



**COMMISSION
AGENDA MEMORANDUM**

Item No. 6b

ACTION ITEM

Date of Meeting March 28, 2017

DATE: March 20, 2017

TO: David Soike, Interim Chief Executive Officer

FROM: Michael Ehl, Director, Airport Operations
Wayne Grotheer, Director, Aviation Project Management
George England, Sr. Capital Program Leader

SUBJECT: Service Tunnel Renewal/Replacement (CIP #C102112)

Amount of this request: \$28,939,925

Total estimated project cost: \$33,505,000

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to (1) authorize an additional \$28,939,925 for construction of the Service Tunnel Renewal/Replacement project at Seattle-Tacoma International Airport for a total project authorization of \$33,505,000, (2) advertise and execute a major public works construction contract, (3) enter into a project labor agreement covering this project, and (4) utilize Port crews and small works contracts to complete the work.

EXECUTIVE SUMMARY

This seismic retrofit effort will reinforce the tunnel and loading dock areas to meet the building code structural standards for a 475-year interval earthquake (design quake). The 100% design is progressing to completion, and advertisement for construction is scheduled for April 2017. Commission previously authorized \$4,565,075 for design. The initial project estimate of \$27,900,000 has grown \$5,605,000 to \$33,505,000 with the addition of the Loading Dock area, the impacts of an active construction market, and additional costs to mitigate impacts within the tunnel and on the drives during construction.

JUSTIFICATION

The Service Tunnel and Central Loading Dock structures are essential Port facilities. These structures support critical portions of the Departures Drive and the entire Arrivals Drive in the terminal area. The activities and infrastructure these structures support are essential to airport operations. They include the employee busing operation, all of the loading dock activities supporting terminal retailers and restaurants, access to the Central Mechanical Plant, and most utilities serving the central terminal. These structures do not meet the current code requirement for preservation of life/safety or collapse during a design quake.

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DETAILS

This seismic retrofit effort will reinforce the tunnel and loading dock areas to meet the building code structural standards for a design quake for both collapse and life/safety. The Loading Dock was added to the project after modeling indicated it did not perform to standard during the design interval quake and would be seriously damaged and cause further damage to the Main Terminal, Parking Garage, Central Mechanical Plant, and adjacent Service Tunnel. Of the \$5,605,000 cost growth, the additional Loading Dock work accounts for \$3,200,000; while the \$2,405,000 balance reflects an active construction market and additional costs incurred to mitigate operational impacts within the tunnel and on the drives. Staff will be holding a pre-advertisement information session to generate bidding interest within the contracting community. A pre-bid conference will also be held to further inform bidders.

Scope of Work

The project will construct seismic reinforcement walls, reinforce portions of the tunnel roof, and increase the spacing between existing structures to allow for vastly improved structural performance during a major quake.

Advanced analysis has resulted in targeted and optimized structural modifications that benefit the schedule, reduce operational impact, and eliminate some night shift work. It impacts the following three project work elements:

- (1) Analysis of the Loading Dock structure was absorbed in the design effort at no additional cost. Strengthening and widening the space between the Loading Dock and adjacent structures will be added to the project scope to eliminate potential failure of the Loading Dock roof structure and damage to it and the adjacent terminal and parking structures during an earthquake.
- (2) Advanced numerical analysis indicated that the southern cast-in-place tunnel segment could withstand the design quake as-is, and it was subsequently deleted from the project scope. The same type of analysis was performed on the northern cast-in-place tunnel segment, allowing for a more targeted and streamlined reinforcement solution in that structure.
- (3) Proposed modifications to the northern retaining wall leading to the tunnel were removed from the project work scope. It is likely the wall will be demolished and replaced during a reconfiguration of the terminal drives triggered by the Sustainable Airport Master Plan. Reinforcing it would just complicate this demolition. There is a limited risk of the North Retaining Wall failing during a major earthquake, but it is a manageable risk, and one that is expected to be eliminated within the next 10 years.

Small Business

Throughout the project, elements within the scope of work will provide small business opportunities, including minority- and women-owned business enterprises. Analysis of small business utilization is on going, but we anticipate a 20% requirement.

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Schedule

Activity

Construction start	2017 Quarter 3
In-use date	2019 Quarter 4

Cost Breakdown

	This Request	Total Project
Design	\$0	\$4,565,075
Construction	\$28,939,925	\$28,939,925
Total	\$28,939,925	\$33,505,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 –Leave it “as-is”

Cost Implications: \$4,565,075 to date, plus the cost of repair or replacement after an event

Pros:

- (1) Minimizes capital expenditures
- (2) Tunnel performed adequately during the 2003 Nisqually earthquake (160-year interval quake), though there was damage

Cons:

- (1) Potential points of failure during a major earthquake include the Service Tunnel, Central Loading Dock, Arrivals Drive, and Departures Drive
- (2) Failure to perform the modifications could also lead to damage of the Central Mechanical Plant, Parking Garage, and terminal structures
- (3) Damage did occur during the Nisqually earthquake, particularly to the portion of the tunnel supporting the southern Arrivals Drive, which could have collapsed if the shaking had continued.
- (4) Would need to write off \$4.5 million in design costs

This is not the recommended alternative.

Alternative 2 – Tunnel-Only Seismic Upgrades

Cost Implications: \$30,305,000

Pros:

- (1) Allows Service Tunnel, Departures and most of Arrivals Drive (with exception of the portion above the Loading Dock) to meet building code standards for collapse and life safety during an earthquake

Cons:

- (1) Not performing the loading dock modifications could lead to Central Mechanical Plant, Terminal and Parking Garage structural damage during a major earthquake

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- (2) Failure of the Arrivals Drive directly above the Loading Dock is possible during an earthquake

This is not the recommended alternative.

Alternative 3 – Tunnel and Central Loading Dock Seismic upgrades

Cost Implications: \$33,505,000

Pros:

- (1) Brings the entire length of the Service Tunnel structure, to include the Central Loading Dock, into compliance for surviving a design-level quake
- (2) Provides increased safety to our public and employees, and ensures continuity of operations

Cons:

- (1) Adds \$5,605,000 to the original authorized project budget of \$27,900,000.
- (2) Longer project duration

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary

	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$27,586,000	\$314,000	\$27,900,000
Current change	\$5,605,000	\$0	\$5,605,000
Revised estimate	\$33,191,000	\$314,000	\$33,505,000
AUTHORIZATION			
Previous authorizations	\$4,565,075	\$0	\$4,565,075
Current request for authorization	\$28,625,925	\$314,000	\$28,939,925
Total authorizations, including this request	\$33,191,000	\$314,000	\$33,505,000
Remaining amount to be authorized	\$0	\$0	\$0

Annual Budget Status and Source of Funds

The Service Tunnel Renewal/Replace project (CIP #C102112) was included in the 2017-2021 capital budget and plan of finance with a budget of \$27,586,000. The budget increase is an adjustment to the preliminary cost estimate driven by increased inflation, clarification of and additions to project scope, and mitigation costs associated with minimizing operational impact. The budget increase will be transferred from the Aeronautical Allowance CIP (C800753), resulting in no net change to the airport capital budget. The funding source for this project will be the Airport Development Fund (ADF) and future revenue bonds, to be issued in 2017. The airlines approved this project through a majority-in-interest (MII) vote in 2014, with a budget of \$27.6 million. The current cost estimate would require another MII vote; however, the Port

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elected to use the management reserve allowance per the signatory lease and operating agreement (SLOA) to cover the increase. The airlines were briefed on the project and the Port’s plan to use management reserve at the March 2, 2017, airport airline affairs committee meeting.

Financial Analysis and Summary

Project cost for analysis	\$33,505,000
Business Unit (BU)	Roadways
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase
IRR/NPV (if relevant)	N/A
CPE Impact	\$0.07 in 2020

Future Revenues and Expenses (Total cost of ownership)

The existing service tunnel structure is nearing the end of its design service life. The Service Tunnel and Central Loading Dock will remain essential to the operation of the airport for decades. The completion of this project will help to expand the useful life of these facilities for 20 to 50 years. We do not anticipate a significant change in operating and maintenance costs for these facilities as a result of this project.

ATTACHMENTS TO THIS REQUEST

- (1) Presentation slides – Vicinity map and project details

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

- August 5, 2014 – The Commission authorized the Chief Executive Officer to execute a professional services agreement for the design development of the Service Tunnel Renewal/Replacement project at Seattle-Tacoma International Airport in the amount of \$4,565,075 of an estimated total project cost of \$27,900,000.
- April 1, 2014 – Commission was briefed on the Service Tunnel Renewal/Replacement Project.
- March 27, 2007 – Commission authorized the Chief Executive Officer to 1) purchase materials, 2) perform environmental evaluations, 3) perform studies and preliminary engineering, 4) advertise, execute and award small works contracts, 5) and execute and award outside professional services agreements for the Parking Garage/Service Tunnel Pre-Design project at Seattle-Tacoma International Airport for a total authorization of \$966,500. Project resulted in a detailed needs assessment for both the garage and service tunnel, but no construction, and has since been expensed.