Airports & GIS: Leveraging Required Data to Improve Business & Safety

Esri User Conference
July 13, 2017
Outline

▪ How Airports Use GIS
▪ FAA Airport GIS
▪ RNO Project Overview
  ▪ Data Development
  ▪ Technical Architecture
  ▪ Applications and Systems Integration
  ▪ Policies and Procedures
▪ Questions
Geographic Information is Everywhere
GIS Lets Us Use Data

GI + S =

Geometry
Attributes
Metadata

Network
Devices
Server

See
Understand
Speak
Benefits of GIS for Airports

▪ “See” – Increased Situational Awareness
  ▪ Where facilities, assets and issues are
  ▪ Relationship to surrounding environment
  ▪ Obstructions to airspace surfaces

▪ “Understand” – Decision Support
  ▪ Facilitate analysis with data and tools
  ▪ Less time spent reviewing proposed changes
  ▪ Improved collaboration

▪ “Speak” – Improved Communication
  ▪ Topics presented in a familiar context
  ▪ Visuals tailored to the audience
  ▪ Complex topics presented in intuitive format
Evolution of GIS Applications

1. Commercial Off the Shelf
2. Customized GIS Viewer
3. Viewer Configured to Support a Specific Audience
4. Application Developed to Support a Particular Process
5. Integration with other Systems
Example of GIS Applications

Lease Management

Planning

Signage & Marking

Special Systems
Support of Other Systems

- Asset Management
- Property Management
- Document Management
- Maintenance & Work Order Management
- Computer Automated Dispatch
- Invoicing and Accounting
FAA Airports GIS
Benefits of FAA Airports GIS

To the FAA:
- Central Data Source
- Support of NextGen
- Procedure Design
- Improve ALP Process
- Airport Coordination
- Allocation of Funds

To Airports:
- Grant Compliance
- Data Augmentation
- Leverage FAA tools
- Entry Point into GIS
- FAA Coordination
- Faster Approvals

Mutual Benefits:
- FAA and Airports Accessing Most Up-to-Date Data
RTAA Project Overview
Project Objectives

✓ Develop and Deliver eALP
  ✓ New high quality data will support RTAA applications
  ✓ New aerial imagery
  ✓ New topographic data
  ✓ FAA Compliance (Requirement for FAA Grant/NextGEN Implementation)

▪ Value Added GIS Applications
  ✓ Provide a viewer to access the new data
  ✓ Establish a foundation for solutions
    ▪ Integrate with other systems
    ▪ Prioritized/cost effective implementation (maximize ROI)

✓ Scalable for Future Phases/Growth
Stakeholder Meetings

- Properties
- Facilities & Maintenance
- IT
- Engineering & Planning
- Air Service
- Operations
- Finance
Information Gathering

- What geographic information do you need/can provide?
- What sources are we missing?
  - The team has received:
    - RTAA GIS Implementation Plan
    - ALP
    - Exhibit A
  - Part 77 Airspace Plan
  - Terminal Floor Plans
  - Signage and Marking Plan
- What systems do you use?
- What tools and applications do you need?
- Where do you need them (desk, vehicle, on foot)?
**FAA Data Submission**

### Survey File Details

<table>
<thead>
<tr>
<th>Item</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Features Uploaded:</td>
<td>249527</td>
</tr>
<tr>
<td>Number of Valid 5300/18 Features:</td>
<td>249527</td>
</tr>
<tr>
<td>Number of Invalid Features:</td>
<td>0</td>
</tr>
<tr>
<td>Number of Warnings &amp; Errors:</td>
<td>0</td>
</tr>
</tbody>
</table>

**Feature List**

- AIRCRAFTGATESTAND (01)
- AIRCRAFTMOVEMENTAREA (20)
- AIRFIELDLIGHT (2199)
- AIRPORTBOUNDARY (15)
- AIRPORTCONTROLPONT (7894)
- AIRPORTPARCEL (269)
- AIRPORTSIGN (409)
- APRON (8)
- BRIDGE (6)
- BUILDING (1172)
- CONSTRUCTIONAREA (3)
- COORDINATEGRIDAREA (91)
- COUNTY (1)
- DECIDUERA (7)
- DRIVEWAYAREA (276)
- DRIVEWAYCENTERLINE (281)
- EASEMENTSANDRIGHTOFWAY (67)
- ELEVATIONCONTOUR (13453)
- ENVIROMENTALCONTAMINATIONAREA (5)
- FENCE (2790)
- FLOODZONE (66)
- FLORASPECIESITE (5772)
- FORESTSTANDAREA (1709)
- GATE (389)
- IMABAREA (46)
- LANDMARKSECTION (924)
- LANDUSE (143374)
- MARKINGAREA (221)
- MILEMARKER (6000)
- MOVEMENTAREA (137)
- MUNICIPALITY (1)
- NAVADIRCTRICALAREA (7)
- NAVADEQIPMENT (28)
- OBSTACLE (3413)
- OBSTRUCTIONAREA (40)
- OBSTRUCTIONCONT (33)
- PARCEL (45566)
- PARKINGLOT (301)
- PASSENGERALIGHTSBRIDGE (23)
- RAILROADCENTERLINE (485)
- RESTRICTEDACCESSBOUNDARY (1)
- ROADCENTERLINE (253)
- ROADPOINT (496)
- ROADSEMENT (445)
- ROOF (4316)
- RUNWAY (3)
- RUNWAYALASTAD (6)
- RUNWAYCENTERLINE (3)
- RUNWAYELEMNT (7)
- RUNWAYEND (6)
- RUNWAYHELPDEPDESIGNSURFACE (67)
- RUNWAYINTERSECTION (2)
- RUNWAYLABEL (6)
- RUNWAYPROTECTAREA (11)
- RUNWAYSAFETYAREABOUNDARY (1)
- SECURITYAREA (1)
- SECURITYIDDISPLAYAREA (1)
- SHORELINE (150)
- SHOULDER (103)
- SIDEWALK (722)
- STATE (1)
- STEELAREA (2)
- TANKSITE (67)
- TAXIWAYELEMNT (85)
- TAXIWAYHOLDINGPOSITION (35)
- TAXIWAYINTERSECTION (43)
- TOADODDHRP (2)
- TOWER (10)
- UTILITILINE (161)
- UTILITYPOINT (4599)
- UTILITYPOLYGON (187)
- WETLAND (15)
Building Datasets and Submitting to FAA
Technical Architecture
Objective of Target Architecture
Goal is an Enterprise GIS

A geographic information system that is intended to meet the needs of and promote collaboration between divisions of the Airport
Next Steps
Next Steps

- Establish GIS Framework
- Deploy
  - Data Viewer Application
  - eDoc Discovery Application
  - Lease/Property Application & Integrate with GCR ABM
  - Airspace Analysis Application
  - Signage and Marking Application
  - Mobile Capabilities
- Delivery of Data Standards, Policies, and Maintenance Procedures
## Reno-Tahoe Airport Authority

### Web Application Portal

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>GIS Data Viewer</td>
<td>View and interact with layers</td>
<td>* available to all users</td>
</tr>
<tr>
<td>eDoc Search Tool</td>
<td>Use this tool to assign files to grid cells</td>
<td>* available to specific groups</td>
</tr>
<tr>
<td>Airspace</td>
<td>View and interact with Airspace data</td>
<td>* available to specific groups</td>
</tr>
<tr>
<td>Economic Development</td>
<td>View and interact with GIS Data for Economic Development</td>
<td>* available to specific groups</td>
</tr>
</tbody>
</table>
Data Viewer Application
Data Viewer Application

Organization Wide Access

Layer Control/Object ID

Mark-Up/Measurement Tools

Exhibit Creation

ARORA

esri Partner Network Silver
Document Discovery Application
Document Discovery Application

Pick on Grid Cell (Fire Grid)
Document Discovery Application

Results meeting criteria are automatically selected.
Document Discovery Application

Multiple Filters:

- File Name
- Grid Cell(s)
- Comments

- C(28).jpg
- C(29).jpg
- C(3).jpg
- C(30).jpg
- C(31).jpg
- C(4).jpg
- C(5).jpg
- C(6).jpg
- C(7).jpg
- C(8).jpg
- C(9).jpg
- COMcheck Envelope pg-1.png
- COMcheck Envelope pg-2.png
- COMcheck Mechanical Comp pg-1.png
- COMcheck Mechanical Comp pg-2.png
- COMcheck Mechanical Reqs pg-1.png

Multiple File Types:

- AutoCad DWG (120)
- PDF (183)
- JPEG Image (427)
- MS Word (5)
- Layer File (1)
- PNG Image (7)
- Tiff Image (5)
- MS Excel xlsx (11)
- MS Excel xls (1)
- Map Package (1)
- Map Document (2)
Document Discovery Application

Filter results by numerous variables
Property and Leasehold Management

Business Systems Integration

Agreement ID = 1838
Agreement Number = 1002
Agreement Title = Delta Airlines Use and Lease
Agreement Type = SIG
Agreement Status = COMPL
Description = Delta Airlines Lease Signatory

Airport Business Manager (ABM)
Mobile Data Collection

Add Information

Publish “on-the-fly”
Or Download once back in office
Mobile Data Collection

- CLT Noise Exposure Map Update (2015)
  - Quickly verified and collected noise sensitive locations
  - Over 9,000 sites evaluated in 1 week
Mobile Data Collection

- PHL ADA Compliance Self-Evaluation (2016)
  - Developed custom ADA compliance database
  - Over 7,000 features field surveyed
  - PHL continuing to use & update database for ADA compliance efforts
Mobile Data Collection

- **FLL Amenities Collection (2017)**
  - Continued use of data collection methodology
  - Over 1600 amenities captured
  - BCAD can leverage for a wide range of uses
    - Asset Tracking / Management
    - Wayfinding / Pax Experience
Mobile Data Collection

- **DFW Signage Collection (2017)**
  - Over 21k signs to be captured
  - 4.5 month schedule
  - Arora scope
    - Data collection app development
    - Orientation/training
    - Data attribution support
Questions