

Airport Surveying – GIS Program

Presentation to:

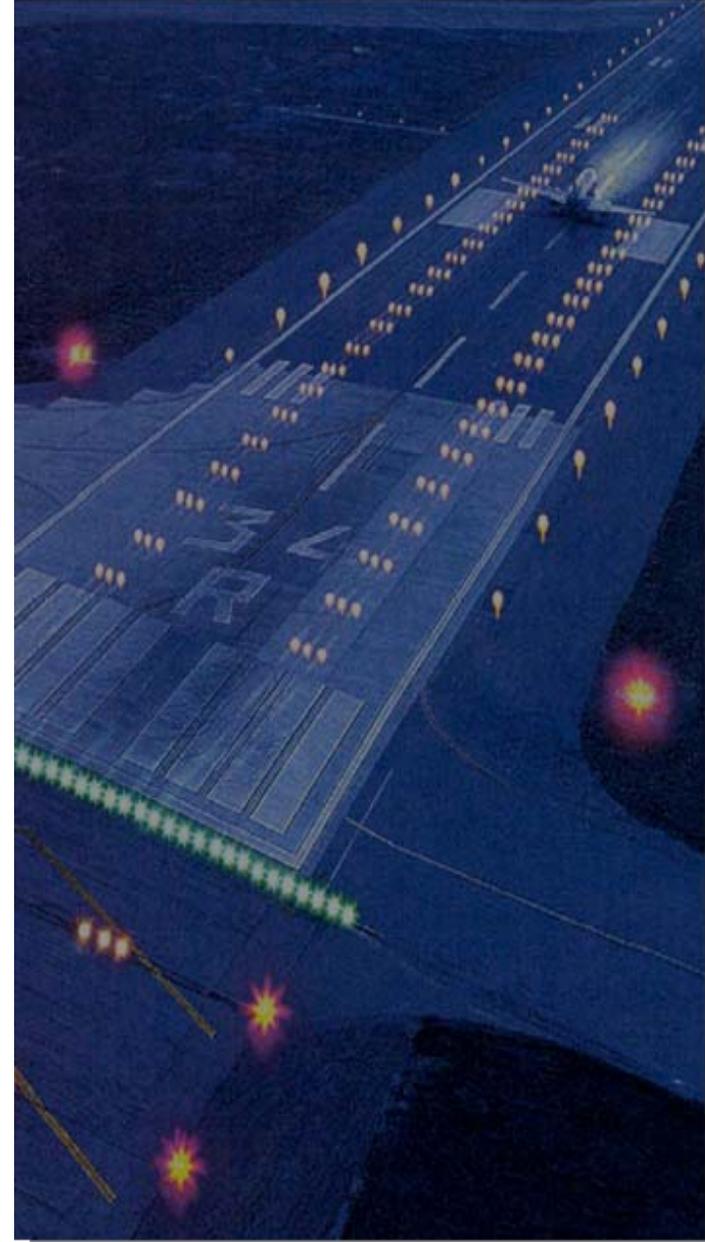
Northwest Mountain Airports
Conference

Name:

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Date:

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Overview

✓ **Why Implement Such a Program?**

- Program Vision
- Program Objectives
- Program Benefits
- Program History

✓ **Airport Surveying**

- Program Vision
- Program Objectives
- Airport Surveying-GIS Program
- Data Approval Process
- Why Validate the data?

✓ **Geospatial Data Standards for GIS**

- Program Vision
- Program Objectives
- Geospatial Features
- Technical Architecture

Program Vision

Provide for a reduction and eventual elimination of funding spent for resurveying by establishing a standardized repeatable program to capture the data in an appropriate format and to an accuracy from the internal and external customers in submitted data sets.

Program Objectives

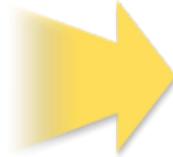
- Increase the Number of Surveys Conducted Annually
- Provide a data standard for GIS capable of supporting the needs of the FAA and individual airports.
- Move toward the implementation of Digital ALPs and OC Drawings.

Program Objectives

- Reduce the FAA's use of NGS for field surveys and transition the requirements for aeronautical and airport surveys to commercial enterprises
- Allow surveys conducted by commercial enterprises to use State & Local Aviation Resources as well as Federal Grants.
- **Standardize** the process of airport and aeronautical surveys in a **cost-effective and expedited manner**

Program Benefits

**Greater
Productivity**



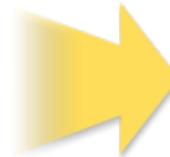
**Increased data verification by
government technical experts in the
field for FAA**

Dependable



**The survey data is verified and metadata
(data about the data) developed for use by
authorized groups and agencies**

Connected



**Connect airports and other organizations via
central data services**

Best Economics

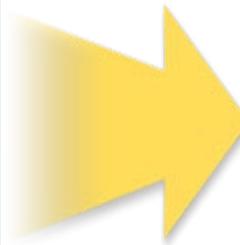


**Maximizes business value by collecting
survey data one time for analysis, planning,
engineering, procedure development, and
charting**

Program's Role in ALP Process

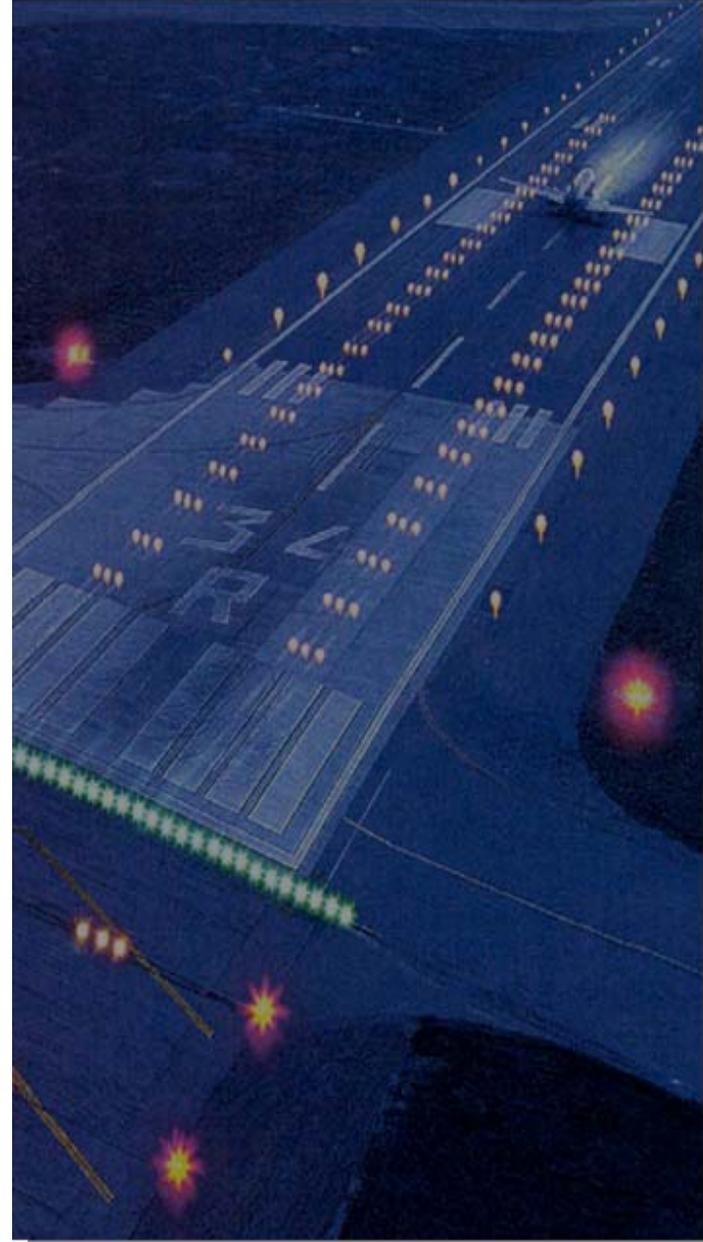
The Airport Surveying-GIS program provides a single portal for the collection and dissemination of standards based validated source data to support future design, mapping, surveying, and construction activities from a known good (validated) and maintained data set.

Airports-GIS provides the foundation for connecting the airports, FAA, and other agencies



A central database for storing survey, charting, analysis, and planning data

Airport Surveying



Vision

To improve the collection and maintenance of airport data through the establishment of a **standardized, repeatable, independently verified** survey program to capture data in an appropriate format against defined standards and accuracies.

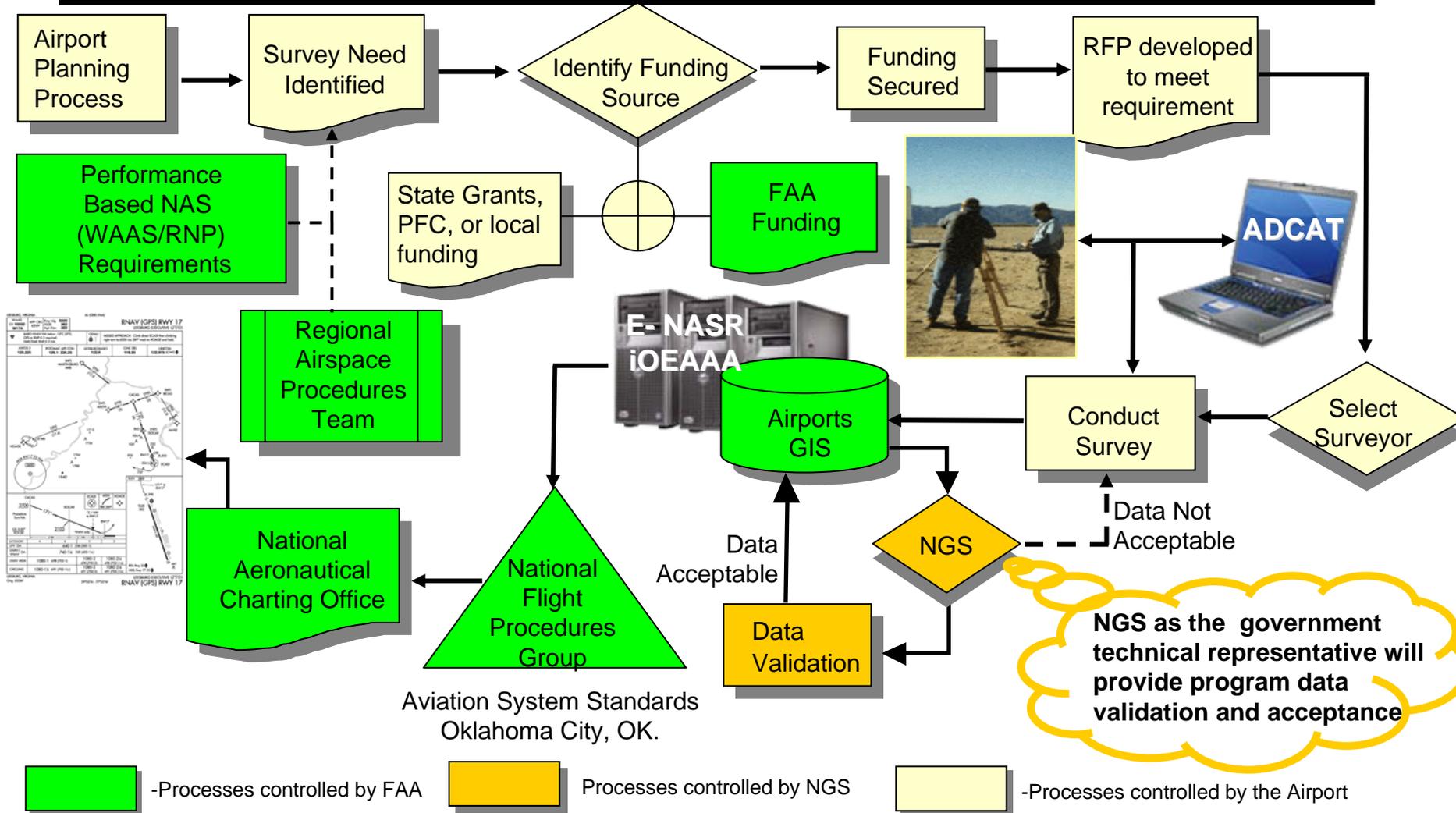
Surveying Objectives

- Create a Standardized Process for conducting airport and aeronautical surveys – Advisory Circulars
 - *AC 150/5300 –16* “General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey”
 - *AC150/5300 – 17* “General Guidance And Specifications For Aeronautical Survey Airport Imagery Acquisition And Submission To The National Geodetic Survey”
 - *AC 150/5300-18* “General Guidance and Specifications for Submission of Aeronautical Surveys to NGS: Field Data Collection and Geographic Information System (GIS) Standards “

Surveying Objectives

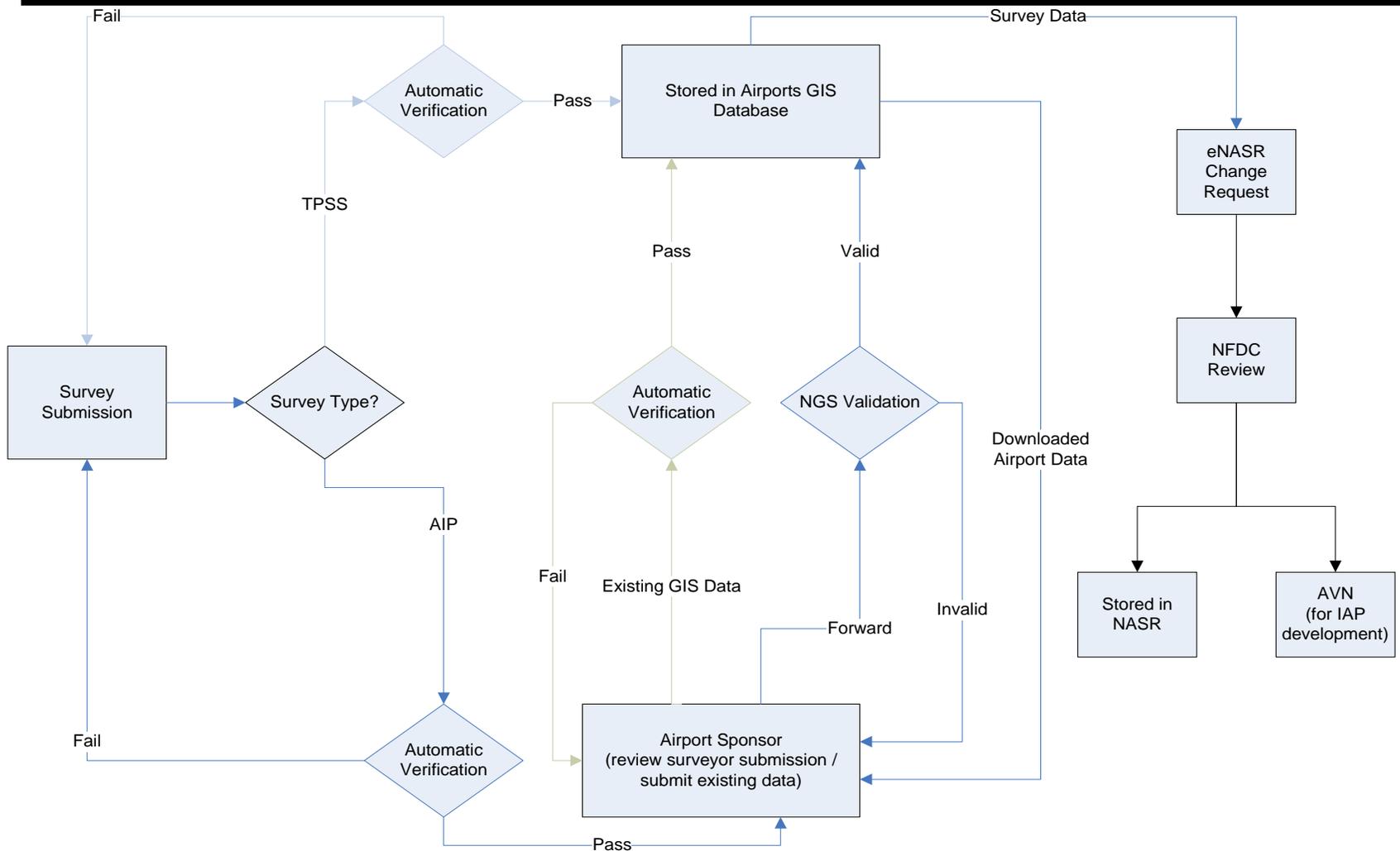
- Guidance and specifications allowing airports to produce digital data meeting FAA needs against defined verifiable standards
- Develop tools for airports and surveyors to capture and provide survey data in digital form
- Provide a means to acquire essential data ***as it is created*** in a digital form with associated metadata
- Develop technical guidance, instructions and templates on contracting out and/or conducting aeronautical surveys for use by airport sponsors

Airport Surveying-GIS Process



NGS as the government technical representative will provide program data validation and acceptance

Integrated Surveying Process



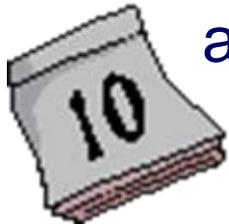
Data Approval Process



Submit airport geodetic control data to NGS via their project web site

<http://www.ngs.noaa.gov/PROJECTS/proposals/project1.shtml>

There is no cost to submitters for NGS quality review, archiving, and distribution functions for survey data submitted.



Expect 10 days for NGS review and approval

Data Approval Process



Imagery must be flown no more than 6 months prior to field survey

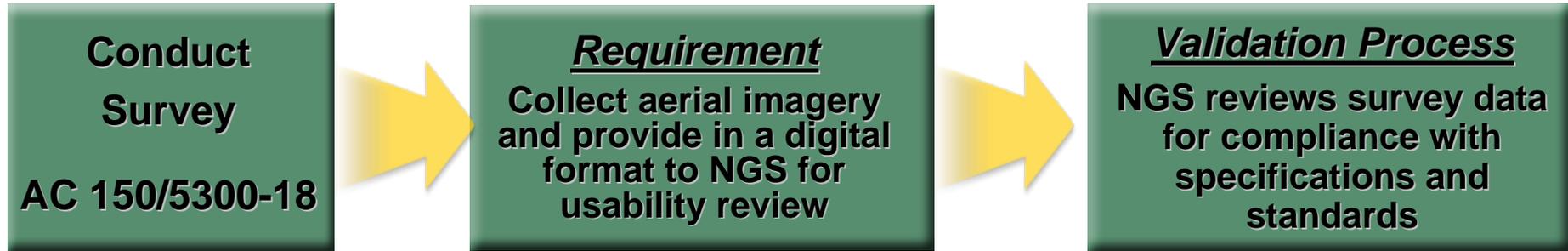
Submit project imagery to NGS and FAA for review on removable media (DVD or CD)

Purpose of imagery is NGS validation and to provide Airports –GIS with a base mapping capability

Expect 5 days for NGS review and approval



Data Approval Process



Submit survey data through FAA Airports GIS website

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

Survey Data Exchange Methodologies (ADCAT and LandXML)



Expect 10 days for NGS review and approval

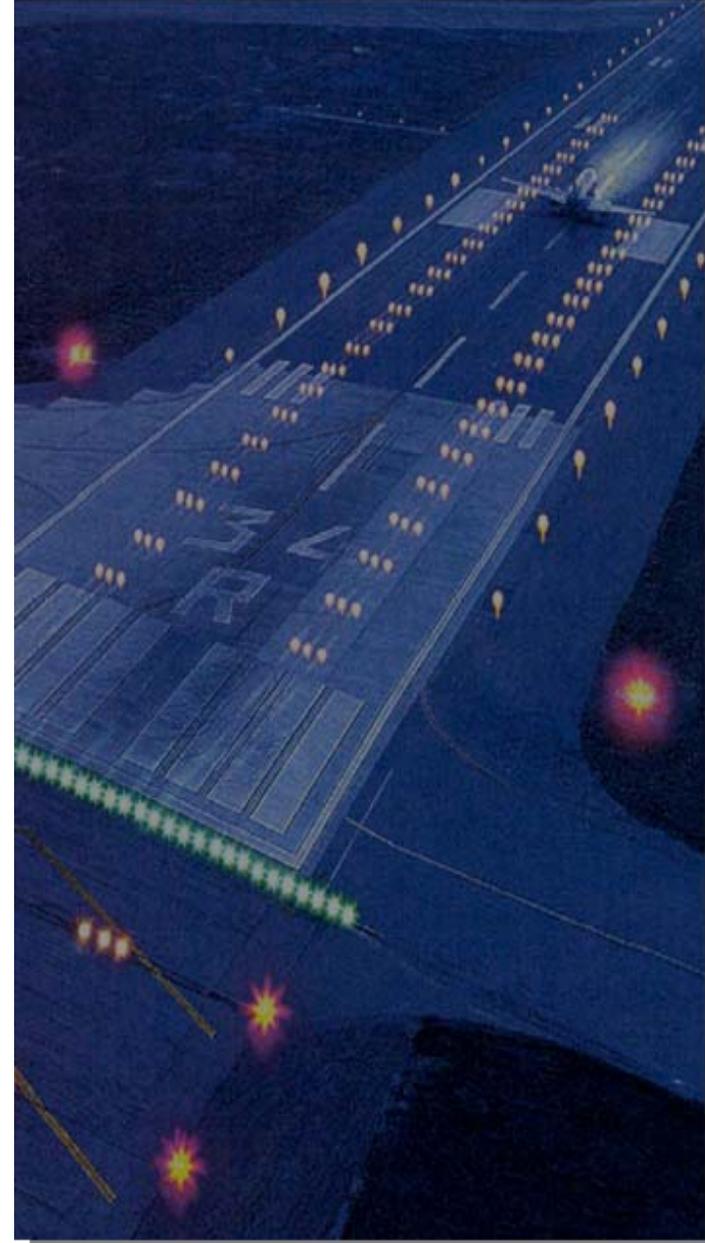
Why validate the data?

- The three pilot surveys conducted for the program identified the following areas
 - Professional Surveyors are not familiar with Airports and Airport Terminology
 - Professional Development training is required to teach Airport Surfaces and Airport Terminology

Why Validate the Data??



Geospatial Data Standards for GIS



Vision for Geospatial Data

Provide an interoperable web-based system for the collection, management, maintenance and sharing of airport data addressing the needs of the FAA lines of business ***collectively*** rather than individually.

Geospatial Data Objectives

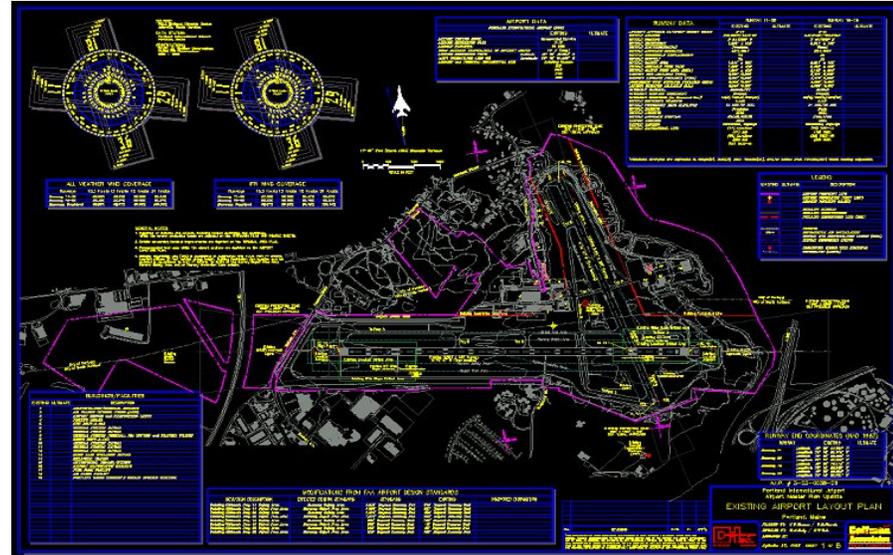
- Consolidate all FAA airport data requirements into a new standard for airport data to support FAA and industry
 - Develop a comprehensive airport geo-spatial data standard
 - RTCA DO-272, “User Requirements for Aerodrome Mapping Information”
 - RTCA DO-276, “User Requirements for Terrain and Obstacle Data”
 - AirMAT Model
 - EuroControl AICM/AIXM
- Collect and maintain Airport data digitally
- Eliminate redundancy
 - Fewer airport surveys
 - Standard feature identification scheme
- Eliminate disparate data sets



Geospatial (Digital) Data ...

The Opportunity...

- ✓ The Airports Division currently funds Airport authority geodetic surveys for ALP development, and the survey results are often delivered with varying degrees of accuracy, media formats, and related data.
- ✓ Airport Layout Plans (ALP) are a graphic representation of current and future airport development as formally adopted by the sponsor and approved by FAA.
- ✓ Airport Layout Plans (ALP) are required by the Airport Improvement Program (AIP). Each NPIAS airport must maintain a current ALP.
- ✓ The FAA is already paying collect this data, now let's move the data into a reusable and validated source data.



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

Geospatial Data Standard for GIS

- AC 150/5300-18 Airport Geospatial Data Standards
 - Based on Aeronautical Information Conceptual Model (AICM)
 - Replaces Appendix 15 in AC 150/5300-13
 - Industry Standards and Support
 - Contents
 - Features
 - Attributes
 - External Data Tables
 - Imagery

Geospatial Data Standard for GIS

- **What is AIXM ?**

- Aeronautical Information Exchange Model
- Based on International Standards Organization 19107 Spatial Schema – basis for Geometry Markup Language (GML) an eXtensible Markup Language (XML) grammar for spatial features
- Use of GML increases the potential for users (airports) to leverage Commercial Off The Shelf (COTS) GIS Tools
- Provides for the exchange of data without translation throughout FAA lines of business
 - Sector Design Analysis Tool (SDAT)
 - Interactive Obstruction Evaluation Airport Airspace Analysis Tool (iOEAAA)
 - Temporary Flight Restriction (TFR) Builder\
 - National Airspace System Repository (NASR)

Airports-GIS Data Potential Uses

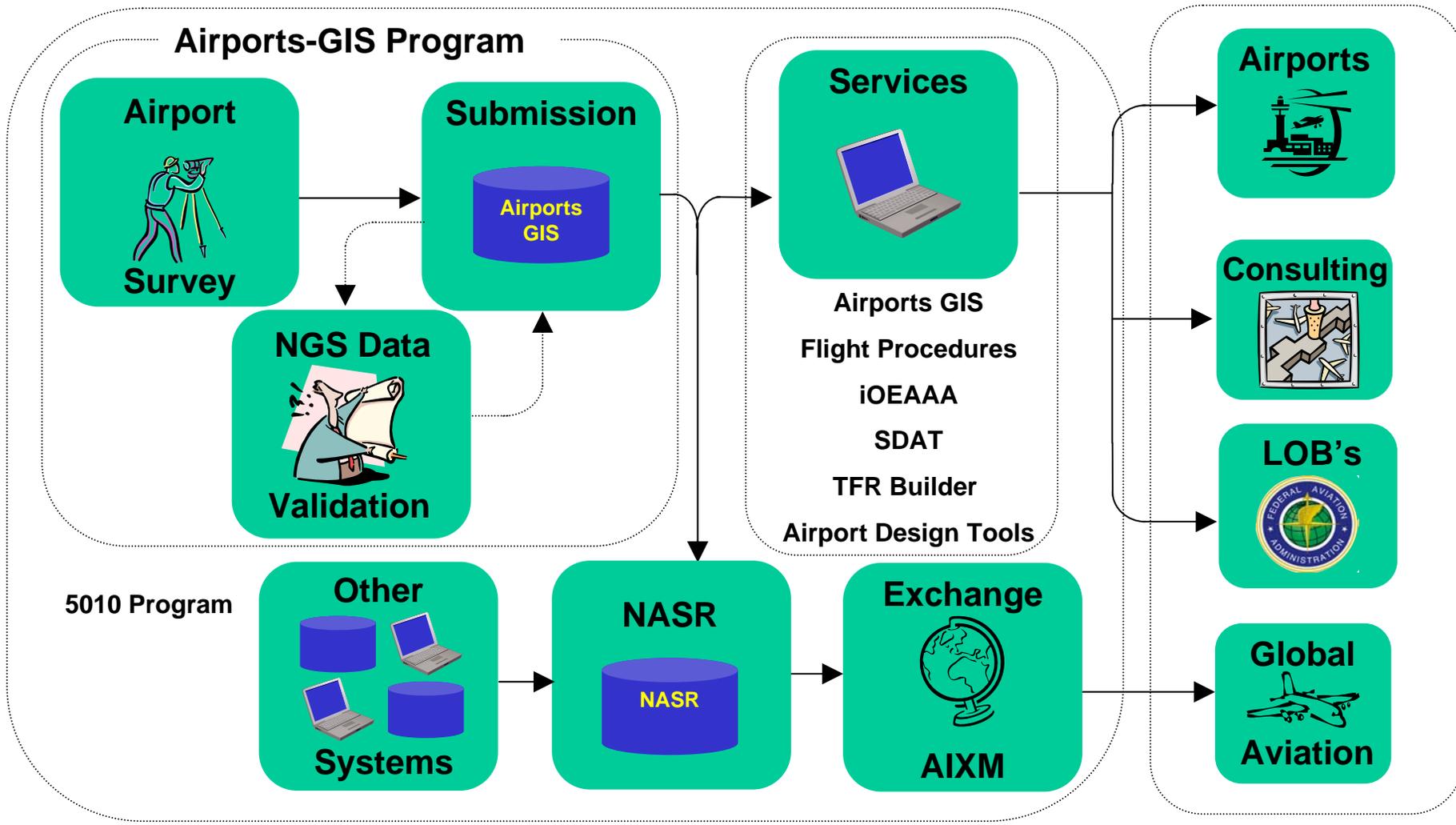
- Obstruction Evaluation
- Airport Airspace Analysis
- Construction Projects
- Aviation Notices (NOTAM)
- Approach Procedures
- Environmental Analysis
- Airport Design
- Utility Management
- Wildlife Strikes
- Moving Maps
- Airport and System Planning
- NAVAID Establishment
- Ground Transportation
- Land Use
- Noise Monitoring
- Property Management
- FAA & Industry Publications
- ATCT Procedures
- Simulation & Training
- Pavement Management

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

Airports GIS Features

- Web-based interface
- Support conversion between three file formats
 - AutoCAD
 - ESRI Shape Files
 - Microstation
- Web-based map viewer
- FGDC compliant Metadata
- Multiple configuration/version support
 - Analysis, Planned, Pending, Validated
- Obstruction Chart creation and printing
- XML support

FAA Data Sharing Model



Questions

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