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

ACTION ITEM **Date of Meeting** February 8, 2022

DATE: January 28, 2022

TO: Stephen P. Metruck, Executive Director

FROM: Laurel Dunphy, Director Airport Operations
Krista Sadler, Director ICT Technology Delivery

SUBJECT: **Surface Area Management Project (CIP #C800650)**

Amount of this project request:	$8,718,000
Total estimated project cost:	$13,500,000
Total estimated 10-year Hosting Fee:	$2,200,000

ACTION REQUESTED

Request Commission authorization for the Executive Director to (1) construct the Surface Area Management System project at Seattle-Tacoma International Airport using Job Order Contracting alternative public works, (2) increase the project budget by $6,900,000 for a new total of $13,500,000, and (3) execute contract amendments over $300,000 with SAAB Inc. to include recurring system hosting fees over the next 10 years of $2,200,000.

EXECUTIVE SUMMARY

In June 2019, the commission approved the first phase of a project to provide the tools needed to effectively predict, respond, and mitigate operational issues and to realize opportunities for improvement such as increasing aircraft taxiing efficiencies and optimizing gate utilization. The approval was for two deliverables: (1) acquire and deploy hardware, software, vendor services, and maintenance and (2) deliver the design for the installation of sensors and cameras used by the new system. This request is for authorization for the construction phase to install the sensors and cameras based on the design.

This project procured and implemented a surface area management (SAM) system to improve airfield situational awareness and provide forensic and analytic information on airfield operations at Sea-Tac airport. The system provides information to 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 provides a real-time, actionable picture of operations that is invaluable to Airport Operations, emergency response, security, and our airline partners.

The system was implemented in multiple phases and is now used by Port staff, Federal Aviation Administration (FAA), and Airlines. The implementation started with an initial phase that deployed the core system in December 2020. This was followed by phase 2 in May 2021 to deploy ASSAIA Video Analytics. Phase 3, implemented in November 2021, deployed the video analytics-based vehicle and equipment tracking and the remaining integrations with other Port systems. In parallel to these phases, the project team progressed the design work for phase 4, the installation of sensors and cameras used by the new system.

Since the deployment of phase 1 of the project, the Port and its partners have realized several benefits from using the new system.

- Alaska Airlines leveraged information from the new system and implemented a change to its operations that that resulted in reduction of wait time for gates upon arrival.
- Ramp Tower and FAA coordination significantly improved coordination during impacts of the 2021 Airport Improvement Project (AIP) work and International Arrivals Facility (IAF) construction taxi lane closures
- Sixty-seven (67) gates are currently under turn monitoring surveillance providing time stamps of up to 36 critical milestones throughout the progression of a turn which establishes a record to gauge vendor performance and predict off-block times

The original estimates for the design and construction for the installation of sensors and cameras that will improve operational efficiency and safety analytics, was $2,643,000. This was based on realistic assumptions from the technical vendor prior to a final contract and design. During design it was discovered that the planned wireless cameras would not meet performance specifications and 50% of existing gate cameras couldn't support turn monitoring. The combined design and construction body of work, that includes the connection and installation of additional cameras, is now estimated to be $9,543,000, which is an increase of $6,900,000. An increase to the vendor contract for hosting fees, not part of the original contract, is estimated at $2,200,000 and will be paid for out of annual operating expense funds.

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 addresses the remaining gaps in sensor coverage as well as limitations in diagnostic and forensic tools. SAM also integrates and leverages data from existing systems and sensors into a consolidated tool to enhance situational awareness and business performance while establishing a common operating picture for the airport, airlines, and FAA to collaborate around and make better decisions towards improved safety and efficiency.

This project includes several important operational and safety benefits.

(1) SAM improves 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 40% reduction of taxi time delays will save airlines up to $2,500,000 annual airline savings and reduce emissions by 3,700 metric tons.
(2) SAM improves safety by providing data to determine incident root cause and develop mitigation measures and intercepting potential hazards before they become an incident.
(3) SAM improves legal defense by providing forensic data associated with incidents. This may include video, vehicle speed, erratic driving patterns, and operating conditions.
(4) SAM improves 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.

Diversity in Contracting

This project will utilize a Job Order Contract (JOC) to construct this project's scope of work. The overall JOC contract has a 16% Women and Minority Business Enterprise (WMBE) commitment goal. Each work order within the JOC strives to achieve this stated WMBE commitment.

DETAILS

Scope of Work

The Phase 4 project scope of work includes sensor and camera installation at various locations in the airfield to improve identification of targets for situational awareness and provide gate turn monitoring at all gates. The scope also includes the setup of the all the required Power and

Communication Infrastructure for the sensors and cameras. This request also includes budget to complete the design remaining design work.

Schedule

Activity	
Phase 4 Construction start	2022 Quarter 3
Phase 4 In-use date	2023 Quarter 4
Total Project Complete	2024 Quarter 1

Cost Breakdown	This Request	Total Project
Capital		
Hardware/Software/Vendor Services		$2,623,000
Port Labor	$80,000	$934,000
Sensor/Camera Installation	$8,638,000	$9,543,000
Total Capital	**$8,718,000**	**$13,100,000**
Expense		
Training		$200,000
Spare Parts		$200,000
Total Expense		**$400,000**
TOTAL PROJECT	**$8,718,000**	**$13,500,000**

ALTERNATIVES AND IMPLICATIONS CONSIDERED

The original construction estimate was based on assumptions that sensors and cameras could utilize wireless connectivity and existing cameras at gates would be sufficient for turn monitoring. During design, it was found that cameras could not meet performance specifications when connected wirelessly and an estimated 50% of the gates did not have cameras that are directed in an optimal way.

Alternative 1 – Utilize wireless connectivity and eliminate cameras associated with sensors and on remaining gates.

Cost Implications: approximately $1,000,000

Pros:

(1) This is the lower cost alternative.

Cons:

(1) Efficiencies and associated cost savings and customer service improvements related to gate turn monitoring will not be realized.
(2) Reduced improvements in safety monitoring of non-aircraft vehicles and equipment on the airfield.

This is not the recommended alternative.

Alternative 2 – Approve cost increase for wired cameras and additional gate cameras to monitor gate turns.

Cost Implications: $6,900,000

Pros:

(1) Gate turn monitoring is essential to realizing efficiencies in the turn process that generate significant savings to our airline partners and support process change that improves the customer experience.
(2) Full camera capability supports real-time safety monitoring and safety management analysis capabilities on non-aircraft vehicles and equipment on the airfield.

Cons:

(1) This is the higher cost alternative.

This is the recommended alternative.

FINANCIAL IMPLICATIONS

Cost Estimate/Authorization Summary	Capital	Expense	Total
COST ESTIMATE			
Original estimate	$6,200,000	$400,000	$6,600,000
Budget Increase	$6,900,000	$0	$6,900,000
Revised estimate	$13,100,000	$400,000	$13,500,000
AUTHORIZATION			
Previous authorizations	$4,382,000	$400,000	$4,782,000
Current request for authorization	$8,718,000	$0	$8,718,000
Total authorizations, including this request	**$13,100,000**	$400,000	**$13,500,000**
Remaining amount to be authorized	$0	$0	$0

Annual Budget Status and Source of Funds

This project, C800650 was included in the 2022-2026 capital budget and plan of finance for $6,200,000. The capital budget increase of $6,900,000 was 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 bonds. This project had prior airlines Majority in Interest (MII) approval of $5M. The budget increase would utilize the MII Management Reserve which would not require additional MII approval. The expense budget for 2022 was included in the operating budget.

Financial Analysis and Summary

Project cost for analysis	$13,500,000
Business Unit (BU)	Airfield Movement Area
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	$0.15 in 2022

Future Revenues and Expenses (Total cost of ownership)

Previously authorized annual recurring maintenance and license costs for this system, estimated at $1,400,000 are budgeted in the Aviation Operations operating budget. A new annual recurring cost for system hosting estimated at $220,000 per year will be budgeted in the Aviation Maintenance operating budget for a total annual cost of $1,620,000.

ATTACHMENTS

(1) Presentation

PREVIOUS COMMISSION ACTIONS OR BRIEFINGS

June 11, 2019 – Item 6e - Commission authorized proceeding with the project for $4,782,000