

**Runway Incursion
Joint Safety Implementation Team**

**Implementation Plan
For
Situational Awareness Technologies for Air Traffic Control**

SE-53-R1

Statement of Work:

The purpose of this project is to develop and implement technology tools including data link that will provide and/or enhance airport surface situational awareness to air traffic controllers. Examples of these technology tools include, but are not limited to, Airport Movement Area Safety System (AMASS), Airport Surface Detection Equipment (ASDE-X), Automated Dependent Surveillance – Broadcast (ADS-B), Next Generation Air-Ground Communications System (NEXCOM), Surface Movement Advisor (SMA), and Airport Target Identification System (ATIDS). The strategies for accomplishing this project include:

- New technology tools will be developed by the FAA to enable enhanced surveillance, information, communication and conflict detection for ATC operations.
- FAA and airport operators will provide airport surface surveillance equipment with conflict alerting capability at air traffic control towers.
- Digital data link capability will be developed and implemented to enable automatic transmission of ATC instructions/information (between the ground & aircraft).
- Situational Awareness Displays developed in support of the above listed strategies will incorporate industry best practices for computer-human interface (CHI) design to enhance and support ATC decision-making.

One of the most fundamental improvements to safety is sharing information between pilots and controllers. Uniform availability of shared, reliable data to both controllers and pilots is necessary to assure safety in the future environment of increased demand. The pilot needs unambiguous understanding of airport layout and clearance instructions to avoid blunders onto uncleared surfaces in all visibility conditions. Improved and more reliable (fewer false reports) surface surveillance will be necessary.

Lead Organization for Overall Project Coordination (LOOPC):

ARI-1

Safety Enhancement 1: (SE-53)

Aviation safety will be improved by installation of enhanced airport surveillance equipment.

Accident Prevention Index:

(To Be Completed by JIMDAT)

Total Resource Requirements:

20 to 35 FTE's

Completion Date:

9 years

Outcome:

Provide and/or enhance airport surface situational awareness to air traffic controllers with the intent of improving runway safety.

Output 1:

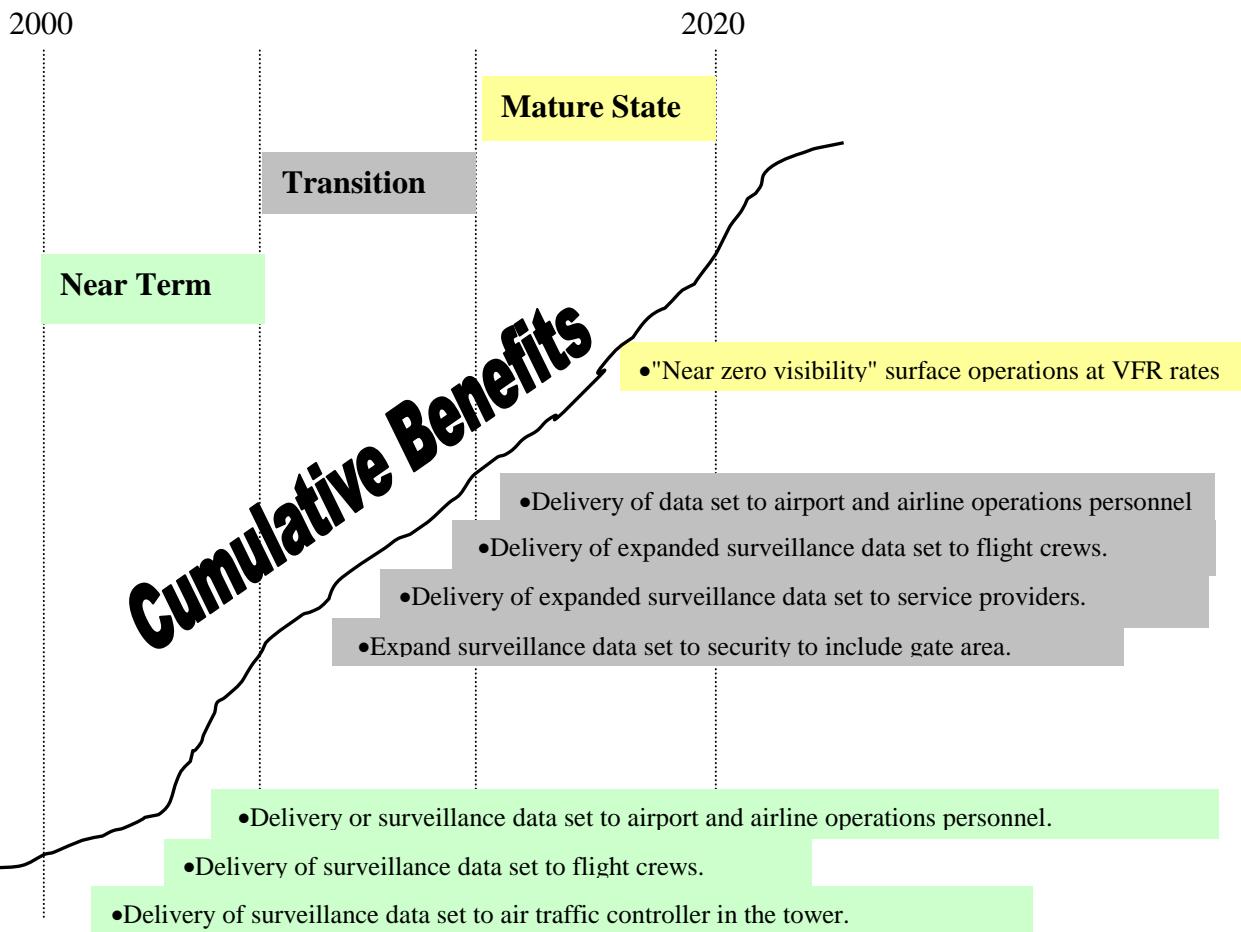
FAA is developing an airport surface systems architecture roadmap, that includes, but is not limited to, sensor systems, display systems (both ground and aircraft-based), and communications systems (voice and data). This surface systems architecture roadmap should be consistent with future updates of the NAS Architecture Plan (Current Version 4.0).

Resources: ARI-1, ASD, ATS, AVR, AND (AND-500 – LOOC), ARS, AOZ, NATCA, PASS, SUPCOM

Timeline: 12 months

Actions:

- FAA should develop a surface technology roadmap to meet the emerging future needs of today's surface environment and present to industry for coordination (i.e., JSIT).
- FAA should capitalize on existing government/industry working groups.
- FAA should define the operations for Surface Movement in accordance with the Operational Evolution Plan (OEP) released in June 2001.
- The FAA and industry should continue their collaboration in implementing the key elements of the airport surface modernization roadmap as outlined in the RTCA document *Government/Industry Operational Concept for the Evolution of Free Flight, Addendum 3.1: Surveillance*. As stated in this RTCA document, "One key capability is the formulation of a common surveillance data set that contains positive identification and accurate position of all aircraft and surface vehicles in the movement area."



- Common surveillance data set with positive identification of all aircraft and surface vehicles in movement area.

Airport Surface Capabilities Timeline

(as shown in RTCA document *Government/Industry Operational Concept for the Evolution of Free Flight, Addendum 3.1: Surveillance*)

Output 2:

FAA should periodically release Broad Agency Announcements (BAA) to solicit industry ideas and concepts that will lead to new or enhanced technology tools to enable enhanced surveillance, information, communications, and conflict detection for ATC operations.

Resources:

AND-500 (LOOC), AND-400, ARI-1, ARS, AVR, NATCA, PASS, SUPCOM

Timeline:

Ongoing & Continuous

Actions:

- The FAA (AND-500) should continue to oversee technology assessment of new and emerging surface technologies.
- The FAA (AND-500) should continue to be the FAA's focal point with industry for technology activities aimed at an overall reduction in runway incursions and an overall improvement of safety on airport movement areas.
- The FAA (AND-500) should ensure that proposed solutions offered in response to the BAA announcements reflect the needs and requirements of the individual(s) who utilize the controlled airport surface movement area, including air traffic controllers, flight crews, vehicle operators and pedestrians.
- The FAA budget should support runway incursion prototyping and development activities over the next 5 years (FY02-FY06).
- AND-500, ARI-1, ARS, NATCA and PASS will collaboratively establish exit criteria and participate actively in BAA evaluation and demonstration.
- The FAA Federal Acquisition Executive (ARA-1) will initiate implementation programs, as appropriate, to field successful capabilities proven during the BAA process.

Output 3:

Develop a prioritized list of FAA towered airports where airport surface surveillance capability should be installed. Prioritization will be based on number of operations per year and runway incursion history.

Discussion:

Controllers at towered airports need complete situational awareness in the entire movement area in order to optimize ground operations safety

Decision criteria should be established by the ATO for determining surveillance equipage for each airport on the prioritized list.

Resources:

ATO (LOOC), Airports,

Timeline

3 Years

Actions:

Since the SE was written, there have been other safety initiatives introduced to mitigate wrong runway operations such as the FAA's Call to Action on Runway Safety and SE-183 Cockpit Moving Map Display and Runway Awareness System. Mitigation of runway incursion causal factors from all activities has resulted in a Part 121 runway incursion accident rate today that is low compared to other accident types.

SE-53's revised CAST score is 3.3% fatality risk reduction based on 60% implementation. The effect of suspending implementation of LCGS is estimated to have less than .1 % impact in the overall fatality risk reduction of the CAST portfolio. On December 5, 2013, CAST agreed to complete this SE based on Output 1, while suspending Outputs 2 and 3.