Airport Gate Activity Monitoring Tool Suite for Improved Turnaround Prediction
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OBJECTIVES

The goal of this research is to create a suite of tools for monitoring airport gate activities with the objective of improving aircraft turnaround prediction. Airport ramp areas are the most crowded and cluttered spaces in the entire National Airspace System (NAS). Operations associated with turnaround of the aircraft from the gate represent a significant source of delay and therefore impact the predictability of NAS operations. The Gate Activity Monitoring Tool Suite (GAMTOS) will specifically identify the various stages of turnaround, create a probabilistic model of the times associated with each of these events, and predict the future sequence of events and their times of completion.

ACCOMPLISHMENTS

NOTABLE DELIVERABLES PROVIDED
1. An interim report and a comprehensive final report that details the development of GAMTOS.
2. Presentation slides of the kick-off meeting and the pre-final review meeting

KEY MILESTONES MET
- Image/video database of airport gate activities constructed for both training and testing of GAMTOS
- Bayesian statistical approach for predicting pushback time and aircraft taxi start time
- GAMTOS evaluated with field recordings of gate activities at Charlotte International Airport

FUTURE PLANNED DEVELOPMENTS

PLANNED POST-PHASE II PARTNERS
Potential post-Phase II partners primarily include avionics and systems integrators for airline operation control systems and equipment. As development of GAMTOS matures, OSI plans to market the technologies to such companies as Saab for collaboration and technology licensing opportunities.

PLANNED/POSSIBLE MISSION INFUSION
By providing improved pushback time prediction, GAMTOS directly benefits surface operation scheduling tools such as NASA’s Spot and Runway Departure Advisor (SARDA). GAMTOS is also directly applicable to objectives of the Networked ATM sub-project under NASA’s Shadow Mode Assessment Using Realistic Technologies in the National Airspace System (SMART NAS) project.

PLANNED/POSSIBLE COMMERCIALIZATION
Low-cost airport activity monitoring techniques can be used by airlines, including American Airlines, who has provided video data to support this research and who is working on expected off-block time prediction, to monitor the efficiency and bottlenecks in their own operations. Potentially GAMTOS technology can be inserted into the existing ramp-area situational awareness products.

CONTRACT (CENTER)

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SOLICITATION-PHASE
SBIR 2015-I

SUBTOPIC
A3.01 Advanced Air Traffic Management Systems

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