



Federal Aviation
Administration

SAA Modernization and AIXM

Presented to: **AIXM/WXXM Conference 2010**

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AIM

Date: **May 5, 2010**



Content

- **Introduction to SAAs**
- **Overview of the SAA System**
- **Approach**
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Introduction to Special Activity Airspaces (SAAs)

- **Special Use Airspace (SUA)**
 - Airspace in which activities must be confined or limitations may be imposed on aircraft, generally below en route airspace
- **Air Traffic Controlled Assigned Airspace (ATCAA)**
 - En Route airspace analogous to SUAs
- **SAAs may depend on many other features**
 - NAVAIDs, airports, runways, cities, other airspaces, geographic features or arbitrary points



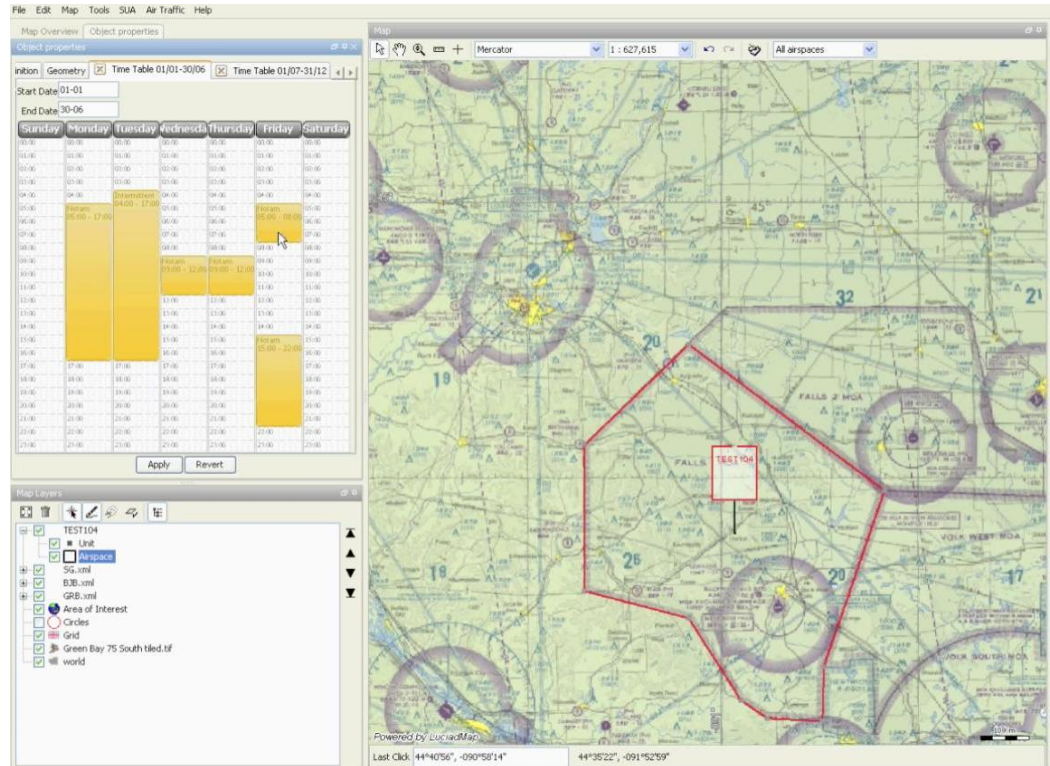
Goals for the SAA Project

- **Define SUAs and ATCAAs in a consistent manner using an editing tool**
- **Use a Service Oriented Architecture (SOA) to distribute that data to interested users**
- **Manage the schedule and status of those airspaces through a SOA**



The Creator/Editor Tool

- ***Allow a user to create and modify SAAs***
- ***SAAs defined using AIXM 5.0***



The Creator/Editor Tool

- ***Generate the SUA 7400.8 legal definition from the AIXM definition***

Carson MOA, NV

Boundaries. Beginning at lat. 40°06'00"N., long. 117°57'33"W.; to lat. 40°06'00"N., long. 118°15'04"W.; to lat. 39°57'00"N., long. 118°38'04"W.; to lat. 39°51'00"N., long. 118°38'04"W.; to lat. 40°01'00"N., long. 118°15'04"W.; thence to the point of beginning.

Altitudes. 500 feet AGL to but not including FL180.

Times of use. 0715-2330 daily; other times by NOTAM.

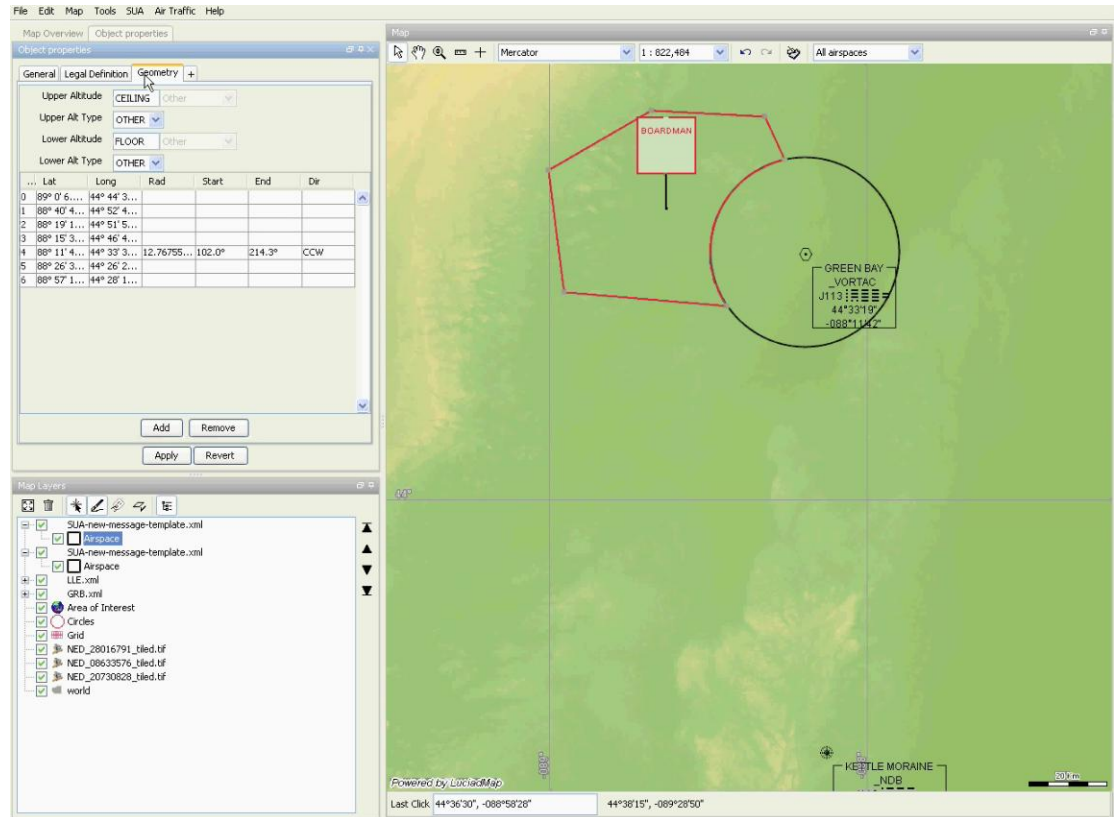
Controlling agency. FAA, Oakland ARTCC.

Using Agency. U.S. Navy, Commander, Naval Strike and Air Warfare Center, NAS, Fallon, NV.



The Creator/Editor Tool

- **Using Lucy and LuciadMap v9**
 - This version has an extension to support for AIXM 5.0



Static Repository

- **Stores the static definitions of SAAs in AIXM 5.0**
- **Notifies subscribers of new SAAs created and old SAAs updated**
 - JMS pub/sub services
- **Provides the SAA definitions to users**
 - SOAP request/response web services

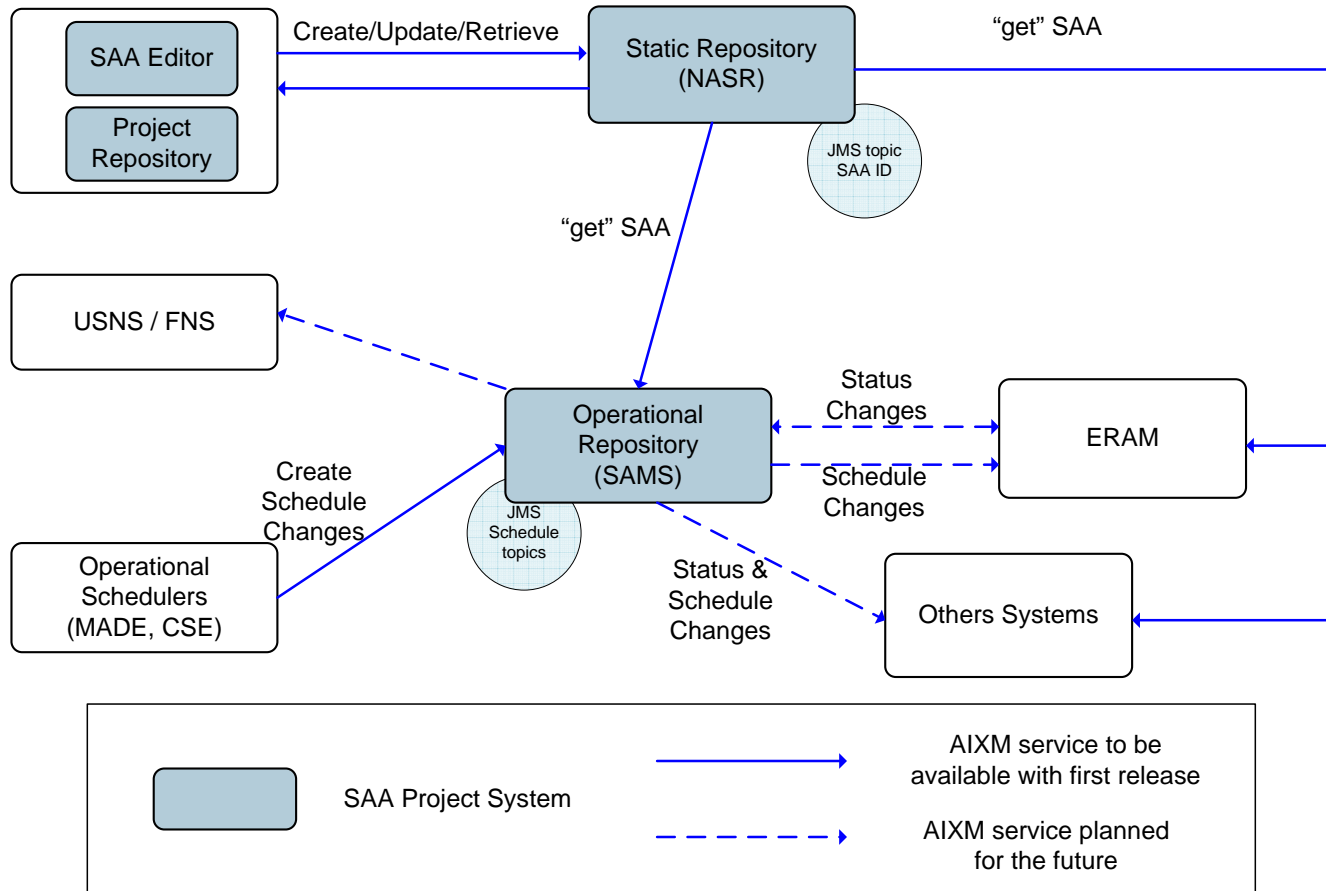


Operational Repository

- **Accepts schedule requests and airspace status changes**
 - SOAP request/response web services
- **Distributes schedule and airspace status updates**
 - JMS pub/sub services



SAA Project Web Services



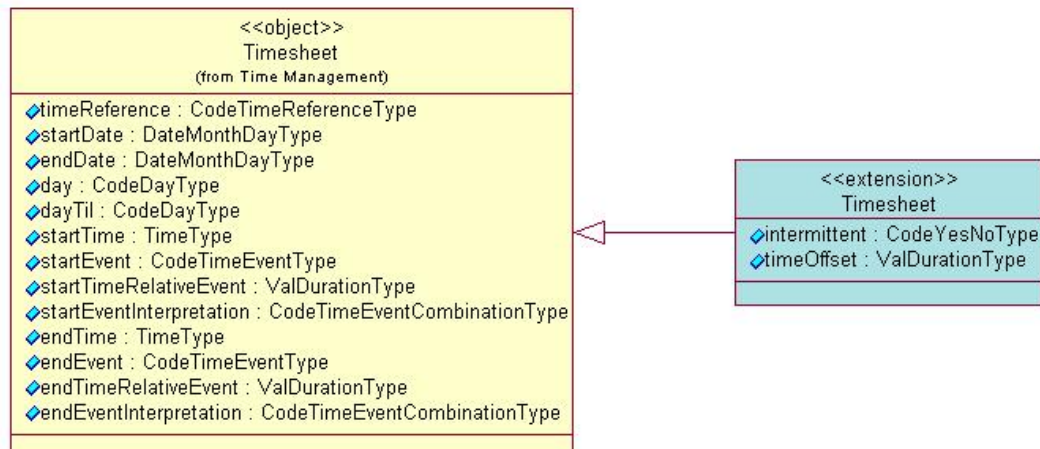
Benefits

- **One definitive source for SUA definitions**
 - Currently there are multiple digital definitions for SUAs and none accurately represent the complete SUA legal definition
- **The AIXM definition of the SUA generates the legal definition**
- **Provide an accurate picture of SAA utilization**



AIXM Extensions

- **Extended the core AIXM model to include:**
 - New elements on existing features/objects
 - New relationships
 - New features/objects



Java Binding

- **Able to bind AIXM 5.0 with extensions to Java types using Apache XMLBeans**



SWIM Integration

- **The SAA project is an FAA System Wide Information Management (SWIM) implementing program.**
- **SWIM implementing programs use Progress FUSE products for SOA infrastructure**
 - ESB (based on Apache ServiceMix)
 - Message Broker (based on Apache ActiveMQ)
 - Services Framework (based on Apache CXF)
 - Mediation Router (based on Apache Camel)
- **Able to implement AIXM 5.0 services with FUSE ESB 4.2**



Lessons Learned

- **Limited what AIXM features are fully implemented**
 - Don't be responsible for aeronautical features outside of the scope of the project
- **Required SAA messages to be complete**
 - Contain all the information needed to create the SAA without outside resources



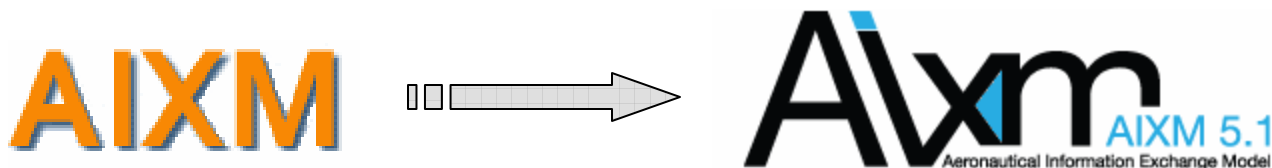
Lessons Learned

- **Strictly define what AIXM elements the services accept**
 - AIXM features, objects
 - How geometries can be defined
- **When working with static data simplify the use of the temporality model**
 - Allowed no gaps or overlaps in the BASELINE data
 - Avoided the use of TEMPDELTA timeslices if they're unneeded



Next Steps for the SAA Project

- Deploy the system this year
- Incorporate other types of airspace in future releases
- Begin working on support for AIXM 5.1 for the second release of the system



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