Geospatial Data Collection for the FAA Airports GIS Program

A Change in Direction

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# What is the FAA Airports GIS Program

- About 544 airports have commercial service in US
- About 3,330 receive federal funding and are included in the National Plan of Integrated Airport System (NPIAS)
- There are about 13,188 Airports and 5,581 Heliports
- Of those about 8,310 Airports and 5,513 Heliports are private use landing facilities.
- About 19, 440 landing facilities in the FAA database including seaplane bases, gliderports, balloonports and ultralight Flightparks

## Full Feature Geospatial Data Collection

<table>
<thead>
<tr>
<th>Limited geospatial features and attributes</th>
<th>2014</th>
</tr>
</thead>
</table>

https://airports-gis.faa.gov/
### January 1, 2013 US Landing Facilities

<table>
<thead>
<tr>
<th>Total</th>
<th>Airport</th>
<th>Heliport</th>
<th>Seaplane</th>
<th>Glider</th>
<th>Balloon</th>
<th>Ultralight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Use</td>
<td>5,171</td>
<td>4,878</td>
<td>68</td>
<td>217</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Private Use</td>
<td>14,269</td>
<td>8,310</td>
<td>5,513</td>
<td>277</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td><strong>19,440</strong></td>
<td><strong>13,188</strong></td>
<td><strong>5,581</strong></td>
<td><strong>494</strong></td>
<td><strong>35</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2012</th>
<th>Airport</th>
<th>Heliport</th>
<th>Seaplane</th>
<th>Glider</th>
<th>Balloon</th>
<th>Ultralight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed</td>
<td>84</td>
<td>34</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Opened</td>
<td>58</td>
<td>66</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Change</td>
<td>-26</td>
<td>+32</td>
<td>-1</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>
National Plan of Integrated Airports Systems 2013 - 2017

3,355 NPIAS Airports
(Of the 5,171 existing public use airports, 64% are NPIAS)

3,330 Existing
3,253 Public Owned
77 Private Owned

25 Proposed

- 378 Primary
- 121 Nonprimary Commercial Service
- 268 Reliever
- 2,563 General Aviation
- 2 Primary
- 4 Nonprimary Commercial Service
- 0 Reliever
- 19 General Aviation

http://www.faa.gov/airports/planning_capacity/npias/
The Federal Aviation Administration
45,000 employees

Safety (AVS)
Flight Standards

Air Traffic Organization (ATO)
AIM
NFDC
Airnav Products
NASR

Office of Airports (ARP)
450 employees
Justification for Airports GIS

- **Improve Efficiencies**
  - Single, authoritative, accessible data source

- **Reduce Costs**
  - Airports, FAA, consultants

- **Improve Safety**
  - Increased need for real-time data accuracy

- **NextGen**
  - A repository of airport information (not just survey data)
Data Collection Requirements

- **AC 150/5300-16 Geodetic Control**
  - National Geodetic Survey (NGS) reviews

- **AC 150/5300-17C Imagery Requirements**
  - Submit Plan in Advance, equipment, ground control
  - Imagery Reviewed and checked for accuracy
  - Imagery used for feature extraction

- **AC 150/5300-18B Feature and schema standards**
  - About 34 safety critical features –
    - Runways, taxiways and safety features - Reviewed
  - About 135 features with attributes
    - 1 foot elevation contours, buildings, proposed features
    - Electronic Airport Layout Plan (eALP)
Data Distribution Before Airports GIS

- No aerial photography
- Airport Layout Plan @ ADO
  - Paper
  - PDF
  - CAD
- Obstruction Surveys to National Geodetic Survey (NGS)
- No airport Data @ HQ
- 5010 Data to NFDC
Data Distribution After Airports GIS

- No aerial photography
- Airport Layout Plan @ ADO
  - Paper
  - PDF
  - CAD
- Modification of Standards @ ADO
- Obstruction Surveys to National Geodetic Survey (NGS)
- No airport Data @ HQ
- 5010 safety data to National Flight Data Center (NFDC)

- Aerial Photography to Cloud Server
- Digital data eALP derived from feature extraction from photography
- Modification of Standards digital tracking in Airports GIS
- Obstruction Surveys in Airports GIS
- All airport data in Airports GIS including the 5010 data (starting 2013)
How can we use Airports GIS data?

- Grant review and approval
- Project eligibility requirements
- Master Plans/ALPs
- Design review
- Conformity to plans and specifications (as-builts)
- Safety and construction phasing
- Environmental/NEPA
- Obstruction Evaluation (OE) Database/Airspace determinations
- Runway Safety Area determinations
- Compliance/grant obligations
- Compatible Land Use
- Land acquisition
What if... the FAA could capture and validate data against a defined standard, import it from and/or export it to an ALP, and make it available electronically for whoever needs it?
Draw and Measure tool in eALP

https://airports-gis.faa.gov/
Full Feature Airport GIS Implementation

Immediate Steps

Safety Critical Data: if a survey is required for a project involving safety-critical data submit into Airports GIS

Initial Data Collection Projection - Short Term

<table>
<thead>
<tr>
<th>NUMBER OF AIRPORTS</th>
<th>FY10</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14</th>
<th>FY15</th>
<th>FY16</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large and Medium Hubs</td>
<td>4</td>
<td>5</td>
<td>35</td>
<td>15</td>
<td>5</td>
<td>2</td>
<td></td>
<td>66</td>
</tr>
<tr>
<td>Small and Non Hubs</td>
<td>3</td>
<td>15</td>
<td>12</td>
<td>100</td>
<td>100</td>
<td>34</td>
<td></td>
<td>264</td>
</tr>
<tr>
<td>Non Primary Certified</td>
<td>0</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>100</td>
<td>45</td>
<td>36</td>
<td>221</td>
</tr>
<tr>
<td>Towered not Certified</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>150</td>
<td>104</td>
<td>274</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7</td>
<td>30</td>
<td>57</td>
<td>135</td>
<td>225</td>
<td>231</td>
<td>140</td>
<td>825</td>
</tr>
</tbody>
</table>

Most requested data – 1 foot elevation contours for planning and preliminary design
AC 150/5300-17C, Standards for Using Remote Sensing Technologies in Airport Surveys

- Mandatory for all Federally Funded Airports
- Survey required for Safety Critical Projects
  - Master Plans, Airport Layout Plan updates
  - Instrument Procedures Updates
  - Major Construction Projects
  - Maybe required for off airport FAA installed Navaids
- Aerial Photography Required
- LIDAR permitted but must be cost effective
Data Required

- 3,331 NPIAS Airports
- Major airports require updates 3-5 years
- 4000 projects per year (60%-70% require survey)
  - Peak Data collection time
- 15 years to collect all airports
- Unless we find ways to reduce future costs it will cost over $1,000,000,000.
- Can we leverage LIDAR (aerial or ground based) with other airport or FAA data needs?
Exceptions to AC 150/5300-17C

• Provided a Modification of Standards to allow Satellite imagery for 5300-18B
  – Five Airports in the Marshall Islands
  – Digital Globe providing imagery

• For the top 1,000 airports we want our current 5300-18B standard of data collection

• What ways can we leverage technology for the remaining 2,300 airports to collect data faster and cheaper?
Aeronautical Data Management (ADM)

- Aeronautical Data Management (ADM)
  - NavLean initiative under ATO
  - 1 Year of planning and Executive buy in
  - NavLean Office to Manage
  - Schedule 6 Jan 2012 to May 30 2013
    - Expect starting money very soon
    - Includes changing 5010 data to Airports GIS Web Interface
    - Includes change of Airport Data Order and AC 5300-19

- **AIM Agreement to Cooperate with ARP**
  - Airports GIS is Authoritative Source
  - All Surveys enter into Airports GIS
  - AIM will use Airports GIS for
    - Airport Diagrams, Digital NOTAMs, LVO/SMGCS Charting
Thank You: Questions Welcome!