



**AGENDA MEMORANDUM**

**Item No.**

6a

**ACTION ITEM**

**Date of Meeting**

January 17, 2017

**DATE:** January 11, 2017

**TO:** Ted Fick, Chief Executive Officer

**FROM:** Jeffrey Brown, Director Aviation Facilities and Capital Programs  
Wayne Grotheer, Director, Aviation Project Management Group

**SUBJECT:** South Satellite (SSAT) HVAC Replacement/Upgrade (CIP #C800798)

**Amount of this request:** \$1,300,000

**Total estimated project cost:** \$11,000,000

**ACTION REQUESTED**

Request Commission authorization for the Chief Executive Officer to prepare design and construction bid documents for the South Satellite Heating Ventilation and Air Conditioning (HVAC) Upgrade project at Seattle-Tacoma International Airport. This authorization is for \$1,300,000 of a total estimated project cost of \$11,000,000.

**EXECUTIVE SUMMARY**

This project addresses immediate needs for improved reliability and capacity of the SSAT HVAC system. Maintaining comfortable heating and cooling is a basic necessity for a satisfying customer experience. While the Port intends to undertake a major renovation of the SSAT, the inadequacy of the HVAC system today and its risk of failure make this investment necessary.

The SSAT was constructed in 1971 and the core mechanical and electrical utilities of the original concourse have remained largely unchanged since it was built. Demand on the mechanical systems has approximately doubled since 1971, primarily from additional cooling load caused by new electronic systems, increasing passenger traffic, and small facility additions. Portions of the HVAC system have failed recently due to age and condition. The resulting shutdown for repairs to obsolescent fans caused a loss of cooling capacity in the SSAT for up to six weeks, which compromised the passenger experience in the SSAT. Additionally the HVAC system needs to be modified to accommodate additional Airport Dining and Retail (ADR) units to serve increased passenger demand in the SSAT.

Equipment installed as part of this project will most likely not be viable for the planned, larger SSAT renovation project and the financial analysis assumes this outcome. Consequently, the capital costs will be amortized over six years.

Meeting Date: January 17, 2017

## **JUSTIFICATION**

The Aviation Division Business Plan includes the following strategies that this project supports:

1. Operate a world-class international airport by anticipating and meeting needs of tenants, passengers, and the region's economy.
2. Facilitate/accommodate growth in international operations until a new International Arrivals Facility (IAF) is completed.
3. Managing Airport Assets to minimize long-term total cost of ownership.
4. Lead the U.S. airport industry in environmental innovation and minimize the airport's environmental impacts.

South Satellite use and growth in passenger volume has increased dramatically in the last three years. This growth has put a premium on having a smoothly operating and serviceable HVAC system at the SSAT. The major elements of the system are the air handler and air distribution boxes, which are now 44 years old – nearly twice their expected useful lives.

Failures in 2015 of a critical air handler component, the cold deck supply fans, highlight the need to upgrade at least key components before catastrophic failure causes the SSAT to lose cooling and ventilation during the summer or heating and ventilation during the winter.

The solution recommended in this action request takes into consideration that a holistic SSAT renovation project is planned and that the following improvement projects are running concurrently:

- South Satellite Structural Improvements (CIP #C800818)
- South Satellite Interior Renovations (CIP #C800549)
- Wi-Fi Enhancement (CIP #C800585)

Combined, these projects represent a commitment of \$31,400,000 and will maximize the level of service the existing SSAT facility can provide.

### ***Small Business and Workforce Development***

The project manager will collaborate with the small business team in the Economic Development Division to maximize small business opportunities and apprenticeship opportunities for disadvantaged communities, as appropriate.

## **DETAILS**

### ***Scope of Work***

This project will replace key components of a portion of the SSAT HVAC system. The project will replace the constant volume penthouse air handler with a more energy efficient variable volume system and replace the distribution boxes serving the concourse level.

Meeting Date: January 17, 2017

New, replacement equipment included:

1. HVAC air handler
2. cooling and heating coils
3. controls and variable frequency drives
4. terminal distribution boxes
5. motor control center

This project will:

1. Improve HVAC reliability.
2. Provide additional HVAC capacity for concourse level areas and support new tenant spaces.
3. Improve energy efficiency.
4. Facilitate maintenance.
5. Remove obsolete equipment and infrastructure.

Within the design and construction phases, there will be opportunities for small and diverse business utilization.

**Schedule**

*Activity*

Design start	2017 Quarter 1
Commission construction authorization	2017 Quarter 2
Construction start	2017 Quarter 3
In-use date	2018 Quarter 2

**Cost Breakdown**

	This Request	Total Project
Design	\$1,300,000	\$1,300,000
Construction	\$0	\$9,700,000
Total	\$1,300,000	\$11,000,000

**ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1** – Maintain the *status quo*

Cost Implications: \$0

Pros:

1. This alternative does not require a capital investment.

Meeting Date: January 17, 2017

Cons:

1. Quality of passenger experience at Sea-Tac Airport will continue to degrade, as adequate cooling to the SSAT concourse level spaces will not be provided.
2. Could potentially lead to airlines insisting on processing departing passengers in severely congested hold rooms on other concourses already being used for other flights.
3. Does not provide capacity for much needed ADR development.
4. Does not provide a dependable or comfortable indoor environment for passengers and airport users.

This is not the recommended alternative.

**Alternative 2** – Install one additional HVAC system and replace/upgrade all existing HVAC systems at the SSAT including ductwork, terminal boxes, controls, ceilings, lights, and signage.

Cost Implications: \$40,000,000 capital cost

Pros:

1. Solves all HVAC related issues at the SSAT and provides the best passenger experience.
2. Provides coordinated, energy efficient HVAC, lighting, and signage.

Cons:

1. This alternative would be significantly more expensive, would be in advance of the planned SSAT renovation project and may not be consistent with business plan goals.
2. This alternative will almost certainly trigger a requirement for building seismic upgrade (estimated cost \$25 million-\$30 million)
3. Improvement may not be supportive of SSAT future development.
4. This alternative could not be completed in time to meet ADR development timetable.

This is not the recommended alternative

**Alternative 3** – Upgrade the existing HVAC System air handlers, fans, controls, and coils: reconfigure the ducting and replace the distribution boxes

Cost Implications: \$11,000,000 (\$10,375,000 capital, \$625,000 Environmental Remediation Liability (ERL) for asbestos removal or encapsulation.)

Pros:

This alternative provides dependable indoor environmental quality in all seasons on the SSAT Concourse level for the immediate future.

This alternative allows the SSAT HVAC system to be operational during the “bridge-years” until the planned SSAT renovation project.

1. This alternative aligns with the Century Agenda goals to meet the region’s air transportation needs at Seattle-Tacoma International Airport for the next 25 years and encourage the cost effective expansion of domestic and international passenger service.
2. This alternative will provide the capacity for the new ADR spaces.

Meeting Date: January 17, 2017

3. This alternative will provide the most energy efficient solution.

Cons:

1. This project will only partially address the under capacity HVAC issue at the SSAT, but it will provide enough capacity for additional tenant spaces. Additional air handlers are needed to meet the current and future cooling loads.

**This is the recommended alternative.**

**FINANCIAL IMPLICATIONS**

<i>Cost Estimate/Authorization Summary</i>	Capital	Expense	Total
<b>COST ESTIMATE</b>			
Original estimate	\$6,000,000	\$150,000	\$6,150,000
Current change	4,375,000	475,000	4,850,000
Revised estimate	10,375,000	625,000	11,000,000
<b>AUTHORIZATION</b>			
Previous authorizations	300,000	0	300,000
Current request for authorization	1,000,000	0	1,000,000
Total authorizations, including this request	1,300,000	0	1,300,000
Remaining amount to be authorized	\$9,075,000	\$625,000	\$9,700,000

***Annual Budget Status and Source of Funds***

The SSAT HVAC project (CIP #C800798) was included in the 2016-2020 capital budget and plan of finance as a business plan prospective project with a total capital budget of \$6,000,000. The cost increase of \$4,375,000 was transferred from the Aeronautical Allowance (CIP #C800753), resulting in no net change to the capital budget. The environmental remediation will be funded through the 2017 Operating Budget. Both the capital and expense portions of this project will be funded by the Airport Development Fund. To resolve the reliability issue, the original scope of work, for a budget of \$6,000,000, was only to replace the equipment in the penthouse air system. The current scope of work includes reconfiguring the duct system and replacing the concourse air distribution boxes. The new scope resolves the reliability and capacity issue for the Concourse HVAC system.

Due to the planned complete renovation of the SSAT, the estimated life of these improvements is approximately six years.

Meeting Date: January 17, 2017

**Financial Analysis and Summary**

Project cost for analysis	\$11,000,000
Business Unit (BU)	Terminal Building
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase
IRR/NPV (if relevant)	N/A
CPE Impact	\$0.02 in 2017, \$0.07 in 2018

**Future Revenues and Expenses (Total cost of ownership)**

No future revenues or expenses are anticipated as a result of the completion of this project.

**ATTACHMENTS TO THIS REQUEST**

Presentation slides

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

- November 8, 2016 – The Commission authorized \$3,450,000 for the preparation of design and construction bid documents, the advertising and execution of a major works construction contract, and the utilization Port crews for the South Satellite Structural Improvements (CIP C800818).
- May 24, 2016 – The Commission authorized the advertising and execution of construction contracts for the Wi-Fi Enhancement Project (CIP #C800585) for an estimated cost of \$7,239,000 and to increase the project’s overall budget to \$10,676,000 for additional scope.
- March 22, 2016 – The Commission authorized a \$6,256,000 construction contract for the South Satellite Interior Renovations Project (CIP #C800549).
- July 24, 2012 – The Commission authorized \$6,500,000 for the redesign the SSAT HVAC systems to meet current and future requirements. The design included adding an additional penthouse system, replacing three existing systems, reconfiguring the ductwork, and replacing all the distribution boxes. The 2012 estimated costs of these improvements were about \$37 million. The design effort was suspended in 2013 and canceled in 2014 after staff determined that:
  - The SSAT would require a seismic upgrade to facilitate any new systems.
  - IAF and SAMP may change the use of SSAT.
- May 3, 2011 – The Commission authorized the negotiation and execution of a professional services contract for design services. No funding was associated with this authorization.
- September 22, 2009 – The Commission was briefing on the condition of the HVAC systems of the North and South Satellites.