

San Francisco International Airport

AIRPORT SHORELINE PROTECTION PROJECT

Fiscal Feasibility Study

September 2015



I. Introduction

The City and County of San Francisco owns and operates San Francisco International Airport (SFO), which is the primary commercial service airport for the San Francisco Bay Area. The Airport serves the Bay Area with domestic and international passenger flights as well as all-cargo flights. SFO is one of the busiest airports in the United States and provides economic benefits to the City of San Francisco and the entire Bay Area. According to Airport Council International (ACI) data, SFO was ranked 7th in the United States in terms of total passengers with 44,399,885 and ranked 19th in terms of air cargo in calendar year (CY) 2012¹. SFO is one of the country's principal international gateways for Pacific Rim traffic, it serves as a hub for United Airlines, and it is Virgin America's primary base of operations.

San Francisco International Airport occupies approximately 5,171 acres of land, with approximately eight miles of shoreline along the west side of San Francisco Bay. The existing seawall system is in need of major improvements in order to protect against 100 year floods and sea level rise. Implementing this proposed Airport Shoreline Protection project would reduce flood risks at SFO by providing protection against 100-year floods. The Airport believes this project is both fiscally responsible and feasible.

Since the early 1980's, SFO has been constructing various types of seawalls including earth berms, concrete dikes and vinyl sheet piles. However, there are gaps of various lengths along the shoreline that may allow water to enter the airfield. These gaps include segments at US Coast Guard Air Station, Mel Leong Waste Treatment Plant, the Airport's north and south boundaries and specific drainage outfall locations.

Recognizing the potential flood risks, SFO completed an Airport Shoreline Protection Feasibility Study (Study) to better understand the deficiencies in its existing shoreline protection system. The Study also provides recommendations on improvements needed to protect the Airport from a 100-year flood and sea level rise.

Summary of Study:

- Performed coastal engineering modeling, geotechnical stability analysis and interior drainage system review
- Identified flood protection system deficiencies in accordance with Article 44 CFR 65.10
- Identified implications of Sea Level Rise (SLR)
- Developed flood protection measures to rectify the current deficiencies as well as address future rising sea levels
- Developed budgetary implementation costs for the protection measures

To address the potential flood risks, SFO is developing a new Shoreline Protection Program (SPP) based upon recommendations in the Airport Shoreline Protection Feasibility Study Report (Report).

¹ 2012 Airports Council International (ACI) and Airports Council International- North America (ACI-NA) Airport Statistics

At this stage, the Airport is proposing this Airport Shoreline Protection project to address the deficiencies identified by the Study in the existing seawall system by constructing new shoreline protection segments, stabilizing the embankments, installation of seepage cutoff walls and providing closures in the seawall system.

Pursuant to Chapter 29 of the San Francisco Administrative Code, prior to initiating environmental review for a proposed project, as defined by the California Environmental Quality Act, which is estimated to have implementation and/or construction costs greater than \$25 million and use more than \$1 million in public monies, the proposal must be submitted to the Board of Supervisors to determine whether the plan for undertaking and implementing the project is fiscally feasible and responsible. The proposing City department must prepare a feasibility study and submit it to the Board of Supervisors prior to submitting the project to the Planning Department for environmental review.

The Airport is submitting this fiscal feasibility study to the Board of Supervisors to comply with Chapter 29 of the Administrative Code, since the total project cost for the Airport Shoreline Protection project is in excess of \$25 million and the project will require a CEQA review.

II. San Francisco International Airport

San Francisco International Airport is owned and operated by the City and serves as the primary airport for the Bay Area. The Airport is governed by the Airport Commission, as outlined in the City Charter. The five-person Airport Commission is primarily a policy-making body, establishing the policies by which the Airport operates. The Airport Director oversees the operation and management of the Airport. SFO also operates under the regulations of the FAA and the Transportation Security Administration (TSA). The Airport's mission is to provide safe and secure facilities for airlines, tenants, employees, and the traveling public and to be fiscally prudent and contribute to the health of the local economy². The Airport Shoreline Protection project would significantly reduce flood risk and enhance safety of the airfield facility and passengers at SFO.

III. Project Overview

The purpose of this project is to address the deficiencies in the existing seawall system by constructing new shoreline protection segments at various locations, including Mel Leong Treatment Plant, U.S. Coast Guard, and south end boundary along the perimeter of the airfield; stabilizing the embankments at end of Runway 19s and at the intersection of Taxiways Lima and Charlie; installation of seepage cutoff walls at Runway 19s and providing closures at outfall pump stations and downstream of San Bruno Channel.

An estimate of probable construction costs is provided in the table below. More details regarding the project costs are shown in Appendix I.

² San Francisco International Airport, "Strategies and Goal 2007 – 2012", pg. 3.

**Table 1
Airport Shoreline Protection Project Costs³**

Airport Shoreline Protection Project Component	Amount
Seawall Improvements	\$33,718,434
Embankment Improvements	\$ 8,273,240
Geotechnical Improvement	\$ 4,134,552
Closures	\$ 3,383,654
Environmental Mitigation	\$ 8,000,000
TOTAL	\$57,509,880

The **Airport Shoreline Protection** project components are diagrammed in Appendix II, and include:

- **Seawall Improvements** - This component will include construction of new berm at Mel Leong Treatment Plant, construction of new seawall at U.S. Coast Guard, extension of existing seawalls with minimum freeboard deficiencies, raising of existing vehicle service road to serve as berm and replacement of existing sheetpiles. SFO will have to obtain necessary approval from the U.S. government/U.S. Coast Guard before implementing improvements at the U.S. Coast Guard located at SFO.
- **Embankment Improvements** - This component will include installation of riprap on the bay side of existing seawall to flatten embankment at the end of Runway 19s and intersection of Taxiways Lima and Charlie.
- **Geotechnical Improvement** - This component will include installation of seepage wall at foot of existing berm landside at the end of Runway 19s.
- **Closures** - This component will include construction of closure devices at existing outfall pump stations and modification of tide gate at the downstream of San Bruno Channel.

IV. Environmental Review

An Environmental Evaluation Application for environmental review has yet to be filed with the City and County of San Francisco’s Planning Department – Environmental Planning Division (SFEP), the City department responsible for undertaking the administrative actions required of the City as lead agency under the California Environmental Quality Act (CEQA). Upon review by the Board of Supervisors of the fiscal feasibility study and a determination that the project is fiscally feasible and responsible, Airport staff will submit the Environmental Evaluation Application for the current project proposal to SFEP for review of potential environmental

³ The cost estimates presented here are based on planning-level requirements and design drawings and are preliminary in nature as developed by SFO. Final cost estimates will be prepared once the environmental process is complete and detailed design drawings are prepared.

impacts for each of the 17 resource categories, conducted according to the procedural requirements of CEQA (California Public Resources Code Section 21000 et seq.), State CEQA Guidelines (Title 14 California Code of Regulations, Section 15000 et seq.) and Chapter 31 of the San Francisco Administrative Code. Airport staff will submit an Initial Study at a future date, which will include environmental analyses of the CEQA resource categories; Airport anticipates the SFEP Environmental Review Officer will prepare a Mitigated Negative Declaration or an Environmental Impact Report.

The environmental permitting process will be conducted concurrently with the environmental review process to expedite the project. Such permits must be coordinated with the design process to ensure final key design conforms to the conditions and analyses provided in the permit applications to various federal, state, and local regulatory agencies. Staff anticipates permits will be required from the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, National Marine Fisheries Service, San Francisco Bay Regional Water Quality Control Board (RWQCB), San Francisco Bay Conservation and Development Commission (BCDC), and Bay Area Air Quality Management District (BAAQMD). Airport staff estimates completion of the environmental review and permitting process for this project within 18 - 24 months from the start of the environmental process.

V. Fiscal Feasibility Analysis

Under the provisions of the San Francisco Administrative Code §29.2 there are five criteria to evaluate the project's fiscal feasibility. The five criteria to study the fiscal feasibility are as follows:

- (1) Direct and indirect financial benefits of the project to the City, including to the extent applicable cost savings or new revenues, including tax revenues generated by the proposed project;
- (2) The cost of construction;
- (3) Available funding for the project;
- (4) The long-term operating and maintenance cost of the project; and
- (5) Debt load to be carried by the City department or agency.

The fiscal feasibility of the Airport Shoreline Protection project is analyzed based on the five criteria below.

(1) Financial Benefits to the City

The Airport provides both direct and indirect financial benefits to San Francisco, including employment and tax revenues. This project plans to construct new levees and improve existing levees at various locations along the shoreline to provide campus wide flood protection for the Airport which in turn would reduce significant air traffic interruption costs due to extreme weather events. In addition, the completed shoreline protection system would allow the Airport to build on grade without elevating or flood proofing which would significantly reduce construction costs on airport development projects.

Direct Financial Benefits

The City receives numerous direct financial benefits resulting from the operation of the Airport in the most efficient and effective manner possible. The Airport Shoreline Protection project is critical to ensure safe operations of air traffic during extreme storm events with a campus wide flood protection system. This will ensure the City continues to receive the maximum financial benefits including tax revenue generated by visitors, job creation benefits, and the Airport's annual service payment into the General Fund. The Airport's economic activity also provides financial benefits to the entire Bay Area economy.

City Revenue

Under the current Lease and Use Agreement between the Airport and the airlines, SFO provides 15% of gross concession revenues to the City's General Fund. These General Fund revenues can be applied to any use determined by policy makers. Without undertaking this essential project, aircraft operations, passenger volumes, and concession revenues could be reduced, and the City's General Fund could see a loss in revenue due to potential reductions in annual service payments.

The annual service payments provided by the Airport to the City's General Fund over the previous five fiscal years totaled \$166.8 million. In FY 2014, the Airport transferred \$38.0 million in revenue to the City. The five-year breakdown of the annual service payments is shown in the table below.

Table 2
Annual Service Payment
FY 2010 to FY 2014
(in millions)

Fiscal Year	Annual Service Payment
FY 2010	\$ 28.1
FY 2011	\$ 30.2
FY 2012	\$ 34.0
FY 2013	\$ 36.5
FY 2014	\$ 38.0
Total	\$ 166.8

Source: San Francisco International Airport Annual Financial Statements

The average annual payment received by the City over the most recent five fiscal years was \$33.4 million which has increased by 35% over the past five-years. The current Lease and Use Agreement between the Airport and signatory airlines operating at the Airport includes the annual service payments through FY 2021. The Airport expects the annual service payments to continue to increase with passenger volumes and concession spending during that period.

Direct Employment

San Francisco International Airport is an economic driver for the City and County of San Francisco and also the entire Bay Area. A key measure of economic activity is the direct employment based on activities related to the Airport. These are jobs that would not exist without the Airport, and they would be impacted by any reduced airport activity. These jobs are within the aviation sector, transportation, professional services, or construction services.

According to Economic Development Research Group, Inc., a total of 36,392 direct jobs are dependent on the activity of SFO. These jobs would be discontinued immediately if airport activity ceased. These jobs would also likely be impacted as a result of changes in number of flights and passenger levels. The table below provides a breakdown of the types of direct jobs by category created by the Airport.

Table 3⁴
Direct Job Impacts from SFO for 2014

Job Category	Direct Jobs	Percent
Passenger Airlines	14,520	39.9%
Airport Retail & Concessions	3,858	10.6%
Rental Car	3,663	10.1%
Limos/Buses/Vans/Transit	3,091	8.5%
FBOs & General Aviation & Aviation. Services	1,817	5.0%
City of San Francisco Airport Commission	1,668	4.6%
All Other Ground Transportation	1,409	3.9%
Security Firms	1,367	3.8%
Federal Government	1,166	3.2%
Capital Construction	949	2.6%
Taxi Cabs	948	2.6%
Other	1,936	5.3%
TOTAL	36,392	100.0%

Source: Economic Development Research Group, Inc., December 2014

Failure to proceed with this project may impact passenger levels at SFO that could in turn impact the number of direct jobs. The total payroll from direct jobs in Fiscal Year 2014 is \$2.4 billion. These jobs provide tax revenue to the City and County of San Francisco and throughout the Bay Area.

The Airport Shoreline Protection construction project will employ significant staff. Based on the construction costs of the project an estimated 414 jobs would result from this project.

⁴ Economic Development Research Group, Inc., “2014 Economic Impact Study of San Francisco International Airport”, December 2014, pg. 22.

**Table 4
Airport Shoreline Protection Project Job Impact**

Airport Shoreline Protection Project Component	Amount	Total Job Impact
Seawall Improvements	\$33,718,434	282
Embankment Improvements	\$8,273,240	69
Geotechnical Improvements	\$4,134,552	35
Closures	\$3,383,654	28
TOTAL	\$49,509,880	414

Source of employment impacts: Regional Economic Models, Inc. (REMI).

The construction impact is a one-time job creation impact for the City and County of San Francisco, but the project duration spans several years.

However, the indirect impact of jobs resulting from the economic activity of the Airport is also significant:

- A total of 11,745 of indirect jobs are generated in the local economy from purchases of goods and services by firms completely dependent upon activity of SFO⁵.
- A total of 13,234 jobs are induced in the region from purchases of goods and services by the direct jobs created by activity at SFO.

Tax and Economic Benefits

In addition to the direct and indirect job impact, activities from SFO generate significant tax revenues for San Francisco and the Bay Area. State and local taxes linked to the Airport are estimated at \$2.5 billion in Fiscal Year 2013-14, including approximately \$1.4 billion from direct activities and \$1.2 billion from purchases of supplier goods and services and re-spending of worker income.⁶

SFO also serves an economic driver for San Francisco and the Bay Area as a whole. In FY 2013/14, SFO directly accounted for approximately \$6.0 billion of business activity. Off-site business activities that depend directly on local air service for staff movements, cargo deliveries, or visitor spending result in a direct airport economic contribution to the Bay Area totaling an estimated \$35.0 billion in business sales. Additionally, there are regional spin-off activities associated with suppliers and services to the directly affected businesses, and the re-spending of additional worker income on consumer goods and services. Adding in these indirect effects brings SFO’s total economic footprint within the Bay Area to approximately \$59.0 billion in business sales, including \$21.0 billion in total payroll, and more than 285,000 jobs in the region⁷.

⁵ Ibid. pg. 23

⁶ Ibid, pg. 39

⁷ Ibid, pg. ii

(2) Costs of Construction

The total project cost is \$58 million for the entire Airport Shoreline Protection project. This amount includes environmental mitigation, as well as construction costs, internal costs for Airport staff, external professional services to provide project management and construction management support, and associated design and engineering work for the project. The full breakdown of the project costs including construction costs and soft costs are shown in the table below.

Table 5
Airport Shoreline Protection Total Project Costs

Airport Shoreline Protection Project Component	Total Amount	Construction Costs	Soft Costs*
Seawall Improvements	\$33,718,434	\$27,854,366	\$5,864,068
Embankment Improvements	\$8,273,240	\$6,834,418	\$1,438,823
Geotechnical Improvements	\$4,134,552	\$3,415,500	\$719,051
Closures	\$3,383,654	\$2,795,193	\$588,461
Environmental Mitigation	\$8,000,000	\$8,000,000	\$0
TOTAL	\$57,509,880	\$48,899,477	\$8,610,461

* Soft costs include project management, design, inspection, and construction management.

Source: SFO

Detailed construction cost estimates are included in Appendix I. The direct construction costs are \$49.5 million and the construction costs related to the project include; earth moving, berm construction, seawall foundation installation; new soldier pile seawall installation, wall cap installation, new sheetpiles, roadway reconstruction, riprap installation, rebar installation, concrete forming and pouring. Standard general conditions and design contingency allowances for the conceptual design stage are also shown.

(3) Available Funding

The Airport anticipates having sufficient funding for the Airport Shoreline Protection project. The Airport's Plan of Finance and the Airport's Five-Year and 10-Year Capital Improvement Plan (CIP) include this project for the Airport. The Airport anticipates funding this project with internal sources.

As a large-hub airport with a robust capital improvement program, the Airport included the costs of the project into the annual 5- and 10-year capital plan. The Airport currently has remaining appropriation from the 2014 \$1,969.8 million supplemental appropriation for capital projects. The Airport will utilize debt financing through General Aviation Revenue Bonds (GARBs) to fund the project.

(4) Project Long-term Operating and Maintenance Costs

The long-term operating and maintenance costs from the proposed project are minimal. These activities will be performed by SFO Maintenance and include typical costs to routine inspection of seawalls, recording of finding and prepare repair recommendation per Federal Emergency Management Agency's (FEMA) certification guidelines

(5) Debt Load Carried by the Airport

The Airport will have to finance the construction costs associated with this project, and thus will incur additional debt. The Airport has an active debt finance department to fund capital projects and manage the Airport's \$4.5 billion debt portfolio.

Based on the FY 2015-16 Capital Improvement Plan, the Airport anticipates funding the full cost of the Shoreline Protection project with debt, however it will pursue any federal and state grant funding that the project may qualify for.

The debt service costs associated with this project will not impact the General Fund. Rather, the debt service payments will increase the costs borne by the airlines doing business at the Airport, through the rates and charges they pay the Airport. The issuance of debt for the project would result in estimated annual debt service payments of approximately \$5.2 million (after the capitalized interest period), or a total of \$147.9 million over the 30-year term of the bonds. This assumes a conservative all in true interest cost of 6.1% and a 12-month capitalized interest period.

VI. Conclusion

Implementing this proposed Airport Shoreline Protection project is essential to reduce flood risks at SFO by proving protection against 100-year floods. The Airport believes this project is both fiscally responsible and feasible. The project would enable the City of San Francisco to maintain a world class airport and continue to be the airport of choice for the Bay Area. The project would continue to provide the City and the entire Bay Area region with significant financial and economic benefits.

If the Airport Shoreline Protection project is not allowed to be considered by the Airport Commission for implementation, the Airport will be subject to flood risks posed by extreme storm and sea level rise effects. Consequently, the Airport would incur significant operational and cost impacts, as a result of flooding. In Addition, the Airport would be required to elevate or floodproof all new structures and substantial improvements to existing structures. This would increase construction costs of future developments at the Airport. Failure to implement this project could in turn adversely affect Airport revenue, reduce annual service payments by the Airport to the City's General Fund, reduce employment provided from Airport activities, and impact the City's economy.

Appendix I Detailed Airport Shoreline Protection Project Costs

Seawall Reach/Component	Seawall Improvements	Embankment Improvements	Geotechnical Improvement	Closures	Total
San Bruno Tide Gate	\$ -	\$ -	\$ -	\$ 2,509,151.24	\$ 2,509,151.24
Mel Leong Treatment Plant	\$ 9,125,247.62	\$ -	\$ -	\$ -	\$ 9,125,247.62
Sea Plane Harbor North	\$ 243,339.94	\$ -	\$ -	\$ -	\$ 243,339.94
US Coast Guard	\$ 4,935,238.09	\$ -	\$ -	\$ -	\$ 4,935,238.09
Pump Station #2 Closure (MERF/USCG)	\$ -	\$ -	\$ -	\$ 296,570.55	\$ 296,570.55
Sea Plane Harbor South	\$ 66,538.26	\$ -	\$ -	\$ -	\$ 66,538.26
19 End	\$ 4,662,124.51	\$ 8,039,405.80	\$ 4,134,551.55	\$ -	\$ 16,836,081.86
Pump Station #1C Closure (19R)	\$ -	\$ -	\$ -	\$ 171,098.39	\$ 171,098.39
19L Edge	\$ 199,614.79	\$ -	\$ -	\$ -	\$ 199,614.79
Lima Charlie Intersection	\$ -	\$ 233,834.47	\$ -	\$ -	\$ 233,834.47
Pump Station #1B Closure (28R)	\$ -	\$ -	\$ -	\$ 171,098.39	\$ 171,098.39
28 End(Raise Road)	\$ 1,908,697.63	\$ -	\$ -	\$ -	\$ 1,908,697.63
28L Edge	\$ 471,471.13	\$ -	\$ -	\$ -	\$ 471,471.13
Pump Station #1A Closure (28L)	\$ -	\$ -	\$ -	\$ 235,735.56	\$ 235,735.56
Lima South (1R) and Millbrae Connection	\$ 12,106,161.84	\$ -	\$ -	\$ -	\$ 12,106,161.84
Total Construction Costs	\$ 33,718,433.80	\$ 8,273,240.27	\$ 4,134,551.55	\$ 3,383,654.14	\$ 49,509,879.76
Environmental Mitigation	\$ 5,448,356.40	\$ 1,336,822.52	\$ 668,077.01	\$ 546,744.07	\$ 8,000,000.00
Total Project Costs	\$ 39,166,790.21	\$ 9,610,062.79	\$ 4,802,628.56	\$ 3,930,398.20	\$ 57,509,879.76

Notes * Design contingency amount is consistent with industry standard of approximately 20% at conceptual design stage.

Appendix II Airport Shoreline Protection Project Overview

