



**COMMISSION
AGENDA MEMORANDUM**

Item No. 6b

ACTION ITEM

Date of Meeting August 8, 2017

DATE: May 25, 2017

TO: Dave Soike, Interim Executive Director

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: \$11,200,000

Total estimated project cost: \$12,500,000

ACTION REQUESTED

Request Commission authorize funding of \$11,200,000 for South Satellite Heating, Ventilation and Air Conditioning Upgrade and for the Executive Director to (1) advertise, bid, and award the construction contract at Seattle-Tacoma International Airport and (2) utilize Port crews to assist with the project.

EXECUTIVE SUMMARY

This project will improve the effectiveness and reliability of the heating, ventilation and air conditioning system for the SSAT, a terminal that has seen dramatic passenger growth. The additional HVAC capacity will also accommodate the expansion of Airport Dining and Retail (ADR), providing needed customer amenities. 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.

At 30 percent design the Project team completed a scope, budget and constructability review.

Four issues were identified that increase the project cost by \$1,500,000:

1. The use of temporary air handling units requires much more ductwork than was assumed at the notebook phase. (+\$300,000)

Meeting Date: August 8, 2017

2. The quantity of regulated material (asbestos and lead) as part of the demolition cost is higher than originally assumed. (RMM +\$665,000)
3. The original plan included only 3 phases vs 6 in the current design. (The phasing allowance increase +\$250,000.)
4. Relocation of communication equipment was not included in the original scope of work. (+\$285,000)

Total budget increase \$1,500,000

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.

JUSTIFICATION

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 fan, 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 \$32,900,000 and will maximize the level of service the existing SSAT facility can provide.

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 air handler serving the Concourse level with a more energy efficient variable air volume system and replace the distribution boxes serving the concourse level.

New, replacement equipment included:

1. HVAC air handler
2. cooling and heating coils and heating water piping
3. controls and variable frequency drives
4. terminal distribution boxes

Meeting Date: August 8, 2017

- 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. Replace obsolete equipment and infrastructure.

By completing this project the energy efficiency for the heating and cooling will increase by approximately 30% on the south satellite concourse level system, but due to the extra capacity needed, actual energy savings will be considerably less. Calculations estimate electric savings of 163,300 kwh/year on motor power and natural gas savings of 20,600 therms per year for heat which combine for a total energy savings of 2,000 MMBTU/year and reduce greenhouse gas emissions by 110 metric tons/year. This represents a savings of approximately 0.2% of the total airport energy consumption and 0.5% of the total airport greenhouse gas emissions.

Small Business

The Port staff is collaborating with the small business team in the Economic Development Division to maximize small business opportunities within the design and construction phases. As part of the collaboration efforts, the PM will be participating in the Port’s PortGen outreach and training session for those small and diverse businesses.

PortGen activities are intended to increase the small businesses knowledge of the project’s scope of work.

Schedule

Construction start	2017 Quarter 4
In-use date	2019 Quarter 2

Cost Breakdown

	This Request	Total Project
Design	\$0	\$1,300,000
Construction	\$11,200,000	\$11,200,000
Total	\$11,200,000	\$12,500,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Defer the HVAC system upgrade until the South Satellite Renovation

Meeting Date: August 8, 2017

Cost Implications: \$750,000 (expensed)

Pros:

- (1) This alternative does not require immediate capital investment.

Cons:

- (1) Costs of design would be expensed-approximately \$750,000.
- (2) This alternative would significantly degrade the quality of passenger experience at Sea-Tac airport, as it would not provide adequate cooling to the space.
- (3) Could potentially lead to airlines insisting on processing departing passengers in severely congested hold rooms on other concourses already being used for other flights.
- (4) Does not provide capacity for additional tenant space development.
- (5) Does not provide a dependable indoor environment to facilitate airline operations.

This is not the recommended alternative.

Alternative 2 – Upgrade the existing HVAC System air handler, fans, controls and coils: reconfigure the ducting and replace the distribution boxes.

Cost Implications: \$ 12,500,000 (11,250,000 cap, 1,250,000 ERL)

Pros:

- (1) This alternative provides dependable indoor environmental quality in all seasons for the foreseeable future.
- (2) This alternative allows the Satellite HVAC system to be operated during the “bridge-years” until the planned renovation of the entire Satellite.
- (3) This alternative aligns with the Century Agenda goal 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.
- (4) This alternative will provide the capacity for the new tenant spaces.
- (5) This alternative will provide the most energy efficient solution.

Cons:

- (1) This project will only partially address the under capacity issue at the South Satellite, but it will provide enough capacity for additional tenant spaces. Additional air handlers are needed to meet the current and near term cooling loads.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary

	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$6,000,000	\$150,000	\$ 6,150,000
Previous changes – net	\$4,375,000	\$475,000	\$4,850,000

Meeting Date: August 8, 2017

Current change	\$835,000	\$665,000	\$1,500,000
Revised estimate	\$11,210,000	\$1,290,000	\$12,500,000
AUTHORIZATION			
Previous authorizations	\$1,300,000	\$0	\$1,300,000
Current request for authorization	\$9,910,000	\$1,290,000	\$11,200,000
Total authorizations, including this request	\$11,210,000	\$1,290,000	\$12,500,000
Remaining amount to be authorized	\$0	\$0	\$0

Annual Budget Status and Source of Funds

The SSAT HVAC project (CIP #C800798) was included in the 2017-2021 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 \$5,210,000 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. The capital portion of this project will be funded with 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 level HVAC system.

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

Financial Analysis and Summary

Project cost for analysis	\$12,500,000
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	\$0.07 in 2020

Future Revenues and Expenses (Total cost of ownership)

This project replaces existing equipment that is old and dated. Replacement of the equipment will require a similar level of maintenance (or slightly less) & does not have a material impact on current Aviation Maintenance O&M costs.

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

ATTACHMENTS TO THIS REQUEST

None

Meeting Date: August 8, 2017

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

- January 17, 2017-The Commission authorized \$1,300,000 for the preparation of design and construction bid documents for the South Satellite HVAC Upgrade project.
- 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.