

# Airports GIS

## Airports GIS What's new?

ADO Acting Manager Andy Peek P.E.

Date | October 2012

**1** Fall Seminar  
October 2012

Federal Aviation  
Administration



# Topic Objective

1. Understand which projects need to incorporate Airports GIS-“think” transition policy
2. Be able to Locate Resources
3. Understand current eligibility guidelines
4. Take a look into the short term future for AGIS and the AGIS portal



# Know where to go!

 U.S. Department of Transportation  
Federal Aviation Administration

## Advisory Circular

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**Subject:** General Guidance and Specifications for Aeronautical Surveys; Establishment of Geodetic Control and Submission to the National Geodetic Survey  
**Date:** 9/15/2007  
**AC No:** 150/5300-16A  
**Initiated by:** AAS-100  
**Change:**

**a. Purpose of this Advisory Circular (AC).**  
This AC explains the specifications for establishing geodetic control on or near an airport. It also describes how to submit the information to the National Geodetic Survey (NGS) for approval and inclusion in the National Spatial Reference System (NSRS) in support of aeronautical information surveys.

**b. Audience.**  
Engineering and surveying companies contracted by state aviation agencies or local airport authorities to perform an aeronautical information survey of an airport should read this AC thoroughly and other related advisory circulars before commencing an airport project.

**c. Application.**  
The Federal Aviation Administration and the NGS Aeronautical Survey Program recommend the guidance and specifications in this AC for establishing on-airport geodetic control and submitting it to NGS for approval and inclusion in the NSRS in support of aeronautical information surveys. This AC does not constitute a regulation and is general in nature. However, use of these guidelines is mandatory for surveys that are funded under Federal grant assistance programs. It also provides one, but not the only, acceptable means of meeting the requirements of Title 14 Code of Federal Regulations (CFR) part 139, *Certification of Airports*. Mandatory terms such as "must" apply only to those who conduct aeronautical information surveys using Airport Improvement Program (AIP) or Passenger Facility Charge Program (PFC) funds or those who seek to demonstrate compliance by use of the specific method described by this AC.

**d. Cancellation.**  
This AC cancels AC 150/5300-16, General Guidance and Specifications for Aeronautical Surveys; Establishment of Geodetic Control and Submission to the National Geodetic Survey, dated February 13, 2009.

## 16A

## Geodetic Control

 U.S. Department of Transportation  
Federal Aviation Administration

## Advisory Circular

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**Subject:** General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey  
**Date:** 9/25/08  
**AC No:** 150/5300-17B  
**Initiated by:** AAS-100  
**Change:**

**1. Purpose.**  
This AC provides the specifications for Airport Imagery acquisition and how to submit the imagery for review and approval in support of aeronautical information and airport engineering surveys.

**2. Application.**  
The Federal Aviation Administration (FAA) recommends the guidance and specifications in this Advisory Circular for Aeronautical Survey Airport Imagery. In general, use of this AC is not mandatory. However, use of this AC is mandatory for all projects funded with Federal grant assistance through the Airport Improvement Program (AIP) and with revenue from the Passenger Facility Charge (PFC) Program. See Order Assistance No. 34, "Policies, Standards, and Specifications," and PFC Assurance No. 9, "Standards and Specifications."

**3. Cancellation.**  
This AC cancels AC 150/5300-17A, *General Guidance and Specifications for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey*, dated September 15, 2007.

**4. Principal Changes:**

- Reformatted entire document for readability, usability, and to provide clarification of some criteria.
- Added requirement for submission and approval of an imagery plan prior to imagery acquisition.
- Clarified requirement of flying height to consider the use of the imagery of further endeavors such as future engineering or planning activities.
- Eliminated requirement for a final report except under most conditions unless there is a change from the provided plan or no unusual circumstances were encountered during the collection effort.
- Added requirement for development and delivery to FAA of digital orthorectification.
- Added a requirement for the use of the Airport GIS to inform and track project requirements such as the plan and deliverables.
- Changes the sensor orientation reporting units for image, phi, kappa, from radians to decimal degrees.
- Allows the use of true phase coordinates, reported in meters.

  
Michael J. O'Donnell  
Director, Office of Airport Safety and Standards

## Imagery

## 17C

 U.S. Department of Transportation  
Federal Aviation Administration

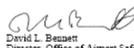
## Advisory Circular

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**Subject:** General Guidance and Specifications for Submission of Aeronautical Surveys to NGS; Field Data Collection and Geographic Information System (GIS) Standards  
**Date:** 3/29/2006  
**AC No:** 150/5300-18  
**Initiated by:** AAS-100

**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.

**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-aid assistance must use these standards. At certificated airports, the guidance and specifications may be used to satisfy specific requirements of Title 14, Code of Federal Regulations (CFR), Part 139, *Certification of Airports*.

  
David L. Bennett  
Director, Office of Airport Safety and Standards

## GIS Data

## 18B



3 Fall Seminar  
October 2012

Federal Aviation  
Administration



# Does my **PROPOSED** project require AGIS



Review the New  
Transition policy dated  
8/23/2012

If your project is not a  
“trigger event” you are  
not required to comply  
with the AGIS guidance



**Federal Aviation  
Administration**

## Memorandum

Date: AUG 23 2012

To: Regional Airports Division Managers

From: Benito DeLeon  
Director, Airport Planning and Programming, APP-1  
Michael J. O'Donnell  
Director, Airport Safety and Standards, AAS-1

CC: APP-400, APP-500, AAS-100, AXX-610 and AXX-620 Branch Managers

Subject: Airports Geographic Information System (Airports GIS) Transition Policy for Non-Safety Critical Projects

This policy memorandum provides national guidance for the phased implementation of Airports GIS for non-safety critical projects, based on information provided in the FAA Airports **Implementation Guidance for Airports Geographic Information System (Airports GIS)**, v2.1, Section IV: Airports GIS Transition Policy<sup>1</sup>. The Implementation Guidance provides additional background and program context, including information on grant requirements related to Airports GIS. This revised Transition Policy replaces the Transition Policy issued on January 14, 2011.

### Background on Airports GIS Requirements

In March 2006, the FAA Office of Airport Safety and Standards (AAS) issued Advisory Circular (AC) 150/5300-18, *General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards*. The AC requires airport sponsors and their consultants to collect project “as-built” data in the National Spatial Reference System (NSRS). It also calls for sponsors and consultants to submit airport planning and as-built data in a specified data schema for review and approval by the FAA and/or National Geodetic Survey (NGS) for safety critical data. AC 150/5300-18 has been a condition of AIP grant offers and PFC decision documents since fiscal year (FY) 2007. In support of the requirements, the

<sup>1</sup> The **Implementation Guidance for Airports Geographic Information System (Airports GIS)**, v2.1 has been updated concurrently with this Airports GIS Transition Policy Memorandum. Section IV contains more information that supports the guidance found in this memorandum. It is available on the Airports Planning and Capacity section of the FAA website: [http://www.faa.gov/airports/planning\\_capacity/airports\\_gis\\_electronic\\_alp/](http://www.faa.gov/airports/planning_capacity/airports_gis_electronic_alp/).



# What is a trigger event? (Table 1)

- Relocate/move a runway end or threshold
- Displace threshold
- Extend/shorten/shift runway
- Widen/runway
- Add/modify stopway, clearway or EMAS
- Modify Declared Distances
- New/revised ILS Procedures
- Install/relocate NAVAID (electronic or visual)
- Changes to airport elevation or reference point

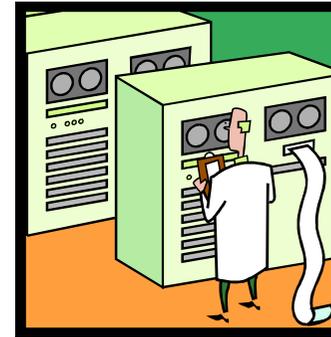


# Question?

**If I am not required to participate in AGIS, can I still do so?**

# Answer

**Yes-however once you enter into GIS data collection every project thereafter will require GIS as a portion of the work**



# New AIP eligibility guidance

Released on August 17, 2012

Available on the web site on October 2, 2012



## Memorandum

Subject: **ACTION:** Program Guidance Letter 12-11  
AIP Eligibility for Geographic Information Systems (GIS) and FAA Airports GIS (AGIS) Data Collection

Date: August 17, 2012

From: *Joe Belvest for*  
Frank San Martin  
Manager, Airports Financial Assistance Division, APP-500

Reply to: Nancy S. Williams  
Attn: of 202-267-8822

To: PGL Distribution List

This Program Guidance Letter:

1. Establishes parameters for the eligibility of costs involved with aeronautical surveys in support of the FAA's Airports GIS program.
2. Explains the ineligibility of acquisition, license or subscription fees for either stand-alone GIS hardware and software or commercially available GIS data management systems.
3. Describes certain circumstances when specific software costs may be eligible for a limited duration in support of an approved planning purpose.



# AGIS Eligibility PGL 12-11

- PGL 12-11
- Stand alone AGIS grant are no longer eligible.
- AGIS will be considered as project formulation similar to engineering design or close-out report costs.
- Data collection beyond the limits of the AIP project is not eligible.



# AGIS Eligibility PGL 12-11

- Acquisition (purchase or lease) of computer hardware or software for GIS applications is not eligible for AIP funding
- Costs for repeat data collection may not be eligible for reimbursement
- Stand alone grant for establishing geodetic control no longer eligible



# AGIS New Training Series

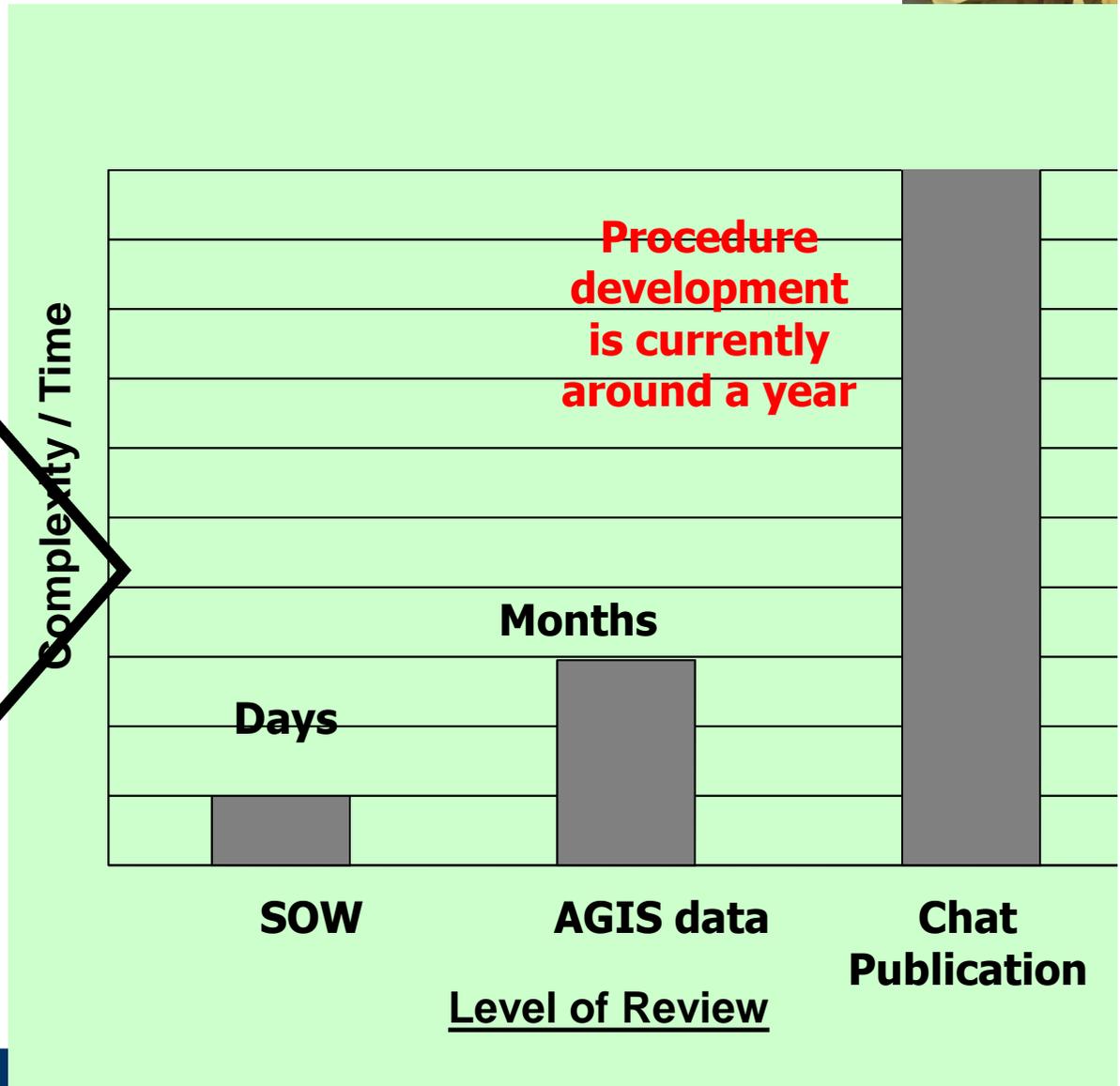
- Five short videos to assist with education/outreach
- AGIS website registration not required
- PDF session also available 10 sessions in total



# AGIS Timelines



**Project Time lines have improved  
However  
Early  
Project  
Coordination  
is Critical!**



# AGIS known Bottlenecks

- **Know who is doing what.** Projects sit when members of the project team think it is someone else's responsibility
- FAA AGIS staff has been able to keep up with review in a timely manner. Current delay is in the quality of data submitted.
- Data analysis takes time, make sure you have staff available when the task needs to be complete.



# Communication

- Single source of most issues is communication and scope.
- Utilize **Table 2-1** early and often in your discussion.
- Communicate with the ADO early and often in development of SOW.



# Table 2-1



**Table 2-1. Survey Requirements Matrix**

This table is designed for use in two ways. First, it defines in a general fashion the task required to meet a specific objective. Each task listed is generalized and the process to complete it many contain many other pieces. Users should refer to the text of the referenced AC to ensure that all the required subtasks are completed. The second way to use this matrix is as a checklist to ensure all the required data is collected either before leaving the field or submitting the data to the FAA.

Intended End Use of the Data ➤	AC Reference	Category II or III Operations	Navigational Aid Siting			Airport Layout Plan (ALP)	Airport Obstruction Chart	Construction		Instrument Procedure Development	Pavement Design, Construction, Rehabilitation or Roughness	Airport Mapping Database
			Non-Precision	Precision	Visual			Airside	Landside			
Provide a Survey and Quality Control Plan	150/5300-16/17/18	•	•	•	•	•	•	•	•	•	•	•
Establish or validate Airport Geodetic Control	150/5300-16	•	•	•	•	•	•	•	•	•	•	•
Perform, document and report the tie to National Spatial Reference System (NSRS)	150/5300-16	•	•	•	•	•	•	•	•	•	•	•
Survey runway end(s)/threshold(s)	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Monument runway end(s)/threshold(s)	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Document runway end(s)/threshold location(s)	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	• <sup>1</sup>	• <sup>1</sup>	•	•
Identify and survey any displaced threshold(s)	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Monument displaced threshold(s)	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Document displaced threshold(s) location	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Determine or validate runway length	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Determine or validate runway width	150/5300-18	•	•	•	•	•	•	• <sup>1</sup>	•	•	•	•
Determine runway profile using 50 foot stations	150/5300-18	•	•	• <sup>2</sup>	•	• <sup>2</sup>	•	• <sup>1</sup>	•	•	• <sup>2</sup>	•
Determine runway profile using 10 foot stations	150/5300-18	•	•	• <sup>2</sup>	•	• <sup>2</sup>	•	• <sup>1</sup>	•	•	• <sup>2</sup>	• <sup>2</sup>
Determine the touchdown zone elevation (TDZE)	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Determine and document the intersection point of all specially prepared surface (SPHS) runways	150/5300-18	•	•	•	•	•	•	•	•	•	•	•

Required Tasks ▼	AC Reference	Category II or III Operations	Non-Precision	Precision	Visual	ALP (ALP)	Obstruction Chart	Airside	Landside	Procedure Development	Design, Construction, Rehabilitation or Roughness	Database
Perform or validate a topographic survey	150/5300-18	• <sup>3</sup>	•	•	•	•	•	•	•	• <sup>4</sup>	•	•
Collect and document runway and taxiway lighting	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Collect and document parking stand coordinates	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Collect cultural and natural features of landmark value	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Determine elevation of roadways at the intersecting point of the Runway Protection Zone (RPZ) or the runway centerline extended	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Determine all Land Use to 65 DNL contour	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Document features requiring digital photographs	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Document features requiring sketches	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Collect position and type of runway markings	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Collect position and type taxiway markings	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Locate, collect, and document photo ID points	150/5300-17	•	•	•	•	•	•	•	•	•	•	•
Identify collect, and document wetlands or environmentally sensitive areas	150/5300-18	•	•	•	•	•	•	•	•	•	•	•
Collect imagery	150/5300-17	•	•	•	•	•	•	•	•	•	•	•
Provide a final Project Report	150/5300-16/18	•	•	•	•	•	•	•	•	•	•	•



# PACS & SACS

- Research existing control possibilities prior to requesting new PAC's and SAC's
- Opportunity for time and money savings by utilizing existing control
- Most projects proceed with temporary control



BV 060 224,DG0715,-,1,14DEC2009



# Existing PACS and SACS



AIRPORTS with PAC and SAC marks

This page is maintained by [NGS Software Requests](#)

Help

Re-Sort-By  LID  Airport\_Name  St  CITY

MFV	ACCOMACK COUNTY.....	VA	MELFA
LIT	ADAMS FIELD.....	AR	LITTLE ROCK
EKX	ADDINGTON FIELD.....	KY	ELIZABETHTOWN
ADS	ADDISON (ADS).....	TX	DALLAS
SLK	ADIRONDACK REGIONAL.....	NY	SARANAC LAKE
AIK	AIKEN MUNICIPAL.....	SC	AIKEN
ANW	AINSWORTH MUNICIPAL.....	NE	AINSWORTH
ILN	AIRBORNE AIRPARK.....	OH	WILMINGTON
AKK	AKHIOK AIRPORT.....	AK	AKHIOK
AKO	AKRON-WASHINGTON COUNTY.....	CO	AKRON
ALM	ALAMOGORDO-WHITE SANDS REGIONAL.....	NM	ALAMOGORDO
ALB	ALBANY COUNTY.....	NY	ALBANY
S12	ALBANY MUNICIPAL.....	OR	ALBANY
T23	ALBANY MUNICIPAL.....	TX	ALBANY
OAJ	ALBERT J ELLIS.....	NC	JACKSONVILLE

Get Marks

<http://www.ngs.noaa.gov/cgi-bin/airports.prl?TYPE=PACSAC>

Most Certificated Airports have/had PACS/SACS established by NGS



# Lessons Learned | General

- **Airport Resources and Involvement** – The amount of data to be submitted and reviewed by the airport is not trivial and requires significant airport involvement and resources. GIS expertise of the Staff/Sponsor will greatly benefit the project formulation and implementation.
- **Improved Processes** - Review of Quality Control plans now being performed by FAA contract personnel has greatly reduced time delays. The help desk has matured and is functioning well. The frequently asked questions are valuable.
- **Data Accuracy** – While data accuracy may meet 18-B requirements, consultants have expressed reluctance without a proven history in the Airports GIS program to accept the data for reuse rather than collect new data.
- **Data Integration with Enterprise Systems** – Airports with established enterprise GIS systems have reported difficulty integrating data with Airports GIS formats.



# Lessons Learned | General

- **Joint Scoping Session** - Conducting a joint scoping session with the FAA project manager, airport and consultant (prime and photogrammetry) is essential for success. Diligence is required to ensure each party (including the airport sponsor) understands expectations and responsibilities.
- **Separate Submittals** - If an Instrument Approach Procedure (IAP) is included in the project, dividing the submissions into separate Airports GIS projects in stages, in order to get the runway and obstacle data to Flight Procedures before the entire project is completed will reduce the time to publish the procedure.
- **Policy** – Development of policy identifying “minimum” requirements for data collection and attribution could greatly reduce scope and price variability



# Current Available Data

- Runway Safety Area Database
- Survey Projects
- eALP's
- On-line help and training
- Resources
- National Flight Center Data
  - NFDC Portal
  - Airport Data Changes
  - Aeronautical Chart Changes



# Screen shot of AGIS as of 10/2/2012

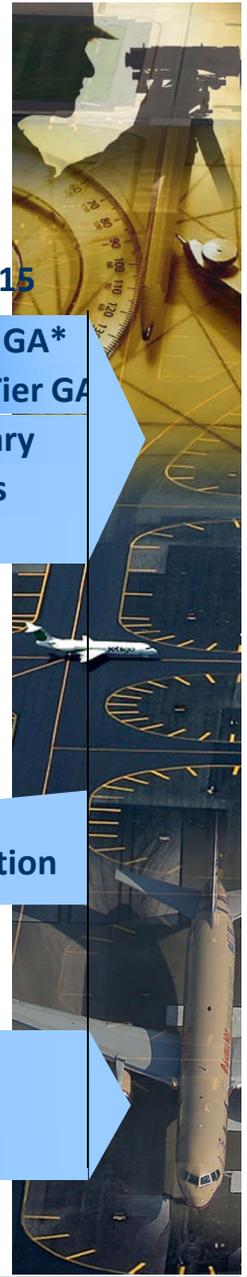
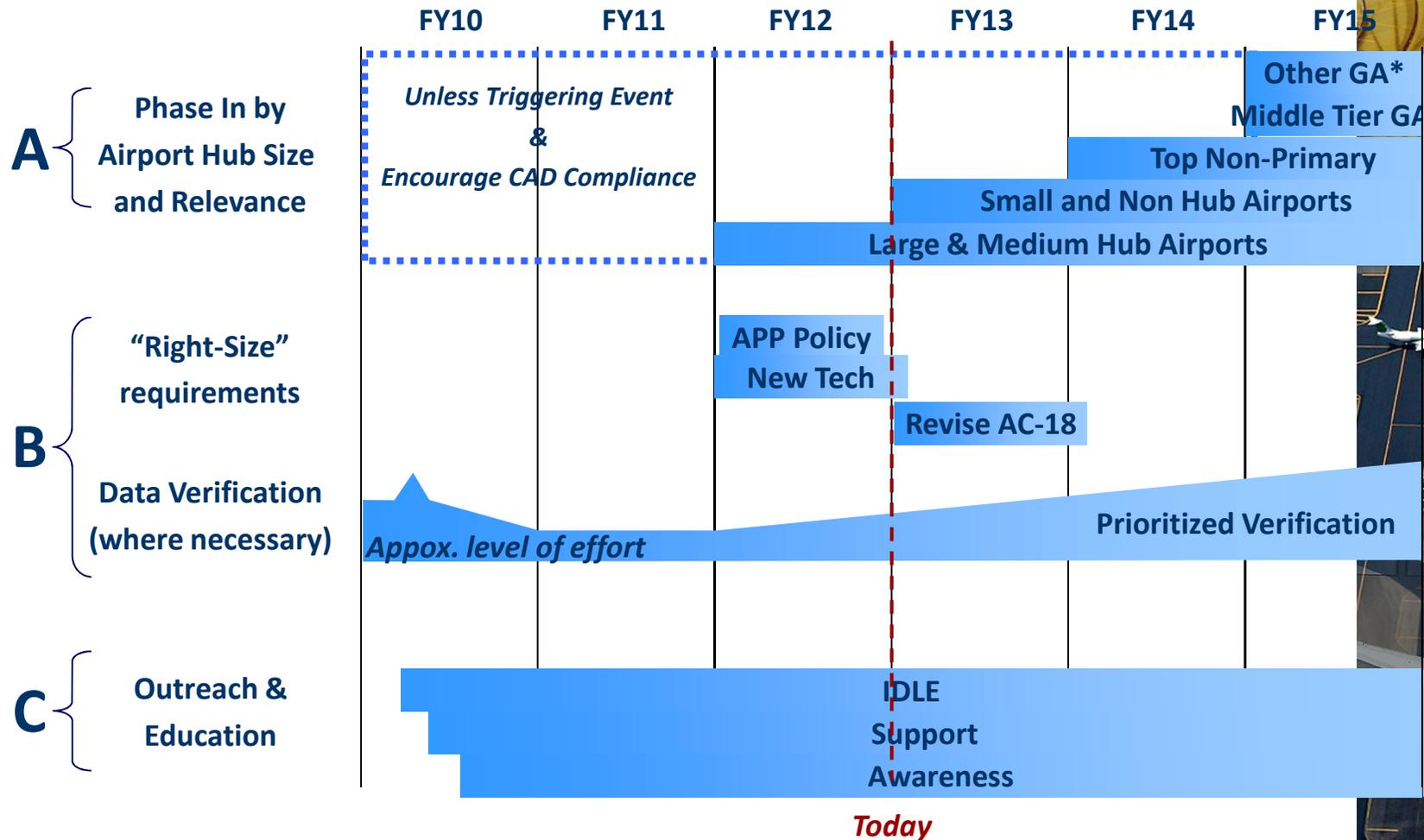
The screenshot shows the 'Airports GIS Home' web application running in Internet Explorer. The browser's address bar displays the URL <https://airports-gis.faa.gov/airportsgis/portal.jsp>. The page header includes the Federal Aviation Administration logo and the text 'Federal Aviation Administration' and 'Airports GIS'. A navigation menu contains links for 'Home', 'Projects', 'Help', and 'Logout'. The main content area is titled 'Airports GIS Home' and features several functional modules:

- My Account:** Welcome Andy J Peek. Includes links for 'Update Account Information' and 'Change Password'.
- Survey Projects:** Manage your survey projects. Includes links for 'My Survey Projects' and 'Test a Survey File'.
- eALP Projects:** Manage your electronic Airport Layout Plan (eALP) projects. Includes a link for 'My eALP Projects'.
- Runway Safety Area Inventory:** The Runway Safety Area policy (Order 5200.8, Runway Safety Area Program) requires regional offices to collect and maintain data for each Runway Safety Area (RSA). Includes a link for 'Download RSAI database'.
- Help & Training:** Includes links for 'Support Desk', 'Online Help', and 'IDLE Training Site'.
- Resources:** Includes links for 'About Airports GIS', 'National Geodetic Survey (NGS)', 'Aviation System Standards (ASST)', and 'FAA Advisory Circulars'.
- National Flight Data Center:** Airport Data Changes, Aeronautical Chart Changes, etc are available at the NFDC Portal. Includes a link for 'NFDC Portal'.
- System Information:** Version 2.6.5 - deployed 7/11/2011. Includes a link for 'View release history and notes'.

At the bottom of the page, there are links for 'FAA.gov Home', 'Privacy Policy', 'Web Policies & Notices', 'Contact Us', and 'Help'. Below these are 'Readers & Viewers' for PDF, MS Word, MS PowerPoint, MS Excel, and WinZip. The Windows taskbar at the bottom shows the Start button, several open applications, and the system tray with the time 6:38 AM on 10/2/2012.



# The history and future of GIS



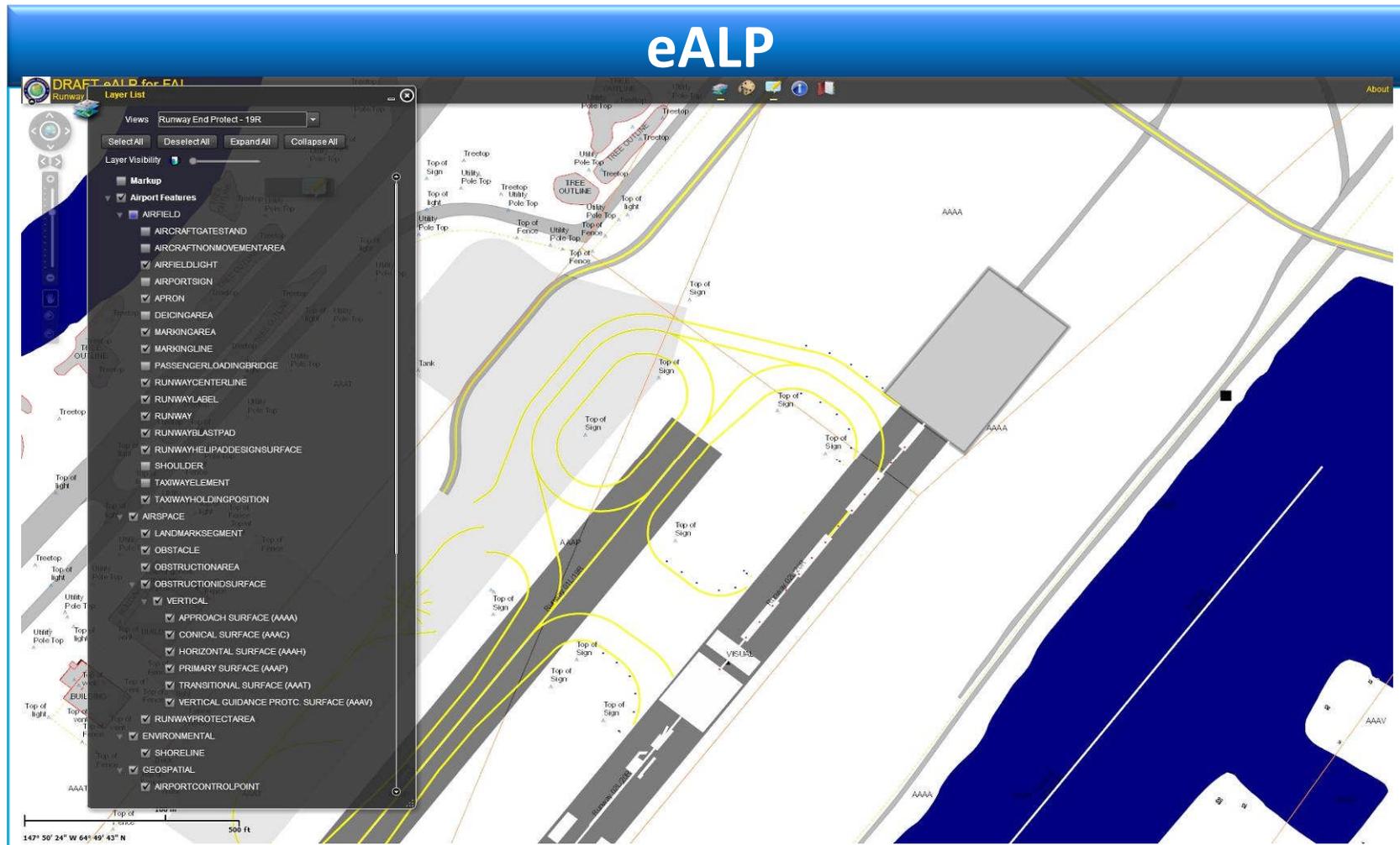
# Airports GIS Tool Development

## FAA Planned and Conceptual Tools (“Apps”)

- **Electronic Airport Layout tool**      **2012**  
**(eALP)**
- **Modification to Standards tool**      **2013**
- **Airport Design tool**      **2014**
- **Airspace Analysis tool**      **2015**
- **Runway Safety Area (RSA) tool**      **2016**

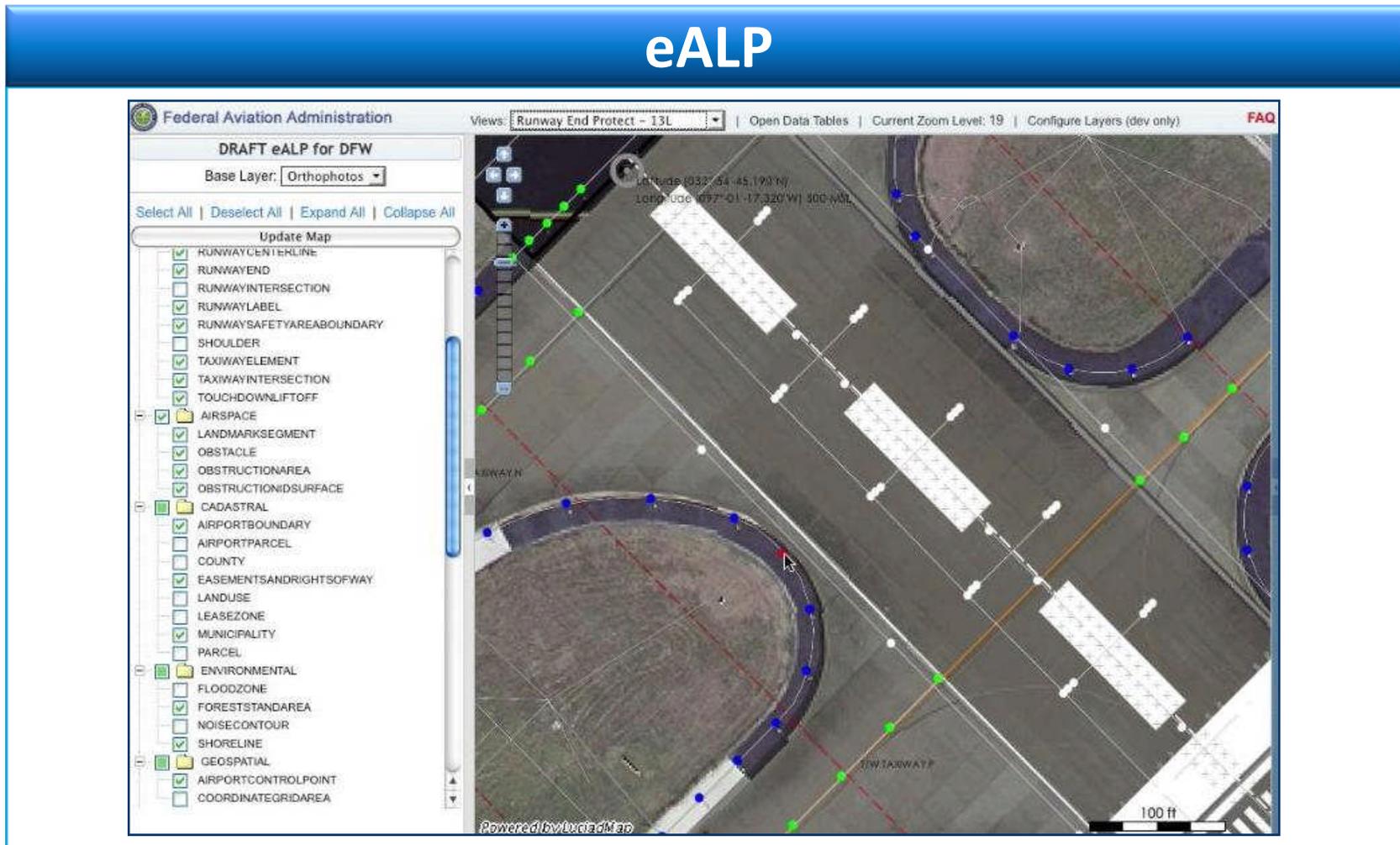


# eALP | On-line Viewer



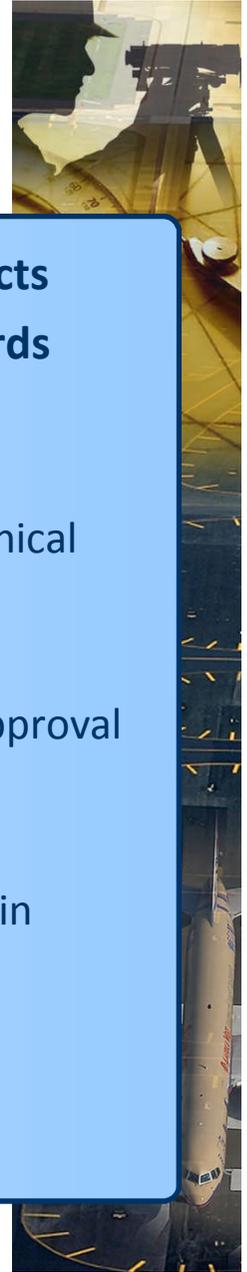
# eALP | Background Imagery

## eALP



# Airport GIS Toolset: Modification to Standards Tool – Mar 2013

- **Applicable to** airport design, construction, or equipment procurement projects
- **Provides functionality to request, approve, or query modifications of standards complying with the FAA Order 5300.1**
- **Supports the ability to:**
  - Capture input for new or existing request and tie it to a specific or set of graphical elements
  - Submit and view supporting documents
  - Review and approve modifications and allows the user to view the required approval memo
  - Manage modifications
  - Query approved modifications for use in analysis (data calls) or as a reference in requesting a modification



# Airport GIS Toolset: Airport Design Standards Tool – Jun 2014

- Allow airport planners and designers to perform ‘what-if’ analysis and test airport dimensional specifications on existing and proposed airfield configurations
- Calculate and plot design standards based on criteria specified by FAA guidance
- Allow users to select design criteria according to an existing airport or enter unique combinations of design criteria
- The tool will include at a minimum:
  - Runway and taxiway width and clearance standards
  - Runway length
  - Wind analysis
  - Taxiway and taxi lanes including centerline, fillets, lead-ins, and shoulders
  - Declared Distances



# Websites

Airports GIS: <http://airports-gis.faa.gov>

FAA Survey Data: <http://avnnet.jccbi.gov/datasheet>

Existing UDDF Data: <http://www.ngs.noaa.gov>

PACS/SACS Data:

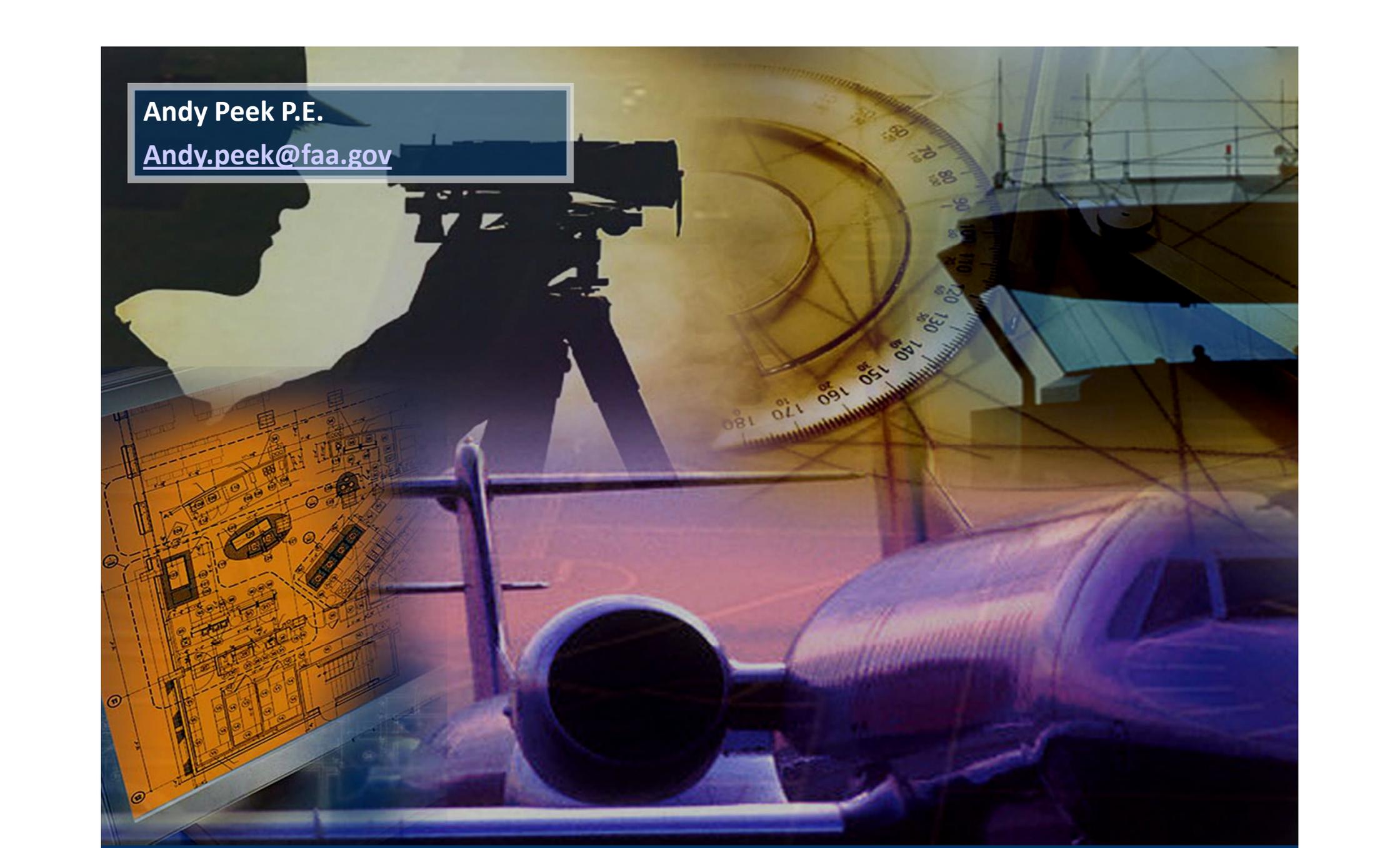
<http://www.ngs.noaa.gov/AERO/aero.html>



# What can you do now to prepare for Airports GIS?

- Register on the Airports GIS website
- Take IDLE level II training for each AC (-16, -17, -18)
- Include Airports GIS knowledge and experience in your thought processes
- Consider developing Airports GIS expertise or identify potential team member(s) to stay up to speed
- Provide feedback to ADO





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29 Fall Seminar  
October 2012

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