

**PORT OF SEATTLE**  
**MEMORANDUM**

**COMMISSION AGENDA**  
**ACTION ITEM**

<b>Item No.</b>	6b
<b>Date of Meeting</b>	June 24, 2014

**DATE:** May 21, 2014  
**TO:** Tay Yoshitani, Chief Executive Officer  
**FROM:** Dave Soike, Director Aviation Facilities and Capital Program  
Wayne Grotheer, Director Aviation Project Management Group  
**SUBJECT:** Airport Energy Conservation Program – Stage III Mechanical Energy  
Conservation Project Analysis and Design (CIP #C800658)

<b>Amount of This Request:</b>	\$330,000	<b>Source of Funds:</b>	Airport Development
<b>Est. Total Project Cost:</b>	\$3,500,000		Fund and Future
<b>Est. State and Local Taxes:</b>	\$230,000		Revenue Bonds

**ACTION REQUESTED**

Request Commission authorization for the Chief Executive Officer to proceed with the stage III mechanical energy conservation project and execute a contract through the State Department of Enterprise Services (DES) for an audit of mechanical systems and preliminary design of energy-saving improvements. This request is for \$330,000 of an estimated total project cost of \$3,500,000.

**SYNOPSIS**

This project uses a contracting model to retain an experienced firm to perform an energy audit of certain portions of the Airport's mechanical systems such as air conditioning units, chilled water systems, and temperature controllers. In general terms, the audit would propose improvements to the systems that would save enough energy to provide a positive financial rate of return. With Commission approval, the Port would then authorize DES to direct the firm to move ahead with the most beneficial improvements. This is the third such mechanical conservation project that the Airport has undertaken. This contracting model is used widely across the state by school districts, municipalities, and other public entities.

This requested action will fund the analysis and design work to conduct an Investment Grade Audit, prepare the project notebook, and prepare preliminary designs of the Stage III Mechanical Energy Conservation project to improve the energy performance of portions of the mechanical infrastructure system at the Airport. The scope of work includes collecting data, preparing preliminary design proposals, preparing cost estimates with maximum allowable project costs, and calculating the savings internal rate of return for the proposed energy conservation measures. A future Commission request will be made upon completion of this preliminary phase to move

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

May 21, 2014

Page 2 of 6

forward with construction of the infrastructure changes that meet or exceed 10% internal rate of return. This will be one of several projects to offset future energy needs for projected building square footage expansions such as the new International Arrivals Facility and the North Satellite expansion project, and to further the Airport's goal to meet future electrical energy needs through conservation and use of renewable power. This project was included in the 2014 – 2018 capital budget.

### **BACKGROUND**

Seattle-Tacoma International Airport includes a terminal building complex that spans over three million square feet. This area is both heated and cooled by the Airport central mechanical plant and the associated heating and chilled water distribution pipes, various equipment, and air handling ducts.

This project is the third mechanical energy conservation initiative developed by the Port of Seattle and we will utilize the Washington State Energy Savings Performance Contracting Program within the Department of Enterprise Services (DES). The program utilizes a partnership between the Port, DES, and the energy service company (ESCO) in order to facilitate the most cost-effective approach to completing energy conservation measures to existing facilities.

All fees associated with the program are determined by the project scope and value and are not in any way based on the energy savings achieved. The Energy Audit costs to the ESCO are applied to the design cost for the project. The program requires that the ESCO calculate a level of energy savings prior to construction and then measure and verify the level of savings is achieved after the project is complete. The measurement and verification process provides high confidence that the energy savings will be realized over the life of the economic analysis. The specific energy savings, economic analysis, measurement and verification process and guarantee will be documented in the Energy Services Audit notebook submittal which becomes the basis for the construction contract with the ESCO.

By utilizing the existing Interagency Agreement with the State of Washington, the DES will contract with an ESCO to prepare conceptual designs and determine the feasibility of proceeding with a capital project to complete the energy conservation measures. The above agreement allows compensation for the services provided by DES and the ESCO to be paid directly by the Port.

### **PROJECT JUSTIFICATION AND DETAILS**

This project will analyze data, calculate cost estimates, and prepare preliminary design for the Stage III mechanical energy conservation project. The budget in this request is for the ESCO Audit, estimated State of Washington project management portion that covers the entire project, and also Port of Seattle costs during the audit and design.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

May 21, 2014

Page 3 of 6

Each energy conservation measure as described below will be developed through the preliminary design phase including feasibility study for energy conservation, scope, and utility incentives and will include estimation of maximum allowable costs of construction. The performance improvements and energy savings will be calculated in the Investment Grade Audit focused on conservation measures that will provide a 10% internal rate of return. The proposed energy conservation measures have been discussed between Port of Seattle staff and the ESCO to determine initial feasibility.

### ***Project Objectives***

The over-arching objective of this work is electrical energy conservation as well as a small savings in natural gas.

### ***Scope of Work***

This project will investigate and evaluate separate measures. Infrastructure modifications that meet the 10% IRR criterion would move forward to construction. The Stage I and Stage II projects have already completed similar measures, which added to staff confidence that this third project will be successful. The measures include:

- Constant volume to variable volume airside optimization: Convert constant volume air handling terminal boxes (e.g. old technology heat and cooling units above certain ceiling areas) to more modern variable volume type as was completed in the Stage 1 and Stage 2 Mechanical Energy projects.
- Chilled water system optimization: Implement mechanical system energy measures to (a) modify the tertiary piping system to utilize the secondary pump system and (b) upgrade air conditioning equipment in computer/electrical rooms to use higher chilled water cooling temperatures and augment waterside economizer mode.
- Optimize sequencing of chillers in the central plant to meet varying loads.
- Conditioned space optimization: Implement occupancy temperature control and/or outside air ventilation carbon dioxide demand flow response controls. This would optimize controls to reduce the amount of air and energy used for cooling and heating depending upon air temperatures and other factors.
- Main Terminal public door Ticketing, Baggage Claim, and bridge level air flow control to reduce the heating and cooling loads.
- Recover heat from condensate return in main terminal to preheat domestic hot water.

### ***Schedule***

The audit and conceptual design with estimated project costs and guaranteed savings calculations should be complete by the end of February 2015, at which time a determination will be made as

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

May 21, 2014

Page 4 of 6

to which energy conservation measures will be recommended to the Commission for final design and construction.

### **FINANCIAL IMPLICATIONS**

#### ***Budget/Authorization Summary***

	Capital	Expense	Total Project
Original Budget	\$3,500,000	\$0	\$3,500,000
Previous Authorizations	\$0	\$0	\$0
Current request for authorization	\$330,000	\$0	\$330,000
Total Authorizations, including this request	\$330,000	\$0	\$330,000
Remaining budget to be authorized	\$3,170,000	\$0	\$3,170,000
Total Estimated Project Cost	\$3,500,000	\$0	\$3,500,000

#### ***Project Cost Breakdown***

	This Request	Total Project
Construction	\$0	\$ 2,300,560
Construction Management	\$0	\$ 210,000
Design	\$179,760	\$ 499,440
Project Management	\$150,240	\$ 210,000
Permitting	\$0	\$50,000
State & Local Taxes (estimated)	\$0	\$ 230,000
Total	\$330,000	\$3,500,000

#### ***Budget Status and Source of Funds***

This project (CIP #C800658) was included in the 2014 – 2018 capital budget and plan of finance as a business plan prospective project. The funding source will be the Airport Development Fund and future bonds. Consistent with the Port's 2014 – 2018 plan of finance, a new revenue bond issue will be needed in late 2014 or early 2015 to fund this project and others.

If the Investment Grade Audit does not find savings meeting agreed criterion of 10% IRR: Port total costs would then amount to the expended portion of the project management costs (thought to be less than \$86,000 at that point). This cost would be charged to expense.

If the Investment Grade Audit does find savings meeting agreed criterion of 10% IRR and the Port elects not to proceed with the work: Under the Agreement with DES a maximum fee of \$25,700 would be owed to the State plus the \$179,760 ESCO Audit fee and the expended portion of the project management costs. These costs would only need to be expensed if the audit finds savings and the Port elects not to move forward.

The individual energy conservation measures that are identified through this work will be submitted to Commission in the future for authorization for final design and construction. The total cost of the project is estimated to be \$3,500,000.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

May 21, 2014

Page 5 of 6

### ***Financial Analysis and Summary***

<b>CIP Category</b>	Renewal/Enhancement
<b>Project Type</b>	Renewal & Replacement
<b>Risk adjusted discount rate</b>	7.0%
<b>Key risk factors</b>	Project costs
<b>Project cost for analysis</b>	\$3,500,000
<b>Business Unit (BU)</b>	Terminal Building
<b>Effect on business performance</b>	Operating cost savings will offset capital costs
<b>IRR/NPV</b>	Positive NPV, 10% IRR (target)
<b>CPE Impact</b>	Likely none, may actually lower CPE

The financial analysis will be updated upon completion of the project notebook when the scope and guaranteed savings can be quantified.

### ***Lifecycle Cost and Savings***

Mechanical systems can be improved in order to reduce electrical energy consumption and thereby achieve cost savings. The savings are particularly important as the Airport will see energy usage increase due to growth and with the implementation of the pre-conditioned air project and the electrification of ground service equipment. Since the amount of electricity the Airport can purchase at the lowest Tier 1 rate from Bonneville Power Administration is limited, the Airport must achieve improved efficiencies in order to offset purchasing electricity at the higher future Tier 2 rate. Some nominal natural gas savings are also expected to be achieved from this project. Both the capital cost of this project, and the resultant anticipated 10% energy savings would both be reflected in the Airport's rates and charges and utility charges.

At this early stage of the project, the impact to ongoing Operations and Maintenance (O&M) costs are undetermined. We do not expect that this project will greatly add to or remove assets that will require maintenance, so we do not foresee a significant increase or decrease in maintenance costs.

## **STRATEGIES AND OBJECTIVES**

This project supports the Port's Century Agenda objective to "Be the greenest, and most energy efficient port in North America" by evaluating energy conservation measures and developing designs that reduce Airport energy consumption.

## **TRIPLE BOTTOM LINE**

### ***Economic Development***

This project will reduce the amount of energy consumption achieving both electrical and natural gas cost savings. The amount of electricity the Airport can purchase at Tier 1 rate from Bonneville Power Administration is limited. Long-term this project will help reduce the cost of utilities passed on to Airport tenants.

## **COMMISSION AGENDA**

Tay Yoshitani, Chief Executive Officer

May 21, 2014

Page 6 of 6

### ***Environmental Responsibility***

This project will reduce the Airport's energy consumption, and supports the Port's Century Agenda objective to "Be the greenest, and most energy efficient port in North America."

### ***Community Benefits***

Long-term vitality of the Airport benefits the regional economy, the local environment, and the nearby communities.

## **ALTERNATIVES AND IMPLICATIONS CONSIDERED**

**Alternative 1)** – Perform traditional design/bid/build project without utilizing the Washington State Energy Savings Performance Contracting Program. This approach would take longer and cost more. Design/Bid/Build elements include consultant selection and contracting, design and bid processes. Total contract costs are not known until project is bid and all change orders accumulated. This approach would not use the expertise of prequalified state contractors and consultants. This is not the recommended alternative.

**Alternative 2)** – Do nothing. This approach would not improve energy conservation within the Airport. This would not enhance the Port's stewardship of financial and natural resources through completing energy savings projects on existing facilities. This is not the recommended alternative.

**Alternative 3)** – Authorize an Addendum to the Interagency Agreement between the Port of Seattle and the State of Washington for Energy Savings Conservation Project Management Services to prepare a feasibility study for the next steps in the Airport energy conservation program. **This is the recommended alternative.**

## **OTHER DOCUMENTS ASSOCIATED WITH THIS REQUEST**

- None.

## **PREVIOUS COMMISSION ACTIONS OR BRIEFINGS**

- Stage III Mechanical Briefing March 11, 2014
- Aviation Division Capital Budget, Commission Briefing October 1, 2013