

# FAA Airports-GIS Program

**FAA | Office of the Associate Administrator of Airports (ARP)**

**▪ ARP | Airport Safety and Standards (AAS)**

**▪ ARP | Airport Planning and Programming (APP)**

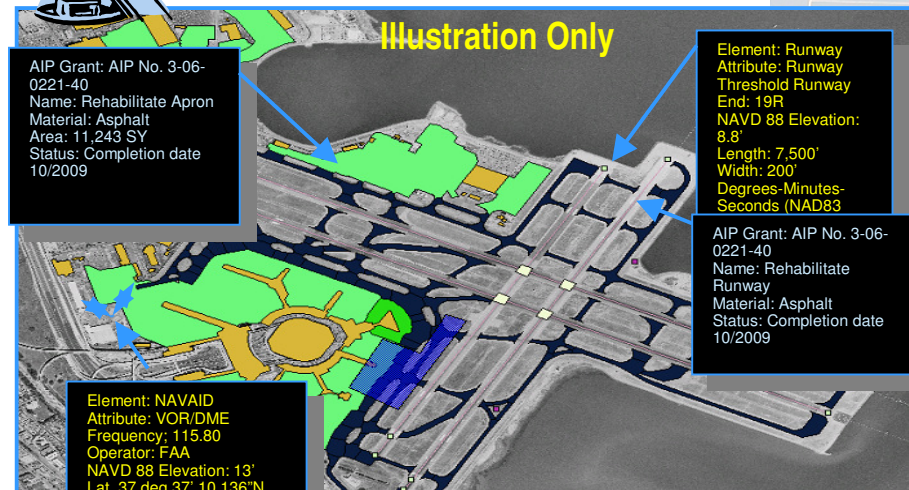
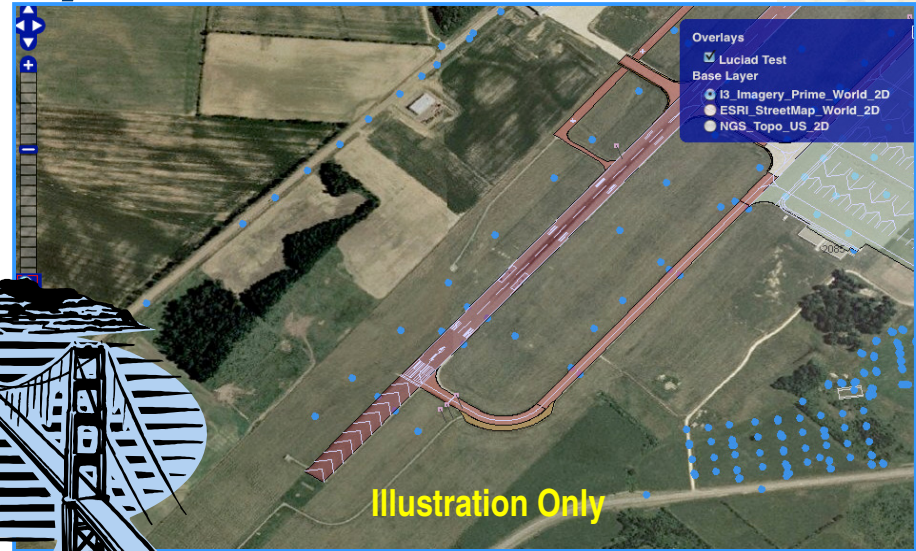
**Presented to | FGDC Metadata Working Group**

**By | Randy Murphy & Charlie Adler**

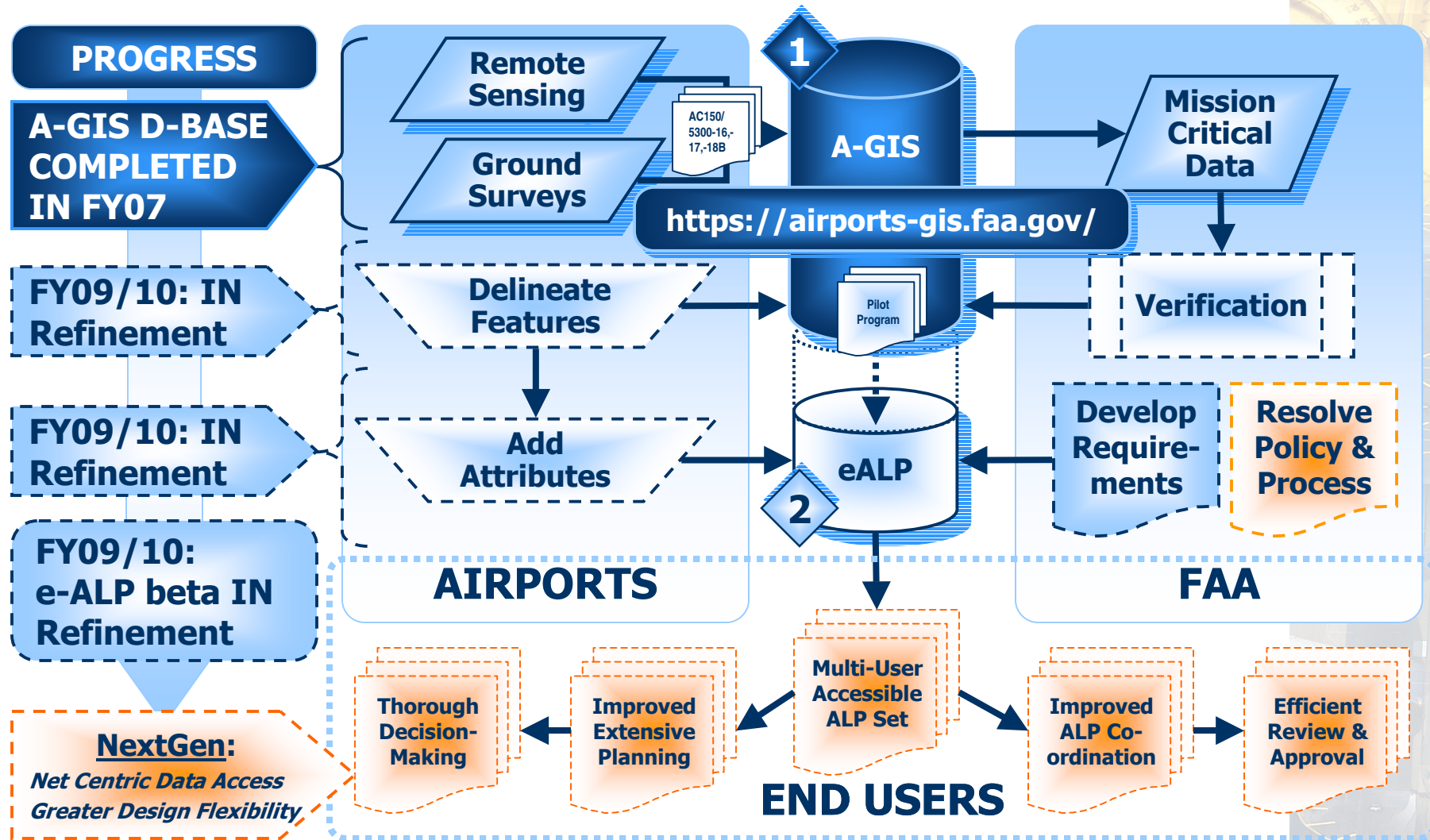
**Date | March 10, 2010**



# Vision | Airports GIS / electronic ALPs

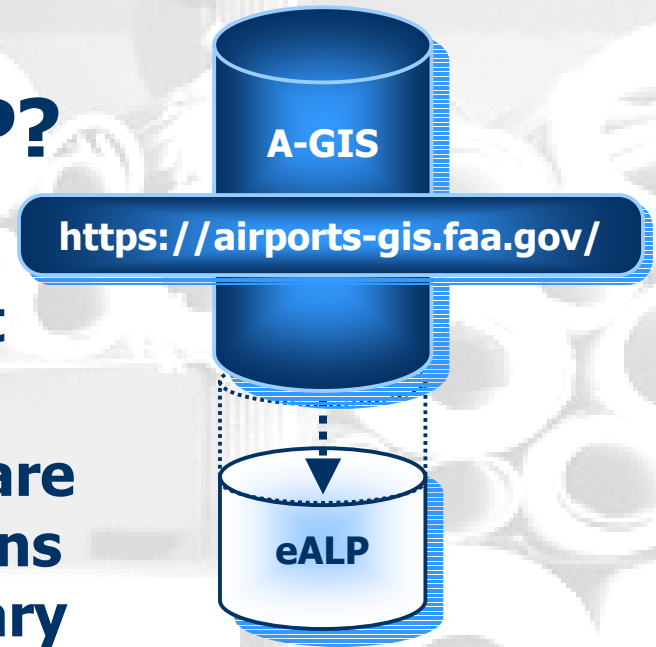


# A-GIS and e-ALP | PROCESS

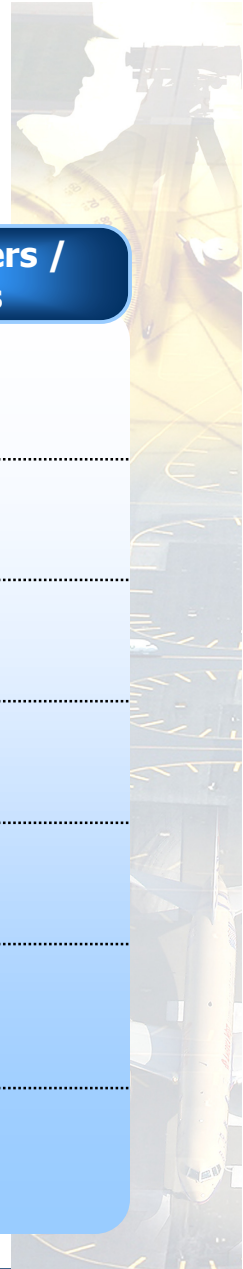


# Why is FAA developing eALP?

- **Currency** | all NPIAS airports required to keep their ALPs current (many are outdated)
- **Versioning** | paper copies of ALPs are typically housed in multiple locations and the “latest” version(s) often vary
- **Accuracy** | plotted ALPs frequently contain airport information that differs from airports data collected for use in other LOBs and/or other airport projects
- **NextGen** | needs real-time, web-based access of the same (“living” document) version by all stakeholders
- **Diligence** | efficient use of updated, precise data (input into A-GIS) for optimal NextGen airport planning, reporting, and decision making



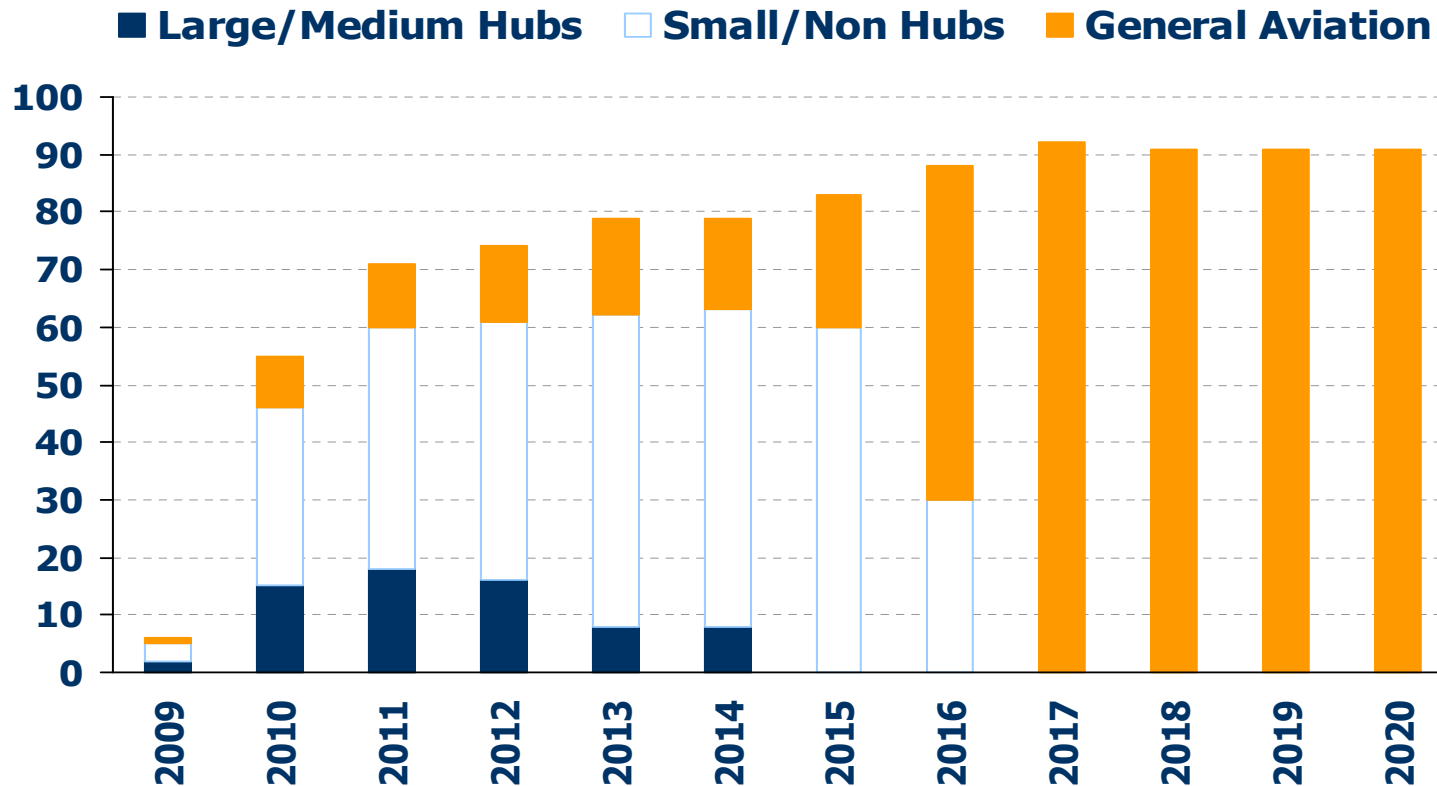
# Benefits of the End-State A-GIS/eALP



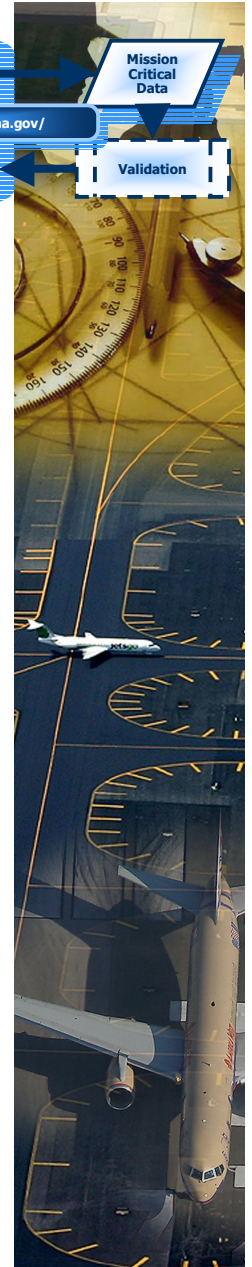
	Federal Aviation Administration	Airport Sponsors	Air Carriers / Pilots
Green	✈	✈	✈
Faster Actions with Reduced Costs	✈	✈	
Improved Airport Access		✈	✈
Improved Efficiencies through Envisioned Tools and Data	✈	✈	
Reduced Costs (additional)	✈	✈	
Provides Leverage for Local GIS System to Manage Non-FAA Related Items		✈	
Think Internet, e-Mail, and Google Earth	✈	✈	✈



# LOOKING FORWARD | A-GIS



- Initial roll-out of A-GIS pilot program happening in the Southwest Region; other regions to follow



# Airports Develop Data



Federal Aviation Administration

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## DFW-102646 : Project Summary

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

**Randy, your next action(s):** Upload Final Report

### Project Information

**Project Type:** New Airport Survey  
**Created By:** Joseph Norton on 11/13/2009  
**Airport:** DALLAS/FORT WORTH INTL  
[View NASR Data for DFW](#)  
**Airport Category:** NPIAS Part 139 Airport  
**Purpose:** Airport Airspace Analysis - Non-Vertically Guided  
**Verification:**

- Geodetic Control
- Imagery
- Survey

### Airport Sponsor Information

**Contact Name:** Joseph Norton  
**Position:** Research Analyst  
**Address:** CNA  
 600 Maryland Ave, SW Suite 800W  
 Washington, DC 20024  
**Phone:** 202-580-7497  
**Email:** [Joseph.CTR.Norton@faa.gov](mailto:Joseph.CTR.Norton@faa.gov)

### Surveyor/Consultant Information

[Add/Modify](#)

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

### Project History & Documents

[Add New Note](#) | 
 [View All History](#) | 
 [View All Documents](#)

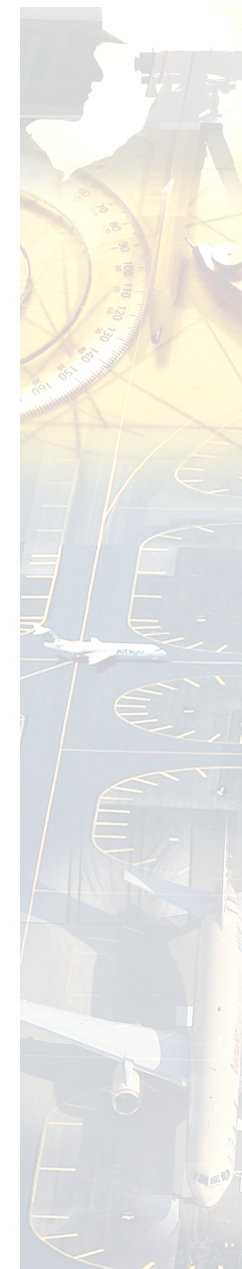
Date	User	Action	Notes/Comments
01/25/2010 05:24 PM	shyamsundar parhi	Requested File/Document Download	GBG_AIRPORT_GIS-2000.zip
01/25/2010 05:22 PM	shyamsundar parhi	Requested File/Document Download	geodetic.pdf
01/08/2010 08:39 AM	Brian Quinn	Opened Survey Viewer	DFW
12/03/2009 09:39 AM	Cynthia DeBisschop	Opened Survey Viewer	DFW
11/17/2009 03:18 PM	David Perry	Opened Survey Viewer	DFW
11/14/2009 09:05 AM	Brian Quinn	Opened Survey Viewer	DFW
11/13/2009 04:08 PM	Joseph Norton	Uploaded Survey File	format: autocad, coord sys: LL-83, description:
11/13/2009 04:06 PM	Joseph Norton	Approved Imagery Data	
11/13/2009 04:06 PM	Joseph Norton	Added Imagery Data	Comment
11/13/2009 04:05 PM	Joseph Norton	Approved Geodetic Control Data	

Only last 10 shown: [more ...](#)

**Administration:**
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# FAA & NGS Validate Data



Federal Aviation Administration

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## DFW-102646 : Validation Report

Project Summary **SOW / Concurrence** Plans Geodetic Control Data Imagery Data **Survey** Verification

Randy, your next action(s): Upload Final Report

Survey File Upload Final Report Survey File Download Validation Summary Validation Errors Survey Viewer

Legend: OK Error Warning Information No Data / Unable to Evaluate

### Feature Data Screen

- NULL Values Found on Critical Attributes 37
- Invalid Enumeration Values Found on Critical Attributes 1
- NULL Values Found on Non-Critical Attributes 716

### Airport

- The feature collection is not within the vicinity of the selected NASR Airport. 1

### Runway

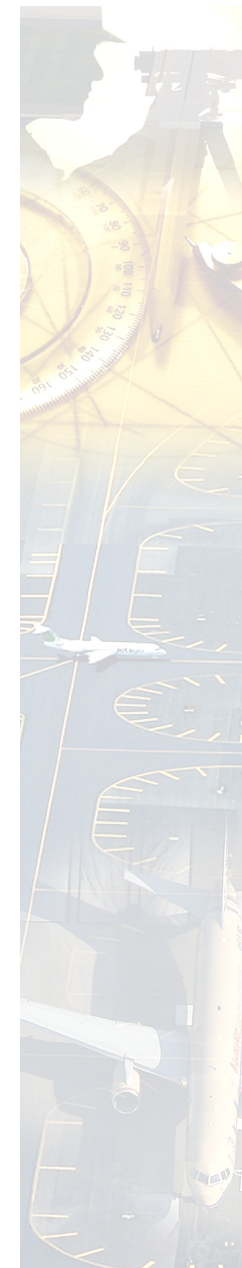
- Missing or Invalid Centerline Point Runway Designator 374
- Calculated Runway Length is not in tolerance (+-3 feet) with the stored value (Calculated from Runway Ends). 2
- Calculated Runway End Bearing is not in tolerance (+-3 degrees) with the stored value (Calculated from Runway Ends). 4
- Missing or Invalid Airport Elevation Runway Designator 1
- Runway Surface either contains more than four points or does not have true parallel sides. 2
- Calculated Runway Length is missing or not between 1000 and 20000 feet (Calculated from Runway Ends). 2

### Navaid

- Navigational Aid Equipment Type Code is missing or invalid. 9

### Obstacle

- Missing or Invalid Obstacle Surface Runway Designator 5
- Missing or Invalid Obstacle Surface Runway End Designator 6
- Unable to Associate Obstacle with a Valid Obstruction Surface 48





# FAA & Airports Use Data – On Line

OFFICIAL ON-FILE eALP for DFW

Views: ALP | Open Data Tables | Current Zoom Level: 18

Layers  
Base Layer: Orthophotos

Select All | Deselect All | Expand All | Collapse All

Update Map

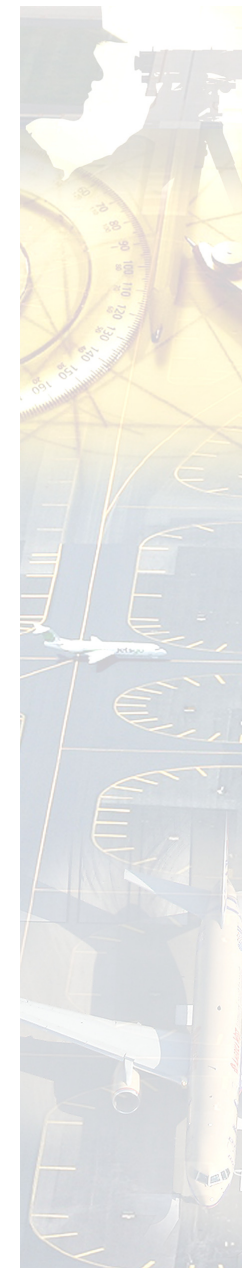
- AIRFIELD
  - AIRCRAFTGATESTAND
  - AIRFIELDLIGHT
  - AIROPERATIONSAREA
  - APRON
  - MARKINGAREA
  - MARKINGLINE
  - RESTRICTEDACCESSBOUNDARY
  - RUNWAY
  - RUNWAYBLASTPAD
  - RUNWAYCENTERLINE
  - RUNWAYEND
  - RUNWAYINTERSECTION
  - RUNWAYLABEL
  - RUNWAYSAFETYAREABOUNDARY
  - SHOULDER
  - TAXIWAYELEMENT
  - TAXIWAYINTERSECTION
  - TOUCHDOWNLIFFOFF
- AIRSPACE
  - LANDMARKSEGMENT
  - OBSTACLE
  - OBSTRUCTIONAREA
  - OBSTRUCTIONIDSURFACE
  - RUNWAYPROTECTAREA
- CADASTRAL
  - AIRPORTBOUNDARY
  - AIRPORTPARCEL
  - COUNTY
  - EASEMENTSANDRIGHTSOFFWAY
  - LANDUSE
  - LEASEZONE
  - MUNICIPALITY
  - PARCEL
- ENVIRONMENTAL
  - FLOODZONE
  - FORESTSTANDAREA
  - NOISECONTOUR

Feature Details  
32° 53 27.56 N | 97° 3 45.17 W

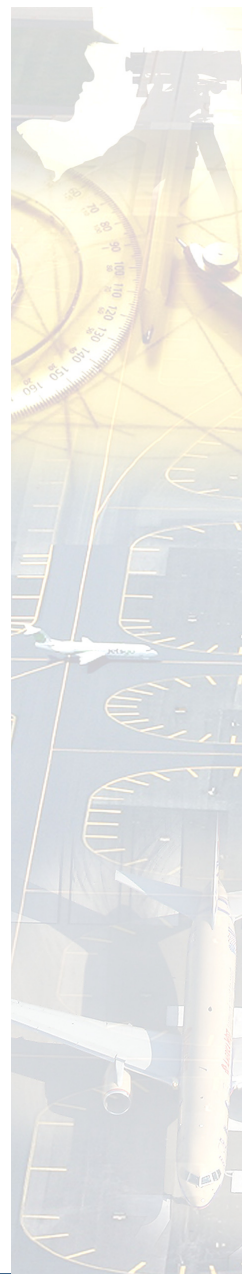
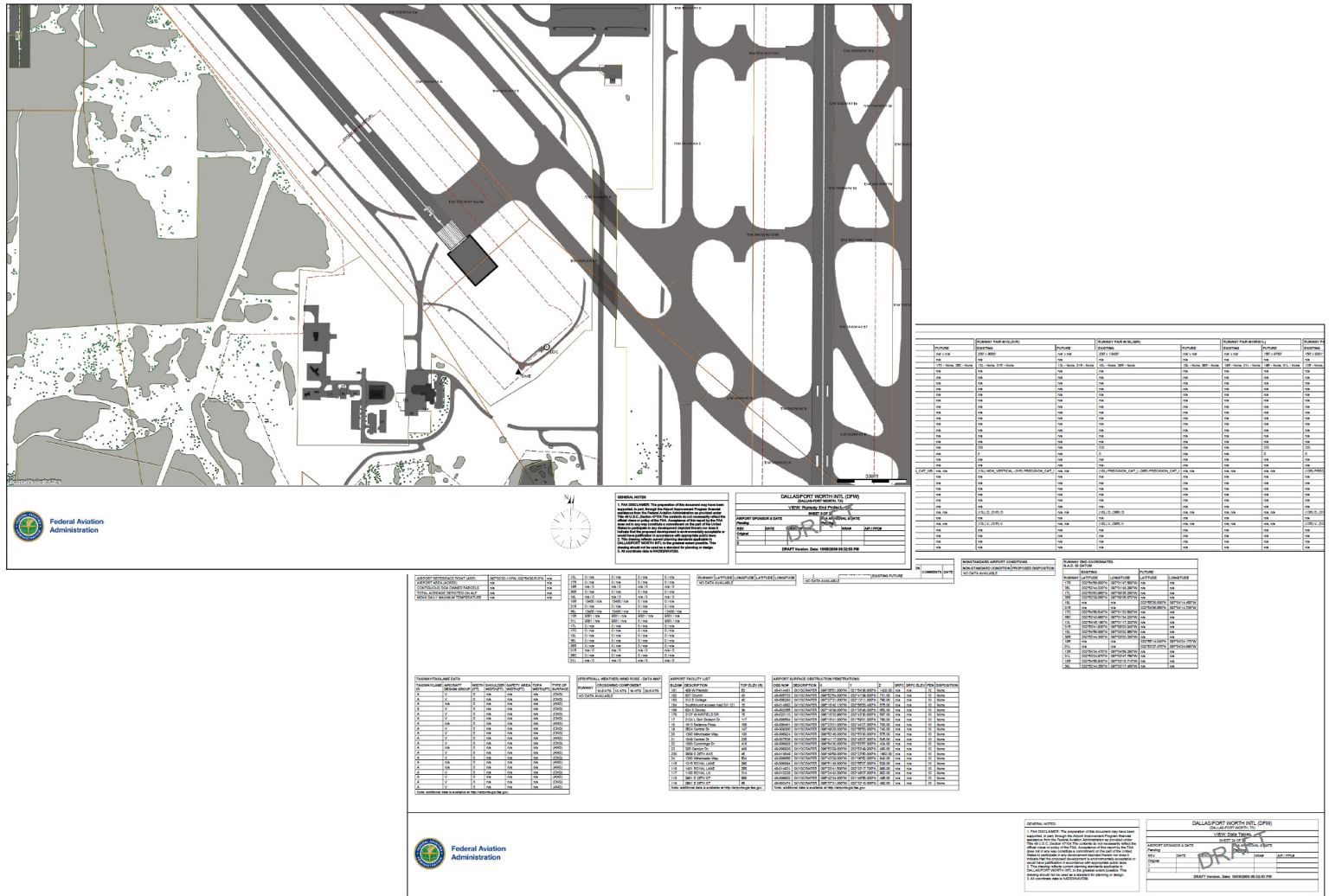
Selected Feature(s):  
AIRFIELDLIGHT

Attribute	Value
alternative	0
color	GREEN
description	CENTERLINE LIGHTING
lightingtype	L-852D
luminescence	1200
name	TAXIWAY CENTERLINE LIGHTS
pilotcontrolfrequency	0
status	ACTIVE
userflag	NULL




Powered by LuciadMap

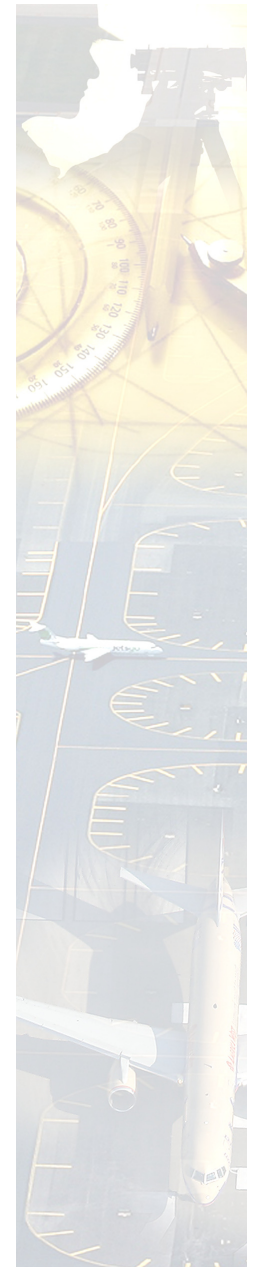


# FAA & Airports Use Data – Off Line



# Three "ACs" Define the Requirements

 <p>U.S. Department of Transportation Federal Aviation Administration</p>	<p><b>Advisory Circular</b></p>	<p><b>= Geodetic Control</b></p>
<p>Subject: General Specifications Establishment Submission to</p>  <p>U.S. Department of Transportation Federal Aviation Administration</p>	<p><b>Advisory Circular</b></p>	<p><b>= Imagery</b></p>
<p>a. Purpose This AC explains describes how and inclusion of information is</p> <p>b. Audience Engineering and authorities to thoroughly and</p> <p>c. Applicat The Federal A guidance and submitting it information su However, use assistance prog requirements of Mandatory test surveys using funds or those this AC.</p> <p>d. Cance This AC canc Surveys. Estab dated February</p> <p>Subject: General for Aeronautical Acquisition and Geodetic Survey</p>  <p>U.S. Department of Transportation Federal Aviation Administration</p> <p>1. Purpose. This AC provides approval in support</p> <p>2. Application. The Federal Aeronautical Survey mandatory for all reviews from the FA Specifications," and</p> <p>3. Cancellation. This AC cancels AC Acquisition and this</p> <p>4. Principal Chan</p> <ul style="list-style-type: none"> <li>• Reformat</li> <li>• Added top</li> <li>• Clarified re engineering</li> <li>• Eliminated provided p</li> <li>• Add equi</li> <li>• Add a re</li> <li>• Add a re</li> <li>• Change th</li> <li>• Allow th</li> </ul> <p>Subject: General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards</p> <p>Date: 3/29/2004 AC No: 150/1300-1E Initiated by: AAS-100</p> <p>a. Purpose of this Advisory Circular (AC). This AC provides the specifications for the collection of airport survey data through field and office methodologies in support of aeronautical information and airport engineering surveys. It also explains how to submit data to the Federal Aviation Administration (FAA), which will forward the data to the National Geodetic Survey (NGS) for quality control purposes. The primary purpose of these general guidelines and specifications is to list the requirements for aeronautical surveys conducted at airports in support of the Federal Aviation Administration (FAA) Airport Surveying-GIS Program. The FAA's Office of Airport Safety and Standards (AAS-1) administers this program. The surveys covered in this document provide critical information to the operation and safety of the National Airspace System (NAS) and are classified as critical by the International Civil Aviation Organization (ICAO). ICAO defines data as critical when "there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe." The information furnished under these standards includes runway and stopway data, navigational aid (NAVAID) data, obstruction data, and data on various airport features, including taxiways, aprons, and landmark features. Most of this information is source data, which is acquired by field survey and/or remote sensing methods.</p> <p>b. Application. FAA and the NGS Aeronautical Survey Program (ASP) recommend the guidance and specifications in this AC for all airport projects. This AC describes an acceptable means, but not the only means, of collecting and submitting airport survey and Geographic Information System (GIS) data in support of aeronautical information surveys. Airport projects receiving Federal grant-in-kind assistance must use these standards. At certificated airports, the guidance and specifications may be used to satisfy specific requirements of rule 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports.</p> <p>Michael J. O'Donnell Director, Office of</p> <p>David L. Bennett Director, Office of Airport Safety and Standards</p>	<p><b>Advisory Circular</b></p>	<p><b>= GIS Data</b></p>



# Evolution of AC150/5300-18B

AAAE GIS Sub-Committee

HJAIA GIS ALP

SDSFIE

A/E/C  
CADD

National CADD  
Standard  
AIA  
NIBS

AirMAT

LBCS  
FGDC Security  
SUE

ED-99a

DO-272  
DO-276

AICM

FGDC Metadata  
ISO 19105

AIXM

AIXM5

AIXM5.1

GOS → FGDC → ANSI ≈ AC 150/5300-18B



# Got Metadata?

- Source & Quality at "project" level

IAD-103226 : Project Summary

Project Summary | SOW / Concurrence | Plans | Geodetic Control Data | Imagery Data | Survey

Randy, your next action(s): Upload Survey

**Project Information**

Project Type: New Airport Survey  
 Created By: Brian Quinn on 02/26/2010  
 Airport: WASHINGTON DULLES INTL  
 Airport Category: NPIAS Part 139 Airport  
 Purpose: Airport Layout Plan - Airport Design or Planning  
 Verification: Geodetic Control, Imagery, Survey

**Airport Sponsor Information**

Contact Name: Brian Quinn  
 Position: Developer  
 Address: CGH Technologies, 10 Drive Way, 234224, Washington, DC 20024  
 Phone: 202-590-7462  
 Email: bquinn@cghtech.com

**Surveyor/Consultant Information**

Name	Organization	Phone
Charles Adler	FAA	202-267-7206
Joshua Abramson	Winchester Airport Authority	931-967-3148

**Project History & Documents**

Date	User	Action
02/26/2010 10:49 AM	Brian Quinn	Approved Imagery Data
02/26/2010 10:48 AM	Brian Quinn	Added Imagery Data
02/26/2010 10:47 AM	Brian Quinn	Approved Geodetic Control Dat
02/26/2010 10:47 AM	Brian Quinn	Added Geodetic Control Data
02/26/2010 10:47 AM	Brian Quinn	Uploaded File/Document
02/26/2010 10:46 AM	Brian Quinn	Approved Imagery Plan
02/26/2010 10:46 AM	Brian Quinn	Approved Geodetic Control Pla
02/26/2010 10:41 AM	Brian Quinn	Approved Quality Control Plan
02/26/2010 10:41 AM	Brian Quinn	Added Quality Control Plan
02/26/2010 10:41 AM	Brian Quinn	Uploaded File/Document

Only last 10 shown: [more ...](#)

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IAD-103226 : Survey File Upload

Plans | Geodetic Control Data | Imagery Data | Survey | Verification

Survey

Feature Schema: Advisory Circular 150/5300-18B

Survey file (zip only):  Browse...

File Format: Autocad DWG/DXF

Coordinate System: LL-83 (NAD83 Latitude/Longitude, Degrees)

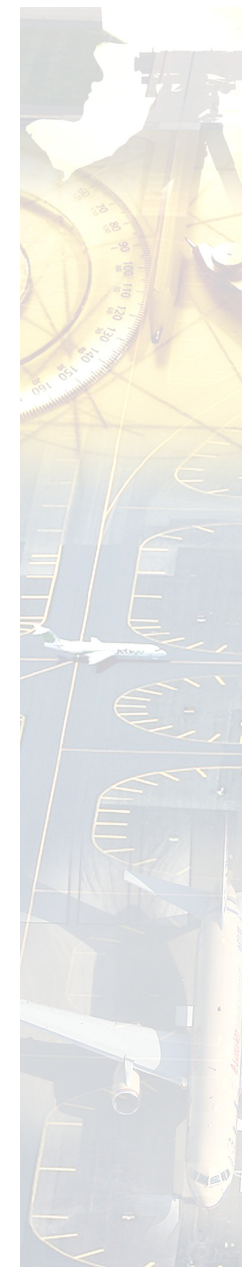
Accuracy:  Field Survey AC 150/5300-18 or  Horizontal ft  Vertical ft  
 (Enter as "Feet at 95% Confidence Level")

Description:

Submit Cancel

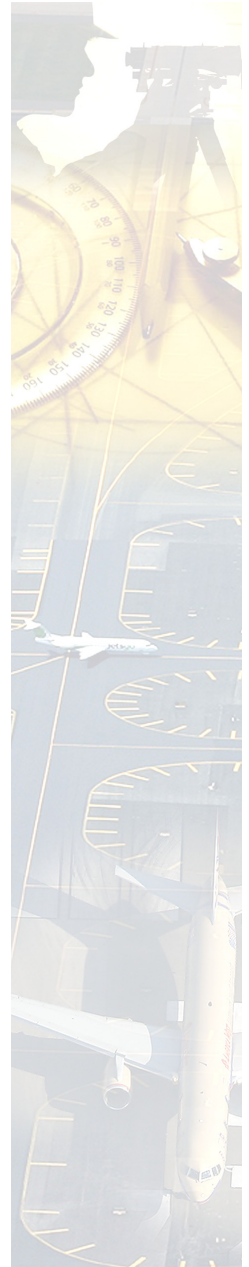
- Version & Status in Attributes

Feature Attributes
Attribute (Datatype)
name (VARCHAR2 (50))
description (VARCHAR2 (255))
status (Enumeration: codeStatus)
userFlag (String 254)
Alternative (Number(2))

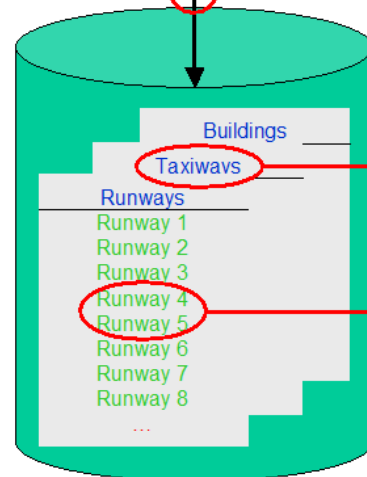
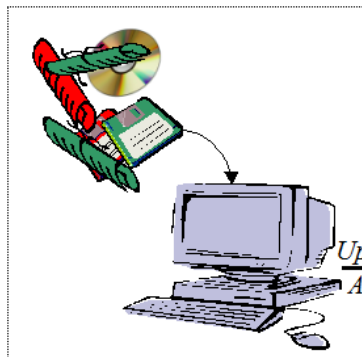


# FAA Airports-GIS Metadata Needs

- **Airports change so should the data**
  - Constant construction and maintenance
  - Natural changes also need to be recorded
- **Use sources of varying qualities**
- **Different versions of the specs**
- **Contacts needed for validation**
- **Easy and intuitive to populate**



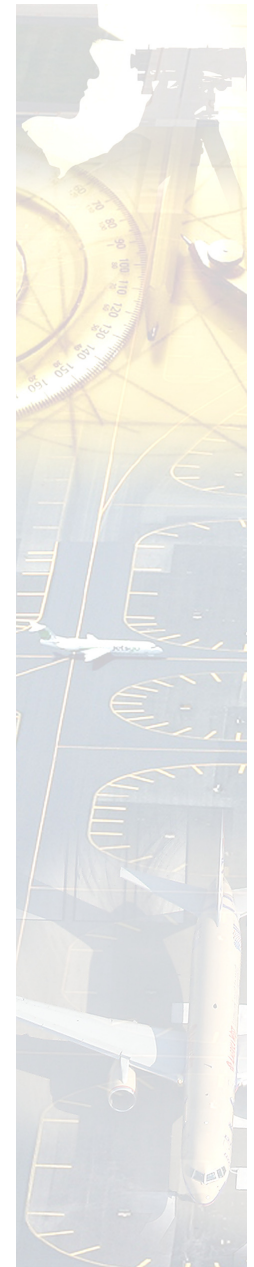
# Metadata Needed at Different Levels



**Metadata at the collection level**  
Applies to everything submitted in a single data exchange  
(e.g. data submitted, provider, etc.)

**Metadata at the Feature Type level**  
Applies to all features of a given type at a given airport  
(e.g. accuracy, coord. system, etc.)

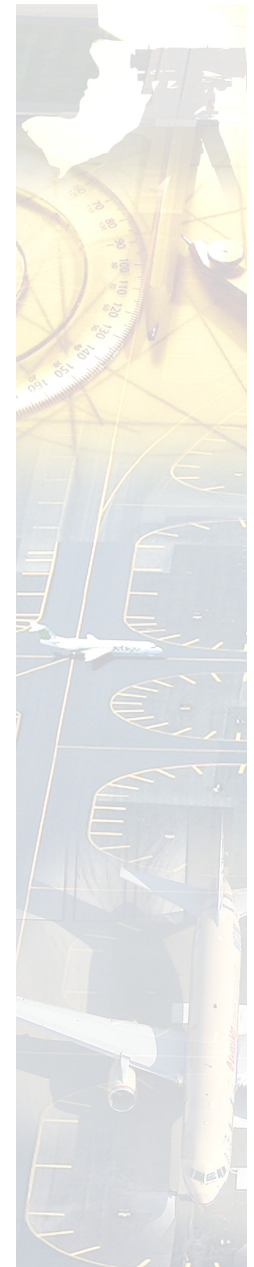
**Metadata at the Feature Instance level**  
Refers to a specific instance of a feature at a given airport  
(e.g. accuracy, coord. system, etc.)



# Focus on Key Elements at Each Level

Table 3-1. List of MetaData elements

	Collection	Set	Feature
<b>Overview</b>			
Abstract	X	X	X
Status	X	X	X
GeometricObjectCount	X	X	
<b>Scope</b>			
Dataset	X		
Features	X	X	
Attributes			X
<b>Usage</b>			
SpecificUsage	X	X	X
BegusageDateTime	X	X	X
EndUsageDateTime	X	X	X
<b>Source</b>			
Statement	X		
IndividualName	X		
OrganizationName	X		
PositionName	X		
DeliveryPoint	X		
City	X		
AdministrativeArea	X		
PostalCode	X		
ElectronicMailAddress	X		
VoicePhoneLine	X		
<b>Coordinate System</b>			
Projection	X	X	
HorizontalDatum	X	X	
VerticalDatum	X	X	
Code	X	X	
<b>Data Quality</b>			
HorizontalAccuracy	X	X	X
VerticalAccuracy	X	X	X
EvaluationMethodName	X	X	X
EvaluationMethodDescription	X	X	X
Pass	X	X	X
GroundSampleDistance	X	X	X





# Thank You! Questions?

FAA | Airports-GIS Project Team

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Airports GIS Program  
March 10, 2009

Federal Aviation  
Administration

