on marine resources associated with operations, would be ***less than significant***.

Mitigation: None required.

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CHAPTER 5
OTHER CEQA ISSUES

5.1 Growth Inducing Impacts

Section 15126.2(d) of the California Environmental Quality Act (CEQA) Guidelines requires that an environmental impact report (EIR) discuss the growth-inducing impacts of a proposed action. A growth-inducing impact is defined in the CEQA Guidelines section 15126.2(e) as:

> [T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth … It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

As discussed in the Initial Study (Appendix B, Section E.3, Population and Housing), the Ocean Beach Climate Change Adaptation Project (project) does not involve any housing construction and therefore would not induce growth directly by constructing housing that would attract people to the area. Project construction would not extend roads or other infrastructure that could indirectly induce growth. Given the size and availability of the regional workforce, project construction would not be expected to induce demand for housing by attracting a substantial number of workers from outside the region. Nor would the project provide new permanent employment opportunities that could attract workers to the area; long-term operation of the project would not increase the number of workers employed by the City and County of San Francisco or the National Park Service. The project would not have a substantial growth-inducing impact, and no mitigation is required.

5.2 Significant Unavoidable Impacts

In accordance with section 21100(b)(2)(A) of CEQA and with sections 15126(b) and 15126.2(c) of the CEQA Guidelines, the purpose of this section is to identify project-related environmental impacts that could not be avoided or reduced to a less-than-significant level with implementation of all feasible mitigation measures, as identified in Chapter 4, Environmental Setting and Impacts. As discussed in Chapter 6, Alternatives, these significant impacts could be reduced to less-than-significant levels by implementing alternative designs. The findings in this chapter are subject to final determination by the San Francisco Planning Commission as part of its certification of the EIR.

5.2.1 Transportation and Circulation

The project would result in the closure of the Great Highway between Sloat and Skyline boulevards and an associated redistribution of vehicular traffic. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.3, Transportation and Circulation, under Impacts TR-5 and C-TR-5, rerouted vehicles would travel an additional 0.46 mile compared to existing conditions, resulting in an increase of approximately 2.45 million vehicle miles traveled (VMT) per year.[1] This increase would exceed the planning department's threshold of 2 million VMT per year and therefore is considered a significant impact. This threshold is based on the fair share VMT allocated to transportation projects statewide in 2014 and required to achieve California's long-term greenhouse gas emissions reduction goal of 40 percent below 1990 levels by 2030.[2] Common strategies to reduce VMT increases from transportation projects may involve: investing in travel alternatives to solo driving such as walking, bicycling, transit and carpooling; and pricing policies that raise the cost of driving and parking. However, as discussed in Impacts TR-5 and C-TR-5, these mitigation strategies would be infeasible for this project to implement or would not reasonably be expected to reduce the project's VMT impact or the project's considerable contribution to the cumulative VMT impact. Therefore, the project and cumulative VMT impacts would be *significant and unavoidable*.

5.2.2 Noise and Vibration

The rerouted vehicular traffic resulting from closure of the Great Highway between Sloat and Skyline boulevards would affect roadside noise levels along roadways that would receive additional vehicular traffic volumes. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.4, Noise and Vibration, under Impacts NO-3 and C-NO-3, project implementation would result in traffic noise increases of up to 6.2 dBA on local roadways near the project site. Of the nine roadway segments examined, traffic noise increases would exceed the applicable 3 dBA increase threshold along segments of Sloat Boulevard and Skyline Boulevard in both the project-only and cumulative conditions, resulting in a substantial roadway noise increase at residential and rehabilitation facility uses along segments of those roadways. These impacts would be significant and unavoidable. Mitigation may reduce the project's impact or the project's contribution to a cumulative impact to less than significant levels; however, the feasibility of the mitigation implementation is uncertain. Therefore, the project's traffic noise impact and the project's contribution to the cumulative traffic noise impact would be *significant and unavoidable with mitigation.*

5.2.3 Biological Resources

The project would replace areas of eroding bluff that are used as nesting habitat by bank swallows (a threatened species listed under the California Endangered Species Act) with slope stabilization and sand. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, Section 4.6, Biological Resources, under Impact BI-2, bank swallows returning to historical nesting areas to breed following project implementation would find this portion of bluff (approximately 500 feet) removed. The birds could attempt to establish burrows in the remaining approximately 2,750 feet of Fort Funston bluffs south of the project area where vertical sandy bluff substrate remains or farther south at Phillip Burton Memorial Beach where they have been documented to nest in the past, most recently in 2019, 2020 and 2021. Although NPS monitoring did not document bank swallow nesting in the project area during 2020 or 2021,[3,4,5] the resilience of the breeding colony to persist following removal of bluff habitat within the project area is unknown. Removal of a portion of the limited bluff habitat currently suitable for hosting the breeding colony could potentially contribute to the extirpation of the Fort Funston breeding colony, therefore the loss of the bank swallow breeding habitat would be a significant impact. Mitigation involving signage and fencing has

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1 ESA, Ocean Beach Climate Change Adaptation Project – Air Quality Technical Memorandum, February 2021.

2 San Francisco Planning Department, Transportation Impact Analysis Guidelines, October 2019, Appendix L Vehicle Miles Traveled (VMT)/Induced Automobile Travel, October 2019.

3 National Park Service, 2020. 2020 Bank Swallow Summary Report.

4 National Park Service, 2021. Bank Swallow Monitoring Update, June 2021.

5 National Park Service, 2021, Email from Bill Merkel (NPS) to James Mates-Muchin (SFPUC) re: Bank Swallow Nesting 2021. November 17, 2021.

been identified to minimize impacts on remaining potential breeding sites adjacent to the project area. However, there are no readily identifiable examples of successful habitat mitigation strategies among bank swallow coastal breeding areas that would fully avoid or reduce the project's effects on bank swallow habitat. Thus, the project would cause a substantial adverse change in special-status species habitat, and the impact on bank swallow habitat would be *significant and unavoidable with mitigation.*

5.3 Significant Irreversible Changes

In accordance with CEQA Guidelines sections 15126(c), 15126.2(d), and 15127, the purpose of this section is to identify significant irreversible environmental changes that the project would cause, including those that could result from environmental accidents. Such significant irreversible environmental changes might include current or future uses of non-renewable resources, secondary or growth-inducing impacts that commit future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified. In general, such irretrievable commitments include the uses of resources such as energy and natural resources that would be required to sustain a project over its usable life.

No significant environmental damage, such as that resulting from accidental spills or the explosion of a hazardous material, is anticipated with implementation of the project. Construction activities associated with the project would result in an irretrievable and irreversible commitment of power supply and construction materials. The project would require commitment of energy resources used to fuel and maintain equipment used for construction and operation (such as gasoline, diesel, and oil). Project construction would also commit resources, such as rock, asphaltic concrete, concrete, and steel and other metals, to be used for the buried wall, multi-use trail, service road, Skyline coastal parking lot, restroom, and other project features.

The project would involve construction of a new restroom building, which would require small amounts of electricity to operate. New buildings in California are required to conform to energy conservation standards specified in California Code of Regulations Title 24, which are among the most stringent in the United States. The standards establish energy budgets for different types of residential and nonresidential buildings with which all new buildings must comply. In addition, the San Francisco Green Building Code requirements are designed to reduce energy and water use and divert waste from landfills. New construction in San Francisco, including the new restroom building, must meet all applicable California and local building codes, provide onsite facilities for recycling and composting, and meet the city's green building requirements, which would ensure that natural resources are conserved or recycled to the maximum extent feasible and that greenhouse gas emissions resulting from the project would be minimized.

As discussed in greater detail in Chapter 2, Project Description, Section 2.4.5 Beach Nourishment, during operation the project would nourish South Ocean Beach with sand collected from North Ocean Beach, the main shipping channel, or imported from elsewhere. North Ocean Beach sand volumes fluctuate seasonally and annually; generally, sand accumulates on the beach as a result of natural processes. This project would continue to use sand, as available, from North Ocean Beach in a manner consistent with its current use at North Ocean Beach and National Park Service policies (which prohibit extracting sand or other resources from Ocean Beach for non-federal purposes; refer to Appendix B, Section E.19, Mineral Resources). For the large sand placements, the city would also beneficially use sand dredged from San Francisco's main shipping channel to maintain its navigability; this sand would otherwise be disposed of in the ocean. Sand continually deposits in the main shipping channel due to natural processes and is a renewable resource over the 60-year lifespan of the project. If needed, the project would also import sand from other sources, but given the abundance and availability of sand from North Ocean Beach and the main shipping channel, the need for imported sand is unlikely and would not be in quantities that would result in a substantial commitment of nonrenewable sand resources.

The consumption of natural resources, including electricity and non-renewable fuel sources, would generally increase with implementation of the project. However, as discussed in Appendix B, Section E.20, Energy, the project would not involve the wasteful, inefficient, or unnecessary consumption of energy resources. As described in Appendix B, Section E.10, Utilities and Service Systems, the project's water demand would be accommodated within available water supplies and current water supply planning. The project would replace the existing NPS restroom with a new restroom maintained by Rec and Park and thus would be expected to use approximately the same amount of water. The project would be designed to incorporate water-conserving measures, such as low-flush toilets and urinals, as required by the San Francisco Green Building Ordinance and the city's Non-potable Water Ordinance. During construction activities, potable water may be used for drinking, on-site sanitary needs, and concrete/slurry mixing. However, as discussed in Appendix B, Section E.8, Air Quality, San Francisco Public Works Code Article 21 restricts the use of potable water for soil compaction and dust control activities and requires the use of recycled water. New landscaping would require irrigation at least for an initial period during plant establishment. Therefore, while the consumption of water would increase as the result of project construction, and possibly under operation as well, the project would not involve the wasteful, inefficient, or unnecessary use of water resources.

5.4 Areas of Known Controversy and Issues to Be Resolved

Section 15123 of the CEQA Guidelines requires that an EIR summary identify each significant effect with proposed mitigation measures and alternatives that would reduce or avoid the effect; areas of controversy known to the lead agency, including issues raised by other agencies and the public; and issues to be resolved including the choice among alternatives and whether or how to mitigate the significant effects.

On September 9, 2020, the San Francisco Planning Department issued a Notice of Preparation (NOP) of an EIR. In accordance with Section 15082 of the CEQA Guidelines, the planning department sent over 1,800 notices of the NOP to public agencies and interested parties to begin the formal CEQA scoping process for the project. Notices were sent to potentially interested parties, including various federal, state, regional, and local agencies, as well as to owners and occupants of properties within 300 feet of the project site. The planning department held a scoping meeting on September 30, 2020, to solicit comments on the scope of the EIR. The NOP is included in Appendix A of this document.

The project's effects on bank swallow habitat and the project's interactions with coastal processes are the primary areas of scientific or technical controversy for this project:

- Effects of bank swallow habitat removal on the Fort Funston bank swallow colony, given the extent of the nesting habitat and varying amount of bank swallow nesting that has historically occurred within the project area
- Effective bank swallow habitat mitigation is not known to the agency with primary jurisdiction over management of the species (California Department of Fish and Wildlife)

- Estimating rates of sediment transport and erosion of beaches and bluffs are inherently uncertain because of the highly variable nature of the forcing mechanisms that include ocean swells, storm surges, El Nino events, and other unpredictable natural processes.

Public comments received on the NOP for the project address the following topics (refer to Table 1-2 in Chapter 1, *Introduction and Background)*:

- Effects on terrestrial and marine biological resources, including special-status plants and wildlife such as bank swallow, snowy plover, and their habitats
- Effects on shoreline erosion, sandbars, and cliff erosion
- Predictions for future sea level rise, effects on project components
- Effects on aesthetic resources, including views and nighttime lighting
- Effects on surfing, swimming, and public access along dry beach
- Project consistency with the 2012 Ocean Beach Master Plan concepts
- Ability to maintain dunes on the proposed slope stabilization and frequency of beach nourishment
- Use of native and climate-appropriate plantings
- Location of public restrooms and parking
- Project area maintenance, including management of invasive species and litter
- Effects of roadway closure on traffic congestion, travel patterns, and safety
- Noise, emissions, and pollution associated with traffic pattern changes
- Consideration for historical features of existing facilities
- Cumulative impacts of development of the project combined with development of other projects (including the SFPUC's Westside Pump Station Reliability Project)

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CHAPTER 6
ALTERNATIVES

6.1 Introduction

As required by the California Environmental Quality Act (CEQA), this chapter presents the alternatives analysis for the San Francisco Public Utility Commission's (SFPUC) Ocean Beach Climate Change Adaptation Project (project). The purpose of the CEQA alternatives analysis is to identify potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for the project while still meeting most of the project objectives. This chapter describes both the methodology used to screen and select alternatives to the project as well as the results of the detailed alternatives analysis. For the alternatives selected for detailed analysis, the chapter evaluates the alternatives' impacts relative to existing environmental conditions and compares the potential impacts of the alternatives with those of the project. Based on this analysis, this chapter then identifies the environmentally superior alternative. Finally, other alternatives that were considered but eliminated from detailed consideration are presented together with the reasons for their elimination.

6.1.1 CEQA Requirements for Alternatives Analysis

The CEQA Guidelines, section 15126.6(a), state that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the project. The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. Specifically, the CEQA Guidelines (section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

- **Range of Alternatives**. An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency is responsible for selecting a range of project alternatives to be examined and for disclosing its reasons for the selection of the alternatives. An EIR is not required to consider alternatives that are infeasible. Factors that might be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative for which impacts cannot be reasonably ascertained and for which implementation is remote and speculative. The specific alternative of "no project" must also be evaluated.
- **Ability to avoid or substantially reduce significant effects.** The discussion of alternatives shall focus on alternatives to the project or its location that are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly (section 15126.6[b]).

- **Ability to meet project objectives.** The range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects (section 15126.6[c]).

6.2 Alternatives Selection

Consistent with CEQA, the approach to alternatives selection focused on the following criteria for identifying the range of alternatives:

- Does the alternative reduce the severity of one or more of the project's significant adverse impacts?
- Is the alternative potentially feasible?
- Does the alternative meet most of the basic objectives of the project?
- Does the alternative foster informed decision-making and public participation?

In developing potential CEQA alternatives, the planning department considered the alternatives concepts identified in the Ocean Beach Master Plan,[1] the Alternatives Analysis Report,[2] comments received during the scoping period,[3] and combinations thereof. Alternative concepts range from relocating facilities inland to armoring the full length of South Ocean Beach. Some concepts serve as the basis for alternatives carried forward. Other concepts were rejected, as discussed in greater detail in Section 6.6.

This section presents the project's potential significant environmental effects and additional details of the alternatives selection process. As explained further in the sections that follow, in the alternatives selection process the planning department eliminated five potentially feasible alternatives from consideration because they would have had the same or more severe environmental impacts compared to the project. The department retained three alternatives for detailed analysis.

6.2.1 Summary of Significant Environmental Impacts

The primary goal of the alternatives selection process is to identify alternatives that could avoid or substantially lessen impacts of the project determined to be significant and unavoidable. Impacts of the project determined to be less than significant with mitigation are also considered, as they aid in identification of and distinction among a reasonable range of alternatives. The following summarizes the conclusions for significant impacts of the project that Chapter 4, Environmental Setting, Impacts, and Mitigation Measures identifies.

6.2.1.1 SIGNIFICANT AND UNAVOIDABLE IMPACTS

Project implementation would result in the following significant and unavoidable impacts:

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1 SPUR, ESA PWA, Moffatt & Nichol, McMillen Jacobs Associates, and AGS, Inc., 2015, Coastal Protection Measures & Management Strategy for South Ocean Beach, Ocean Beach Master Plan: Coastal Management Framework, Prepared for San Francisco Public Utilities Commission, April 24, 2015.
2 SFPUC, Alternatives Analysis Report for Coastal Adaptation Strategies for South Ocean Beach Wastewater Systems, February 2018.
3 See Chapter 1, Section 1.5.1, Notice of Preparation and Public Scoping Period, and Table 1-2, Summary of Scoping Comments

Biological Resources

- Project construction would permanently remove portions of existing bluff which provide habitat for the protected bank swallow and could result in a substantial adverse impact on the bank swallow colony (Impact BI-2).

Noise

- Project operations would redirect traffic around the closed portion of the Great Highway, which would result in a permanent increase in ambient noise at noise-sensitive receptors along affected roadways and a cumulatively considerable contribution to a significant cumulative traffic-related noise impact (Impacts NO-3 and C-NO-3).

Transportation

- Project operations would redirect traffic around the closed portion of the Great Highway, which would result in substantial additional vehicle miles traveled (VMT) and a cumulatively considerable contribution to a significant cumulative VMT impact (Impacts TR-5 and C-TR-5).

6.2.1.2 SIGNIFICANT IMPACTS THAT CAN BE MITIGATED TO LESS THAN SIGNIFICANT

Project implementation would result in the following significant impacts, all of which could be mitigated to less-than-significant levels with the implementation of mitigation measures identified in Chapter 4, under the respective impact evaluations:

Biological Resources

- During project construction, prior to reshaping the bluffs, construction activities could adversely affect bank swallow nesting within the South Ocean Beach project area bluffs. During project operations, sand nourishment events requiring sand placement at the southern limits of the project area could adversely affect bank swallow nesting within adjacent bluff habitat outside the project area. With implementation of Mitigation Measures M-BI-2a (Nesting Bank Swallow Protection Measures), M-BI-2b (Worker Environmental Awareness Program Training), and M-BI-2c (Bank Swallow Educational Signage and Protective Fencing) this impact would be less than significant. (Impact BI-2)
- Tree trimming during construction could result in direct mortality of or indirect disturbance to roosting bats. With implementation of Mitigation Measure M-BI-9 (Avoidance and Minimization Measures for Bats), this impact would be less than significant. (Impact BI-9)

Noise

- In combination with cumulative projects, daytime construction of the project could result in a cumulatively considerable contribution to significant cumulative temporary or periodic increases in ambient noise levels at noise-sensitive receptors. With implementation of Mitigation Measure M-C-NO-1 (Cumulative Construction Noise Control Measures), this impact would be less than significant. (Impact C-NO-1)

Air Quality

- Average daily NOx emissions during construction years 2, 3 and 4 (2024, 2025, and 2026) would result in a considerable net increase in criteria air pollutants. With implementation of Mitigation Measure M-AQ-2 (Construction Emissions Minimization), this impact would be less than significant. (Impact AQ-2)

Paleontological Resources

- Excavations could extend into geologic units with moderate paleontological potential and could disturb paleontological resources. With implementation of Mitigation Measure M-GE-5 (Paleontological Resources Monitoring and Mitigation Program), this impact would be less than significant. (Impact GE-5)

6.2.2 Alternatives Screening and Selection

The planning department based the alternatives selection process on first identifying alternative concepts that would avoid or lessen the significant and unavoidable impacts identified above. Strategies to avoid or lessen significant environmental impacts primarily involve preserving or minimizing effects on bluff habitat used by bank swallows for nesting (possibly an environmentally sensitive habitat area),[4] and avoiding or minimizing vehicular traffic rerouting (and associated noise and VMT) along Sloat and Skyline boulevards by retaining Great Highway road capacity south of Sloat Boulevard. The planning department then screened the potential alternatives for their feasibility and ability to meet most of the project objectives. This process resulted in the selection of three alternatives to be carried forward for detailed evaluation. The planning department determined that the three alternatives, along with the no project alternative, represent a reasonable range of alternatives described and analyzed in this EIR.

6.3 CEQA Alternatives and Potential Environmental Effects

The following alternatives are analyzed in this chapter:

- Alternative A: No Project
- Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment
- Alternative C: Protect Critical Infrastructure with Conventional Seawall
- Alternative D: Replace Lake Merced Tunnel with Inland Infrastructure

Because the alternatives are conceptual, this evaluation is based on the best available information and reasonable assumptions about how the city would implement a given alternative. For each, this section presents the following:

- A description of the alternative, including facilities and project components. Each description discusses feasibility issues as well as assumptions regarding both the construction methods likely to be used and the project's long-term operations characteristics.
- Analysis of the potential environmental impacts of each alternative compared to those of the project. The order of the topics is generally based upon significance determinations for the project and alternative, in descending order of severity. For example, topics for which the project or alternative were identified as having significant effects are addressed first, followed by those identified as resulting in less-than-significant effects or no impact. The level of detail for each topic generally varies by impact conclusion, with topics involving significant impacts and notable changes in severity of effects discussed in greater detail. Topics for which the effects of the project and alternative would be substantially similar are addressed together in a less detailed summary discussion towards the end of the section.

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4 Refer to Section 4.6.2.2, Project Setting, subsection *Environmentally Sensitive Habitat Areas*, for additional discussion.

Section 6.4 lists the project objectives and discusses the ability of each alternative to meet the project objectives. Section 6.5 presents a comparison of the alternatives environmental effects and ability to meet project objectives, and identifies the environmentally superior alternative.

Table 6-1 compares the characteristics of the project with those of alternatives A, B, C, and D. **Table 6-2** lists the individual components in the project and each alternative.

6.3.1 Alternative A: No Project

6.3.1.1 DESCRIPTION

As required by CEQA Guidelines section 15126.6(e), this EIR evaluates a No Project Alternative to allow decision-makers to compare the environmental effects of approving the project with the effects of not approving the project. Alternative A, the No Project Alternative, represents what would reasonably be expected to occur in the foreseeable future if the project were not approved.

Under this alternative, the city would not construct the project. The existing revetments and rubble, NPS restroom and parking lot, sand ramp, and Great Highway would remain. The city would not close the Great Highway between Sloat and Skyline boulevards nor would it modify the Sloat Boulevard/Great Highway or Skyline Boulevard/Great Highway intersections, or the San Francisco Zoo parking access. Alternative A would not include development of new coastal parking, a multi-use trail, or beach access stairway.

Under Alternative A, the city would continue to monitor shoreline conditions and the performance of existing rock and sandbag revetments at South Ocean Beach. While existing revetments and rubble would remain on the beach, these structures alone are not sufficient to protect the full length of the Lake Merced Tunnel. To provide continued protection to the Lake Merced Tunnel, the city would maintain the existing revetments and, as under existing conditions, the city would continue periodic *sand backpassing*[5] from North Ocean Beach to help minimize bluff erosion and maintain a sandy beach.

If required to protect public safety and/or wastewater infrastructure from damage due to sudden risk of exposure (e.g., resulting from an unusually strong storm season causing accelerated shoreline erosion), the city would implement temporary emergency shoreline protection measures which could include placement of additional sand, sandbags, revetment rock, and/or longer-term measures if authorized by the environmental regulatory agencies with jurisdiction (e.g., California Coastal Commission).

The city would continue to store large sandbags in an upland area near South Ocean Beach (e.g., within a gravel lot at the zoo south of Zoo Road where they are currently stored, or a similar developed or disturbed site), for rapid deployment in the event of severe localized erosion during a single storm season that threatens the Lake Merced Tunnel.

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5 Sand backpassing refers to the city's ongoing practice of excavating and trucking excess sand from North Ocean Beach to South Ocean Beach and placing coarse sand from other sources as a top layer. Sand backpassing has been performed regularly at Ocean Beach since 2013 and occurred most recently in 2019. The annual average volume of sand backpassed between 2013 and 2020 is approximately 42,000 cubic yards.

Table 6-1 Project and Alternatives Components Comparison

Proposed Project	Alternative A: No Project	Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C: Protect Critical Infrastructure with Conventional Seawall	Alternative D: Replace Lake Merced Tunnel with Inland Infrastructure
Permanently close the Great Highway between Sloat and Skyline boulevards to public vehicular traffic, reconfigure affected intersections and San Francisco Zoo parking access, and maintain a service road to SFPUC facilities	Vehicular access along Great Highway and to zoo parking would not change, until future erosion results in the need to close lanes	Vehicular access along Great Highway and to zoo parking would not change, until future erosion results in the need to close lanes	Vehicular access along Great Highway and to zoo parking would not change since protected by seawall	Permanently close the Great Highway between Sloat and Skyline boulevards to public vehicular traffic, reconfigure affected intersections and San Francisco Zoo parking access, and maintain a service road to SFPUC facilities, until future erosion results in the need to close road
Construct buried wall to protect existing wastewater infrastructure from shoreline erosion	No new shoreline protection Wastewater infrastructure would remain vulnerable to coastal hazards Future erosion may necessitate emergency response in the form of additional shoreline protection (e.g., sandbags, revetment rock)	No new shoreline protection Wastewater infrastructure would remain vulnerable to coastal hazards Future erosion may necessitate emergency response in the form of additional shoreline protection (e.g., sandbags, revetment rock)	Construct conventional seawall along bluff face to the bluff top or height of the existing revetments (approximately 30 feet above sea level) to protect existing wastewater infrastructure from shoreline erosion	No new shoreline protection Replace Lake Merced Tunnel with infrastructure at inland location
Remove rubble and revetments from the beach Remove roadway and parking lot pavement, reshape the bluff and plant vegetation[a]	Existing rubble and revetments remain on the beach No pavement removal, bluff reshaping or planting vegetation	Remove rubble, and revetments from the beach No pavement removal, bluff reshaping or planting vegetation	Remove rubble and revetments from the beach Partial pavement removal. No bluff reshaping or planting vegetation	Remove rubble and revetments from the beach Remove pavement. No bluff reshaping, no planting vegetation

Table 6-1 Project and Alternatives Components Comparison (Continued)

Proposed Project Component	Alternative A: No Project	Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C: Protect Critical Infrastructure with Conventional Seawall	Alternative D: Replace Lake Merced Tunnel with Inland Infrastructure
Construct multi-use trail, beach access stairway, coastal access parking, and restrooms	No multi-use trail, beach access stairway, or coastal parking Retain NPS restroom and parking lot in current locations until future erosion results in the need to close	No multi-use trail, beach access stairway, or coastal parking Retain NPS restroom and parking lot in current locations, until future erosion results in the need to close	Construct multi-use trail and beach access stairway Retain NPS restroom and parking lot in current location since protected by seawall	Construct coastal access parking and temporary (~7-10 year) unpaved trail until future erosion results in the need to close trail. No beach access stairway. Construct new restroom at northeast corner of the Sloat Boulevard/Great Highway intersection to replace the removed NPS restroom
Long term beach nourishment to maintain beach width of at least 50 feet 90 percent of the time Approximately 36,000 cubic yards (cy) per year, from both North Ocean Beach and main ship channel[b] Sand placed every 4 to 10 years	Emergency shoreline protection, as needed Periodic sand backpassing from North Ocean Beach Approximately 42,000 cy per year from North Ocean Beach[c] Sand placed every 1 to 2 years	Emergency shoreline protection, as needed Sand placements of greater volumes, or greater frequency, than the project Approximately 200,000 cy per year, from both North Ocean Beach and main ship channel[d] Sand placed every 1 to 2 years	Sand placements of greater volumes, or greater frequency, than the project Approximately 100,000 cy per year, from both North Ocean Beach and main ship channel[e] Sand placed every 2 to 3 years	Placement of approximately 43,000 cy sand per year, from both North Ocean Beach and main ship channel Sand placed every 4 to 7 years

NOTES:

[a] Bluff reshaping would involve removing or grading portions of the bluff to create a more gently sloping transition between the beach and upland areas; higher elevation areas would be planted with native plants, including those appropriate for coastal dunes, that help cover and stabilize sand.

[b] Sand volume presented is the annualized average of large and small sand placements (larger placements less frequently, smaller placements more frequently); actual sand placement likely to occur less frequently. Proposed sand placement would result in beach width greater than 50 feet wide, about 90 percent of the time (refer to Table 2-2). Approximate annual sand volume calculated by averaging the estimated annual placement volumes for the large and small sand placements (average of 85,000 cy divided by four years and 500,000 cy divided by 10 years). The first sand placement would likely occur between 2 and 8 years from completion of construction.

[c] Alternative A would continue sand placements at the same volumes and frequencies as under existing conditions. Approximate annual sand volume calculated by dividing total sand backpassed from 2013 to 2020 by eight years.

[d] The existing annual average sand placement protects approximately 600 linear feet of beach. In Alternative B the same amount of protection provided by sand placement would be needed for the full length of beach, approximately 3,200 feet. Approximate annual volume calculated by multiplying existing sand placement volume by 5.

[e] Alternative C seawall would be positioned farther west than proposed buried wall. To maintain a beach width of 50 feet, is it assumed that enough sand to cover a 25-foot wide beach would be needed annually, on average. Approximate annual volume calculated by multiplying beach length (3,200 feet) by 25 feet width, by a factor that accounts for the loss of sand to erosion and currents (1.3).

Table 6-2 Project and Alternatives Comparison Summary

Project Component	Included in Project/Alternative?				
	Proposed Project	Alternative A: No Project	Alternative B: Beach Nourishment	Alternative C: Conventional Seawall	Alternative D: Replace Infrastructure Inland
Close Great Highway	Yes	No[a]	No[a]	No	Yes
Modify entrance to zoo	Yes	No[a]	No[a]	No	Yes
Dedicated Service Road	Yes	No	No	No	Yes[a]
Construct wall	Yes (buried)	No	No	Yes (along bluff)	No
Remove revetments	Yes	No	Yes	Yes	Yes
Construct new trail	Yes	No	No	Yes	Yes[a]
Construct new beach stairs	Yes	No	No	Yes	No
Construct new restroom	Yes	No	No	No	Yes
Construct new parking	Yes	No	No	No	Yes
Retain NPS parking and restroom	No	Yes[a]	Yes[a]	Yes	No
Beach Nourishment[b]	Yes	Yes (similar)	Yes (more)	Yes (more)	Yes (similar)

NOTES:
[a] Included until erosion results in the need to close project component.
[b] Amount of beach nourishment as compared to the proposed project (similar, more or less)

Under Alternative A, the Great Highway between Sloat and Skyline boulevards would be retained and remain open to public vehicular traffic in both directions in the near-term. The city would continue to manage the existing roadway as under current conditions. If a substantial erosion event were to occur, intermittent closures of the Great Highway could be required for localized repairs in the near-term, with permanent lane closures possible if, over time, erosion progressed and undermined the roadbed. Additionally, the existing NPS restroom and parking lot may be closed and/or removed, as needed to protect public health and safety.

6.3.1.2 COMPARISON OF ENVIRONMENTAL IMPACTS

Alternative A would avoid the significant and unavoidable impacts related to removal of bank swallow habitat, as well as the VMT and ambient noise impacts from rerouted vehicular traffic identified for the project in Chapter 4. Under stable shore conditions (with sufficient protection from coastal hazards during storm events), the no project alternative would avoid all construction and operational impacts that were identified for the project. However, under possible future scenarios with severe erosion and sudden risk of exposure, additional impacts could occur. As discussed below, for some resource topics, there could be distinct and minor increases in environmental impacts compared to the project, but for most topics there would either be no impacts or similar impacts to those of the project.

BIOLOGICAL RESOURCES

Alternative A would avoid the significant and unavoidable impacts of the project on bank swallow habitat because no excavation or bluff reshaping would occur. Under existing conditions, the city may only nourish the beach if the bank swallows are not present; it is assumed this same requirement would apply under Alternative A. Alternative A would not require tree removal during construction, and would therefore result in reduced (i.e., less-than-significant) effects on special-status bats or bat maternity colonies compared with the project. If required, and depending on the location and extent, emergency shoreline protection measures (such as sandbags or revetment rock) would reduce localized erosion but could accelerate erosion adjacent to the emergency protection. The resulting effect on the stability of the adjacent Fort Funston bluffs would likely be greater than would occur under the project and could indirectly affect nearby bank swallow habitat.

NOISE AND VIBRATION

Alternative A would avoid the significant roadway noise increase at noise-sensitive receptors along Sloat and Skyline boulevards because the Great Highway south of Sloat Boulevard would remain open. If continued erosion were to require further Great Highway lane closures, increased noise would result due to rerouted vehicular traffic along Sloat and Skyline boulevards.

Alternative A would not construct any of the proposed components (such as the buried wall and intersection modifications), and therefore would have no impact on ambient daytime and nighttime noise levels, vibration, groundborne noise, or construction-related cumulative noise. If large storms were to cause substantial erosion that required emergency response to protect or remove city infrastructure, the associated construction activity would result in temporary construction noise increases; however, those activities are likely to be a shorter duration and further from sensitive receptors than project construction.

Sand placement under Alternative A would not result in any new noise and vibration impacts because it would continue as occurs under current conditions.

TRANSPORTATION AND CIRCULATION

Alternative A would avoid the significant and unavoidable VMT impact caused by the project because the Great Highway between Sloat and Skyline boulevards would remain open. If continued erosion were to require further Great Highway lane closures, increased VMT would result due to rerouted vehicular traffic along Sloat and Skyline boulevards.

AIR QUALITY

Alternative A would avoid the considerable net increase in criteria air pollutants caused by project construction because no planned construction would occur. If large storms were to cause substantial erosion that required emergency response to protect or remove city infrastructure, the associated construction activity would emit criteria air pollutants. If continued erosion were to require further Great Highway lane closures, increased criteria air pollutant emissions from the additional VMT would result due to rerouted vehicular traffic along Sloat and Skyline boulevards.

GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Alternative A would have minimal direct effects on the bluffs. Without the buried wall or bluff reshaping, Alternative A would avoid the project's impacts on potential paleontological resources. As discussed in

Impact GE-3 (within Appendix B, Initial Study), the South Ocean Beach shoreline is already substantially modified, and the erosion of the bluffs on the project site and the Fort Funston bluffs to the south would continue. If required, and depending on the location and extent, emergency shoreline protection measures (such as sandbags or revetment rock) would reduce localized erosion but could accelerate erosion adjacent to the emergency protection. The resulting effect on the stability and unique geology of the bluffs would likely be greater than would occur under the project.[6]

GREENHOUSE GAS EMISSIONS

Alternative A would not increase sand placement volumes compared with existing conditions, construct new facilities, or reroute vehicular traffic, and therefore would have less-than-significant effects related to greenhouse gas emissions, same as the project.

UTILITIES AND SERVICE SYSTEMS

Under stable shore conditions (with sufficient protection from coastal hazards during storm events), the no project alternative would have no impacts on utilities and service systems. Under Alternative A, the Lake Merced Tunnel and other shoreline wastewater facilities would continue to be vulnerable to coastal hazards. If continued erosion were to require the relocation or construction of new wastewater treatment facilities, additional environmental effects could result.

HYDROLOGY AND WATER QUALITY

Under stable shore conditions (with sufficient protection from coastal hazards during storm events), Alternative A would have none of the impacts on hydrology or water quality that were identified for the project during either construction or operation. Under Alternative A, the Lake Merced Tunnel and other shoreline facilities would continue to be vulnerable to coastal hazards. With continued shore erosion, the Lake Merced Tunnel would be subject to increased risk of upset or failure, resulting in greater potential for release of untreated wastewater to the Pacific Ocean, which could impact water quality and potentially violate water quality standards, effects which would not occur under the project.

CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

Because Alternative A would result in only minimal ground disturbance at the South Ocean Beach project site, impacts on cultural and tribal cultural resources would be reduced relative to the project.

AESTHETICS

Under Alternative A, the revetments and rubble would remain, and abandoned stormwater pipes and debris would continue to erode from the exposed bluff and roadbed, diminishing the scenic quality of the shoreline relative to the proposed project.

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[6] The Golden Gate National Recreation Area’s 2014 General Management Plan identifies the Fort Funston bluffs as having unique geology. The management plan calls for preservation of the bluffs, while allowing natural processes to continue unimpeded.

RECREATION

Alternative A would not displace recreational users to other areas such that physical degradation of facilities would result because during ongoing shoreline management activities ample beach surrounding the project site would remain available for recreationists, resulting in less-than-significant impacts related to recreation.

OTHER ENVIRONMENTAL TOPICS

Alternative A would have similar or reduced environmental effects as the proposed project for the following topics, as further explained below: land use and land use planning; population and housing; wind and shadow; public services; hazards and hazardous materials; mineral resources; energy; agriculture and forestry resources; and wildfire.

Alternative A would not directly remove bank swallow habitat, and therefore would not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Alternative A would not result in population growth and would have no population and housing impacts. Alternative A would not include any new structures, and therefore would not create wind hazards or shadow in publicly accessible areas; Alternative A would have no impacts with respect to wind and shadow.

Similar to the project, Alternative A would have less-than-significant public services impacts as it would not cause population growth or alter land use such that new or altered governmental facilities would be needed. Sand backpassing and emergency shoreline protection activities of Alternative A would be similar to sand backpassing activities of the project, and subject to the same hazardous materials handling, storage, containment, and management requirements, a less-than-significant impact.

As with the project, lands affected by Alternative A are not in areas designated by the state or the city as containing mineral deposits of significance and thus Alternative A would have the same less-than-significant mineral resources impacts as the project. Alternative A energy use would be less than is estimated for the project, and would not be unusually large or inefficient, wasteful, or unnecessary. As would also be the case for the project, lands affected by Alternative A are not used for farming or agricultural activities, are not zoned as agricultural or timber uses, and are not classified as very high fire hazard severity zones and therefore would not result in any impacts related to these topics.

6.3.2 Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment

6.3.2.1 DESCRIPTION

Alternative B addresses the project's significant construction effect on bank swallow habitat associated with bluff reshaping, as well as the project's significant operational noise and VMT impacts from vehicular traffic rerouted due to the Great Highway closure. Under this alternative, illustrated in **Figure 6-1**, the city would remove the existing revetments and rubble from the beach, but would not construct the buried wall. The remaining bluff along the shoreline and behind the removed revetments would not be reshaped, and vegetation would not be planted. In the absence of shoreline protection, and given the shoreline's susceptibility to erosion during severe storms, the city would place large quantities of sand (approximately five times as much as the project) along the shoreline to maintain a beach width of at least 50 feet most of the time (similar to the project), minimize bluff retreat, and protect the Lake Merced Tunnel, which would also reduce associated effects on bank swallow habitat. The city would not close the Great Highway or reconfigure the Sloat Boulevard/Great Highway or Great Highway/Skyline Boulevard intersections, nor would it modify zoo parking access. Because the Great Highway would remain open, there would not be sufficient room to construct a multi-use trail. The existing NPS restroom and parking lot and sand ramp would remain in their current locations, and the city would not construct a new restroom, parking lot, or beach access stairway.

CONSTRUCTION

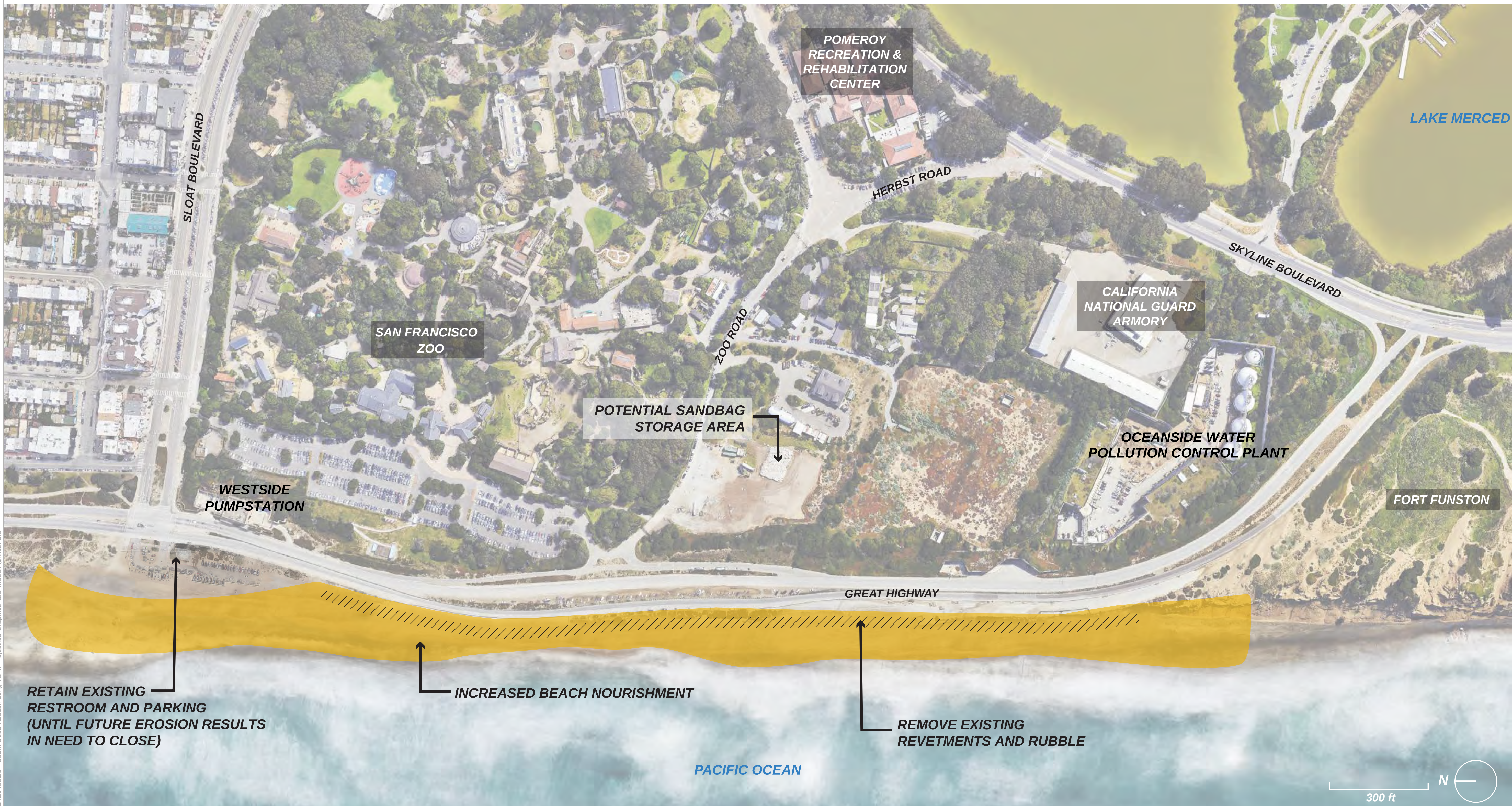
Construction activity for Alternative B would be limited to revetment and rubble removal, consistent with construction activities for this portion of the proposed project described in Section 2.5.1.3. Unlike the proposed project, the bluff would not be reshaped and slope stabilization would not be installed. No other features proposed for the project, such as the new service road, multi-use trail, or Skyline coastal parking lot, would be constructed under Alternative B. Construction would be complete once the city removes the revetments and rubble. Alternative B construction duration would be substantially shorter than that of the proposed project (approximately 1 year instead of 4 years).

OPERATIONS

Shortly after revetment and rubble is removed, and on a semi-regular basis thereafter, the city would place large quantities of sand along South Ocean Beach. Under Alternative B, about 200,000 cubic yards of sand per year, on average, would be placed and formed into an embankment in front of the bluffs, extending approximately 3,000 feet south from Sloat Boulevard. Based upon the backshore position under Alternative B, which would be seaward relative to that for the project (i.e., similar to the existing bluff toe), and considering the amount of beach erosion that can occur at South Ocean Beach during a single storm event, this volume would be expected to provide for a beach width of 50 feet or greater most of the time.

Given the volume required, the primary source of sand for Alternative B would be the San Francisco Harbor – Main Ship Channel, which is dredged by the U.S. Army Corps of Engineers as part of its ongoing federal navigation channels maintenance program. Under this alternative, the city would partner with the Corps to obtain regularly scheduled dredge sand placements of approximately once every one to two years, as available, or smaller volumes with greater frequency; placement activities would be as described in Section 2.4.5.3 for the proposed project’s large sand placements. Similar to the proposed project, federal authorization could be needed prior to the Corps’ involvement.

Under Alternative B, beach nourishment would be performed to protect city infrastructure from further exposure to coastal hazards. While the alternative would be expected to substantially reduce the rate of shore erosion and protect coastal assets, the shoreline conditions at South Ocean Beach are dynamic, highly variable, and there remains a possibility that in a severe storm, substantial shore erosion could result. The city would continue to monitor shoreline conditions to assess the performance of the placed sand and vulnerability of the Lake Merced Tunnel. As may be required to address substantial erosion events that might occur between the scheduled dredge sand placement events, the city would obtain smaller amounts of sand from North Ocean Beach or commercial vendors; placement activities would be as described in Section 2.4.5.4 for the proposed project’s small sand placements.



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Ocean Beach Climate Change Adaptation Project

Figure 6-1
Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment

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As a precautionary measure and consistent with existing practice, the city would store large sandbags in an upland developed area near South Ocean Beach (e.g., within a gravel lot at the zoo south of Zoo Road where they are currently stored, or a similarly developed or disturbed site), for rapid deployment in the event of severe localized erosion during a single storm season that threatens the Lake Merced Tunnel. The sandbags would be removed the summer following their emergency deployment and replaced by dredged sand or North Ocean Beach or commercial vendor sand, as determined by the established placement schedule and availability. However, in the event of substantial erosion, the city would implement emergency shoreline protection measures which could include placement of additional sand, sandbags, revetment rock, and/or longer-term measures if approved, as described for Alternative A.

Under Alternative B, the Great Highway between Sloat and Skyline boulevards would be retained and remain open to public vehicular traffic in both directions in the near-term. The city would continue to manage the existing roadway as under current conditions. If a substantial erosion event were to occur, intermittent closures of the Great Highway could be required for localized repairs in the near-term, with permanent lane closures possible if, over time, erosion progressed and undermined the roadbed. Additionally, the existing NPS restroom and parking lot may be closed and/or removed, as needed to protect public health and safety.

6.3.2.2 COMPARISON OF ENVIRONMENTAL IMPACTS

BIOLOGICAL RESOURCES

Alternative B would avoid the direct significant and unavoidable bank swallow habitat impact identified for project construction, because the habitat would not be directly removed. Alternative B would result in similar impacts on bank swallow as the proposed project during operations; if beach nourishment requires sand placement at the southern limits of South Ocean Beach during bank swallow nesting season, these impacts would be reduced to less-than-significant levels with implementation of the same mitigation identified for the project.

Under Alternative B, the city would place large amounts of sand along the shoreline to slow bluff erosion to temporarily protect wastewater infrastructure assets, which would also protect bank swallow habitat and maintain beach width. Removal of the revetment would expose the bluffs to more natural rates of erosion, which could eventually lead to loss of the bank swallow habitat. Larger and more frequent sand placements would provide less time for recovery of impacted benthic communities, relative to the project, but for the same reasons described for the project would result in a less-than-significant impact for special-status marine species. Alternative B would not require tree removal during construction, and would therefore result in reduced (i.e., less-than-significant) effects on special-status bats or bat maternity colonies compared with the project.

NOISE AND VIBRATION

Alternative B would avoid the significant and unavoidable roadway noise increase at noise-sensitive receptors along Sloat and Skyline Boulevards because the Great Highway south of Sloat Boulevard would remain open. If continued erosion were to require further Great Highway lane closures, increased noise would result due to rerouted traffic along Sloat and Skyline boulevards similar to the project.

Because Alternative B would not include any construction other than removing the revetments, daytime and nighttime construction noise levels would be reduced and would not exceed noise standards or ambient noise levels. Similar to the project, Alternative B would result in less-than-significant impacts related to vibration or groundborne noise, and the impacts would be reduced compared with the project due to less construction activity.

Alternative B would result in similar beach nourishment noise impacts as the project because, while sand placement may occur more frequently, or include greater sand volumes, it would occur in the same areas and with the same type of equipment as proposed for the project.

TRANSPORTATION AND CIRCULATION

Alternative B would avoid the significant and unavoidable VMT impact caused by the project because the Great Highway between Sloat and Skyline boulevards would remain open. If continued erosion were to require further Great Highway lane closures, increased VMT would occur due to rerouted traffic along Sloat and Skyline boulevards.

AIR QUALITY

Alternative B would have no impact related to operational emissions from traffic redistribution because the Great Highway between Sloat and Skyline boulevards would remain open. Therefore, emissions during operation would only come from beach nourishment activities. However, if continued erosion were to require further Great Highway lane closures, increased emissions of criteria air pollutants could result from traffic rerouted along Sloat and Skyline boulevards.

In Alternative B, sand placements (including large sand placements) would likely occur more frequently than for the proposed project, thereby resulting in a greater total volume of sand placed over the project life. Thus, operations emissions from Alternative B beach nourishment would result in greater total emissions compared with the project’s nourishment program. The Alternative B emissions from sand placements would be below the operational significance thresholds, and the impact would be less than significant.

Average daily construction emissions of criteria air pollutants, including fugitive dust, would be reduced compared with those emitted by the proposed project, because a reduced level of construction activity would likely occur on a daily basis. Construction would not interfere with implementation of the 2017 Clean Air Plan, result in a considerable net increase in criteria air pollutants, or result in odor emissions affecting a substantial number of people, and associated impacts would be less than significant.

GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Similar to the project, removal of revetments and rubble under Alternative B would widen the beach. This would both reduce the wave-revetment reflection that contributes to beach and sandbar scour, but also reduce the roughness of the shore, allowing wave action to extend further landward (see Impact GE-3 within Appendix B [Initial Study] for additional discussion of coastal processes). As the bluff would not be reshaped under Alternative B, the bluff toe would remain seaward relative to the top of wall under project conditions. Within the portion of South Ocean Beach south of the NPS parking lot, where the beach would be backed by exposed Colma Formation, there would be greater potential for wave-bluff interactions over several years until the bluff face equilibrates into a more gradual slope. The larger sand placements would increase beach width and elevation, minimize the occurrence of wave-bluff interactions, and contribute greater amounts of sand to the surf zone, which could nourish sand bars and adjacent beaches. However, as under the project, there could be brief periods during which the placed sand erodes and the bluff face is exposed to wave action. During such events, wave-bluff interactions could result in localized beach and sand bar scour effects similar to or slightly greater than would be expected for the project, but which would remain less than significant. With the removal of revetments and rubble, and increased volume of sand placement, and considering the backshore position, the effects of Alternative B on adjacent shoreline erosion would be similar to those described for the project; less than significant.

Alternative B would have minimal direct ground-disturbing effects on the bluffs. Without construction of the buried wall or bluff reshaping, Alternative B would avoid impacts on potential paleontological resources and would result in less-than-significant impacts, a reduction compared with the impact of the project.

GREENHOUSE GAS EMISSIONS

Alternative B would avoid or reduce greenhouse gas emissions from construction activities compared with the project. While Alternative B would not close the Great Highway to vehicular traffic south of Sloat Boulevard, and therefore would not cause additional greenhouse gas emissions due to rerouted traffic, larger or more frequent large sand placements would be necessary under Alternative B compared with the project. The sand placements would require the use of off-road equipment similar to the equipment that would be used for the project's large sand placements. Overall greenhouse gas emissions associated with Alternative B sand placement would likely be greater than those of the project, but for the same reasons presented for the project,[7] the emissions would be consistent with the city's greenhouse gas reduction strategy. If continued erosion were to require further Great Highway lane closures, increased greenhouse gas emissions from the additional VMT would result due to rerouted traffic along Sloat and Skyline boulevards.

UTILITIES AND SERVICE SYSTEMS

Alternative B would result in no near-term impacts related to utilities and service systems. Without the buried wall, the Lake Merced Tunnel and other shoreline facilities would be at greater risk of upset or failure. If continued erosion were to require the relocation or construction of new wastewater treatment facilities, additional environmental effects could result.

HYDROLOGY AND WATER QUALITY

Similar to the project, Alternative B would not result in any significant impacts related to hydrology and water quality, because it would not involve new discharges, affect groundwater supplies, change drainage patterns, or involve new development in a hazard zone. Without the buried wall, the Lake Merced Tunnel and other shoreline facilities would be at greater risk of upset or failure, resulting in greater potential for release of untreated wastewater to the Pacific Ocean, which could impact water quality and potentially violate water quality standards.

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7 As discussed in Appendix B Topic E.9, Greenhouse Gas Emissions, large sand placement offshore emission sources would not be under the city's control or subject to city requirements, but would implement best available control technology to reduce air pollutant emissions that have a co-benefit of reducing greenhouse gas emissions and would comply with applicable BAAQMD air quality requirements.

CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

Because Alternative B would result in only minimal ground disturbance at the South Ocean Beach project site, impacts on cultural and tribal cultural resources would be reduced compared to the project and less than significant.

AESTHETICS

Aesthetic resource impacts of Alternative B would be similar to the project; while there would be less construction activity, there would also be fewer enhancements to the scenic quality of the project site.

RECREATION

During construction and beach nourishment, ample beach surrounding the project site would remain available for recreationists. Owing to the larger beach nourishment volumes, beach widths would be expected to remain similar to or wider than those under the project. As noted above, Alternative B would result in similar or slightly larger changes to sand bars than the project. Given the dynamic nature of the system, it is expected that bar characteristics would continue to vary seasonally. A change in sand bar geometry may result in enhanced or degraded wave breaking conditions for surfing, as a function of wave conditions and skill level, with resulting changes in wave conditions likely being more attractive to some users and less to others. However, given the anticipated range of sediment dispersion, the extent of such changes relative to inherent variability would not be substantial – discernable on the order of about 1,000 feet to 3,000 feet from the project site to the north and likely an equal distance to the south. For these reasons, and given the amount of adjacent and nearby coastline available for surfing, the changes under Alternative B would not be expected to result in the displacement of substantial numbers of visitors such that other beach park facilities experienced substantial physical deterioration.

OTHER ENVIRONMENTAL TOPICS

Alternative B would have similar or reduced environmental effects as the project for the following topics, as further explained below: land use and land use planning; population and housing; wind and shadow; public services; hazards and hazardous materials; mineral resources; energy; agriculture and forestry resources; and wildfire.

Alternative B would not directly remove bank swallow habitat, and therefore would not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Like the project, Alternative B would not result in population growth and would have less-than-significant population and housing impacts. Alternative B would not include any new structures, and therefore would not create wind hazards or shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces; Alternative B would have no impacts with respect to wind or shadow.

Similar to the project, Alternative B would have less-than-significant public services impacts as it would not cause population growth or alter land use such that new or altered governmental facilities would be needed. Construction and operation activities of Alternative B would be similar to those of the project, and subject to the same hazardous materials handling, storage, containment, and management requirements as the project, a less-than-significant impact.

As with the project, lands affected by Alternative B are not in areas designated by the state or the city as containing mineral deposits of significance and thus Alternative B would have the same less-than-significant mineral resources impacts as the project. Alternative B energy use during construction would be less than the project; during operation fuel usage would be more than double that required for the project during sand placement, although less transportation fuels would be used because traffic would not be rerouted. Alternative B's energy usage would not be unusually large or inefficient, wasteful, or unnecessary, a less-than-significant impact (same as the project). As would also be the case for the project, lands affected by Alternative B are not used for farming or agricultural activities, are not zoned as agricultural or timber uses, or classified as very high fire hazard severity zones and therefore would not result in any impacts related to these topics.

6.3.3 Alternative C: Protect Critical Infrastructure with Conventional Seawall

6.3.3.1 DESCRIPTION

Alternative C avoids the project's significant construction effect on bank swallow habitat associated with bluff reshaping, as well as the project's significant operational noise and VMT impacts from traffic rerouted due to the Great Highway closure. Under this alternative, shown in **Figure 6-2**, the city would construct a conventional seawall[8] along the South Ocean Beach shoreline, from Sloat Boulevard to the Fort Funston bluffs. The seawall would stabilize the shoreline, avoid or minimize further bluff retreat, and thereby allow for retention of the Great Highway and continued protection of the bank swallow habitat. The seawall would rise to approximately 30 feet above sea level, or roughly the height of the existing bluff top at the north end (near Sloat Boulevard) and the top of the revetments at the south end (which is about 15 to 20 feet below the bluff top) just below the bank swallow habitat.

Under Alternative C, the Great Highway would be retained and remain open to public vehicle traffic in both directions between Sloat and Skyline boulevards. There would be no need for a dedicated service road or modifications to nearby intersections and zoo parking access. Similarly, under this alternative, the existing NPS restroom would be retained in its current location and would be protected by the seawall. Coastal parking would continue to be provided within the NPS parking lot at Sloat Boulevard, and a new coastal access parking lot would not be constructed. However, the city would construct a multi-use trail behind the seawall, which may require adjustments to the alignment of the Great Highway's southbound travel lanes, and would integrate a beach access stairway into the wall at one location. The multi-use trail would be a similar width as the proposed project's trail, but straighter due to space limitations. To maintain a beach width of at least 50 feet most of the time (similar to the project), under Alternative C the city would place approximately three times as much sand as proposed for the project.

CONSTRUCTION

The wall would include a foundation, a sculpted face, and tieback anchors. Unlike the project, which proposes a buried secant pile wall, the city would instead construct a taller sculpted wall. After removal of the revetments and rubble, the seawall would be built by shotcreting the face of the exposed bluff and installing tieback anchors. The finished surface would then be sculpted to resemble a natural bluff surface. The seawall at the bluff toe would be approximately 80 feet seaward of the Lake Merced Tunnel, farther west than the

8 The seawall in Alternative C would include vertical portions that would always be exposed, while the proposed buried wall would have a lower profile. A taller exposed seawall is considered more conventional, which is why the term "conventional seawall" is used to describe Alternative C.

project's buried wall. Once seawall construction is complete, the city would reconfigure the southbound lanes of the Great Highway to accommodate the multi-use trail.

Compared to the project, the duration of Alternative C construction would be shorter (approximately three years instead of four years) because the city would not modify the Great Highway/Skyline Boulevard and Sloat Boulevard/Great Highway intersections, would not remove the Great Highway travel lanes between Sloat and Skyline boulevards, would not construct a new restroom or a new coastal access parking lot, and would not reshape the bluff and plant vegetation.

OPERATIONS

During operation of Alternative C, the city would implement a beach nourishment program to maintain a sandy beach seaward of the wall; however, the city would not plant vegetation because there would not be a reshaped bluff.

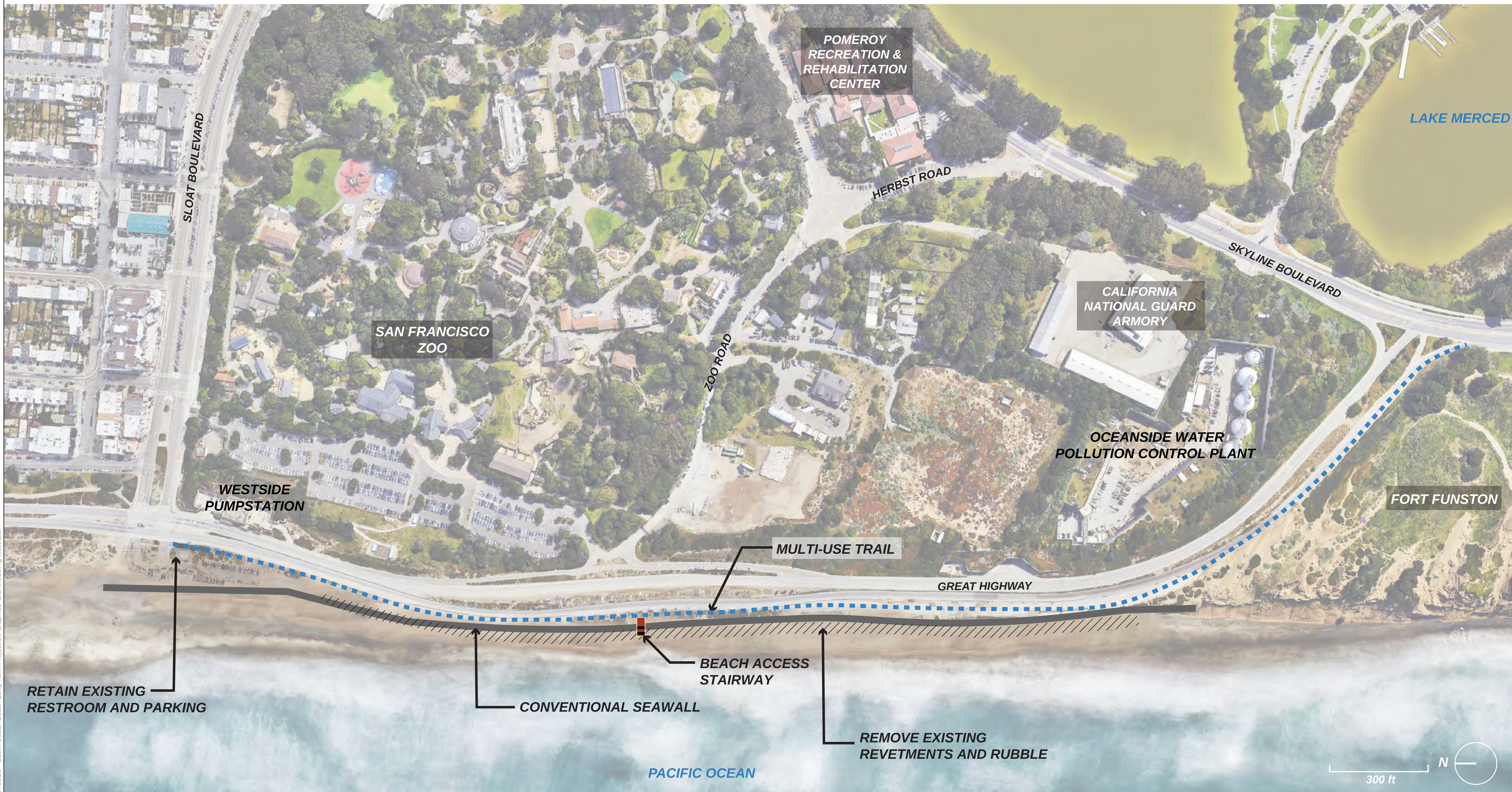
Under Alternative C, about 100,000 cubic yards of sand per year, on average, would be placed and formed into an embankment in front of the seawall, extending approximately 3,000 feet south from Sloat Boulevard. Based upon the backshore position under Alternative C, which would be seaward relative to that for the project (i.e., at the existing bluff toe), and considering the amount of beach erosion that can occur at South Ocean Beach during a single storm event, this volume would be expected to provide for a beach of 50 feet or greater most of the time.

The primary source of sand for Alternative C would be the main ship channel. Under this alternative, the city would partner with the Corps to obtain regularly scheduled dredge sand placements approximately once every two to three years, as available, or smaller volumes with greater frequency; placement activities would be as described in Section 2.4.5.3 for the project's large sand placements. Similar to the proposed project, federal authorization could be needed prior to the Corps' involvement. To address substantial erosion events that might occur between the scheduled dredge sand placement events, the city would obtain smaller amounts of sand from North Ocean Beach or commercial vendors; placement activities would be as described in Section 2.4.5.4 for the project's small sand placements.

6.3.3.2 COMPARISON OF ENVIRONMENTAL IMPACTS

BIOLOGICAL RESOURCES

Alternative C would avoid significant and unavoidable direct impacts on bank swallow habitat by constructing a conventional seawall to the height of the existing revetments at the south end (which is about 15 to 20 feet below the bluff top), below the bank swallow habitat. Excavation into the bluff supporting the bank swallow habitat would not be required and thus the bank swallow habitat would not be disturbed. The seawall would protect the toe of the bluff supporting the bank swallow habitat from future erosion. Alternative C beach nourishment would result in the same impacts on remaining bank swallow habitat as the project during operations, if sand placement occurs at the southern limits of South Ocean Beach during bank swallow nesting season; these impacts would be reduced to less-than-significant levels with implementation of the same mitigation identified for the project. However, during operations the wall could be exposed to wave interaction more often than would be the case with the buried wall under the project. Wave interaction with the exposed seawall could accelerate erosion of the Fort Funston bluffs to the south, resulting in a potentially significant impact on adjacent bank swallow habitat.



Notes:
Long-term beach nourishment not shown.
Multi-use trail may require Great Highway travel lane adjustments at selected locations.

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Ocean Beach Climate Change Adaptation Project

Figure 6-2
Alternative C: Protect Critical Infrastructure with Conventional Seawall

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The larger and more frequent sand placements would provide less time for recovery of impacted benthic communities, relative to the project, but for the same reasons described for the project would result in a less-than-significant impact for special-status marine species.

Alternative C would not require tree removal during construction, and would therefore result in reduced (i.e., less-than-significant) effects on special-status bats or bat maternity roosts compared with the project.

NOISE AND VIBRATION

Alternative C would avoid the significant and unavoidable permanent roadway noise increase at noise-sensitive receptors along Sloat and Skyline Boulevards because the Great Highway south of Sloat Boulevard would remain open thus vehicular traffic would not be rerouted. Because there would be no construction noise for intersection improvements that are close to residences, the seawall would be farther from receptors due to its more seaward position, and the seawall would not require as extensive pile drilling as the project, overall construction noise impacts would be reduced. Alternative C operations would result in similar less-than-significant beach nourishment noise impacts as the project because, while sand placement may occur more frequently, or include greater sand volumes, it would occur in the same areas and with the same type of equipment as proposed for the project.

TRANSPORTATION AND CIRCULATION

Alternative C would avoid the significant and unavoidable VMT impact caused by the project because the Great Highway between Sloat and Skyline boulevards would remain open and vehicular traffic would not be rerouted. The conventional seawall would also protect the Great Highway from erosion in the long-term.

AIR QUALITY

Alternative C would have no impact related to operational emissions from traffic redistribution because the Great Highway between Sloat and Skyline boulevards would remain open. Therefore, emissions during operation would only come from beach nourishment activities.

In Alternative C, sand placements would occur more frequently than for the proposed project, thereby resulting in a greater total volume of sand placed over the project life. Thus, operations emissions from Alternative C beach nourishment would result in greater total emissions compared with the project's beach nourishment program. The Alternative C emissions from sand placements would be below the operational significance thresholds, and the impact would be less than significant.

While overall construction of Alternative C would take less time than the project and would result in reduced total emissions over the duration of construction, average daily construction emissions of criteria air pollutants, including fugitive dust, would be similar to those emitted by the project, because a similar level of construction activity would likely occur on a daily basis. Therefore, as would be the case for the project, with mitigation, Alternative C construction would not result in a considerable net increase in criteria air pollutants.

GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

As under the project, removal of revetments and rubble under Alternative C could potentially widen the beach. This would reduce the wave-revetment reflection that contributes to beach and sandbar scour, but also reduce the roughness of the shore, allowing wave action to extend further landward. However, as the wall would be constructed along the existing bluff toe, it would be seaward and more exposed relative to the top of the buried wall under project conditions. The conventional seawall would also be considerably more reflective than the buried wall.[9] The larger volume of sand placement would increase beach width and elevation, which may help reduce the occurrence of wave-wall interactions, and contribute greater amounts of sand to the surf zone, which could nourish sand bars and adjacent beaches. However, there would likely be periods during which the placed sand erodes and a greater amount of the wall is exposed. As a result of reducing the roughness and substantially increasing reflectivity, and because the shore would not be allowed to erode over time (i.e., would be fixed at the wall location) there would likely be more frequent wave-wall interactions which could result in substantially greater beach and sand bar scour under Alternative C than would be expected for the project. While a larger volume of sand would be placed to maintain a sandy beach, the more frequent wall exposure could also result in accelerated erosion of shore areas to the north and south of the wall. Based on the rate of erosion documented south of the 2010 emergency riprap revetments after placement, accelerated erosion from a conventional seawall, even if only exposed infrequently or temporarily, could cause bluff instability at Fort Funston and damage to a unique geologic feature, a potentially significant impact.

Without excavation for the buried wall or bluff recontouring, the impact of Alternative C on potential paleontological resources would be reduced compared with the impact of the project.

GREENHOUSE GAS EMISSIONS

While Alternative C would not close the Great Highway to vehicular traffic south of Sloat Boulevard, and therefore would not cause additional greenhouse gas emissions due to rerouted traffic, larger or more frequent sand placements would be necessary under Alternative C compared with the project. Off-road equipment would be similar to the equipment that would be used for the project's large sand placements. Overall greenhouse gas emissions associated with Alternative C sand placement would be greater than those of the project, but for the same reasons presented for the project,[10] the emissions would be consistent with the city's greenhouse gas reduction strategy. Alternative C would generate reduced greenhouse gas emissions from construction activities compared with the project because overall construction duration would be shorter.

UTILITIES AND SERVICE SYSTEMS

Similar to the project, Alternative C would have less-than-significant utilities and public services impacts as it would not cause population growth or land use changes such that new or altered utilities would be needed, a less-than-significant impact.

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9 The proposed buried wall and slope stabilization would be at a lower elevation than a conventional seawall (which would extend to the top of bluff) and allow wave runup over the slope stabilization, reducing the buried wall's reflectivity.

10 As discussed in Appendix B Topic E.9, Greenhouse Gas Emissions, large sand placement offshore emission sources would not be under the city's control or subject to city requirements, but would implement best available control technology to reduce air pollutant emissions that have a co-benefit of reducing greenhouse gas emissions and would comply with applicable BAAQMD air quality requirements.

HYDROLOGY AND WATER QUALITY

Construction and operation activities of Alternative C would be similar to those of the project, and subject to the same stormwater management requirements as the project, a less-than-significant impact.

CULTURAL AND TRIBAL CULTURAL RESOURCES

Because Alternative C would reduce the amount of excavation at the South Ocean Beach project site, impacts on cultural and tribal cultural resources would be reduced compared with the project, and less than significant.

AESTHETICS

Alternative C would improve the visual quality of and expand scenic viewing opportunities along the shore by removing the rubble and revetments. However, due to its prominence, both in height and shore position, portions of the Alternative C seawall would be regularly exposed. As compared to project conditions, under which the wall would be buried most of the time, the Alternative C shoreline would be dominated by the sculpted seawall. Similar to the project, Alternative C would include beach nourishment designed to maintain a beach width of at least 50 feet most of the time, and such nourishment would bury or obscure views of portions of the wall. Nonetheless, due to its prominence, the exposed conventional seawall would be a conspicuous and dominant artificial landscape feature that could detract from the surrounding natural shoreline aesthetic, a potentially significant impact.

RECREATION

During construction activities and beach nourishment, ample beach surrounding the project site would remain available for recreationists. Similar to the project, Alternative C would establish better connectivity between segments of the coastal trail system, which may attract additional local and regional users, but would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Owing to the relatively larger beach nourishment volumes, beach widths would be expected to remain similar to or slightly narrower than those under the project. As noted above, Alternative C changes in sand bars would be more substantial than identified for the project. A change in sand bar geometry may result in enhanced or degraded wave breaking conditions for surfing, also as a function of wave conditions and skill level. Given the dynamic nature of the system, it is expected that bar characteristics would continue to vary seasonally, with resulting changes in wave conditions likely being more attractive to some users and less to others. However, given the anticipated range of sediment dispersion, the extent of such changes relative to inherent variability would not be substantial – discernable on the order of about 1,000 feet to 3,000 feet from the project site to the north and likely an equal distance to the south. For these reasons, and given the amount of adjacent and nearby coastline available for surfing, the changes under Alternative C would not be expected to result in the displacement of substantial numbers of visitors such that other beach park facilities experienced substantial physical deterioration.

OTHER ENVIRONMENTAL TOPICS

Alternative C would have similar or reduced environmental effects compared to the project for the following topics, as further explained below: land use and land use planning; population and housing; wind and shadow; public services; hazards and hazardous materials; mineral resources; energy; agriculture and forestry resources; and wildfire.

Alternative C would not directly remove bank swallow habitat, and therefore would not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Like the project, Alternative C would not result in population growth and would have less-than-significant population and housing impacts. While Alternative C would include a seawall, it would not create wind hazards or shadow that could affect the use and enjoyment of publicly accessible open spaces; Alternative C would have less than significant impacts with respect to wind and shadow.

Similar to the project, Alternative C would have less-than-significant public services impacts as it would not cause population growth or land use changes such that new or altered utilities would be needed, a less-than-significant impact. Construction and operation activities of Alternative C would be similar to those of the project, and subject to the same hazardous materials handling, storage, containment, and management requirements as the project, less-than-significant impacts.

As with the project, lands affected by Alternative C are not in areas designated by the state or the city as containing mineral deposits of significance and thus Alternative C would have the same less-than-significant mineral resources impacts as the project. Alternative C energy use during construction would be less than the project; during operation fuel usage would be more than that required for the project during sand placement, but less transportation fuels than the project would be used because traffic would not be rerouted. Alternative C's energy usage would not be unusually large or inefficient, wasteful, or unnecessary, a less-than-significant impact (the same as the project). As would also be the case for the project, lands affected by Alternative C are not used for farming or agricultural activities, are not zoned as agricultural or timber uses, or classified as very high fire hazard severity zones and therefore would not result in any impacts related to these topics.

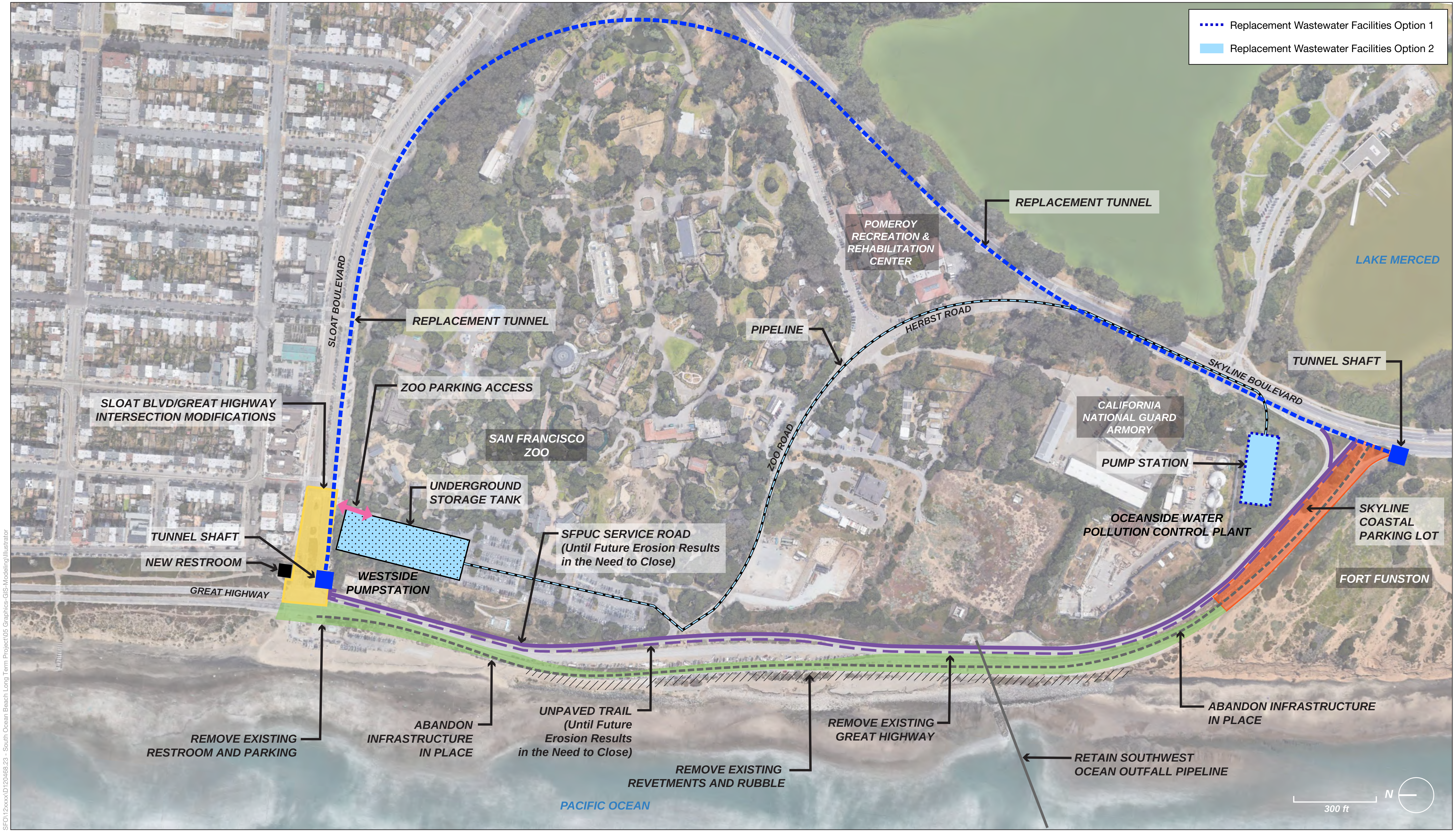
6.3.4 Alternative D: Replace Lake Merced Tunnel with Inland Infrastructure

6.3.4.1 DESCRIPTION

Alternative D would address the project's significant construction effect on bank swallow habitat associated with buried wall construction. No shoreline protection structures would be installed or retained under this alternative. Because the existing revetments would be removed and there would be no protection from erosion, the city would need to close the Great Highway between Sloat and Skyline boulevards, close the NPS restroom and parking lot, and abandon the Lake Merced Tunnel.

To maintain wastewater system functions provided by the Lake Merced Tunnel the city would construct new conveyance facilities along an inland alignment, connecting Westside Pump Station facilities near the Sloat Boulevard/Great Highway intersection and Oceanside Treatment Plant facilities near the Skyline Boulevard/Great Highway intersection. The city could replace the Lake Merced Tunnel functions with a new pump station and tunnel (Option 1) or a new pump station, pipeline, and storage tank (Option 2). Either option could extend beneath the San Francisco Zoo or zoo parking (**Figure 6-3**). The city would then abandon the existing Lake Merced Tunnel in place, which may include drilling holes in the tunnel to prevent buoyancy but otherwise not altering the tunnel.

Similar to the project, the city would remove the revetments, modify the Skyline Boulevard/Great Highway and Sloat Boulevard/Great Highway intersections and construct a new coastal access parking area near the Great Highway/Skyline Boulevard intersection. As described for the project in Section 2.4.1.2, the Great



Ocean Beach Climate Change Adaptation Project

Figure 6-3
Alternative D: Replace Tunnel with Inland Infrastructure

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Highway's easternmost northbound travel lane would be retained or reconstructed as a service road to provide continued, restricted vehicle access to the Oceanside Treatment Plant, the Westside Pump Station and associated facilities for SFPUC operations. With the removal of the rubble and revetments, the shoreline profile would be lower, the beach wider, and the reach of the tides farther inland. The remaining available space between the beach and the service road would be limited, and its exposure to coastal processes would be high. As a result, and since erosion of the area is expected within seven to 10 years, rather than constructing a permanent paved multi-use trail, the city would construct a temporary unpaved trail between Sloat and Skyline boulevards and would not install beach access stairs. A new restroom would be constructed at the northeast corner of the Sloat Boulevard/Great Highway intersection to replace the removed NPS restroom. The city would also implement a beach nourishment program, similar to the project, to maintain a beach width of at least 50 feet most of the time, slow bluff retreat, and protect inland infrastructure and the coastal trail.

CONSTRUCTION

Alternative D construction would occur over approximately four years, similar to the project. Construction would begin with the wastewater facilities required to replace the function provided by the Lake Merced Tunnel. Either a trenchless construction technique, such as tunnel-boring, or open cut trenching would be used to construct the replacement facilities. Two deep shafts would be dug at either end of the tunnel(s) to allow for trenchless construction, if used.

Concurrently with construction and operational testing of the replacement infrastructure, the city would modify the Skyline Boulevard/Great Highway and Sloat Boulevard/Great Highway intersections, zoo parking access, and remove the NPS restroom and parking lot and the Great Highway's southbound travel lanes as described for the project in Section 2.5.1. The city would remove all revetments and rubble from South Ocean Beach but the remaining bluff would not be reshaped. The city would then install the unpaved trail.

Once the replacement facilities are operational, the city would abandon the Lake Merced Tunnel in place, which could involve perforating the tunnel, or simply leaving the tunnel in its current state.

OPERATIONS

Under Alternative D, the city would implement a beach nourishment program to maintain a sandy beach seaward of the bluffs, but would not plant vegetation. Under this alternative the volume of sand placed would be similar to that under existing conditions (approximately 43,000 cubic yards per year, on average), with placements occurring approximately once every four to seven years. Given the backshore position under Alternative D (i.e., the existing bluff toe after rubble and revetment removal), that no shore protection would protect the Lake Merced Tunnel and the bluff would erode, and considering the amount of beach erosion that can occur at South Ocean Beach during a single storm event, this volume would be expected to provide for a beach of 50 feet or greater most of the time. The sand sources and placement methods would also be as described for the project, and federal authorization could be needed prior to the Corps' involvement.

In the absence of shoreline protection, and given the shoreline's susceptibility to erosion during severe storms, the placed sand would also serve to reduce the rate of bluff retreat, protect the remaining inland assets, and reduce associated effects on bank swallow habitat. Accordingly, the placement locations would consider and be informed by beach and bluff conditions near the Westside Pump Station and Oceanside Treatment Plant. The unpaved trail and other infrastructure would not be protected from shoreline erosion.

The tunnel is buried in the bluff at near beach elevation and over time coastal processes would expose the top of the tunnel seasonally during storm events when sand is washed from the beach. While the tunnel's structure could be compromised, it would not affect wastewater system function because the inland replacement would be operational. If segments of the tunnel were to become exposed for long periods of time, or substantially weakened or damaged such that they presented a safety hazard, the city would remove them. Tunnel segment removal would likely require excavation adjacent to the tunnel, as well as the use of large equipment designed to demolish and off-haul large concrete structures.

6.3.4.2 COMPARISON OF ENVIRONMENTAL IMPACTS

BIOLOGICAL RESOURCES

Alternative D would avoid the direct significant and unavoidable bank swallow habitat impact identified for project construction, because the habitat would not be directly removed. Alternative D would result in the same impacts on remaining bank swallow habitat as the project during operations; if beach nourishment requires sand placement at the southern limits of South Ocean Beach during bank swallow nesting season, these impacts would be reduced to less-than-significant levels with implementation of the same mitigation identified for the project. Alternative D would require the same tree removal as the proposed project, and therefore would result in similar impacts on special-status bats and bat maternity roosts (less than significant with mitigation).

Unlike the project, work on the pump station could adversely affect special-status plants during construction of Alternative D, a potentially significant impact that would be greater than the project's impact. Alternative D would likely require special-status plant surveys and avoidance during construction to reduce potentially significant impacts on special-status plants.

Under Alternative D, the city would place large amounts of sand along the shoreline to maintain beach width for public access, which would also slow bluff erosion near the remaining wastewater infrastructure assets and protect bank swallow habitat. However, removal of the revetment would expose the bluffs to more natural rates of erosion, which could eventually lead to loss of the bank swallow habitat.

NOISE AND VIBRATION

Alternative D would cause the same significant and unavoidable roadway noise increase at noise-sensitive receptors along Sloat and Skyline boulevards as the project because the Great Highway would be closed and vehicular traffic would be rerouted. Construction noise and vibration impacts would be increased compared with the project, because the relocated wastewater infrastructure would include excavation for a tunnel portal or an underground tank across the street from residential receptors on Sloat Boulevard. These activities would be closer to sensitive receptors and remain in place longer than most other construction activities for the project. If a tunnel is constructed (Option 1) there is the potential for 24-hour work from a tunnel boring machine. Additionally, cut and cover work for the new pipeline (Option 2) would generate noise along the alignment exposing more sensitive receptors to construction noise. Alternative D would likely require mitigation, such as implementation of noise barriers between sensitive receptors and sites with prolonged construction activity, that may reduce potentially significant impacts. If 24-hour work were required over multiple nights then the impact may be significant and unavoidable.

TRANSPORTATION AND CIRCULATION

Alternative D would cause the same significant and unavoidable VMT impacts as the project, because the Great Highway south of Sloat Boulevard would be closed and through vehicular traffic would be rerouted to Sloat and Skyline boulevards.

AIR QUALITY

Alternative D operations would require similar sand placements and similar re-routing of vehicular traffic as proposed for the project, and therefore would result in similar amounts of criteria air pollutant emissions as the project (less than significant). Alternative D could, however, result in greater toxic air contaminant emissions if construction activities related to relocated infrastructure occur near sensitive receptors for longer than two months (such as would occur for excavation of the underground storage tank or tunnel shaft). Given the anticipated duration and intensity of Alternative D construction, the impacts from toxic air contaminant emissions could be significant.

GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Similar to the project, removal of revetments and rubble under Alternative D would widen the beach. This would both reduce the wave-revetment reflection that contributes to beach and sandbar scour, but also reduce the roughness of the shore, allowing wave action to extend further landward. As the bluff would not be reshaped under Alternative D, the bluff toe would remain seaward relative to the top of wall under project conditions. Within the portion of South Ocean Beach south of the NPS parking lot, where the beach would be backed by exposed Colma Formation, there would be greater potential for wave-bluff interactions over several years until the bluff face equilibrates into a more gradual slope. The sand placements would increase beach width and elevation, minimize the occurrence of wave-bluff interactions, and contribute greater amounts of sand to the surf zone, which could nourish sand bars and adjacent beaches. However, as under the project, there could be brief periods during which the placed sand erodes and the bluff face is exposed to wave action. During such events, wave-bluff interactions could result in localized beach and sand bar scour effects similar to or slightly greater than would be expected for the project, but which would remain less than significant. With the removal of revetments and rubble and similar volume of sand placement, and considering the backshore position, the effects of Alternative D on adjacent shoreline erosion would be similar to those described for the project; less than significant.

Construction of the replacement wastewater infrastructure would increase the likelihood of encountering potentially significant paleontological resources impacts due to the greater amount of ground disturbance in geologic units with moderate paleontological potential for either option. Similar to the project, this alternative would likely require paleontological resources monitoring and mitigation to reduce impacts to less-than-significant levels.

GREENHOUSE GAS EMISSIONS

Alternative D would involve similar amounts of construction and operations activities as proposed for the project, including rerouting a similar amount of vehicular traffic and placement of similar volumes of sand for beach nourishment, and therefore would also have similar less-than-significant effects related to greenhouse gas emissions.

UTILITIES AND SERVICE SYSTEMS

Similar to the project, Alternative D would not cause population growth or alter land use such that new or altered utilities would be needed. Under Alternative D, other shoreline wastewater facilities remaining after relocation of the Lake Merced Tunnel would continue to be vulnerable to coastal hazards. If continued erosion were to require the relocation or construction of new wastewater treatment facilities, additional environmental effects could result.

HYDROLOGY AND WATER QUALITY

While some construction activities of Alternative D would differ from those of the project, they would be subject to the same stormwater management requirements as the project. Without the buried wall or the Lake Merced Tunnel, other shoreline wastewater facilities would be at greater risk of upset or failure, resulting in greater potential for release of untreated wastewater to the Pacific Ocean, which could impact water quality and potentially violate water quality standards.

CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

Construction of the replacement wastewater infrastructure would increase the likelihood of encountering potentially significant archeological resources due to the potential for excavation and tunneling near or along the alignment and mouth of the former Lake Merced Creek and the potential for buried archeological resources near Sloat Boulevard. To reduce potential impacts to less-than-significant levels, implementation of SFPUC Standard Construction Measure III (Archeological Testing/Data Recovery) would be required (similar to the project).

AESTHETICS

Under Alternative D, with removal of the rubble and revetments, the Great Highway, and NPS restroom and parking lot, scenic viewing opportunities would be expanded and the scenic quality of the shoreline would be improved.

RECREATION

During construction, ample beach surrounding the project site would remain available for recreationists. Owing to the similar beach nourishment volumes, beach widths would be expected to remain similar to or wider than those under the project. As noted above, Alternative D would result in similar or slightly larger changes to sand bars than the project. Given the dynamic nature of the system, it is expected that bar characteristics would continue to vary seasonally. A change in sand bar geometry may result in enhanced or degraded wave breaking conditions for surfing, as a function of wave conditions and skill level, with resulting changes in wave conditions likely being more attractive to some users and less to others. However, given the anticipated range of sediment dispersion, the extent of such changes relative to inherent variability would not be substantial – discernable on the order of about 1,000 feet to 3,000 feet from the project site to the north and likely an equal distance to the south. For these reasons, and given the amount of adjacent and nearby coastline available for surfing, the changes under Alternative D would not be expected to result in the displacement of substantial numbers of visitors such that other beach park facilities experienced substantial physical deterioration.

OTHER ENVIRONMENTAL TOPICS

Alternative D would have similar or reduced environmental effects as the project for the following topics, as further explained below: land use and land use planning; population and housing; wind and shadow; public services; hazards and hazardous materials; mineral resources; energy; agriculture and forestry resources; and wildfire.

While Alternative D would construct new underground infrastructure, it would not directly remove bank swallow habitat, and therefore would not conflict with a land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Like the project, Alternative D would not result in population growth and would have less-than-significant population and housing impacts. Alternative D would relocate structures (i.e., NPS restroom) and would not create wind hazards or shadow publicly accessible open spaces; Alternative D would have less-than-significant impacts with respect to wind and shadow.

Similar to the project, Alternative D would not cause population growth or alter land use such that new or altered governmental facilities would be needed, a less-than-significant impact. While some construction activities of Alternative D would differ from those of the project, they would be subject to the same hazardous materials handling, storage, containment, and management requirements as the project.

As with the project, lands affected by Alternative D are not in areas designated by the state or the city as containing mineral deposits of significance and thus Alternative D would have the same less-than-significant mineral resources impacts as the project. Alternative D energy use during construction would be similar to or greater than the project; during operation fuel usage would be similar to that required for the project, due to similar sand placement volumes and similar amounts of vehicular traffic being rerouted. Alternative D's energy usage would not be unusually large or inefficient, wasteful, or unnecessary, a less-than-significant impact. As would also be the case for the project, lands affected by Alternative D are not used for farming or agricultural activities, are not zoned as agricultural or timber uses, or classified as very high fire hazard severity zones and therefore would not result in any impacts related to these topics.

6.4 Ability to Meet Project Objectives

As discussed in Chapter 2, Project Description (Section 2.3, Project Objectives), the objectives of the project are to:

1. Implement the city's local coastal program policies for the long-term management of South Ocean Beach, including managed retreat, beach nourishment, and sea level rise adaptation in compliance with Coastal Commission permit requirements
2. Preserve and enhance coastal public access and recreation, habitat, and scenic quality at South Ocean Beach
3. Protect the Lake Merced Tunnel and related wastewater system infrastructure from damage due to shoreline erosion, storm and wave hazards, and sea level rise in order to maintain current operational capacity and meet regulatory permit requirements
4. Maintain vehicle access for:
    a. SFPUC wastewater facility operations
    b. San Francisco Zoo visitor parking lot
    c. Emergency response personnel

d. Maintenance of public access trail
e. Long-term beach nourishment

Table 6-3 summarizes the ability of the four alternatives to meet the project objectives. The No Project Alternative (Alternative A) is included, as required by CEQA Guidelines section 15126.6(e), even though it would not meet the basic project objectives. Each of the remaining alternatives would meet or partially meet all of the project objectives.

6.5 Alternatives Comparison and the Environmentally Superior Alternative

6.5.1 Comparison and Summary of Alternatives' Impacts and Ability to Meet Project Objectives

The ability of each alternative to reduce the environmental impacts of the project, new impacts resulting from each alternative, and the ability of each alternative to meet project objectives are summarized below. **Table 6-4** details environmental effects of the alternatives relative to those identified for the project.

6.5.2 Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative among the alternatives (CEQA Guidelines section 15126.6[e]). If it is determined that the "no project" alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (CEQA Guidelines section 15126.6[e][2]).

On the basis of comparing the extent to which the alternatives reduce or avoid significant impacts of the project, the No Project Alternative (Alternative A) would be the environmentally superior alternative because it would avoid the project's significant and unavoidable impacts, and would reduce other impacts related to special-status bats and bat maternity roosts, cumulative construction noise, criteria air pollutants, and paleontological resources to less than significant. Under Alternative A, the revetments and rubble would remain, and abandoned stormwater pipes and debris would continue to erode from the exposed bluff and roadbed, diminishing the scenic quality of the shoreline.

Over the long-term, if the Alternative A nourishment program and existing shoreline protection were incapable of sufficiently reducing the rate of erosion, additional effects related to bank swallow habitat, traffic noise, VMT, utilities, water quality, and adjacent shore erosion (i.e., unique geologic features) could result.

Alternative B would avoid the significant construction impact on bank swallow habitat, and the significant operational VMT and vehicular traffic noise impacts identified for the project. However, the larger and more frequent sand placements would result in greater impacts on benthic communities and greater criteria air pollutant and greenhouse gas emissions. All other effects under this alternative would be similar or less than identified for the project. Over the long-term, if the Alternative B nourishment program were incapable of sufficiently reducing the rate of erosion, additional effects on bank swallow habitat, traffic noise, VMT, utilities, and water quality could result including potential significant and unavoidable impacts similar to the project's impacts.

Table 6-3 Summary of Ability of Alternatives to Meet Project Objectives

Project Objective	Alternative A: No Project	Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C: Protect Critical Infrastructure with Conventional Seawall	Alternative D: Replace Lake Merced Tunnel Inland
	WOULD THE ALTERNATIVE MEET THIS OBJECTIVE?			
1. Implement the city's local coastal program policies for the long-term management of South Ocean Beach, including managed retreat, beach nourishment, and sea level rise adaptation in compliance with Coastal Commission permit requirements	No Does not represent a long-term solution that reflects the city's local coastal program policies and would not meet the terms of the coastal development permit	Yes	Partial While this alternative would remove revetments and implement beach nourishment, it does not include managed retreat	Yes
2. Preserve and enhance coastal public access and recreation, habitat, and scenic quality at South Ocean Beach	Partial While leaving revetments on beach would retain bank swallow habitat, the revetments would continue to limit public access and recreational opportunities, and diminish scenic quality	Yes	Partial Bank swallow habitat would be retained onsite, but offsite habitat could be impacted; public access and recreation on the beach would be slightly improved; removal of revetments would improve scenic quality, but exposed seawall would diminish scenic quality	Yes
3. Protect the Lake Merced Tunnel and related wastewater system infrastructure from damage due to shoreline erosion, storm and wave hazards, and sea level rise in order to maintain current operational capacity and meet regulatory permit requirements	Partial Revetments would continue to provide partial protection for Lake Merced Tunnel; unprotected sections would remain vulnerable to coastal hazard exposure	Partial Large sand placement would buffer the Lake Merced Tunnel from coastal hazards; however, without structural protection, risk of exposure would remain	Yes	Partial While the Lake Merced Tunnel would not be protected, it would be relocated to meet operational capacity or regulatory permit requirements; however, over the long-term, with continued erosion, other landward wastewater infrastructure could be exposed to coastal hazards

Table 6-3 Summary of Ability of Alternatives to Meet Project Objectives (Continued)

Project Objective	Alternative A: No Project	Alternative B: Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C: Protect Critical Infrastructure with Conventional Seawall	Alternative D: Replace Lake Merced Tunnel Inland
	WOULD THE ALTERNATIVE MEET THIS OBJECTIVE?			
4. Maintain vehicle access for: • SFPUC wastewater facility operations • San Francisco Zoo visitor parking lot • Emergency response personnel • Maintenance of public access trail • Long-term beach nourishment	Partial Retention of the Great Highway south of Sloat Boulevard would provide continued access; however, without structural protection, risk of coastal erosion would remain, and future roadway closures could be required	Partial Retention of the Great Highway south of Sloat Boulevard would provide continued access; however, without structural protection, risk of coastal erosion would remain, and future roadway closures could be required	Yes	Partial Retention of service road to SFPUC wastewater system facilities; however, over the long-term, with continued erosion, service road could be exposed to coastal hazards and require closure

Table 6-4 Environmental Effects of Project Alternatives Relative to Effects of Proposed Project

Impact of Proposed Project	Alternative A No Project	Alternative B Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C Protect Critical Infrastructure with Conventional Seawall	Alternative D Relocate Lake Merced Tunnel Inland
BIOLOGICAL RESOURCES				
Impact BI-1: Effects on special-status plants (LTS)	Less than project (NI)	Same as project	Same as project	Greater than project Potentially significant impacts on special-status plants during excavation for the pump station adjacent to Oceanside Treatment Plant (PS)
Impact BI-2: Construction effects on bank swallows (SU)	Less than project (LTS)[b]	Less than project (LTS)[b]	Less than project (LTS)	Less than project (LTS)[b]
Impact BI-2: Operations effects on bank swallows (LSM)	Similar to project (LSM)	Similar to project (LSM)[b]	Similar or greater than project Potentially significant indirect effects on bank swallow habitat in Fort Funston due to seawall (PS)	Similar to project (LSM)[b]
Impact BI-5: Operations effects on special-status marine species (LTS)	Less than project (LTS)	Greater impacts on benthic communities (LTS)	Greater impacts on benthic communities (LTS)	Same as project
Impact BI-9: Construction and operations effects on bats (LSM)	Less than project (LTS)	Less than project (LTS)	Less than project (LTS)	Same as project (LSM)
All other impacts LTS	Less than project (LTS)	Same as project	Same as project	Same as project
NOISE AND VIBRATION				
Impact NO-1: Construction-related increases in ambient noise levels at noise-sensitive receptors. (LTS)	Less than project (NI)	Less than project (LTS)	Less than project (LTS)	Same or greater than project (LSM)

Table 6-4 Environmental Effects of Project Alternatives Relative to Effects of Proposed Project (Continued)

Impact of Proposed Project	Alternative A No Project	Alternative B Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C Protect Critical Infrastructure with Conventional Seawall	Alternative D Relocate Lake Merced Tunnel Inland
NOISE AND VIBRATION (CONT.)				
Impact NO-3: Operations-related increases in ambient noise levels at noise-sensitive receptors. (SU)	Less than project (LTS)[b]	Less than project (LTS)[b]	Less than project (LTS)	**Same as project (SU)**
Impact C-NO-1: Construction-related cumulative noise increases (LSM)	Less than project (LTS)	Less than project (LTS)	Same as project (LSM)	Same as project (LSM)
Impact C-NO-3: Operation-related cumulative noise increases (SU)	Less than project (LTS) [b]	Less than project (LTS) [b]	Less than project (LTS)	**Same as project (SU)**
All other impacts LTS	Less than project (NI)	Same as project	Same as project	Same as project
TRANSPORTATION AND CIRCULATION				
Impact TR-5: Operation impacts related to VMT (SU)	Less than project (LTS)[b]	Less than project (LTS)[b]	Less than project (LTS)	**Same as project (SU)**
Impact C-TR-5: Cumulative operation impacts related to VMT (SU)	Less than project (LTS)[b]	Less than project (LTS)[b]	Less than project (LTS)	**Same as project (SU)**
All other impacts LTS	Less than project (LTS)	Same as project	Same as project	Same as project
AIR QUALITY				
Impact AQ-2: Construction would result in considerable net increase in criteria air pollutants (LSM)	Less than project (LTS)	Less than project (LTS)	Similar to project (LSM)	Similar to project (LSM)
Impact AQ-3: Operations would not result in considerable net increase in criteria air pollutants (LTS)	Same as project	Greater than project (LTS)	Greater than project (LTS)	Similar to project (LTS)

Table 6-4 Environmental Effects of Project Alternatives Relative to Effects of Proposed Project (Continued)

Impact of Proposed Project	Alternative A No Project	Alternative B Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C Protect Critical Infrastructure with Conventional Seawall	Alternative D Relocate Lake Merced Tunnel Inland
AIR QUALITY (CONT.)				
Impact AQ-4: The project would not expose sensitive receptors to substantial pollutant concentrations (LTS)	Same or less than project (LTS)	Same as project	Same as project	Greater than project Potentially significant toxic air contaminant concentrations near sensitive receptors (PS)
All other impacts LTS	Same or less than project (LTS)	Same as project	Similar to project (LTS)	Same as project
GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES				
Impact GE-3: The project would not destabilize adjacent bluffs or sandbars at South Ocean Beach (LTS)	Greater than project (LTS)	Similar to project (LTS)	Greater than project Potentially significant destabilization of Fort Funston bluffs (PS)	Similar to project (LTS)
Impact GE-5: The project could destroy paleontological resources or unique geologic features (LSM)	Less than project (LTS)[b]	Less than project (LTS)	Greater than project Reduced impacts on paleontological resources, but accelerated erosion of bluffs could affect unique geologic features (PS)	Similar to project (LSM)
All other impacts LTS	Less than project (LTS)	Same as project	Same as project	Same as project
GREENHOUSE GAS EMISSIONS				
All impacts LTS	Less than project (LTS)	Greater than project (LTS)	Greater than project (LTS)	Similar to project (LTS)
UTILITIES AND SERVICE SYSTEMS				
Impact UT-1: The project would not require relocation or construction of new utilities, the relocation or construction of which could cause environmental effects (LTS)	Less than project (NI)[b]	Less than project (NI)[b]	Same as project	Same as project[b]
All other impacts LTS	Less than project (LTS)	Same as project	Same as project	Same as project

Table 6-4 Environmental Effects of Project Alternatives Relative to Effects of Proposed Project (Continued)

Impact of Proposed Project	Alternative A No Project	Alternative B Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C Protect Critical Infrastructure with Conventional Seawall	Alternative D Relocate Lake Merced Tunnel Inland
HYDROLOGY AND WATER QUALITY				
Impact HY-1: Operations would not degrade water quality (LTS)	Less than project (NI)[b]	Same as project[b]	Same as project	Same as project[b]
All other impacts LTS	Same as project	Same as project	Same as project	Same as project
LAND USE AND LAND USE PLANNING				
All impacts LTS	Same as project	Same as project	Same as project	Same as project
AESTHETICS				
All impacts LTS	Greater than project (LTS)	Same as project	Greater than project due to views of the seawall (PS)	Same as project
POPULATION AND HOUSING				
All impacts LTS	Less than project (NI)	Same as project	Same as project	Same as project
CULTURAL RESOURCES				
All impacts LTS	Less than project (LTS)	Less than project (LTS)	Less than project (LTS)	Greater impacts due to excavation and tunneling along former Lake Merced Creek (LTS)
TRIBAL CULTURAL RESOURCES				
All impacts LTS	Less than project (LTS)	Less than project (LTS)	Less than project (LTS)	Greater impacts due to excavation and tunneling along former Lake Merced Creek (LTS)
WIND AND SHADOW				
All impacts LTS	Less than project (NI)	Less than project (NI)	Same as project	Same as project
RECREATION				
All impacts LTS	Same as project	Same as project	Same as project	Same as project
PUBLIC SERVICES				
All impacts LTS	Same as project	Same as project	Same as project	Same as project

Table 6-4 Environmental Effects of Project Alternatives Relative to Effects of Proposed Project (Continued)

Impact of Proposed Project	Alternative A No Project	Alternative B Protect Critical Infrastructure with Increased Beach Nourishment	Alternative C Protect Critical Infrastructure with Conventional Seawall	Alternative D Relocate Lake Merced Tunnel Inland
HAZARDS AND HAZARDOUS MATERIALS				
All impacts LTS	Same as project	Same as project	Same as project	Same as project
MINERAL RESOURCES				
All impacts LTS	Same as project	Same as project	Same as project	Same as project
ENERGY				
All impacts LTS	Same as project	Same as project	Same as project	Same as project
AGRICULTURAL AND FORESTRY RESOURCES				
All impacts NI	Same as project	Same as project	Same as project	Same as project
WILDFIRE				
All impacts NI	Same as project	Same as project	Same as project	Same as project

NOTES:

All SU impacts are shown in **bold**.

[a] See Chapter 4 for complete impact statements. CEQA significance determination: NI = No Impact; LTS = Less than significant; LSM = Less than significant with mitigation; PS = Potentially significant; SU = Significant and unavoidable.

[b] Impact could be greater in the future, if shoreline erosion results in the closure of the Great Highway, removal of bank swallow habitat, or damage to wastewater infrastructure.

Alternative C would avoid the significant construction impact on bank swallow habitat, and the significant operational VMT and traffic noise impacts identified for the project. However, during periods of larger waves and a narrowed beach, wave interactions with the conventional seawall could cause accelerated erosion of adjacent Fort Funston bluffs, resulting in new potentially significant effects related to geologic stability, unique geologic features, and bank swallow habitat. Under Alternative C, the potentially significant impacts on scenic resources would be greater than for the project, as the conventional seawall would represent a conspicuous and dominant artificial landscape feature that would diminish the scenic quality of the shoreline, and which would not occur under the project. Also, the larger and more frequent sand placements would result in greater impacts on benthic communities and would have greater criteria air pollutant and greenhouse gas emissions. All other effects under this alternative would be similar or less than those identified for the project.

Alternative D would avoid the significant construction impact on bank swallow habitat, but would not avoid the significant operational VMT and traffic noise impacts identified for the project. Alternative D would also result in new potentially significant construction impacts associated with the inland replacement of wastewater conveyance infrastructure, including effects related to special-status plants and exposure of sensitive receptors to substantial noise and toxic air pollutant concentrations. This work would also result in less-than-significant effects on cultural and tribal cultural resources, beyond those identified for the project. All other effects under this alternative would be similar or less than identified for the project. Over the long-term, if the Alternative D nourishment program were incapable of sufficiently reducing the rate of erosion, additional effects on bank swallow habitat, utilities, and water quality could result.

In summary, based on the evaluation above, Alternative B is the environmentally superior alternative among the project alternatives (other than Alternative A). Alternative B would avoid the significant and unavoidable effects identified for the project related to bank swallow habitat, VMT, and traffic noise. Alternative C would also avoid the significant and unavoidable project effects; however, Alternative C would also result in new potentially significant- effects related to geologic stability, unique geologic features, adjacent bank swallow habitat, and aesthetic resources. Alternative D would not avoid the significant and unavoidable project effects related to VMT and traffic noise. Alternative D would also result in greater construction phase effects related to special-status plants, noise, and toxic air pollutant concentrations, beyond those identified for the project.

As with each of the other project alternatives (except Alternative A), Alternative B would fully meet two of the project objectives and partially meet two of the project objectives. Specifically, the alternative would fully meet project objectives 1 and 2, related to implementing the city's local coastal program and complying with Coastal Commission permit requirements, and preserving and enhancing coastal public access, habitat, and scenic quality. Alternative B would partially meet project objectives 3 and 4, related to protection of wastewater system infrastructure and maintenance of operational capacity, and maintaining vehicle access. Therefore, the alternative would meet or partially meet most of the project objectives. However, it is notable that one of the objectives that the alternative would not fully meet is related to wastewater system infrastructure protection. While the alternative would be expected to provide wastewater system reliability, the shoreline conditions at South Ocean Beach are dynamic, highly variable, and remain the subject of much coastal engineering research. If through nourishment alone (i.e., without a seawall or other hard structure) the alternative were incapable of sufficiently reducing the rate of erosion such that the system were exposed to coastal hazards, the effects on the wastewater infrastructure and water quality could be substantial.

6.6 Alternatives Considered but Eliminated from Further Analysis

In developing the project, the SFPUC identified and analyzed multiple project concepts; some were incorporated into the project and others were eliminated from further consideration by SFPUC. The list of potentially feasible project options drew upon historic studies and proposals, the Ocean Beach Master Plan process, stakeholder and regulatory agency concerns, and the perspectives and experience of city planning and engineering personnel. The planning department reviewed the initial project concepts and locations as potential strategies for reducing or avoiding the significant adverse impacts identified for the project. The concepts considered but eliminated from further analysis are described in the following sections.

6.6.1 Remove Shoreline Structures

To avoid the impacts of the project, similar to Alternative B, the SFPUC would remove the existing shoreline protection system (revetments, rubble, sandbags) but unlike Alternative B would not otherwise intervene to protect the Lake Merced Tunnel and other wastewater infrastructure. There would be no sand nourishment with this alternative.

This concept would not meet most of the project objectives, and while it would avoid or substantially lessen the significant effects of the project, other adverse environmental effects would likely result (threats to water quality given the lack of protection for wastewater infrastructure; undermining and erosion of the Great Highway). Therefore, the planning department rejected this concept, and it is not analyzed.

6.6.2 Protect Lake Merced Tunnel with Breakwater

To avoid or reduce the significant and unavoidable impacts related to bank swallow habitat and noise from redirected vehicular traffic, the planning department considered construction of an offshore breakwater parallel to the shoreline. The breakwater would be constructed large rocks and boulders and would rise above the sea water line by about 10 feet.

Construction and operation of an offshore breakwater would result in different, potentially significant adverse impacts compared with those identified for the project, including changes to nearshore habitat, shoreline erosion patterns at the breakwater edges and associated changes to onshore habitat and infrastructure, air pollutant emissions, scenic quality, and recreation (surfing).

While some project objectives would be met by this alternative, protecting the Lake Merced Tunnel and other infrastructure with a breakwater would not meet the project objective to preserve and enhance coastal public access and recreation, habitat, and scenic quality, given the scale and footprint of the structures needed.

While the significant impacts of the project would be avoided with this concept, other adverse environmental effects may result, and the concept only meets some of the project objectives. Alternative C would eliminate the same significant and unavoidable impacts as this concept but would likely result in fewer impacts. As a result, this concept was rejected and is not analyzed.

6.6.3 Protect Lake Merced Tunnel with Groins or Groin Field

The planning department also considered the installation of groins or jetties to avoid or reduce the significant and unavoidable impacts of the project. This alternative would be similar to a breakwater, described above, except that the structure would be perpendicular to the shoreline and extend hundreds of feet into the ocean. The groins would require periodic monitoring and repositioning or replacement of damaged or displaced rock.

Construction and operation of groins or jetties would result in different, potentially significant adverse impacts compared with those identified for the project, including changes to nearshore and offshore habitat, shoreline erosion patterns to the north and south of the groins and associated changes to onshore habitat and infrastructure, air pollutant emissions, scenic quality, and recreation (surfing).

While some project objectives would be met by this alternative, this alternative would not meet the project objective to preserve and enhance coastal public access and recreation, habitat, and scenic quality, given the scale and footprint of the structures needed.

While the significant impacts of the project would be avoided with this concept, other adverse environmental effects may result, and the concept only meets some of the project objectives. Alternative C would eliminate the same significant and unavoidable impacts as this concept but would likely result in fewer new impacts. As a result, this concept was rejected and is not analyzed.

6.6.4 Protect Lake Merced Tunnel with Artificial Reef

During the scoping process for the EIR, one commenter recommended considering a reef ball artificial breakwater system to reduce coastal erosion. The planning department also considered constructing an artificial reef offshore comprised of concrete blocks or other human-made objects to protect wastewater infrastructure. The reef would be similar in scale to the breakwater described above but would not rise above the water surface. The planning department considered this concept because it could reduce the significant and unavoidable impacts related to bank swallow habitat and noise from redirected vehicular traffic.

Because the reef would not rise above the water surface, its ability to absorb wave energy and protect the Lake Merced Tunnel would be reduced relative to a breakwater or Alternative C. Construction and operation of this concept would result in different, potentially significant adverse impacts compared with those identified for the project, including changes to nearshore habitat, shoreline erosion patterns to the north and south of the artificial reef and associated changes to onshore habitat and infrastructure, air pollutant emissions, and recreation (surfing).

Alternative B better meets the objectives of preserving and enhancing public access and recreation, complying with permit requirements, consistency with the city's local coastal program, and limiting and minimizing impacts from shoreline protection, compared with this concept.

Given that this concept could have greater potentially significant impacts than Alternative C, and would provide similar protection as Alternative B while failing to meet more of the project objectives, it was rejected and is not analyzed.

6.6.5 Protect Lake Merced Tunnel with Interior Reinforcement and New Storage

To avoid the significant and unavoidable direct impact on bank swallow habitat, the planning department also considered an alternative concept in which the SFPUC would reinforce the existing Lake Merced Tunnel by adding a 2-foot-thick reinforced concrete liner inside the tunnel. A new 1.1-million-gallon underground storage reservoir would be constructed beneath the zoo parking lot to offset the conveyance capacity displaced by the concrete liner. The reinforced tunnel and storage basin would require periodic monitoring and regular maintenance to remove sand.

While this concept would not construct a wall, it would result in similar construction impacts as the project because construction would occur in a similar area and for a similar amount of time. During operations, this alternative could have significant noise impacts similar to those described for Alternative B and D, because portions of the Great Highway may be eroded over time, thereby necessitating road closure and vehicular traffic rerouting. During operations of this concept, for the same reasons presented for Alternative B and D, erosion could adversely affect bank swallow nesting in the bluffs once the revetments are removed.

This concept would meet some of the project objectives. It would maintain operational capacity of wastewater infrastructure, protect the Lake Merced Tunnel, and be consistent with permit requirements, but it would not implement managed retreat or maintain long-term vehicle access for SFPUC wastewater facility operations and zoo parking. In the absence of additional shoreline management (e.g., placement of sand) this concept would not provide long-term enhancement of coastal public access and recreation, or protect other landward wastewater infrastructure.

Given that this concept would not reduce project impacts as much as other potential alternatives, and would result in similar new impacts during operations as other potential alternatives that meet more of the project objectives, the planning department rejected this concept and it is not analyzed.

6.6.6 Protect Lake Merced Tunnel with Dune Restoration

One of the project objectives is to implement a project consistent with the Western Shoreline Area Plan (part of the city's local coastal program). The Western Shoreline Area Plan requires that shoreline protection devices such as seawalls only be implemented where less environmentally damaging alternatives are not feasible. The plan identifies dune restoration as among the potentially less environmentally damaging alternatives to shoreline protection devices that should be considered.

In order for sand dunes to be established successfully and function optimally, sufficient space is required between development (e.g., the Lake Merced Tunnel) and the shoreline. The available space should typically allow for a beach width between 100 and 200 feet, in addition to the space required for the constructed dune footprint.[11] At South Ocean Beach, the beach width varies alongshore and seasonally. There is typically less than 100 feet of beach; along the narrowest stretch, there are periods when there is less than 100 feet between the Lake Merced Tunnel and the shoreline. This setback is insufficient to protect the Lake Merced Tunnel and allow dunes to establish.

[11] Newkirk, S.; Veloz, S., Hayden, M., Battalio, B., Cheng, T., Judge, J., Heady, W., Leo, K., Small, M., 2018. Toward Natural Shoreline Infrastructure to Manage Coastal Change in California. A Report for California's Fourth Climate Change Assessment. August 2019.

Additionally, given the lack of available space, establishing dunes along South Ocean Beach would require reshaping the bluff and removing the Great Highway, which would also reduce the amount of remaining protective bluff cover and potentially increase the tunnel's vulnerability. As part of its preliminary design development, SFPUC evaluated the vulnerability of the Lake Merced Tunnel without hard shore protection and the estimated time until action would be required to protect the tunnel.[12] As part of that analysis, the SFPUC identified the minimum amount of remaining bluff above (vertical) and seaward (horizontal) of the Lake Merced Tunnel, below which hazard risk levels would be unacceptable. At the time of the study, the minimum amount of horizontal bluff cover was estimated at 59 feet, and the time by which action would be required to protect the tunnel at that location was estimated at between eight and 24 years (without beach nourishment). The assessment explains that unarmored bluffs along the South Ocean Beach shoreline may erode by 1 to 3 feet per year, on average. However, the study notes that during a large winter storm, unarmored bluffs or sand dunes at South Ocean Beach could erode up to 25 horizontal feet.

For the reasons presented, dune restoration alone would not be a feasible long-term alternative that would protect the Lake Merced Tunnel. Furthermore, because it would require reshaping the bluff and removing the Great Highway, both of which would result in result in the same significant and unavoidable impacts as the project, dune restoration was rejected from further consideration as an alternative.

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[12] SPUR, ESA PWA, Moffatt & Nichol, McMillen Jacobs Associates, and AGS, Inc., 2015, Coastal Protection Measures & Management Strategy for South Ocean Beach, Ocean Beach Master Plan: Coastal Management Framework, Prepared for San Francisco Public Utilities Commission, April 24, 2015.

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