

Providing Fully Integrated Solutions For:

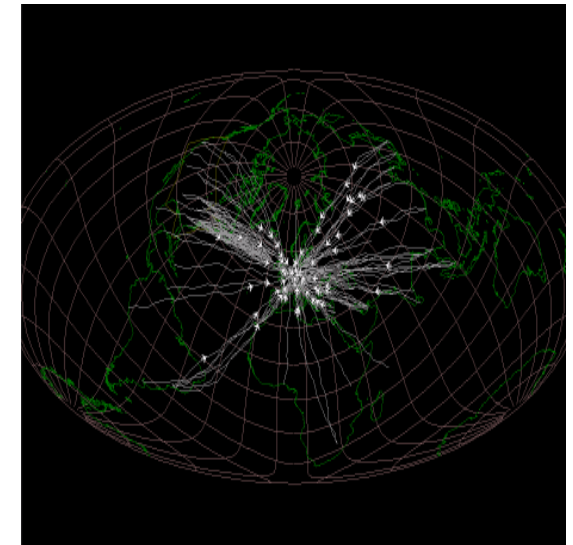
- Analysis and Metrics
- Airspace Design
- Policies and Procedures
- Data Quality Analysis
- Independent Validation and Verification

User Community

- FAA HQ ASD- 430
- FAA WJHTC ACB- 330
- FAA WJHTC Human Factors
- Nasa Langley Research Center
- ATH Group, Inc.

AwSim™ Airspace Simulator

- *Parametric Traffic Generator*
- *Live Data Inputs*
- *Conflict Analysis*
- *Conflict Resolution*
- *Airspace Metrics*



Aerospace

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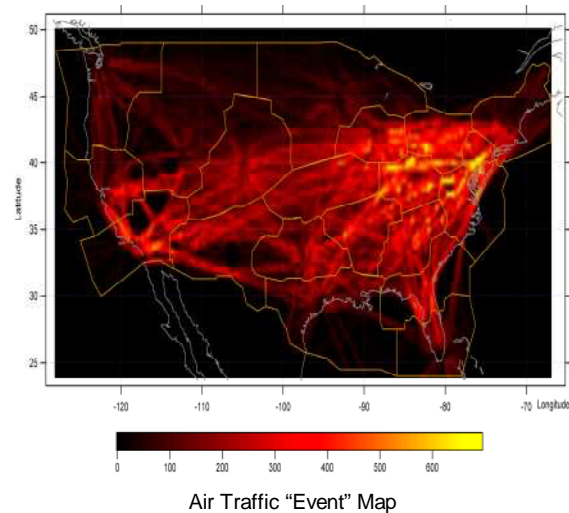
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What Is *AwSim*TM

*AwSim*TM is a general-purpose trajectory simulator aimed at measuring the effect of changes to airspace structures, policies and procedures or equipment. *AwSim*TM can be used in the areas of testing, modeling and training.

- **Airspace Structure** – Use existing Arinc 424 compatible adaptation data or on board for generating hypothetical approach airspace
- **Traffic Generator** – *AwSim*TM generates realistic 4d trajectories using either Monte Carlo simulation or real flight data (such as ASDI) or both
- **Conflict Analysis** – Aircraft against aircraft and aircraft against airspaces
- **Optimization** – *AwSim*TM provides an interface point where external processes may optimize trajectories. This may be an existing *AwSim*TM process, a computer process or a human action/interface
- **Metric Analysis** – *AwSim*TM provides comprehensive trajectory and airspace metric analysis for measuring the effect of changes in the airspace



Functional Overview

Trajectory Simulation

The main output produced by *AwSim*TM is a stream of trajectories encapsulating 4-dimensional profile of a moving object in an Earth centered coordinate system. The segments from which trajectories are built can be made to snap to an airspace structure such as aerodromes, fixes and airways or they can be generated in a free-flight unrestricted fashion. The user can set the parameters that control the statistical distribution functions from which the population of segments is drawn. The variables under control (all of which have their separate distribution function) are: segment speed, segment length, Gaussian transverse deviation, segment altitude, start and end location of the trajectory, number of segments in a trajectory, and start time.

Conflict Analysis

The *AwSim*TM Conflict Prediction (CPR) process examines the *AwSim*TM trajectories (or trajectories from other sources) and determines if any violations of the adaptable separation rules exists. CPR provides the relevant conflict data to *AwSim*TM metrics application for display and comparison purposes and applies the user supplied separation rules including NAS and ICAO.

Trajectory Propagator

The *AwSim*TM Trajectory Propagator simulates the actual flight of an aircraft by generating a stream of targets for each trajectory. The propagation characteristics are parameter controlled.

Trajectory Adjustment and Optimization

The Trajectory Adjustment and Optimization (TAO) process of *AwSim*TM receives trajectories generated by the simulator (or any other source of trajectories) and adjusts them with regard to a number of selected criteria.

Intelligent Conflict Resolution

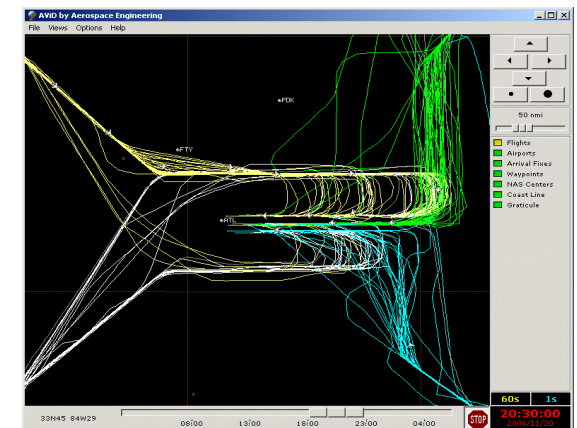
The Intelligent Conflict Resolution process of *AwSim*TM is an extension to the TAO process that provides solutions to predicted conflicts optimized based on user driven criteria.

Features and Benefits

Modeling. Investigate quantitative effects of changes to airspace structure, policies/procedures or equipment.

Testing. Provides realistic traffic programmed to test specific function parameters such as boundary condition or capacity limits. *AwSim*TM will also allow you to test two or more different implementations of a given function to compare effects.

Training. Provides realistic traffic for executing operational systems in a training environment.



Airport Dwell Time Analysis



Queuing Delay and Runway Pressure