



**COMMISSION  
AGENDA MEMORANDUM**

**Item No.** 4b

**ACTION ITEM**

**Date of Meeting** November 28, 2017

**DATE:** November 16, 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:** \$1,425,000

**Total estimated project cost:** \$13,925,000

**ACTION REQUESTED**

Request Commission approval for the Executive Director to increase the South Satellite (SSAT) Heating, Ventilation, and Air Conditioning (HVAC) Replacement/Upgrade Project authorization by \$1,425,000 for a total estimated project cost of \$13,925,000.

**EXECUTIVE SUMMARY**

This project will improve the effectiveness and reliability of the HVAC 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 failed recently due to age and condition, the repairs caused a loss of cooling capacity in the SSAT for approximately six weeks, compromising the passenger experience.

This project received Commission authorization for construction on August 8, 2017 with a construction cost estimate prepared based on 90% design documents. At 100% design, the Project team completed a scope, budget, and constructability review in preparation for advertising for construction.

Three issues were identified that increase the project cost by \$1,425,000:

Meeting Date: November 28, 2017

1. Temporary Air Handling Units (AHUs) ductwork needs to be hard ducting instead of flexible ducting; hard ducting requires insulation. (+\$100,000)
2. The demolition cost of existing HVAC components is higher than originally assumed. (+\$325,000)
3. Based on current market conditions and the complexity of the work the construction costs are higher than originally assumed. (+\$1,000,000)

Equipment installed as part of this project may not be compatible for the planned, larger SSAT renovation project and the financial analysis for this project is based on this premise. Given what we know today about a likely SSAT renovation project schedule, the HVAC improvements would have a life of at least six years. Consequently, the capital costs will be amortized over six years.

By completing this project the energy efficiency for the heating and cooling will increase by approximately 30% on the SSAT concourse level system, but due to the extra capacity needed, actual energy savings may 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

### **JUSTIFICATION**

SSAT use and growth in passenger volume has increased dramatically in the last few years such that the existing HVAC system is only capable of providing 70% of the building load. 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 46 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)
- S-11 and S-6 Passenger Loading Bridge Replacement (CIP #C800793)

Combined, these projects represent a commitment of \$37,500,000 and will maximize the level of service the existing SSAT facility can provide until the major SSAT renovation project.

Meeting Date: November 28, 2017

Current small business requirement is 23%; this will continue to be applied to the additional funds requested.

**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 larger capacity and more energy efficient variable air volume system and replace the distribution boxes serving the concourse level.

New, replacement equipment includes:

1. HVAC air handler
2. Cooling and heating coils and heating water piping
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 new tenant spaces.
3. Improve energy efficiency.
4. Facilitate maintenance.
5. Replace obsolete equipment and infrastructure.

***Schedule***

*Activity*

Construction start	2018 Quarter 1
In-use date	2020 Quarter 1

***Cost Breakdown***

	This Request	Total Project
Design	\$0	\$1,300,000
Construction	\$1,425,000	\$12,625,000
<b>Total</b>	<b>\$1,425,000</b>	<b>\$13,925,000</b>

Meeting Date: November 28, 2017

**ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1** – Do not complete the HVAC system upgrade and defer HVAC improvements until the South Satellite renovation.

Cost Implications: \$850,000 (expense design)

Pros:

- (1) This alternative requires no additional capital investment.

Cons:

- (1) This alternative would significantly degrade the quality of passenger experience at SSAT.
- (2) This option does not provide a dependable indoor environment to facilitate airline operations.
- (3) This alternative would potentially lead to airlines insisting on processing departing passengers in severely congested hold rooms on other concourses already being used for other flights.
- (4) This alternative does not provide reliable HVAC capacity for the increasing number of flights.
- (5) This alternative does not provide capacity for additional tenant space development.

This is not the recommended alternative.

**Alternative 2** – Upgrade the existing air handlers, fans, controls and coils that provide HVAC to the South Satellite.

Cost Implications: \$13,925,000

Pros:

- (1) This alternative provides a dependable indoor environmental quality in all seasons for the foreseeable future.
- (2) This alternative allows the SSAT 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 STIA for the next 25 years and encourage the cost effective expansion of domestic and international passenger services.
- (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.***

Meeting Date: November 28, 2017

**FINANCIAL IMPLICATIONS**

**Cost Estimate/Authorization Summary**

	Capital	Expense	Total
<b>COST ESTIMATE</b>			
Original estimate	\$6,000,000	\$150,000	\$6,150,000
Previous changes – net	\$5,210,000	1,140,000	\$6,350,000
Current change	\$1,425,000	\$0	\$1,425,000
Revised estimate	\$12,635,000	\$1,290,000	\$13,925,000
<b>AUTHORIZATION</b>			
Previous authorizations	\$11,210,000	\$1,290,000	\$12,500,000
Current request for authorization	\$1,425,000	\$0	\$1,425,000
Total authorizations, including this request	\$12,635,000	\$1,290,000	\$13,925,000
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 total cost increase of \$6,635,000 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. This project, with a budget of \$10.3 million, was approved by the airlines through a Majority-in-Interest (MII) vote. While this cost increase would require an additional MII vote, the Port will elect to use the Management Reserve provision within the Signatory Operating Lease Agreement to eliminate the need for the additional vote.

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	\$13,925,000
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	\$.11 in 2021

Meeting Date: November 28, 2017

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

This project replaces existing equipment that is old and dated. Regulated Materials Abatement performed as part of this project will allow appropriate preventive maintenance to be performed on the equipment. This will increase O&M costs somewhat for this system. Aviation Maintenance expects to be able to absorb this increase within current budget. The new system will provide improved customer service and reliability.

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

**ATTACHMENTS TO THIS REQUEST**

None

**PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

- August 8, 2017 – The Commission authorized \$11,200,000 for the advertisement, bid, and award the construction contract for the South Satellite HVAC Upgrade project.
- 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.