Protecting your airspace - Implementing obstruction management plans

Thursday, April 23, 2020
2:00-3:30 PM ET

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Learning Objectives

At the end of this webinar, you will be able to:

• Identify objects, obstructions, obstacles and hazards as defined by regulations and standards, and identify the critical areas for airspace protection of your airport

• Identify airport obstruction data sources and list obstruction management tools and airport sponsor responsibilities

• Describe composite map development

• List available community outreach and conflict resolutions tools
Protecting Your Airspace – Implementing Obstruction Management Plans

April 23, 2020
Kyle Williams
AECOM

Sr. Project Manager, Transportation - Aviation
GIS Background 20+ Years
Airports and USAF for 10+ Years
GIS Obstruction Analysis
Data Submitted to FAA
Work with Aviation Planners to Remediate
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Five Ways to Get Involved!

1. Join the ACRP IdeaHub community
2. Volunteer for a project panel
3. Prepare a research proposal
4. Answer an ACRP survey
5. Apply the research results

Visit us online: www.trb.org/ACRP
Today's Speakers

Susan Zellers, Hanson Professional Services Inc.,

Ken Scarborough, Planning Technology, Inc.,

and

Julie Quinn, QuinnWilliams, LLC

Presenting

Best Practices for Airport Obstruction Management

Susan J. H. Zellers, P.E., A.A.E., ENV-SP
Ken Scarborough
Julie Quinn, M.P.P.
Susan J. H. Zellers, P.E., A.A.E., ENV-SP
Investigator

Q Senior Project Manager, Hanson Professional Services Inc.
Q 28 Year of Airport Planning, Design and Management Experience
Q Former Deputy Director of Planning and Development for Indianapolis Airport Authority
Q Licensed Professional Engineer in IN, IL, KY and Accredited Airport Executive
Q Instrument Rated Private Pilot
ACRP Report 195 Oversight Panel

Bryan E. Johnson, Aviation Management Consulting Group, Centennial, CO (Chair)
Kevin R. Carlson, Minnesota DOT, St. Paul, MN
Darren Large, DM Airports, Ltd, Morristown, NJ
Anna Marron, ATKINS, Melbourne, FL
Scott Millis, America Airlines, Inc., Fort Worth, TX
Enrique Sanabria, The Port Authority of New York and New Jersey, New York, NY
Glenn A. Boles, FAA Liaison
Joseph Carlini, FAA Liaison
Andrew Tamanaha, FAA Liaison
Matthew Griffin, Airport Consultant Council Liaison
Christopher J. Oswald, Airports Council International-North America Liaison
Justin N. Towles, American Association of Airport Executives Liaison
Christine Gerencher, TRB Liaison
Webinar Objectives

Q Understand the definition of objects, obstructions, obstacles and hazards
Q Know how to identify the critical surfaces for your airport’s airspace protection and special considerations
Q Identify the sources of airport obstruction data, obstruction management tools and airport sponsor responsibilities
Q Describe composite map development and uses
Q Appreciate outreach strategies for consensus building and conflict resolution
Q Know the tools available in the WebResource to assist in obstruction management
Airport Obstruction Management

Q  Practice of protecting navigable airspace around an airport
B  Approach surfaces
B  Circling approaches
B  Missed approaches
B  Departure surfaces
B  One engine inoperative surfaces
B  En-route airspace (minimum vectoring altitude)
B  Navigational facilities
Protect from Encroachment by

- Tall structures
- Buildings
- Antennae
- Smokestacks
- Silos
- Cranes
- Vegetation
- Terrain
- Vehicles on other transportation modes

- Overview of regulatory criteria
- Critical surface identification
- Composite map development
- Obstruction evaluation
- Obstruction management
- Action plan development
- Consensus building and conflict resolution
- Best practices for protective monitoring and coordination
ACRP WebResource 7

- Presentation templates
- Bibliography of references
- Contains sample airspace composite maps

The ACRP Guidebook on Developing an Obstruction Management Program
Object, Obstruction, Obstacle and Hazards

Q Object – item that protrudes into airspace
Q Obstruction – object that upon FAA evaluation is required to be marked, lighted and identified on publications
Q Obstacle – object that does or would penetrate and obstacle clearance surface
Q Controlling Obstacle – obstacle around which a flight procedure is designed
Q Hazard to Air Navigation – an obstruction that would have a substantial adverse effect to a significant volume of aeronautical operations
Responsibility for Obstruction Management

Q Airport Sponsor
Q State Code for airport, airspace or tall structures
Q FAA can only evaluate and modify the system to maintain safety
Obstruction Management Process

Q Identify airport’s role now and future
Q Identify applicable airspace surfaces
Q Create composite airspace surface map
Q Identify lowest critical surface
Q Gather object data for airport
Q Evaluate object data against airspace surfaces
Q Identify potential obstruction mitigation or management activities
Q Engage stakeholders - build support for obstruction mitigation and management
Q Monitor and maintain
Identify Airport Role and Future Vision

Q Are airport planning documents current?
Q Will aircraft using airport change in the future?
Q Are there any existing constraints?
Q Can the constraints be resolved?
Q Are the constraints potentially controlling obstacles?
Identify Critical Airspace Surfaces

Q Identify federal regulatory and design airspace surfaces
   - 14 CFR Part 77 (FAR Part 77): Safe, Efficient Use and Preservation of Navigable Airspace
   - FAA Advisory Circular 150/5300-13A: Airport Design
   - FAA Order 8260.3D: U.S. Standards for Terminal Instrument Procedures (TERPS)

Q Does air carrier one engine inoperable (OEI) apply?
   - FAA AC 120-91: Airport Obstacle Analysis and ICAO Annex 6: Operation of Aircraft

Q Identify any state or local regulatory or zoning surfaces
FAR Part 77

- Establishes requirements to provide notice to FAA
- Sets standards used to determine obstruction to air navigation
- Provides process for aeronautical studies
- Establishes process to petition for discretionary review
FAA Advisory Circular 150/5300-13A

- Sets appropriate design standards based on size of aircraft using the airport
- Provides threshold siting criteria and departure protection
- FAA Engineering Brief 99 threshold siting criteria update
- FAA Engineering Brief 91: Management of Vegetation in the Airport Environment
FAA Order 8260.3D (TERPS)

Q Critical surfaces and criteria (clearances) used to design instrument procedures
Q Initial, intermediate and final approach
Q Missed approach
Air Carrier Regulations

Q FAA AC 120-91 Airport Obstacle Analysis
  ß One engine inoperative (OEI) - obstacle clearance for irregular operations
Q ICAO Annex 6, Chapter 5
  ß aircraft performance limitations for foreign flag carriers

Source: Planning Technology Inc.
Critical Surface Identification

Q Must consider all surfaces
  β Part 77 approach for each visual or instrument procedure
  β Part 77 transitional, horizontal, and conical surface
  β FAA Advisory Circular 150/5300-13A
    • Threshold siting
    • Departure surface
  β TERPs surfaces
    • 20:1 Visual surface
    • Missed approach
  β OEI Surface
  β PAPI Surface

Source: FAA Order 8260.3D, Figure 2-1-5
Ken Scarborough
Team Member

Q Senior Project Manager, Planning Technology, Inc.
Q 29 years Aviation Consulting experience
Q Focus on inner airspace design around airports
Q Pilot ratings held: Commercial, Instrument, Multi-engine, CFI
Composite Map

- 3D model of airport’s airspace
- Identified height of desired most critical surface over any given point
- Consider long-term airport build-out

Source: Planning Technology Inc., Map data: Google, Image Landsat/Copernicus, Data SIO, NOAA, U.S./Navy, NGA, GEBCO
Part 77.19 Surfaces

Source: Planning Technology Inc., Map data: Google, Image Landsat/Copernicuc, Data SIO, NOAA, U.S./Navy, NGA, GEBCO
Non-Precision Approach Surfaces

Some special considerations

- Circling or offset approaches
- Step down for non-vertically guided approach

Source: Planning Technology Inc.
Step Down Approach Surfaces

Source: Planning Technology Inc., Map data: Google, Image Landsat/Copernicus, Data SIO, NOAA, U.S./Navy, NGA, GEBCO
OEI Surfaces

Source: Planning Technology Inc., Map data: Google, Image Landsat/Copernicus, Data SIO, NOAA, U.S./Navy, NGA, GEBCO
ILS with PAPI Surfaces

Source: Planning Technology Inc., Map data: Google, Image Landsat/Copernicus, Data SIO, NOAA, U.S./Navy, NGA, GEBCO
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<th><strong>FAA Evaluation vs. Local Evaluation</strong></th>
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<td><strong>(National)</strong></td>
<td><strong>(Airport / State / City)</strong></td>
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Q Evaluates Surfaces that protect FAA-published procedures only.

Q If building Determined to be a Hazard by the FAA gets built, the FAA must be able to change a published procedure to mitigate the Hazard.

Q Airline OEI Surfaces are not designed, published or controlled by the FAA—therefore not a basis for Hazard Determination.

Q “No Hazard”: DOES NOT mean “No Impact” to airport operations.

Q Responsible for protecting the Airport and the Economic Benefit it provides to the City/Region.

Q Penetrations to Airline OEI Surfaces result in weight penalties (Economic Impact) and/or shifting flights to other runway (Environmental Impact).

“There’s a fire hydrant right outside my building, so why do I also need sprinklers?”
Critical Surface Identification

Some special considerations:

OEI – Straight and Turning

Utility runways with vertically guided approaches

Visual runways with instrument departure procedures
Data Sources

- FAA Digital Obstacle File (DOF)
  - Need to check verification status
- Data from OE/AAA submittals
- FAA 5010 Airport Master Record submittals
- Air Carriers
- State and local government
- Locally collected data (project)
  - AC 150/5300-16,17,18
- Handheld tool (spot check)
Survey Standards

Some special considerations

- Terrain
- Proposed obstacles
Obstruction Evaluation Tools

- **Part 77 Notice Tool**
- **Software solutions – AutoCAD/ GIS to custom software**
- **Surface Analysis and Visualization Tool**
- **iOE/ AAA – FAA’s internal tool**
- **State resources**

https://oeaaa.faa.gov/oeaaa/external/portal.jsp
Obstacle Action Plan

- Best developed before submitting GIS data to FAA
- Identifies obstacle and resolution
- Resolution must consider the environment

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<th>Obstacle Action Plan</th>
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**Mitigation**

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Obstacle Action Plan

Q. Document your Approach / Departure Corridors

2001
SOUTH BAY DEVELOPMENT ENVELOPE
(over Turnpike/93 Interchange)
SEAPORT HOTEL COMPLEX
ONE FINANCIAL
FEDERAL RESERVE
NORTHERN AVE PARCELS
AT PROPOSED HEIGHTS

2018
COMPOSITE MAP SURFACE
OUTSIDE OF DOWNTOWN ZONE
Julie Quinn, M.P.P.
Team Member

Q Partner, QuinnWilliams, a public policy consulting firm specializing in public safety

Q 15 years crisis management experience in Transportation and Security

Q Focus on Communications, Human Behavior, Stakeholder Engagement and Conflict Resolution

Q Certified Mediator, Mediators Beyond Borders
Obstruction Mitigation and Management

- Tied to grant assurances
- Airport sponsor has primary responsibility but cannot do it alone
- Goal is proactive rather than reactive management
- Need coordination and working relationship with nonairport stakeholders
Obstruction Management Tools

Q Prevention methods
   B Airport leases
   B Avigation easements
   B Airport zoning ordinances
      o Overlay
      o Land Use
   B High-set aside areas
   B Transfer of development rights
   B Purchase of development rights

Q Be aware of when these tools need to be updated
Building Support

Q Proactive management provides best opportunity to collaborate

Q Develop a communication strategy

- What do they want?
- What do they need?
- How does obstruction management impact their daily activities?
- What do they stand to lose or gain from an obstruction management issue?
Identify the Audience

Q Identify the stakeholders
    B Do they have decision making authority?
Q Communicate the obstruction effects to decision makers
Q Determine if cross-jurisdictional coordination is needed
Q Engage with adjacent property owners
Q Coordinate with real estate and communication infrastructure industries
Q Engage with the general public

Q SEEK TO IDENTIFY MUTUAL GAINS
Crafting the Message

Q Is this new information for them or has your audience been exposed to these concepts before?
   - Be specific as to the impact

Q Does your audience understand why obstruction management is so important to your airport?
   - Make it easy to understand
   - Tailor your message to the audience

Q Do you have visual aids, such as graphics or videos, to help them understand?
   - Use graphics and visuals to provide context
Building Consensus

Q Mutual gains in multi-stakeholder negotiations
   § Be fully informed on technical and jurisdictional issues
   § Understand and respect opposing viewpoints
   § Be willing to consider reasonable alternatives

Q Collaboration requires
   § A common sense of purpose and identification of the problem
   § Participants educating each other
   § Participants sharing in the implementation of solutions
   § Participants being kept informed as situations evolve
Q Comprehensive airport obstruction management program involves:

- Airport strategic and operational planning
- Identifying applicable criteria
- Using of best available resources for data collection and analysis
- Considering innovative and solution-oriented mitigation measures through collaboration and consensus building
- ONGOING COMMUNICATION - Community and stakeholder engagement before, during and following the implementation of obstruction management measures
- Continuous monitoring of program performance to achieve the goal of protecting the airport from encroachment
ACRP Report 95 and WebResource 7

http://www.trb.org/Publications/Blurbs/178568.aspx

Q Guidebook expands on topics covered

https://crp.trb.org/acrp0916

Q WebResource includes:

- Stand-Alone Airport Zoning Ordinance
- Airspace Education Presentation
- Presentation on Airspace Surfaces
- Noise and Avigation Easement
- Obstacle Action Plan
- Simple and complex composite map examples
- Searchable reference resources
FOR ADDITIONAL INFORMATION

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Report 38: *Understanding Airspace, Objects, and Their Effects on Airports*

Report 108: *Guidebook for Energy Facilities Compatibility with Airports and Airspace*

Report 113: *Guidebook on General Aviation Facility Planning*

Report 138: *Preventive Maintenance at General Aviation Airports Volume 1: Primer*

Legal Research Digest 14: *Achieving Airport-Compatible Land Uses and Minimizing Hazardous Obstructions in Navigable Airspace*

Synthesis 58: *Safety Reporting Systems at Airports*
Upcoming ACRP Webinars

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Staying Connected – Improving Your Airport’s Communication Strategies

May 21
You Can Get There From Here - Developing an Emissions Roadmap for Airports
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