

“Tower, this is GIS Requesting a Flyby...”

Andrew Clem, GISP

SCAUG 2013
Addison, TX



One Glen Lakes
8140 Walnut Hill Lane
Suite 1000
Dallas, Texas 75231



About Me

- ▶ Andrew Clem, GISP
- ▶ GIS Specialist at CDM Smith since 2007
- ▶ Projects: Airports GIS (AGIS), environmental (EA & EIS), NPDES, FEMA, utilities, disaster recovery, implementation
- ▶ Previous: natural resource management, habitat mapping, utilities mapping, UXO mapping, post-Katrina surveys

Agenda

- ▶ Goals
- ▶ Keywords & Acronyms
- ▶ Introduction
- ▶ Resources
- ▶ The FAA NextGen Program
- ▶ From the ALP to the eALP
- ▶ Advisory Circular
- ▶ Airports GIS
- ▶ Lessons Learned & Recommendations
- ▶ Q & A



Goals

- ▶ Give the 30,000-ft view
 - Limit details
- ▶ Introduce terminology
- ▶ Keep the Airports GIS buzz alive
- ▶ Overview of characteristics
- ▶ How is GIS helping the effort?
- ▶ What to expect – get the wheels turning

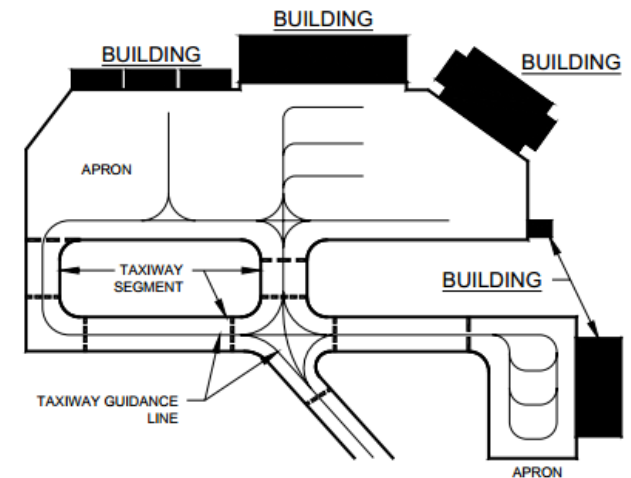
Keywords & Acronyms

- ▶ FAA – Federal Aviation Administration
- ▶ AGIS – Airports GIS
- ▶ ALP – Airport Layout Plan
- ▶ eALP – Electronic Airport Layout Plan
- ▶ AC – Advisory Circular
- ▶ AIP – Airport Improvement Plan
- ▶ NextGen – FAA's Improvement Program



Introduction

- ▶ The Buzz: Airports GIS
 - Has been growing in interest
 - Directed by the FAA
 - Pilot Program
 - Included 37 airports (including DFW)
 - More airports looking to jump on board early
 - Building Momentum
 - Grants (Airport Improvement Plan)
 - Ahead of the curve
 - The program is up and running



Resources

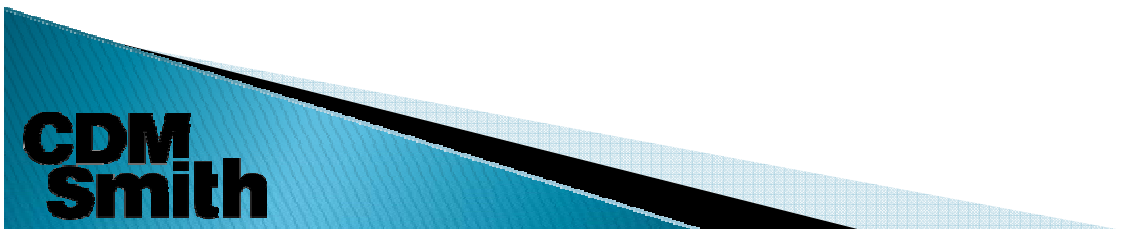
▶ FAA

◦ Websites

- Airports GIS: http://www.faa.gov/airports/planning_capacity/airports_gis_electronic_alp/
 - Guidance
 - Training
 - presentations and videos
- NextGen: <http://www.faa.gov/nextgen/>

◦ Documentation

- Advisory Circular 150/5300-18B



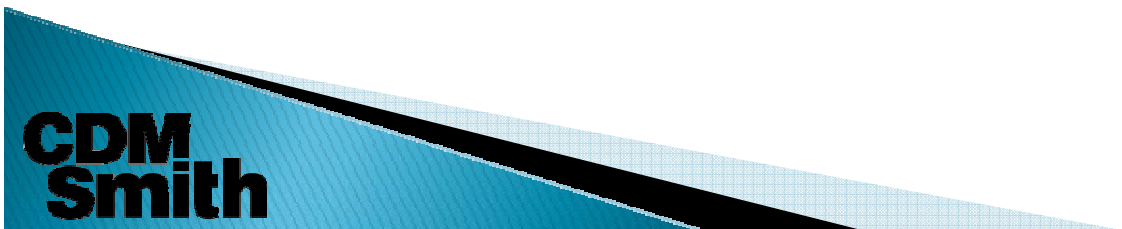
**U.S. Department
of Transportation**

Federal Aviation
Administration

Resources

- ▶ FAA, continued...
 - GIS Helpdesk
 - Standards and Schemas
 - AutoCAD, Microstation
 - GIS gdb
 - GIS upload tool
 - Compliance, testing

- ▶ Esri – Aeronautical Solution
 - <http://www.esri.com/software/arcgis/extensions/aero-solution>



**U.S. Department
of Transportation**

Federal Aviation
Administration

NextGen Overview

► What is it?

- The FAA's program taking airports into the next generation
- Uses newer technologies than in the past
- Standardizes data survey/collection methods
- Streamline decision-making
- According to the FAA...

"At its most basic level, NextGen represents an evolution from a ground-based system of air traffic control to a satellite-based system of air traffic management. This evolution is vital to meeting future demand, and to avoiding gridlock in the sky and at our nation's airports."

- http://www.faa.gov/nextgen/why_nextgen_matters/what/

NextGen, continued...

- ▶ What will the program accomplish?

1. An Improved Travel Experience for Everyone

- Performance, On-time

2. Economic Vitality & Enhanced Operations

- Ready for the future, reduced environmental impact

3. Enhanced Safety

http://www.faa.gov/nextgen/why_nextgen_matters/

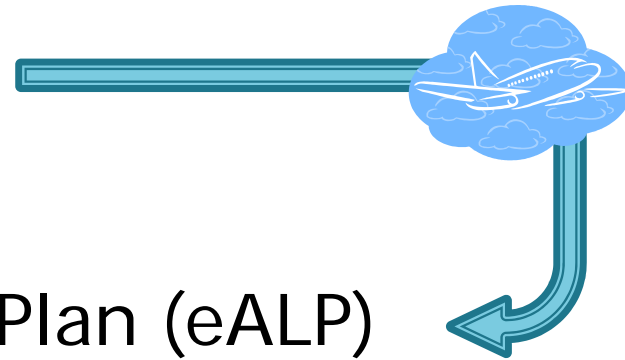


NextGen, continued...

- ▶ Airports GIS is coming
 - Slow to start, but airports are ready
- ▶ Pilot Program
 - Up and running several years ago
 - 37 airports
- ▶ TLH
- ▶ The tools, training, and people are out there.

From the ALP to the eALP

- ▶ Airport Layout Plan (ALP)
 - More CAD and Paper based
- ▶ Electronic Airport Layout Plan (eALP)
 - GIS based
 - Geodatabase
 - Standardized
- ▶ eALP Tools
 - eALP Uploading and Testing Tools



Advisory Circular

▶ AC 150/5300-18B

- Almost 500 pages!
- Sets the Standard

1. PURPOSE: This Advisory Circular (AC) provides the specifications for the collection of airport data through field and office methodologies in support of the Federal Aviation Administration (FAA).

- Field work, survey, data collection
 - Accuracies
- AutoCAD and Microstation
- GIS

Airfield
Airspace
Cadastral
Environmental
Geodetic
Navigational_Aids
SeaPlane
Security
Structures
Surface_Transportation
Utilities

AircraftGateStand
AircraftNonMovementArea
AirfieldLight
AirOperationsArea
AirportSign
Apron
ArrestingGear
DeicingArea
FrequencyArea
MarkingArea
MarkingLine
MovementArea
PassengerLoadingBridge
RestrictedAccessBoundary

Runway
RunwayArrestingArea
RunwayBlastPad
RunwayCenterline
RunwayElement
RunwayEnd
RunwayHelipadDesignSurface
RunwayIntersection
RunwayLabel
RunwayLAHSO
RunwaySafetyAreaBoundary
Shoulder
Stopway
TaxiwayElement
TaxiwayHoldingPosition
TaxiwayIntersection
TouchdownLiftOff

Advisory Circular

► Standards Layout

5.3. FEATURE CLASS DESCRIPTION LEGEND

The following table identifies how each feature description is setup and provides information on what is contained within the section.

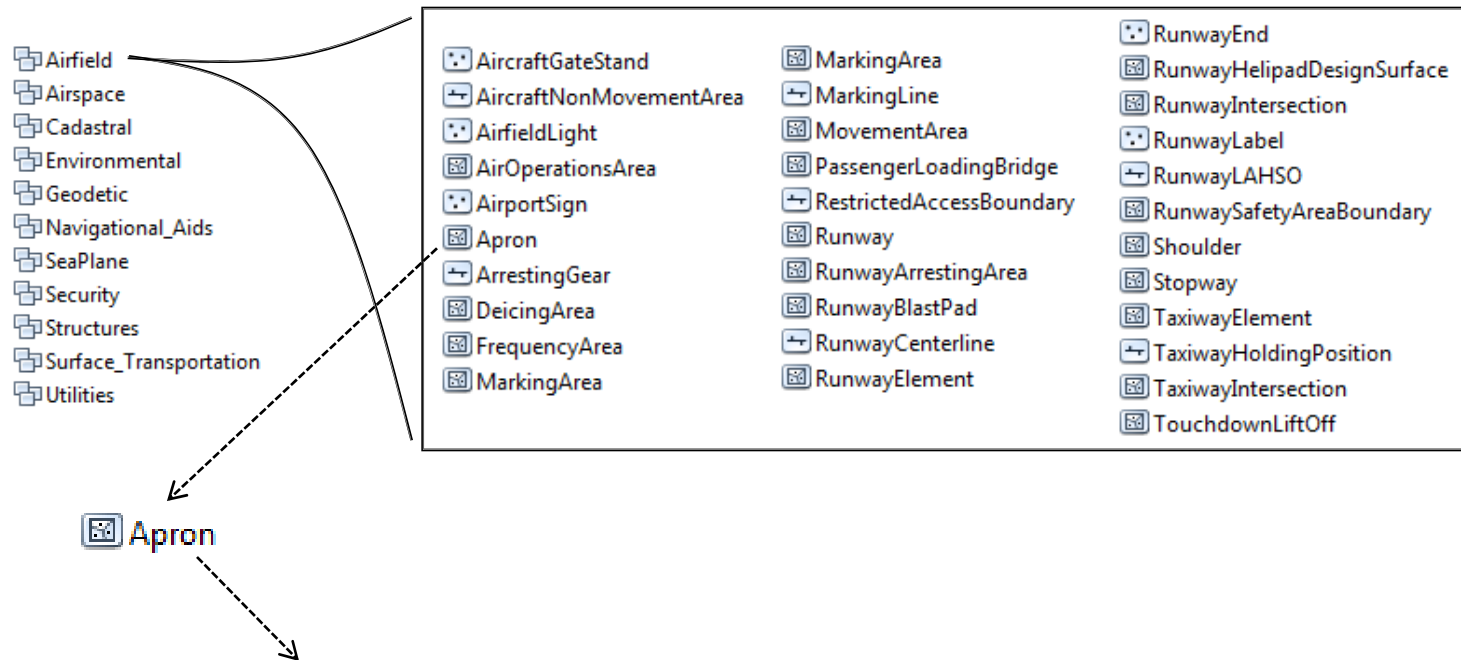
5.3.1. Paragraph Number and FeatureClassName

Definition: <i>Definition of feature.</i>				
Feature Group	<i>The Feature Group of the element.</i>			
Feature Class Name	<i>The proper name of the Feature Class.</i>			
Feature Type	<i>The compliant geometry of element.</i>			
CADD Standard Requirements				
Layer/Level	Description			
<i>Compliant layer name.</i>	<i>Compliant layer description. [Siting]</i>			
	Color	Line type	Line Weight	Symbol
AutoDesk Standards	<i>Color code AutoCAD</i>	<i>Line type required</i>	<i>Line weight AutoCAD</i>	<i>Symbol type is user defined</i>
MicroStation Standards	<i>Color code MicroStation</i>		<i>Line weight MicroStation</i>	
Information Assurance Level	<i>Security level credential</i>			
Equivalent Standards	AIXM	<i>AIXM equivalent of feature.</i>		
	FGDC	<i>FGDC equivalent of feature.</i>		
	SDSFIE	<i>SDSFIE equivalent of feature.</i>		
Documentation and Submission Requirements	The required documentation for feature class elements. Minimum requirements are defined in paragraphs 1.5.2 and 1.5.3. Additional or expanded documentation requirements are located here.			
Related Features				
Data Capture Rules: <i>Description of proper collection limits and requirements for feature class element.</i>				
Monumentation	<i>Monumentation requirements.</i>			
Survey Point Location	Horizontal		Vertical	
	<i>Description of specific HSP location.</i>		<i>Description of specific VSP location.</i>	

Accuracy Requirements (in feet)	Horizontal	Vertical	
		Orthometric	Ellipsoidal
		Accuracy requirement	Accuracy requirement
Resolution	Geographic Coordinates	Distances and Elevations	
	Coordinate resolution requirement	Coordinate resolution requirement	
Feature Attributes			
Attribute (Datatype)	Description		
Name of attribute field	Description of attribute specifications		

Airports GIS

► Features and Attributes

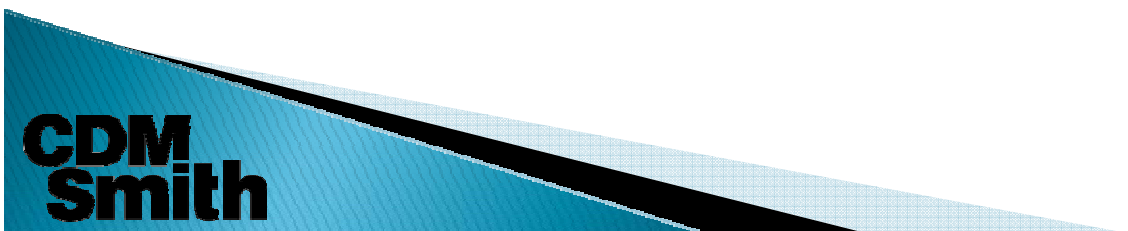


Lessons Learned & Recommendations

- ▶ Not everything is going to fit!
 - Get friendly with the FAA GIS Helpdesk
 - Example: Parcels ID's
- ▶ Differences between eALP.gdb schema and existing data/management systems
 - Example: Pavement
- ▶ There are still bugs
 - Stay friendly with FAA GIS Helpdesk
 - Pass these on! They want to know!
 - Examples: Domains, GIS Field Values vs. 18B
- ▶ As big-and-bad as the AC is, some topics and descriptions are very generalized.

Lessons Learned & Recommendations

- ▶ Be an early adopter, be prepared
 - If you have a system in excellent shape, roll it up into eALP format
- ▶ Be open to a new schema, new thinking, new purpose
 - Example: utilities
- ▶ Prioritize
 - Safety-Critical vs. Non Safety-Critical
- ▶ Challenge – managing both systems
 - Day-to-day GIS geodatabase
 - eALP geodatabase



Sources & Thanks

▶ FAA

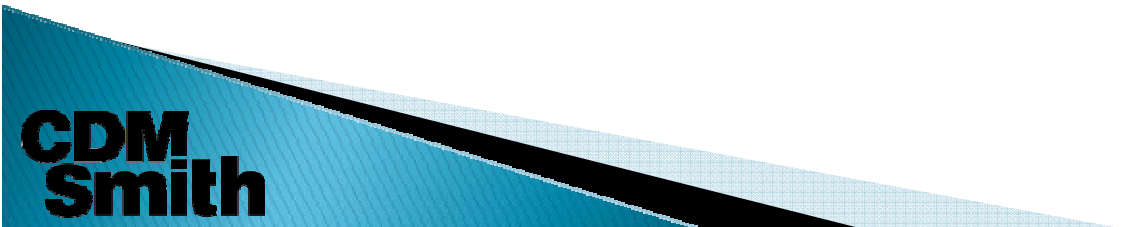
- http://www.faa.gov/airports/planning_capacity/airports_gis_electronic_alp/
- <http://www.faa.gov/nextgen/>
- http://www.faa.gov/nextgen/why_nextgen_matters/
- http://www.faa.gov/nextgen/why_nextgen_matters/what/
- AC 150/3500 18-B

▶ Esri

- <http://www.esri.com/software/arcgis/extensions/aero-solution>

▶ DFW

- Dave DeSanto
- One of the first pilot airports for eALP



Thank you!

► Questions?

SCAUG 2013
Addison, TX

Andrew Clem, GISP

 @MapHound

 [linkedin.com/in/andrewclem/](https://www.linkedin.com/in/andrewclem/)

