



**COMMISSION
AGENDA MEMORANDUM**

Item No. 6e

ACTION ITEM

Date of Meeting June 11, 2019

DATE: June 3, 2019

TO: Stephen P. Metruck, Executive Director

FROM: Dave Crowner, Manager, Aviation Safety Management Systems
Krista Sadler, Director ICT Technology Delivery
Wayne Grotheer, Director Aviation Project Management Group

SUBJECT: Surface Area Management Project (CIP #C800650)

Amount of this request: \$4,782,000

Total estimated project cost: \$6,600,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) proceed with the airfield Surface Area Management System project at Seattle-Tacoma International Airport; (2) execute a contract for required hardware, software, vendor services, and maintenance for the Surface Area Management System; (3) proceed with design for sensor and camera installation, (4) use Port staff for implementation; and (5) execute a contract for up to ten years for license, service, and maintenance fees estimated at \$12,000,000, which will be paid for out of annual expense funds. The amount requested for project implementation under this authorization is \$4,782,000 out of a total estimated project cost of \$6,600,000.

EXECUTIVE SUMMARY

This project will procure and implement a surface area management (SAM) system to improve airfield situational awareness and provide forensic and analytic information on airfield operations at Sea-Tac airport. This valuable information will improve aircraft flow and gate docking efficiencies, reduce aircraft holds, and support safety initiatives by providing more detailed information on incident causes and contributing factors. Integrating with several Port and external data feeds, the system will provide a real-time, actionable picture of operations that will be invaluable to Airport Operations, emergency response, and security.

In addition, advanced analytics and reporting will provide trends and correlations for better decision making and process improvement. Delta Air Lines, Alaska Airlines, and the Federal Aviation Administration (FAA) have provided letters of endorsement for the project based on the efficiency and safety improvements they have seen at other airports that have implemented a similar system.

Meeting Date: June 11, 2019

Design for the installation of sensors and cameras used by the new system is included in this authorization. Authorization for construction will follow in a future Commission request anticipated for Q3 2020.

Funding for this project was included in the 2019-2023 capital budget and plan of finance in the amount of \$5,000,000 under CIP #C800650, Surface Area Management System. The capital budget increase of \$1,200,000 will be transferred from the Aeronautical Allowance #C800753 resulting in no net change to the Aviation Division capital budget.

JUSTIFICATION

Over the last few years, the Port has invested in several key systems, practices, and services to improve overall airfield efficiency. This includes Airport Surface Detection System (ASDE-X), Automatic Dependent Surveillance-Broadcast (ADS-B), Flight Information System (FIMS), Visual Docking Guidance Systems (Safedock), and Foreign Object Debris Detection System (FOD). Although, existing systems improve the airport's detection of activities within their respective coverage areas, they do not provide a holistic view or understanding of underlying reasons or root causes for delays, bottlenecks, or deficiencies. These systems detect and tell us what is occurring, but we are unaware of why they are occurring, or where there may be opportunities to improve. For example, existing systems can tell us how long an aircraft may hold for a gate, or the taxiing time to reach the gate, but there is no way of knowing if the aircraft had to hold for the gate due to a vehicle blocking its path, a lack of personnel to marshal or guide the aircraft into the gate, or a delay in the departure of a preceding aircraft. Without knowing the cause for these deficiencies, the airport has no way to effectively improve and correct underlying causes for inefficiency.

As a result, the Port continues to lack sufficient situational awareness of aircraft, vehicle, and equipment movement on the airport ramp, gate, and aircraft parking areas, hindering the Airport's ability to diagnose and mitigate capacity issues, anticipate threats, realize organizational gaps and lapses, and optimize gate usage.

The implementation of a SAM system is the next step in the evolution of this effort and will address the remaining gaps in sensor coverage as well as limitations in diagnostic and forensic tools. SAM will also integrate and leverage data from existing systems and sensors into a consolidated tool to enhance situational awareness and business performance.

This project includes several important operational and safety benefits.

- 1) SAM will improve efficiency by detecting taxi times and the underlying causes of delays and airfield bottlenecks, synchronizing ground traffic flow with FAA's airspace procedures to set taxi routes, and alerting staff of delays so we can more proactively mitigate issues. It is estimated that, annually, a 15-second taxi time reduction for 25

Meeting Date: June 11, 2019

percent of operations will save airlines up to \$7,500,000 and reduce emissions by 2,105 metric tons.

- 2) SAM will improve safety by providing data to determine incident root cause and develop mitigation measures and intercepting potential hazards before they become an incident.
- 3) SAM will improve legal defense by providing forensic data associated with incidents. This may include video, vehicle speed, erratic driving patterns, and operating conditions.
- 4) SAM will improve business performance by showing real-time gate usage to reduce conflicts, track progress of deicing equipment and match schedule with aircraft readiness, and more accurately record hardstand usage for billing purposes.

DETAILS

Scope of Work

Procure and implement a surface area management system to improve situational awareness and business performance for the Sea-Tac Airport ramp, gate, and aircraft parking areas. Design and construct power and data points of connection for new cameras and sensors located throughout the ramp, gate, and aircraft parking areas to support the SAM system.

Schedule

Activity

Commission Authorization	2019 Quarter 2
Procurement Complete	2019 Quarter 2
Construction Commission Authorization	2020 Quarter 3
Substantial Completion Date	2021 Quarter 2

Cost Breakdown

This Request

Total Project

	This Request	Total Project
Capital		
Hardware/Software/Vendor Services	\$2,623,000	\$2,623,000
Port Labor	\$854,000	\$934,000
Sensor/Camera Installation	\$905,000	\$2,643,000
Total Capital	\$4,382,000	\$6,200,000
Expense		
Training	\$200,000	\$200,000
Spare Parts	\$200,000	\$200,000
Total Expense	\$400,000	\$400,000
TOTAL PROJECT	\$4,782,000	\$6,600,000

Meeting Date: June 11, 2019

ALTERNATIVES AND IMPLICATIONS CONSIDERED

Alternative 1 – Continue to operate without a comprehensive Surface Area Management System

Cost Implications: \$0

Pros:

- (1) Capital funding and annual recurring operating cost is available for other efforts.

Cons:

- (1) No improvement in situational awareness will hamper our ability to improve processes, detect and correct hazardous conditions, and proactively manage emerging issues.
- (2) Lack of accurate and timely information will reduce our ability to recreate and evaluate incidents.
- (3) Lack of sufficient capabilities to effectively identify and perform proactive mitigation of emerging hazards and trends.

This is not the recommended alternative.

Alternative 2 – Retrofit existing systems to resolve some gaps in the non-movement areas.

Cost Implications: \$3,600,000

Pros:

- (1) This alternative is less costly than the recommended solution both in product costs as well as annual recurring costs.
- (2) Port personnel have experience in working with current systems.

Cons:

- (1) Existing systems do not currently meet the broader requirements of a surface area management system and this alternative will require commitment from vendors to make the necessary changes.
- (2) These vendors do not have experience providing a full-featured solution in an airport environment.
- (3) There is no certainty that retrofitting the existing system will provide significant improvements to situational awareness, due to potential limitations of the existing systems.

This is not the recommended alternative.

Meeting Date: June 11, 2019

Alternative 3 – Procure and implement a Surface Area Management system for the Sea-Tac non-movement area.

Cost Implications: Total 10-Year Cost \$18,600,000 (Project Cost: \$6,600,000; 10-Year Recurring \$12,000,000)

Pros:

- (1) The new system will provide essential airfield situational awareness and business performance improvement tools to support the Sea-Tac goals of operating a world-class airport.
- (2) There are opportunities to reduce other point solutions that overlap requirements, reducing maintenance costs, training, and operational efficiency.

Cons:

- (1) Capital funding and annual recurring costs are higher than the alternative.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary

	Capital	Expense	Total
COST ESTIMATE			
Original estimate	\$5,000,000	\$0	\$5,000,000
Budget Increase	\$1,200,000	\$400,000	\$1,600,000
AUTHORIZATION			
Previous authorizations	\$80,000	\$0	\$80,000
Current request for authorization	\$4,382,000	\$400,000	\$4,782,000
Total authorizations, including this request	\$4,462,000	\$400,000	\$4,862,000
Remaining amount to be authorized	\$1,738,000	\$0	\$1,738,000

Annual Budget Status and Source of Funds

This project was included in the 2019-2023 capital budget and plan of finance for \$5,000,000 under CIP #C800650, Surface Area Management System. The capital budget increase of \$1,200,000 will be transferred from the Aeronautical Allowance C800753 resulting in no net change to the Aviation Division capital budget. The funding source would be the Airport Development Fund and future bond. The expense budget increase of \$400,000 for spare parts and training will be budgeted in 2020.

Financial Analysis and Summary

Project cost for analysis	\$6,600,000
Business Unit (BU)	Airfield Movement Area
Effect on business performance (NOI after depreciation)	NOI after depreciation will increase

Meeting Date: June 11, 2019

IRR/NPV (if relevant)	N/A
CPE Impact	\$0.07 in 2021

Future Revenues and Expenses (Total cost of ownership)

Annual recurring maintenance and license costs for this system, estimated at \$1,190,000 will be budgeted in the Aviation Operations operating budget. Port support and spare parts are estimated at \$10,000 annually will be budgeted in the Aviation Maintenance and Information & Communication Technology operating budgets.

ATTACHMENTS TO THIS REQUEST

Surface Area Management Letters of Endorsement

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

None