



AGENDA MEMORANDUM

Item No.

4e

ACTION ITEM

Date of Meeting

July 25, 2017

DATE: July 7, 2017

TO: Dave Soike, Interim Executive Director

FROM: Jeffrey Brown, Director Aviation Facilities and Capital Program
Wayne Grotheer, Director Aviation Project Management Group
Arlyn Purcell, Director Aviation Environment and Sustainability

SUBJECT: Stage 3 Mechanical Energy Conservation Project (CIP #C800658)

Amount of this request: \$6,791,000

Total estimated project cost: \$7,121,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) execute an Interagency agreement (IAA) with the Washington State Department of Enterprise Services (DES) to proceed with energy conservation measures at Seattle-Tacoma International Airport as described in the project energy service proposal updated January 2017; (2) execute contracts for the design and construction of the Stage 3 energy savings initiatives within the DES IAA; and (3) utilize Port crews and small works contracts to perform work as required. The amount of this request is \$6,791,000 for a total project authorization of \$7,121,000.

EXECUTIVE SUMMARY

This project is the third phase of the Airport's mechanical energy conservation program. The Stage 3 project directly supports the Century Agenda Goals to meet future energy needs through conservation and reduce greenhouse gas emissions. It also advances the accelerated goals in the Energy and Sustainability Policy (E&S Policy) recommendations by adding electrical submetering to 35 motors that serve large mechanical system loads.

Stage 3 will reduce 605,989 KWh of electricity use per year, an approximate 0.4% reduction in total electricity consumption. In addition, the project reduces Airport natural gas use by 156,496 Therms per year, a 6.1% reduction of natural gas required to meet Airport terminal building heating needs.

The project has also been identified as the next big win for airport energy conservation, reducing airport greenhouse gases by over 800 tons per year, a 4% reduction in our overall carbon footprint. Carbon reductions from Stage 3 are more than a quarter of all carbon reduced by airport conservation projects combined in the last 15 years.

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Lastly, Stage 3 will improve the efficiency of Airport heating and cooling systems, replace equipment that has exceeded its useful life with energy efficient equipment, and increase passenger comfort. The project provides an internal rate of return (IRR) ranging from negative 0.3% to negative 7.0% depending on utility rate assumptions.

JUSTIFICATION

The project will reduce use of electricity, natural gas, and reduce annual carbon emissions by 839 metric tons, equivalent to taking 178 cars off the road. By conserving electricity, the project also reduces the Port's reliance on our hydropower system, although those benefits cannot be quantified at this time. Similarly, energy conservation projects increase airport resilience against unexpected changes in energy prices and availability. The project adds submetering that measures energy consumption on 35 large electrical loads on the systems that deliver cooling and heating at the airport, an important keystone in our ongoing energy conservation work, and identified in the E&S Policy recommendations.

DETAILS

Background

This project is the third mechanical energy conservation initiative developed by the Port of Seattle. The first two projects replaced old constant volume air terminal units with more efficient variable volume air units supplying air to the main terminal, and increased the efficiency of operation in the central mechanical plant that delivers chilled water for cooling of the buildings and equipment.

For Stage 3 of the effort, the Port chose to continue in Washington State's Energy Savings Performance Program (ESPC). This program provides partners with a pre-qualified energy service company (ESCO) as an efficient method to:

- (1) Conduct an energy audit of their facility and preliminary designs, and
- (2) Implement the energy conservation measures identified in step 1.

ESCOs reduce costs and time required to complete energy conservation projects because the design and construction are handled by the same firm. All ESCOs in the ESPC program must calculate energy saved by the project *prior* to construction, and then verify those savings *after* construction is complete. This provides high confidence that the energy savings will be realized over the predicted life of the equipment.

The Port signed an Inter-Agency Agreement (IAA) on July 23, 2009 prior to the Stage 2 Mechanical Conservation Project with the State of Washington's Department of Enterprise Services (DES) to become a partner in the ESPC Program. The IAA allows compensation for the services provided by DES and the ESCO to be paid directly by the Port.

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On June 24, 2014, the Port of Seattle Commission authorized \$330,000 to proceed with audit and preliminary design and to execute a contract through DES. DES then signed a contract with the ESCO. The ESCO finished the audit and preliminary design and submitted the Energy Services proposal on February 27, 2015 that includes the expected energy savings, project cost, economic analysis and the measurement and verification (M&V) plan.

The Energy Services Proposal, as revised in January, 2017, becomes the basis for the construction contracts between DES and the ESCO to be paid directly by the Port. DES has requested that the existing IAA be allowed to expire on June 30, 2017 and to execute a new IAA as we move forward with the Stage 3 Mechanical Conservation project.

Scope of Work

This project will improve the efficiency of the Airport’s mechanical systems, replace equipment that has exceeded its useful life and reduce energy usage. Energy savings will be achieved for both electricity and natural gas, with a resulting reduction in carbon emissions.

The project work includes:

- (1) Optimize chilled water production and distribution network
- (2) Remove non performing heat exchanger in the chilled water system
- (3) Replace direct expansion refrigeration units with chilled water units and install duct work in the main data center to improve cooling at the server racks
- (4) Optimize chilled water pumping
- (5) Monitor indoor air quality in the airport Main Terminal to improve efficiency and reduce energy consumption
- (6) Install air curtains at public doors on baggage and ticketing levels to reduce the amount of conditioned air leaving the building
- (7) Replace older constant volume terminal boxes with variable volume boxes
- (8) Insulate condensate tanks
- (9) Add electrical submetering.

Small Business

Because the Port is continuing the project under the ESPC/ESCO model, this project will not fall under the Port’s Small Business Generator Program. Within the DES’s ESPC program, DES is requiring diverse business inclusion plans from all ESCO firms and has an aspirational goal of 26% for diverse business utilization across all contracts. The ESCO for this project has a diverse business inclusion program, adopted in 2014, with implementation strategies and goals of between 5 and 10% each for minority, women, veteran and small business enterprises.

Schedule

Activity

Design Start	2017 Quarter 4
Construction start	2018 Quarter 3
In-use date	2019 Quarter 3

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Cost Breakdown	This Request	Total Project
Design	\$1,483,000	\$1,813,000
Construction	\$5,308,000	\$5,308,000
Total	\$6,791,000	\$7,121,000

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Do not proceed with this project.

Cost Implications: \$243,000 Expense

Pros:

- (1) No capital investment

Cons:

- (1) No energy conservation or environmental benefits achieved from the identified energy conservation measures
- (2) Does not improve performance of Airport infrastructure or renew and replace equipment that has exceeded its useful life
- (3) \$243,000 spent to date for the energy and regulated materials surveys would be expensed

This is not the recommended alternative.

Alternative 2 – Proceed with the energy conservation measures.

Cost Implications: \$6.8 million

Pros:

- (1) Reduces Airport electricity use by 605,989 KWH/year; an approximate 0.4% reduction in total electricity use
- (2) Reduces Airport natural gas use by 156,496 Therms/year; a 6.1% reduction of energy demand required to meet Airport terminal building heating needs
- (3) Airport carbon emissions will be reduced by 839 metric tons per year. This reduction amounts to approximately 4% of the airport’s total carbon footprint
- (4) Upgrade infrastructure by replacing equipment that has exceeded its useful life with energy efficient equipment
- (5) Improve passenger comfort by reducing the amount of cool air entering the terminal

Cons:

- (1) Financial return on investment does not meet the standard returns the Port usually seeks to achieve. This is an energy conservation project for which the Commission might accept the return due to the electricity, natural gas and greenhouse gas emissions reduction benefits

This is the recommended alternative.

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FINANCIAL IMPLICATIONS

<i>Cost Estimate/Authorization Summary</i>	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$3,500,000	\$0	\$3,500,000
Current change	\$3,300,000	\$321,000	\$3,621,000
Revised estimate	\$6,800,000	\$321,000	\$7,121,000
AUTHORIZATION			
Previous authorizations	\$330,000	\$0	\$330,000
Anticipated request for authorization	\$6,470,000	\$321,000	\$6,791,000
Total authorizations	\$6,800,000	\$321,000	\$7,121,000
Remaining amount to be authorized	\$0	\$0	\$0

Annual Budget Status and Source of Funds

This project (CIP #C800658) was included in the 2017 – 2021 capital budget and plan of finance with a budget of \$3.5 million. As a result of the energy audit, it has been determined that the cost of the project has increased and that original goal of a 10% internal rate of return (IRR) cannot be met. The budget increase will be transferred from the Aeronautical Allowance CIP (C800753), resulting in no net change to the airport capital budget. The projected IRR is between negative 0.3% and negative 7.0% depending on electric power and natural gas rate assumptions. The funding source for this project will be the Airport Development Fund (ADF) and future revenue bonds, to be issued in 2017.

The airlines approved this project through a majority-in-interest (MII) vote in 2014, with a budget of \$3.5 million. The current cost estimate would require another MII vote; however, the Port elected to use the management reserve allowance per the Signatory Lease and Operating Agreement (SLOA) to cover the increase. The airlines were briefed on the project and the Port’s plan to use management reserve at the March 2, 2017, Airport Airline Affairs Committee meeting.

Financial Analysis and Summary

Project cost for analysis	\$7,121,000
Business Unit (BU)	Terminal Building
Effect on business performance (NOI after depreciation)	NOI after depreciation will decrease
IRR/NPV (if relevant)	IRR:-0.3% to - 7.0%; NPV: -\$3.7 million to -\$5.5 million
CPE Impact	\$0.03 in 2019

Future Revenues and Expenses (Total cost of ownership)

Aviation Maintenance is expected to see an overall small decrease in maintenance costs. Removing a heat exchanger, optimizing pumps and fans and replacing constant volume

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terminal boxes and direct expansion air conditioning units will result in less maintenance. The additional air curtains may result in some additional maintenance costs, though based on history of these units, they are not anticipated to be significant and should be able to be absorbed with current maintenance staffing resources.

ATTACHMENTS TO THIS REQUEST

- (1) Presentation slides

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

July 11, 2017 – The Commission was briefed on Stage 3 Mechanical energy Conservation

June 24, 2014 – The Commission authorized Stage 3 Mechanical Energy Conservation Audit

March 11, 2014 – The Commission was briefed on Stage 3 Mechanical Energy Conservation