

# AIXM Operational Perspectives

## Airports GIS (AGIS)

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Federal Aviation  
Administration



# Airports GIS (AGIS)

- Objectives

- Create a single integrated web application for the collection of survey data
- Establish guidance and standards for airport survey data collection
- Promote productivity and fiscal responsibility
- Improve existing programs – data-centric support for and production of digital products
- Deliver static airport information through enterprise services

The screenshot displays the 'Project Summary' page for VGC-103428. It includes a navigation menu with 'Home', 'Projects', 'Help', 'Administration', and 'Logout'. The page status shows 'There are no pending actions for you, Joseph.' The 'Project Information' section lists: Project Type: New Airport Survey; Created By: shyamsundar.parki on 04/09/2010; Airport: HAMILTON MUNI; Airport Category: NPAS Non-Part 139 Airport; Purpose: Airport Airspace Analysis - Vertically Guided; Verification: Geodetic Control, Imagery, Survey. The 'Surveyor/Consultant Information' section lists: Name: Brian Quinn, Organization: Joseph Norton, Email: [redacted]. The 'Project History & Documents' table shows a list of actions:

Date	User	Action	Notes/Comments
04/15/2010 01:07 PM	Brian Quinn	Opened Survey Viewer	VGC
04/13/2010 05:19 PM	Joseph Norton	Opened Survey Viewer	VGC
04/13/2010 02:52 PM	Brian Quinn	Opened Survey Viewer	VGC
04/09/2010 03:01 PM	shyamsundar.parki	Verified Survey	test
04/09/2010 02:55 PM	shyamsundar.parki	Opened Survey Viewer	VGC
04/09/2010 02:42 PM	shyamsundar.parki	Generated New Survey Download	Format: kml, coord sys: LL-83
04/09/2010 02:42 PM	shyamsundar.parki	Generated New Survey Download	Format: shape, coord sys: LL-83
04/09/2010 02:41 PM	shyamsundar.parki	Generated New Survey Download	Format: shpdoc, coord sys: LL-83
04/09/2010 02:40 PM	shyamsundar.parki	Generated New Survey Download	Format: subdoc, coord sys: LL-83

The screenshot shows the 'Survey Viewer for FAI-101546' interface. It features a map with a 'Layers' panel on the left containing categories like AIRFIELD, AIRCRAFT GATE STAND, AIRFIELD LIGHT, AIRPORT SIGN, APRON, etc. The map displays various airport features. On the right, the 'Feature Details' panel shows information for a selected feature: 'APRON' with attributes such as 'alternative: 0', 'aprontype: NORMAL', 'description: Apron outline', 'fuel: NULL', 'name: Apron', 'numberofsidings: 0', 'pavementclassificationnumber: 0', 'status: OTHER', 'surfacecondition: NULL', 'surfacematerial: ANS', 'surfacestee: 2', and 'useflag: NULL'. The map includes a scale bar for 5,000 feet and a current zoom level of 13.

# A Collaborative Partnership



- **Air Traffic Organization (ATO)**
  - System engineering
  - Data management, processing, and distribution
- **Office of Airports (ARP)**
  - Airport data collection and standards
  - Airport design, equipment, and operational standards
  - Certification and inspection of air carrier airports
- **National Geodetic Survey**
  - Inter-agency agreement to perform Independent Validation & Verification (IV&V)



# Supporting NextGen Objectives

- **Provide SWIM-compliant digital enterprise aeronautical information services to support shared situational awareness**
- **NextGen operational improvements**
  - Provide secure on-demand airport and constraint information
  - Provide consistent and managed airport data to airport users during airport operations

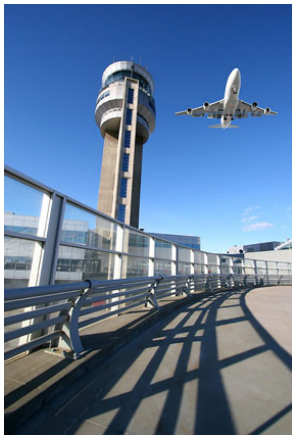
- Surface situation information
- Low visibility surface operations
- Improve runway safety awareness for pilots and controllers
- Surface traffic management
- Improved management of arrival/surface/departure flow operation



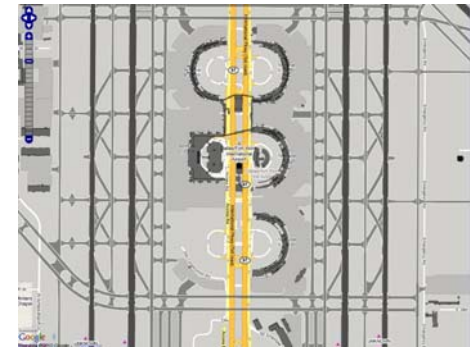
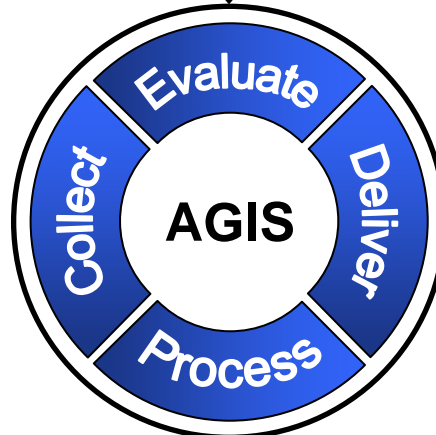
# High-Level Operational Concept



**Airport Survey Data**  
AC 150/5300



**Airport Data Changes**



**Digital Products**

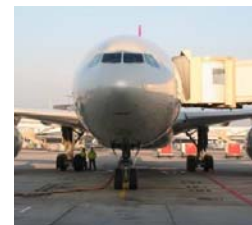


**Static Airport Data**

- OE/AAA
- SDAT
- SAA
- FNS
- NFPO
- SWIM
- TFDM
- ERAM
- TMA/TBFM
- TDDS
- RTCA

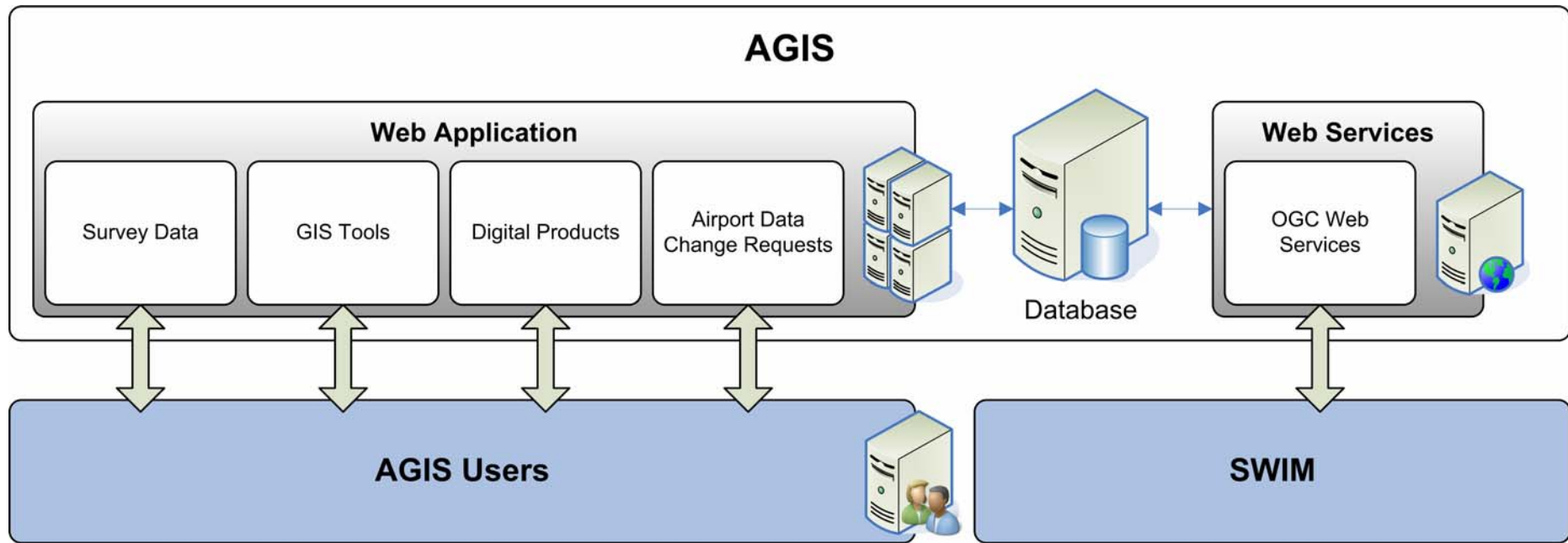


**AIM**



**Office of Airports**

# Airports GIS (AGIS) System



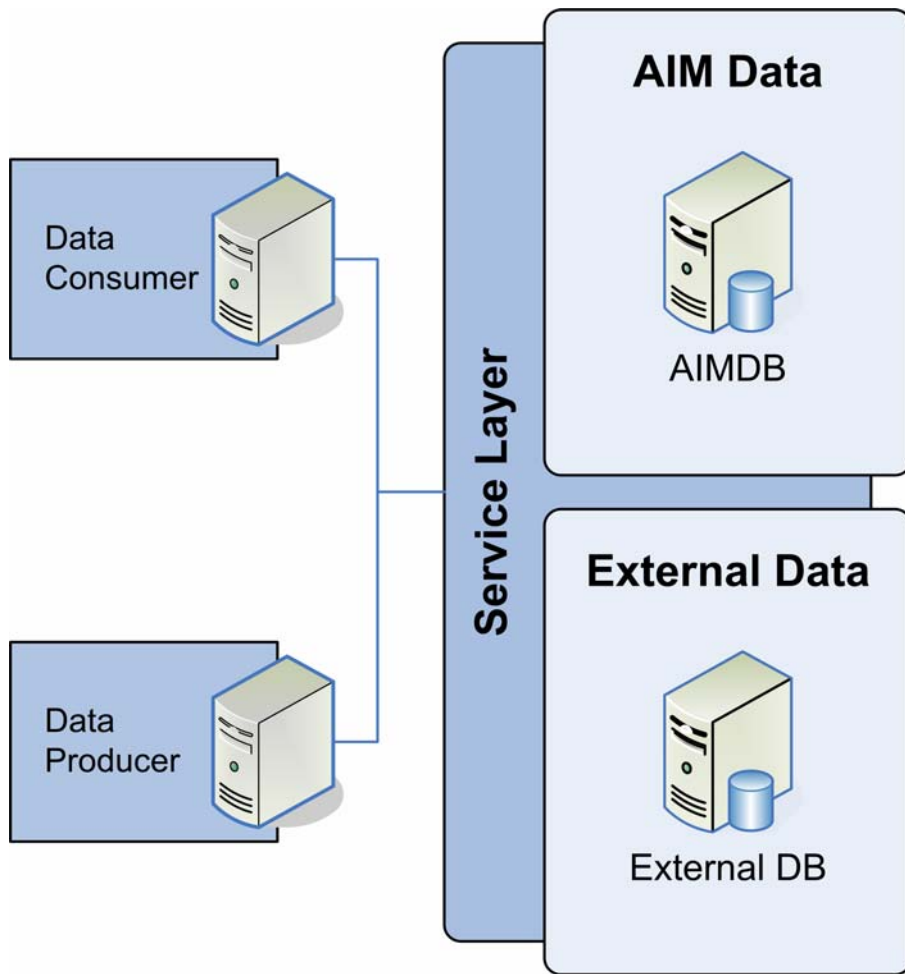
- **Web application interface** for survey data collection, GIS viewing, digital products, and airport data maintenance
- SWIM compliant **service interface** based on OGC standards
- **Centralized database**

# Survey Data Collection

- **FAA Advisory Circulars 150/5300 Series**
  - 16, Geodetic Control
  - 17, Imagery
  - 18, Survey Data Collection
- **Provide standardized data collection guidance and a common view of airport survey data**
- **Current efforts to make data model more AIXM compliant**
- **Current AGIS survey projects**
  - 800+ airport surveys
  - **37 completed surveys (13 new surveys, 24 existing surveys)** (as of May 3, 2010)



# Data Distribution using OGC Web Services



- **Data Layer**
  - AIM database and external databases
- **Service Layer**
  - Java-based GeoServer platform
  - Strictly adheres to OGC standards (e.g., WMS, WFS, WCS, KML)
- **Data Users**
  - Data consumers/producers
  - Data stewardship
  - Custom adapters to support legacy systems



# AIXM Web Services

- **Web Services**
  - WSDL (Web Service Description Language)
  - REST (Representative State Transfer)
- **Currently, airport data is provided as AIXM 5.1**
  - Approximately 800 airports – National Geospatial-Intelligence Agency (NGA)
  - NASR data
  - Convert 3D to 2.5D
  - Simplified XLink – internally refer to gml:id
- **In the future, airport data will be provided through WFS (WFS 2.0)**
  - Survey data will be integrated with NGA baseline data

# Airports GIS Video Demonstration

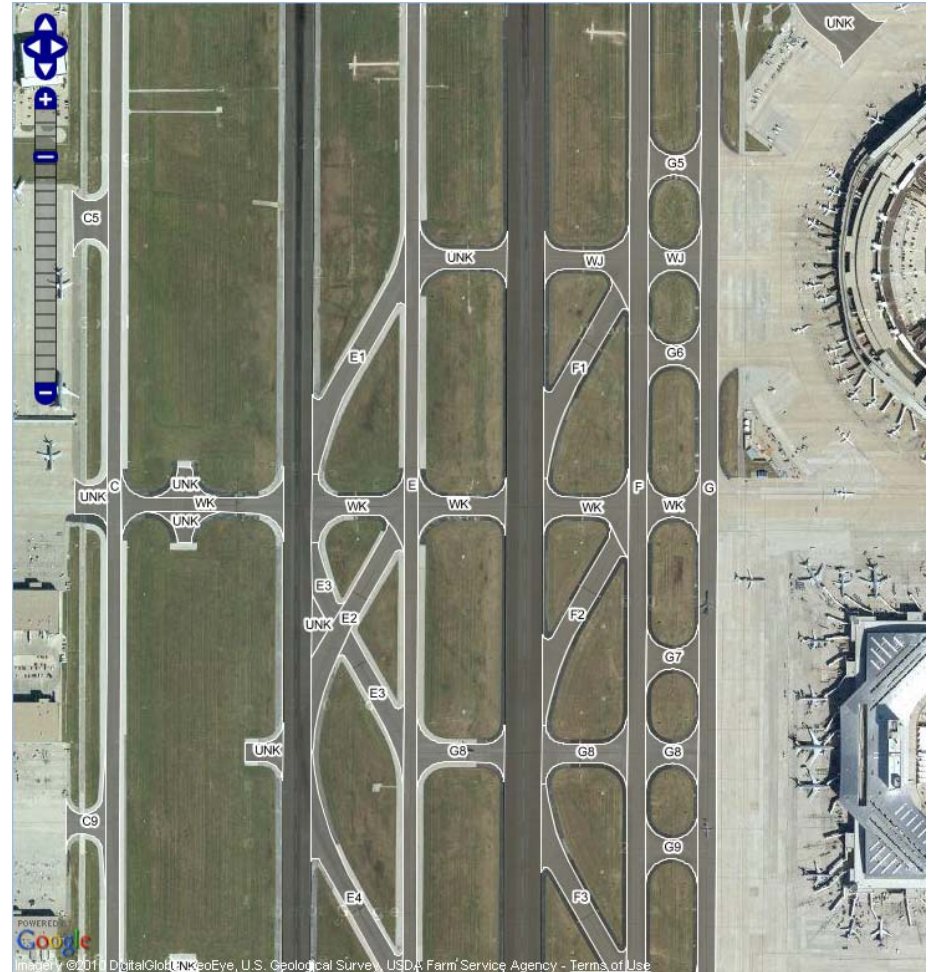
## Survey Data Collection and Web Services

<https://airports-gis.faa.gov>  
<https://agisdemo.faa.gov/airportgis/services>



# Support Tactical Airport Operations

- Provide static airport configuration information to support operations in the Terminal and En Route environments
  - Airport/runway configurations
  - Taxiway routing
  - Airport base data for moving map displays
    - Airport Mapping Database (AMDB)



# Integration with Industry

- **AMDB requirements**
- **RTCA data link applications (DO-272) – performance and operations**
  - D-(Aerodrome) NOTAMs
  - D-Taxi
  - D-Traffic
  - D-Lighting
- **Aeronautical Radio, Incorporated (ARINC)**
  - Airlines Electronic Engineering Committee (AEEC)



# Integration with Federal NOTAM System (FNS)

US Digital NOTAM System - Mozilla Firefox

Closure of TWY A between RWY 13/31 and Approach RWY End 22 at ACY

The screenshot displays the 'US Digital NOTAM System' interface within a Mozilla Firefox browser. The page header includes the Federal Aviation Administration logo, 'Test System' text, and navigation links for 'My Profile', 'Preferences', 'Feedback', 'Help', and 'Logout'. The main content area is titled 'NOTAM Manager' and shows a user named 'Jocelyn Cox' on 'FEB 25 2010 THU 1925 UTC'. A toolbar contains options like 'New', 'Cancel NOTAM', 'Replace', 'Clone', 'Discard', 'Save as Draft', 'Error Check', and 'Submit NOTAM'. The left sidebar lists categories: 'ALL (24/ 22)', 'Aerodrome (17/ 12)', 'Apron/Ramp (0/ 1)', 'Obstruction (0/ 0)', 'Runway (3/ 6)', and 'Taxiway (3/ 3)'. A 'Taxiway - Select a Feature' dialog box is open, showing a search for 'A' and a list of options, with 'TWY A between RWY 13/31 AND Approach RWY End 22' selected. A 'Select Scenario' dialog box is also open, with 'Closure' selected. Below these dialogs is a map of the airport layout with a red rectangle highlighting the selected taxiway. On the right, a table lists various NOTAMs with their times and statuses.

Time	Status
13:14	Active
13:00	Cancelled
13:00	Cancelled
13:00	Active
12:10	Draft
2:10	Expired
2:10	Expired
0:00	Expired
2:10	Expired
2:11	Expired
3:00	Draft
2:10	Expired
2:10	Draft
4:40	Expired
4:50	Expired
5:00	Expired
5:10	Expired
5:20	Expired
5:20	Expired
5:40	Expired
5:50	Expired
6:00	Expired
6:10	Expired
2:10	Active
2:00	Expired

# Integration with Special Activity Airspace (SAA)

SAA Editor Demo 1280x968

Design of an SAA around a VORTAC near GRB

Object properties

General | Legal Definition | Geometry +

Upper Altitude: CEILING Other  
Upper Alt Type: OTHER  
Lower Altitude: FLOOR Other  
Lower Alt Type: OTHER

...	Lat	Long	Rad	Start	End	Dir
0	88° 0' 6...	44° 44' 3...				
1	88° 40' 4...	44° 52' 4...				
2	88° 19' 1...	44° 51' 5...				
3	88° 15' 3...	44° 46' 4...				
4	88° 11' 4...	44° 33' 3...	12.76755...	102.0°	214.3°	CCW
5	88° 26' 3...	44° 26' 2...				
6	88° 57' 1...	44° 28' 1...				

Add Remove  
Apply Revert

Map Layers

- SUA-new-message-template.xml
- Airspace
- SUA-new-message-template.xml
- Airspace
- LLE.xml
- GRB.xml
- Area of Interest
- Circles
- Grid
- NED\_28016791\_hiled.tif
- NED\_09633576\_hiled.tif
- NED\_20730828\_hiled.tif
- world

GREEN BAY  
\_VORTAC  
J113  
44°33'19"  
-088°11'42"

BOARDMAN

KETTLE MORaine  
\_NDB

Powered by LuciadMap

Last Click: 44°36'30", -088°58'28"      44°38'15", -089°28'50"

Workspace successfully loaded from 'lucy\workspace\defaultWorkspace.lws'

237 MB of 259 MB LUCIAD

# Status & Next Steps

- Prototype OGC and AIXM web services
- Demonstrate enterprise airport data services (**End June 2010**)
- Deliver digital airport information to support situational awareness – airport configuration (**End September 2011**)
- **Airport survey data collection**
  - Support improvement of data standards, workflow, and automatic validation
  - Phase I (FY2009) – Southwest Region – 6 airports and ATL
  - Phase II (FY2010) – Remaining Regions – 30 airports
  - Phase III (FY2010–25) – Incremental projects
- **Electronic Airport Layout Plans (eALP)**
  - Beta (CY10–11) and Release (CY12)

# Contact Information

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## Airports GIS

Web Application – <http://airports-gis.faa.gov>

Web Services – <https://agisdemo.faa.gov/airportsgis/services>





# Summary

- **AGIS is a single access point for the collection of airport survey data; continually working to improve workflow and data standards**
- **AGIS uses a data-centric approach to support the aeronautical community**
  - Support distribution of airport data using a standardized format; ICAO and international standards – **AIXM** and **OGC** web services
  - Provide static airport data to support dynamic operational environment of NextGen – airport configuration, airport status, taxiway routing
- **Integrate with other FAA and AIM systems, and industry**

