

FAA Airport Surveying – Geographic Information System (GIS) Program Airport Data and Information

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Date: February 24, 2020



Federal Aviation
Administration



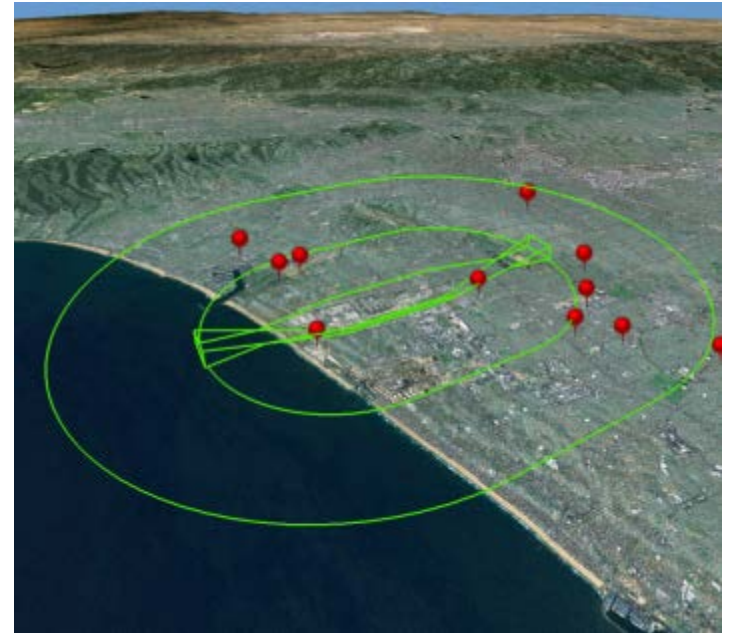
Topics

- **Overview of Airport Surveying – GIS Program**
- **Why collect rich, location based airport data?**
- **System Demonstration**
- **Questions & Answers**



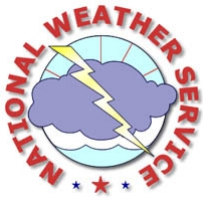
Airports GIS Vision

- Provide an interoperable web-based toolset to electronically collect, collaborate, manage, process, approve, maintain and share airport data addressing the needs of the FAA and its customers collectively rather than individually.



Airport Data and Information

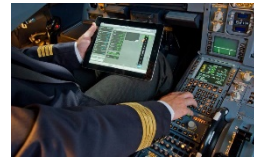
Each pilot in command shall, before beginning a flight, become familiar with all available information concerning that flight.



•Hazardous Weather



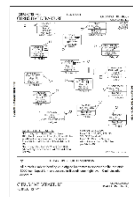
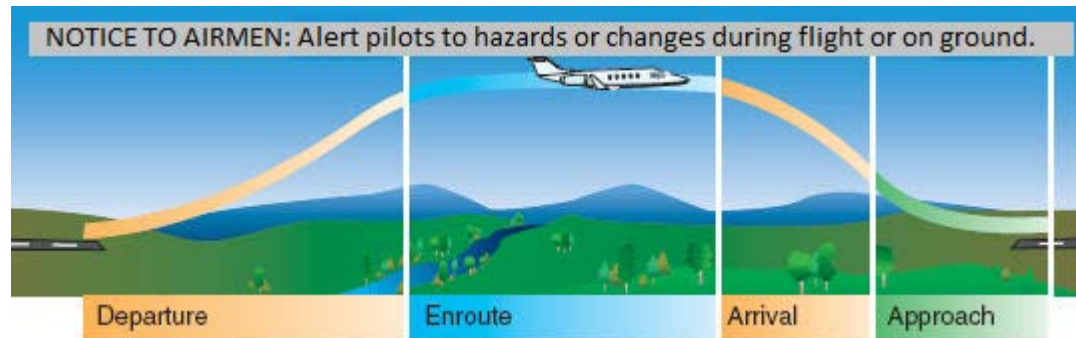
•Data Changes



•New Obstructions



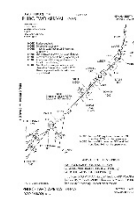
•Taxi and Runway closures



•Airspace Restrictions



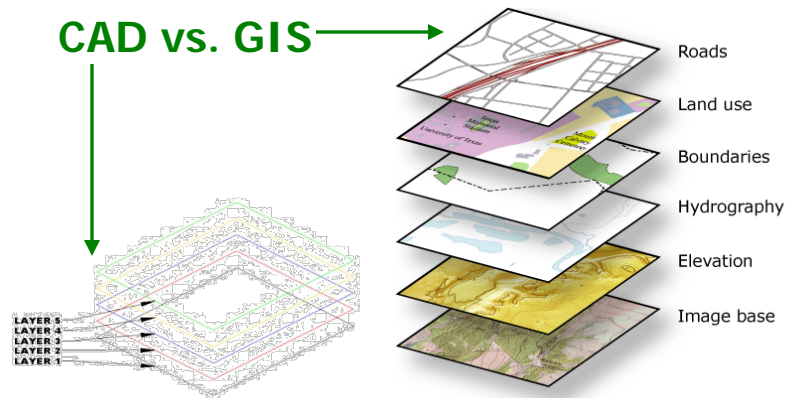
•Procedure Changes



AIRPORTS GIS

WHAT IS GIS?

- In GIS, data is layered like a stack of transparencies



- Data that may come from many different sources is geographically projected, through the use of common datum's and coordinate systems, to align with each other
- Metadata: data about data

AIRPORTS GIS?

- A single, web-based database system for validated data in support of airport design & construction programs
- A GIS planning tool to help airport planners visualize the characteristics of airport facilities & features (runway length, width, surface type)
- A tool to help field personnel address & coordinate airport changes in a timely manner in an integrated environment

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 Airport GIS survey projects**
 - 3000+ airport surveys



PURPOSE OF AIRPORTS GIS

- Conceived to address the airport data consistency and maintenance problems the FAA was experiencing agency-wide
- To create a better way of collecting, storing, managing, and sharing airports data
- To design a tool to assist the FAA's Office of Airports' personnel located across the United States in accomplishing their duties (both planning & engineering) in an integrated environment

•What if... the FAA could capture and validate against a defined standard, import data from the ALP, and make it available electronically for whoever needs it?



Airports GIS Objectives

- **Single portal for airport data into the FAA**
 - Currently there are too many interfaces and ways for data to enter the system, causing confusion and extra workload
- **Eliminate disparate airport data sets**
 - Provide a means to acquire essential data as it is created in a digital form with associated metadata
- **Provide standards based, verified and maintained airport data for use in ...**
 - Airport Planning
 - Airport Design
 - Airport Operations



Airports GIS Objectives (continued)

- **Data standard harmonized with national (Federal Geographic Data Committee) and International standards (AIXM)**
- **Support NextGen initiatives of the FAA**
 - High density Airports
 - More accurate standards based data for use in airport planning and trajectory based instrument procedure design
 - Flexible Airports and Terminals
 - Requires digital representations of the airports developed to a single standard
 - Create a Standardized Process for conducting airport and aeronautical surveys – Advisory Circulars
 - Current FAA guidance (FAA Specification 405) was not robust enough for the required data

Airports GIS - Example

VGC-103428 : Project Summary

[Project Summary](#) ✓ |
 [SOW / Concurrence](#) ✓ |
 [Plans](#) ✓ |
 [Geodetic Control Data](#) ✓ |
 [Imagery Data](#) ✓ |
 [Survey](#) ✓ |
 [Verification](#) ✓

There are no pending actions for you, Joseph.

Project Information

Project Type: New Airport Survey
Created By: shyamsundar parhi on 04/09/2010
Airport: HAMILTON MUNI
[View NASR Data for VGC](#)
Airport Category: NPIAS Non-Part 139 Airport
Purpose: Airport Airspace Analysis - Vertically Guided
Verification:

- Geodetic Control
- Imagery
- Survey

Airport Sponsor Information

Contact Name: shyamsundar parhi
Position: computer scientist
Address: faa airports
 800 independence ave sw
 washington dc, DC 11111
Phone: 202-267-8286

Surveyor/Consultant Information

Name	Organization	Phone	Email
There are no Surveyor/Consultant(s) associated with the Survey Project.			

Project History & Documents

[View All History](#) | [View All Documents](#)

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
04/12/2010 02:52 PM	Brian Quinn	Opened Survey Viewer	VGC
04/09/2010 03:01 PM	shyamsundar parhi	Verified Survey	test
04/09/2010 02:55 PM	shyamsundar parhi	Opened Survey Viewer	VGC
04/09/2010 02:42 PM	shyamsundar parhi	Generated New Survey Download	format: kml, coord sys: LL-83
04/09/2010 02:42 PM	shyamsundar parhi	Generated New Survey Download	format: dgnv8, coord sys: LL-83
04/09/2010 02:41 PM	shyamsundar parhi	Generated New Survey Download	format: shape, coord sys: LL-83
04/09/2010 02:40 PM	shyamsundar parhi	Generated New Survey Download	format: autocad, coord sys: LL-83

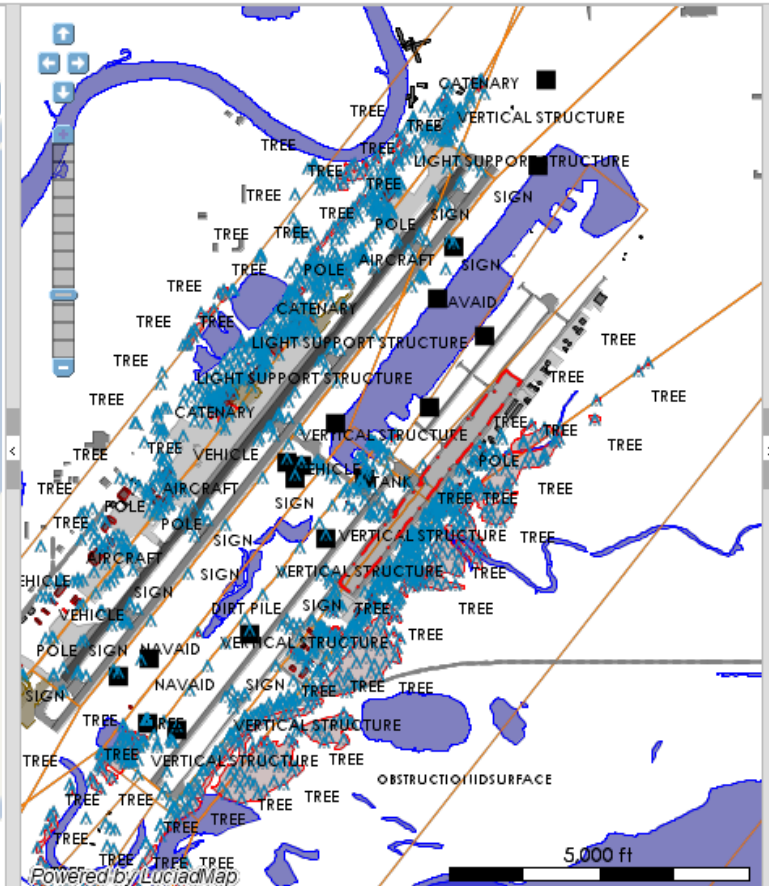


Layers

Select All | Deselect All | Expand All | Collapse All

Update Map

- AIRFIELD
 - AIRCRAFTGATESTAND
 - AIRCRAFTNONMOVEMENTAREA
 - AIRFIELDLIGHT
 - AIRPORTSIGN
 - APRON
 - DEICINGAREA
 - MARKINGAREA
 - MARKINGLINE
 - PASSENGERLOADINGBRIDGE
 - RUNWAY
 - RUNWAYBLASTPAD
 - RUNWAYCENTERLINE
 - RUNWAYEND
 - RUNWAYLABEL
 - SHOULDER
 - TAXIWAYELEMENT
 - TAXIWAYHOLDINGPOSITION
- AIRSPACE
 - LANDMARKSEGMENT
 - OBSTACLE
 - OBSTRUCTIONAREA
 - OBSTRUCTIONDSURFACE
- ENVIRONMENTAL
 - SHORELINE
- GEOSPATIAL
- AIRPORTCONTROLPOINT



Feature Details

64° 49 0.91 N | 147° 50 29.6 W

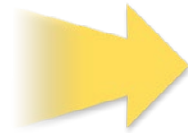
Selected Feature(s): APRON

Attribute	Value
alternative	0
aprontype	NORMAL
description	Apron outline
fuel	NULL
name	Apron
numeroftiedowns	0
pavementclassificationnumber	0
status	OTHER
surfacecondition	NULL
surfacematerial	ANG
surfacetyp	P
userflag	NULL



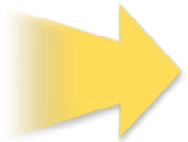
Program Benefits

Greater Productivity



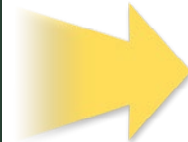
Submission and processing of airport geospatial data

Dependable



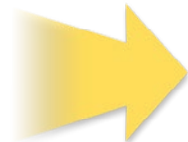
Data is collected once and then managed through the system ensuring the most current data is readily available

Connected



Electronic management and processing of all airport data ... one stop shop for managing and updating an airports data

Best Economics

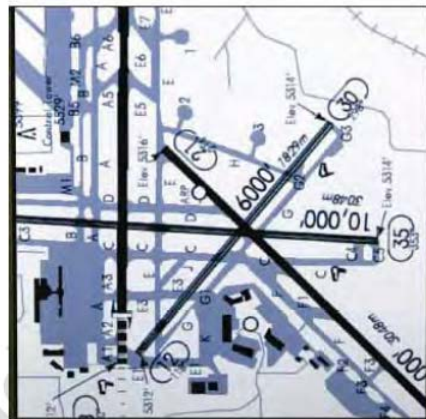


GIS is a scalable and interoperable technology allowing others to use and share data without recollecting, because the metadata provides the source, accuracy, collection methodology, etc. of the dataset. Each entity builds on the base data set to meet its own requirements

Why Implement Such A Process?

New Navigation Technologies

- Current initiatives within aviation industry (moving maps, electronic flight information, advanced avionics) require a data centric airport environment, as opposed to the traditional product based environment.



New Process

- To meet the challenges of the changing role of aeronautical data in the system, the FAA needed to rethink the way it collects, stores, maintains and shares data.
- We needed to change and focus on **managing** our airport and aeronautical data.

Airport Benefits

- ✓ Provides a single point of entry for the submission and maintenance of **AIRPORT DATA** and to communicate the changes electronically to the FAA
- ✓ Provides non-GIS Equipped Airports with a GIS Foundation for:
 - ✓ Airport Layout Plans,
 - ✓ Obstruction Charts,
 - ✓ Construction plans, and other airport mapping products
 - ✓ Planning
 - ✓ Zoning
- ✓ Improves Response to Airport Changes
- ✓ Provides On-line Access to Electronic Obstruction Charts and Airport Layout Plan Data to FAA, Airports, and Consultants
- ✓ Provides the sponsor access to FAA data
- ✓ Speeds Production and Currency of FAA Charts and publications

Why Implement Such A Process?

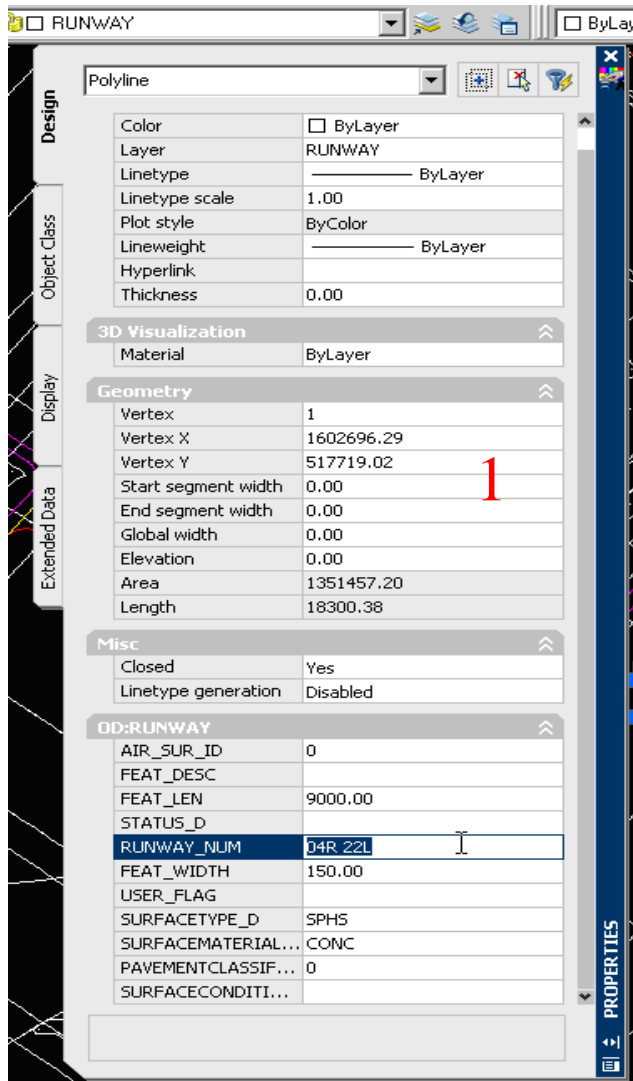
- To provide a common platform for the collection, maintenance and dissemination of airport and aeronautical information and sharing of the data for improved efficiency of airport operations for both the sponsor and the FAA.
- Current initiatives within aviation industry require a data centric airport environment, as opposed to the traditional product based environment.
- To meet the challenges of the changing role of aeronautical data in the system, the FAA needed to rethink the way it collects, stores, and maintains the data about airports.
- We need to focus on **managing** our airport and aeronautical data

Why Change?

ASR	(MFR)	422306.6000	-1225146.7000	1310.0			0721993
DME	(14_MFR)	422140.0470	-1225201.8010	1334.0			0721993
GS	(14_MFR)	422242.4910	-1225224.7530	1297.1			0721993
GS	(14_MFR) PP	422241.0590	-1225229.7230			400R	1081 0721993
LMM	(14_MFR)	422321.0000	-1225250.6000				3250 0721993
LMM	(14_MFR) CLPT	422322.5454	-1225249.3030			4L	3250 0721993
LOC	(14_MFR)	422140.1380	-1225157.8070	1318.9			998 0721993
LOM	(14_MFR)	422703.2000	-1225448.2000				27420 0721993
LOM	(14_MFR) CLPT	422702.5454	-1225444.3030			221L	27385 0721993
VORTAC	(OED)	422846.5000	-1225446.7000	2080.0			0721993
#							
ALS	(14)						0721993
APBN		422100.1234	-1225100.0023				0721993
REIL	(14)						0721993
#							
MTI # 1		350337.2031	-895915.6612				0721993
MTI # 2		350343.7826	-895834.7896				0721993
CPME		350300.2394	-895851.9403				0721993
RBPM		345414.0699	-895513.5368				0721993

- UDDF (Universal Data Delivery Format) delivered data ... it was an outline, it did not tell the whole story!
- Did not provide Metadata

The answer ... a richer data set

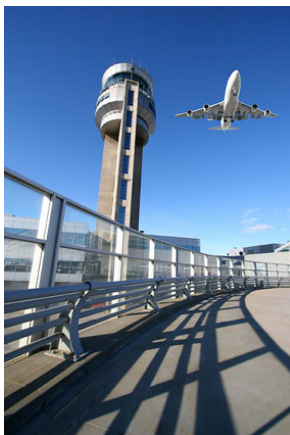


- Geospatial data identifies the geographic location and characteristics of natural or man-made features
- Moving to a geospatial environment allows us to not only know the geographic location but also, and sometimes more importantly the characteristics of a feature.
- In the example (left) of a runway ...
 - We not only have the coordinates (1)
 - We also have the characteristics (2)
- A much richer data set ...all together in a single place!

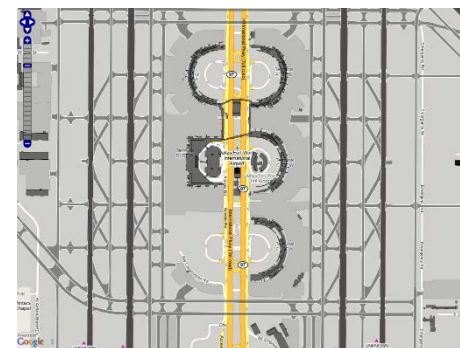
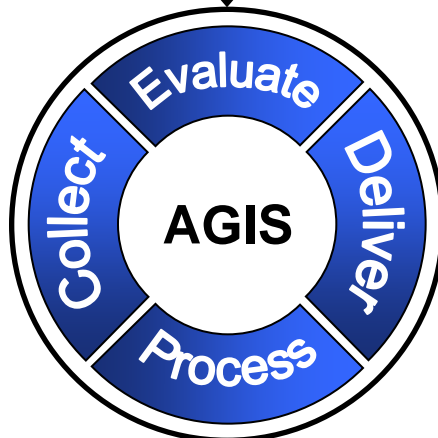
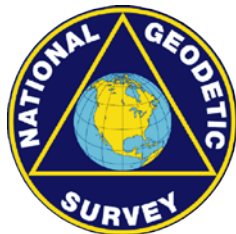
High-Level Operational Concept



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

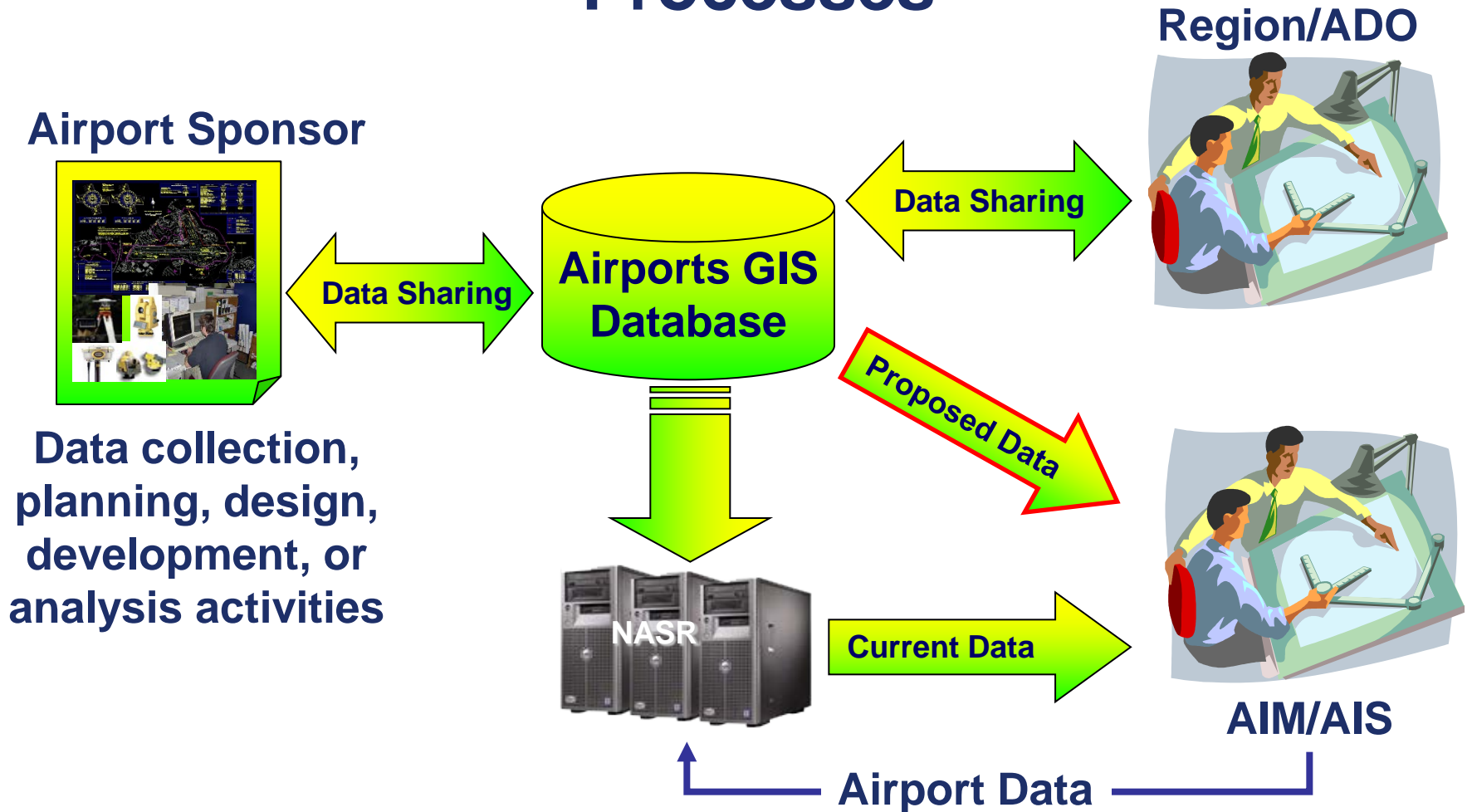


AIM/AIS

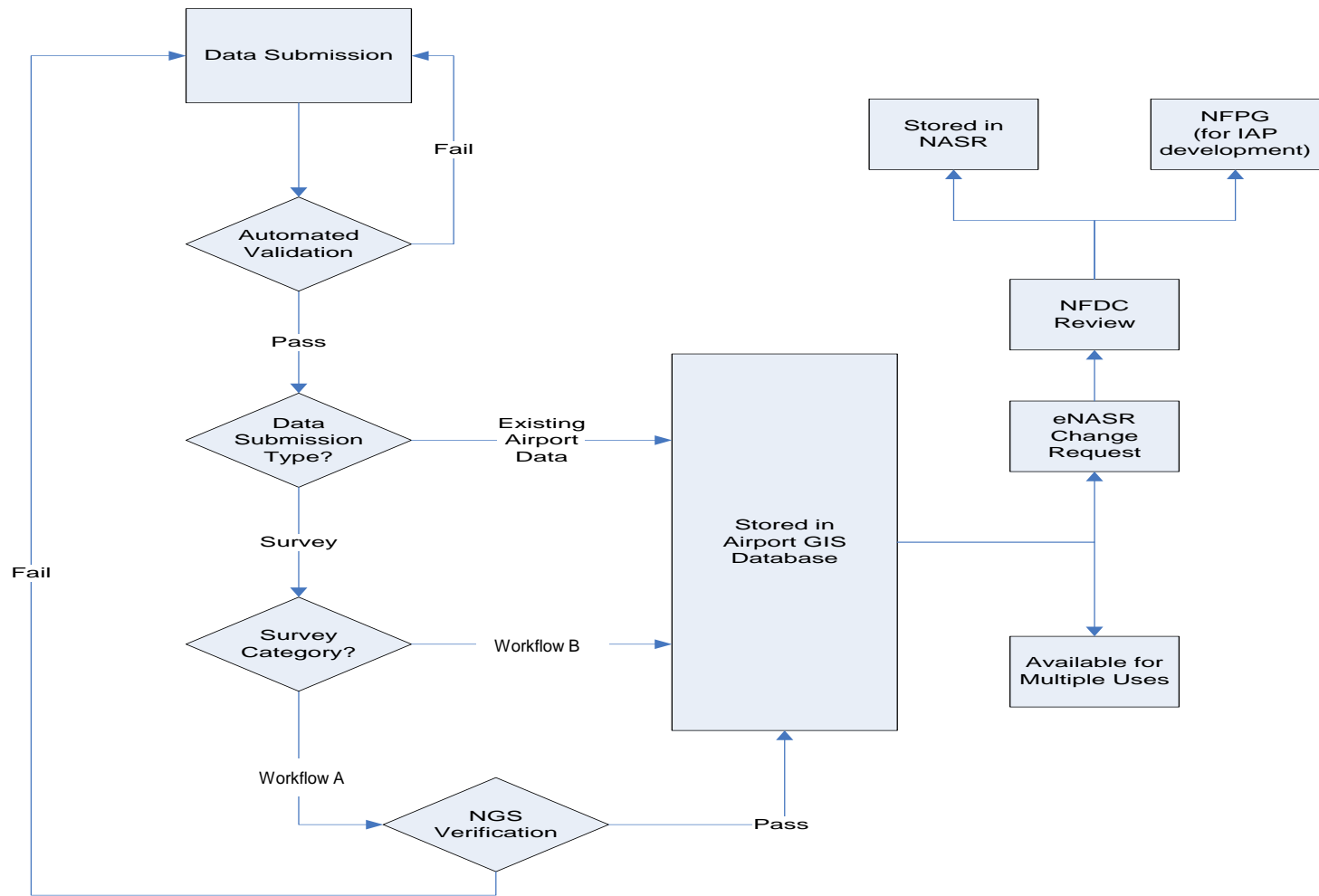


Office of Airports

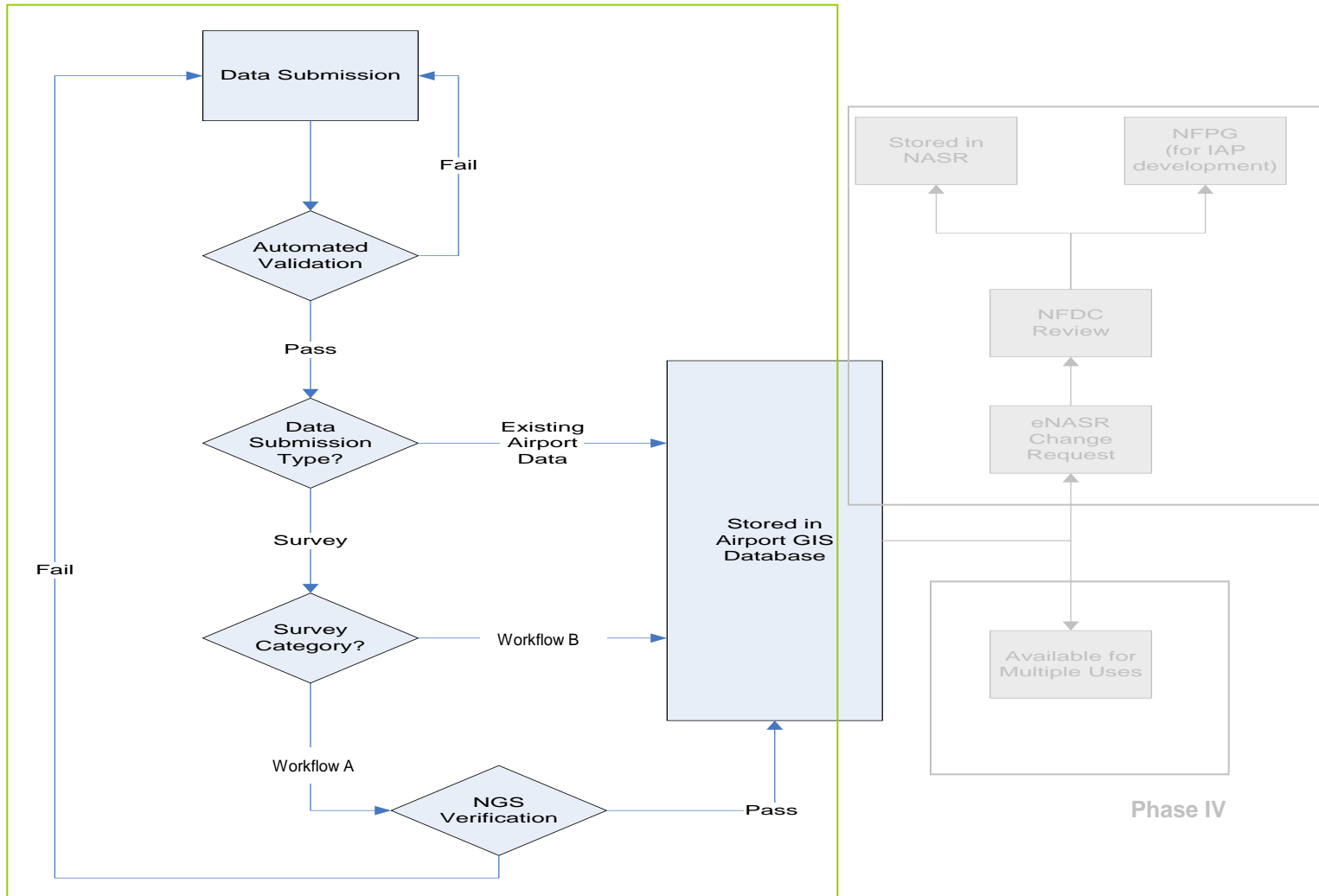
Integrating Airports GIS into Our Business Processes



Airport GIS – High Level Workflow



Airport GIS – High Level Workflow



Airport GIS – System Demonstration

Airports GIS

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

Web Services –



NEXT STEPS

- What does the future hold?



Questions & Answers



Contact Information

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Airports GIS

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

Web Services –

