

# Aeronautical Information Management Modernization (AIMM)

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**Federal Aviation  
Administration**



# Objectives – What is AIMM?

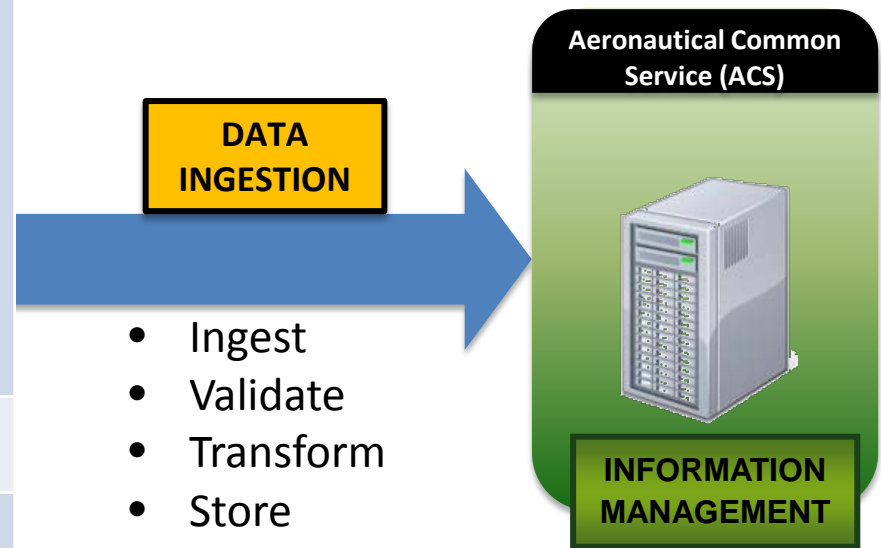
## Aeronautical Information Management Modernization (AIMM)

Modernizing the collection, management, delivery, and use of AI in the NAS & supporting systems through the implementation of the Aeronautical Common Service (ACS), enabling NextGen Air Transportation System.



# Data Ingestion – Aeronautical Common Services (ACS) Baseline

"System / Program"	Data
National Airspace System Resources (NASR)	Airways Military Training Routes (MTRs) Preferred Routes ARTCC Boundaries Parachute Jump Areas Airport Runway Runway Direction Navigation Aid Instrument Landing System (ILS) Communications Services Fixes (pertaining to Airways)
Electronic National Airspace System Resources (eNASR)	Special Activity Airspace definitions
Special Use Airspace Management System (SAMS)	Special Activity Airspace schedules
NAVLean - Obstacle Authoritative Source (OAS)	Obstacle definitions
Federal NOTAM System (FNS)	NOTAMs



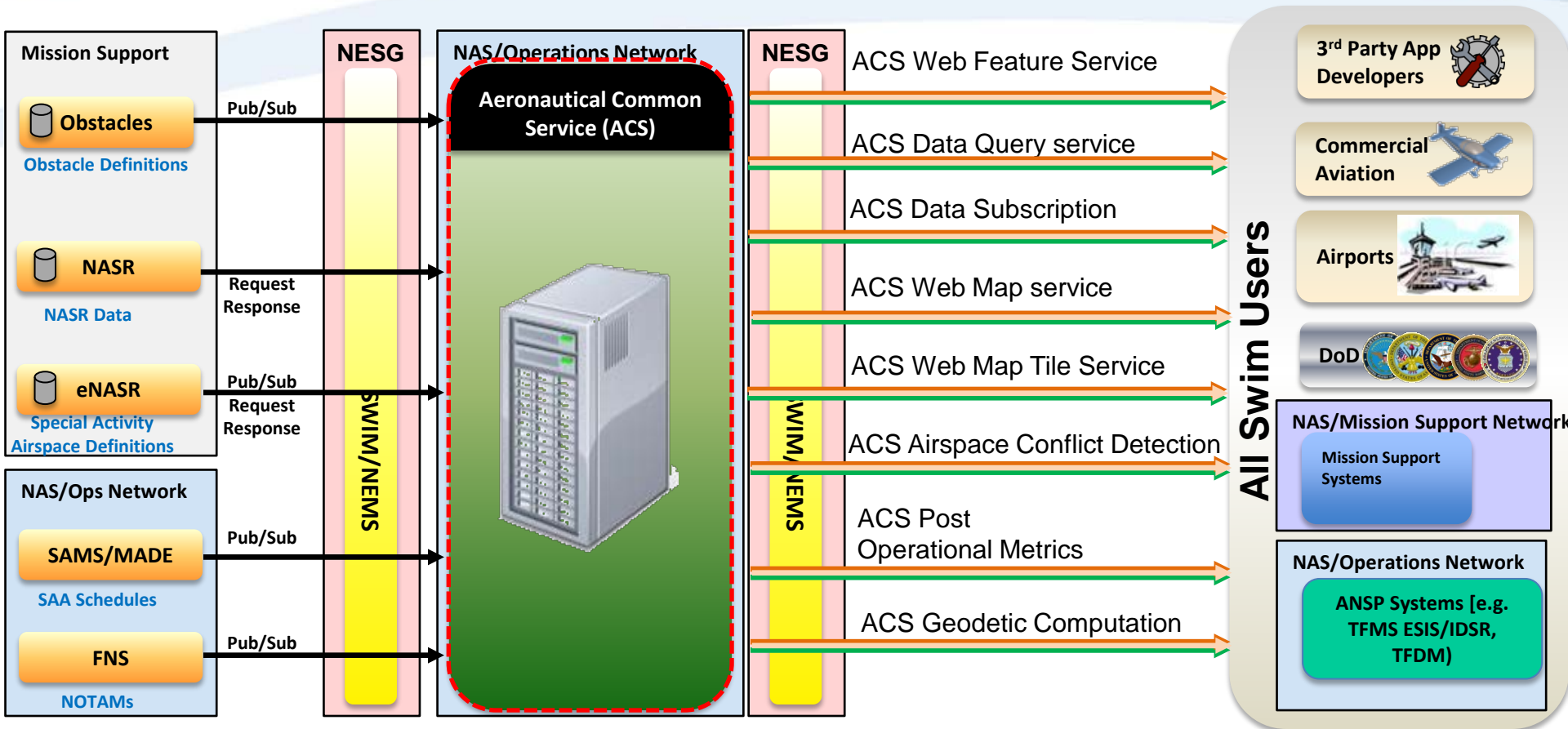
# ACS Data Sources

Data Source	Service	Types of AI	Format	Source AI Temporality (AIXM Timeslice Interpretation Equivalent)	Frequency AI Received by ACS
<b>NASR</b>	NASR Static AI (WS-P)	Static definitions for: Airport, Runway, Runway Direction, Navigation Aid, Airways, Military Training Routes (MTRs), Preferred Routes, ARTCC Boundaries, Parachute Jump Areas, Instrument Landing System (ILS), Communications, Service	Custom XML	AI effectivity aligned with the 28/56 day AIRAC cycle (BASELINE)  Daily National Flight Data Digest (NFDD) AI updates (PERMDELTA)	ACS retrieves updates (NFDD) once a day of new and changed AI
<b>eNASR</b>	Get Static SAA (WS-P)  Static SAA Updates Notification (WS-P)	Special Activity Airspace (SAA) definitions	AIXM 5.0	AI effectivity aligned with 28/56 day AIRAC cycle (BASELINE)  Changes when occurs (BASELINE)	ACS receives notification of new or changed SAA when occurs then retrieves AI change details

# ACS Data Sources

Data Source	Data Source Service	Types of AI	Format	Source AI Temporality (AIXM Timeslice Interpretation Equivalent)	Frequency AI Received by ACS
<b>SAMS</b>	SAA Schedule Notification (JMS-P)	SAA schedules	AIXM 5.0	Dynamic AI status change (TEMPDELTA)	ACS receives notification of AI status changes when occurs
<b>Obstacles</b>	AI Authoritative Source Notification Service (JMS-P)	Obstacle definitions	AIXM 5.1	Approved new and changed obstacles (BASELINE and PERMDELTA)	ACS receives notification of new obstacles and changes when occurs
<b>FNS</b>	FNS NOTAM Publication (JMS-P)	NOTAMs	AIXM 5.1	Dynamic AI status change with effective dates (TEMPDELTA)	ACS receives notification of AI status changes (via NOTAM) when occurs

# ACS Context Diagram



Authoritative Sources



# ACS Web Services (1 of 4)

ACS Service	Description	Operations	Types of AI
<b>ACS Web Feature Service (ACSWFS)</b>	<p>The ACS WFS Service allows a service consumer to submit queries to return aeronautical features that match the query. In addition the ACS WFS service also allows the user to create, update, list, and delete stored queries that pertain to their user ID.</p>	<ul style="list-style-type: none"> <li>• getFeature</li> <li>• getCapabilities</li> <li>• describeFeatureType</li> <li>• getPropertyValue</li> <li>• listStoredQueries</li> <li>• describeStoredQueries</li> <li>• createStoredQuery</li> <li>• dropStoredQuery</li> </ul>	<p>Integrated AI Events (NOTAMs) with snapshots not integrated</p>
<b>ACS Data Query Service (ACSDDataQuery)</b>	<p>The ACSDDataQuery Service allows a service consumer to submit predefined custom queries to return complex aeronautical data which cannot be retrieved by ACSWFS web services.</p>	<ul style="list-style-type: none"> <li>• getSaaDefinitionByUuid</li> <li>• getSaaScheduleByUuid</li> <li>• getIntegratedSaaByUuid</li> <li>• getAIAlongFlightPath</li> <li>• getAIWithinRadius</li> <li>• getAIForNotamEvent</li> <li>• getChartDataForCycle</li> </ul>	<p>Integrated AI Events (NOTAMs) with snapshots not integrated</p>



# ACS Web Services (2 of 4)

ACS Service	Description	Operations	Types of AI
<b>ACS Data Subscription (ACSDataSubscription)</b>	The ACSDataSubscription Service provides a service consumer a publish/subscribe function that notifies subscribers of changes to the Aeronautical Information data. This service also provides the capability to setup/remove a pull point for notifications.	<ul style="list-style-type: none"> <li>• subscribe</li> <li>• renew</li> <li>• unsubscribe</li> <li>• createPullPoint</li> <li>• getPullPointMessages</li> <li>• destroyPullPoint</li> <li>• getResourceProperty</li> </ul>	Integrated AI Events (NOTAMs) with snapshots not integrated
<b>ACS Web Map Service (ACSWMS)</b>	This service gives consumers the capability to produce maps of spatially referenced data dynamically from geographic information. The map is a portrayal of geographic information as a digital image file suitable for display on a computer screen. WMS-produced maps are rendered in a pictorial format such as PNG, GIF or JPEG.	<ul style="list-style-type: none"> <li>• getCapabilities</li> <li>• getMap</li> <li>• getFeatureInfo</li> <li>• getLegendGraphic</li> <li>• describeLayer</li> </ul>	AI WMS layers for: airports, nav aids, airspace, obstacle, and event (NOTAMs)

WS-P = Web Service Producer  
 JMS-P = Java Messaging Service Producer





# ACS Web Services (3 of 4)

ACS Service	Description	Operations	Types of AI
<b>ACS Web Map Tile Service (ACSWMTS)</b>	<p>This service gives consumers the capability to produce a map tile of spatially referenced data dynamically from geographic information, using tile images with predefined content, extent, and resolution. The map tile is a portrayal of geographic information as a digital image file suitable for display on a computer screen. WMTS-produced map tiles are rendered in a pictorial format such as PNG, GIF or JPEG.</p>	<ul style="list-style-type: none"> <li>• getCapabilities</li> <li>• getTile</li> <li>• getFeatureInfo</li> </ul>	<p>AI WMS layers for: airports, nav aids, airspace, obstacle, and event (NOTAMs)</p>
<b>ACS Airspace Conflict Detection</b>	<p>This service gives consumers the capability to detect airspace conflicts by evaluating if a specified airspace and schedule conflicts spatially and temporally with other airspace schedules.</p>	<ul style="list-style-type: none"> <li>• getAirspaceConflict</li> <li>• getAirspaceConflictByUUID</li> </ul>	<p>Airspace conflict</p>

# ACS Web Services (4 of 4)

ACS Service	Description	Operations	Types of AI
<b>ACS Post Operational Metrics (ACSPostOpMetrics)</b>	<p>This service gives consumers the capability to produce metrics reports about Aeronautical Information. Reports are defined by an JRXML document, which allows a query so that the consumer can specify the data contained in the metrics report.</p>	<ul style="list-style-type: none"> <li>• createMetricDefinition</li> <li>• listMetricDefinitions</li> <li>• modifyMetricDefinition</li> <li>• getMetricDefinition</li> <li>• getMetricResults</li> <li>• deleteMetricDefintion</li> <li>• listPreDefinedMetricDefinitions</li> </ul>	<p>Metrics</p>
<b>ACS Geodetic Computation</b>	<p>This service gives consumers the capability to calculate geodetic components and compute magnetic field components.</p>	<ul style="list-style-type: none"> <li>• computeInverse</li> <li>• computeInverse3D</li> <li>• computeForward</li> <li>• computeForward3D</li> <li>• computeBearingBearing</li> <li>• computeSegmentSegment</li> <li>• computeSegmentDistance</li> <li>• computePointSegment</li> <li>• computeMagneticDeclination</li> </ul>	

# Overall Benefits

- **Reduced Total Costs of Ownership – System Architecture**
  - **Reduced future infrastructure costs** to support individual aeronautical data process and dissemination
  - **Reduced future custom interfaces costs**
  - **Cloud computing ready**
- **Increased Safety – Consistency and Trust**
  - **Improved data standards** through AIXM and OGC ensures common language
  - **Improved data integrity** through business rule validation, enhancing operational safety by ensuring AI is accurate and timely
- **Increased Efficiencies – AIMM in the middle**
  - **Common operating picture** – all users have access to the same data, enhancing system capacity and efficiency by improving the use of NAS assets
  - **Enable the ability of NextGen DSTs** to access/extract SAA and other AI
  - **Platform Independent** – up to the user how data are displayed
  - **Enable iPad-like apps**, e.g., TFR alerts, GPS/Moving Maps

# Acronym List

- **ACS**                    **Aeronautical Common Service**
- **AI**                      **Aeronautical Information**
- **AIXM**                **Aeronautical Information Exchange Model**
- **ANSP**                **Air Navigation Service Provider**
- **ATM**                   **Air Traffic Management**
- **DST**                   **Decision Support Tool**
- **FNS**                   **Federal NOTAM System**
- **FOC**                   **Flight Operations Center**
- **MDM**                  **Master Data Management**
- **MOA**                   **Military Operating Area**
- **NASR**                **NAS Resource System**
- **NSAAP**              **National Special Activity Airspace Project**
- **SAA**                   **Special Activity Airspace**
- **SAMS**                **Special Use Airspace Management System**
- **SUA**                   **Special Use Airspace**
- **TFR**                   **Temporary Flight Restriction**
- **USNS**                **United States NOTAM System**

