



**COMMISSION
AGENDA MEMORANDUM**

Item No. 10b

ACTION ITEM

Date of Meeting July 27, 2021

DATE: July 16, 2021

TO: Stephen P. Metruck, Executive Director

FROM: Eileen Francisco, Interim Director, Aviation Facilities and Capital Programs
Wayne Grotheer, Director Aviation Project Management
Stuart Mathews, Director Aviation Maintenance

SUBJECT: Satellite Transit System (STS) Controls Renewal and Replacement Project Procurement and Construction Authorization (CIP#801043)

Amount of this request: \$69,240,000

Total estimated project cost: \$78,240,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) execute a contract with Bombardier Transportation Holdings USA for goods and services; (2) advertise and award a major works construction contract; (3) advertise and award contracts for busing and wayfinding services, and (4) use Port crews and small works contracts, in support of the STS Controls Renewal and Upgrade project (CIP #801043) at the Seattle-Tacoma International Airport (Airport). The amount of this request is \$69,240,000 for a total project authorization of \$78,240,000.

EXECUTIVE SUMMARY

The Satellite Transit System (STS) transports passengers to and from the Airport's North and South Satellites. This project is a renewal and replacement of the STS's Automated Train Control (ATC) system. The current ATC system is 20 years old and is at the end of its useful life. This project installs STS network infrastructure, replaces end of life ATC systems equipment, and updates the ATC with the most current version of the manufacturer's controls software while maintaining passenger service to the Satellites. This authorization allows for: (1) the purchase and installation of replacement controls equipment from the STS manufacturer Bombardier Transportation Holdings USA (BTH USA) an Alstom Group Company, (2) procurement of busing and wayfinding services, and (3) the selection and award of an enabling construction contract for new STS controls fiber and electrical infrastructure. The STS Controls Renewal and Replacement Project (CIP 801043) is included in the 2021-2025 capital budget and plan of finance. The project was approved on the 2020 #2 Majority-In-Interest (MII) ballot.

While this project will extend the useful life of the existing STS, it is expected that a new STS or an alternate means of travel to and from the North and South Satellites will be required no later

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than 2034. Outside of this project, Airport staff will begin a study in Q4 of 2021 to look at alternatives and make a recommendation for future passenger conveyance to the North and South Satellites.

JUSTIFICATION

This project provides important benefits for continued operations, security, and safety. The STS is the primary conveyance method to move passengers efficiently between the Main Terminal and the thirty-five gates in the North and South Satellites. In 2019, the STS carried approximately 28 million passengers. The last major STS upgrade was completed in 2003 under CIP #100783. The current ATC subsystem was installed around 2001, and major components are now either obsolete or at the end of their useful life. The ATC system is an integrated set of computerized hardware, software and networks that safely operate the automatic movements of the train system. The STS will cease to operate without a functioning ATC. Key suppliers and repair facilities have indicated that remaining repair inventories are no longer being manufactured and will be gone within a few years. Action is required now to ensure the STS remains operational before more critical pieces of the ATC become obsolete or irreparable. A catastrophic failure or even a prolonged failure of the STS would significantly impact operations at the Airport.

In addition to the obsolescence need for the project, a benefit of updating the controls system software is the flexibility to run an additional set of train cars on each of the STS loops. Each loop currently runs two sets of train cars that can carry a maximum of 3,300 passengers per hour. An additional set, or three sets of train cars, can carry a maximum of 4,950 passages per loop per hour. After the International Arrivals Facility Bridge is operational, it may be possible to reduce the number of STS vehicles operating in the South loop, which would allow for additional vehicles for the North loop. Purchase of additional or replacement STS vehicles is not part of the scope of this project. The Airport will be going through a modeling effort to optimize STS vehicle availability balanced against airline passenger demand.

At the forecasted rate of use, the STS will reach the end of its expected useful life around 2030; with additional renovation, renewal, and replacement expenditures the STS subsystems life may be extended several years beyond that. A new STS or an alternate means of travel to and from the North and South Satellites is being programmed for replacement by 2034. Outside of this project, Airport staff will begin a study in Q4 of 2021 to look at alternatives and make a recommendation for future passenger conveyance to the North and South Satellites.

This project scope was informed by the December 2018 STS Audit and Alternatives Analysis study and similar ATC system replacement projects in recent years at San Francisco International Airport (SFO), Dallas Fort Worth International Airport (DFW), London's Heathrow Airport (LHR) and the APM project at Los Angeles International Airport (LAX).

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Diversity in Contracting

The project team with the Diversity in Contracting Department determined a Women and Minority Business Enterprise (WMBE) participation aspirational goal of ten percent for the enabling construction project. The previously selected design and automated people mover consultant committed to a sixteen percent WMBE goal.

DETAILS

This project installs modern and redundant fiber optic and radio networks, replaces end of life ATC systems hardware, and updates the ATC system with the most current version of the manufacturer’s controls software while maintaining passenger service to the North and South Satellites. The project is divided into two distinct phases. The first phase, an enabling project, is the design and construction of new STS network infrastructure; the second phase is the design, installation, and testing of the ATC equipment.

Scope of Work

Phase 1 – Design and construction of a new hardened STS controls fiber optic network including conduit, fiber optic cable, server rooms, and supporting electrical infrastructure. Work will primarily be performed within the 1.7 miles of STS tunnels and maintenance support spaces.

Phase 2 – Design, installation, testing and certification of a new STS train controls system including new ATC software and associated equipment (hardware, servers, computers, radios, networking equipment), STS Vehicle ATC replacement, system testing, certification and decommissioning of the old system.

Both phases will require over the ramp busing and passenger wayfinding support.

Impacts to Operations

The project will have major impacts to operations at the North and South Satellites. Installation, testing and certification of the whole system is expected to take approximately 30 months and will require parts of the STS to be out of service. The current plan is to limit STS service outages to the North and South Satellites to a nightly 6-hour window for a 15 to 18- month period. Over the ramp busing will be required during outages to maintain access to the North and South Satellites. Impacts are expected to begin late 2022 and run through the end of 2024.

Acquisition Methodology

The project is predominantly equipment replacement with a supporting construction project to provide new physical network infrastructure. Contracts include:

- (1) Consulting services for the Automated People Mover and Design Consultant;

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- (2) Major Construction for the enabling STS fiber optic loop;
- (3) Goods and Services Contract for the STS Controls Equipment;
- (4) Services contracts for busing and wayfinding support.

Seventy-five percent of the overall contracting opportunity is for the purchase, installation, testing and certification of ATC equipment which comes from an Automated People Mover (APM) system manufacturer. The APM manufacturer is responsible for the design, installation, integration, testing and certification for passenger use. ATC software equipment configuration is proprietary to each APM manufacturer. Staff advertised Request for Information (RFI) 20-3 to determine which suppliers could provide, install, and certify a replacement ATC for the STS. Only the manufacture BTH USA responded. Pursuant to CPO-6 and RCW 39.04.280 staff plans to utilize a CPO-5 waiver to directly negotiate with BTH USA for the equipment purchase.

Schedule

Activity

Phase 2 Design Start	2022 Quarter 1
Phase 1 Construction Start	2022 Quarter 4
Phase 1 Substantial Completion	2023 Quarter 2
Phase 2 Installation and Testing Start	2023 Quarter 3
Phase 2 Substantial Completion	2024 Quarter 4

Cost Breakdown

	This Request	Total Project
Design	\$0	\$9,000,000
Construction	\$7,740,000	\$7,740,000
Equipment Procurement	\$58,500,000	\$58,500,000
Support Services	\$3,000,000	\$3,000,000
Total	\$69,240,000	\$78,240,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

The minimum implementation timeline of the replacement ATC system is 36 months. The status quo or delayed implementation options place the STS system replacement beyond 2024 which would significantly increase the risk of system failure and therefore were not considered viable options.

Alternative 1 – Whole STS replacement. This would include replacing the entire automated people mover system: remove all existing systems and replace with yet to be determined new system that include new cars, new power rail, new power centers, new controls, and integration into the existing facilities footprint.

Cost Implications: Cost range \$600M to \$800M

Pros:

- (1) New 30-year APM System

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- (2) Competed requirement

Cons:

- (1) High Cost
- (2) Loss of 10 years of STS vehicle life
- (3) STS Service shutdowns (will require months of extensive and continuous shutdown)
- (4) Full time busing to Satellite Terminals or construction of new tunnel/bridge
- (5) Increased risk of failure while planning and designing replacement project.

This is not the recommended alternative.

Alternative 2 – Renewal and replacement of the ATC system to reduce risk of failure. The project justification and description above speak to this alternative. This option provides the lead time required to evaluate new technologies and develop a better understanding of a future SEA facility layout that the new transportation system will integrate into. In this option, the equipment manufacturer is given a 6-hour working window each night.

Cost Implications: Estimated cost \$78,240,000

Pros:

- (1) Maximizes flexibility of STS vehicle fleet
- (2) Required for additional passenger throughput
- (3) Decreases the risk of major disruption to Satellite Services due to failure
- (4) Ten-year minimum additional useful life of the STS system

Cons:

- (1) Single source negotiations with the STS manufacturer
- (2) Nighttime STS shutdowns
- (3) May have limited useful life (10 years), given future airport growth projections

This is the recommended alternative.

FINANCIAL IMPLICATIONS

<i>Cost Estimate/Authorization Summary</i>	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$57,000,000	\$0	\$57,000,000
Previous changes – net	\$19,000,000	\$3,000,000	\$22,000,000
Art (Transfer to Art CIP)	(\$760,000)	\$0	(\$760,000)
Current estimate	\$75,240,000	\$3,000,000	\$78,240,000
AUTHORIZATION			
Previous authorizations	\$9,000,000	\$0	\$9,000,000
Current request for authorization	\$66,240,000	\$3,000,000	\$69,240,000
Total authorizations, including this request	\$75,240,000	\$3,000,000	\$78,240,000
Remaining amount to be authorized	\$0	\$0	\$0

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Annual Budget Status and Source of Funds

This project, CIP C801043, was included in the 2021-2025 capital budget and plan of finance with a budget of \$57,000,000. A budget increase of \$19,000,000 was transferred from the Aeronautical Reserve CIP (C800753) resulting in zero net change to the Aviation capital budget. The funding source will be revenue bonds. This project was approved as a Majority-in-Interest by the airlines on May 26, 2020.

Financial Analysis and Summary

Project cost for analysis	\$78,240,000
Business Unit (BU)	Terminal Building
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase due to inclusion of capital (and operating) costs in airline rate base.
IRR/NPV (if relevant)	N/A
CPE Impact	\$.30 in 2025

Future Revenues and Expenses (Total cost of ownership)

Additional Aviation Maintenance personnel will be required to support the installation of the ATC system and expanded operation of two to three trains in a loop. Staff anticipate an additional two maintenance personnel for the installation of the ATC. Staff will evaluate further staffing increases for the expanded loop capacity at the end of the project.

ADDITIONAL BACKGROUND

The STS was the first inter-terminal Automated People Mover (APM) system in the world and the second operational APM at an Airport. Construction of the STS started in 1969 with passenger service beginning in 1973. The 2003 upgrade of the STS installed twenty-one (21) new vehicles, a more modern ATC system, electrical distribution components, and a new guiderail in the existing STS tunnel complex and was expected to last 30 years. The original power rail and travel path are still in service.

ATTACHMENTS TO THIS REQUEST

- (1) Presentation slides

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

July 14, 2020 – The Commission authorized the award of a consultant contract, design, preparation of construction and purchasing documents, and use of Port crews. At that time, the estimated project cost range was \$65,000,000 to \$95,000,000.

March 26, 2020 – The Commission’s Aviation Committee was briefed on the need for the project.