Advanced ADS-B Applications

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FAA MOIE

MITRE Technology Program

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Problem

- **What is the overall “promise” of ADS-B and what are the “tall poles”- i.e., main issues to be addressed?**

- **What is the next set of ADS-B applications, beyond those currently under development or deployment, that provide the most promise to users or providers?**

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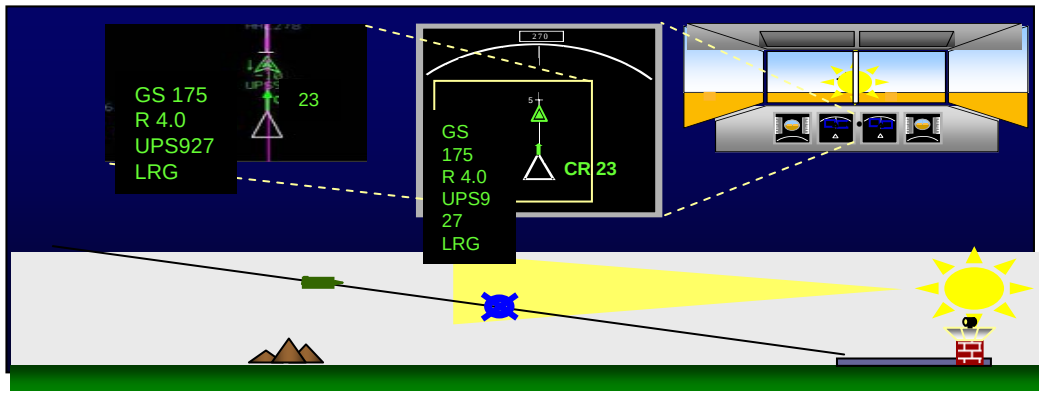
Background

CDTI Assisted Visual Separation

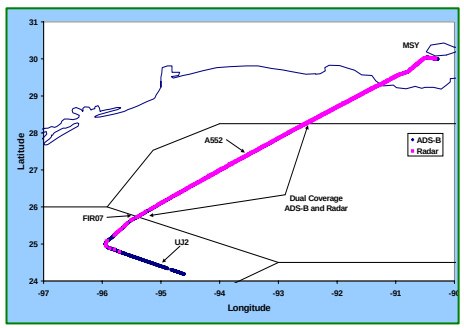


Enhanced Situation Awareness

Enhanced Visual Approaches

Merging and Spacing

Radar Coverage Where None Available



Oceanic in-trail procedures

Final Approach & Runway Occupancy Awareness

Airport Surface Situation Awareness

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Objective

- Define major promises in implementing ADS-B applications in terms of overall end-to-end capabilities

- Demonstrate at least one component application in a concept visualization environment

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Activities

- Inventory possible applications
- Define “end-state capabilities” in terms of the “modes of operation” offered to a user by ADS-B
- Develop an operations concept and visualization of at least one application with promise

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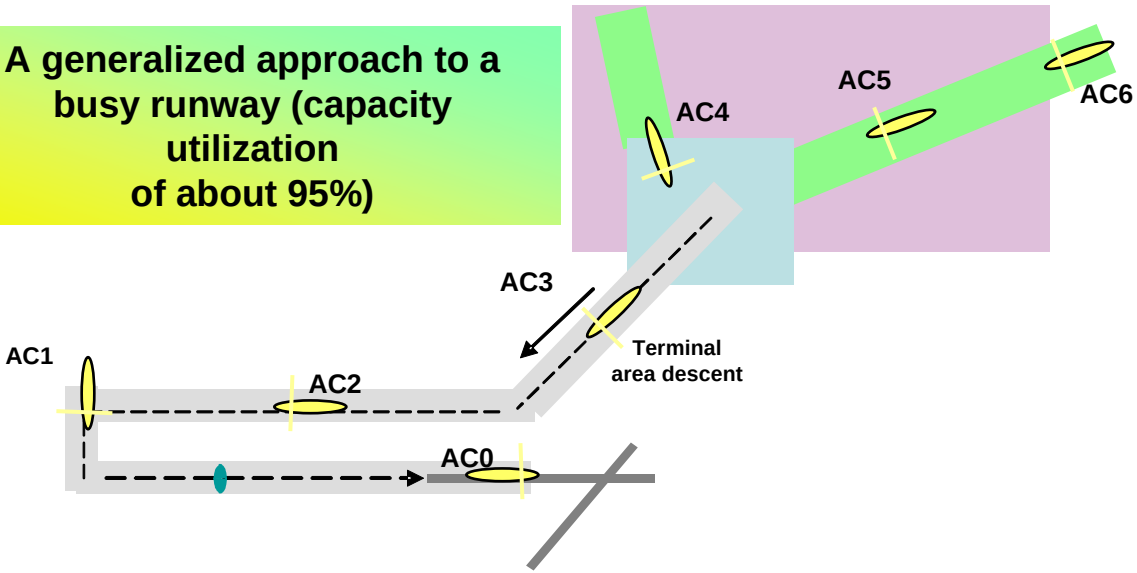
Highlight

A generalized approach to a busy runway (capacity utilization of about 95%)



Operators can maneuver within the envelope of an agreement without ATC coordination
A change outside of an agreement would require a re-negotiation with ATC

(0) En route along RNP route – pilots use 4-dimensional capabilities to self-manage compliance

(1) Near top of descent – pilot can zoom out to see others in sequence; conflict prevention highlights any issues with the upcoming merge; ADS-B tools used to resolve them

(2) At merge – pilots use merging tools to line up and sequence at entry to RNP approach

(3) Along RNP approach – spacing tools on final approach

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Highlight

Integrated Technology Adapts to Phase of Flight and Type of Task

Surface Operations:
Managing Departure Sequence

Enroute:
Autonomous Conflict Resolution

Approach:
Delegated Separation Responsibility

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Impacts

- Capture knowledge of what user missions can be met through information in the cockpit
- Help define the evolution of ADS-B applications and corresponding R&D
- Encourage implementation by providers and users of a specific capability by illustrating its operational feasibility and benefits

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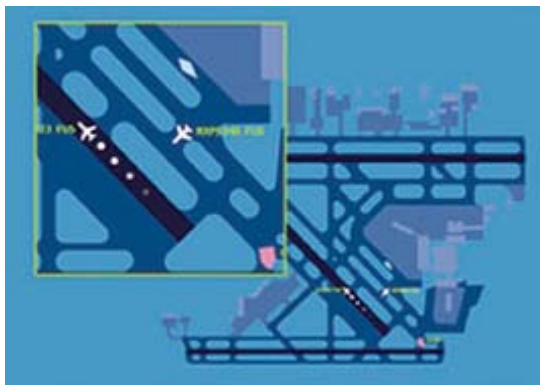
Future Plans

Controller productivity improvement concepts

Visual-like operations in all weather conditions



Runway safety improvements

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