COMMISSION
AGENDA MEMORANDUM **Item No.** 8e

ACTION ITEM **Date of Meeting** October 22, 2019

DATE: October 14, 2019

TO: Stephen P. Metruck, Executive Director

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

SUBJECT: North Terminals Utilities Upgrade Project (#C800717) Phase 1 Construction Authorization.

Amount of this request: $12,064,000
Total estimated project cost: $40,000,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) advertise and award a construction contract for Phase 1 of the North Terminals Utilities Upgrade project at Seattle-Tacoma International Airport; (2) employ a project labor agreement (PLA);. The amount of this request is $12,064,000. The total estimated Phase 1 and Phase 2 project cost is $40,000,000.

EXECUTIVE SUMMARY

This project will replace and extend the existing 45-year-old undersized steam, condensate and chilled water supply and return piping from the Central Mechanical Plant and create a redundant interconnected piping loop in two phases.

Phase 1 will provide new upsized piping from the Central Mechanical Plant to points of connection for the Concourse D Annex and North Satellite. Phase 1 work is time critical as it is required for the planned 2021 opening of the newly renovated North Satellite.

Phase 2 will provide a fully redundant loop system that will enable any part of the airport terminal to operate Heating, Ventilation, and Air Conditioning (HVAC) systems while being supplied from the south or north steam, condensate, chilled water supply and return piping. This level of redundancy currently exists for Concourse A, B, and the South Satellite. Completing this project will enable airport wide HVAC system redundancy for all concourses and satellites.

The full project scope cannot be completed for the previously estimated amount of $21,335,000.

This authorization is for Phase 1 construction only. The project team will return to Commission for Phase 2 construction authorization at a later date.

JUSTIFICATION

The existing steam, condensate, and chilled water supply and return piping are undersized for current and future projected system loads. The project is required to supply adequate heating and cooling to the Terminal building and North Satellite. The NorthSTAR Program is currently under construction and requires the completion of this work to support the operational readiness of Phase 2 of the NorthSTAR Program by summer 2021.

Diversity in Contracting

The project manager is working with the Diversity in Contracting Department to determine participation opportunities and set goals for women and minority business enterprises (WMBE) attainment.

DETAILS

The existing steam, condensate, and chilled water supply and return piping are undersized for current and future projected system loads. The project is required to supply adequate heating and cooling infrastructure to the Terminal building and North Satellite. The project is planned to be implemented in two phases.

The Commission authorized the full project scope on June 28, 2016. Since this time the project team has prioritized the approved scope into two phases. Phase 1 will provide capacity improvements to support the Terminal building and North Satellite in support of the NorthSTAR Program. New piping will be installed from the Central Mechanical Plant to the new valve room located north of the Main Terminal building, and from the valve room to the existing Concourse D Annex and North Satellite connections. Phase 2 will provide capacity improvements to support Concourses C and D and complete the interconnected loop system making the system fully redundant. The Phase 2 scope of work requires close coordination with the baggage optimization program, airline baggage operations, and will require additional design analysis. Phase 2 of this project is significantly more complex in design and construction than Phase 1 and will require much more coordination construction effort.

The scope and complexity of this project has increased significantly since it was originally presented to Commission in 2016. The new Concourse D Annex and Baggage Optimization projects have imposed substantial cost and schedule impacts. To accommodate the Concourse D Annex facility, the project will need to build a new valve room. This new valve room will displace existing facilities that must also be relocated. The technical difficulties and complexities of working in and around assets installed by the Baggage Optimization project were also not properly accounted for in the early construction estimate. Finally, this project has faced costly challenges associated with maintaining full airport operations during construction.

Scope of Work

Phase 1 - Install new upsized chilled water, steam and condensate piping from the Central Mechanical Plant to a new valve room located in the north ground transportation lot adjacent to the D Annex sloped walkway and from the valve room as far as the North Satellite tunnel connection. This will provide the required infrastructure for the HVAC system for the North Terminal building and the North Satellite.

Phase 2 - Install steam, condensate, and chilled water supply and return piping from the Central Terminal baggage level connection point to the new valve room building that will be in the north east corner of the north GT lot east of the D Concourse Annex sloped walkway. Provide a fully redundant loop system. Enable any part of the airport terminal to operate HVAC systems while being supplied from the south or north steam, condensate, chilled water supply and return piping. This level of redundancy currently exists for Concourse A, B, and the South Satellite. Completing this project will enable airport wide HVAC system redundancy for all concourses and satellites.

Schedule

Construction start	1st Quarter 2020
In-use date (phase 1)	2nd Quarter 2021
In-use date (phase 2)	3rd Quarter 2023

Cost Breakdown	This Request	Total Project
Design Phase	$3,427,000	$7,039,000
Construction Phase	$8,637,000	$32,961,000
Total	$12,064,000	$40,000,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Proceed with Phase 1 only - replace and upsize the existing 50-year-old HVAC piping. Do not proceed with installing a redundant interconnected loop.

Cost Implications: $21,335,000 (approximately $1,600,000 in design funds associated with Phase 2 work will need to be expensed.)

Pros:

(1) North Satellite will have the utilities required for opening and operation as identified in the NorthSTAR Program basis of design.

Cons:

(1) Does not provide capacity improvements to Concourses C and D.
(2) Does not create a fully redundant interconnected chilled water, steam and condensate piping system.

This is not the recommended alternative.

Alternative 2 – Proceed with Phase 1 and defer Phase 2 to a future Capital Improvement Project.

Cost Implications: $44,925,000 (Phase 1, $21,335,000 - Phase 2, $23,590,000)

Pros:

(1) North Satellite will have the utilities required for opening and operation as identified in the NorthSTAR Program basis of design.
(2) Improves system reliability by creating a fully redundant interconnected chilled water, steam and condensate piping system.
(3) Improves maintainability of system by allowing maintenance bypass.

Cons:

(1) Largest Capital investment.
(2) Current design work related to Phase 2 may need to be expensed.
(3) Benefit of capacity improvements to support Concourse C and D are not realized until a future date.
(4) Benefit of redundant loop is not realized until future date.

This is the not recommended alternative.

Alternative 3 – Proceed with full project scope (Phase 1 and Phase 2). Phase 1 (urgent work) will replace and upsize the existing 50-year-old HVAC piping. Phase 2 will install a redundant interconnected loop.

Cost Implications: $40,000,000

Pros:

(1) North Satellite will have the utilities required for opening and operation as identified in the NorthSTAR Program basis of design.
(2) Provides the capacity improvements to support Concourses C and D, and the North Satellite.
(3) Improves system reliability by creating a fully redundant interconnected chilled water, steam and condensate piping system.
(4) Improves maintainability of system by allowing maintenance bypass.

Cons:

(1) Requires a substantial capital and expense investment.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary	Capital	Expense	Total
COST ESTIMATE			
Original estimate	$11,950,000	$50,000	$12,000,000
Previous changes – net	$8,349,000	$986,000	$9,335,000
Current change	$18,665,000	$0	$18,665,000
Revised estimate	$38,964,000	$1,036,000	$40,000,000
AUTHORIZATION			
Previous authorizations	$9,036,000	$235,000	$9,271,000
Current request for authorization	$12,033,000	$31,000	$12,064,000
Total authorizations, including this request	$21,069,000	$266,000	$21,335,000
Remaining amount to be authorized	$17,895,000	$770,000	$18,665,000

Annual Budget Status and Source of Funds

The North Terminals Utilities Upgrade Project (#C800717) was included in the 2019-2023 capital budget and plan a finance with a budget of $20,299,000. The cost increase is related to constructability and operational challenges that were significantly underrepresented in the pre-design cost estimate. The budget increase will be transferred from the Aeronautical Reserve CIP (C800753) resulting in no net change to the Aviation Division capital plan. The funding source would be the Airport Development Fund and future revenue bonds.

Financial Analysis and Summary

Project cost for analysis	$40,000,000
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	$.13 by 2023

Future Revenues and Expenses (Total cost of ownership)

A steam, condensate and chilled water supply and return piping systems have an expected life cycle of 25-30 years. The technology and insulation materials designed into this project will extend the life cycle to 40-50 years.

ADDITIONAL BACKGROUND

This project was originally proposed as part of the Year 2000 Mechanical Systems Master Plan but was deferred due to the elimination of the North End Air Terminal (NEAT) program.

ATTACHMENTS TO THIS REQUEST

(1) PowerPoint slides

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

September 12, 2017 – The Commission authorized the Executive Director to extend the North Terminals Utilities Upgrade Project major construction contract for the Early Work Mechanical Contract by adding 250 days to the contract duration.

June 28, 2016 – The Commission authorized the Chief Executive Officer to increase the North Terminals Utilities Upgrade Project scope, budget, authorization, utilize Port crew advertise and award a major construction contract for the Early Work Mechanical Contract for an additional $7,271,000.

April 28, 2015 – The Commission authorized the Chief Executive Officer to execute service agreements and conduct studies, cost estimates, design and prepare construction documents for the North Terminals Utilities Upgrade Project in the amount of $2,000,000.