SPRING 2017 WORKSHOP

Introduction to Airports GIS and Project Scoping

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What is Airports GIS (AGIS)

Airports Surveying Geographic Information System (Airports GIS) helps the Federal Aviation Administration (FAA) collect airport and aeronautical data to meet the demands of the Next Generation National Airspace System.

It is a tool to store, use and disseminate Geospatial information in graphical and database form.

Accessed On-line
Maintaining Data

• **Tools for Maintaining Data**
  - Data Submittal Standards
  - Data QC / QA Procedures
  - Contract Language for Deliverables (GIS!)
  - Conditional Payment Clauses
  - Contractor Upload-to-FAA Requirements
Airports GIS Project Flow

Project Creation - Airport
Assignment of Representatives - Airport
Upload Statement of Work - Airport (Consultant)
SOW Concurrence - FAA (HQ or Region)
Plan Submittal(s) - Consultant
Plan Approval(s) - NGS
Project Execution - Consultant Team

Deliverables - Consultant □ Airport
Data Verification/Validation - NGS
Data Use - FAA/Others
Project Creation in Airports GIS

Airport Sponsor/ Operator Responsibility
Can be delegated to State Agency through Letter of Authorization
Reference to Online Help
Create an Airports GIS Project

Step 1 of 4: Airport & Project Type

- **Airport:** BWI - BALTIMORE/WASHINGTON INTL THURGOOD MAR
  
  This is an "auto-lookup" field: type locator ID or airport name.

- **Project Type:**
  - New Airport Survey Project
    
    This project involves a new airport survey meeting the AC 150/5300-18 standards.
  
  - Existing Airport Data Project
    
    This project involves current airport data in use that was transformed to meet the AC 150/5300-18 standards and is being provided to Airports GIS.
  
  - Design/As Built Airport Data Project
    
    This project allows an incremental workflow, starting from proposed airport information, adding more detailed and more accurate design information, and culminating in a set of features that represents the as-built state of the airport.

Next
Create an Airports GIS Project

Step 2 of 4: Airport Category & Level of Verification

- **Airport Category:**
  - NPIAS Part 139 Airport
  - NPIAS Non-Part 139 Airport
  - Non-NPIAS Airport

- **Verification Options:** Select data for verification as appropriate. There is no verification for an **Design/As Built Airport Data** project.
  - [ ] I will submit Imagery Data for verification
  - [ ] I will submit Geodetic Control Data for verification

Next
Create an Airports GIS Project

New Survey Project Form

Step 3 of 4: Additional Data

- Purpose of Survey:
  - Airport Airspace Analysis - Non-Vertically Guided
  - Airport Airspace Analysis - Vertically Guided
  - Airport Layout Plan - Airport Design or Planning
  - Airport Layout Plan - Airport Movement Area Construction
  - Airport Layout Plan - Airport Non-Movement Area Construction
  - Airport Layout Plan - Obstruction Removal IFR Operations
  - Airport Layout Plan - Obstruction Removal VFR Operations
  - Airport Layout Plan - Periodic Update
  - Airport Mapping Database - Initial Development
  - Airport Mapping Database - Periodic Update
  - Airport Obstruction Chart - Initial Development
  - Airport Obstruction Chart - Periodic Update
  - Construction - Airside
  - Construction - Landside
  - NAVAID Siting - Non-Precision/Visual
  - NAVAID Siting - Precision
  - Survey Work - Establish permanent geodetic control (PACS/SACS)

AIP Grant Number: [ ]

Format like: 3-36-1234-012-2005 (must have dashes)
Create an Airports GIS Project

New Project Form

Step 4 of 4: Confirmation

Please confirm your project before submitting:

<table>
<thead>
<tr>
<th>Airport Locator ID:</th>
<th>BWI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Type:</td>
<td>New Airport Survey</td>
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<tr>
<td>Airport Category:</td>
<td>NPIAS Part 139 Airport</td>
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<td>Verification Options:</td>
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<td>Airport Airspace Analysis - Vertically Guided</td>
</tr>
<tr>
<td>AIP Grant Number:</td>
<td></td>
</tr>
</tbody>
</table>

[Back] Submit
Airports GIS

Click on one of the image links on the table of contents below to go directly to the topic of your interest:

- Introduction
  - System Overview
- Access to Airports GIS System - (http://airports-gis.faa.gov)
- Airports GIS Login Page
- Airports GIS Homepage
- User Designated Role and Perspective
- Survey Project - Tools & Facility
- eALP Project -- Restricted Use Only!!!
- Airport Centric -- Restricted Use Only!!!
- Modification of Standards (MOS)
- Imagery and Data - GovCloud -- Restricted Use Only!!!
- Surface Analysis and Visualization -- Restricted Use Only!!!
- Revision History

PROJECT SCOPING
Setting Roles and Responsibilities

• Who is...

  - Creating the Project?
  - Responsible for Interacting with the FAA Website?
  - Creating the Statement of Work and Other Plans?
  - Conducting Surveys?
  - Collecting Aerial Photography, If Necessary?
  - Converting and Preparing Data?
  - Uploading Deliverables to the FAA?
  - Managing the Grant?
Statement of Work

Framework
- FAA/Airport Agreement
- Written from Airport Perspective
- Not Consultant Scope of Services
- NGS Compares Plans to SOW
- See Online Help Templates
- Pre Coordinate with ADO

Components
- Background & Objective
  - RW Extension, with or w/o Safety-Critical Data
- Requirements
  - Plans
- Geodetic Control
- Imagery
- Survey & QC
  - Features
  - As-Built Data
- Graphic
Airports GIS Statement-of-Work

Aeronautical Survey and Airport Airspace Analysis

Administrative

Date: October 6, 2009

Prepared for: Somewhere International Airport (XXX), Somewhere, TX

Airport Contact: Ms. Airport Contact
Planning Director
1234 Airport Drive
Somewhere, NM, XXXXX
Ph: 800.555.5555
airport.contact@Somewhere.org

Prepared by: Mr. Joe Consultant
Consultants, Inc.
Somewhere, USA 76137-0610
Phone:
email address

Planned NTP: Expected Start Date
Estimated Completion: Expected Completion Date (or number of days)

Objectives and Background

The project objective is to extend Runway 13/31 by approximately 880 feet to 8,000 feet and extend the parallel Taxiway A. The extension will be to the RW 31 end. An Aeronautical Survey and Airport Airspace Analysis for vertically-guided operations will be conducted to support FAA development of LPV approaches to both ends. The desired decision altitude (DA) is 250 feet with 1/4 mile visibility minima. The imagery will be acquired while the construction effort is in the grading and drainage phase - approximately 2 years prior to commissioning. In a future A-GIS project, the imagery will be used to map the airport to produce an electronic ALP.

A project schedule could also be included (or attached) with milestones for key activities.

Provide overall project objective(s). Other information potentially included in Objectives and Background could include information on approach light PAPI or REIL relocation, instrument approaches, utilities and environmental.
Project Scoping

Reference -18B, Table 2-1
- Safety Critical Features?
- Imagery Required? Photo Scale(s)?
- Contour intervals?
- Aeronautical Survey and Airspace Analysis Required? Which Runway(s)?
- Design and As-Built Data?
- ALP Follow-on Project?

Identify Responsible Party/Data Source for each Feature/Attribute Statement-of-Work/Implementation Plans

Most Projects Require Some GIS Expertise
**Table 2-1. Survey Requirements Matrix**

This table is designed for use in two ways. First, it defines in a general fashion the tasks required to meet a specific objective. Each task listed is generalized and the process to complete it may 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.

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<th>Intended End Use of the Data</th>
<th>Required Tasks</th>
<th>AC Reference</th>
<th>Category</th>
<th>Operations</th>
<th>Navigational Aid Setting</th>
<th>Airport Layout Plan (ALP)</th>
<th>Airport Obstruction Chart</th>
<th>Construction</th>
<th>Environmental</th>
<th>Pavement Design, Construction, Rehabilitation or Roughness</th>
<th>Airport Mapping Database</th>
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<tr>
<td></td>
<td></td>
<td>150/5300-18</td>
<td>Non-Precision</td>
<td>Precision</td>
<td>Visual</td>
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<tr>
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<tr>
<td>Determine elevation of runways at the intersecting point of the Runway Protection Zone (RPZ) or the runway centerline extended</td>
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### REQUIRED TASKS

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<tr>
<th>OBJECTIVE</th>
<th>Construction Airside</th>
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<tbody>
<tr>
<td>Provide a Survey and Quality Control Plan</td>
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<tr>
<td>Establish or validate Airport Geodetic Control</td>
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<td></td>
</tr>
<tr>
<td>Collect and document helicopter touchdown lift off area (TLQF)</td>
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<td></td>
</tr>
<tr>
<td>Collect and document helicopter final approach and takeoff area (FATO)</td>
<td>‹</td>
<td></td>
</tr>
<tr>
<td>Collect or validate and document airport planimetric data</td>
<td>‹</td>
<td></td>
</tr>
<tr>
<td>Determine or validate the elevation of the Airport Traffic Control Tower Cab Floor (if one is on the airport)</td>
<td>‹</td>
<td></td>
</tr>
<tr>
<td>Perform or validate a topographical survey</td>
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<td></td>
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<tr>
<td>Document features requiring digital photographs</td>
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<td></td>
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<td>Document features requiring sketches</td>
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<tr>
<td>Provide a final Project Report</td>
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</table>
Phase I - **Develop Base Map** *(Estimate 27G days from NIT)*

- Conduct an Obstruction Survey and Conduct Airport Airspace Analysis in accordance with 150 5300-1 SB, Paragraph 2.7
- Set Primary Airport Control Station (PACS) and Secondary Airport Controls Stations (SACS) [per AC 150 5300-1(5A) - if not already present. Re-establish PACS SACS as required.

- Collect Aerial Photogrammetry [per AC 150-5300-17B] - if existing airport survey is over 5 years old. Include additive alternative for One Engine Inoperative surfaces [select option if cost effective - evaluation in later project],
- Evaluate all surfaces for runways with vertical guidance or without vertical guidance per 5300-1SB, 2.7.1.1 or 2.7.1.3.
- Evaluate Certificated Runway Profiles at 10-ft intervals [centerline and 10-ft offsets],
- Evaluate Category 1 and 111 Operations Area (1SB, 2.0.1). Mapping Database Surveys (1SB, 2.10)
- Validate existing EAANGS safety-critical data including NAVAEDS, Runway Ends, etc.
- Submit to FAA Survey Data including safety critical data for approval acceptance by XGS
- Collect GIS Planimetric data [per AC 150 5300-1 SB], identify attributes as required for runways, taxi ways, aprons, buildings, roadways, utilities, etc.
- Collect [from existing sources) and convert to GIS model existing airport Cadastral data for Property boundary, property map, land use, etc. and attribute features,
- Collect [from existing sources) and convert to GIS model existing airport Utility data for. and attribute features
- Submit GIS data features, with attributes for existing airfield

Phase II - **Develop Airport Layout Plan**

- Submit GIS data features with attributes for proposed development on current ALP
- Test Evaluate eALP software tools in development by FAA
Phase A1: Obstruction Survey, Photogrammetry, and Planimetrics

Under Phase A1 of the A-GIS and e-ALP program, IMC will complete the following tasks for KXXX in accordance with FAA Advisory Circulars 150/5300-16A, -17B, and -1 SB, and additional guidance received from the FAA Central Region related to the A-GIS and e-ALP Program.

Geodetic Control

IMC will verify/confirm existing geodetic control in accordance with AC 150/5300-16A, including evaluating the existing PACS and SACS. It is assumed that the PACS and SACS will not need to be re-established. Under this task, IMC will prepare a Survey and Quality Control Plan and work with the FAA to procure all applicable reviews and approvals in accordance with published guidance. IMC will develop all required documentation, digital images, and other data as specified in AC 150/5300-18B for airport surveys.

Imagery

Under this task, IMC will prepare an Imagery Plan, determine proper photo control points required to validate the ABGPS control, comply with flight guidance, imagery quality, and weather/seasonal considerations, and produce the required deliverables for National Geodetic Survey (NGS) review.

IMC will acquire new vertical stereo aerial photography (leaf-on) at a nominal scale of 1:300 for the airport property and 1:2000 for the remaining obstruction surface areas. The aerial photography covers all of the Vertically Guided (VG) Airspace Analysis surfaces using natural color film during leaf-on conditions.
Scope of Work Review

From the 1 =300' aerial photography, IMC will produce:
• Airport property planimetric mapping
• 1-foot contours of the airfield area
• Color Digital with a .25-foot pixel resolution
• Identification and mapping of obstruction obstacles for all of the VGRPS, VGPCS & VGPS surfaces

From the 1 =2000 aerial photography, IMC will produce:
• Limited landmark feature planimetric mapping outside of the airport area
• Color Digital Orthophotos with a 1-foot pixel resolution
• Identification and mapping of obstruction obstacles for all of the VG surfaces

The flight missions will be conducted after September 23 when Runway 09-27 is scheduled to re-open.

What will be produced from each orthophoto... resolution, planimetrics, off-airport data, etc.

Are there any existing construction projects or other airfield issues that might impact the timing of the imagery collection?
Obstruction Survey and Airport Airspace Analysis

IMC will conduct a vertically guided (VG) surface analysis for all existing runways. IMC will conduct an obstruction survey (OS) and an airport airspace analysis (AAA) in accordance with AC 150/5300-16A, -17B, and -13B. IMC will comply with all reporting requirements in AC150/5300-18B section 2.6 while conducting the OS/AAA. IMC will coordinate with the Airport’s FAA Airport Traffic Control Tower (ATCT) management and KXXX Operations for the flight mission and with the ATCT and FAA Technical Operations for access to NAVAID facilities.
Topographic Survey

IMC will generate 1-foot topographic contours for all of the maintained airfield area. The necessary mass points break lines, and supplemental random mass points will be collected in order to create a Digital Terrain Model (DTM) in Autodesk Civil 3D format.

Define topographic deliverables

Topographic data is expensive - clearly delineate the expected coverage
Collect Planimetric Data

IMC will use the photogrammetry as a source for planimetric data development, developing features where possible in accordance with the geometric rules defined in AC150/5300-1 SB section 3.4. Additionally, photogrammetry will be used to collect attributes that can be identified from imagery without requiring additional survey or other information. Refer to the attached spreadsheet for details of features and attributes that will be collected directly from planimetrics/photogrammetry.

Phase A1 Deliverables

A Statement of Work
A Survey and Quality Control Plan per AC 150/5300-1SA and -1 SB
An Imagery Plan per AC 150/5300-1TB
Project Status Report per AC 150/5300-1 SB
Raw imagery will be submitted to NGS for review and approval
Once the raw imagery has been approved by NGS, imagery will be submitted to the FAA
Obstruction Survey/Airport Airspace Analysis will be submitted to the FAA
An interim report at the conclusion of the Obstruction Analysis and Airport Airspace Analysis task
Field Note Information and Data per AC 150/5300-1 SB
Quarterly reports for the FAA Grant (KXXX will submit to FAA)

Address planimetrics - and include an attached spreadsheet for all features and attributes

Consider phasing the project and providing interim deliverables
Additional non-planimetric data (Level D) to be provided to IMC for incorporation into AGIS include:

- Coordinate grid area
- Fence/gate map and numbering system
- FAA lease area for parcels on Airport property
- SI DA maps
- High-jacking/bomb threat location maps
- Hazmat locations
- Sod area maps and numbering system
- Airport driveway maps and names
- Parking lot maps, names, and capacities
- Snow and ice map

IMC will not be held accountable for the accuracy of the non-planimetric data provided by the Airport or other data providers. Refer to the attached spreadsheet for details of features and attributes that will be collected from non-planimetric sources.

**Convert Non-Planimetric Data to GIS Format**

IMC will convert non-planimetric data into GIS format in compliance with the geometric rules defined in AC 150/5300-18B section 3.4. IMC will use a geodatabase to manage data converted to the required format, and will export data from that geodatabase for submittal to the FAA in the required format.

**Phase A2 Deliverables**

- An interim report at the conclusion of the Planimetric, Utility, and Cadastral feature collection
- Field Note Information and Data per AC 150/5300-1 SB
- Airport GIS data of the existing airport infrastructure as defined in AC 150/5300-1 SB will be submitted to the FAA
Phase A3: Proposed Features, Design Surfaces, and eALP Submittal Using FAA Tools

In this phase of the program, IMC will incorporate the planned/proposed features identified on the currently approved Airport Layout Plan. IMC will prepare a base map of the proposed features in AutoCAD and then extract the data into GIS format. IMC will not be performing any planned improvements as part of this effort.

The data will be developed in accordance with the standards defined in AC150/5300-18B and then attributed as required by the FAA.

IMC will also develop the One-Engine Inoperative (OEI) surfaces for informational purposes only; obstruction analysis will not be included for the OEI surfaces.

Upon conclusion of the data development, IMC will upload the planned data to the A-GIS for use in assembling the eALP. The eALP module currently has the five following standard sheets:

- The Future Airport Layout Plan
- Runway End Protect
- Combined Property and Land Use Plan
- Data Sheet
- Airspace Plan

IMC will provide the Airport with six hard copies of the eALP output for review and submittal to the FAA.

Phase A3 Deliverables

- Airport GIS data of the proposed airport infrastructure, imaginary surfaces, and design parameters as defined in AC150/5300-18B will be submitted to the FAA.
- An interim report at the conclusion of submittal of planned and design data.
- An interim report at the conclusion of eALP assembly.
- Project Final Report per AC150/5300-1 SB
- Six hardcopy plots of the eALP output for FAA review and signature,
- Six hardcopy plots of the FAR Part 77 Analysis.
Assumptions

KXXX will grant IMC with access to their account on the FAA A-GIS website and IMC will be designated as an authorized user on the account.
Runway 9-27 will reopen no later than September 23, 2010.
IMC will refer to FAA Advisory Circulars 150/5300-16A, -17B, and -1 SB for detailed guidance in carrying out the program.
IMC will not be held accountable for changes to the advisory circulars or new regulatory guidance that may be published during the duration of the program. Project impacts associated with updates to the Advisory Circular will be evaluated and may require amending the scope and fee.
Longer than planned duration Federal Aviation Administration and National Geodetic Survey reviews will not because for AEGOM’s project to be considered behind schedule.
Planned development will be provided by The XXX Airport from their currently approved Airport Layout Plan. The Airport will request a CADD version of the currently approved Airport Layout Plan from the consultant that produced the ALP.
Imaginary and design surfaces will be incorporated manually rather than automatically generated by the A-GIS application.
The survey information collected in this project will prevail in the event of discrepancies between the existing Airport Layout Plan (i.e. runway end coordinates, etc.) prepared by others and the information collected in this project.
IMC will provide two days of orientation on the FAA’s website and GIS
Hardware or hardware upgrades for KXXX are not included in this scope.
Software or software upgrades for KXXX are not included in this scope.
An Airport Boundary Survey is not included in this task. IMC will utilize the Exhibit A from the Airport’s currently approved ALP Set.

Important assumptions

- HW / SW
- Website Management
- Boundary Survey
- Training
- AC Changes
- Others!
Questions

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