

Intelligent Automation, Inc.– Rockville, MD

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Identification and Significance of Innovation

The key innovation in this effort is the development of an analysis testbed to integrate simulation tools, such as ACES, with aviation environmental effects models, such as the Aviation Environmental Design Toolkit (AEDT), to provide a “360-degree” evaluation of new operational concepts. The testbed will be demonstrated by producing a “360-degree” evaluation of advanced NextGen concepts such as four-dimensional trajectories (4DTs), dependent arrivals to parallel or converging runways, continuous descent arrivals (CDAs), time-based merging and spacing, flow corridors, and many other NextGen operational improvements.

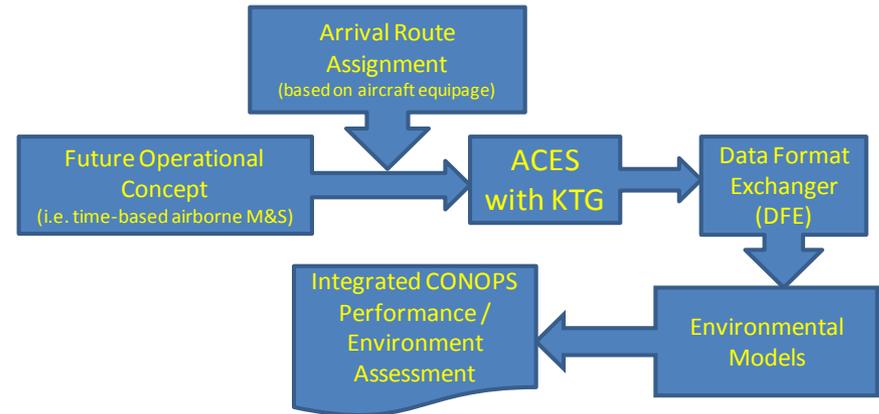
TRL 2 at project inception, TRL 3 at end.

Technical Objectives and Work Plan

- Objective 1.** Define a modeling framework for ACES/environmental model connectivity and identify data conversion/interface issues.
- Objective 2.** Develop a strategy for improving the process of generating meaningful environmental results for future concept of operations.
- Objective 3.** Demonstrate the utility of the modeling framework and improved environmental modeling results by using an example future concept (e.g. time-based airborne merging and spacing).
- Objective 4.** Document the results for both the example study and the use of the modeling framework itself.

Work Plan:

- Task 1.** Conduct a trade study to evaluate NAS existing environmental tools.
- Task 2.** Define the modeling framework and associated tools
- Task 3.** Develop modeling strategies for improving the state of the practice in several key areas: deterministic trajectory generation, runway-to-runway trajectory generation, and mixed equipage analysis (transition period).
- Task 4.** Configure ACES for modeling advanced concepts
- Task 5.** Conduct the integrated performance/environmental study
- Task 6.** Document the results.



NASA and Non-NASA Applications

Potential applications include NASA, the FAA, and industrial companies whose business it is to do either environmental assessment or performance analysis. They would use this capability to develop an integrated picture of the performance and environmental assessment of future proposed projects. Potentially, all airports with planned improvements, all large metroplexes (approximately fifteen) with planned system upgrades, and all air traffic control centers are customers.

Firm Contacts

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