



Metropolitan Nashville Airport AuthoritySM

NES Department Safety Meeting March 17, 2015

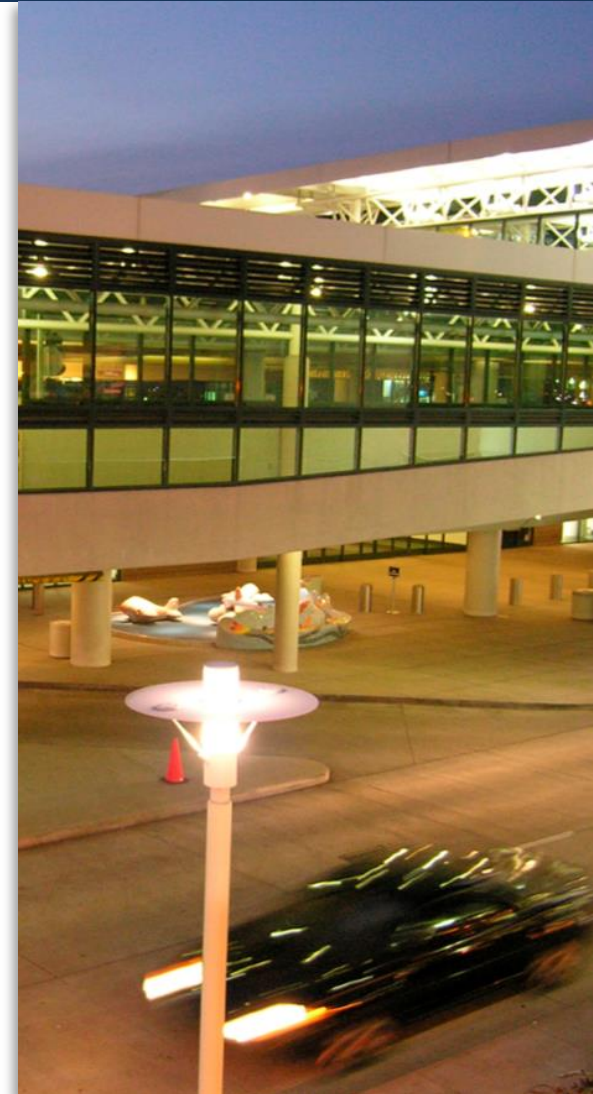
Butch Gelband, A.A.E., ACE





Outline

- Overview of airspace
- Complexity of BNA airspace
- Federal Aviation Regulations
- Notice of Proposed Construction
- Airport Coordination



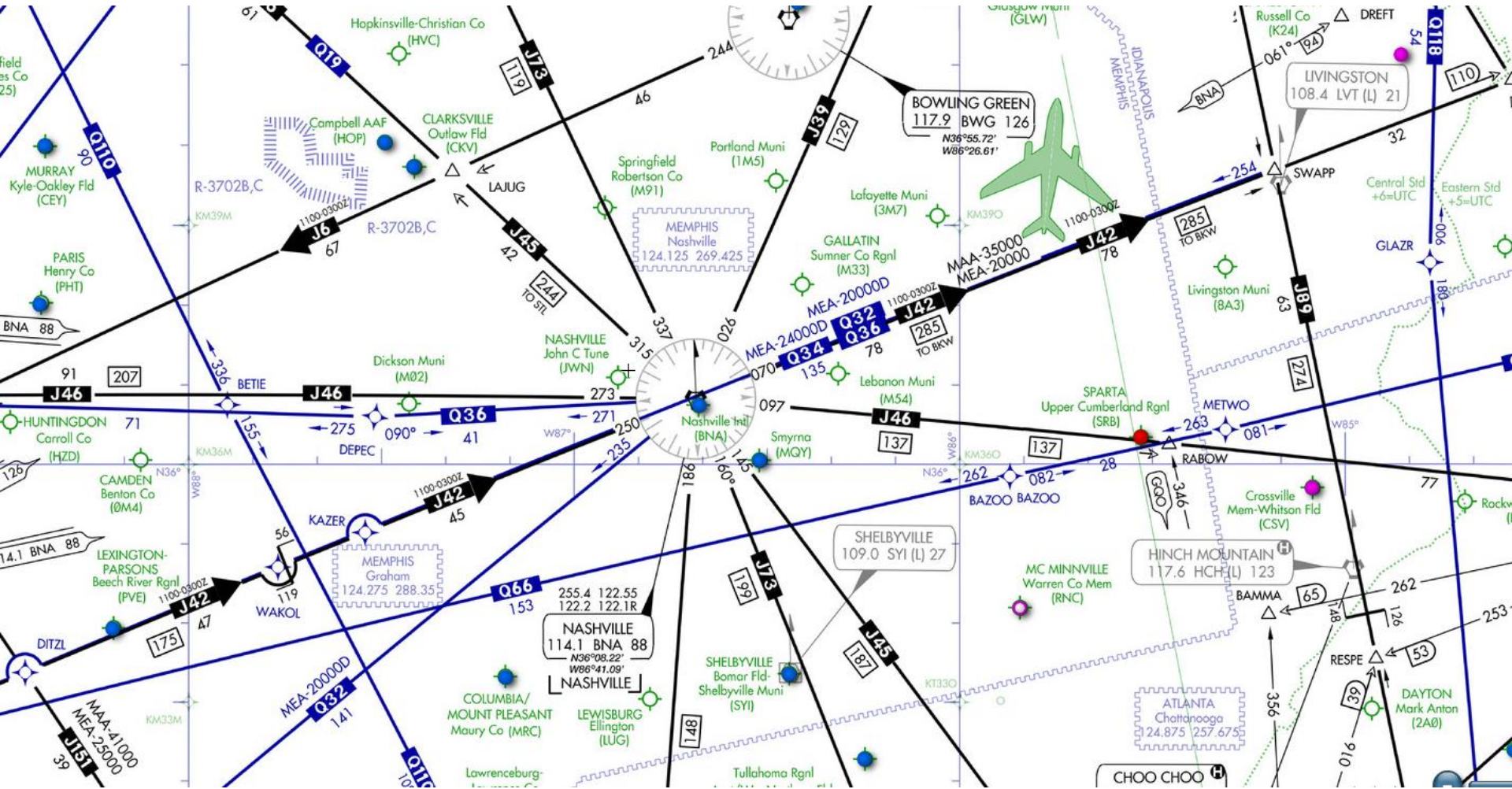
Classes of Airspace



Airspace Features	Class A	Class B	Class C	Class D	Class E	Class G
ATC Facility	ARTCC	TRACON	TRACON or ATCT	ATCT	ARTCC	None
Operations Permitted	IFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR
Entry Requirements	ATC Clearance	ATC Clearance	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	None
VFR Minimum Distance from Clouds	N/A	Clear of clouds	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	Clear of clouds
Aircraft Separation	All	All	IFR, SVFR, and runway operations	IFR, SVFR, and runway operations	IFR and SVFR	None

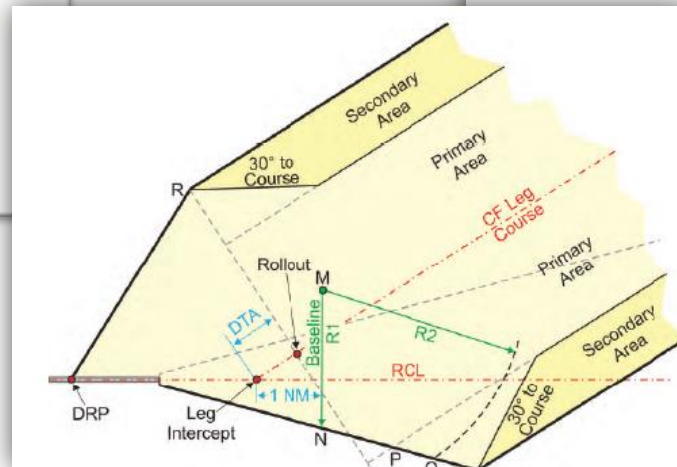
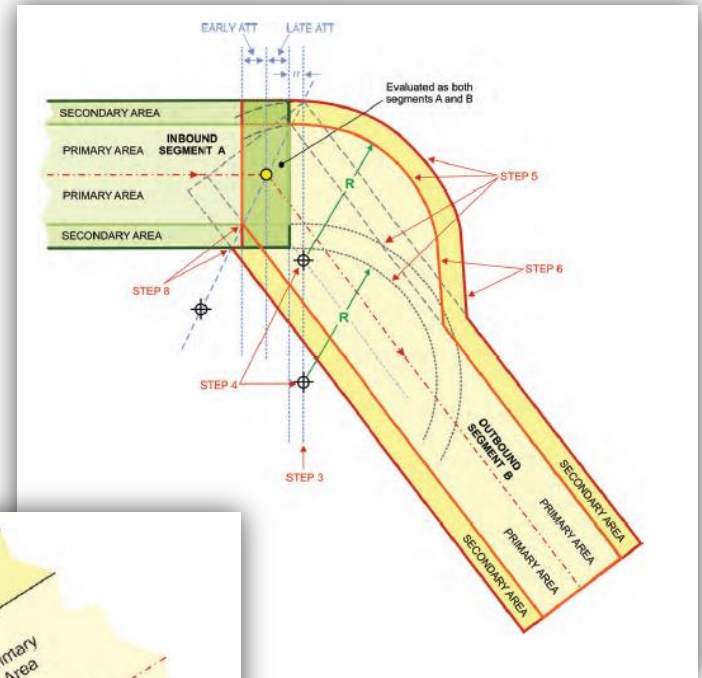
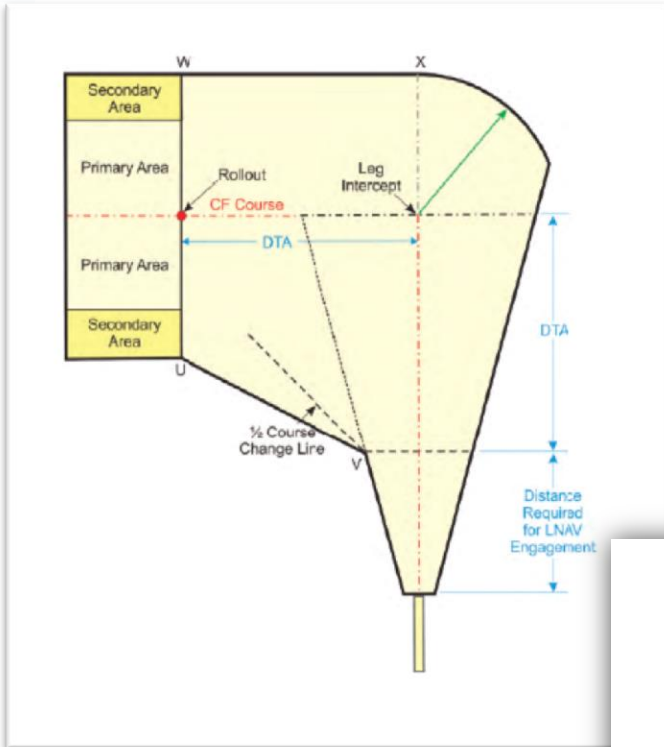
Courtesy of FAA

IFR High Altitude Chart





Complexities of Airspace Design



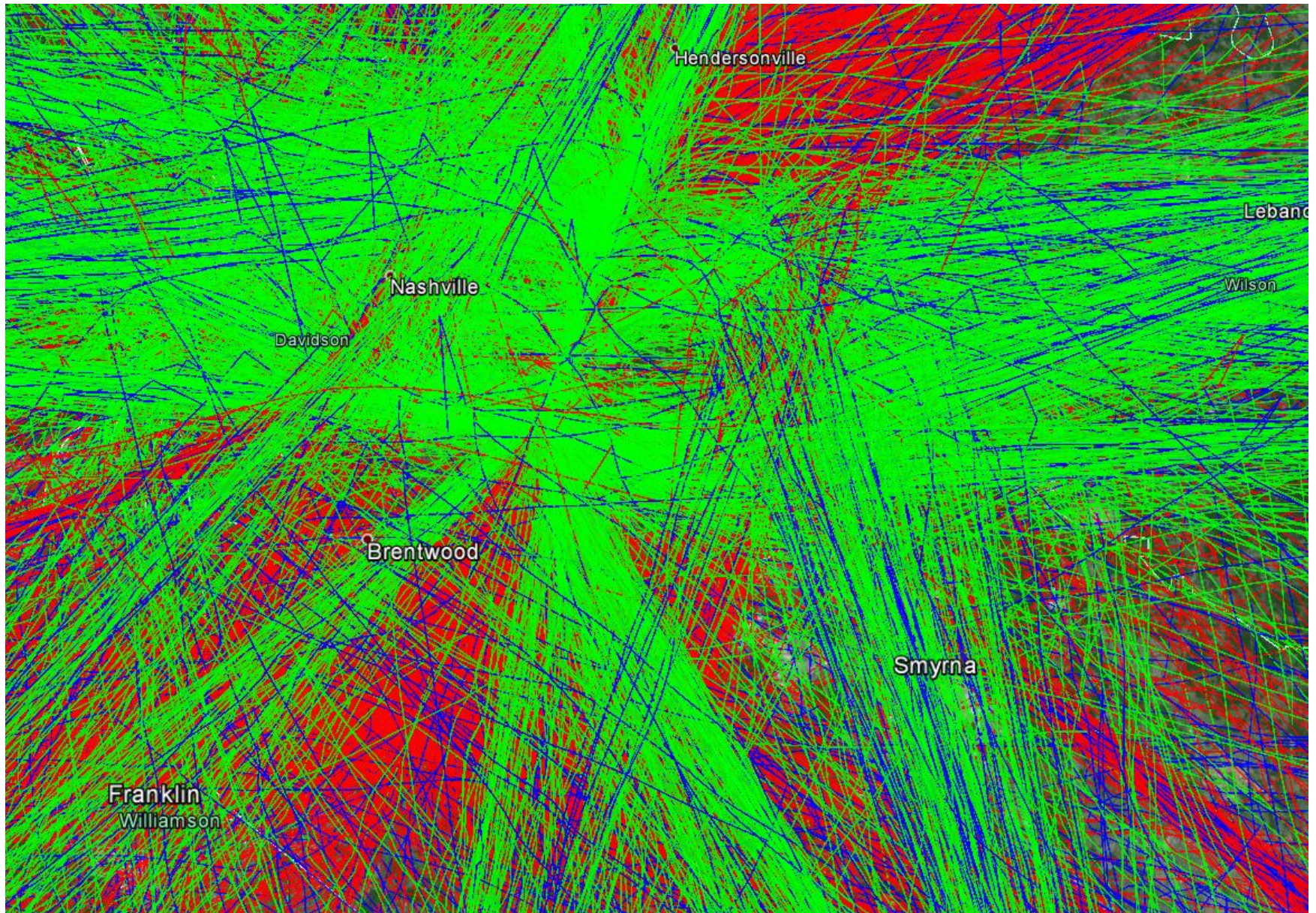
BNA Flight Tracks for one day



© 2015 Google
Image Landsat

Goog

Flight Tracks for BNA for two weeks





Navigational Aids (NAVAIDS)

- Instrument Landing System (ILS)
 - Provides precision and non-precision approach capability





Navigational Aids (NAVAIDS)

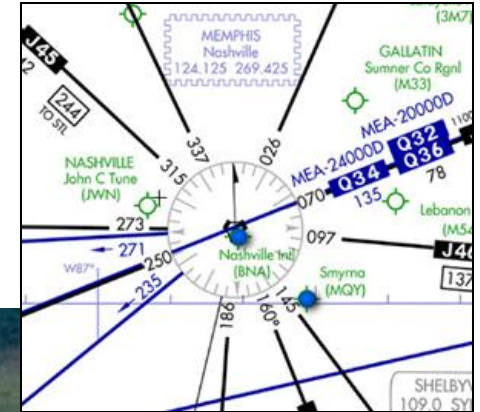
- Instrument Landing System (ILS)





Navigational Aids (NAVAIDS)

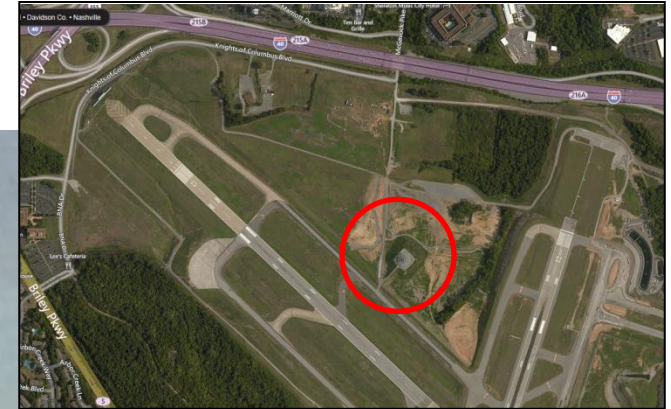
- VOR/VORTAC
 - Non-precision approach
 - Enroute
 - Departure





Navigational Aids (NAVAIDS)

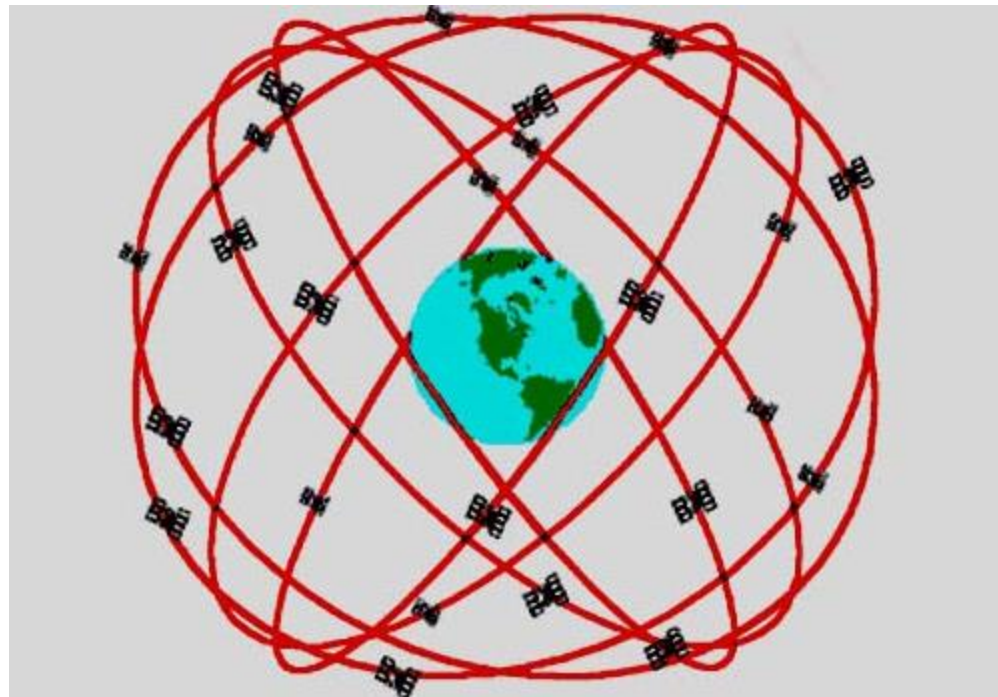
- BNA VORTAC





Navigational Aids (NAVAIDS)

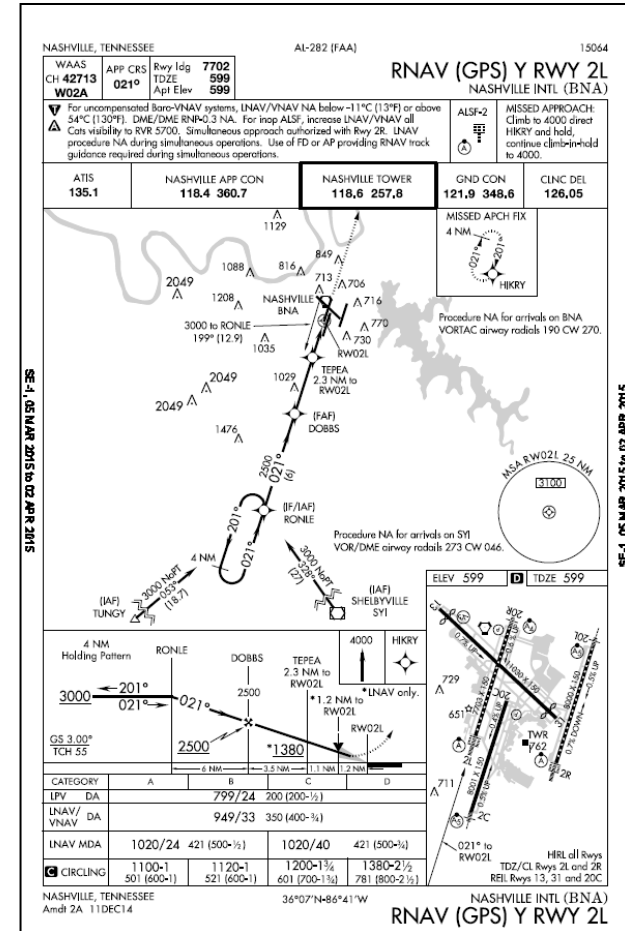
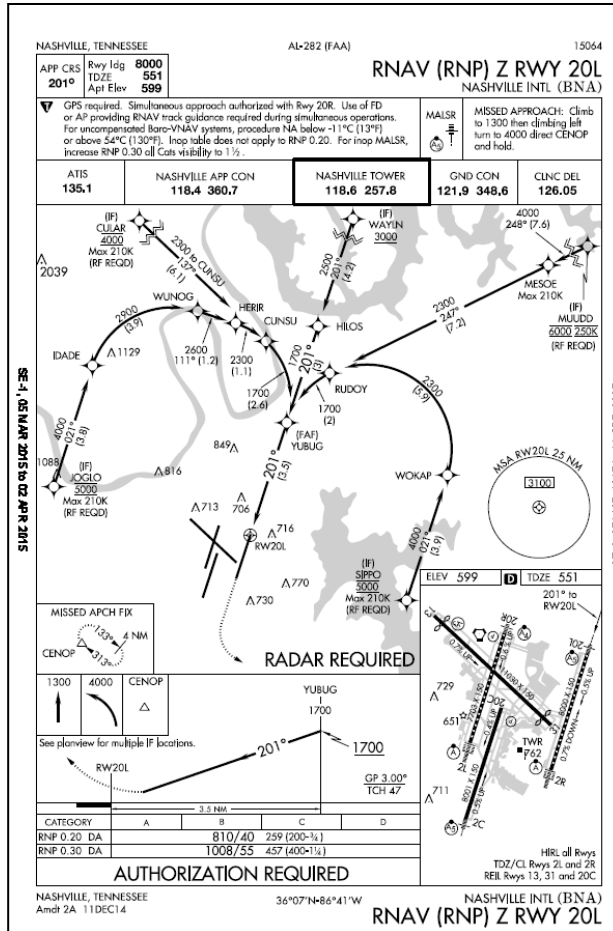
- Global Position System (GPS)
 - Approaches
 - Enroute
 - Departures





Navigational Aids (NAVAIDS)

- GPS approaches





Plane Encounters TV Tower in Lubbock, TX on 4 Feb, 2015



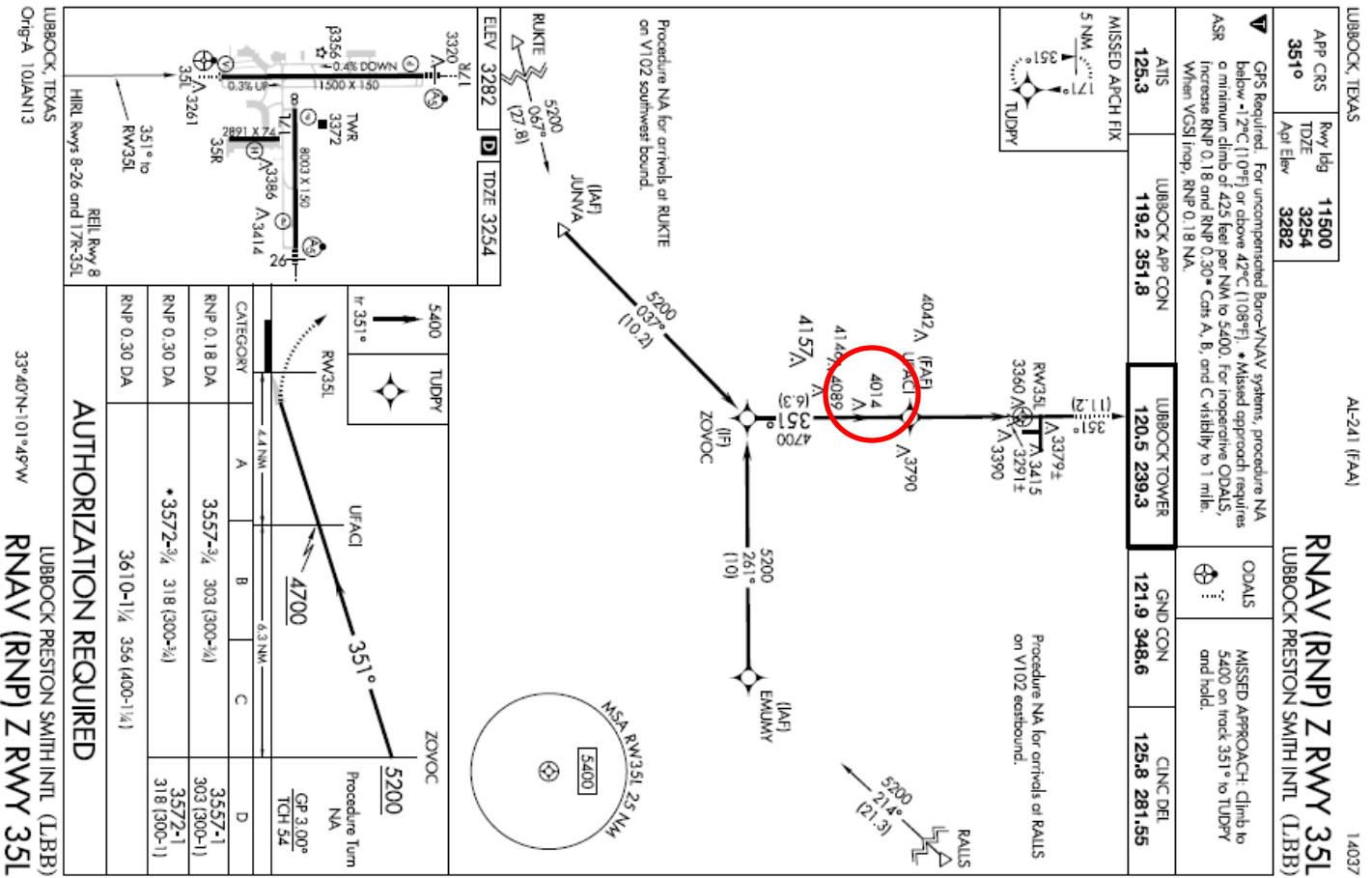


Result of Encounter with TV Tower





Aircraft was on published instrument approach; tower location was noted on approach chart





Imagine what happens when obstructions are not charted...

Issues:

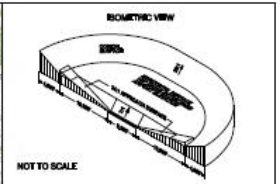
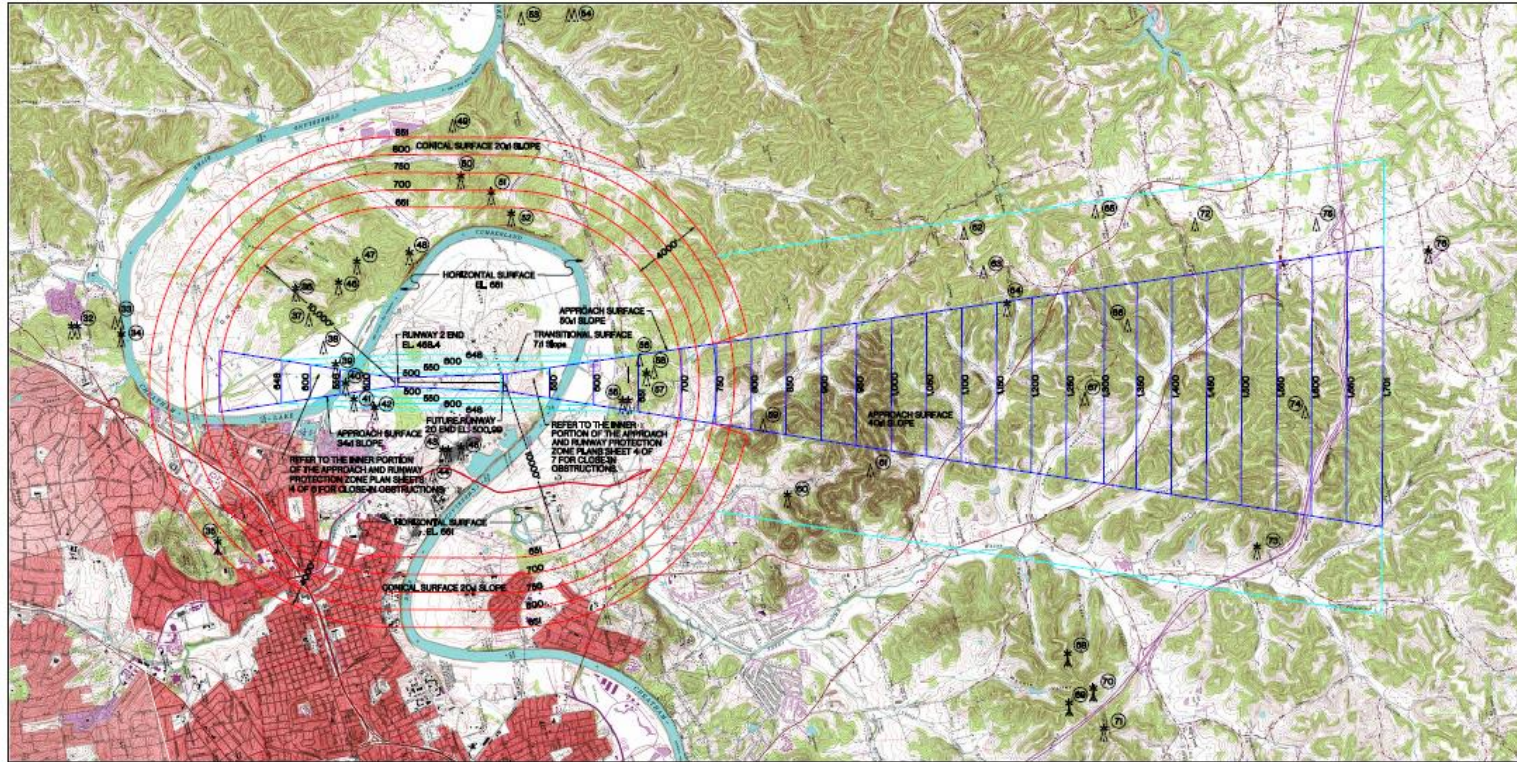
- Hazard to aircraft
- Reflect navigational aid signals
- Subject to \$1,000 fine per day



Federal Grant Assurances

- (The airport) will take appropriate action to assure that such terminal airspace as is required to protect instrument and visual operations to the airport will be adequately cleared and protected by removing, lowering, relocating, marking, or lighting or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

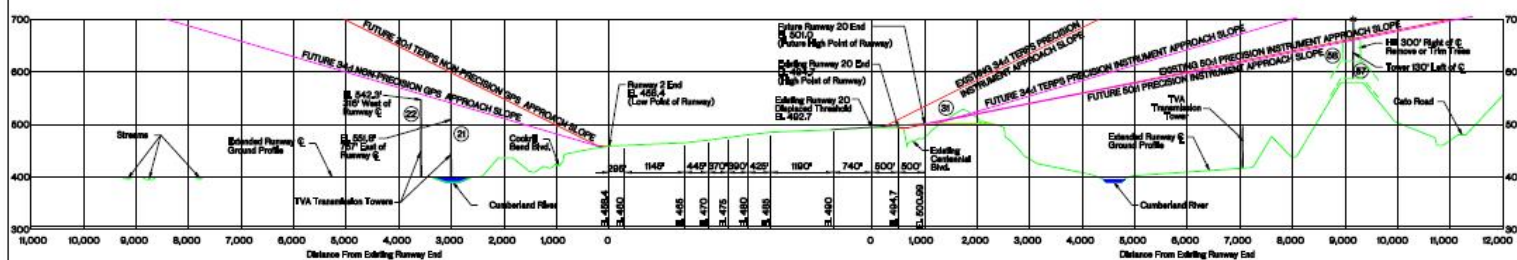
JWN's FAR Part 77 Airspace



- LEGEND**
- △ Obstruction (Below 1000' AGL)
 - ▲ Obstruction (1000' and Higher AGL)
 - ⚡ Multiple Obstructions
 - ⚡ Obstructions with High Intensity Lights (May Operate Part-Time)
 - ⚡ Multiple Obstructions with High Intensity Lights (May Operate Part-Time)
- Obstruction locations and elevations obtained from:
 St. Louis Barometric Altimeter Chart
 8163 D-100, Area 20, 2001
 U.S. Department of Transportation
 Federal Aviation Administration
 National Aeronautics Charting Office
 Metropolitan Nashville Airport Authority
 Metropolitan Government of Nashville and Davidson County, Tennessee

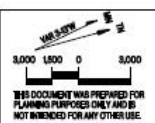
Part 77 Surface Clearance Table

Obst. No.	Description	(M.S.L.)	Penetration	Proposed Action	Affected Surface
36	TVA Tower 15	787.3	149%	LI	Horizontal
37	TVA Tower 14	693.6	0.0	None	Horizontal
38	TVA Tower 13	642.0	0.0	None	Horizontal
39	TVA Tower 12	642.3	0.0	LI	Approach
40	TVA Tower 11	642.6	0.0	LI	Transitional
41	TVA Tower 10	616.6	0.0	LI	Horizontal
42	Water Tank 1	645.8	0.0	LI	Horizontal
43	Stack 1	716.1	64.0%	LI	Horizontal
43	Stack 2	690.0	44.0%	LI	Horizontal
43	Stack 3	682.6	48.0%	LI	Horizontal
44	Antenna	726.1	92.0%	None	Horizontal
45	Water Tank 2	656.6	1.0%	LI	Horizontal
46	Tower on Hill	698.0	237.0%	LI	Horizontal
47	Tower on Hill	668.0	348.0%	LI	Horizontal
48	Tower on Hill	664.0	218.0%	LI	Horizontal
80	Tower 19	608.3	316.0%	LI	Control
81	Tower on Hill	640.0	178.0%	LI	Control
82	Tower on Hill	632.0	182.0%	LI	Horizontal
86	Tower 1	681.9	1.0%	LI	Horizontal
88	Tower 2	664.0	33.0%	LI	Horizontal
86	Tower 3	668.2	7.0%	LI	Horizontal
86	Tower 4	661.7	1.0%	LI	Horizontal
89	Hill 25	622.0	0.0	None	Approach
87	Tower 21	703.0	43.0%	LI	Approach
88	Hill 26	694.0	0.0	None	Approach
89	Tower 6	733.0	0.0	LI	Approach
80	Tower 6	1061.2	188.0%	LI	Transitional
81	Hill 27	623.0	0.0	None	Horizontal
83	Hill 28	686.0	0.0	None	Transitional
83	Hill 29	670.0	0.0	None	Transitional
84	Antenna 84	1626.0	664.0%	LI	Approach
85	Hill 28	620.0	0.0	None	Transitional
85	Hill 29	643.0	0.0	None	Approach
87	Tower 67	608.0	0.0	None	Approach
77	Hill 30	626.0	0.0	None	Transitional
79	Tower 31	678.0	0.0	LI	Transitional
74	Hill 31	668.0	0.0	None	Approach
76	Hill 32	624.0	0.0	None	Approach



REVISIONS

No.	Description

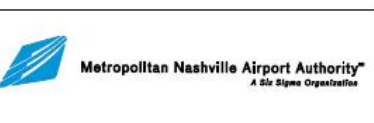


CONSTRUCTION NOTICE REQUIREMENT

TO PROTECT OPERATIONAL SAFETY AND FUTURE DEVELOPMENT, ALL PROPOSED CONSTRUCTION ON THE AIRPORT MUST BE COORDINATED BY THE AIRPORT OWNER WITH THE TENNESSEE DEPARTMENT OF TRANSPORTATION-AERONAUTICS DIVISION PRIOR TO CONSTRUCTION. THIS COORDINATION AND NOTICE TAKES APPROXIMATELY NINETY (90) DAYS.

ALP APPROVAL BLOCK

METROPOLITAN NASHVILLE AIRPORT AUTHORITY DATE: _____



**JOHN C. TUNE AIRPORT
AIRPORT LAYOUT PLAN UPDATE**

PART 77 APPROACH SURFACES

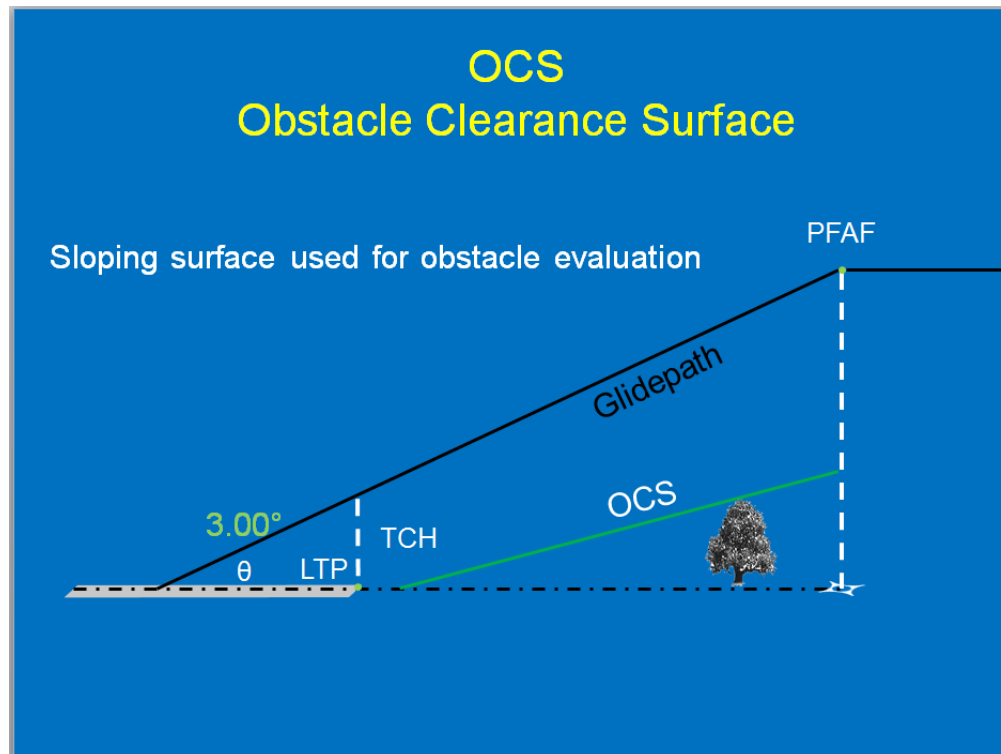
DATE: April 10, 2013

**SHEET
5 OF 7**



Arrival Surface

- Standard 3 degree approach slope
- Protected by a 50:1 FAR Part 77 approach surface and a 34:1 Terminal Instrument Procedures arrival surface

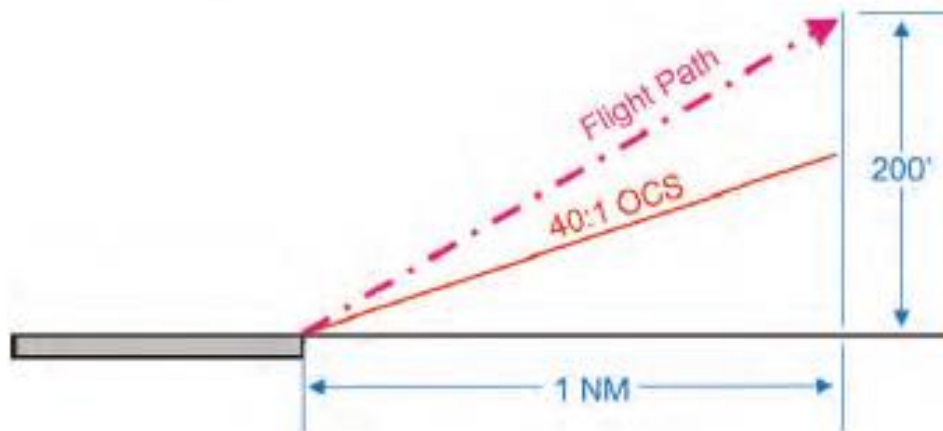




Departure Surface

- Standard climb gradient of 200 feet/nautical mile
- Protected by a 40:1 departure surface

Figure 1-4. Standard Climb Gradient





Federal Aviation Regulation Part 77 Safe, Efficient Use, and Preservation of the National Airspace

- **Who Needs to File**
- [14 CFR Part 77.9](#) states that any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:
- any construction or alteration exceeding 200 feet above ground level
- any construction or alteration:
 - within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet
 - within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
 - within 5,000 feet of a public use heliport which exceeds a 25:1 surface
- any highway, railroad or other traverse way whose prescribed adjusted height would exceed the above noted standards
- when requested by the FAA
- any construction or alteration located on a public use airport or heliport regardless of height or location



Federal Aviation Regulation Part 77 Safe, Efficient Use, and Preservation of the National Airspace

- **Who Needs to File**
- [14 CFR Part 77.9](#) states that any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:
- **any construction or alteration exceeding 200 feet above ground level**
- **any construction or alteration:**
 - **within 20,000 feet of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 feet**
 - within 10,000 feet of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 feet
 - within 5,000 feet of a public use heliport which exceeds a 25:1 surface
- any highway, railroad or other traverse way whose prescribed adjusted height would exceed the above noted standards
- when requested by the FAA
- **any construction or alteration located on a public use airport or heliport regardless of height or location**



Form and Time of Notice

- FAA Form 7460-1, “Notice of Proposed Construction or Alteration”
- Must be filed 45 days before the earlier of the following days:
 - The date construction is to begin
 - The date an application for a construction permit is filed
- Applies to temporary as well as permanent structures
- The length of time a temporary structure will be used is irrelevant



FAA's OE/AAA Website



Federal Aviation Administration

« OE/AAA

Obstruction Evaluation
Version 2015.1.2

Obstruction Evaluation / Airport Airspace Analysis (OE/AAA)

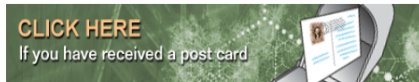
faa.gov Tools Print this page

- Home
- FAA OE/AAA Offices
- View Determined Cases
- View Interim Cases
- View Proposed Cases
- View Supplemental Notices (Form 7460-2)
- View Circularized Cases
- Search Archives
- Download Archives
- Circle Search for Cases
- Circle Search for Airports
- General FAQs
- Wind Turbine FAQs
- Discretionary Review FAQs
- Notice Criteria Tool
- DoD Preliminary Screening Tool
- Wind Turbine Build Out
- Distance Calculation Tool

In administering Title 14 of the Code of Federal Regulations (14 CFR) [Part 77](#), the prime objectives of the FAA are to promote air safety and the efficient use of the navigable airspace. To accomplish this mission, aeronautical studies are conducted based on information provided by proponents on an FAA Form 7460-1, Notice of Proposed Construction or Alteration. [Advisory Circular 70/7460-1K](#), Obstruction Marking and Lighting, describes the standards for marking and lighting structures such as buildings, chimneys, antenna towers, cooling towers, storage tanks, supporting structures of overhead wires, etc.

OE/AAA Filing Process

If your organization is planning to sponsor any construction or alterations which may affect navigable airspace, you must file a Notice of Proposed Construction or Alteration (FAA Form 7460-1) either electronically via this website or manually with the FAA.



If construction or alteration IS NOT LOCATED on an airport:

File forms 7460-1 and 7460-2 electronically via this website - [New User Registration](#).

E-filing your proposal is preferred because

- It's the fastest, most accurate method to submit to the FAA and immediately assigns an aeronautical study number to your case.
- It establishes an electronic communications link with FAA and allows you to obtain project status and notifications directly from this site.



or

If you are unable to file electronically please [click here](#)

Questions? Please contact the [appropriate representative](#).

If construction or alteration IS LOCATED on an airport:

You may file forms 7460-1 electronically via this website - [New User Registration](#).

or

Find the [FAA Airports Region / District Office](#) having jurisdiction over the airport on which the construction is located, and file to that address.

Who Needs to File

14 CFR [Part 77.9](#) states that any person/organization who intends to sponsor any of the following construction or alterations must notify the Administrator of the FAA:

- any construction or alteration exceeding 200 ft above ground level
- any construction or alteration:
 - within 20,000 ft of a public use or military airport which exceeds a 100:1 surface from any point on the runway of each airport with its longest runway more than 3,200 ft
 - within 10,000 ft of a public use or military airport which exceeds a 50:1 surface from any point on the runway of each airport with its longest runway no more than 3,200 ft
 - within 5,000 ft of a public use heliport which exceeds a 25:1 surface
- any highway, railroad or other traverse way whose prescribed adjusted height would exceed the above noted standards
- when requested by the FAA
- any construction or alteration located on a public use airport or heliport regardless of height or location.

- OE/AAA Account
- Login
- New User Registration
- Instructions
- Information Resources
- FAA Acronyms
- Forms
- Regulatory Policy
- Relevant Advisory Circulars
- Survey Accuracy
- Light Outage Reporting
- Useful Links
- State Aviation Contacts
- On Airport Contacts
- Off Airport Contacts

Airspace Determination



Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2008-ASO-5853-OE


Issued Date: 10/31/2008



NASHVILLE, TN 37214

****TEMPORARY DETERMINATION OF NO HAZARD TO AIR NAVIGATION****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: 
Location: NASHVILLE, TN
Latitude: 36-09-12.96N NAD 83
Longitude: 86-48-31.61W
Heights: 218 feet above ground level (AGL)
720 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is (are) met:

As a condition to this Determination, the structure is marked and/or lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, flags/red lights - Chapters 3(Marked),4,5(Red),&12.

As a condition to this determination, the temporary structure must be lowered to the ground when not in use and during the hours between sunset and sunrise.

This determination expires on 05/01/2010 unless extended, revised or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. Any changes in coordinates and/or heights will void this determination. Any future construction or alteration, including increase to heights, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

Airspace Determination



Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2008-ASO-5853-OE


Issued Date: 10/31/2008



NASHVILLE, TN 37214

****TEMPORARY DETERMINATION OF NO HAZARD TO AIR NAVIGATION****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure: 
Location: NASHVILLE, TN
Latitude: 36-09-12.96N NAD 83
Longitude: 86-48-31.61W
Heights: 218 feet above ground level (AGL)
720 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is (are) met:

As a condition to this Determination, the structure is marked and/or lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, flags/red lights - Chapters 3(Marked),4,5(Red),&12.

As a condition to this determination, the temporary structure must be lowered to the ground when not in use and during the hours between sunset and sunrise.

This determination expires on 05/01/2010 unless extended, revised or terminated by the issuing office.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE POSTMARKED OR DELIVERED TO THIS OFFICE AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE.

This determination is based, in part, on the foregoing description which includes specific coordinates and heights. Any changes in coordinates and/or heights will void this determination. Any future construction or alteration, including increase to heights, requires separate notice to the FAA.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.



Notice to Airmen (NOTAM)

- Issued to make pilots and air traffic controllers aware of conditions, hazards, etc.
- Can be issued if cranes, boom trucks, etc. used on an emergency basis create a potential hazard
- Not a substitution for filing proper notice with the FAA
- Can often result in airspace restrictions or runway closures
- Airport issues notice to inform pilots and ATC; does not condone the use of NOTAMs



NOTAM

The proponent is required to provide Notice to the Federal Aviation Administration (FAA) of proposed construction or alteration under circumstances outlined in Federal Aviation Regulation (FAR) Part 77, Section 77.9, at least 45 days prior construction. The proponent's failure to do so is subject to FAA fines. This requirement applies to permanent construction as well as temporary structures, including cranes, regardless of how brief their use. Such notice may be filed via the FAA's OE/AAA website at the following link: <https://oeaaa.faa.gov/oeaaa/external/portal.jsp>. Note: the Metropolitan Nashville Airport Authority has no authority to approve or disapprove any such activity nor does it condone such activity without appropriate notice to the FAA.

As timely notice has not been provided for use of this crane, the information contained herein requesting issuance of a Notice to Airmen (NOTAM) is strictly advisory in nature to inform pilots and air traffic control personnel of a potentially hazardous situation.




FAA AC 70/7460-1K

Obstruction marking and lighting

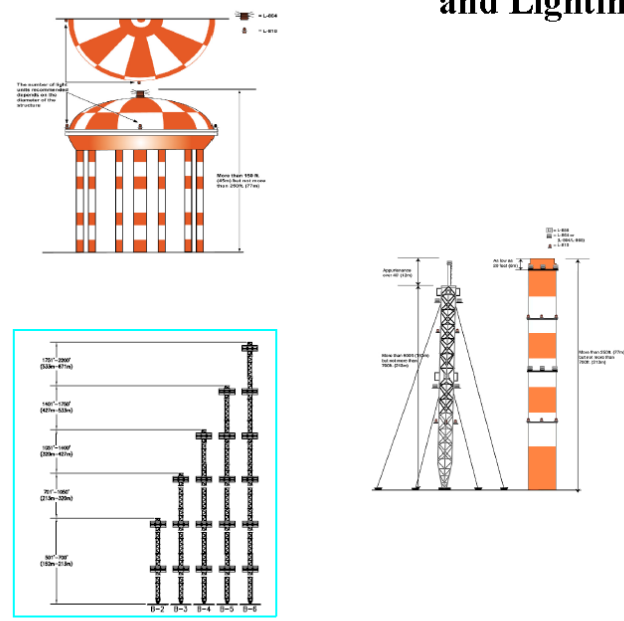
“Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet above ground level (AGL) or exceeds any obstruction standard contained in 14 CFR part 77, should normally be marked and/or lighted.”

Equipment on the airport and cranes in close proximity to the airport should be both marked (flagged) and lighted

 U.S. Department of Transportation
Federal Aviation Administration

ADVISORY CIRCULAR
AC 70/7460-1K

Obstruction Marking and Lighting



Effective: 2/107

Initiated by: System Operations Services



Marking and Lighting

- “Any temporary or permanent structure, including all appurtenances, that exceeds an overall height of 200 feet (61m) above ground level (AGL) or exceeds any obstruction standard contained in 14 CFR part 77, should normally be marked and/or lighted.”
- “An FAA aeronautical study may reveal that the absence of marking and/or lighting will not impair aviation safety.”
- “Conversely, the object may present such an extraordinary hazard potential that higher standards may be recommended for increased conspicuity to ensure safety to air navigation.”

Spherical Markers

- **Spherical markers are used to identify overhead wires.**
- ***Size and Color.***
 - “The diameter of the markers used on extensive catenary wires should be not less than 36 inches (91cm). Smaller 20-inch (51cm) spheres are permitted on less extensive power lines or on power lines below 50 feet above the ground and within 1,500 feet (458m) of an airport runway end. Each marker should be a solid color such as aviation orange, white, or yellow.”
- ***Installations.***
 - “**(a) Spacing.** Markers should be spaced equally along the wire at intervals of approximately 200 feet (61m) or a fraction thereof. Intervals between markers should be less in critical areas near runway ends (i.e., 30 to 50 feet (10m to 15m)). They should be displayed on the highest wire or by another means at the same height as the highest wire. Where there is more than one wire at the highest point, the markers may be installed alternately along each wire if the distance between adjacent markers meets the spacing standard. This method allows the weight and wind loading factors to be distributed.”
 - **(b) Pattern.** An alternating color scheme provides the most conspicuity against all backgrounds. Mark overhead wires by alternating solid colored markers of aviation orange, white, and yellow. Normally, an orange sphere is placed at each end of a line and the spacing is adjusted (not to exceed 200 feet (61m)) to accommodate the rest of the markers. When less than four markers are used, they should all be aviation orange.



When is coordination necessary?

- Not necessary when:
 - Replacing a pole/tower of the same height
 - If equipment is not higher than the pole/tower on which it is being used
 - If the equipment is “shadowed” by taller structures
- Necessary when:
 - Installing a new pole/tower close to the Airport
 - When equipment used close to the Airport will exceed height of pole or tower
 - When there is doubt as to whether FAA Form 7460-1 should be filed or there is insufficient time to file
 - When working on the Airport