Golden Gate National Recreation Area
San Francisco Maritime National Historical Park
February 2012

National Park Service
U.S. Department of the Interior

Final Environmental Impact Statement for Extension of F-Line Streetcar Service to Fort Mason Center

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Extension of F-Line Streetcar Service to Fort Mason Center

GOLDEN GATE NATIONAL RECREATION AREA, SAN FRANCISCO MARITIME NATIONAL HISTORICAL PARK, CALIFORNIA

Lead Agency: National Park Service, U.S. Department of Interior
Cooperating Agencies: San Francisco Municipal Transportation Agency,
Federal Transit Administration

The *Environmental Impact Statement for the Extension of F-Line Streetcar Service to Fort Mason Center* presents and analyzes alternatives to lengthen the historic streetcar F-line from Fisherman's Wharf to the San Francisco Maritime National Historical Park and on to the Golden Gate National Recreation Area, ending at the Fort Mason Center. The intended effect of this action is to provide park visitors and transit-dependent residents with high-quality rail transit that improves transportation access and mobility between existing streetcar service at Fisherman's Wharf to San Francisco Maritime National Historical Park and Fort Mason Center. The Environmental Impact Statement (EIS) presents and analyzes the potential consequences of implementing the alternatives.

Alternative 1, the No-Action Alternative, would provide no change from the existing historic streetcar line and would not provide transit connections to the Fort Mason Center.

Alternative 2, the Preferred Alternative, would extend the existing F-Line from Fisherman's Wharf to the Fort Mason Center. The track extension would include a street-running segment along Beach Street, a transition zone between the street-running segment and the Fort Mason Tunnel, a tunnel segment and a turnaround segment with two options for locations, Alternative 2A: North Loop (Fort Mason parking lot) and 2B: South Loop (Great Meadow). Project elements would include the construction of streetcar track for approximately 0.85 miles, construction of 8-9 station platforms, upgrades to the existing Fort Mason Tunnel, and installation of signals, crossings, wires and poles.

Based on issues identified during the public and agency scoping process, and public correspondence received during the 60-day Draft EIS comment period, the impact analysis focuses on land use, socioeconomics, transportation and circulation, air quality, noise and vibration, cultural resources, recreation and visitor use, visual and aesthetic resources, night sky visibility and light pollution, geological resources, biological resources, public health and safety, and public services and utilities.

Decision Process: The National Park Service will execute a Record of Decision (ROD) no sooner than 30 days following publication by the Environmental Protection Agency of the Notice of Availability of the Final EIS. The Final EIS will be available for public inspection as follows: at http://parkplanning.nps.gov/streetcar; in the Office of the Superintendent (Bldg. 201 Fort Mason, San Francisco, CA); at local public libraries (San Francisco Public Libraries: Marina Branch, Main Branch, Golden Gate Valley Branch, North Beach Branch, Eureka Valley Harvey Milk Library, Presidio Branch Library), or by requesting a copy (contact Steve Ortega at 415-561-2841, or e-mail at goga_planning@nps.gov). Written inquiries can also be sent to:

Superintendent, Golden Gate National Recreation Area
Attention: F-Line FEIS
Fort Mason, Building 201
San Francisco, CA 94123-0022

Golden Gate National Recreation Area
San Francisco Maritime National Historical Park
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FINAL ENVIRONMENTAL IMPACT STATEMENT FOR EXTENSION OF F-LINE STREETCAR SERVICE TO FORT MASON CENTER

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF FIGURES (continued)

LIST OF TABLES

LIST OF TABLES (continued)

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ACRONYMS

ABAG – Association of Bay Area Governments
ABS – Automatic Block Signaling
AC Transit – Alameda-Contra Costa Transit District
ACHP – Advisory Council on Historic Preservation
ADA – Americans with Disabilities Act
AHPA – Archeological and Historic Preservation Act
APE – Area of Potential Effect
ARPA – Archeological Resources Protection Act
BAAQMD – Bay Area Air Quality Management District
BART – Bay Area Rapid Transit
BCDC – Bay Conservation and Development Commission
BMP – Best Management Practices
CARB – California Air Resources Board
CBC – California Building Code
CCR – California Code of Regulations
CDFG – California Department of Fish and Game
CDMG – California Division of Mines and Geology
CEQ – Council on Environmental Quality
CEQA – California Environmental Quality Act
CESA – California Endangered Species Act
CFR – Code of Federal Regulations
CGS – California Geologic Survey
CHP – California Highway Patrol
CLR – Cultural Landscape Report
CNDDB – California Natural Diversity Database
CNPS – California Native Plant Society
CO – Carbon Monoxide
CPUC – California Public Utility Commission
CZMA – Coastal Zone Management Act
dB – Decibels
DEIS – Draft Environmental Impact Statement
DOT – Department of Transportation
DPM – Diesel Particulate Matter

DTSC – Department of Toxic Substances Control
EDR – Environmental Data Resources
EIR – Environmental Impact Report
EIS – Environmental Impact Statement
EPA – Environmental Protection Agency
ESA – Environmental Science Associates
FESA – Federal Endangered Species Act
FEIS – Final Environmental Impact Statement
FHWA – Federal Highway Administration
FMC – Fort Mason Center
FTA – Federal Transit Administration
FY – Fiscal Year
GGNRA – Golden Gate National Recreation Area
GGT – Golden Gate Transit
GHG – Green House Gas
GMP – General Management Plan
HABS – Historic American Building Survey
HALS – Historic American Landscape Survey
LOS – Level of Service
MBTA – Migratory Bird Treaty Act
MCE – Maximum Credible Earthquake
MM – Modified Mercalli
MOA – Memorandum of Agreement
msl – mean sea level
MTA – Municipal Transportation Authority
MTC – Metropolitan Transportation Commission
Muni – San Francisco Municipal Railway
NAGPRA – Native American Graves Protection and Repatriation Act
NEPA – National Environmental Policy Act
NHLD – National Historic Landmark District
NHP – National Historical Park
NHPA – National Historic Preservation Act
NO2 – Nitrogen Dioxide
NOA – Notice of Availability
NOI – Notice of Intent

NPS – National Park Service

NPDES – National Pollutant Discharge Elimination System

NRCS – Natural Resources Conservation Service

NRHP – National Register of Historic Places

OCS – Overhead Contact System

OSHA – Occupational Safety and Health Administration

PCC – Presidential Committee Car

PCJPB – Peninsula Corridor Joint Powers Board

PEPC – Planning, Environment, and Public Comment

PGA – Peak Ground Acceleration

PM – Particulate Matter

PPV – Peak Particle Velocity

RCRA – Resource Conservation and Recovery Act

ROD – Record of Decision

ROW – Right of Way

SamTrans – San Mateo County Transit

SEL – Sound Exposure Level

SF Maritime NHP – San Francisco Maritime National Historical Park

SFFD – San Francisco Fire Department

SFMTA – San Francisco Municipal Transportation Agency

SFPD – San Francisco Police Department

SHPO – State Historic Preservation Office

SMARA – Surface Mining and Reclamation Act

SO2 – Sulfur Dioxide

SWPPP – Storm Water Pollution Prevention Plan

TAC – Technical Advisory Committee

TEP – Transit Effectiveness Program

USCG – United States Coast Guard

USDOT – United States Department of Transportation

USFWS – United State Fish and Wildlife Service

USGS – United States Geological Survey

VA – Value Analysis

VdB – Vibration velocity level

WHRS – Wildlife Habitat Relationship System

WPA – Works Progress Administration

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GLOSSARY OF TERMS

Automatic Block Signaling (ABS) - Under this system, signals indicate whether or not a train may enter a block (railway section) based on automatic train detection indicating whether a block is clear.

Action alternative – Project alternative that includes activities that would result in physical changes to the environment.

Active fault – An active fault is defined by the CGS as a fault that has had surface displacement within Holocene time (approximately the last 11,000 years).

Anthropogenic – Derived from human activities, as opposed to effects or processes that occur in the natural environment without human influences.

Alternatives – A reasonable range of options that can accomplish an agency's objectives.

Arterial Traffic – Traffic along an arterial road, which is a high-capacity road immediately beneath a highway level of service.

At-grade crossing – Areas where the road crosses the railway at the street level.

Best Management Practices - Effective, feasible (including technological, economic, and institutional considerations) conservation practices and land- and water management measures that avoid or minimize adverse impacts to natural and cultural resources. Best Management Practices may include schedules for activities, prohibitions, maintenance guidelines, and other management practices.

Corridor – Land between two termini within which traffic, transit, land use, topography, environment, and other characteristics are evaluated for transportation purposes.

Cultural resources – Aspects of a cultural system that are valued by or significantly representative of a culture or that contain significant information about a culture.

Cumulative actions – Actions that, when viewed with other actions in the past, the present, or the reasonably foreseeable future, regardless of who has undertaken or will undertake them, have an additive impact on the resource the proposal would affect.

Cumulative impact – Two or more environmental effects that, when considered together, are considerable or that compound or increase other environmental impacts.

Cut – Excavation into a slope. A road constructed on a hillside, for example, must be constructed partially in a cut area in order to provide a flat surface for the road.

Density – The number of individuals, usually by species, per unit area.

Direct effect – An impact that occurs as a result of the proposal or alternative in the same place and at the same time as the action.

Environmental cases – Environmental cases are sites suspected of releasing hazardous substances or that have had cause for hazardous materials investigations and are identified on regulatory agency lists. These are sites where soil and/or groundwater contamination is known or suspected to have occurred.

Environmental impact statement (EIS) – A detailed NEPA document that is prepared when a proposal or alternatives have the potential for significant impact on the human environment.

Environmentally preferred alternative – Of the alternatives analyzed, the one that would best promote the policies in NEPA Section 101. This is usually selected by the project team members. It is presented in the NPS NEPA document (draft and final EIS or EA) for public review and comment.

Facultative species – Species that can occur both in wetland and upland habitat.

Fill – Material used to raise the level of the land. A road constructed on a hillside, for example, must be constructed partially on fill (and partially within an excavated area, known as "cut") in order to provide a flat surface for the road.

Floodplain – Land on either side of a stream or river that is submerged during floods.

Fugitive dust – The dust released from activities associated with construction, manufacturing, or transportation.

Hazardous waste – Hazardous materials that no longer have practical use, such as substances that have been discarded, spilled, or contaminated, or that are being stored temporarily prior to disposal.

Headway – The time interval or distance between two vehicles, as railroad or subway cars, traveling in the same direction over the same route.

Hydrology – The science dealing with the properties, distribution, and circulation of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere.

Impact topics – Specific natural, cultural, or socioeconomic resources that would be affected by the proposed action or alternatives (including no action). The magnitude, duration, and timing of the effect to each of these resources are evaluated in the impact section of an EA or an EIS.

Human environment – Defined by CEQ as the natural and physical environment, and the relationship of people with that environment (1508.14). Although the socioeconomic environment receives less emphasis than the physical or natural environment in the CEQ regulations, the NPS considers it to be an integral part of the human environment.

Impact topics – Specific natural, cultural, or socioeconomic resources that would be affected by the proposed action or alternatives (including no action). The magnitude, duration, and timing of the effect on each of these resources is evaluated in the impact section of an EA or an EIS.

Impervious Surface – A hard surface that either prevents or retards the entry of water into the soil.

Indirect impact – Reasonably foreseeable impacts that occur removed in time or space from the proposed action. These are "downstream" impacts, future impacts, or the impacts of reasonably expected connected actions (e.g., growth of an area after a highway to it is complete).

Invasive Species – Species that reproduce aggressively, that are typically nonnative (i.e., do not naturally occur) to an ecosystem under consideration, and that cause or are likely to cause economic or environmental harm or harm to human health.

Lead agency – The agency either preparing or taking primary responsibility for preparing the NEPA document.

Level of Service (LOS) – A metric which qualitatively characterizes traffic conditions associated with varying levels of vehicle traffic, based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined, ranging from LOS A (indicating free-flow traffic conditions with little or no delay experienced by motorists) to LOS F (indicating congested conditions where traffic flows exceed design capacity and result in long delays). This LOS grading system applies to both signalized and unsignalized intersections.

Major federal action – Actions that have a large federal presence and that have the potential for significant impacts on the human environment. They include adopting policy; implementing ru1es or regulations; adopting plans, programs, or projects; ongoing activities; issuing permits; or financing projects completed by another entity.

Mitigation – A modification of the proposal or alternative that lessens the intensity of its impact on a particular resource.

National Geodetic Vertical Datum (NGVD) – A fixed surface reference established by the U.S. Coast and Geodetic Survey to which relief features and elevation data are referenced.

National Register of Historic Places – The comprehensive list of districts, sites, buildings, structures, and objects of national, regional, state, and local significance in American history, architecture, archeology, engineering, and culture. This list is maintained by the National Park Service under authority of the National Historic Preservation Act of 1966.

NEPA process – The objective analysis of a proposal to determine the degree of its environmental and interrelated social and economic impacts on the human environment, alternatives and mitigation that reduce those impacts, and the full and candid presentation of the analysis to, and involvement of, the interested and affected public.

No-Action Alternative – Project alternative that would result in no project being implemented.

Notices of Availability – Separate notices submitted to the Federal Register that the draft EIS and the final EIS are ready for distribution.

Notice of Intent (NOI) – The notice submitted to the Federal Register indicating that an EIS will be prepared. It describes the proposed action and alternatives, identifies a contact person at the NPS, and gives time, place, and descriptive details of the agency's scoping process.

Off-Peak Season – Time period during which a recreational or tourist area received the least number of visitors.

Overhead Contact System (OCS) – A single-wire connection system that provides power to the street cars using overhead poles.

Pantograph – A device usually consisting of two parallel, hinged, double-diamond frames, for transferring current from an overhead wire to a vehicle, such as a trolley car or electric locomotive.

Peak Season – Time period during which a recreational or tourist area received the greatest number of visitors.

Particulate Matter (PM10) – Any material that exists as solid or liquid in the atmosphere that is less than 10 microns. Particulate matter may be in the form of ash, soot, dust, fog, fumes etc.

Permitted hazardous materials uses – Permitted hazardous materials uses are facilities that use hazardous materials or handle hazardous wastes but that comply with current hazardous materials and hazardous waste regulations.

Preferred alternative – The alternative an NPS decision maker has identified as preferred at the draft EIS or EA stage. Identification of the preferred alternative helps the public focus its comments during review of the NEPA document.

Record of Decision (ROD) – The document that is prepared to substantiate a decision based on an EIS. It includes a statement of the decision made, a detailed discussion of decision rationale, and the reasons for not adopting all mitigation measures analyzed, if applicable.

Retaining wall – A wall constructed to hold earth secure. Retaining walls are typically constructed on sloping grades in order to provide a flat area for a building, road, or trail. A retaining wall can be constructed below the flat area in order to hold earth in place and keep the flat area intact. A retaining wall can also be constructed above the flat area in order to keep earth from sliding into the flat area.

Revegetation – Plant stock that is germinated and grown in one location, and then planted at another site.

Right-of-way – A strip of land that is granted, through an easement or other mechanism, for transportation or utility purposes.

Riparian – Relating to, or living or located on the banks of a river or stream.

Scoping – Internal NPS decision making on issues, alternatives, mitigation measures, the analysis boundary, appropriate level of documentation, lead and cooperating agency roles, available references

and guidance, defining purpose and need, and so forth. External scoping is the early involvement of the interested and affected public.

Soundscape – The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive, and can be transmitted through air, water, or solid materials.

Special-status species – For purposes of this EIS, any species listed or proposed for listing under the state or federal endangered species acts, or recognized as locally rare by recognized authorities.

Spill sites – Spill sites are locations where a spill has been reported to the state or federal regulatory agencies. Such spills do not always involve a release of hazardous materials.

Traction Power System – The system that provides power to the overhead contact system by connecting it to an existing substation.

Trip Generators – Trip generators are activity centers, sites, or amenities that attract people, whether they are local residents or out-of-town visitors.

Watershed – The area from which water drains to a single point or body of water; also called drainage basin.

Wetland – An area that floods periodically, has waterlogged soils, or is covered with a relatively shallow later of fresh or saltwater.

EXECUTIVE SUMMARY

INTRODUCTION

The National Park Service (NPS) is preparing an environmental impact statement (EIS) for an extension of the historic streetcar F-line from Fisherman's Wharf to the Fort Mason Center. The National Park Service is the lead agency and the San Francisco Municipal Transportation Agency (SFMTA) and the Federal Transit Administration are the cooperating agencies under the National Environmental Policy Act (NEPA). The proposed Project is the culmination of a cooperative effort by the National Park Service with the Golden Gate National Recreation Area and the San Francisco Maritime National Historical Park, the City and County of San Francisco, the SFMTA, and the Presidio Trust. Studies from these agencies showed that these urban national park destinations could benefit from improved regional and local transit connectivity. This improved service connectivity would help accommodate existing and future visitor demand. Based on those studies, conceptual approaches to address alternative transportation needs were identified and evaluated against the purpose and need of the Project, park management objectives, and operability constraints.

The Project proposes to extend the F-Market & Wharves Line (F-line) from Fisherman's Wharf through the San Francisco Maritime National Historical Park (SF Maritime NHP) and the Golden Gate National Recreation Area (GGNRA), in San Francisco, California. The GGNRA and the SF Maritime NHP are two separate National Park Service units in San Francisco's northeastern waterfront; SF Maritime NHP is adjacent to the GGNRA, which includes Fort Mason. The GGNRA was established in 1972, and encompasses over 80,000 acres of land in San Francisco, Marin, and San Mateo Counties. The 50-acre SF Maritime NHP, established in 1988, includes the Maritime Museum and a Senior Center (both housed in the original Aquatic Park Bathhouse), Aquatic Park, Municipal Pier, Hyde Street Pier, and a collection of National Historic Landmark vessels.

One Action alternative (the Proposed Action) and the No Action alternative were identified to be carried forward for detailed evaluation in this EIS. This document has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) (42 United States Code 4321 et seq.), and *Director's Order No. 12: Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001). The *Director's Order No. 12* and NEPA regulations require consideration of a project's potential environmental impacts as early as possible in the planning process. This helps to ensure environmental values are considered as the project takes shape. At the same time, because the NEPA process occurs early in the planning stages, some of the project elements being evaluated can be conceptual in nature, and subject to change through subsequent state or local planning processes.

This document closely examines the potential impacts of the F-line extension from Fisherman's Wharf to the Fort Mason Center, while recognizing that decisions regarding various elements of the proposed project, such as in-street track alignment, platform location, and shelter design, will be determined during a subsequent local public planning and design process managed by SFMTA, with additional oversight from the San Francisco Planning Department. That process will provide additional opportunity for consideration of operational and design characteristics, with input from

public stakeholders and federal agenecies. At the outset, all owners and interested parties within 300 feet of the project would be sent notification informing them of the proposed project and planning process. Initial drawings and concepts would be shared at one or more public meetings, and after a period of outreach, a general public hearing would be held by the SFMTA to receive comments on the initial work. The findings would then be reported to the San Francisco Planning Department, which may choose to hold their own public meetings on the issue. Following comments from the Planning Department, design and engineering would be refined and shared with the public stakeholders and federal agencies once again. When the majority of parties are in agreement, the design and engineering work would then proceed to the advanced level. The process would repeat until the SFMTA completed a final design for the project, and that would be the project that is constructed.

Project Study Area

The study area for the Project in San Francisco's northeastern waterfront is bounded by Mason Street on the east, Bay Street on the south, Fillmore Street on the west and the bayfront, including the piers and parklands within the east-west boundary, on the north.

Part of the SF Maritime NHP has been designated as the Aquatic Park National Historic Landmark District (NHLD). Fort Mason—which includes the San Francisco Port of Embarkation NHLD[1]—consists of Upper Fort Mason and Lower Fort Mason. Lower Fort Mason encompasses the historic piers and buildings in which Fort Mason Center (the Center) is located. Fort Mason Center is a non-profit entity that is a destination for programs, events and organizations. Both the NHLDs mentioned above are in dense, urban locations, directly adjacent to high-density residential and commercial districts. These districts are characterized by high visitation rates, high pedestrian and automobile traffic volumes, and intense recreational and commercial use.

PROJECT PURPOSE AND NEED

Purpose of Project

The purpose of this project is to provide park visitors and transit-dependent residents with high-quality rail transit that improves transportation access and mobility between existing streetcar service at Fisherman's Wharf and Fort Mason Center in GGNRA. The streetcar service would have connection to the regional transit rail services, while respecting the settings, context, and resources of these two national park destinations and avoiding or minimizing adverse effects to National Historic Landmarks and National Register of Historic Places (NRHP) listed or eligible properties.

[1] The San Francisco Port of Embarkation NHLD includes all of Lower Fort Mason and only Building 201 in Upper Fort Mason.

Need for Project

The need for this project resulted from the following issues:

- **Inadequate Regional Transit Access to Fort Mason Center**

  Visitors traveling to Fort Mason on regional transit are required to make multiple transfers to reach their destination. For regional riders using the Bay Area Rapid Transit (BART), or regional services offered by Caltrain, access to Fort Mason frequently requires at least two transfers. Alameda-Contra Costa Transit District (AC Transit) and ferry riders must transfer at least two, and often three, times to reach Fort Mason. Multiple transfers are a deterrent to the use of regional transit to reach Fort Mason.

  Nearby transit service does not directly link the Fort Mason Center with transit lines. The 28 bus line provides the closest connection to Fort Mason Center with a station at Marina Boulevard and Laguna Street; however this bus line originates in Daly City and only services the western and northern parts of San Francisco.[2] Passengers arriving near Upper Fort Mason via the 47 or 49 bus lines disembark at Van Ness Avenue and North Point Street and then walk approximately 0.6 miles along streets or a path through the Great Meadow to reach Fort Mason Center. Passengers arriving via the 30 bus line would disembark at Chestnut Street and Laguna Street and then walk approximately 0.3 miles along Laguna Street to the Fort Mason Center entrance. Visitors coming from Fisherman's Wharf take the existing F-line to Jones Street and then walk approximately 1 mile to reach the Fort Mason Center.

- **Limited Transportation Options for Transit-Dependent Residents**

  In the spirit of bringing national parks to the people, GGNRA and SF Maritime NHP reach out to, and promote the richness and breadth of the national park system to a diverse urban community, including city residents who may be experiencing a national park for the first time and who may not have access to private vehicles. One of the goals of NPS is to provide recreational and cultural facilities and destinations to transit-dependent residents. Although the GGNRA and SF Maritime NHP are in the City of San Francisco (the City) and therefore closer to these residents than many other national parks, the public transportation access required by most potential park patrons continues to be insufficient, often requiring multiple transfers to reach the NPS sites along the waterfront. As noted above, multiple transfers can be a deterrent to transit use.

  Underserved populations living outside San Francisco may require transfers within their communities to reach the regional transportation network, as described above. Underserved residents living inside San Francisco are interspersed throughout most of the City. However, according to the 2006 San Francisco Mayor's Office of Community Investment *2005-2010 Consolidated Plan*, underserved areas are in the eastern and southeastern portions of the City. While most San Francisco residents generally require at least one transfer to access the parks, those living in the eastern/southeastern portion of the City may require additional transfers. For example, portions of the Bayview Hunters Point neighborhood require a minimum of two transfers to access the parks. The 1980 GGNRA General Management Plan identified the need for an extension of transit service between the park and transit dependent neighborhoods (1980).

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[2] SFMTA's *Transit Effectiveness Project* recommends changes to the 28 and 28L bus line that would eliminate the bus stop closest to Fort Mason Center at Marina Boulevard. The new route would run along Lombard Street and terminate at Van Ness Avenue and North Point Street (SFMTA 2008b).

- **Limited Connectivity to Northeastern Waterfront Cultural and Recreational Corridor**

  Over the past 20 years, San Francisco's northeastern waterfront has been transformed from an underused industrial area to a vibrant waterfront cultural corridor stretching from AT&T Park to the Presidio. This corridor includes South Beach Marina, the Ferry Building, Pier 7, Pier 39, the Aquarium of the Bay, Fisherman's Wharf, SF Maritime NHP and Fort Mason Center. Throughout the northeastern waterfront corridor there is a high level of pedestrian activity, with visitors seamlessly moving between the commercial establishments and the NPS facilities. Many of these attractions are linked by SFMTA's historic streetcar service (the F Line), which has proven to be popular with visitors and residents alike. However, this service does not currently reach the National Park Service's recreational and historic attractions including the Hyde Street Pier, Aquatic Park, the Maritime Museum, the Municipal Pier, nor Upper and Lower Fort Mason including the Fort Mason Center.

  The facilities within Fort Mason and SF Maritime NHP are integrated into the fabric of the City, serving as an arts and cultural activity center. Many of the 14 million annual visitors to Fisherman's Wharf, a major tourist destination immediately adjacent to SF Maritime NHP, are also drawn to the neighboring national park destinations. The necessity of multiple transfers slows trips and increases the difficulty for visitors or residents unfamiliar with the local transit network.

- **Insufficient Transportation Infrastructure to Accommodate Existing and Projected Visitor Demand**

  Fort Mason Center hosted more than 11,400[3] events in fiscal year 2009 (October 2008-September 2009), bringing approximately 1.7 million visitors to the site (FMC 2009a). **Table ES-1** shows a breakdown of projected attendance at major events hosted by the Fort Mason Center in 2010. These figures do not include regularly scheduled meetings, classes, and smaller events. Many events at Fort Mason Center are attended by thousands of visitors, with the largest events attended by 8,000 visitors. Other events in the area that impact the Fort Mason Center such as the Bridge to Bridge Run bring over 10,000 visitors to the area.

TABLE ES-1: FORT MASON CENTER PROJECTED ATTENDANCE FOR MAJOR EVENTS[a] IN 2010

Visitor Attendance[b]	Number of Events
0-100	88
101-500	349
501-1000	83
1001-5000	66
Over 5000	2

[a] Major events do not include the daily regularly scheduled meetings, classes and smaller events at the FMC

[b] Crowd numbers for events are estimates

Source: Fort Mason Center Parking Impact Notice, 2010.

[3] Events include classes, meetings, conferences, exhibitions and performances; many occur simultaneously each day.

Transportation access to Fort Mason Center is primarily by automobile, in part due to the inadequate regional and local transit access described above. The Fort Mason Center is served directly by only one bus line (the 28-19th Avenue); this line does not originate from downtown or other parts of the City frequented by visitors, and it has poor connections to regional transit lines and to local transit lines serving the rest of San Francisco. Existing transit service to the Fort Mason Center may be further impacted in the future by a proposed bus rapid transit project on Van Ness Avenue.[4] At the Fort Mason Center, there are 446 parking spaces available. While parking volumes for this lot are highly cyclical and depend on the events occurring at the Center, the annual volume of cars for 2009 was 236,271 (FMC 2009b). This results in substantial parking problems, especially on weekends, when parking spills over into the adjacent Marina neighborhood and adjacent parking areas (Gashouse Cove and Marina Green) that are not under NPS jurisdiction. Some event organizers hire valet services or use Marina Middle School for overflow parking.

SF Maritime NHP has 4 million visitors each year. The SF Maritime NHP relies on the availability of on-street or commercial parking lots available for the Fisherman's Wharf area. The number of visitors coming to the Fort Mason Center and SF Maritime NHP is expected to increase in the future. With the San Francisco Bay Area[5] population projected to grow 18.8 percent by 2030 (presently 7.3 million) (ABAG 2009), transit links will be critical to maintaining access to the Parks. The Bay Area region recognized the importance of the expansion of historic streetcar service by including it as one of the "Strategic Expansion" projects in San Francisco in the *Transportation 2030 Plan* for the San Francisco Bay Area (MTC 2005.) The planned restoration of a historic pier at the Fort Mason Center will provide additional exhibition space, as will the renovated Maritime Museum recently re-opened to the public. These improvements are anticipated to draw a greater number of visitors to the national park destinations, which would in turn exacerbate existing parking and traffic capacity demands.

The *Fort Mason Center Long-Term Lease Environmental Assessment* projects an increase in visitor levels to the Fort Mason Center by 14.5 percent contingent upon the renovations of Pier One, which is currently not used as an event space. If Pier One was restored, the 2003 Environmental Assessment (EA) projected that the 1.6 million annual visitors would be increased to 1.9 million for the entire Fort Mason Center. The EA also predicts that the increase in visitors from the development of Pier One could increase transit demand.

The 2007 *Fort Mason Center Employee Survey* (URS 2009f) concluded that approximately 17 percent of Fort Mason Center employees currently arrive at work by transit and that 48 percent of employees noted they would have taken the F-line if it already served Fort Mason directly. Similarly, the 2007 *Fort Mason Intercept Survey* (URS 2009f), which surveyed 729 visitors to Fort Mason Center found that approximately 11-14 percent of current visitors reported that they took transit to Fort Mason and 45 percent of visitors said that they would have taken the F-line if it already served Fort Mason Center.

NPS goals for transportation in the GGNRA include the reduction of automobile-based trips for recreational travel, and inter- and intra-park transportation networks coordinated with existing transportation systems (NPS 1980). The *San Francisco Maritime National Historical Park Climate Change Action Plan* (NPS 2010a) and the *Golden Gate National Recreation Area Climate Change Action Plan* (NPS 2008b) both seek to reduce fuel consumed by visitors by maximizing

[4] The Van Ness Avenue Bus Rapid Transit (BRT) Project would implement transit improvements along the Van Ness Corridor from Mission Street to Lombard Street.

[5] Bay Area region includes the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma (ABAG 2009).

transportation options in the parks and providing linkages to public transportation systems. This is particularly desirable, appropriate, and feasible at dense, urban national parks such as SF Maritime NHP and GGNRA, where existing public transit infrastructure can be extended at a reasonable cost.

- **Infrastructure Constraints Impacting Effectiveness and Operations of Fort Mason Center**

  Fort Mason Center is an international model for an urban park setting which preserves historic buildings for uses consistent with and related to the mission of the National Park Service and GGNRA.

  Fort Mason Center hosts numerous expositions, conferences, and events throughout the year however, the closest hotels are in the Fisherman's Wharf area and along Lombard Street and Van Ness Avenue. The lack of a direct transit connection between the hotels in the Fisherman's Wharf area and Fort Mason Center limits the potential of the center as an event destination. With better transit, Fort Mason Center would also function better as a conference/meeting location. The lack of direct transit limits the number of transit-dependent visitors who participate in activities at the center, and may be a deterrent to others who avoid the area due to roadway congestion and difficulty of parking. Furthermore, the lack of transit to the Center directly contributes to roadway congestion along Marina Boulevard which is a direct link to the Golden Gate Bridge. Its unique position as a large multi-use venue offers a tremendous opportunity to benefit businesses and nonprofit organizations as well as 1.7 million visitors per year.

  Under the lease terms with the National Park Service, Fort Mason Center has a financial obligation to assist with funding historic preservation and rehabilitation of all of the buildings and amenities on the campus. Funds to support operations are generated by tenant rentals at the Center, including a restaurant, a café, art galleries, non-profit organizations, and museums. Additional revenues are generated by visual, performing and literary arts events, large and small expositions, conferences and meetings. Funds for rehabilitation and restoration of the Center will be derived from financing supported by these revenues. Major funding is also derived from the philanthropic community which supports the Center's programs.

PUBLIC REVIEW PROCESS

The Notice of Intent (NOI) for the Project was published in the Federal Register on March 29, 2006. The NOI announced the preparation of an EIS by the National Park Service, as the federal lead agency. The NOI also provided information on Project issues and potential impacts and invited comments, questions, and suggestions on the scope of the EIS during the 60-day public scoping period, which ended on May 29, 2006. Postcards notifying the public of the commencement of the planning process were sent to approximately 4,000 individuals; the mailing list was developed from GGNRA, SF Maritime NHP, and SFMTA databases. A half-page ad announcing the public scoping meeting and requesting input was placed in the *San Francisco Examiner* on May 3, 2006, and a legal notice was posted in the *San Francisco Chronicle* on May 6, 2006. Public and agency scoping meetings were held on May 9, 2006 at the Fort Mason Officer's Club in San Francisco. A meeting with the NPS and the cooperating agencies was held from 2:00 p.m. to 4:00 p.m. and the public meeting was held from 6:00 p.m. to 9:00 p.m.

During the scoping period, the National Park Service received 101 comments from individuals, organizations representing environmental, conservation and recreational interests, and governmental agencies. The primary environmental concerns focused on changes in traffic and parking, impacts on parklands and recreational facilities, noise and vibration, visual impacts, and cultural resources.

Input was also solicited from the National Park Service Historic Streetcar Extension Technical Advisory Committee (TAC), which consists of members of GGNRA, SF Maritime NHP, SFMTA, Fort Mason Center, Market Street Railway, San Francisco County Transportation Authority, Golden Gate National Parks Conservancy, San Francisco Recreation and Park Department, and the Federal Transit Administration (FTA). NPS staff with expertise on park resources were also consulted. After the initial scoping period, the National Park Service continued to update the public about the Project during the park's quarterly open houses.

The Draft Environmental Impact Statement for the Historic Streetcar Extension was published in March of 2011. Public notice of availability and opportunity to comment, along with an invitation to attend a public open house meeting, were provided through mailers, email, public postings, and publication in the Federal Register. The public comment period remained open for 60 days; from March 18 to May 17, 2011. A public open house meeting was held at the Fort Mason Center on April 20, 2011, from 7:00pm to 9:00pm.

Approximately 37 people attended the open house meeting. The public was invited to submit comments through the NPS' Planning, Environment, and Public Comment (PEPC) website, regular mail, email, and park comment posters and forms during the public open house meeting. A total of 97 pieces of correspondence were received during the DEIS public comment period.

THE ALTERNATIVES

The study area is divided into the following four segments analyzed separately in the alternatives: In-Street; Transition; Fort Mason Tunnel; and Turnaround. During the alternatives development process alternatives were examined for each of these segments.

In-Street Segment. This approximately 2,500 foot street segment runs west down Jefferson Street (from its intersection with Jones Street) to Leavenworth Street, then south to a section of Beach Street extending from Jones Street to the base of Polk Street (approximately adjacent to the Maritime Museum). This segment would connect the terminus of the existing F-line at Jones Street with the proposed F-line extension.

Transition Segment. This approximately 750 foot segment connects the In-Street Segment from Beach Street, through San Francisco Maritime NHP, and up to the Fort Mason Tunnel Segment. This segment crosses Van Ness Avenue before entering the tunnel.

Fort Mason Tunnel Segment. The existing 1,500 foot tunnel segment runs underneath Fort Mason and the Great Meadow from the east tunnel portal at Van Ness Avenue to the west tunnel portal at Marina Boulevard and Laguna Street. It is a single-track tunnel, used for freight train movements until

the late 1970s. This tunnel segment would need to accommodate the bi-directional movement of streetcars on a single track. Structural rehabilitation of the tunnel would be required for its use.

Turnaround Segment. The turnaround segment occurs between the west tunnel portal at Marina Boulevard and Laguna Street. The areas considered in the alternatives include the lower Fort Mason (Fort Mason Center) parking lot and the Great Meadow. The turnaround segment would be the terminus of the proposed F-line extension and would allow for westbound streetcars to turnaround in a loop of track before returning eastbound back through the Fort Mason Tunnel.

Alternative 1 – No Action

Alternative 1 provides a baseline for comparing the other alternative, evaluating the magnitude of proposed changes, and measuring the effects of those changes. The No Action alternative follows the guidance of the Council on Environmental Quality, which describes the No Action alternative as representing no change from the current management direction. Under the No Action Alternative, the F-line would not be extended beyond Fisherman's Wharf; the Transition Segment within the Aquatic Park NHLD would remain undisturbed; the Fort Mason Tunnel would remain closed and would not be renovated or made seismically sound; and the Turnaround Areas (Great Meadow or lower Fort Mason) within the Fort Mason National Register Historic District and the San Francisco Port of Embarkation NHLD would remain undisturbed.

The 2007 *Fort Mason Center Employee Survey* (URS 2009f) concluded that approximately 17 percent of Fort Mason Center employees currently arrive at work by transit. The 2007 *Fort Mason Intercept Survey* (URS 2009f), which surveyed 729 visitors to Fort Mason Center found that approximately 11-14 percent of current visitors reported that they took transit to Fort Mason

The lack of connectivity between the Fort Mason Center and nearby transit lines would continue. The 28 bus line provides the closest connection to Fort Mason Center with a station at Marina Boulevard and Laguna Street; however this bus line originates in Daly City and only services the western and northern parts of San Francisco.[6] Passengers arriving near Upper Fort Mason via the 47 or 49 bus lines, disembark at Van Ness Avenue and North Point Street and then walk approximately 0.6 miles along streets or a path through the Great Meadow to reach Fort Mason Center. Passengers arriving via the 30 would disembark at Chestnut Street and Laguna Street and then walk approximately 0.3 miles along Laguna Street to the Fort Mason Center entrance. Visitors coming from Fisherman's Wharf take the existing F-line to Jones Street and then walk approximately 1 mile to reach the Fort Mason Center.

[6] SFMTA's *Transit Effectiveness Project* recommends changes to the 28 and 28L bus line that would eliminate the bus stop closest to Fort Mason Center at Marina Boulevard. The new route would run along Lombard Street and terminate at Van Ness Avenue and North Point Street (SFMTA 2008b).

Alternative 2 – Proposed Action Alternative (with Turnaround Options)

The Proposed Action would extend the existing F-line streetcar service from Jones Street to Fort Mason Center. This section describes the Proposed Action components, as well as anticipated construction requirements and operation. Alterative 2 includes a preferred In-Street alignment, Transition, Fort Mason Tunnel, and Turnaround Segments. The Turnaround Segment presents two options, Alternative 2A: North Loop (located in the Fort Mason Center parking lot) and Alternative 2B: South Loop (located in Great Meadow), which are analyzed separately. The In-Street Segment presents both mixed traffic and semi-exclusive options (autos do or do not share track right-of-way); however these would be determined during the final design phase. They have been analyzed separately as appropriate in the resource sections.

Project Components. If implemented, the extension would include approximately 0.85 mile of new rail track; associated features such as signals, crossings, wires and poles; approximately 8-9 new platforms; new designated stops; retrofitting of the historic State Belt Railroad tunnel (Fort Mason Tunnel); and construction of a track turnaround in the Fort Mason Center parking lot or Great Meadow (see **Table ES-2** for details).

TABLE ES-2: ALTERNATIVE 2 PROJECT SEGMENT DETAILS

	In-Street Segment	Transition Segment	Fort Mason Tunnel Segment	Turnaround Segment
Alternative 2 Options	Operates west down Jefferson Street to Leavenworth Street, south to Beach Street, and in both directions along Beach Street between Jones Street and the transition at Van Ness Avenue. Four platforms would be added to this segment. Options to be determined during design phase: 1) shared auto/streetcar operation 2) semi-exclusive for the eastbound alignment and shared operation for the westbound alignment 3) hybrid of the two options	The transition segment takes the alignment from the double-track, street-running segment to the east, shifting the alignment to NPS property to the west of Polk Street. The line would move from double track to single track between two new platforms and the tunnel portal.	The streetcar extension would run on a single track through the tunnel. Tunnel improvements would include installation of new track and overhead lines and reconstruction of the tunnel interior	**Alternative 2A: North Loop (Preferred).** In the North Loop turnaround tracks would loop north out of the Fort Mason Tunnel and enter the Lower Fort Mason parking lot. Two platforms would be constructed within the loop. **Alternative 2B: South Loop.** In the South Loop turnaround tracks would loop south out of the Fort Mason Tunnel and enter the Great Meadow. One platform would be constructed in this loop.

PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 2 – Action Alternative. This alternative was determined after a multi-year alternative development and screening process during which time alternatives for the project's street-running alignment, transition segment, and turnaround segment were analyzed. These alternatives were evaluated based on a standard set of criteria. Alternatives that were unreasonable were eliminated from further analysis. Following this process a preferred street-running alignment and transition segment were selected. However, two options remained for the turnaround segment.

The North Loop (Alternative 2A) and South Loop (Alternative 2B) Turnaround Alternatives were analyzed during a 1.5-day Value Analysis (VA) workshop held in August of 2010. In the Value Analysis Workshop, the North Loop and South Loop turnaround alternatives were evaluated using a process called Choosing by Advantages (CBA), where decisions are based on the weighted importance of the advantages between alternatives with capital and life cycle costs factored in last, to illustrate benefits to cost. In using CBA to determine a preferred alternative, the VA team identified the alternative that offers the highest total importance of advantages at the lowest cost (in both initial and life cycle).

In this workshop, the North Loop was identified as best value due to the following advantages:

- Significantly Better at Limiting Disruption to Natural Resources;
  - No impervious surface is added (can increase pervious surface between rail);
  - Does not remove vegetation;
  - Emits the least amount of emissions during construction (less earth moved).
- Somewhat Better at Improving Visitor Experience;
  - Limited view shed impacts by adding streetcars and infrastructure in the Fort Mason Center (FMC) parking lot;
  - Provides direct interior connection between SF Maritime NHP and Fort Mason Center.
- Slightly Better at Protecting Public Health, Safety and Welfare;
  - All the alternatives create potential conflicts between pedestrians, auto and transit. This alternative limits those conflicts particularly with bicycles. It may include conflict with bicycles in the future;
  - Allows for redesign of the Bay Trail with less change required (this is an independent project).
- Slightly Better at Supporting Criteria for Large Events;
  - It is best able to manage headway (frequency and storage of streetcars);
  - Creates more room to queue visitors away from Laguna Street.
- Somewhat Better at Accessing Disabled Streetcar;
  - Creates better access to disabled streetcar in the storage area for repair via service truck in this location.

- Slightly Better at Minimizing Noise & Sound Impacts;
  - Minimizes noise impacts on residential neighborhoods since it is the farthest from the residential areas;
  - Minimizes vibration impacts. All the options create vibration but this option is 10 feet farther away from the historic structures than the other alternatives.
- Somewhat Better at Attracting New Tenants:
  - This alternative gives Fort Mason Center the ability to attract new tenants (via *Fort Mason Center Long-Term Lease Environmental Assessment*).

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The Preferred Alternative (Alternative 2) would also be the environmentally preferred alternative. Alternative 1 (the No-Action Alternative) does not meet project goals, purpose, or need, and does nothing to reduce the number of automobiles used to access the park and/or the Fort Mason Center. Changes to the mix of transportation modes [autos and transit] serving the project area resulting from the Preferred Alternative identified a 14.4 percent increase in transit use for daily person trips to Fort Mason Center between the No Project and implementation of the Project with the F-line extension. The result would be a long-term, moderate, beneficial impact which leads to the conclusion that the Preferred Alternative is the environmentally preferred alternative.

This conclusion is reached looking at current conditions. The environmental preference for an alternative that provides increased transit is further supported by future conditions. The Fort Mason Center Long-Term Lease Environmental Assessment projects an increase in visitor levels by 14.5 percent contingent upon the renovations of Pier One, which is currently not used as an event space. If Pier One were restored, the 2003 EA projected that the 1.6 million annual visitors would be increased to 1.9 million for the entire Fort Mason Center. Increased transit would support these visitors and be in compliance with renewable goals set out in Director's Order #12.

ENVIRONMENTAL CONSEQUENCES

The following topics were raised during the scoping process and selected for detailed analysis: Land Use; Socioeconomics; Transportation and Circulation; Air Quality; Noise and Vibration; Cultural Resources; Recreation and Visitor Use; Visual and Aesthetic Resources; Night Sky Visibility and Light Pollution; Geology, Soils and Seismicity; Biological Resources; Public Health and Safety; Public Services and Utilities. Rational for selection of each impact topic was based on potential for substantive impact; environmental statues, regulations, and executive orders; and/or NPS management policies and guidance. **Table ES-3** summarizes the potential impacts of the Project and proposes mitigation measures.

TABLE ES-3: SUMMARY OF IMPACTS AND MITIGATION

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Land Use				
Alternative 1 would result in no direct, indirect impacts to land use	The implementation of Alternative 2 would result in a minor long-term adverse impact to land use practices due to change in land use of the existing site, however the Project would remain consistent with applicable land use plans and policies	The North Loop Turnaround Option would result in a negligible impact to land use	The South Loop Turnaround Option would result in a long-term moderate adverse impact	N/A
Socioeconomics				
Alternative 1 would have no economic impacts to the San Francisco economy	Alternative 2 would have short-term negligible beneficial construction related economic impacts and long-term negligible beneficial operations related economic impacts on the San Francisco economy	The North Loop Turnaround Option would result in negligible positive short-term economic impacts to the City and County of San Francisco economy	The South Loop Turnaround Option would result in negligible positive long-term economic impacts to the City and County of San Francisco economy.	N/A
Transportation and Circulation				
Transit Operations				
Alternative 1 would result in no impacts to transit operations	Alternative 2 would result in a long-term, moderate, beneficial impact	The North Loop Turnaround Option would result in a long-term, moderate, beneficial impact	The South Loop Turnaround Option would result in a long-term, moderate, beneficial impact	N/A
Traffic Safety				
Alternative 1 would result in long-term, minor, adverse impacts to traffic safety conditions	In-Street Segment: long-term, negligible, adverse impact Transition Segment: long-term, minor, adverse impact	The North Loop Turnaround Option would result in a long-term, minor, adverse impact	The South Loop Turnaround Option would result in a long-term, minor, beneficial impact	TRANS-2: Install Wayfinding Devices

TABLE ES-3: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Transportation and Circulation (cont.)				
Parking				
Alternative 1 would result in no impacts to parking conditions	The overall impact would be long-term, minor and adverse	The North Loop Turnaround Option would result in a long-term, minor, adverse impact	The South Loop Turnaround Option would not affect parking conditions at Fort Mason Center, and would not displace any parking spaces resulting in no impact	TRANS-3: Reconfigure On-Street Parking Spaces TRANS-4: Implement Parking Time Restrictions
Traffic Flow				
Alternative 1 would result in long-term, minor, adverse impacts to traffic flow	The result with implementation of the Public Realm Plan would be a long-term, minor, adverse impact, and without implementation of the Public Realm Plan would be a long-term, major, adverse impact	N/A	N/A	TRANS-1: Optimize Traffic Signal Timing
Air Quality				
Alternative 1 would result in no short- or long-term air quality or greenhouse gas emission impacts, either beneficial or adverse	Short-term adverse air quality impacts would result from daily maximum construction activities. With implementation of mitigation measures, short-term air quality impacts would be minor to moderate and adverse Alternative 2 would result in negligible to minor beneficial operational impacts to both regional and local air quality as well as greenhouse gas emissions	The North Loop Turnaround Option would result in a net negligible to minor beneficial operational air quality impact. Construction-related GHG emissions are considered a minor adverse impact with respect to global climate change. The North Loop Turnaround Option would result in a minor net beneficial impact to GHG emissions.	The South Loop Turnaround Option would result in a net minor beneficial operational air quality impact. The South Loop option would have the same net minor adverse construction-related GHG emission impact with as would occur with the North Loop Option The South Loop option would have the same net minor beneficial impact with regard to GHG emissions as would occur with the North Loop Option.	AIR-1: Implement BAAQMD Basic Construction Mitigation Measures

TABLE ES-3: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Noise and Vibration				
Alternative 1 would result in no new short- or long-term noise or vibration impacts, either beneficial or adverse	Alternative 2 would result in major adverse impacts to the residential units on the corner of Hyde and Beach Streets and at Ghirardelli Square as well as hotels along Beach Street and the Maritime Museum. Impacts would result from construction noise, construction-related vibration, operational noise and operational vibrations. Identified mitigation would reduce these major adverse impacts to the moderate level	The North Loop Turnaround Option would result in the following: Construction Noise: minor adverse impact Construction Vibration: minor adverse impact. Operational Noise: moderate adverse impact Operational Vibration: minor adverse impact similar to existing vibration levels monitored in the area	The South Loop Turnaround Option would result in the following: Construction Noise: minor adverse impact Construction Vibration: minor adverse annoyance impact at the residences on Laguna Street. Operational Noise: moderate adverse impact Operational Vibration: minor adverse impact	NOISE-1: Implement Construction Noise Mitigation NOISE-2: Implement Operational Noise Mitigation VIBR-1: Implement Construction Vibration Mitigation VIBR-2: Implement Operational Vibration Mitigation
Cultural Resources				
Alternative 1 would not result in any new short- or long-term impacts, either beneficial or adverse	Impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features in the In-Street and Transition segments range from negligible to moderate adverse impact, see Table 4.7-1 and Table 4.7-2 for details	The North Loop Turnaround Option would result in impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features range from negligible to moderate adverse impact, see Table 4.7-1 for details	The South Loop Turnaround Option would result in impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features range from negligible to moderate adverse impact, see Table 4.7-2 for details	CUL-1: Measures to mitigate the adverse impacts of the loss of individual resources at Aquatic Park NHL District (stone retaining wall) CUL-2: Measures to mitigate the adverse impacts due to the introduction of new, incompatible uses to the Aquatic Park NHL District CUL 3: Measures to mitigate the adverse impacts of the alteration of individual resources at San Francisco Port of Embarkation U.S. Army NHL District and Fort Mason National Register Historic District CUL 4: Measures to mitigate the adverse impacts due to the introduction of new, incompatible uses to the San Francisco Port of Embarkation U.S. Army NHL District/Fort Mason National Register Historic District

TABLE ES-3: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Cultural Resources (cont.)				
				CUL-5: Measures to mitigate negligible impacts to archeological resources due to inadvertent discovery during ground-disturbing activities
Recreation and Visitor Use				
Alternative 1 would result in no impacts to recreational opportunities	Alternative 2 would result in short-term and long-term, minor, adverse impacts on recreation and visitor use in the project area	The North Loop Turnaround Option would result in short and long-term minor adverse impacts	The North Loop Turnaround Option would result in short and long-term minor adverse impacts	REC-1: If necessary, relocate the bocce ball courts to suitable location REC-2: Post signage to direct Bay Trail users of temporary re-routes. REC-3: Coordinate the Bay Trail reroutes with Association of Bay Area Governments (ABAG)
Visual and Aesthetic Resources				
Alternative 1 would result in no direct, indirect, or cumulative impacts to visual resources	Alternative 2 would result in a long-term moderate adverse impact	The North Loop Turnaround Option would result in long-term minor and moderate, adverse effects	The South Loop Turnaround Option would result in long-term minor and moderate, adverse effects	VIS-1: Install temporary visual screening during construction. VIS-2: To the extent feasible, construction staging areas shall be located to the largest extent possible away from view of public viewsheds and remain clear of all trash, weeds and debris etc. VIS-3: Signs will be limited to the minimum necessary to meet information, warning, and regulatory needs and to avoid confusion and visual intrusion.
Night Sky Visibility and Light Pollution				
Alternative 1 would result in no direct or indirect, impacts to night sky visibility	Alternative 2 would result in long-term minor impacts due to increased night lighting	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	NIGHT-1: The project would be required to minimize the use of lighting in areas already well lit and to use full cutoff light fixtures throughout the project.

TABLE ES-3: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Geology, Soils, and Seismicity				
Alternative 1 would result in negligible impacts with respect to soil erosion and seismic or landslide events for all segments of the alternative, except for the Fort Mason Tunnel Segment, which could experience a moderate, long-term, adverse impact from dynamic settlement caused by a design-basis earthquake. This moderate impact would be reduced to minor intensity with implementation of the proposed mitigation measure(s).	Alternative 2 would result in minor adverse effects	The North Loop Turnaround Option would result in minor adverse effects after implementation of mitigation measure GEO-3.	The South Loop Turnaround Option would result in minor adverse effects after implementation of mitigation measure GEO-2.	GEO-1: Conduct further analyses to determine whether or not the tunnel is vulnerable to additional damage due to compaction of soil during an earthquake GEO-2: Slope stability evaluation and adherence to California Building Code GEO-3: Fort Mason Tunnel rehabilitation
Biological Resources				
Alternative 1 would result in no measurable change to vegetation, wildlife, or special-status species (if present)	Alternative 2 would result in negligible impacts to biological resources after implementation of the mitigation measures BIO-1 and BIO-2, construction and operation impacts	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	BIO-1: Preconstruction Nesting Bird Surveys BIO-2: Preconstruction Roosting Bat Surveys
Public Health and Safety				
Alternative 1 would result in no direct or indirect impacts to public health and safety	Alternative 2 would result in a short-term, minor, adverse impact	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	HEA-1: Pre-Construction Hazardous Materials Assessment HEA-2: Soil and Groundwater Management Plan HEA-3: Health and Safety Plan (HSP)
Public Services and Utilities				
Alternative 1 would result in no impacts to public services or utilities under this alternative	Alternative 2 would result in moderate adverse impacts	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	PUB-1: Maintain Utility Services

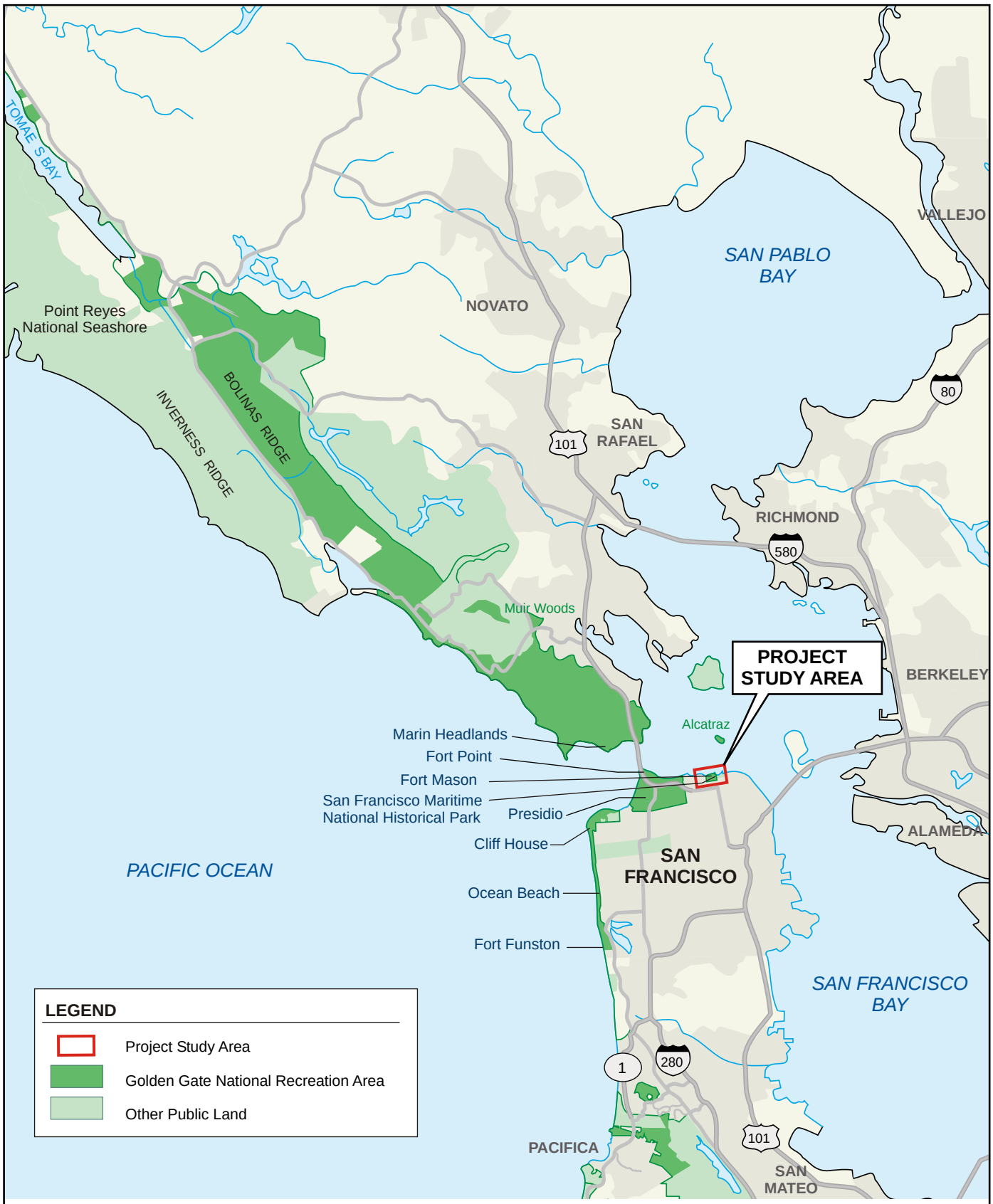
1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The National Park Service (NPS) is preparing an environmental impact statement (EIS) for an extension of the historic streetcar F-line from Fisherman's Wharf to the Fort Mason Center. The National Park Service is the lead agency and the San Francisco Municipal Transportation Agency (SFMTA) and the Federal Transit Administration are the cooperating agencies under the National Environmental Policy Act (NEPA). The proposed Project is the culmination of cooperative efforts by the National Park Service with the Golden Gate National Recreation Area and the San Francisco Maritime National Historical Park, the City and County of San Francisco, the SFMTA, and the Presidio Trust. Previous studies from these agencies showed that these urban national park destinations could benefit from improved regional and local transit connectivity. This improved service connectivity would help accommodate existing and future visitor demand. Based on those studies, conceptual approaches to address alternative transportation needs were identified and evaluated against the purpose and need of the Project, park management objectives, and operability constraints. One Action alternative (the Proposed Action) and the No Action alternative were identified to be carried forward for detailed evaluation in this EIS. This document has been prepared in accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA) (42 United States Code 4321 et seq.), and *Director's Order No. 12: Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001).

The Project proposes to extend the F-Market & Wharves Line (F-line) from Fisherman's Wharf through the San Francisco Maritime National Historical Park (SF Maritime NHP) and the Golden Gate National Recreation Area (GGNRA), in San Francisco, California (**Figure 1-1**). The GGNRA and the SF Maritime NHP are two separate National Park Service units in San Francisco's northeastern waterfront; SF Maritime NHP is adjacent to the GGNRA, which includes Fort Mason. The GGNRA was established in 1972, and encompasses over 80,000 acres of land in San Francisco, Marin, and San Mateo Counties. The 50-acre SF Maritime NHP, established in 1988, includes the Maritime Museum and a Senior Center (both housed in the original Aquatic Park Bathhouse), Aquatic Park, Municipal Pier, Hyde Street Pier, and a collection of National Historic Landmark vessels.

The historic alignment of the State Belt Railroad, in use from 1889–1976, is within both parks and extends outside the study area. During the 1915 expansion of the railway, a tunnel under Fort Mason (from Van Ness Avenue to what is now Fort Mason Center) was constructed; the tunnel was closed in the 1980s and is currently part of Fort Mason, under the jurisdiction of the National Park Service. Since the 1970s a mass-transit connection to the existing local and regional transportation network has been identified as a NPS objective for the GGNRA. The congressionally mandated *1977 Golden Gate Travel Study* recommended restoring the historic State Belt Railroad link from Hyde Street Pier (now part of the SF Maritime NHP) through the tunnel at Fort Mason to improve access to NPS facilities and destinations and reduce congestion and private automobile use at the GGNRA (NPS 1977). The 1980 *General Management Plan and Environmental Analysis, Golden Gate National Recreation Area and Point Reyes* (GMP) identified management objectives that would use a transit extension to make the GGNRA available to a broad variety of park users, and use transit systems to alleviate traffic impacts



N

0 5 10

Scale in Miles

REGIONAL LOCATION MAP

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 1-1

on adjacent communities and park resources. Further, the transportation section of the GMP proposed a shuttle, possibly using historic trolley cars, connecting parklands along the northern San Francisco waterfront utilizing the State Belt Railroad right-of-way (1980:72).

In 1995, the SFMTA's Municipal Railway (Muni) began operation of historic streetcars along the F-line, along Market Street and in 2000 it was extended to Jones Street at Fisherman's Wharf (see **Figure 1-2**). Currently, the F-line serves more than 20,000 passengers a day and is one of Muni's most popular rail lines. The *1997 General Management Plan* of the SF Maritime NHP includes proposals to improve accessibility to the park by supporting related transportation proposals outlined in the *GGNRA GMP* and *Presidio Trust Management Plan*, including opening the railroad tunnel under Fort Mason and extending the F-line rail system from Fisherman's Wharf west through Aquatic Park. The San Francisco Municipal Railway *Short Range Transit Plan FY2006-2025* also identifies extension of the F-line in the Service Planning and Expansion section.

1.1.1 Project Study Area

The study area for the Project in San Francisco's northeastern waterfront is bounded by Mason Street on the east, Bay Street on the south, Fillmore Street on the west and the bay front, including the piers and parklands within the east-west boundary, on the north (Figure 1-2).

Part of the SF Maritime NHP has been designated as the Aquatic Park National Historic Landmark District (NHLD). Fort Mason—which includes the San Francisco Port of Embarkation NHLD[1]—consists of Upper Fort Mason and Lower Fort Mason. Lower Fort Mason encompasses the historic piers and buildings in which Fort Mason Center (the Center) is located (**Figure 1-3**). Fort Mason Center is a non-profit organization that is a destination for programs, events and organizations. Both the NHLDs mentioned above are in dense, urban locations that lie directly adjacent to high-density residential and commercial districts. These districts are characterized by high visitation rates, high pedestrian and automobile traffic volumes, and intense recreational and commercial use.

1.2 PURPOSE OF PROJECT

The purpose of this project is to provide park visitors and transit-dependent residents with high-quality rail transit that improves transportation access and mobility between existing streetcar service at Fisherman's Wharf and Fort Mason Center in GGNRA. The streetcar service would have connection to the regional transit rail services, while respecting the settings, context, and resources of these two national park destinations and avoiding or minimizing adverse effects to National Historic Landmarks and National Register of Historic Places (NRHP) listed or eligible properties.

[1] The San Francisco Port of Embarkation NHLD includes all of Lower Fort Mason and only Building 201 in Upper Fort Mason.

1.3 NEED FOR PROJECT

The need for this project resulted from the following issues:

- **Inadequate Regional Transit Access to Fort Mason Center**

  Visitors traveling to Fort Mason on regional transit are required to make multiple transfers to reach their destination. For regional riders using the Bay Area Rapid Transit (BART), or regional services offered by Caltrain, access to Fort Mason frequently requires at least two transfers. Alameda-Contra Costa Transit District (AC Transit) and ferry riders must transfer at least two, and often three, times to reach Fort Mason. Multiple transfers are a deterrent to the use of regional transit to reach Fort Mason.

  Nearby transit service is depicted in **Figure 1-2** and illustrates the lack of connectivity between the Fort Mason Center and transit lines. The 28 bus line provides the closest connection to Fort Mason Center with a station at Marina Boulevard and Laguna Street; however this bus line originates in Daly City and only services the western and northern parts of San Francisco.[2] Passengers arriving near Upper Fort Mason via the 47 or 49 bus lines disembark at Van Ness Avenue and North Point Street and then walk approximately 0.6 miles along streets or a path through the Great Meadow to reach Fort Mason Center. Passengers arriving via the 30 bus line would disembark at Chestnut Street and Laguna Street and then walk approximately 0.3 miles along Laguna Street to the Fort Mason Center entrance. Visitors coming from Fisherman's Wharf take the existing F-line to Jones Street and then walk approximately 1 mile to reach the Fort Mason Center.

- **Limited Transportation Options for Transit-Dependent Residents**

  In the spirit of bringing national parks to the people, GGNRA and SF Maritime NHP reach out to, and promote the richness and breadth of the national park system to a diverse urban community, including city residents who may be experiencing a national park for the first time and who may not have access to private vehicles. One of the goals of NPS is to provide recreational and cultural facilities and destination to transit-dependent residents. Although the GGNRA and SF Maritime NHP are in the City of San Francisco (the City) and therefore closer to these residents than many other national parks, the public transportation access required by most potential park patrons continues to be insufficient, often requiring multiple transfers to reach the NPS sites along the waterfront. As noted above, multiple transfers can be a deterrent to transit use.

  Underserved populations living outside San Francisco may require transfers within their communities to reach the regional transportation network, as described above. Underserved residents living inside San Francisco are interspersed throughout most of the City. However, according to the 2006 San Francisco Mayor's Office of Community Investment *2005-2010 Consolidated Plan*, underserved areas are in the eastern and southeastern portions of the City. While most San Francisco residents generally require at least one transfer to access the parks, those living in the eastern/southeastern portion of the City may require additional transfers. For example, portions of the Bayview Hunters Point neighborhood require a minimum of two transfers to access the parks. The 1980 GGNRA General Management Plan identified the need for extension of transit service between the park and transit dependent neighborhoods (1980).

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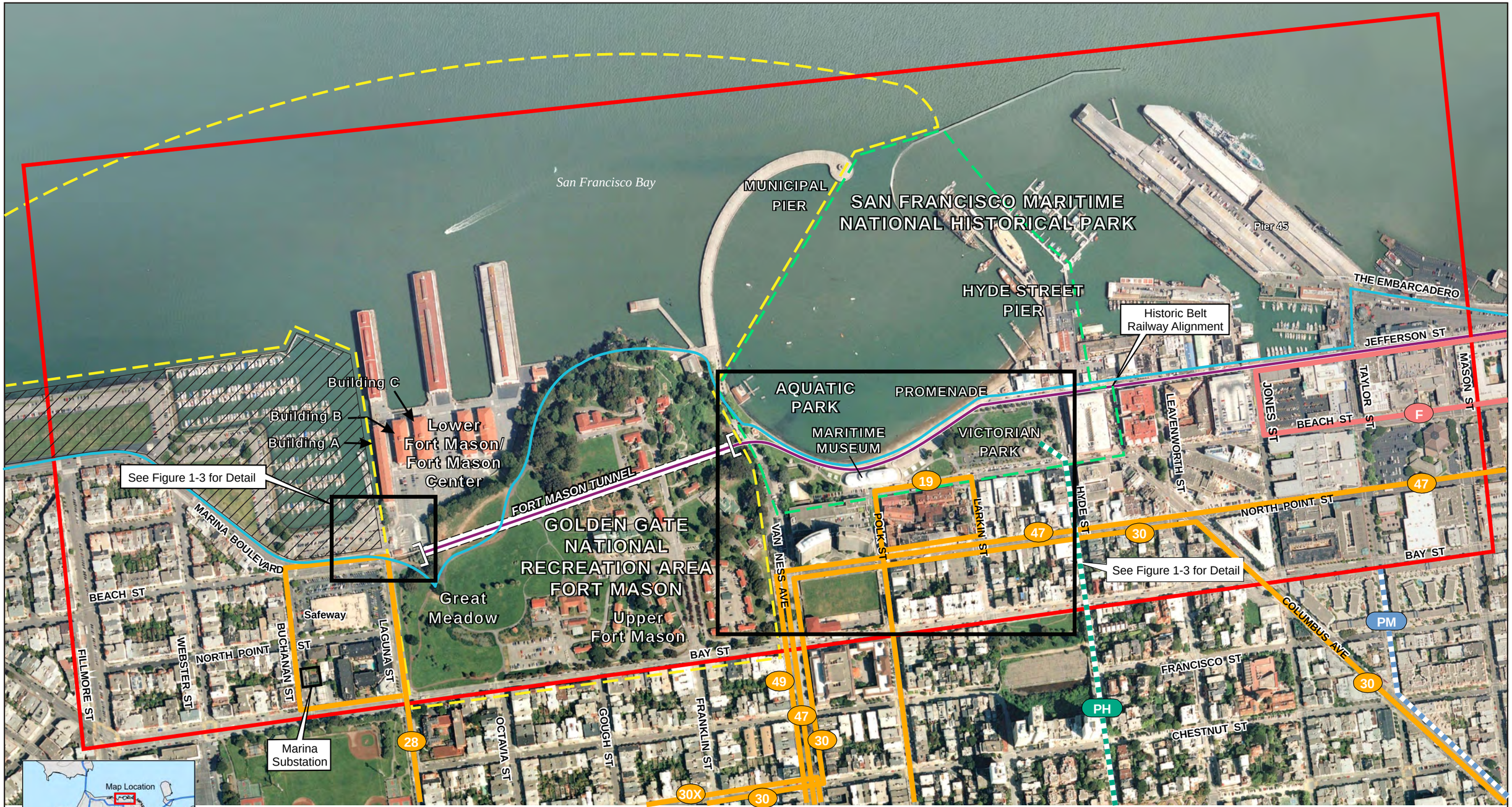
[2] SFMTA's *Transit Effectiveness Project* recommends changes to the 28 and 28L bus line that would eliminate the bus stop closest to Fort Mason Center at Marina Boulevard. The new route would run along Lombard Street and terminate at Van Ness Avenue and North Point Street (SFMTA 2008b).



Source: GlobeXplorer 2009

N

0 900

Approximate Scale in Feet

LEGEND

- Project Study Area
- Historic Belt Railway Alignment
- Fort Mason Tunnel
- GGNRA
- SF Maritime NHP
- SF Bay Trail Alignment
- San Francisco Recreation & Park Property
- 47 Bus Lines
- PH Powell-Hyde Cable Car
- PM Powell-Mason Cable Car
- F F-Line Historic Streetcar

PROJECT STUDY AREA

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 1-2

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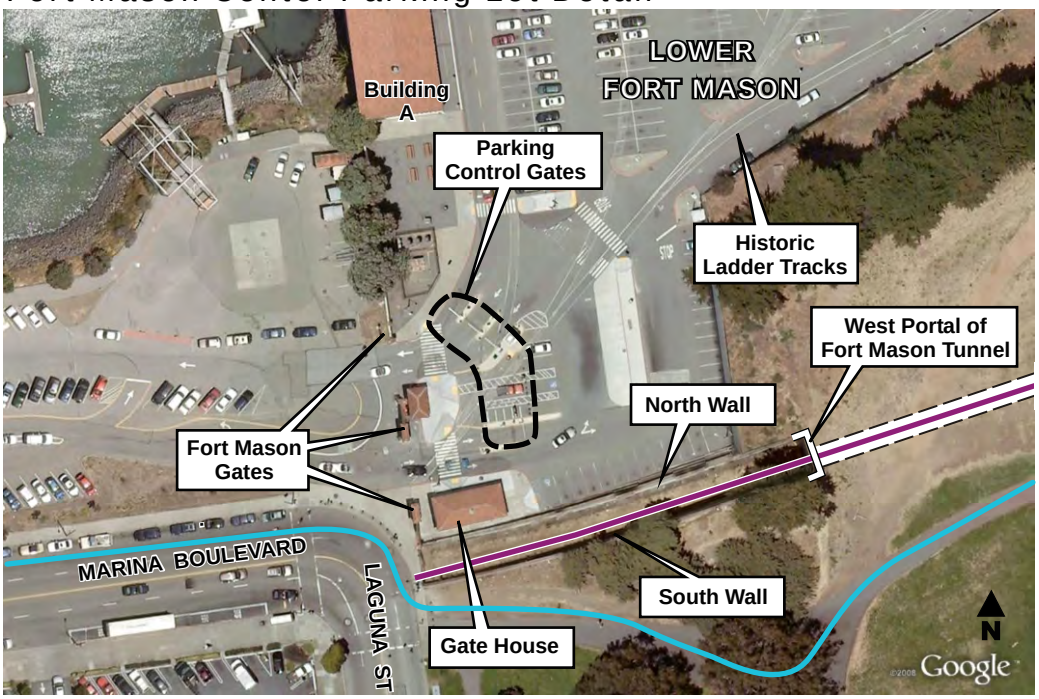
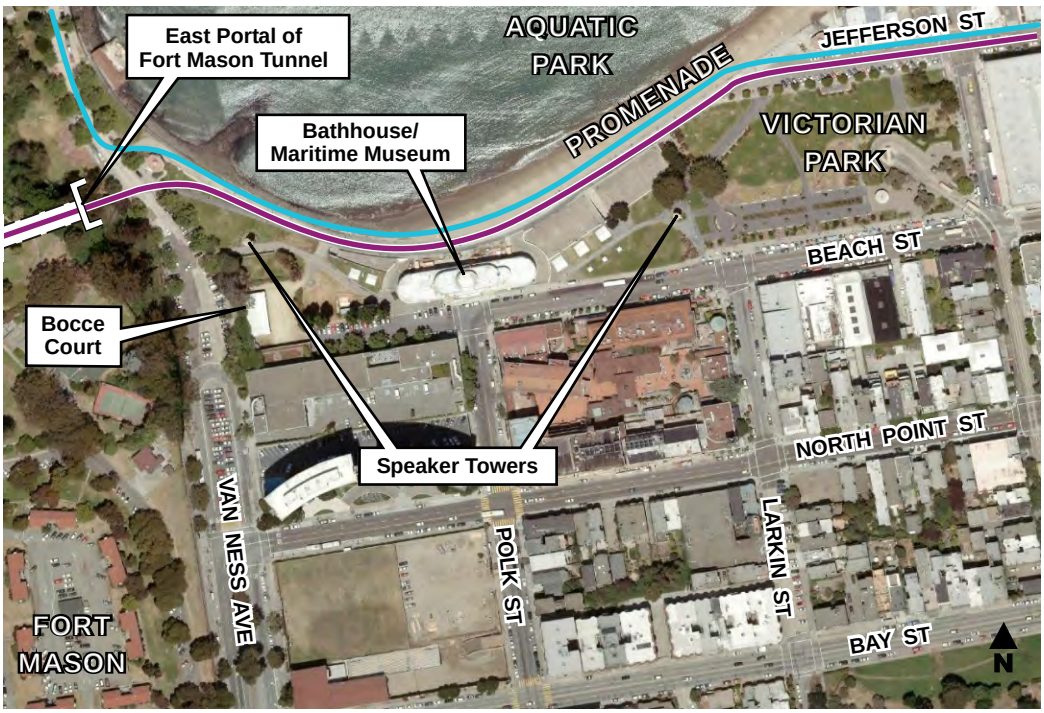
Fort Mason Center Parking Lot Detail



Aquatic Park Detail



LEGEND

- Historic Belt Railway Alignment
- Fort Mason Tunnel
- SF Bay Trail Alignment

Source: Google Earth 2008

FORT MASON CENTER PARKING LOT AND AQUATIC PARK: DETAIL

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 1-3

- **Limited Connectivity to Northeastern Waterfront Cultural and Recreational Corridor**

  Over the past 20 years, San Francisco's northeastern waterfront has been transformed from an underused industrial area to a vibrant waterfront cultural corridor stretching from AT&T Park to the Presidio. This corridor includes South Beach Marina, the Ferry Building, Pier 7, Pier 39, the Aquarium of the Bay, Fisherman's Wharf, SF Maritime NHP, and Fort Mason Center. Throughout the northeastern waterfront corridor there is a high level of pedestrian activity, with visitors seamlessly moving between the commercial establishments and the NPS facilities. Many of these attractions are linked by SFMTA's historic streetcar service (the F Line), which has proven to be popular with visitors and residents alike. However, this service does not currently reach the National Park Service's recreational and historic attractions including the Hyde Street Pier, Aquatic Park, the Maritime Museum, the Municipal Pier, nor Upper and Lower Fort Mason including the Fort Mason Center.

  The facilities within Fort Mason and SF Maritime NHP are integrated into the fabric of the City, serving as an arts and cultural activity center. Many of the 14 million annual visitors to Fisherman's Wharf, a major tourist destination immediately adjacent to SF Maritime NHP, are also drawn to the neighboring national park destinations. The necessity of multiple transfers slows trips and increases the difficulty for visitors or residents unfamiliar with the local transit network. Figure 1-2 illustrates the lack of connectivity between Fort Mason Center and the northeastern waterfront.

- **Insufficient Transportation Infrastructure to Accommodate Existing and Projected Visitor Demand.**

  Fort Mason Center hosted more than 11,400[3] events in fiscal year 2009 (October 2008-September 2009), bringing approximately 1.7 million visitors to the site (FMC 2009a). **Table 1-1** shows a breakdown of projected attendance at major events hosted by the Fort Mason Center in 2010. These figures do not include regularly scheduled meetings, classes, and smaller events. Many events at Fort Mason Center are attended by thousands of visitors, with the largest events attended by 8,000 visitors (see Appendix A1 for a complete list of the major events in 2010). Other events in the area that impact the Fort Mason Center such as the Bridge to Bridge Run bring over 10,000 visitors to the area.

TABLE 1-1: FORT MASON CENTER PROJECTED ATTENDANCE FOR MAJOR EVENTS[a] IN 2010

Visitor Attendance[b]	Number of Events
0-100	88
101-500	349
501-1000	83
1001-5000	66
Over 5000	2

[a] Major events do not include the daily regularly scheduled meetings, classes and smaller events at the FMC

[b] Crowd numbers for events are estimates

Source: Fort Mason Center Parking Impact Notice, 2010.

[3] Events include classes, meetings, conferences, exhibitions and performances; many occur simultaneously each day.

Transportation access to Fort Mason Center is primarily by automobile, in part due to the inadequate regional and local transit access described above. The Fort Mason Center is served directly by only one bus line (the 28-19th Avenue) (see Figure 1-2); this line does not originate from downtown or other parts of the City frequented by visitors, and it has poor connections to regional transit lines and to local transit lines serving the rest of San Francisco. Additionally, it will have limited service to the Van Ness Avenue corridor in the future due to a bus rapid transit project on Van Ness Avenue.[4] At the Fort Mason Center, there are 446 parking spaces available. While parking volumes for this lot are highly cyclical and depend on the events occurring at the Center, the annual volume of cars for 2009 was 236,271 (FMC 2009b). This results in substantial parking problems, especially on weekends, when parking spills over into the adjacent Marina neighborhood and adjacent parking areas (Gashouse Cove and Marina Green) that are not under NPS jurisdiction. Some event organizers hire valet services or use Marina Middle School for overflow parking.

SF Maritime NHP has 4 million visitors each year. The SF Maritime NHP relies on the availability of on-street or commercial parking lots available for the Fisherman's Wharf area. The number of visitors coming to Fort Mason Center and SF Maritime NHP is expected to increase in the future. With the San Francisco Bay Area[5] population projected to grow 18.8 percent by 2030 (presently 7.3 million) (ABAG 2009), transit links will be critical to maintaining access to the Parks. The Bay Area region recognized the importance of the expansion of historic streetcar service by including it as one of the "Strategic Expansion" projects in San Francisco in the *Transportation 2030 Plan* for the San Francisco Bay Area (MTC 2005.) The planned restoration of a historic pier at Fort Mason Center will provide additional exhibition space, and the renovated Maritime Museum recently re-opened to the public. These improvements are anticipated to draw a greater number of visitors to the national park destinations, which would in turn exacerbate existing parking and traffic capacity demands.

The *Fort Mason Center Long-Term Lease Environmental Assessment* projects an increase in visitor levels to the Fort Mason Center by 14.5 percent contingent upon the renovations of Pier One, which is currently not used as an event space. If Pier One was restored, the 2003 Environmental Assessment (EA) projected that the 1.6 million annual visitors would be increased to 1.9 million for the entire Fort Mason Center. The EA also predicts that the increase in visitors from the development of Pier One could increase transit demand.

The 2007 *Fort Mason Center Employee Survey* (URS 2009f) concluded that approximately 17 percent of Fort Mason Center employees currently arrive at work by transit and that 48 percent of employees noted they would have taken the F-line if it already served Fort Mason directly. Similarly, the 2007 *Fort Mason Intercept Survey* (URS 2009f), which surveyed 729 visitors to Fort Mason Center found that approximately 11-14 percent of current visitors reported that they took transit to Fort Mason and 45 percent of visitors said that they would have taken the F-line if it already served Fort Mason Center.

NPS goals for transportation in the GGNRA include the reduction of automobile-based trips for recreational travel, and inter- and intra-park transportation networks coordinated with existing transportation systems (NPS 1980). The *San Francisco Maritime National Historical Park Climate Change Action Plan* (NPS 2010a) and the *Golden Gate National Recreation Area Climate Change Action Plan* (NPS 2008b) both seek to reduce fuel consumed by visitors by

[4] The Van Ness Avenue Bus Rapid Transit (BRT) Project would implement transit improvements along the Van Ness Corridor from Mission Street to Lombard Street.

[5] Bay Area region includes the following counties: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma (ABAG 2009).

maximizing transportation options in the parks and providing linkages to public transportation systems. This is particularly desirable, appropriate, and feasible at dense, urban national parks such as SF Maritime NHP and GGNRA, where existing public transit infrastructure can be extended at a reasonable cost.

- **Infrastructure Constraints Impacting Effectiveness and Operations of Fort Mason Center**

  Fort Mason Center, a non-profit organization within the National Historic Landmark, is a destination for programs, events and organizations. It is an international model for an urban park setting which preserves historic buildings for uses consistent with and related to the mission of the National Park Service and GGNRA.

  Fort Mason Center hosts numerous expositions, conferences, and events throughout the year; however, the closest hotels are in the Fisherman's Wharf area and along Lombard Street and Van Ness Avenue. The lack of a direct transit connection between the hotels in the Fisherman's Wharf area and Fort Mason Center limits the potential of the center as an event destination. With better transit, Fort Mason Center would also function better as a conference/meeting location. The lack of direct transit limits the number of transit-dependent visitors who participate in activities at the center, and may be a deterrent to others who avoid the area due to roadway congestion and difficulty of parking. Furthermore, the lack of transit to the Center directly contributes to roadway congestion along Marina Boulevard which is a direct link to the Golden Gate Bridge. Its unique position as a large multi-use venue offers a tremendous opportunity to benefit businesses and nonprofit organizations as well as 1.7 million visitors per year.

  Under the lease terms with the National Park Service, Fort Mason Center has a financial obligation to assist with funding historic preservation and rehabilitation of all of the buildings and amenities on the campus. Funds to support operations are generated by tenant rentals at the Center, including a restaurant, a café, art galleries, non-profit organizations, and museums. Additional revenues are generated by visual, performing and literary arts events, large and small expositions, conferences and meetings. Funds for rehabilitation and restoration of the Center will be derived from financing supported by these revenues. Major funding is also derived from the philanthropic community which supports the Center's programs.

1.4 PROJECT OBJECTIVES

Project objectives are specific statements of purpose that relate to the need for the Project. A project's success can be evaluated based on whether it has successfully achieved its objectives. Objectives also provide the basis for creating the evaluation criteria used in the screening of a reasonable range of project alternatives (refer to Chapter 2. Alternatives). The objectives for this project are to:

- Increase regional access and decrease automobile-based trips to SF Maritime NHP and GGNRA
- Create and/or enhance transit connections to SF Maritime NHP and GGNRA for transit-dependent populations
- Provide direct transit service connecting SF Maritime NHP and Fort Mason Center with the recreation and cultural corridor along the northeastern waterfront, which would fill an existing gap in SFMTA's current service network

- Enhance the ability of Fort Mason Center to offer events, to provide increased funding support for GGNRA historic preservation efforts
- Offer park visitors and employees an attractive energy-efficient mass transit transportation alternative
- Avoid or minimize adverse effects to the NHLDs and NRHP-listed or eligible properties, and maintain the integrity of related cultural and historic resources
- Maintain the natural, scenic, and recreational values of SF Maritime NHP and GGNRA
- Create a transit link between the hotel facilities at Fisherman's Wharf and the conference facilities at Fort Mason Center

1.5 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

This project is focused on providing park visitors and transit-dependent residents with high-quality rail transit that improves transportation access and mobility between existing streetcar service at Fisherman's Wharf and SF Maritime NHP and the Fort Mason in GGNRA, with connection to the regional transit rail services. It will not make decisions on other mass transportation alternatives, transit links beyond Fort Mason or projects on San Francisco property.

The EIS evaluates impacts for the entire Project area (including non-federal lands), but in a NEPA framework. This project has been exempted from the California Environmental Quality Act (CEQA). In 1985, the San Francisco Planning Department issued a "Certificate of Determination of Exemption/ Exclusion from Environmental Review" for construction and operation of an E–Embarcadero Streetcar Line project between the Ferry Building and the west end of the Fort Mason Tunnel. The certificate was issued pursuant to a Statutory Exemption from CEQA for rail extension projects of under 4 miles in length, as specified in state law. This CEQA exemption was updated and reissued by the Planning Department, City and County of San Francisco on April 28, 2006 (SF Planning 2006).

1.5.1 Impairment of Resources and Values

The NPS Organic Act of 1916 prohibits the impairment of park resources and values. The NPS Management Policies 2006 define impairment as: an impact that, in the professional judgment of the responsible National Park Service 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. A written impairment determination will be made for the selected alternative and appended to the Record of Decision.

1.6 PARK PURPOSE AND SIGNIFICANCE

1.6.1 National Park Service Mission

The primary responsibility of the National Park Service is to ensure that park resources and values will continue to exist in an unimpaired condition that will allow people to enjoy them now and in the

future. The National Park Service Organic Act of 1916 and the General Authorities Act of 1970 are the foundation for this mission. These acts prohibit impairment of park resources and values. The 2006 NPS Management Policies use the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this EIS. Impairment is more likely when there are potential impacts to 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 as a goal in the park's general management plan or other relevant NPS planning documents.

1.6.2 National Park Sites in the Project Study Area

Golden Gate National Recreation Area. Congress established the GGNRA in 1972 under Public Law 92-589 with the purpose:

> *...to preserve for public use and enjoyment certain areas of Marin and San Francisco Counties, California, possessing outstanding natural, historic, scenic, and recreational values and...to provide for the maintenance of needed recreational open space necessary to urban environment and planning...* (Pub.L. 92-589, § 1, Oct. 27, 1972, 86 Stat. 1299).

This mandate to preserve the varied resources of the park for public use and enjoyment is significant in that it provided "an unprecedented opportunity to make national park resources and programs available to a wide variety of (urban) visitors, many of whom had not been reached by the more remote national parks" (NPS 1980). The GGNRA comprises a diverse collection of properties in three counties (now including San Mateo County) that range from bay and ocean shoreline to historic sites such as Alcatraz Island.

The former United States (U.S.) Army post at Fort Mason was incorporated into the national park system when GGNRA was established in 1972. Fort Mason is a Historic District and the San Francisco Port of Embarkation NHLD is within Fort Mason. Fort Mason is separated from SF Maritime NHP and Fisherman's Wharf by steep bluffs that form the eastern edge of Fort Mason and limit access between SF Maritime NHP and the Fort Mason Center.

Fort Mason consists of both Upper and Lower Fort Mason. Upper Fort Mason is at a higher elevation, and includes the Great Meadow and the headquarters of the GGNRA. Lower Fort Mason houses the administrative offices of SF Maritime NHP, including the headquarters offices, library and collections

and the Fort Mason Center,[6] which is administered by the non-profit organization also named Fort Mason Center under the terms of a long-term lease with National Park Service. The Center's Mission is:

> *To create and preserve a cultural, educational and recreational center that reflects the unique history, talents and interests of the people in the Bay Area, in partnership with the National Park Service*

Fort Mason Center is northeast of Marina Boulevard and Great Meadow. The entrance to Fort Mason Center is at the intersection of Marina Boulevard and Buchanan Street, adjacent to the high-density residential Marina district neighborhood of San Francisco, and associated commercial use close to the Center's entrance. As has been stated, Fort Mason Center is an important venue in the City for performances, conferences and exhibitions. **Photo 1-1** provides an overview of the Fort Mason Center (Lower Fort Mason).

Photograph 1-1. Fort Mason Center

San Francisco Maritime National Historical Park. SF Maritime NHP was established in 1988 as a distinct national park unit, incorporating such existing elements as the 1936 Aquatic Park Bathhouse (housing the Maritime Museum and San Francisco Senior Center), Aquatic Park, Hyde Street Pier, and the historic ship collection acquired by the National Park Service in 1978. **Photo 1-2** provides an overview of the Maritime Museum from Van Ness Avenue, including a portion of the former State Belt Railroad trackage. SF Maritime NHP's boundaries abut Fort Mason and include portions of Van Ness Avenue, Jefferson Street and Hyde Street. The SF Maritime NHP's mission is as follows:

> *San Francisco Maritime [NHP], with its partners, seeks to forge emotional and intellectual connections though preservation and interpretation of the resources and stories of America's maritime gateways, history, and culture, especially the development of the Pacific Coast. We maintain and make available the park's assets to enrich the lives of multiple communities and users.*

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[6] The following organizations are tenants at the Fort Mason Center: Animal Switchboard; Arts Arbitration & Mediation Services; BATS Improv; Blue Bear School of Music; Book Bay Bookstore; California Lawyers for the Arts; Chinese Cultural Productions; City College of San Francisco; Cooks & Company; Environmental Traveling Companions; Greens Restaurant; Long Now Foundation; Magic Theater; Mexican Museum; Museo ItaloAmericano; On the Commons; Ploughshares Fund; SF Children's Art Center; SFMOMA Artists Gallery; SF Maritime National Historical Park; World Arts West; Young Performers Theater.

Photograph 1-2. Maritime Museum

The significance of SF Maritime NHP is found in the museum and collections and the fleet of NHL vessels. Aquatic Park features historic structures and settings associated with the history of the Bay and Black Point, such as the Aquatic Park Historic District (which includes the Maritime Museum and associated public artwork, bleachers, concession stand and restroom buildings, east/west speaker towers, seawall and promenade, WWII army landing pier, integrated landscape portions of Aquatic Park, and the Aquatic Park Lagoon and Beach). The NHL nomination describes San Francisco's Aquatic Park as having "national significance in architecture and landscape architecture because of its outstandingly thorough and masterful design. The buildings and site are outstanding examples of Streamline Moderne. The park has no architectural parallel on the west coast, and although on a smaller scale, it rivals the design quality of portions of Miami Beach, famous for its Deco and Moderne buildings."

1.7 RELATED PLANS AND STUDIES

The Project is informed by the following studies and in conformance with approved plans and policies.

1.7.1 National Park Service Studies

Golden Gate Recreational Travel Study. In the 1970s, Congress mandated that the newly formed GGNRA conduct a Travel Study to investigate access issues to the new urban national park. The 1977 *Golden Gate Recreational Travel Study* identified environmental impacts, social impacts, and system goals

(NPS 1977). One of the recommendations from this study was that the State Belt Railroad right-of-way extending from Fisherman's Wharf through the Fort Mason Tunnel, should be used for transit. The study also found that recreational transit could play a large role in meeting the demand of transit dependent groups, including low-income populations.

Fort Mason Tunnel Studies. In 2005, the National Park Service conducted an evaluation to determine the structural deficiencies of the tunnel, and to assess the feasibility of rehabilitating the Fort Mason Tunnel for use by the future streetcar extension (Kleinfelder, Inc. 2005). The purpose of the study was to characterize the current condition of the tunnel and portal retaining structures and to develop concepts for rehabilitating these facilities for streetcar use. This study also included a geotechnical and seismic examination of the Fort Mason Tunnel. The study found that rehabilitation and strengthening of the tunnel would be needed due to voids behind the tunnel lining, water infiltration inside the tunnel, large cracks in the interior lining, and potential instability of the slope above the east portal. The report noted that the tunnel itself was not subject to earthquake damage from liquefaction or lateral spreading. In 2005, the National Park Service conducted an additional study to investigate methods for conducting the rehabilitation of the tunnel and estimate costs for the work (Jacobs Associates 2005). The study recommended preliminary construction scope, methods and costs. The 2004 study estimated costs for the tunnel work to be approximately $12.2 million, of which $5.2 million were estimated to be for streetcar track and systems, and approximately $7 million for tunnel rehabilitation work required to preserve the historic tunnel and prevent failure that would disturb land and buildings above the tunnel.[7]

1.7.2 National Park Service Plans

GGNRA General Management Plan. The GGNRA's *1980 General Management Plan* established management objectives to ensure that the park's purpose was fulfilled. These consisted of preservation and restoration of natural and cultural resources, making the recreation area readily available to the broadest variety of park users, provision of a broad variety of park experiences, and consideration of park neighbors. The plan identified the pursuit of transit extension between the park and transit dependent neighborhoods, and the use of transit systems to alleviate traffic impacts on adjacent communities and park resources. Furthermore, the plan identified the improvement of transit service to the park, and the provision of transit service within the park. The plan also identified the potential to use historic San Francisco trolley cars traveling along the existing State Belt Railroad right-of-way. The National Park Service is currently updating the 1980 GMP; the update is estimated to be complete in 2012.

GGNRA Strategic Plan, Fiscal Year 2008–2012. The *Strategic Plan for the Golden Gate National Recreation Area (Fiscal Year [FY] 2008–2012)* documents long-term goals that detail the actions and projects that National Park Service will accomplish towards meeting the overall park mission and associated goals. As part of its goal to increase overall visitor satisfaction with appropriate park facilities, services, and recreational facilities, the National Park Service has identified improving access options to GGNRA. One of the major transportation plans included in the strategic plan to further this goal is the extension of historic streetcar lines to Fort Mason.

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[7] Cost estimates for tunnel rehabilitation without rail for 2011 are: $750,000 for design, $9.2 million for construction; $1,380,000 for construction management.

Statement for Management. The 1992 *Golden Gate National Recreation Area Statement for Management* reiterated the importance of public access and public transportation. This statement for management identified the following management objectives: to provide alternative public transportation services as proposed in the GMP; to alleviate traffic impacts on adjacent communities and on park resources by promoting and encouraging visitor and employee use of public transportation; and to design and implement transportation plans to effectively manage the safe flow of traffic (1992).

SF Maritime NHP General Management Plan. The *1997 General Management Plan* of the SF Maritime NHP includes proposals to improve accessibility to the park by supporting related transportation proposals outlined in the *GGNRA GMP* and *Presidio Trust Management Plan*. These proposals include "opening the railroad tunnel under Fort Mason as an access to the maritime park from the Marina District and Presidio and extending the F-line rail system from Fisherman's Wharf west through Aquatic Park…" (NPS 1997).

Fort Mason Center Long-Term Lease Environmental Assessment. The purpose of this document, prepared in August 2003, is to allow the continued operation of the Fort Mason Center to meet the objectives identified in the Fort Mason Foundation's mission statement and the 1980 General Management Plan: to create and preserve a cultural, educational, and recreational center, which reflects the unique history, talents, and interests of the people of the Bay Area in partnership with the National Park Service (EIP et al. 2003)

The San Francisco Maritime National Historical Park Climate Change Action Plan (2010). The Climate Change Action Plan identifies steps that San Francisco Maritime National Historical Park can undertake to reduce greenhouse gas (GHG) emissions and adapt to the current and future impacts of climate change. The plan presents the Park's emission reduction objectives, and associated reduction actions to achieve the Park's goals.

The Golden Gate National Recreation Area Climate Change Action Plan (2008). The purpose of this plan is to provide a guide for the GGNRA to become a carbon neutral park and to adapt to changes the Park may experience due to a changing climate. The Action Plan is a planning-level document that lays out the principles and process by which the Park will adapt to climate change and reduce its net emissions of greenhouse gases (GHGs) (including those of its visitors) to the point that it is no longer a contributor to global warming. This plan will be implemented through annual plans that select actions and projects to pursue each year to achieve the overall goal of carbon neutrality by 2016.

1.7.3 Related Studies

2004 Muni E-Line[8] Extension Feasibility Study. In December 2004, the Presidio Trust completed the *Muni E-line Extension Feasibility Study*, which examined the feasibility of extending the yet-to-be-

[8] The E-line (also known as the E-Embarcadero Line) is identified in the SFMTA FY2008-FY2027 *Short Range Transit Plan* as a historic streetcar line that is proposed to run along the length of The Embarcadero using the existing F-line track between the Caltrain Terminal at Fourth and King Streets and the existing F-line terminus at Jones Street (Fisherman's Wharf). This project uses the term F-line extension since the E-line has not been developed. In the future, the extension proposed in this project from Fisherman's Wharf to Fort Mason Center may be a part of the E-line.

implemented E-line historic streetcar line from Fisherman's Wharf to Fort Mason Center using the Fort Mason Tunnel. San Francisco Municipal Railroad, SF Maritime NHP, and GGNRA were participating agencies in the study, which evaluated the potential effects of multiple alignment options on engineering, transit operations, land use, ridership potential, traffic, parking and circulation impacts and cultural resources.

1.7.4 Related Plans

In addition to NPS plans, the extension of historic streetcar service to Fort Mason has been identified or addressed in a variety of other local plans since the 1970s.

SFMTA 5 Year Plan 1977-1982. As early as 1977, SFMTA identified rail service along the Embarcadero, using upgraded State Belt Line Railroad infrastructure. The *5 Year Plan 1977-1982 Muni Metro: Issues and Strategies* issue paper identified a proposed line extending "along the waterfront to Fisherman's Wharf and perhaps Fort Mason" (1970).

SFMTA 1979 Short Range Transit Plan. As envisioned, in the 1979 Short Range Transit Plan (SRTP), historic and vintage streetcars would one day operate between the Caltrain Terminal at its southern end and Fort Mason Center at its northern end, via the Embarcadero (identified in the plan as the E-line). Tracks would be shared on the southern Embarcadero with the Muni Metro operation, and on the northern Embarcadero with the F-Market line.

1984 I-280 Transfer Concept Program EIR. The Interstate 280 (I-280) Transfer Concept Program was a comprehensive planning process developed jointly by Caltrans and the City and County of San Francisco. This process was mandated once San Francisco chose to cancel construction of I-280 north of King and 3rd Streets and decided instead to seek funding for replacement projects as part of the Interstate Transfer Program, which allowed local jurisdictions to substitute public transit or surface roadway projects for cancelled Interstate Highway projects. The 1984 I-280 Transfer Concept Program Environmental Impact Report (EIR) examined a variety of potential projects, including construction of a new historic streetcar line. The EIR included alternatives for the historic streetcar line that would extend along the Embarcadero to Fort Mason.

SFMTA 2000 Preliminary E-Embarcadero Line Operating Plan. In 2000, SFMTA prepared the Draft *Preliminary E-Embarcadero Line Operating Plan* for the E-line starter operation. This plan identified a basic E-line service from Fourth and King Streets, extending along the Embarcadero, terminating in Fisherman's Wharf. Additionally, SFMTA identified potential extension options for the future line- one of which was to Fort Mason.

2004 San Francisco Countywide Transportation Plan. The 2004 San Francisco County Transportation Authority (SFCTA) Countywide Transportation Plan identified the extension of historic streetcar service from Fisherman's Wharf to Fort Mason as a transit enhancement project that is eligible for $5 million in transportation funds approved through the 2003 voter approval of Proposition K.

2005/2008 Metropolitan Transportation Commission Transportation Plans. The 2005 *Metropolitan Transportation Commission [MTC] Final Transportation 2030 Plan* presented a list of key

investment projects and programs that expand the Bay Area region's transportation network and enhance mobility and accessibility for transit users. One of the identified projects listed in the plan is for the expansion of historic streetcar service. In December 2008, the MTC released the Draft Transportation 2035 Plan: *Change in Motion*. One of the projects listed in this plan is the extension of streetcar service from Fisherman's Wharf to Fort Mason. The MTC adopted the *Transportation 2035 Plan for the San Francisco Bay Area* on April 22, 2009. Under projects listed for San Francisco County, this plan includes extending streetcar service from Fisherman's Wharf to Fort Mason.

2006/2008 SFMTA Transit Effectiveness Program (TEP) and Enhanced Plan. The SFMTA Transit Effectiveness Program (TEP) was established in 2006 to provide a top-to-bottom review of the SFMTA transit system and to offer recommendations on improving reliability, reducing travel delay, and updating routes to more efficiently meet the transit needs of San Francisco. In 2008, the SFMTA Board of Directors endorsed TEP staff recommendations, which include initiating basic E-line service between the Caltrain Station and Fisherman's Wharf. In September of 2008, SFMTA released an Enhanced TEP, which serves as a "roadmap for the SFMTA to grow Muni service." The enhanced TEP identifies the extension of historic streetcar service (either as an extension of the existing F-line or as part of a future E-line) to Fort Mason to benefit residents and visitors.

2006 and 2007 SFMTA FY Short Range Transit Plan. In 2006, the Municipal Transportation Agency Board of Directors adopted the FY2006-FY2025 Short Range Transit Plan [SRTP]. The proposed project is included in this plan, which identifies the proposed historic streetcar extension as a precursor to a future E-line operation or as an extension of the existing F-line. In 2007, SFMTA released the Draft FY2008-FY2027 Draft Short Range Transit Plan for public review. This plan includes the extension of historic streetcar service to Fort Mason as identified in the FY2006-FR2025 SRTP.

San Francisco General Plan: Northeastern Waterfront Area Plan. The study area is partially included in the current Northeastern Waterfront Area Plan element of the *San Francisco General Plan* (as amended 07/31/2003), and specifically in the Fisherman's Wharf Subarea which extends from Municipal Pier to Pier 39. This plan includes policies that address transit and connectivity including:

- **Policy 7.3.** Connect the recreation and open space facilities of the Northeastern Waterfront with those of the Golden Gate National Recreation Area.
- **Policy 14.5.** Facilitate access into and within the Fisherman's Wharf area by transit through the provision of exclusive rights-of-way and other preferential treatment, through the extension of additional transit lines, improving frequency, speed, hours of operation, and providing clearly identified loading areas and routes. Establish a rail/bus transit line on Jefferson and Beach Streets, providing access to the Ferry Building and the South of Market area.
- **Policy 31.3.** Provide rail transit service in an exclusive transit way from Fort Mason to the Southern Pacific Depot. An extension of Market Street surface rail, the F-line should operate north of Market Street; the vehicles should be historic in character in order to provide a special waterfront transit identity. South of Market Street the transit service should be a surface extension of the MUNI Metro. Allow for continuous rail transit service along the length of the waterfront.

1.8 SCOPING FOR THE EIS

Scoping is an early and open process to determine the scope of environmental issues and alternatives to be addressed in a planning document in accordance with NEPA and Director's Order No. 12. To focus the analysis for this EIS, the National Park Service identified specific issues (also called "Impact Topics"). Issues were selected for analysis through internal scoping with NPS staff, cooperating agencies, and public scoping as described below. Refer to Chapter 6 (Consultation and Coordination) for additional information on public and agency involvement.

1.8.1 Public Involvement

The Notice of Intent (NOI) for the Project was published in the Federal Register on March 29, 2006. The NOI announced the preparation of an EIS by the National Park Service, as the federal lead agency. The NOI also provided information on Project issues and potential impacts and invited comments, questions, and suggestions on the scope of the EIS during the 60-day public scoping period, which ended on May 29, 2006. Postcards notifying the public of the commencement of the planning process were sent to approximately 4,000 individuals; the mailing list was developed from GGNRA, SF Maritime NHP, and SFMTA databases. A half-page ad announcing the public scoping meeting and requesting input was placed in the *San Francisco Examiner* on May 3, 2006, and a legal notice was posted in the *San Francisco Chronicle* on May 6, 2006. Public and agency scoping meetings were held on May 9, 2006 at the Fort Mason Officer's Club in San Francisco. A meeting with the NPS and the cooperating agencies was held from 2:00 p.m. to 4:00 p.m. and the public meeting was held from 6:00 p.m. to 9:00 p.m.

During the scoping period, the National Park Service received 101 comments from individuals, organizations representing environmental, conservation and recreational interests, and governmental agencies. The primary environmental concerns focused on changes in traffic and parking, impacts on parklands and recreational facilities, noise and vibration, visual impacts, and cultural resources.

Input was also solicited from the National Park Service Historic Streetcar Extension Technical Advisory Committee (TAC), which consists of members of GGNRA, SF Maritime NHP, SFMTA, Fort Mason Center, Market Street Railway, San Francisco County Transportation Authority, Golden Gate National Parks Conservancy, San Francisco Recreation and Park Department, and the Federal Transit Administration (FTA). NPS staff with expertise on park resources were also consulted. After the initial scoping period, the National Park Service continued to update the public about the Project during the park's quarterly open houses.

1.8.2 Concerns and Issues

During the scoping period, the National Park Service received 101 comments, 77 of which were written and the remainder heard and transcribed at the public scoping meeting. A total of 69 comments came from individuals not affiliated with any group. Organizations, particularly those representing environmental, conservation, and recreational interests, submitted 20 comments. Governmental agencies provided 12 comments. In general, the comments were divided into three categories:

- Support for the Project
- Environmental issues that needed to be addressed in the EIS
- New alternatives or recommended alternatives

Forty-eight comments supported the Project and five were in opposition. A plurality of comments regarding a recommended alternative favored the streetcar alignment operating with two tracks on Beach Street (Originally called Option 3 in the Feasibility Study, this later became the preferred alternative alignment). Thirty-one comments suggested new alternatives, including extensions of existing diesel and trolley bus routes into Fort Mason, should be studied. The primary environmental concerns focused on traffic and parking (31 comments), parklands and recreational facilities (22 comments), and noise and vibration (22 comments). Between 10 and 20 comments identified MUNI operational issues and visual and cultural resource concerns.

Comments received regarding the alternatives presented during the scoping period supported one or more of the alternatives presented. Additionally, a number of comments suggested new alternatives, including extensions of existing diesel and trolley bus routes to Fort Mason. A total of six more alignment alternatives and seven turnaround alternatives were developed as a result of the comments received during the public scoping period. This included consideration of other transit modes such as diesel bus and trolley coach. Four additional turnaround alternatives were subsequently developed during the Project's TAC meetings.

1.8.3 Impact Topics Selected for Detailed Analysis

The following issues and concerns were raised during the scoping process and selected for detailed analysis. Rational for selection of each impact topic was based on potential for substantive impact; environmental statues, regulations, and executive orders; and/or NPS management policies and guidance.

- **Land Use:** The majority of the study area is urbanized, and the proposed alignment for the build alternative is predominantly located within existing transportation corridors. However, if implemented, the Project could result in the conversion of open space or park/recreational areas to transportation use in the Transition Segment and in the Great Meadow of Fort Mason, dependent on the design option selected. Portions of the Project area are within the San Francisco Bay Conservation and Development Commission (BCDC) shoreline band jurisdiction (100 feet inland from the shoreline around San Francisco Bay); the Project could impact public access to the bay and its shoreline. According to the BCDC, the Project would require a BCDC permit and a consistency determination in accordance to the requirements of the federal Coastal Zone Management Act and the Coastal Management Program (BCDC letter dated June 12, 2006).

- **Socioeconomics:** The Project could stimulate economic activity along the northeastern waterfront and within the Fort Mason Center.

- **Transportation and Circulation**: Design of the system needs to be consistent with SFMTA's operational needs and engineering standards and function as an effective component of the City's transit system. Implementation of the extension may affect operations on existing

portions of the streetcar system. Implementation of the Project may affect the number of traffic lanes available for general traffic circulation in the Project study area. The Project would also reduce automobile trips, reducing traffic congestion. Implementation of the Project may eliminate existing parking spaces in the study area. The Project may include changes to existing bicycle and pedestrian paths in the study area.

- **Air Quality:** The study area is in an area that does not meet National Ambient Air Quality Standards for the federal $PM_{2.5}$ 24-hour standard (particulate matter with a diameter of 2.5 micrometers or less). Therefore, the Project must be analyzed for transportation conformity.

  – *Greenhouse Gas Emissions*: The proposed extension would extend a zero-local emission streetcar system; the electricity for which is a non-polluting source of renewable energy. A potential benefit of the Project would be the provision of an electric transit option for thousands of visitors who currently drive to the National Park destinations. The Project could impact vehicular traffic patterns and levels of service on adjacent city streets.

- **Noise and Vibration:** As the study area includes natural, cultural, residential and commercial uses, noise and vibration from the streetcar's operation may be a concern for park visitors, local residents and business owners.

- **Cultural Resources**: The study area includes three designated NHLDs (Aquatic Park; San Francisco Port of Embarkation; and San Francisco Cable Cars). Projects implemented in these districts must consider the preservation of their historic sites, structures, and other resources. Numerous NRHP-listed or eligible properties are also present in the study area. The National Park Service must avoid or minimize adverse effects to these properties. Cultural resource topics to be analyzed include: cultural landscapes; historic structures; and archeological resources. Cultural resource effects will be taken into account under Section 106 of the National Historic Preservation Act in consultation with the California State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP).

- **Recreation and Visitor Use:** When the GGNRA was established, recreation was among the purposes identified in the legislation (§ 460bb). The GMP and Development Concept Plan (DCP) for the park identify goals for recreation and visitor use, as well as the related facilities to support these uses. The Project would impact existing access for recreational and visitor use to the NPS facilities in GGNRA and SF Maritime NHP. The impact of the Project on park operations is considered in this section as well as Public Health and Safety.

- **Visual and Aesthetics Resources:** There has been concern that the proposed streetcar service would include overhead wires for power distribution and traffic signals at intersections. Visual resources within the Project area could be altered by facilities being constructed or removed.

- **Night Sky Visibility and Light Pollution**: The Project would introduce new night lighting sources at station platforms and along the alignment.

- **Geology, Soils and Seismicity:** The Project would be predominately in areas that currently or previously have supported developed facilities. Existing soil strata could be altered or removed and land contours could be changed as a result of construction and demolition activities. The study area lies within the right-lateral San Andreas Fault system, and re-use of historic infrastructure may require seismic retrofitting.

- **Biological Resources:** No threatened or endangered species, or designated critical habitat, have been reported in the study area. However, the Project area provides potential suitable habitats for special-status species including protected bat species; birds of prey; and birds protected under the Migratory Bird Treaty Act (MBTA). The Fort Mason Tunnel provides potential suitable roosting habitat for special-status bat species. For example, day and night roosts for pallid bats include crevices in caves, mines, and various human structures such as bridges, barns, and human-occupied as well as vacant buildings, besides rocky outcrops cliffs, and trees. Trees within, and in the vicinity of, the Project area could be used by birds protected by the MBTA, for nesting and foraging. The Project could impact special-status species or habitat used by these species.

- **Public Health and Safety:** A preliminary review of federal, local, and state databases for hazardous materials, and historic maps and documentation identifies potential hazardous materials concerns within the study area. The impact of the Project on park operations is considered in this section as well as Recreation and Visitor Use.

- **Public Services and Utilities**: This section reviews the infrastructure and services needed to support operation of the proposed historic streetcar extension.

1.8.4 Impact Topics Dismissed from Detailed Analysis

The following issues and concerns would not be affected, or would be affected negligibly by the alternatives; therefore, these topics have been dismissed from detailed analysis:

- **Cultural Resource Topics:** The National Park Service dismissed further evaluation of ethnographic resources (including sacred sites) and museum objects because these resources are not found in the Project study area. However, tribal consultation is ongoing for other aspects of the Project.

- **Energy Requirements and Conservation Potential:** The Council on Environmental Quality requires that an environmental impact evaluation include an assessment of the effects of the proposed activity on energy consumption and energy conservation. The Project would include streetcars powered by a traction power system. This electric traction power system consists of a substation and underground feeders in duct banks that provide power between the substation and the extension. According to SFMTA staff, the nearest SFMTA substation (Marina Station, 1575 North Point Street, San Francisco) is in the study area, and has spare capacity that could be used to provide power for this extension. If implemented, the proposed action would require a maximum draw of approximately 3300 amps, resulting in a voltage draw of 912 kw; this would be a negligible increase in the overall draw of the SFMTA traction power system from light rail vehicles and trolleys (84,194,369 kwh). According to the SFMTA's 2008 *Climate Action Plan*, the SFMTA fleet of historic streetcars is zero-local emission; the electricity for these vehicles is generated from a San Francisco hydroelectric power plant, a non-polluting source of renewable energy. Construction activities associated with the proposed action, if implemented, would be undertaken in an energy efficient matter. Although use of the electric streetcars would be expected to assist in reducing or offsetting vehicle based trips to Fort Mason the potential for the proposed action to result in measurable net energy conservation as a result of transit trips replacing automobile use is negligible. Energy consumption related to transportation within the study area is negligible when compared to the entire region. Therefore this topic was dismissed.

- **Environmental Justice**: Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations") requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. According to the Environmental Protection Agency (EPA), environmental justice is the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group of people, including a racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies. The Project would be beneficial for low income populations by improving public transportation opportunities for transit-dependent groups. The alternatives would not have disproportionate health or environmental effects on minorities or low income populations or communities as defined by the Environmental Protection Agency; therefore, this topic was dismissed.

- **Floodplain Management:** E.O. 11988, Floodplain Management, requires all federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. According to the San Francisco General Plan Community Safety Element (revised 1997), "San Francisco is not subject to flooding of natural waterways (The National Flood Insurance Program, which designates flood-prone areas, has identified no areas in San Francisco)." More recently The Pacific Institute published maps of 100 year flood inundation for California, incorporating 1.4 meter of sea level rise (Pacific Institute 2009). While there is some evidence of inundation within the San Francisco Bay shoreline, these maps show this inundation to be outside of the project area. Therefore, this topic was dismissed.

- **Indian Trust Resources:** Department of Interior Environmental Compliance Memorandum 95-2 requires the National Park Service to address environmental impacts of its proposed actions on Indian Trust Resources. Indian trust resources are those assets owned by Native Americans but held in trust by the United States. Since the lands in the study area are not trust resources, this topic was dismissed.

- **Park Operations:** Park operations refers to the staff and budget required to adequately protect and preserve park resources and provide for a safe and effective visitor experience. Full consideration of a proposed project's impact upon park operations may be warranted if a project has the potential to affect park staffing requirements, management policies, and/or changes to maintenance budgets. SFMTA will be responsible for operating the F-Line streetcars and maintain the project-related improvements (i.e., track, platforms, overhead cables, lights, etc.) Impacts to Fort Mason and San Francisco Maritime National Historic Park (SAFR) operations could occur if the project induced a substantial increase in park visitation. The resulting pressure on park operations and maintenance personnel could have an impact on park staffing and budgeting.

  While the proposed project is expected to result in a noticeable modal shift (i.e., from personal automobile to transit), it is not expected to cause a substantial increase in total visitation to either park. Without the proposed project, daily trips to the two parks by the year 2030 are expected to increase by 7.8% and 6.6%, respectively (URS 2009f). With project

implementation, daily trips to the two parks by the year 2030 are expected to increase by 8.2% and 5.3%, respectively (URS 2009f).[9]

The proposed project would reduce pressure on SAFR by diverting riders from existing transit lines within the SAFR district (such as the Powell-Hyde cable car) to the stops on the proposed Fort Mason streetcar extension within the Fort Mason district. Therefore, by 2030, implementation of the proposed project, as compared to the no-project alternative, is expected to result in a net change in daily ridership to Fort Mason and SAFR of +1.0% and -1.0%, respectively. Although such a shift may result in a slight increase in maintenance staff hours (as discussed in the analysis of Recreation and Visitor Use) the implications for overall park operations are considered negligible and, as a result, Park Operations was not included as an impact topic selected for detailed analysis.

- **Prime and Unique Agricultural Land:** The Farmland Protection Policy Act was established to minimize the conversion of prime and unique farmland, and farmland of statewide or local importance, to nonagricultural uses, and to ensure that federal programs are compatible with state, local, and private programs and policies to protect farmland. The Act does not apply to projects already in urban development; all soils within the study area have been classified as urban land by the National Resources Conservation Service; therefore, this topic was dismissed.

- **Sea-Level Rise**: According to several reports released in 2009, global warming is expected to result in a predicted sea-level rise in San Francisco Bay of 16 inches by 2050, and a sea-level rise of up to 55 inches (1.4 meters) by 2100 (BCDC 2009; Pacific Institute 2009). Increases in sea level are anticipated to result in a variety of local impacts, such as erosion of beaches, bay shores, and tidally influenced river deltas; increased flooding and erosion of marshes, wetlands, and tidal flats; increased flooding and storm damage in low-lying coastal areas, damage to costal infrastructure and property, etc.)(SF Dept. of the Environment 2004).

  The San Francisco Bay Conservation and Development Commission (BCDC) has mapped the effects of such a sea-level rise in the San Francisco Bay Area, including a 16-inch rise by mid century and a 55-inch rise by the end of the century. According to BCDC maps and projections, this predicted rise in water levels may be less in the Project study area (BCDC 2008) due to the existing breakwater and the steeper slope rising up from the shore. Thus, such a rise is not expected to impact the proposed streetcar extension alternatives, as the alternatives would be at an adequate distance and elevation to be protected from such a rise. For this reason, the sea-level rise impact topic was dismissed from further evaluation in this report.

- **Wetlands**: E.O. 11990, Protection of Wetlands, directs federal agencies to avoid adverse impacts to wetlands. No potential jurisdictional waters of the United States are within the Project area. The San Francisco Bay, which is a jurisdictional water of the U.S., is located within the study area. No fill or adverse modification of wetlands or non-wetland waters of the U.S. by the Project are expected. Therefore, this topic was dismissed.

- **Wilderness Values:** The Wilderness Act of 1964 established the national wilderness preservation system. This impact topic was dismissed because there are no designated wilderness areas within the study area.

[9] The study in which these figures appear uses 2005 ridership as the base for its projections.

- **Wild and Scenic Rivers, Ecologically Critical Areas:** The Wild and Scenic Rivers Act of 1968 established the national wild and scenic river system to preserve certain rivers with outstanding cultural, natural, or recreational values. There are no designated wild, scenic, or recreational rivers or other designated ecologically critical areas within the study area; therefore this topic was dismissed.

- **Water Resources:** With the exception of the San Francisco Bay, which would not be impacted by the Project, no other surface waterways are present in the Study Area. As noted above, no fill or adverse modification of wetlands or non-wetland waters of the U.S. by the Project are expected. The Study Area is not subject to flooding of natural waterways. Neither of the Project alternatives would result in any change to water rights. If the Proposed Action were implemented, a Construction General Permit issued by the State Water Resources Control Board—including a Storm Water Pollution Prevention Plan—would be obtained prior to construction and would incorporate best management practices to reduce storm water pollution and erosion. Additionally, design and construction for facilities within the study area would comply with NPS and GGNRA policies, standards and guidelines, including the Golden Gate Project Handbook (NPS 2004a). Therefore, this topic was dismissed.

1.9 PROJECT PARTNERS

1.9.1 Cooperating Agencies

The core team for this Project includes the National Park Service as the lead federal agency for the EIS, as well as representatives from the following cooperating agencies:

- San Francisco Municipal Transportation Agency
- Federal Transit Administration

1.9.2 Technical Advisory Committee

A TAC was convened to meet periodically to review the progress of the Project and provide technical support during the various stages of the study and preparation of the EIS. Members of the TAC include the cooperating agencies as well as representatives from the following organizations:

- Fort Mason Center
- Golden Gate National Parks Conservancy
- Market Street Railway
- San Francisco Department of Recreation and Parks
- San Francisco County Transportation Authority

1.10 PLANNING PROCESS

The EIS is being prepared in accordance with NEPA and *Director's Order 12: Conservation Planning, Environmental Impact Analysis, and Decision Making*. The EIS describes, analyzes, and compares the potential environmental impacts of the alternatives and their implementation, and provides additional

information on the methodologies and assumptions used for the analyses. It also proposes mitigation measures that can minimize the effect of adverse impacts.

The National Environmental Policy Act regulations and *Director's Order No. 12* require consideration of a project's potential environmental impacts as early as possible in the planning process. This helps to ensure environmental values are considered as the project takes shape. At the same time, because the NEPA process occurs early in the planning stages, some of the project elements being evaluated can be conceptual in nature, and subject to change through subsequent state or local planning processes. This document closely examines the potential impacts of the F-line extension from Fisherman's Wharf to the Fort Mason Center, while recognizing that decisions regarding various elements of the proposed project, such as in-street track alignment, platform location, and shelter design, will be determined during a subsequent local public planning process facilitated by SFMTA. That process will provide additional opportunity for consideration of operational and design characteristics, and public comment.

The Draft EIS was published in March of 2011. Government agencies and the general public had the opportunity to review and comment on the document during a 60 day formal comment period. The public comment period began on March 18, 2011 with publication of a Notice of Availability (NOA) for the DEIS in the Federal Register. NPS also distributed a news release and mailed approximately 3,750 letters announcing the DEIS' availability and describing the public commenting process and review schedule. Members of the public were invited to attend an open house meeting on April 20, 2011, during which time NPS collected written comments on the DEIS. The public comment period officially closed on May 17, 2011.

Public comments were recorded and categorized in order for the National Park Service to prepare responses to the comments, which are incorporated into this Final EIS (FEIS). The FEIS incorporates revisions to the text that correspond to the comments received and identifies the lead agency's reasons for selecting the preferred alternative. A more detailed discussion of the comments analysis process, and reference to specific changes to the document resulting from those comments, is provided in Chapter 7. The release of the FEIS was announced through publication of a Notice of Availability (NOA) in the Federal Register. A minimum of 30-days must pass between publication of the NOA and issuance of a Record of Decision (ROD). A ROD notifies the public of the alternative that the agency has selected to be carried forward for more detailed engineering and design and the rationale for that decision. The EIS analysis is considered as part of the decision-making process, which may also include consideration of other decision factors such as costs, technical feasibility, agency statutory mission, project purpose and need, and goals and objectives.

2.0 ALTERNATIVES

2.1 INTRODUCTION

This chapter identifies a range of alternatives that were considered technically feasible and that meet the project objectives, as outlined in Chapter 1. Purpose and Need. The following sections present the development and evaluation of the project alternatives and the selection of the preferred alternative.

2.1.1 Alternatives Development Process

The National Environmental Policy Act (NEPA) requires that an Environmental Impact Statement (EIS) evaluate a reasonable range of feasible alternatives to the proposed action. The EIS must evaluate a No Action Alternative to allow decision makers to compare the effects of approving the proposed action with the effects of not approving it. Alternatives must be evaluated in the same level of detail provided for the proposed action (40 Code of Federal Regulations [CFR] 1502.14).

The preliminary alternatives considered in this EIS were developed based on previous planning studies, public scoping and agency working group input. In 2004, the *Muni E-Line Extension Feasibility Study* (Feasibility Study) was conducted under the direction of a Project Steering Committee consisting of the Presidio Trust, the Golden Gate National Recreation Area (GGNRA), the San Francisco Maritime National Historical Park (NHP), Fort Mason Center (FMC), Market Street Railway, and San Francisco Municipal Transportation Agency (SFMTA). The Feasibility Study examined the technical feasibility of extending the SFMTA San Francisco Municipal Railway's (Muni's) proposed E-Line[1] west from its proposed initial terminal in Fisherman's Wharf to Fort Mason. A number of alternatives were considered and broken into sections or segments and sub-segments. The mode of transportation considered for all alternatives in the Feasibility Study was streetcar, and all alternatives used the Fort Mason Tunnel.

The alternatives proposed in the Feasibility Study were further developed and refined during the environmental review process for this project to generate alternatives for the Proposed Action that were responsive to public and agency comments, the Project Goals and Objectives, and the Purpose and Need. Particular attention was paid to minimize impacts to the parks and the historic districts. The rest of the preliminary alternatives considered but eliminated from further study are discussed in Section 2.5 of this chapter.

Public Scoping. The scoping process began March 29, 2006, and included a public scoping meeting and a local and regulatory agency scoping meeting, both held on May 9, 2006. Project objectives were refined from those in the Feasibility Study, and alignment alternatives, transition segments, and

[1] As noted in Chapter 1, the E-line (also known as the E-Embarcadero Line) is identified in the SFMTA FY2008-FY2027 *Short Range Transit Plan* as a historic streetcar line that is proposed to run along the length of The Embarcadero using the existing F-line track between the Caltrain Terminal at Fourth and King Streets and the existing F-line terminus at Jones Street (Fisherman's Wharf). This project uses the term F-line extension since the E-line has not been developed. In the future, the extension proposed in this project from Fisherman's Wharf to Fort Mason Center may be a part of the E-line.

turnaround concepts were presented at both the public and agency scoping meetings. The following project objectives were presented:

- Increase alternative transportation options for visitors to the SF Maritime NHP and Fort Mason Center;
- Serve a defined recreation and cultural corridor along the northern waterfront;
- Enhance links for the City's transit-dependent population with all NPS sites and other northern waterfront attractions;
- Improve local and regional transit connectivity and decrease the need for automobile use and parking in historic and environmentally sensitive areas;
- Facilitate efforts to reduce the need for automobile-based trips to the National Historic Landmark District destinations by providing park visitors an attractive, non-polluting mass transit access;
- Avoid or minimize adverse effects on the National Historic Landmark District and related cultural and historic resources and waterfront values.

Alternatives Screening Process. Following the identification of alternatives, a screening process was developed to eliminate alternatives that were not feasible or that did not meet the project's purpose and need. Evaluation criteria were developed in consultation with the cooperating agencies and the Technical Advisory Committee[2] (TAC) to screen the alternatives developed in scoping to be taken forward into the environmental process for analysis, and to be compared against a No Action scenario. The screening criteria for this project were organized into three major areas:

- **Purpose and Need** – Criteria relating to the Purpose and Need for the project.
- **Park Preservation** – Criteria relating to the various objectives of the National Park Service in operating the national parks through which this project passes.
- **Operability** – Criteria relating to the technical capabilities and limitations of the transit vehicles and infrastructure proposed for use in the various alternatives, and criteria relating to the objectives of the SFMTA in operating the citywide transit system.

This section will describe the individual criteria developed for each screening subject area, and how it was applied in the process.

Purpose and Need Criteria

- **Increase connectivity with regional transit services –** The degree to which each alternative facilitates transit connectivity, which is the ability of users to connect from one transit system to another. For this project's purposes, it is desirable to provide visitors with the greatest number of possible regional transit connections, within one-half block of the proposed alignment, such as to the Caltrain Terminal, Ferry Building, Bay Area Rapid Transit (BART), Transbay Terminal.

[2] The project's TAC consists of the NPS/GGNRA, NPS/San Francisco Maritime NHP, San Francisco Municipal Transportation Agency – San Francisco Municipal Railway (Muni), Federal Transit Administration, Fort Mason Center, Market Street Railway, San Francisco County Transportation Authority, and San Francisco Department of Recreation and Parks.

- **Improve connectivity for transit-dependent residents** – The degree to which each alternative enables transit-dependent residents to access the two national parks and the northeastern waterfront with one or no transfer.
- **Improve local transit access** – The degree to which each alternative provides enhanced local transit.
- **Connect the San Francisco Maritime NHP and GGNRA to trip generators[3] along the northeastern waterfront cultural and recreational corridor** – The degree to which each alternative connects NPS sites with trip-generating elements of the northeastern waterfront cultural and recreational corridor, such as the Ferry Building, the Alcatraz ferry dock at Pier 33, and the shops and aquarium at Pier 39.
- **Facilitate and encourage potential transit ridership increase** – The degree to which each alternative facilitates projected increased transit ridership to the two national parks.
- **Increase connectivity with current historic streetcar service** – The degree to which each alternative directly (no transfer) links to the existing historic streetcar service.
- **Integrate historic infrastructure** – The degree to which each alternative incorporates historic rail infrastructure, as identified in previous NPS plans.

Park Preservation Criteria

- **Minimize impact on National Historic Landmark (NHL) Properties** –The degree to which each alternative minimizes adverse effects on the Aquatic Park National Historic Landmark District (NHLD) and the San Francisco Port of Embarkation NHLD. There are several historic properties within the project study area. Any effects to these properties would be taken into account and avoided, minimized or mitigated.
- **Minimize impact on the existing historic and cultural setting** – The degree to which each alternative minimizes visual, noise, or other impacts on historic and cultural facilities.
- **Minimize use of parkland for non-park purposes** – The degree to which each alternative minimizes the use of parkland for a non-park use (e.g., incorporation into a transportation facility, temporary occupancy of park land that would result in permanent adverse physical impacts, or would interfere with the activities or purpose of the park).
- **Increase access to NPS facilities** – The degree to which each alternative is in close proximity to NPS sites, without physical impediments to access (e.g., steep grades, physical barriers) between the proposed project area and NPS facilities.
- **Minimize bike and pedestrian impacts** – The degree to which each alternative minimizes conflict with major bike or pedestrian flows.
- **Minimize air quality impacts** – The degree to which each alternative minimizes air quality impacts through incorporation of vehicles and other operating facilities that produce the least possible emissions.

[3] Trip generators are activity centers, sites, or amenities that attract people, whether they are local residents or out-of-town visitors.

Operability Criteria

- **Engineering – street grade** – The degree to which each alternative minimizes operation on steep grades. Grades between 6 and 9 percent are not desirable for rail operations. Grades between 3 and 6 percent are not optimal, but acceptable. Grades less than 3 percent are the most desirable.
- **Engineering – curves and special work** – The degree to which each alternative minimizes construction and operation of complex trackwork—especially in combination with curves and/or steep grades—for operational safety, maintainability, and transit rider comfort. Complex track work, special work on steep grades, and curves on steep grades are not desirable.
- **Maximize separate right-of-way for transit** – Measurement of mileage operating in a separate off-street right-of-way (ROW) (e.g., in tunnel, open space).
- **Arterial traffic** – The degree to which each alternative maximizes the ability to create reserved or semi-exclusive ROW within street for separation from arterial traffic.
- **Minimize operating costs** – The degree to which each alternative minimizes estimated incremental additional operating cost for each alternative.
- **Service design** – The degree to which each alternative adheres to Muni Service Planning guidelines - conforms with overall route network structure and conforms to general Muni preferences for straight-line routes, minimizes use of single-purpose shuttles, and maintains the ability to serve both directions of travel at the same location.
- **Network Efficiency** – The degree to which each alternative minimizes the amount of time spent traveling out-of-direction.
- **Minimize conflict with other transit operations** – degree to which each alternative minimizes conflicts with other transit modes, operations and terminals and minimizes the necessity to move other transit operations to accommodate the project.
- **Surface operational safety** – The degree to which each alternative ensures that the surface operational safety for all users, operators, and the public is not compromised by any operating condition, or combination of conditions.
- **Tunnel Operational Safety** – The degree to which each alternative provides a secure method for controlling operation in the Fort Mason tunnel by precluding non-transit vehicle access into the tunnel.

Results of Preliminary Alternatives Evaluation. The results of the preliminary alternatives evaluation yielded one alignment alternative and two turnaround options. Two design options were added for the on-street segments; these design options are essentially different arrangements of the trackway within the street ROW. Together these alternatives fully address the project objectives and project purpose and need while also avoiding or minimizing impacts to nearby resources. Among all the preliminary alternatives considered technically feasible, they are considered to represent a reasonable range of alternatives to be considered for detailed analysis in this EIS. Based upon the conceptual engineering analysis, these alternatives are considered technically feasible and cost effective. These alternatives were, therefore, selected for further analysis regarding their potential environmental impacts and are carried forward for analysis. Section 2.5 describes the rest of the alternatives that were considered dismissed from further analysis.

2.2 ALTERNATIVES ANALYZED IN DETAIL

This section describes the alternatives considered for detailed analysis.

2.2.1 Project Study Area Segments

The Project study area includes a 0.85-mile length from the established F-line terminus on Jones Street at Fisherman's Wharf through San Francisco Maritime NHP, extending west through the historic State Belt Railroad tunnel (Fort Mason Tunnel) to a new terminus in GGNRA in either Fort Mason Center or Great Meadow (see Figure 1-2).

The study area is divided into the following four segments analyzed separately in the alternatives: In-Street; Transition; Fort Mason Tunnel; and Turnaround (**Figure 2-1**). During the alternatives development process alternatives were examined for each of these segments as described in Section 2.5.

In-Street Segment. This approximately 2,500 foot street running segment runs along Beach Street between Jones Street and the base of Polk Street (approximately adjacent to the Maritime Museum). This segment would connect the terminus of the existing F-line at Jones Street with the proposed F-line extension.

Transition Segment. This approximately 750 foot segment connects the In-Street Segment from Beach Street, through San Francisco Maritime NHP, and up to the Fort Mason Tunnel Segment. This segment crosses Van Ness Avenue before entering the tunnel.

Fort Mason Tunnel Segment. The existing 1,500 foot tunnel segment runs underneath Fort Mason and the Great Meadow from the east tunnel portal at Van Ness Avenue to the west tunnel portal at Marina Boulevard and Laguna Street. It is a single-track tunnel, used for freight train movements until the late 1970s. This tunnel segment would need to accommodate the bi-directional movement of streetcars on a single track. Structural rehabilitation of the tunnel would be required for its use.

Turnaround Segment. The turnaround segment occurs between the west tunnel portal at Marina Boulevard and Laguna Street. The areas considered in the alternatives include the lower Fort Mason (Fort Mason Center) parking lot and the Great Meadow. The turnaround segment would be the terminus of the proposed F-line extension and would allow for westbound streetcars to turnaround in a loop of track before returning eastbound back through the Fort Mason Tunnel.

2.2.2 Alternative 1 – No Action

The No Action Alternative is included as an alternative for detailed analysis pursuant to 40 CFR 1502.14(d) of the Council on Environmental Quality regulations. The No Action Alternative assumes that the National Park Service would not grant a new easement for a streetcar extension. The existing F-line Streetcar service, which terminates at Jones Street, would not be extended. There would be no construction or transit operation costs, and no additional funding would be raised. Chapter 3.4, Transportation and Circulation, describes the current transit services and storage and maintenance facilities in the study area.

Alternative 1 provides a baseline for comparing the other alternative, evaluating the magnitude of proposed changes, and measuring the effects of those changes. The No Action alternative follows the guidance of the Council on Environmental Quality, which describes the No Action alternative as representing no change from the current management direction. Under the No Action Alternative, the F-line would not be extended beyond Fisherman's Wharf; the Transition Segment within the Aquatic Park NHLD would remain undisturbed; the Fort Mason Tunnel would remain closed and would not be renovated or made seismically sound; and the Turnaround Areas (Great Meadow or lower Fort Mason) within the Fort Mason National Register Historic District and the San Francisco Port of Embarkation NHLD (see Figure 2-1) would remain undisturbed.

The 2007 *Fort Mason Center Employee Survey* (URS 2009f) concluded that approximately 17 percent of Fort Mason Center employees currently arrive at work by transit. The 2007 *Fort Mason Intercept Survey* (URS 2009f), which surveyed 729 visitors to Fort Mason Center found that approximately 11-14 percent of current visitors reported that they took transit to Fort Mason.

The lack of connectivity between the Fort Mason Center and nearby transit lines is depicted on Figure 1-2. The 28 bus line provides the closest connection to Fort Mason Center with a station at Marina Boulevard and Laguna Street; however this bus line originates in Daly City and only services the western and northern parts of San Francisco.[4] Passengers arriving near Upper Fort Mason via the 47 or 49 bus lines disembark at Van Ness Avenue and North Point Street and then walk approximately 0.6 miles along streets or a path through the Great Meadow to reach Fort Mason Center. Passengers arriving via the 30 would disembark at Chestnut Street and Laguna Street and then walk approximately 0.3 miles along Laguna Street to the Fort Mason Center entrance. Visitors coming from Fisherman's Wharf take the existing F-line to Jones Street and then walk approximately 1 mile to reach the Fort Mason Center.

2.2.3 Alternative 2 – Proposed Action Alternative (with Turnaround Options)

The Proposed Action would extend the existing F-line streetcar service from Jones Street to Fort Mason Center. This section describes the Proposed Action components, as well as anticipated construction requirements and operation. Section 2.5 provides detail regarding the alternative development process which resulted in the Action Alternative. Alterative 2 includes a preferred In-Street alignment, Transition, Fort Mason Tunnel, and Turnaround Segments. The Turnaround Segment presents two options, Alternative 2A: North Loop (located in the Fort Mason Center parking lot) and Alternative 2B: South Loop (located in Great Meadow), which are analyzed separately in the Environmental Consequences chapter. The segment details are summarized in **Table 2-1**. The In-Street Segment presents both mixed traffic and semi-exclusive options (autos do or do not share track right-of-way); however these would be determined during the final design phase. They have been analyzed separately as appropriate in the resource sections.

[4] SFMTA's *Transit Effectiveness Project* recommends changes to the 28 and 28L bus line that would eliminate the bus stop closest to Fort Mason Center at Marina Boulevard. The new route would run along Lombard Street and terminate at Van Ness Avenue and North Point Street (SFMTA 2008b).

Note: Track details generalized.

* Platform locations are for illustrative purposes only and subject to change. Final platform locations will be determined through a separate local planning process that will take into account operational and design considerations, as well as public comment.

N

0 300

Scale in Feet

ALTERNATIVE 2 PROJECT COMPONENTS AND TRACK SEGMENTS

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 2-1

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TABLE 2-1: ALTERNATIVE 2 PROJECT SEGMENT DETAILS

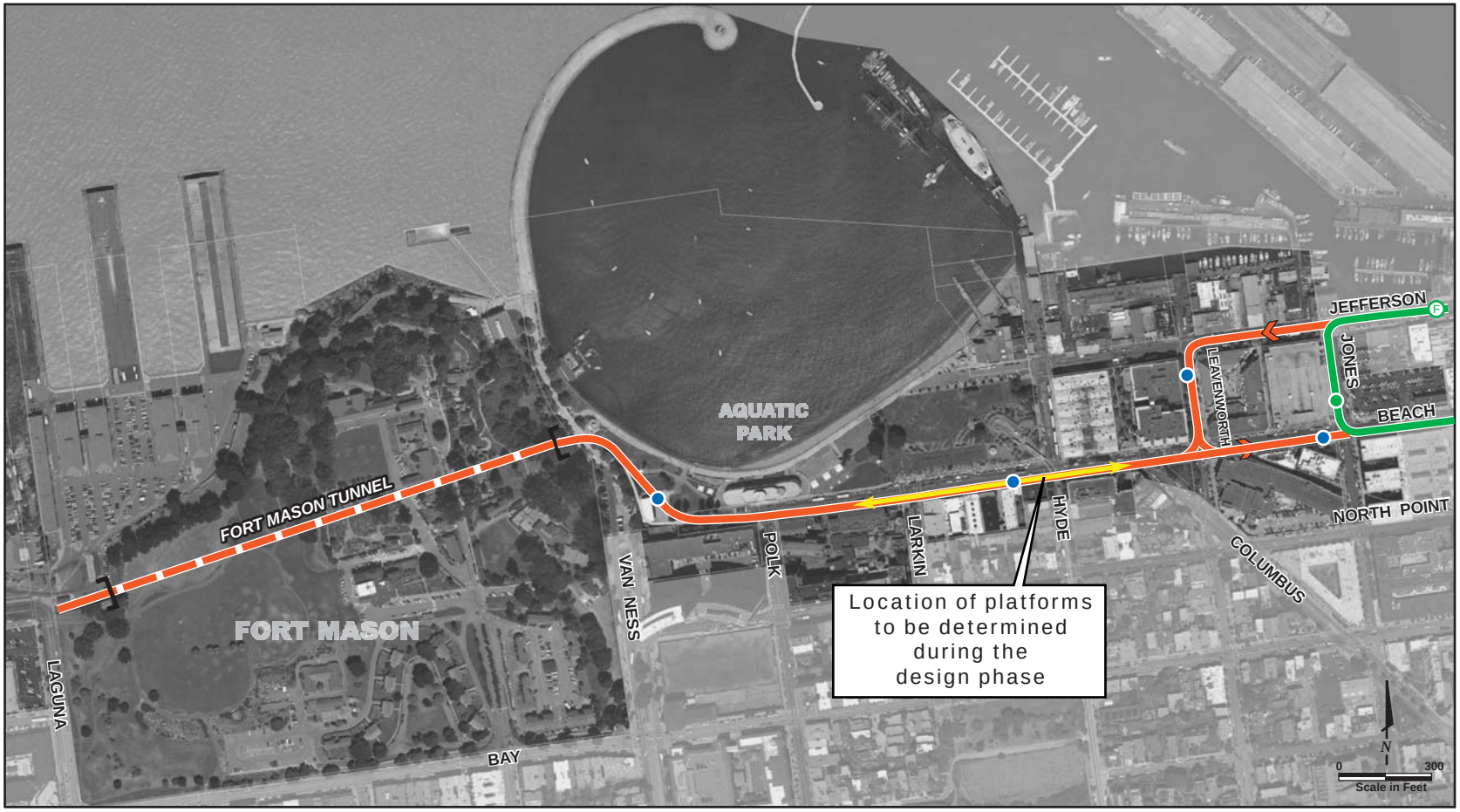
	In-Street Segment	Transition Segment	Fort Mason Tunnel Segment	Turnaround Segment Option– Alternative 2A North Loop (Preferred)	Turnaround Segment Option– Alternative 2B South Loop
Description	Operates west down Jefferson Street to Leavenworth Street, south to Beach Street, and in both directions along Beach Street between Jones Street and the transition at Van Ness Avenue. • semi-exclusive operations along Jefferson Street • mixed traffic operation along Leavenworth Street • crossing the existing cable car tracks at Hyde Street	The transition segment takes the alignment from the double-track, street-running segment to the east, shifting the alignment to NPS property to the west of Polk Street. The line would move from double track to single track between the platforms and the tunnel portal.	The streetcar extension would run on a single track through the tunnel. Tunnel improvements would include installation of new track and overhead lines and reconstruction of the tunnel interior	In the North Loop turnaround tracks would loop north out of the Fort Mason Tunnel and enter the Lower Fort Mason parking lot.	In the South Loop turnaround tracks would loop south out of the Fort Mason Tunnel and enter the Great Meadow.
Segment-Specific Details	Options to be determined during design phase: 1) shared auto/streetcar operation 2) semi-exclusive for the eastbound alignment and shared operation for the westbound alignment 3) hybrid of the two options	None	Upgrades needed: Installation of new track and overhead lines and reconstruction of the tunnel interior—including a new tunnel lining, ventilation fan, signals, lighting, and utilities and traction power feeders. Additional capacity (e.g., track circuitry and logic controlling the signaling and the interlocking) would also be built into the system		
Station Platforms	Total Added: Four Location: • dual side platforms on bulbed-out sidewalks east or west of Hyde Street on Beach Street • eastbound side platform west of Jones Street on Beach Street • westbound side platform south of Jefferson Street on Leavenworth Street	Total Added: Two Location: • east side of the transition segment • west side (located just south of an existing east/west pedestrian path and the historic speaker tower in Aquatic Park)	Total Added: None	Total Added: Two Location: • alongside Building A • on the loop's eastern side near the east retaining wall in the Fort Mason Center parking lot	Total Added: One Location: • In the Great Meadow adjacent and parallel to Laguna Street
Specifications Common to all Segments	signals, crossings, wires and poles	signals, crossings, wires and poles	signals	signals, crossings, wires and poles	signals, crossings, wires and poles

Project Components. If implemented, the extension would include approximately 0.85 mile of new rail track; associated features such as signals, crossings, wires and poles; approximately 8-9 new platforms; new designated stops; retrofitting of the historic State Belt Railroad tunnel (Fort Mason Tunnel); and construction of a track turnaround in the Fort Mason Center parking lot or Great Meadow.

In-Street Segment. The configuration options for the In-Street alignment, which runs west down Jefferson Street (from its intersection with Jones Street) to Leavenworth Street, then south to a section of Beach Street extending from the streetcar terminal at Jones Street to the base of Polk Street (approximately adjacent to the Maritime Museum), were developed based on what was termed Alignment Option 3: Beach Street, in the Feasibility Study. This alignment operates in both directions on Beach Street between Leavenworth Street and the transition at Van Ness Avenue (see **Figure 2-2**). One option consists primarily of shared auto/streetcar operation and a second option consists of semi-exclusive for the eastbound alignment and shared operation for the westbound alignment. There are portions of the shared option that contain semi-exclusive operations along Jefferson. It is possible to create a hybrid of the two options having some semi-exclusive and some shared for the eastbound alignment. As described above, these options would be determined during the final design phase. Due to the high level of pedestrian activity in this area, special attention will be paid to pedestrian safety measures during the final design. The curved cable car trackage through the intersection at Beach Street and Hyde Street will require a custom, fabricated crossing to accommodate the cable car appurtenances and maintain traction power (URS 2009e). The actual design of the cable car crossing structure will be accomplished during preliminary and final design. Both options include:

- semi-exclusive operations along Jefferson Street
- mixed traffic operation along Leavenworth Street
- crossing the existing cable car tracks at Hyde Street
- three new traffic signals and three existing signals would be added or reconstructed to accommodate streetcar operations
- Mini-high station platforms that are Americans with Disabilities Act (ADA) compliant:
  - Dual side platforms on bulbed-out sidewalks east or west of Hyde Street on Beach Street
  - Eastbound side platform west of Jones Street on Beach Street
  - Westbound side platform south of Jefferson Street on Leavenworth Street

Mixed Traffic (autos share track lanes) Streetcar Design Option. Under this option, the alignment would extend from the transition segment at Beach Street and Polk Street and continue east along Beach Street to Leavenworth Street in mixed traffic. At Leavenworth Street, the eastbound alignment would continue on a single track along Beach Street to Jones Street where it would connect with the existing F-line streetcar tracks. The westbound alignment would proceed north on Leavenworth Street from Beach Street to Jefferson Street in mixed traffic for this block. At Jefferson Street, the westbound alignment would continue in semi-exclusive ROW east to Jones Street, where it would connect with the existing F-line. The existing F-line would be realigned with the proposed extension on a shared single track, through a semi-exclusive track configuration.



Source: Wilbur Smith Associates, 2004; NPS

LEGEND

- F Market (existing)
- Fort Mason Extension (proposed)
- Platform (existing)
- Platform (proposed)*

ALTERNATIVE 2 PROPOSED ACTION ALIGNMENT

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 2-2

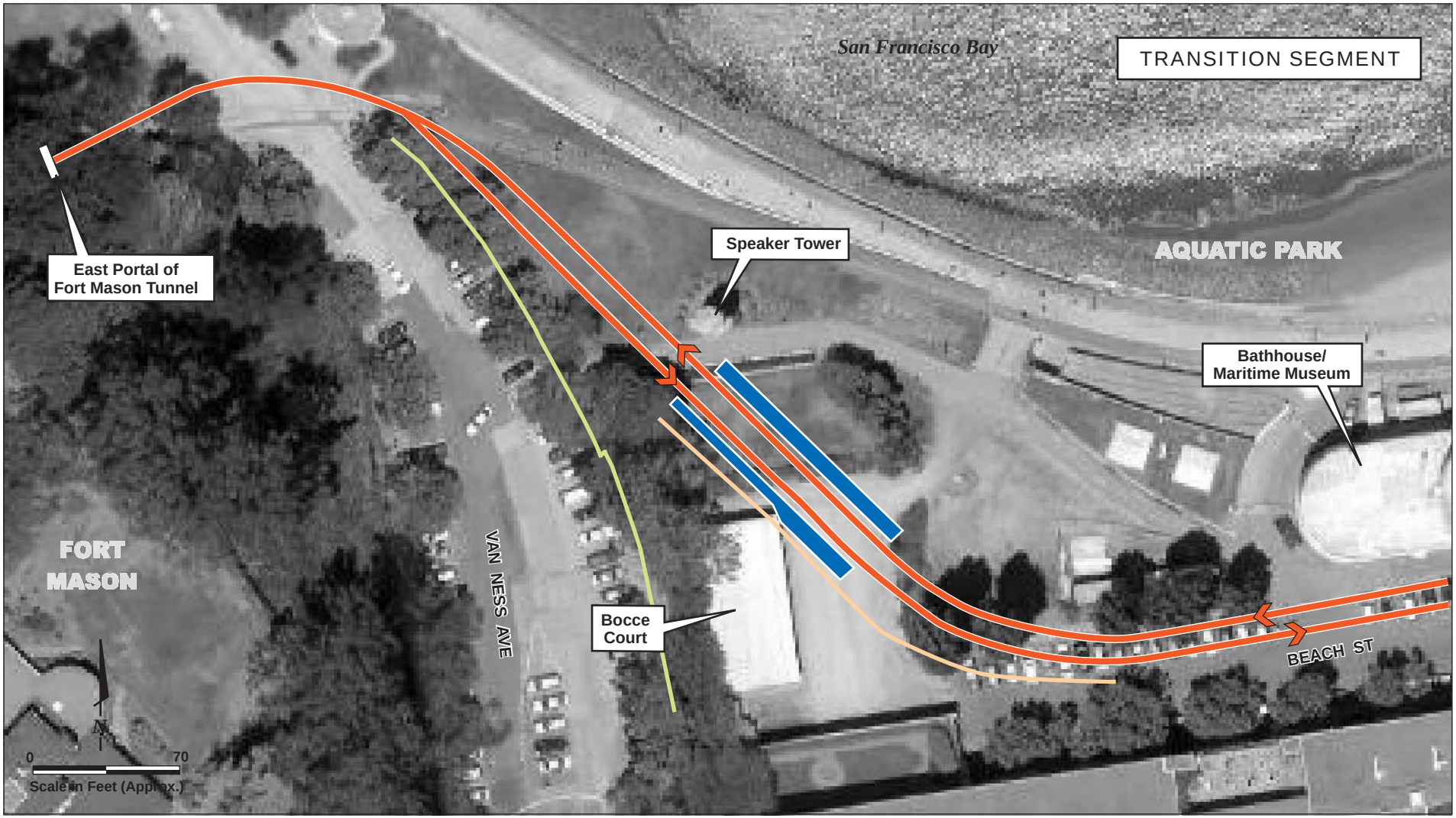
* Platform locations are for illustrative purposes only and subject to change. Final platform locations will be determined through a separate local planning process that will take into account operational and design considerations, as well as public comment.

Semi-exclusive Eastbound Option. Under this scenario, the eastbound alignment would extend from the transition segment at Beach Street and Polk Street east along Beach Street to Leavenworth Street with the eastbound streetcar in a semi-exclusive ROW (autos do not share track lanes, except when making turns) and the westbound streetcar in mixed traffic. At Leavenworth Street, the eastbound alignment would continue in a semi-exclusive ROW along Beach Street to Jones Street, where it would connect with the existing F-line streetcar tracks. The westbound alignment would be configured in mixed traffic north on Leavenworth Street to Jefferson Street. At Jefferson Street, the westbound alignment would continue in a semi-exclusive ROW east to Jones Street, where it would connect with the existing F-line streetcar tracks. The proposed Fort Mason extension would continue adjacent to the existing F-line for approximately one-half block east of Jones Street, where the two alignments would connect. The eastbound streetcar alignment would be semi-exclusive for the entire segment. The westbound streetcar alignment would be shared with autos except along Jefferson Street, where it would be configured as semi-exclusive ROW.

Transition Segment. The In-Street segment requires traversing NPS property between approximately Beach and Polk Streets and the tunnel's eastern portal at Van Ness Avenue, in an area known as the "transition." The transition segment takes the alignment from the double-track, street-running segment to the east, shifting the alignment to NPS property to the west of Polk Street. Due to the high level of pedestrian activity in this area, special attention will be paid to pedestrian safety measures during the final design. A station would be located on the transition segment near the base of Van Ness Avenue, and the line would move from double track to single track between the platforms and the tunnel portal. **Figure 2-3** illustrates this area. Passengers wishing to transfer from the existing bus terminal at Van Ness Avenue and North Point Street (see Figure 1-2) to the F-line extension will walk north on Van Ness Avenue and take a right at the first trail and walk to the station platform. The station would have two mini-high, ADA-compliant platforms, one installed on the east side of the transition segment, and one on the west side (located just south of an existing east/west pedestrian path and the historic speaker tower in Aquatic Park).

The transition segment area was developed through consultation with the project's TAC and other stakeholders. It combines earlier versions of two design segments, segments #E-3A(1) and #E-3A(2), that were dismissed (see Section 2.5). Other changes in the transition area would include adding retaining walls, modifying existing historic retaining walls, and possibly modifying or relocating the Aquatic Park Bocce Ball Court. The General Management Plan to be prepared by the San Francisco Maritime NHP would provide direction on future use of the bocce ball court area within the transition area, including retaining the bocce ball court or using the area for a maintenance facility. If the outcome of the GMP or the final design of the transition area is to move the bocce courts, then impacts to this recreational activity would be minimized by relocating the courts before construction of the proposed streetcar line through the transition area. If the bocce court is to be relocated, then the National Park Service would conduct a separate planning effort to evaluate suitable bocce court sites within and outside the parks.

Fort Mason Tunnel Segment. The Fort Mason Tunnel is a concrete-lined tunnel that was constructed in 1914, and was operated by the State Belt Railroad for active freight service until the late 1970s. The tunnel is currently owned by the National Park Service. It runs east-west about 60 feet beneath the upper Fort Mason complex. The tunnel is about 1,500 feet long, 16 feet wide and 22 feet



Source: NPS; Google Earth 2009.

ALTERNATIVE 2 PROPOSED ACTION TRANSITION SEGMENT AREA

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 2-3

LEGEND

- Proposed Streetcar Alignment
- Platform
- Existing Retaining Wall
- Proposed Retaining Wall

high at its highest point. Given these limitations, the proposed streetcar extension would run on a single track through the tunnel. The design and configuration of track within the Fort Mason Tunnel would be based on the *Tunnel Rehabilitation and Preliminary Cost Estimate Report* (Jacobs 2005). The tunnel improvements would include installation of new track and overhead lines and reconstruction of the tunnel interior—including construction of a new tunnel lining. Associated ventilation fan, signals, lighting, and utilities would be installed, including traction power feeders. Additional capacity (e.g., track circuitry and logic controlling the signaling and the interlocking) would need to be built into the system to control the number of cars allowed west of the tunnel's eastern portal, in order to ensure that more cars did not proceed west through the tunnel than could be handled by the Fort Mason terminal. There are currently manual tunnel gates providing tunnel security. Future tunnel security under the Project may replace the manual security gates with automatic security gates close to the tunnel entrance (Pulon 2010).

Turnaround Segment Options.

Alternative 2A: North Loop (Preferred). The North Loop turnaround (originally called Option 3) would consist of tracks that loop north out of the west portal of the Fort Mason Tunnel and enter the Fort Mason Center parking lot (see **Figure 2-4**). A 155-foot-long by 13-foot-wide, ADA-compliant mini-high station platform would be constructed alongside Building A. A second platform could be placed on the loop's eastern side, near the existing east retaining wall. A storage track would be provided extending west from the loop, adjacent to the NPS gate house. A detection circuit with a "clear to proceed" signal would be installed at the south end of the platform or adjacent to the Fort Mason Tunnel. The Project would be designed to ensure the safety of pedestrians and bicycles including measures such as incorporating traffic signals where appropriate.

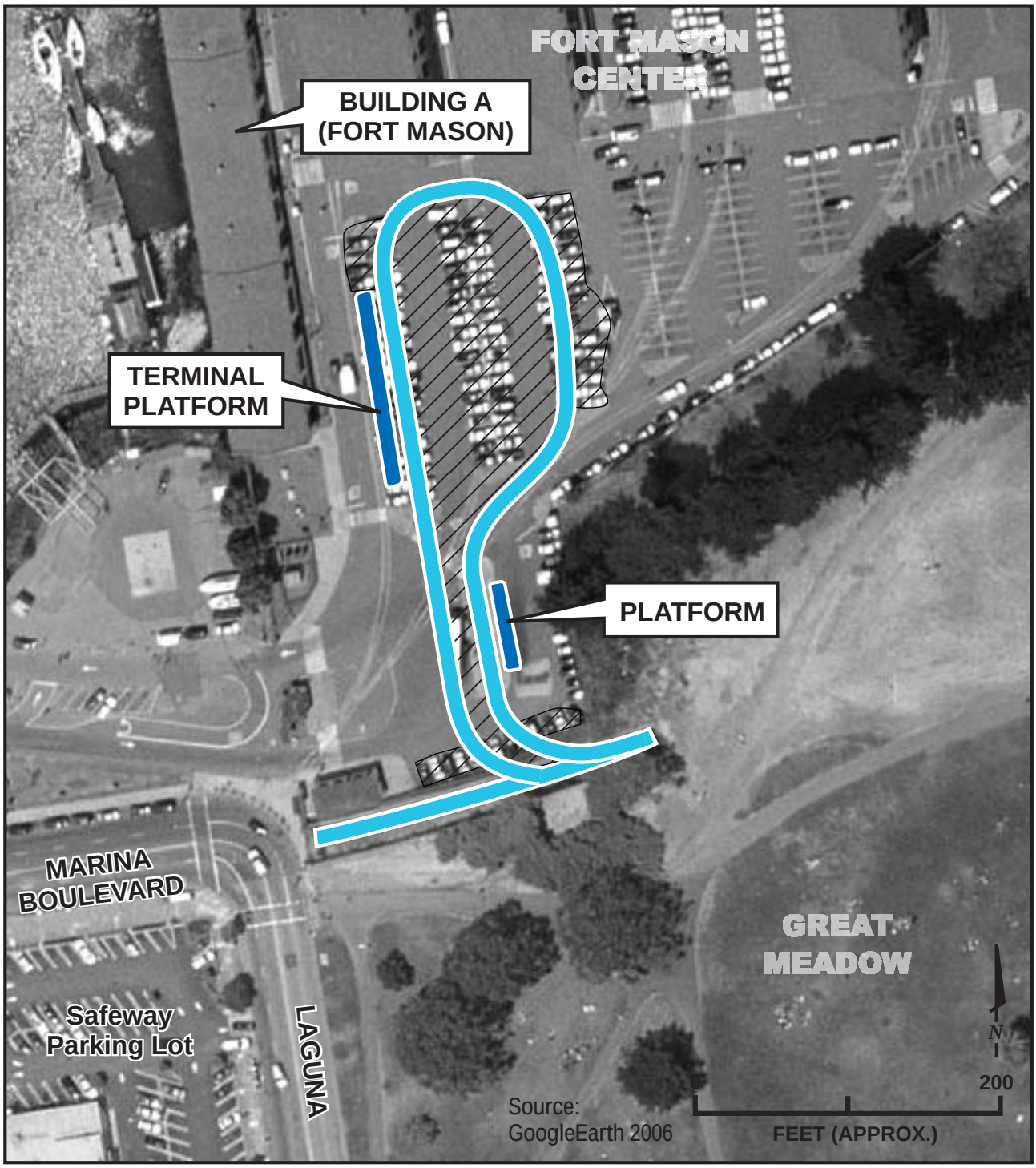
Alternative 2B: South Loop. The South Loop option would consist of tracks that loop south after it emerges from the west portal of the Fort Mason Tunnel in the Great Meadow. One 155-foot-long by 13-foot-wide, ADA-compliant mini-high station platform would be located adjacent and parallel to Laguna Street. Space for vehicle storage would be on a stub track inside the terminal loop. This configuration is shown in **Figure 2-5**.

Other Project Components. In order to connect the in-street alignment, turnarounds, and transition segments discussed above, the following ancillary components would be required: traction power system, overhead contact system, signaling.

Traction Power System. The streetcars would be powered by a traction power system which would feed power to the overhead contact system (OCS), described below. The traction power system would connect to an existing substation[5] (shown on Figure 1-2) via underground feeders in duct banks and would provide power to the OCS.

Overhead Contact System. The OCS would consist of a single-wire system similar to the existing Muni OCS on the F-line tracks in the Fisherman's Wharf area. The OCS would be configured for trolley pole operation by historic streetcars. The OCS would also be configured to accommodate pantograph operation consistent with the configuration of the existing F-line segments in the Fisherman's Wharf

[5] The closest Muni substation is Marina Station, located at 1575 North Point Street.



Source:Transit Operations Plan, URS, July 2009

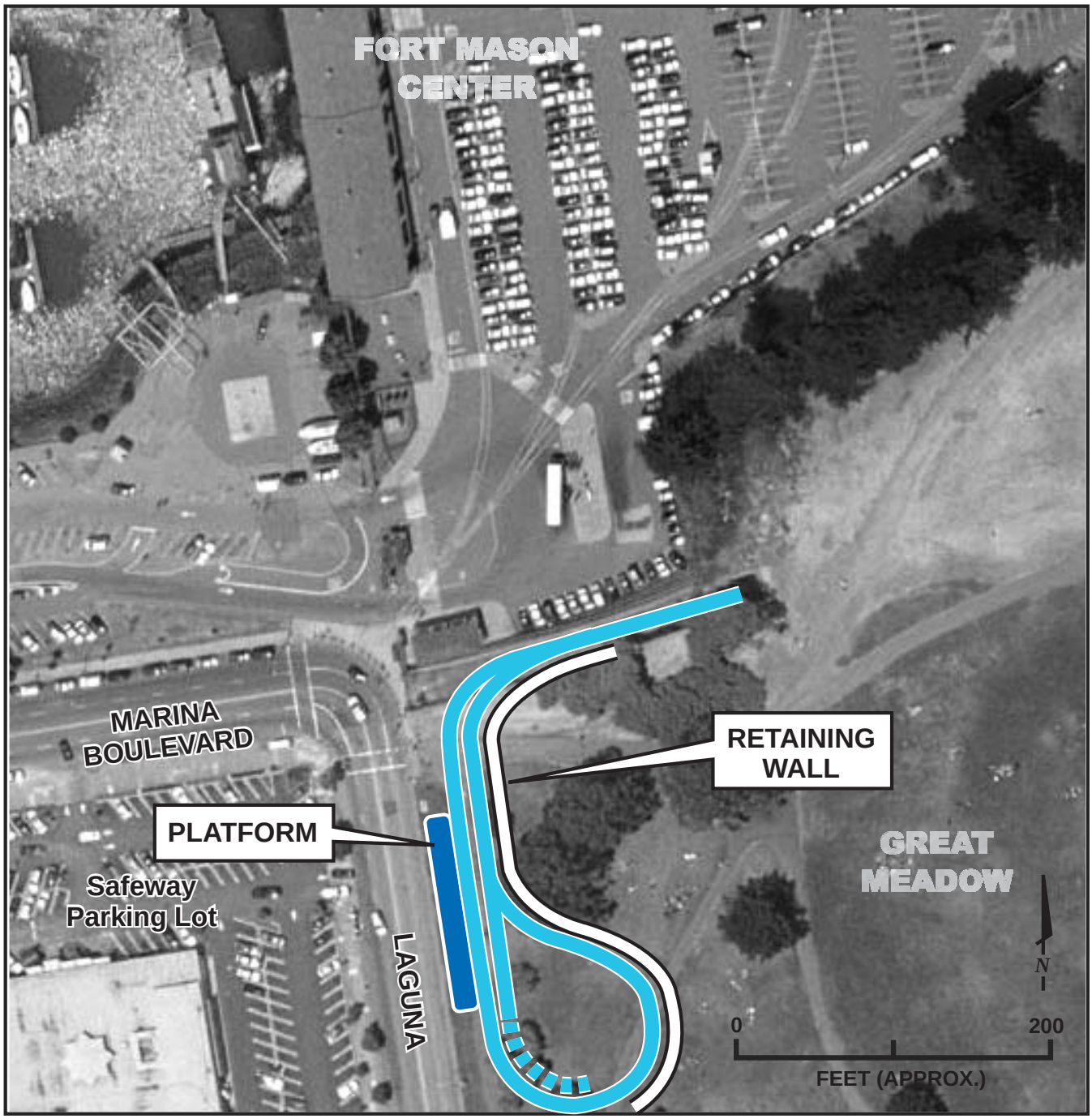
LEGEND

Parking will be removed in this area for operational and pedestrian safety

ALTERNATIVE 2 PROPOSED ACTION NORTH LOOP TURNAROUND

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 2-4



Source:Transit Operations Plan, NPS

ALTERNATIVE 2 PROPOSED ACTION SOUTH LOOP TURNAROUND

Environmental Impact Statement
Historic Streetcar Extension
San Francisco, California

FIGURE 2-5

area and along the Embarcadero roadway. This would extend the existing OCS capabilities for pole and pantograph operation that currently exist along the northeast waterfront from Fisherman's Wharf to the Muni Metro terminal near the Caltrain Terminal. The poles would be spaced every 100 feet on tangent track, and closer together where the track curves.

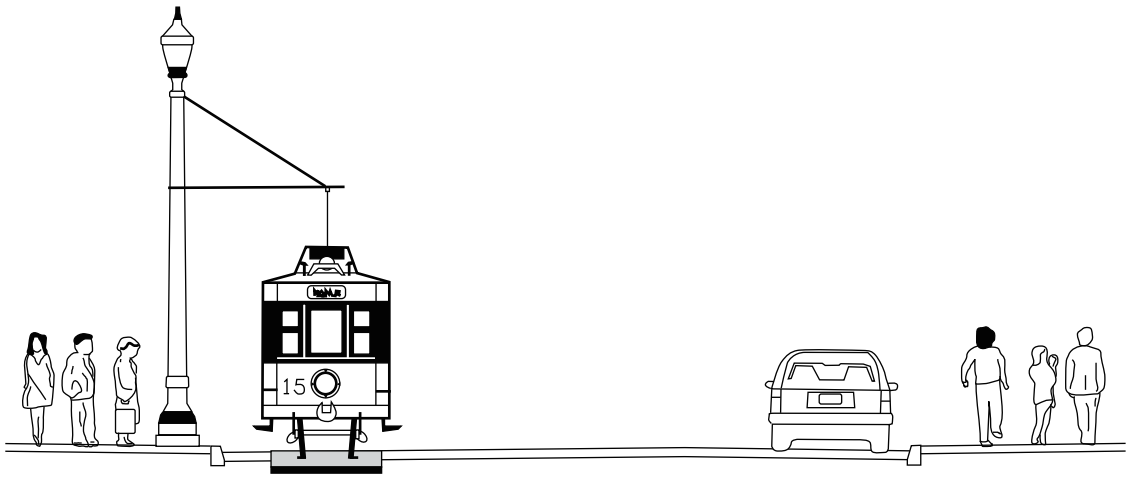
There are three OCS configurations that the proposed action would utilize. The first configuration would be a span of wire hanging between two poles. This configuration would be used on streets with double tracks. The second configuration would be utilized on streets with only one track; the OCS would be suspended from a mast arm attached to a trolley pole on the sidewalk, incorporating decorative streetlights similar to those used for the F-line. The third configuration would suspend the OCS from center poles with two mast arms, suspending out over both tracks. **Figure 2-6** illustrates the three types of OCS suspension. Track junctions, 90-degree corners and terminal trackage would require more specialized OCS suspension. The OCS suspension configurations for the Proposed Action would be determined during the design phase.

Signaling. In the street-running segments of the Project, streetcar movements would be governed by line-of-sight operations, with movement at intersections controlled by traffic signals. Traffic signals or stop signs will be used at intersections. At these intersections a separate signal head may be provided for streetcar control. The streetcar control signal would be interconnected to the traffic signals and provide the streetcar operator an indication of when the streetcar is clear to move or required to stop. In areas of exclusive ROW, where streetcars operate on a dedicated trackway, vehicle operations would be governed by an Automatic Block Signaling (ABS) system. The ABS area would be marked with wayside signs, sized per SFMTA regulations.

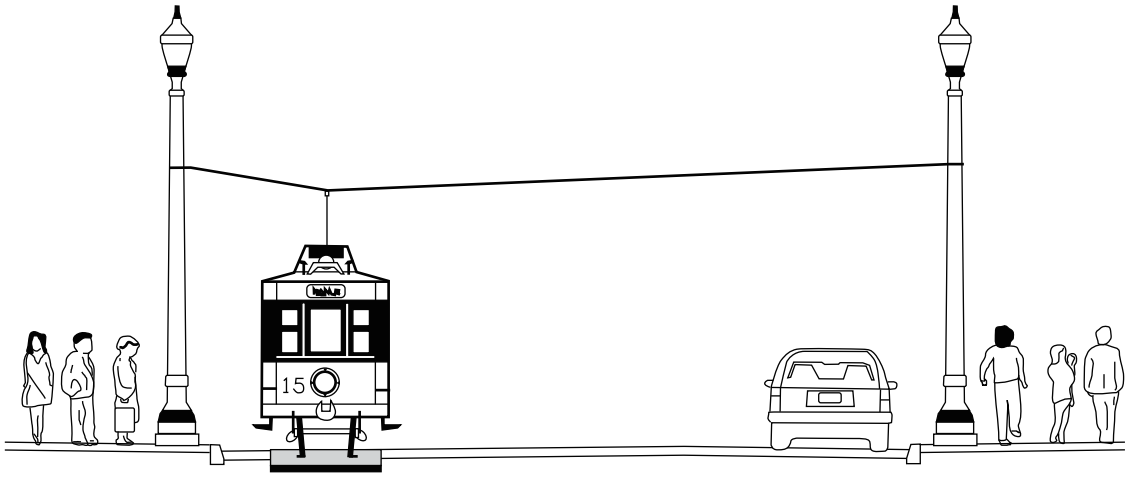
2.2.4 Construction

The construction activities for the Proposed Action would affect portions of Jefferson Street, Leavenworth Street and Beach Street (street sections), Van Ness Avenue and the transition area between the intersection of Beach Street and Polk Street and the Fort Mason Tunnel (transition section), the Fort Mason Tunnel (tunnel section) and the turnaround area at Lower Fort Mason or the Great Meadow. Construction activities would include multiple contractor laydown areas, which would range in size, from 500 to over 5,000 square feet.

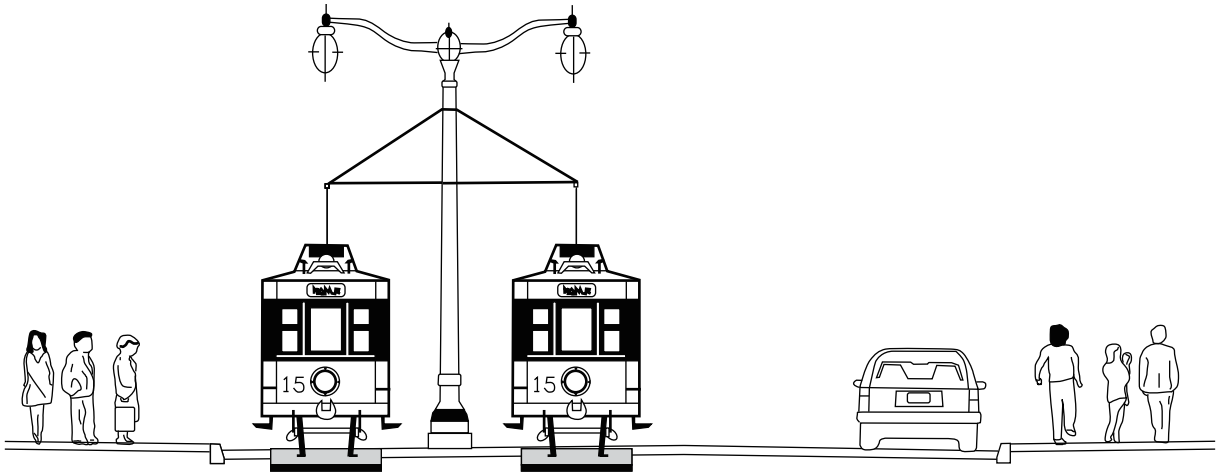
Schedule. Construction would be expected to occur from 18-24 months, with SFMTA overseeing construction pending resource availability. Construction would be phased to retain some access to each street at all times. Traffic may be re-routed temporarily and loading/unloading of delivery trucks and parking may be relocated. Construction would only occur on one side of the road at a time. Construction of tracks and rail along each block segment is anticipated to be 3 weeks on each side of the road, for a total of 6 weeks per block; this is in addition to advance utility work (anticipated to be 4 weeks/side/block [total of 8 weeks per block]), and subsequent installation of poles and other ancillary features (minor work that would not be anticipated to disrupt vehicular or pedestrian traffic, access, etc.). Actual timing may vary depending on the number of crews that the contractor builds into their schedule or the types of restrictions (i.e., no night work) placed on the contractor by the city.



1. Suspended from two mast arms



2. Suspended from span wire between two poles



3. Double tracks suspended from center-pole mast

STREET CROSS-SECTIONS TYPICAL OCS SUSPENSION

Environmental Impact Statement
Historic Streetcar Extension EIS
San Francisco, California

FIGURE 2-6

In-Street Segment. The construction activities on the in-street alignment portion of the Proposed Action would affect the streets and blocks shown on Figure 2-1. Construction would include installation of embedded trackway within the street ROW, requiring excavation to a depth of 3 feet. The street would be reconstructed curb-to-curb in all locations, and property line-to-property line in selected locations. Utilities would be updated and/or relocated within the street ROW on all blocks. The utility excavation depth would typically be 5 feet.

Trolley poles, overhead wires for the OCS, and an underground traction power feeder system would be installed. The sidewalks at station platform locations would be extended via bulb-outs into the parking lane. Station platform construction would include construction of 34-inch tall mini-high level ramps to meet ADA access requirements. The construction activities would be phased to retain some access to each street block at all times. Traffic may be re-routed temporarily and loading/unloading of delivery trucks and parking may be relocated.

Cable Car Crossing. Construction of the crossing of the cable car line at Hyde Street would require careful coordination and advance work to prepare the underground cable car machinery vaults in advance of streetcar track construction. It would also require phased closures of portions of the roadway and intersection of Hyde and Beach Streets for the preparation work and the installation. Underground excavation in this area would be monitored for the existence of a reported archeological site at the Hyde/Beach Street intersection. If archeological materials are found, this could extend the period of preparation work, installation of the streetcar line, or both. Work would require the closure of the 60 (Powell/Hyde) cable car line for up to one month. However, the length of closure time could be minimized if track work could be constructed in advance before it is installed. Because this would require the shut-down of one cable car line, 50 percent more cable cars would be run on the 59 (Powell/Mason) line to accommodate ridership demand. For those who use the line for commuter or other purposes, a bus substitution (diesel bus) would run the full 60 (Powell/Hyde) line (Market Street to Hyde Street) during the cable car line closure. Actual installation of the crossing is estimated to take no more than one week following the advance preparation work. It is anticipated that the closure would occur during non-holiday, non-tourist peak season.

New switches to the F-line at Jones Street would be installed, which would take approximately six months and would likely require a temporary shuttle bus for the F-line for the duration of construction.

Traffic signals would be installed at the intersections of Jefferson and Leavenworth Streets, Leavenworth and Beach Streets, and Beach and Polk Streets. As much as possible, traffic lights would be coordinated with other signals adjacent to the project area. Traffic lanes on all affected streets would be re-striped.

Transition Segment. The transition section is the portion of the alignment from the intersection of Beach Street and Polk Street to the Fort Mason Tunnel (east tunnel portal) crossing the northern end of Van Ness Avenue (see Figure 2-3). During construction, it is anticipated that temporary closures of portions of Van Ness Avenue would be required.

Streetcar tracks would be constructed in open trackway configuration along with the traction power system and OCS. Two new station platforms with connecting sidewalks would be installed as well. A portion of the Bay Trail at Van Ness Avenue may be regraded. The existing bocce court, which is

currently located near the intersection of Van Ness Avenue and Beach Street, would be retained or relocated to be determined by a subsequent planning study.

A critical utility in this area is the auxiliary water supply system 20-inch line which is in the streetbed of Van Ness Avenue. The auxiliary water supply system line would be cased for protection during the construction of the streetcar tracks as well as during operation. Construction in the immediate transition area may require relocating and/or settlement monitoring of other utilities (as determined by the City and County of San Francisco Bureau of Engineering). Additionally, a portion of a historic granite retaining wall would need to be removed and salvaged.

Fort Mason Tunnel Segment. The construction activities for the Fort Mason Tunnel would include geotechnical investigation of the tunnel, track construction, reconstruction of the interior of the tunnel, including the construction of a new tunnel lining and injection of grout and epoxy materials into existing walls. Existing freight rail tracks currently in the tunnel would be removed and a single streetcar track would be constructed on the tunnel floor, which may require regrading of the tunnel floor. Overhead lines would be constructed and hung from the interior of the tunnel. Signals, switches, ventilation systems and other essential utility systems would be installed inside the tunnel. Construction would take approximately 9 to 12 months.

Turnaround Segment.

Alternative 2A: North Loop Option. For the North Loop Option, streetcar tracks would be constructed at grade. Portions of the existing historic track would be removed to accommodate new track construction. The construction of the station platform (Fort Mason Center terminal) would be performed in phases to minimize impacts including general public access to Fort Mason Center. Trolley poles, overhead wires for the OCS, and an underground traction power feeder system would be installed at the terminal. Portions of the existing retaining walls may be demolished and braces would be constructed as needed to reinforce the remaining retaining walls. Station platforms would be constructed at the terminal including a mini-high ramp that is ADA compliant and an operator restroom structure would be built.

Alternative 2B: South Loop Option. For the South Loop Option, the hillside to the south of the alignment would be regraded. Streetcar tracks would be constructed at grade with open track configuration. Potential tree removal would be required in the meadow area south of the historic State Belt Railroad alignment along with realignment of the pedestrian path. Trolley poles, overhead wires for the OCS, and an underground traction power feeder system would be installed at the terminal. Portions of the existing retaining walls would be demolished and braces would be constructed as needed to reinforce the remaining retaining walls. Both the north and south retaining walls along the alignment would also be removed, and the area south of the south wall excavated and re-graded; a new retaining wall would be constructed. Depending on final design configuration, the north retaining wall could remain in place. A station platform would be constructed at the terminal including a mini-high ramp that is ADA compliant. In addition, an operator restroom structure would be built. During construction there may be partial lane closures on Laguna Street.

2.2.5 Operation

The F-line extension would be in operation 7 days a week, from approximately 6:00 a.m. to 1:00 a.m. (the same hours as the existing F-line). The run time from the San Francisco Ferry Building to Fort Mason Center (as proposed) would be 23-27 minutes (URS 2009f). At peak hours of demand, the existing F-line operates at six minute headways[6]; therefore, the Proposed Action assumes a six-minute-headway for the F-line operational frequency—except as noted below. Weekday headways would be between 6–15 minutes; weekend headways would be between 8–15 minutes, as shown in **Table 2-2**. Use of the Fort Mason tunnel would limit operations through the structure to headways of five minutes or greater. Therefore, to assess the greatest potential impact to properties within Fort Mason and the San Francisco Maritime NHP, the peak-period headway would be assumed to be 5 minutes for purposes of analyzing impacts. The operating speed of the F-line varies over its full length, with speeds on different segments ranging between 3.2 and 12.2 mph (exclusive of layover time) depending on the time of day and direction. The F-line extension would be designed with measures to ensure that the current 8 mph average operating speed would not be diminished. SFMTA recommends using transit signal priority and other measures to reduce delay and bring average speeds up to 10 mph.

TABLE 2-2: 2030 HEADWAYS FOR PROPOSED ACTION (JONES ST. TO FORT MASON)[a]

Weekday			
5:30 am – 9:00 am	9:00 am – 4:00 pm	4:00 pm – 6:00 pm	6:00 pm – 1:30 am
6 minutes	8 minutes	7 minutes	15 minutes
Weekend			
5:30 am – 10:00 am	10:00 am – 6:00 pm		6:00 pm – 1:30 am
10 minutes	8 minutes		15 minutes

[a] Start time (5:30 am) is the time the first eastbound car arrives at Jones Street, end time (1:30 am) is the time the last eastbound car arrives at Jones Street. Therefore, cars may be in operation within the project area before and after noted times. Times are approximate.

Single-Track Operations in Fort Mason Tunnel. The Fort Mason Tunnel is only wide enough to accommodate a single track. This places limitations on the proposed streetcar operations through the tunnel, including constraints on running times and headways as described above. Only one streetcar would occupy the tunnel at a time and operations would proceed with a westbound car first, followed by an eastbound car, followed by a westbound car, etc., in rotation. The running time for the single track section is estimated at approximately 2 minutes and 4 seconds assuming a travel speed inside of 15 mph inside the tunnel and 3.5 miles per hour for the surface approach.

Signals placed at the Transition area east platform and at the Turnaround tracks at the west portal of the Fort Mason Tunnel will act as an interlocking for the single track segment. Track circuitry will control the number of streetcars allowed west of the east portal to ensure that more streetcars do not reach Fort Mason than can be accommodated by the terminal trackage there. Proven and effective

[6] The time interval or distance between two vehicles, as railroad or subway cars, traveling in the same direction over the same route.

safety control mechanisms will be required for proactive implementation to prevent two rail vehicles from simultaneously occupying the single track section, even in the event of a signal violation.

Ridership. During fiscal year 2010 the average weekday ridership reported for the existing F-line was 20,921. The predicted ridership for the F-line with the extension would be 22,561 for average weekday ridership in 2030 (URS 2009f).

Vehicle Requirements. The F-line's current peak vehicle demand for service during the weekday is 26 vehicles (i.e., 18 scheduled revenue-service vehicles, two supplemental revenue-service shuttle cars, and six maintenance spare vehicles). The estimated 2030 weekday peak vehicle demand for the F-line with the extension to Fort Mason Center would require a total of 28 vehicles (i.e., 21 revenue-service vehicles and seven maintenance spare vehicles) (URS 2009f). The 2030 vehicle requirement assumes service provided by the current shuttle cars (from the Ferry Building to Fisherman's Wharf during some periods of high ridership) would be replaced by an E-line service. Therefore, assuming no E-line service, the Project would result in an increase in three revenue-service vehicles plus one maintenance vehicle for a total of four vehicles required for the extension of the F-line to Fort Mason Center.

The SFMTA service fleet consists of 17 President's Conference Committee (PCC) streetcars and 10 Peter Witt streetcars from Milan, Italy for a total of 27 cars. SFMTA is undertaking projects to increase the size of the regular service fleet. Eleven additional PCC cars were purchased from New Jersey Transit and are undergoing rehabilitation. In addition, four double-ended PCC cars are also undergoing rehabilitation. Once these cars are fully operational in the fleet, the regular service fleet would consist of 42 cars, which should be sufficient to cover the peak demand, plus spare cars (URS 2009f).

There are two streetcar maintenance facilities. Geneva Yard is SFMTA's primary facility for the repair and storage of the historic streetcar fleet located at San Jose and Geneva Avenues in San Francisco. It is anticipated that additional space would be available in the Geneva Yard when some of the light rail vehicles (LRVs) are moved from the Geneva Yard to the Metro East facility, therefore no related costs are anticipated for this project for maintenance facilities. The Duboce Yard is a satellite facility for historic streetcar rehabilitation and maintenance, located at Market Street and Duboce Avenue (URS 2009f).

The vehicles that would operate on the Historic Streetcar Extension are historic streetcars, from both San Francisco and around the world. The design parameters of the Project would accommodate any of Muni's current fleet; however, the Project is expected to run only the historic streetcars. Streetcars on the Historic Streetcar Extension would operate primarily by line of sight, in which control of the vehicle depends on the driver's field of vision. At intersections controlled by traffic signals, streetcar operators would comply with the same traffic signals as drivers of other motorized vehicles. In some locations, as described above, there would be transit-only signals that give streetcars priority over other traffic; these transit-only signals would be coordinated with the traffic signals.

2.3 PREFERRED ALTERNATIVE

The Preferred Alternative is Alternative 2 – Action Alternative. This alternative was determined after a multi-year selection process and alternative development. Section 2.5 describes the process that preceded the preferred alternative selection by outlining the alternatives considered and dismissed.

The North Loop (Alternative 2A) and South Loop (Alternative 2B) Turnaround Alternatives were analyzed during a 1.5-day Value Analysis (VA) workshop held in August of 2010. During the Value Analysis Workshop, two additional South Loop configurations were discussed at length. One additional option discussed would have located an additional platform within the Fort Mason Center parking lot between the Gatehouse and the tunnel entrance. The second option discussed would have eliminated the platform along Laguna Avenue completely and served passengers exiting at the Fort Mason Center solely from one platform on the northern portion of the South Loop. After further investigation SFMTA staff determined that constructing a platform within the Fort Mason Center parking lot between the Gatehouse and the tunnel entrance would not be feasible due to the dynamic envelop of the vehicles. There is not enough space for two vehicles to fit side by side at the tunnel's west portal so a vehicle leaving the terminal to return towards Fisherman's Wharf would not be able to proceed until the alighting (northern) platform is clear.

In the Value Analysis Workshop, the North Loop and South Loop turnaround alternatives were evaluated using a process called Choosing by Advantages (CBA), where decisions are based on the weighted importance of the advantages between alternatives with capital and life cycle costs factored in last, to illustrate benefits to cost. In using CBA to determine a preferred alternative, the VA team identified the alternative that offers the highest total importance of advantages at the lowest cost (in both initial and life cycle).

In this workshop, the North Loop was identified as best value due to the following advantages:

- Significantly Better at Limiting Disruption to Natural Resources;
  - No impervious surface is added (can increase pervious surface between rail);
  - Does not remove vegetation;
  - Emits the least amount of emissions during construction (less earth moved).
- Somewhat Better at Improving Visitor Experience;
  - Limited view shed impacts by adding streetcars and infrastructure in the Fort Mason Center (FMC) parking lot;
  - Provides direct interior connection between SF Maritime NHP and Fort Mason Center.
- Slightly Better at Protecting Public Health, Safety and Welfare;
  - All the alternatives create potential conflicts between pedestrians, auto and transit. This alternative limits those conflicts particularly with bicycles. It may include conflict with bicycles in the future;
  - Allows for redesign of the Bay Trail with less change required (this is an independent project).

- Slightly Better at Supporting Criteria for Large Events;
  - It is best able to manage headway (frequency and storage of streetcars);
  - Creates more room to queue visitors away from Laguna Street.
- Somewhat Better at Accessing Disabled Streetcar;
  - Creates better access to disabled streetcar in the storage area for repair via service truck in this location.
- Slightly Better at Minimizing Noise & Sound Impacts;
  - Minimizes noise impacts on residential neighborhoods since it is the farthest from the residential areas;
  - Minimizes vibration impacts. All the options create vibration but this option is 10 feet farther away from the historic structures than the other alternatives.
- Somewhat Better at Attracting New Tenants:
  - This alternative gives Fort Mason Center the ability to attract new tenants (via *Fort Mason Center Long-Term Lease Environmental Assessment*).

2.4 ENVIRONMENTALLY PREFERRED ALTERNATIVE

In accordance with Director's Order #12 and the National Environmental Policy Act, the National Park Service is required to identify the environmentally preferred alternative (NPS 2001a). The Council on Environmental Quality defines the environmentally preferred alternative as "the alternative that will promote the national environmental policy as expressed in the National Environmental Policy Act's Section 101." Under section 101(b) of the act, it is the continuing responsibility of federal agencies to:

1. fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
2. assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
3. attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences;
4. preserve important historic, cultural and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity and variety of individual choice;
5. achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities; and
6. enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Closely mirroring these criteria, particularly criteria #3 and #6, are the project's goals and objectives. Goals and objectives for this project emphasize enhancing visitor experience and reducing automobile-based trips for recreational travel, and inter- and intra-park transportation. Alternative 2

(the Preferred Alternative) was ultimately found to be more consistent with the criteria listed above than the No-Action alternative.

Moreover, during the CBA, it became apparent that the turnaround option Alternative 2A: North Loop performed significantly better at limiting disruption to natural resources due to: (1) no addition of impervious surface; (2) no removal of vegetation; (3) fewer earth movement required; and (4) less emissions during construction. Therefore, Alternative 2 with the Turnaround option Alternative 2A: North Loop was selected as the environmentally preferred alternative.

Alternative 1 (the No-Action Alternative) does not meet project goals, purpose, or need and in particular does not "enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources" in that this alternative does nothing to reduce the number of automobiles used to access the park and/or the Fort Mason Center. As discussed further in this document, changes to the mix of transportation modes [autos and transit] serving the project area resulting from the Preferred Alternative identified a 14.4 percent increase in transit use for daily person trips to Fort Mason Center between the No Project and implementation of the Project with the F-line extension. The result would be a long-term, moderate, beneficial impact which leads to the conclusion that the Preferred Alternative is the environmentally preferred alternative.

This conclusion is reached looking at current conditions. The environmental preference for an alternative that provides increased transit is further supported by future conditions. The Fort Mason Center Long-Term Lease Environmental Assessment projects an increase in visitor levels by 14.5 percent contingent upon the renovations of Pier One, which is currently not used as an event space. If Pier One was restored, the 2003 EA projected that the 1.6 million annual visitors would be increased to 1.9 million for the entire Fort Mason Center. The EA also states that the increase in visitors from the development of Pier One could increase transit demand. The No-Action Alternative would not provide any increased transit and would not support the goal of "recycling of depletable resources."

2.5 ALTERNATIVES ELIMINATED FROM FURTHER STUDY

The preliminary alternatives were developed using previous planning studies with agency working group input. The alternatives proposed in the 2004 Feasibility Study were further developed and refined during the environmental review process. Based on the Feasibility Study a number of alternatives were developed and refined before being eliminated. The mode of transportation considered for all alternatives in the Feasibility Study was the streetcar, and all alternatives used the Fort Mason Tunnel. Also, some preliminary on-street design options were considered in the development of the alignment alternatives. The following section outlines the alternatives considered but eliminated from further study. **Table 2-4** summarizes the alternatives considered and dismissed. A detailed description of each alternative and the reason why it was dismissed is included in Appendix A along with Figures (numbers are preceded by the letter 'A') illustrating each of these alternatives.

An initial screening process was undertaken by the TAC for the alignment alternatives. As described in Section 2.1.1 Alternative Development Process, the criteria included:

- **Purpose and Need** – Criteria relating to the Purpose and Need for the project.

- **Park Preservation** – Criteria relating to the various objectives of the National Park Service in operating the national parks through which this project passes.
- **Operability** – Criteria relating to the technical capabilities and limitations of the transit vehicles and infrastructure proposed for use in the various alternatives, and criteria relating to the objectives of the SFMTA in operating the citywide transit system.

2.5.1 Screening Process

The goal of the screening phase of the alternatives analysis is to evaluate all alternatives developed during scoping against a standard set of criteria, and to eliminate alternatives that were unreasonable. Unreasonable alternatives are those that are 1) unreasonably expensive, 2) can't be implemented for technical or logistic reasons, 3) do not meet park mandates, 4) are inconsistent with park statements of purpose and significance, and 5) are inconsistent with park or cooperating agency management objectives. The Council on Environmental Quality (CEQ) defines reasonable alternatives as those that are technically and economically feasible and that show evidence of common sense. They also meet project objectives, resolve need, and alleviate potentially significant impacts to important resources. The steps the IDT took to develop a reasonable range of alternatives are as follows:

- Incorporate all feasible alternatives from Feasibility Study (three rail alternatives)
  - Option 1 – Promenade/Beach
  - Option 2 – Victorian Park/Beach
  - Option 3 – Beach 2-way
- Incorporate alternatives suggested in scoping process
  - Option 4 – Rail alternative via North Point, Van Ness, and the tunnel
  - Option 4A – Rail alternative via North Point and Bay
  - Option 5 – Bus alternative via North Point and Bay – extension of the 10-line
  - Option 5A – Bus alternative via North Point, Van Ness, and the tunnel, i.e., extension of Muni's 10-line
  - Option 6 – Trolley coach alternative via North Point, Van Ness and the tunnel
  - Option 6A – Trolley coach alternative via North Point and Bay
- Develop screening criteria
  - Evaluate all alternatives against screening criteria. Alternatives scoring less than 75 percent in screening process are eliminated from further consideration
- Develop screening criteria for secondary screening if more than one alternative scores 75 percent or greater
- Evaluate all remaining alternatives against secondary screening criteria, with a goal of advancing only alternatives with a high likelihood of success
- Define the Build Alternative to be carried forward into the EIS

2.5.2 Feasible Alternatives from Feasibility Study

The Muni E-Line Extension Feasibility Study (WSA, et al. 2004) presented alternatives that were examined in the initial screening process. The screening process resulted in the reduction of nine alignment alternatives to three alignment alternatives (Alignment Options 1, 2 and 3). Table A-1 in Appendix A illustrates the initial screening process.

Further refinements were made during the screening process that involved a number of agency working groups, including the National Park Service, SFMTA, and the TAC. The second screening process reduced the three alignment alternatives to one alignment alternative (Alignment Option 3, which is the design for the Proposed Action discussed above).

The East Segment, from Fisherman's Wharf to the East Portal of the Fort Mason Tunnel (the general location discussed in this EIS) had two sections with eleven options. The West Segment, from the West Portal of Fort Mason Tunnel to the Presidio of San Francisco, had two sections with thirteen options. The Presidio Segment, from Baker Street to Fort Point, had two sections, with ten options. The initial screening resulted in the elimination of seven options from the East Segment, nine options from the West Segment, and seven options from the Presidio Segment (WSA, et al. 2004). The F-line project ends at Fort Mason Center; the West Segment and Presidio Segment are outside the scope of this project.

Three preliminary alignment alternatives, Options E-1, E-2, and E-3 emerged from the evaluation of the remaining alternatives in the East Segment. All three preliminary alignment alternatives would continue through the Fort Mason Tunnel via a transition segment at Aquatic Park. Two transition segment options, #E-3A (1) and #E-3A (2) were developed along Van Ness Avenue at Aquatic Park, one involving the relocation of a retaining wall between Van Ness Avenue and the bocce courts.

At the Fort Mason Turnaround, a number of concepts were examined. Only two concepts were found to meet the operational criteria, Concepts 1 and 2. These alignment alternatives, transition segments, and turnaround concepts were then presented to the public during the EIS scoping period, as Alignment Options 1, 2, and 3, Turnaround Options 1, and 2, and Transition Segments #E-3A(1) and #E-3A (2).

The alignment alternatives, transition segments, and turnaround concepts from the Feasibility Study were renamed and presented as shown in **Table 2-3** and Figures A-1 through A-7 (in Appendix A).

2.5.3 Alternatives Suggested in Scoping Process

Comments received regarding the alternatives presented during the scoping period supported one or more of the alternatives presented. Additionally, a number of comments suggested new alternatives, including extensions of existing diesel and trolley bus routes to Fort Mason. A total of six more alignment alternatives and seven turnaround alternatives were developed as a result of the comments received during the public scoping period. This included consideration of other transit modes such as diesel bus and trolley coach. Four additional turnaround alternatives were subsequently developed

TABLE 2-3: RENAMING OF PRELIMINARY ALTERNATIVES

Preliminary Alternatives from the Feasibility Study (2004)	Preliminary Alternatives for Public Scoping (2006)
Option E-1: Westbound—Jefferson-Promenade/Eastbound Van Ness Beach	Alignment Option 1: Promenade and Beach Street: Jones Street to Van Ness Avenue via Jefferson Street, Promenade, Beach Street
Option E-2: Westbound--Jefferson-Victorian Park-Beach-Van Ness/Eastbound Van Ness-Beach	Alignment Option 2: Victorian Park and Beach Street: Jones Street to Van Ness Avenue via Jefferson Street, Aquatic Park, Beach Street
Option E-3: Westbound/Eastbound--Van Ness Beach	Alignment Option 3: Beach Street: Jones Street to Van Ness Avenue via Jefferson Street, Leavenworth Street, and Beach Street
Concept 1: Fort Mason Loop	Turnaround Option 1: Fort Mason Loop: Turnaround within Fort Mason Center
Concept 2: Beach Street/Yacht Harbor Parking Loop	Turnaround Option 2: Marina Loop: Turnaround on Marina Boulevard
Transition Segment #E3-A(1)	Transition Segment #E3-A(1)
Transition Segment #E3-A(2)	Transition Segment #E3-A(2)

during the project's TAC meetings. Alternative Alignment Options 4[7], 4A, 5, 5A, 6 and 6A and Turnaround Options 1 through 13 were developed to address public scoping comments, but were later dismissed from analysis.

The following **Table 2-4** summarizes all alternatives that were considered and later dismissed. See Appendix A for more detail.

2.6 COMPARISON OF ALTERNATIVES

2.6.1 Alternatives Comparison Matrix

Table 2-5 shows a comparison between the two alternatives based on the elements of the project.

2.6.2 Summary of Impacts and Potential Mitigation

Table 2-6 summarizes the impacts and potential mitigation measures for each resource topic under the two different alternatives. These impacts are analyzed in detail in Chapter 4. Environmental Consequences.

[7] Options 4 and 5 were previously developed in the early stages of the Feasibility Study, but were subsequently dropped from consideration.

TABLE 2-4: ALTERNATIVES CONSIDERED AND DISMISSED

Alternative	Description	Reason for Dismissal
In-Street Segment		
Alignment Option 1: Promenade and Beach Street	Follows historic State Belt Railroad	Not consistent with park management objectives
Alignment Option 2: Victorian Park and Beach Street	Similar to Option 1 but, at Jefferson Street and Hyde Street it leaves the historic State Belt Railroad alignment, turn southward and continues at an angle through Victorian Park	Did not meet park preservation criteria and resulted in a conflict with the purpose and need of the project
Alignment Option 4: North Point via Tunnel	Streetcar alternative; would operate in both directions on North Point Street between Jones Street	Infeasibility
Alignment Option 4A: North Point via Bay	Streetcar alternative; would use Bay Street rather than the Fort Mason Tunnel	Infeasibility and conflicts with the purpose and need of the project
Alignment Option 5: Motor Coach via Bay	Motor coach alternative, extension of the Muni 10-Townsend local bus line, using Bay Street	Infeasibility and conflicts with the purpose and need of the project
Alignment Option 5A: Motor Coach via Tunnel	Motor coach alternative, extension of the Muni 10-Townsend local bus line, using Fort Mason Tunnel	Infeasibility and conflicts with the purpose and need of the project
Alignment Option 6: Trolley Coach via Tunnel	New trolley coach line connecting to the current F-line at Jones Street and Beach Street, uses Fort Mason Tunnel	Infeasibility and conflicts with the purpose and need of the project
Alignment Option 6A: Trolley Coach via Bay	Trolley coach alignment that consists of a new trolley coach line connecting to the current F-line, uses Bay Street	Conflicts with the purpose and need of the project
Transition Segment		
Transition Segment #E-3A (1)	This segment stretches from Fort Mason tunnel east portal to Polk Street in an inverted S-curve shape with double-track alignment with an interlocked track at the entrance to the Fort Mason tunnel	Combined with Transition Segment #E-3A(2) and renamed the Transition Segment Area that is now part of the proposed project
Transition Segment #E-3A (2)	Similar to #E-3A (1) with a dual-side platform station parallel to the existing retaining wall on Van Ness Avenue, north of Option 1 platforms	Combined with Transition Segment #E-3A(1) and renamed the Transition Segment Area that is now part of the proposed project
Transition Segment Option 2	The switch (the transition between double tracks and single tracks) is located on the west side of Van Ness Avenue	Does not conform to SFMTA or San Francisco Maritime NHP management objectives and was not supported for technical reasons
Turnaround Segment[a]		
Turnaround Option 1: Fort Mason Loop	Fort Mason Center parking lot, east of the Fort Mason gates; would operate in a counter-clockwise loop and would bisect the parking control gates as well as cross over the historic trackwork	Infeasibility and conflicts with the purpose and need of the project

[a] Note: Turnaround Options 9 through 12 were mislabeled 10 through 13 on Table A-2 of the Appendix A.

TABLE 2-4: ALTERNATIVES CONSIDERED AND DISMISSED (CONTINUED)

Alternative	Description	Reason for Dismissal
Turnaround Segment (cont.)		
Turnaround Option 2: Fort Mason Short Loop	Counter-clockwise loop beginning in the Great Meadow; travels through the Fort Mason parking lot, to the south of the Guard House, crosses the Laguna Street and Beach Street intersection	Infeasibility
Turnaround Option 4: East-West Loop	Counter-clockwise loop within Fort Mason Center parking lot with platforms oriented east-west instead of north-south	Infeasibility and failed to meet park management criteria
Turnaround Option 5: North Wye	Wye-shaped track north of the main running track; located in the Fort Mason gates on NPS property; includes two platforms and no storage capability	Infeasibility
Turnaround Option 6: North Wye – Two Tracks	Similar wye-shape as option 5; three platforms ; differs from Turnaround Option 5 by allowing for an extra car at the terminal	Infeasibility
Turnaround Option 7: South Wye	Wye-shaped track to the south of the main running track with two platforms	Infeasibility and failed to meet park management criteria
Turnaround Option 9: Fort Mason Gate Loop	Counter-clockwise loop using the Gas House Cove parking lot for both directions and goes through the Fort Mason gates	Infeasibility and conflicts with the purpose and need of the project
Turnaround Option 10: Safeway Loop	Clockwise loop around the Safeway block within city street ROWs	Infeasibility and conflicts with the purpose and need of the project
Turnaround Option 11[b]: Marina Loop	Counter-clockwise loop using Gas House Cove parking lot (outbound), inbound track on south side of Marina Boulevard	Failed to meet park management objectives
Turnaround Option 12: Small Marina Loop	Clockwise loop using northern side of Marina Boulevard for outbound direction, with a loop in Gas House Cove parking lot	Conflicts with the purpose and need of the project
Fort Mason Turnaround: Modified North Wye – Two Tracks – Option RL	Modified version of Turnaround Option 6: North Wye – Two Tracks	Infeasibility

[b] Formerly Option 2.

TABLE 2-5: ALTERNATIVES COMPARISON SUMMARY

Plan Element	Alternative 1 No Action	Alternative 2A Proposed Action with North Loop Option	Alternative 2B Proposed Action with South Loop Option
In-Street Segment	• No new construction would occur on Beach Street • There would be no loss of parking on Beach Street • No new overhead poles and wires would be installed on Beach Street	• Alignment operates in both directions on Beach Street between Leavenworth Street and the transition at Van Ness Avenue • Semi-exclusive operations along Jefferson Street • Mixed Traffic operation along Leavenworth Street • Cross the existing cable car tracks at Hyde Street • Three new traffic signals and three existing signals added or reconstructed • Mini-high ADA-compliant station platforms • Mixed Traffic/Shared Auto/Streetcar Design Option • Semi-exclusive Eastbound Option	Same as Alternative 2A-North Loop
Transition Segment	• The bocce court would remain in its current location • No modification of retaining walls would occur • No changes would be made to Aquatic Park NHLD	• Traverses NPS property between Beach and Polk Streets and the Fort Mason tunnel's eastern portal at Van Ness Avenue • Transitions the double-track, street-running segment to the east to the NPS property to the west of Polk Street • Two mini-high, ADA-compliant station platforms: one on the east side of the transition segment and one on the west side • The bocce court in Aquatic Park would be retained or relocated • Modification to existing historic retaining walls • Construction of new retaining walls needed to accommodate the streetcar alignment	Same as Alternative 2A-North Loop
Fort Mason Tunnel Segment	The tunnel would not be rehabilitated and would remain closed to use	• Tunnel improvements include: installation of new track and overhead lines and reconstruction of the tunnel interior – including construction of a new tunnel lining • Associated ventilation systems, signals, lighting, and utilities would be installed, including traction power feeders • Additional capacity (e.g. track circuitry and logic controlling the signaling and the interlocking) would need to be built into the system	Same as Alternative 2A-North Loop

TABLE 2-5: ALTERNATIVES COMPARISON SUMMARY (CONTINUED)

Plan Element	Alternative 1 No Action	Alternative 2A Proposed Action with North Loop Option	Alternative 2B Proposed Action with South Loop Option
Turnaround Segment Options	North Loop: • Lower Fort Mason would remain undisturbed (no addition of streetcar tracks; overhead lights and wires; station platforms, etc…) • Retaining walls would remain intact • No changes would be made to the San Francisco Port of Embarkation NHLD South Loop: • The Great Meadow would remain undisturbed (no addition of streetcar tracks; overhead lights and wires; station platforms, etc…) • Retaining walls would remain intact • No changes would be made to the Bay Trail configuration	• Trackage would loop north after it emerges from the Fort Mason Tunnel into the Lower Fort Mason parking lot • A 155-foot-long by 13-foot-wide, ADA-compliant mini-high station platform would be located alongside Building A at the Fort Mason Center • A second optional platform could be placed on the loop's eastern side near the existing east retaining wall • Storage track would be provided adjacent to the NPS gate house	• Trackage would loop south after it emerges from the Fort Mason Tunnel into the Great Meadow • A 155-foot-long by 13-foot-wide, ADA-compliant mini-high station platform would be adjacent and parallel to Laguna Street • Vehicle storage would be on a stub track inside the terminal loop

TABLE 2-6: SUMMARY OF IMPACTS AND MITIGATION

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Land Use				
Alternative 1 would result in no direct, indirect impacts to land use	The implementation of Alternative 2 would result in a minor long-term adverse impact to land use practices due to change in land use of the existing site, however the Project would remain consistent with applicable land use plans and policies	The North Loop Turnaround Option would result in a negligible impact to land use	The South Loop Turnaround Option would result in a long-term moderate adverse impact	N/A
Socioeconomics				
Alternative 1 would have no economic impacts to the San Francisco economy	Alternative 2 would have short-term negligible beneficial construction related economic impacts and long-term negligible beneficial operations related economic impacts on the San Francisco economy	The North Loop Turnaround Option would result in negligible positive short-term economic impacts to the City and County of San Francisco economy	The South Loop Turnaround Option would result in negligible positive long-term economic impacts to the City and County of San Francisco economy.	N/A
Transportation and Circulation				
Transit Operations				
Alternative 1 would result in no impacts to transit operations	Alternative 2 would result in a long-term, moderate, beneficial impact	The North Loop Turnaround Option would result in a long-term, moderate, beneficial impact	The South Loop Turnaround Option would result in a long-term, moderate, beneficial impact	N/A
Traffic Safety				
Alternative 1 would result in long-term, minor, adverse impacts to traffic safety conditions	In-Street Segment: long-term, negligible, adverse impact Transition Segment: long-term, minor, adverse impact	The North Loop Turnaround Option would result in a long-term, minor, adverse impact	The South Loop Turnaround Option would result in a long-term, minor, beneficial impact	TRANS-2: Install Wayfinding Devices

TABLE 2-6: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Transportation and Circulation (cont.)				
Parking				
Alternative 1 would result in no impacts to parking conditions	The overall impact would be long-term, minor and adverse	The North Loop Turnaround Option would result in a long-term, minor, adverse impact	The South Loop Turnaround Option would not affect parking conditions at Fort Mason Center, and would not displace any parking spaces resulting in no impact	TRANS-3: Reconfigure On-Street Parking Spaces TRANS-4: Implement Parking Time Restrictions
Traffic Flow				
Alternative 1 would result in long-term, minor, adverse impacts to traffic flow	The result with implementation of the Public Realm Plan would be a long-term, minor, adverse impact, and without implementation of the Public Realm Plan would be a long-term, major, adverse impact	N/A	N/A	TRANS-1: Optimize Traffic Signal Timing
Air Quality				
Alternative 1 would result in no short- or long-term air quality or greenhouse gas emission impacts, either beneficial or adverse	Short-term adverse air quality impacts would result from daily maximum construction activities. With implementation of mitigation measures, short-term air quality impacts would be minor to moderate and adverse Alternative 2 would result in negligible to minor beneficial operational impacts to both regional and local air quality as well as greenhouse gas emissions	The North Loop Turnaround Option would result in a net negligible to minor beneficial operational air quality impact. Construction-related GHG emissions are considered a minor adverse impact with respect to global climate change. The North Loop Turnaround Option would result in a minor net beneficial impact to GHG emissions.	The South Loop Turnaround Option would result in a net minor beneficial operational air quality impact. The South Loop option would have the same net minor adverse construction-related GHG emission impact with as would occur with the North Loop Option The South Loop option would have the same net minor beneficial impact with regard to GHG emissions as would occur with the North Loop Option.	AIR-1: Implement BAAQMD Basic Construction Mitigation Measures

TABLE 2-6: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Noise and Vibration				
Alternative 1 would result in no new short- or long-term noise or vibration impacts, either beneficial or adverse	Alternative 2 would result in major adverse impacts to the residential units on the corner of Hyde and Beach Streets and at Ghirardelli Square as well as hotels along Beach Street and the Maritime Museum. Impacts would result from construction noise, construction-related vibration, operational noise and operational vibrations. Identified mitigation would reduce these major adverse impacts to the moderate level	The North Loop Turnaround Option would result in the following: Construction Noise: minor adverse impact Construction Vibration: minor adverse impact. Operational Noise: moderate adverse impact Operational Vibration: minor adverse impact similar to existing vibration levels monitored in the area	The South Loop Turnaround Option would result in the following: Construction Noise: minor adverse impact Construction Vibration: minor adverse annoyance impact at the residences on Laguna Street. Operational Noise: moderate adverse impact Operational Vibration: minor adverse impact	NOISE-1: Implement Construction Noise Mitigation NOISE-2: Implement Operational Noise Mitigation VIBR-1: Implement Construction Vibration Mitigation VIBR-2: Implement Operational Vibration Mitigation
Cultural Resources				
Alternative 1 would not result in any new short- or long-term impacts, either beneficial or adverse	Impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features in the In-Street and Transition segments range from negligible to moderate adverse impact, see Table 4.7-1 and Table 4.7-2 for details	The North Loop Turnaround Option would result in impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features range from negligible to moderate adverse impact, see Table 4.7-1 for details	The South Loop Turnaround Option would result in impacts to NRHP-listed, eligible, or contributing building, structure, object, site or cultural landscape features range from negligible to moderate adverse impact, see Table 4.7-2 for details	CUL-1: Measures to mitigate the adverse impacts of the loss of individual resources at Aquatic Park NHL District (stone retaining wall) CUL-2: Measures to mitigate the adverse impacts due to the introduction of new, incompatible uses to the Aquatic Park NHL District CUL 3: Measures to mitigate the adverse impacts of the alteration of individual resources at San Francisco Port of Embarkation U.S. Army NHL District and Fort Mason National Register Historic District CUL 4: Measures to mitigate the adverse impacts due to the introduction of new, incompatible uses to the San Francisco Port of Embarkation U.S. Army NHL District/Fort Mason National Register Historic District

TABLE 2-6: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Cultural Resources (cont.)				
				CUL-5: Measures to mitigate negligible impacts to archeological resources due to inadvertent discovery during ground-disturbing activities
Recreation and Visitor Use				
Alternative 1 would result in no impacts to recreational opportunities	Alternative 2 would result in short-term and long-term, minor, adverse impacts on recreation and visitor use in the project area	The North Loop Turnaround Option would result in short and long-term minor adverse impacts	The North Loop Turnaround Option would result in short and long-term minor adverse impacts	REC-1: If necessary, relocate the bocce ball courts to suitable location REC-2: Post signage to direct Bay Trail users of temporary re-routes. REC-3: Coordinate the Bay Trail reroutes with Association of Bay Area Governments (ABAG)
Visual and Aesthetic Resources				
Alternative 1 would result in no direct, indirect, or cumulative impacts to visual resources	Alternative 2 would result in a long-term moderate adverse impact	The North Loop Turnaround Option would result in long-term minor and moderate, adverse effects	The South Loop Turnaround Option would result in long-term minor and moderate, adverse effects	VIS-1: Install temporary visual screening during construction. VIS-2: To the extent feasible, construction staging areas shall be located to the largest extent possible away from view of public viewsheds and remain clear of all trash, weeds and debris etc. VIS-3: Signs will be limited to the minimum necessary to meet information, warning, and regulatory needs and to avoid confusion and visual intrusion.
Night Sky Visibility and Light Pollution				
Alternative 1 would result in no direct or indirect, impacts to night sky visibility	Alternative 2 would result in long-term minor impacts due to increased night lighting	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	NIGHT-1: The project would be required to minimize the use of lighting in areas already well lit and to use full cutoff light fixtures throughout the project.

TABLE 2-6: SUMMARY OF IMPACTS AND MITIGATION (CONTINUED)

ALTERNATIVE 1 NO ACTION	ALTERNATIVE 2 ACTION ALTERNATIVE	ALTERNATIVE 2A PROPOSED ACTION WITH NORTH LOOP OPTION	ALTERNATIVE 2B PROPOSED ACTION WITH SOUTH LOOP OPTION	MITIGATION MEASURES
Geology, Soils, and Seismicity				
Alternative 1 would result in negligible impacts with respect to soil erosion and seismic or landslide events for all segments of the alternative, except for the Fort Mason Tunnel Segment, which could experience a moderate, long-term, adverse impact from dynamic settlement caused by a design-basis earthquake. This moderate impact would be reduced to minor intensity with implementation of the proposed mitigation measure(s).	Alternative 2 would result in minor adverse effects	The North Loop Turnaround Option would result in minor adverse effects after implementation of mitigation measure GEO-3.	The South Loop Turnaround Option would result in minor adverse effects after implementation of mitigation measure GEO-2.	GEO-1: Conduct further analyses to determine whether or not the tunnel is vulnerable to additional damage due to compaction of soil during an earthquake GEO-2: Slope stability evaluation and adherence to California Building Code GEO-3: Fort Mason Tunnel rehabilitation
Biological Resources				
Alternative 1 would result in no measurable change to vegetation, wildlife, or special-status species (if present)	Alternative 2 would result in negligible impacts to biological resources after implementation of the mitigation measures BIO-1 and BIO-2, construction and operation impacts	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	BIO-1: Preconstruction Nesting Bird Surveys BIO-2: Preconstruction Roosting Bat Surveys
Public Health and Safety				
Alternative 1 would result in no direct or indirect impacts to public health and safety	Alternative 2 would result in a short-term, minor, adverse impact	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	HEA-1: Pre-Construction Hazardous Materials Assessment HEA-2: Soil and Groundwater Management Plan HEA-3: Health and Safety Plan (HSP)
Public Services and Utilities				
Alternative 1 would result in no impacts to public services or utilities under this alternative	Alternative 2 would result in moderate adverse impacts	Same as Alternative 2 Action Alternative conclusions	Same as Alternative 2 Action Alternative conclusions	PUB-1: Maintain Utility Services

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