

PORT OF SEATTLE
MEMORANDUM

COMMISSION AGENDA
ACTION ITEM

Item No.	6d
Date of Meeting	August 5, 2014

DATE: July 29, 2014
TO: Tay Yoshitani, Chief Executive Officer
FROM: Michael Ehl, Director, Airport Operations
Wayne Grotheer, Director, Aviation Project Management
George England, Capital Program Leader, Aviation Project Management
SUBJECT: Service Tunnel Renewal/Replacement (CIP #C102112)

Amount of This Request:	\$4,500,000	Source of Funds:	Airport Development Fund (ADF) and Future Revenue Bonds
Est. Total Project Cost:	\$27,900,000		

ACTION REQUESTED

Request Commission authorization for the Chief Executive Officer to execute a professional services agreement for design development of the Service Tunnel Renewal/Replacement project at Seattle-Tacoma International Airport in the amount of \$4,500,000 of an estimated total project cost of \$27,900,000.

SYNOPSIS

The Airport service tunnel is located below the Airport arrivals drive, and runs the full length of the main terminal. It structurally supports the entire arrivals drive, and critical portions of the departure drive. The service road within the tunnel provides the only access to the central loading dock and central heating plant located at tunnel midpoint that are critical to supporting continuous 24 hour airport operations. Two employee parking bus stops are also located within the tunnel. The roof of the tunnel supports a range of utilities also essential to main terminal operations. The 2,500-foot-long service tunnel was designed, constructed, and commissioned in phases between 1968 and 1974.

The Airport Service Tunnel Renewal/Replacement project will bring the structures up to current seismic code and improve their earthquake reliability. Work includes improvements to existing shear walls, improved column footings, beam reinforcement, and additional seismic bracing. Ongoing seismic upgrades at the Airport have included upgrades to the parking garage (1990), the central loading dock area (1997), main terminal baggage and ticketing (1998 and 1999), Airport roads and bridges (2001), and additional main terminal seismic retrofitting (2004).

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This request is to retain a consultant to conduct further site investigations, conditions surveying, and to design the project. The information gathered during design will inform staff whether to award a single construction contract or several phased contracts, to address the various construction risks when retrofitting the existing structural, electrical, and mechanical systems in the tunnel.

This project was approved by the airlines under the Majority-In-Interest process in July 2014. This project is included in the 2014-2018 capital budget and plan of finance. The project will include a project labor agreement.

BACKGROUND

The service tunnel structure is complex, consisting of several different structural designs mirroring themselves as one moves north and south from the center of the tunnel (see Attachment A). The central area structure was upgraded in 1997 as part of the Ground Access and Seismic Improvements project. The Service Tunnel Renewal/Replacement project will address the remaining portions of the service tunnel that have not been upgraded.

An earlier condition assessment of the various portions of the service tunnel identified a number of seismic vulnerabilities in every portion of the service tunnel, with the exception of the loading dock area. The study also identified the need to accurately locate and investigate the numerous utilities located throughout the tunnel. Several of the utilities within the tunnel are vital to 24/7 operations of the Airport.

PROJECT JUSTIFICATION AND DETAILS

The service tunnel is an essential Airport facility and is structurally linked to other critical Airport infrastructure. The roof of the service tunnel forms the support for most of the Airport's arrivals drive and portions of the departures drive. The service tunnel provides critical secured access to the central heating plant and its supporting infrastructure, the central loading dock (used by commercial delivery vehicles to support continuous 24-hour terminal operations), and the employee busing operation. The service tunnel provides structural support for multiple critical utilities, offices, locker rooms, storage rooms, and emergency generators. A catastrophic failure during a seismic event could cripple airport operations above and within the service tunnel.

The service tunnel is an essential element of Airport infrastructure that has not been strengthened or upgraded to current seismic building codes. Seismic standards have changed greatly since the construction of the service tunnel, and an update is needed. Retrofitting the service tunnel will improve its survivability and strength, while also extending the service life of the facility.

Without seismic upgrades, there are unreinforced portions of the service tunnel that will be at risk of severe damage or localized failure during a seismic event. This in turn could lead to localized failure of the departures and arrivals drives, and possible utilities failures. A 2009 study by Kennedy/Jenks indicated that each section of the service tunnel has unique seismic

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deficiencies, with the transition structures between the cast-in-place concrete sections and the sections supported by structural framing being the areas of greatest risk. There are also failing expansion and construction joints that are causing water-related deterioration and damage to the tunnel structure. Unique design solutions will be required for different sections of the service tunnel due to the variations in the existing structural designs.

Proposed improvements that will be considered during design include strengthening columns and their footings, reinforcing structural beams, tying structural beams together, and adding shear walls and panels. Other critical repairs within the service tunnel include improving the drainage and repairing failed structural and expansion joints that are allowing backfill material to move through joints in the service tunnel walls.

After considering several different contracting methods to accomplish the project, staff determined that design-bid-build was the most efficient. It was determined that this method would allow the Port to best manage the design, develop phasing that minimizes operational impacts, and manage unforeseen site conditions and risks. There is also an opportunity to consider phased construction contracts – where the Airport can leverage lessons learned from the first contract to improve our bid documents and reduce our risks with the subsequent contract(s).

A consultant team will be hired with experience in structural, mechanical, electrical, and geotechnical engineering design to survey existing utilities, conduct site investigations, and prepare design documents and specifications. The team will also contain expertise in constructability analysis. Extensive surveying needs to be conducted to more precisely locate the numerous existing utilities within the tunnel. Further investigative work is needed to better determine unknown conditions staff speculates may exist. These additional efforts will reduce, but not eliminate, the Port's risks for inadequate as-built information and unknown conditions.

Given the confined nature of the tunnel and the type of improvements necessary to reinforce the various structures, the project will develop plans to mitigate operational impacts to the loading dock, employee parking buses, and central plant. Extensive stakeholder feedback will be sought and incorporated into the design documents.

Project Objectives

The project will bring the service tunnel into compliance with modern life/safety seismic standards and code, and would:

- Enhance the survivability of the service tunnel in a major seismic event.
- Extend the useful life of the service tunnel.
- Improve public safety and maintain Airport operations.

Scope of Work

Staff is recommending that the design of the project include a geotechnical analysis, deficiency assessment of each section, a detailed survey, constructability review, phasing analysis, and

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design plans and specifications to address a seismic reinforcement strategy for each section. It is also estimated that \$314,000 of regulated materials management abatement work will be required during the project.

The design effort will focus on the following outcomes:

- Improving structural performance and reducing damage in all levels of earthquake
- Reducing interference/connectivity issues between the service tunnel and the primary terminal structure and parking garage in all levels of earthquake (helping to preserve the integrity of the terminal and parking garage)
- Reducing the likelihood of disruption to utilities servicing the terminal in all levels of earthquake
- Performing constructability analyses
- Reducing drainage issues and repairing drainage-related damage
- Correcting existing voids and reducing future voids and other movements that may cause instability and damage, even in everyday conditions
- Increasing the lifespan of the existing structural components
- Compatibility with adjacent current and planned projects
- Minimizing operational impacts during construction, while maintaining operational continuity

Schedule

MII approval	July 2014
Design Authorization	August 2014
Construction Authorization	2 nd Quarter 2016
Construction Completion	4 th Quarter 2018

FINANCIAL IMPLICATIONS

Budget/Authorization Summary

	Capital	Expense	Total Project
Original Budget	\$24,009,000	\$0	\$24,009,000
Budget increase	\$3,577,000	\$314,000	\$3,891,000
Revised budget	\$27,586,000	\$314,000	\$27,900,000
Previous Authorizations	\$65,075	\$0	\$65,075
Current request for Authorization	\$4,500,000	\$0	\$4,500,000
Total Authorizations, including this request	\$4,565,075	\$0	\$4,565,075
Remaining budget to be Authorized	\$23,020,925	\$314,000	\$23,334,925
Total Estimated Project Cost	\$27,586,000	\$314,000	\$27,900,000

Project Cost Breakdown

	This Request	Total Project
Design	\$4,500,000	\$4,550,000
Construction	\$0	\$21,240,000

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RMM Abatement	\$0	\$314,000
State & Local Taxes (estimated)	\$0	\$1,796,000
Total	\$4,500,000	\$27,900,000

Budget Status and Source of Funds

The Service Tunnel Renewal/Replacement project (CIP #C102112) was included in the 2014-2018 capital budget and plan of finance with a budget of \$24,009,000. The budget increase is an adjustment to the preliminary cost estimate for increased inflation and clarification of project scope. The budget increase will be transferred from the Aeronautical Allowance CIP (C800404) 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 Aviation bonds. The Port anticipates issuing bonds in late 2014 or early 2015 to fund a number of projects. This project was approved by the airlines under the Majority-In-Interest process in July 2014.

Financial Analysis and Summary

CIP Category	Renewal/Enhancement
Project Type	Renewal and Replacement
Risk adjusted discount rate	N/A
Key risk factors	N/A
Project cost for analysis	\$27,900,000
Business Unit (BU)	Roadways
Effect on business performance	NOI after depreciation will increase
IRR/NPV	N/A
CPE Impact	\$.07 in 2019

Lifecycle Cost and Savings

The existing service tunnel structure is nearing the end of its design service life. The completion of this project will help to extend the useful life 20 to 50 years. We do not anticipate a significant change in the operating and maintenance costs for the service tunnel.

STRATEGIES AND OBJECTIVES

This project supports the Century Agenda objective of meeting the region's air transportation needs at Sea-Tac Airport for the next 25 years. Renovating existing assets is critical to maintaining capacity.

The Service Tunnel Renewal/Replacement project is consistent with the Airport's strategic goal to operate a world-class international airport by ensuring safe and secure operations and managing our assets to minimize the long-term total cost of ownership. The project will:

- Upgrade existing structures to meet current life/safety seismic standards
- Extend the useful life of existing structures and increase survivability

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TRIPLE BOTTOM LINE

Economic Development

The service tunnel is an essential Airport facility. The service tunnel supports a portion of the departures drive and all of the arrivals drive. It also serves the central loading dock, the central plant, the employee bus operation, most of the utilities serving the main terminal and several other key functions. Keeping this facility whole helps keep the Airport operational. Failure of the facility impacts terminal access, logistics, critical operations and public safety.

Environmental Responsibility

Preservation of an existing facility minimizes environmental impact. A complete rebuild of this facility would result in a very large civil works project that is unnecessary with targeted improvements to the existing infrastructure.

Community Benefits

The safety and convenience of the travelling public and Airport employees depends on a service tunnel that can remain standing through and after the area's next substantial earthquake. Taking steps to protect and preserve this essential facility is far less expensive, and much less disruptive, to operations than having it fail. By taking precautions now, rather than waiting until after a catastrophic seismic event, the Port can better control the cost and tempo of the upgrade. This minimizes the cost to the public and our airline partners.

It is anticipated that there will be opportunities for women and minority owned firms, as well as small and disadvantaged business enterprises, on this project. The selected build team will be strongly encouraged to provide opportunities for, and seek engagement of, these firms.

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1) – Do nothing. This option perpetuates a known hazard. This is not the recommended alternative.

Alternative 2) – Upgrade transition structures only. The transition structures are, nominally, the most at-risk portions of the service tunnel. However, not completing the other portions of the service tunnel that contain critical infrastructure and support the drives still leaves the Airport at risk. This is not the recommended alternative.

Alternative 3) – Upgrade of all of the remaining unreinforced portions of the service tunnel. This option allows a proactive approach to preserve public safety, protect Port infrastructure, and ensure continuous Airport operations. **This is the recommended alternative.**

ATTACHMENTS TO THIS REQUEST

- Attachment A – Vicinity Map and Details.

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PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

- April 1, 2014 – Commission was briefed on the Service Tunnel Renewal/Replacement Project.
- March 27, 2007 – Commission authorized funds for the Parking Garage/Service Tunnel Pre-Design project.