



SESSION 6

INSTRUMENT APPROACHES – PART 77 SURFACES FROM AN IFR PILOT'S

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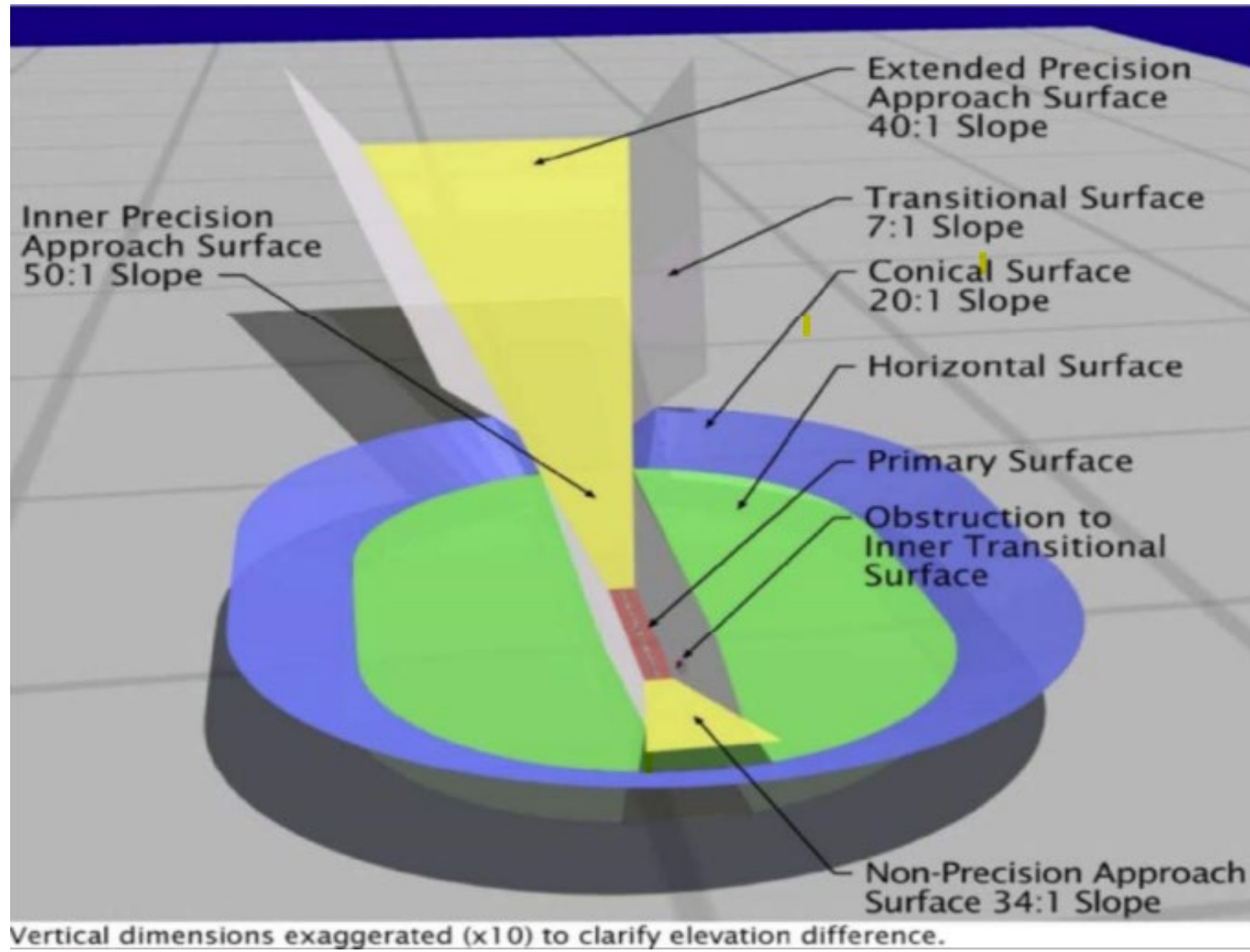
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INSTRUMENT APPROACHES – PART 77 SURFACES FROM AN IFR PILOT'S PERSPECTIVE





From Runway to Spaceport



Long haul airplane flights more than 10 hours in duration may become point to point flights on rockets

Space industry anticipated to double by 2030

Hi speed travel via outer space will become an emerging market






14 CFR Part 77


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⦿ PART 77—SAFE, EFFICIENT USE, AND PRESERVATION OF THE NAVIGABLE AIRSPACE

Authority: 49 U.S.C. 106 (g), 40103, 40113–40114, 44502, 44701, 44718, 46101–46102, 46104.

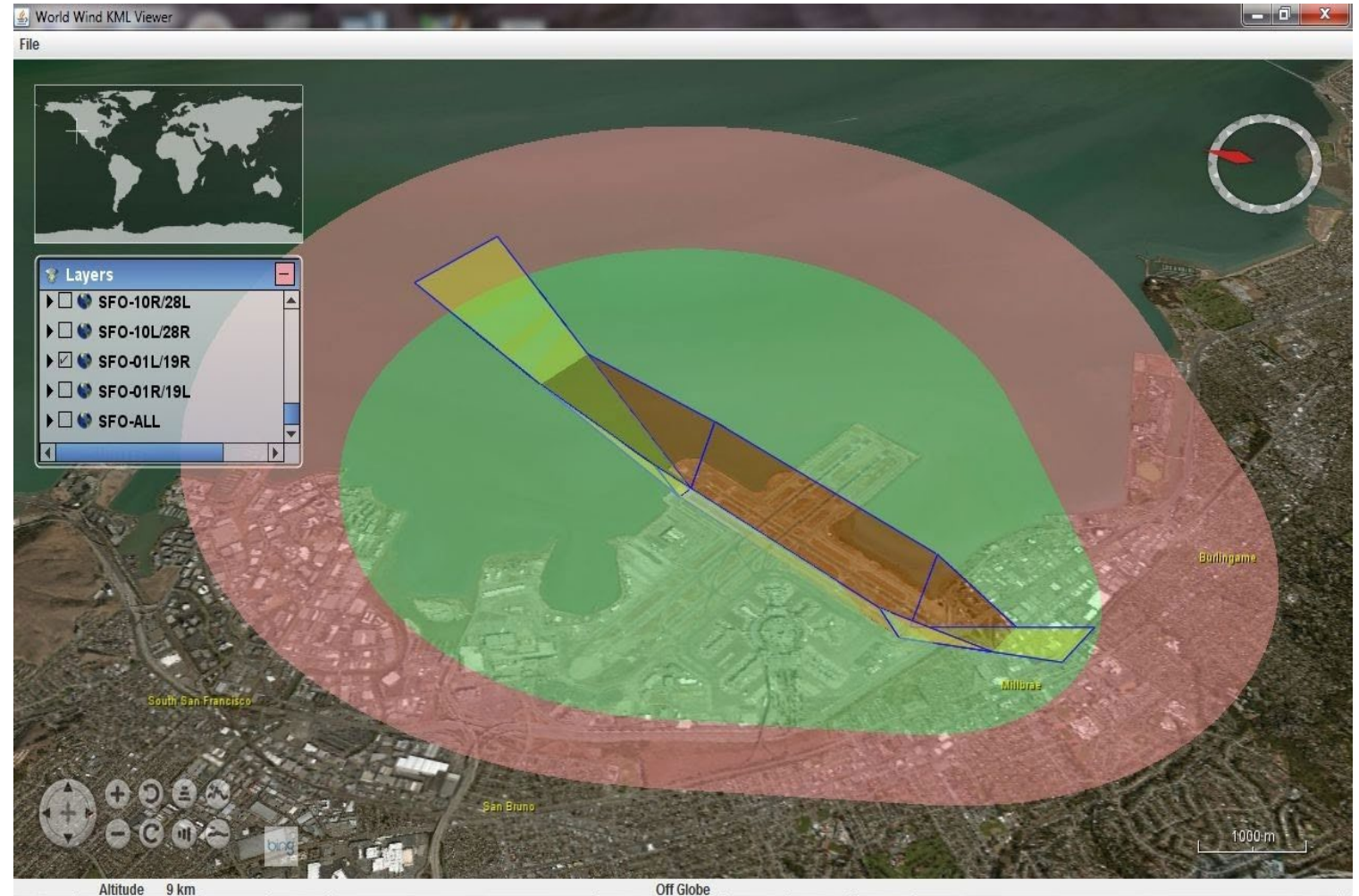




“Part 77”

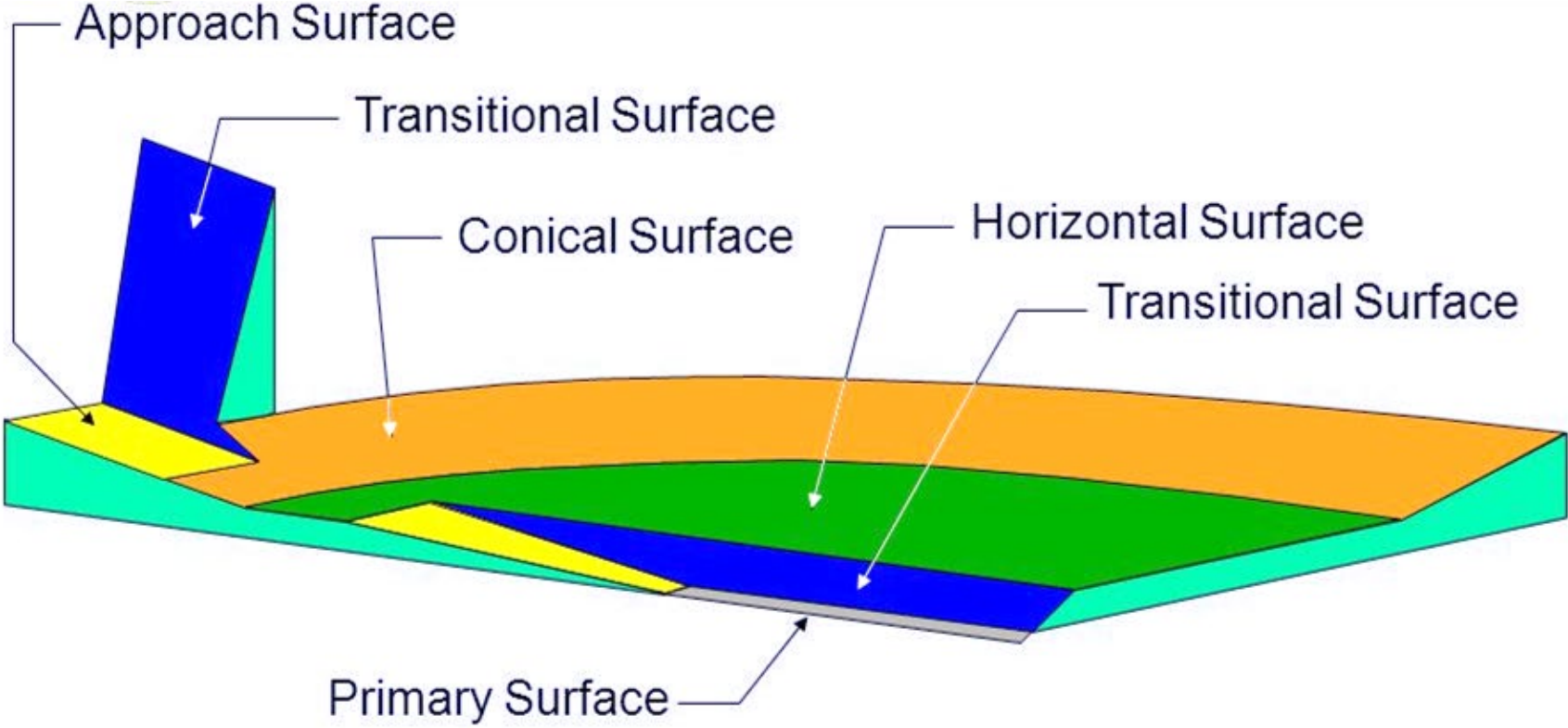
Part 77 Establishes:

- Notification Requirements
- Obstruction Standards
- Process of aeronautical studies
- Process of reviews/extensions





Civil Airport Imaginary Surfaces





Part 77 Primary Surface – 1972 vs. 2023

the runway centerline. The width of a primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having nonprecision instrument approaches.

(3) For other than utility runways the width is:

(i) 500 feet for visual runways having only visual approaches.

(ii) 500 feet for nonprecision instrument runways having visibility minimums greater than three-fourths statute mile.

(iii) 1,000 feet for a nonprecision instrument runway having a nonprecision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.

point on the runway centerline. The width of the primary surface is:

(1) 250 feet for utility runways having only visual approaches.

(2) 500 feet for utility runways having non-precision instrument approaches.

(3) For other than utility runways, the width is:

(i) 500 feet for visual runways having only visual approaches.

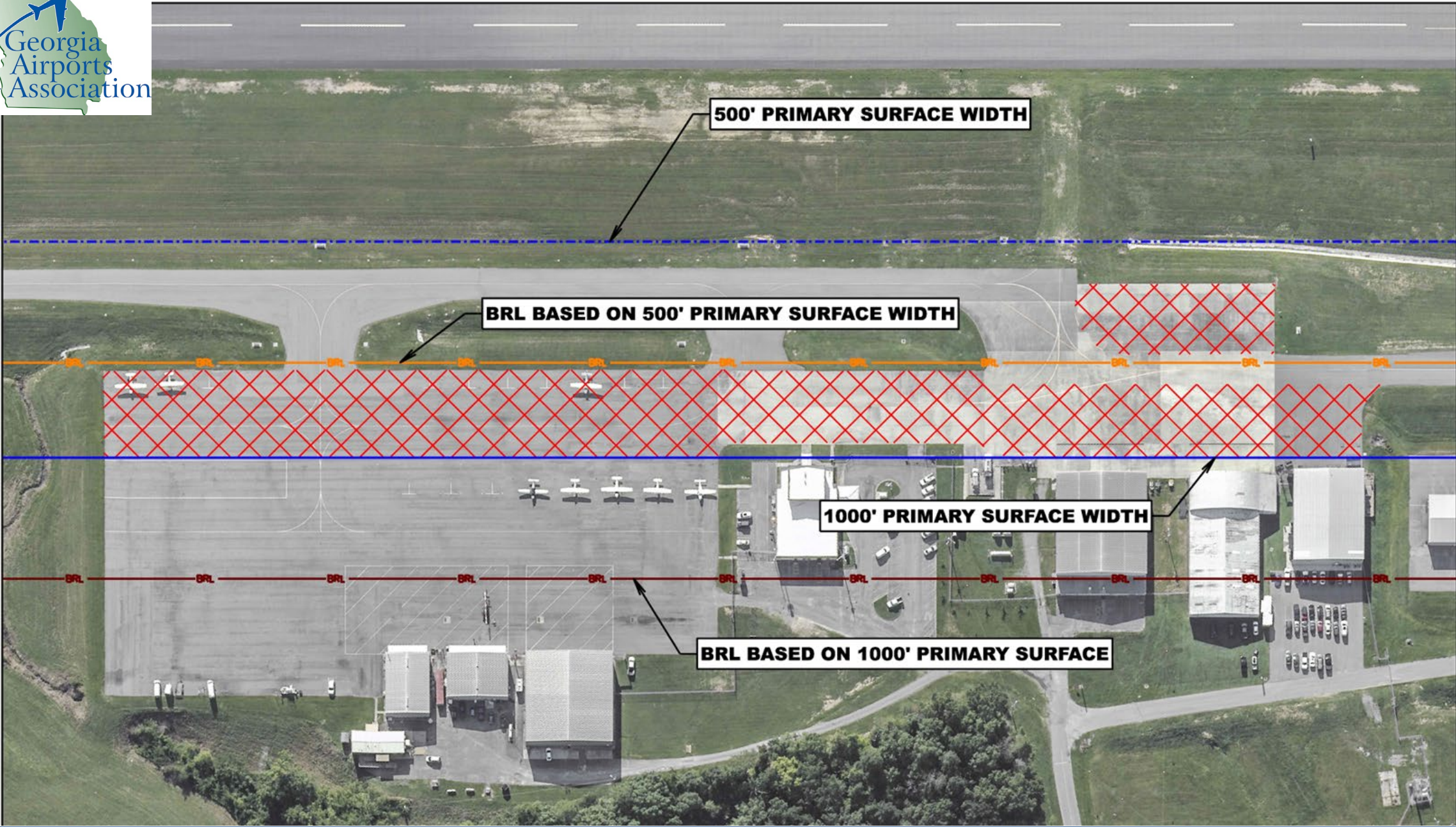
(ii) 500 feet for non-precision instrument runways having visibility minimums greater than three-fourths statute mile.

(iii) 1,000 feet for a non-precision instrument runway having a non-precision instrument approach with visibility minimums as low as three-fourths of a statute mile, and for precision instrument runways.





INSTRUMENT APPROACHES – PART 77 SURFACES FROM AN IFR PILOT'S PERSPECTIVE



500' PRIMARY SURFACE WIDTH

BRL BASED ON 500' PRIMARY SURFACE WIDTH

1000' PRIMARY SURFACE WIDTH

BRL BASED ON 1000' PRIMARY SURFACE



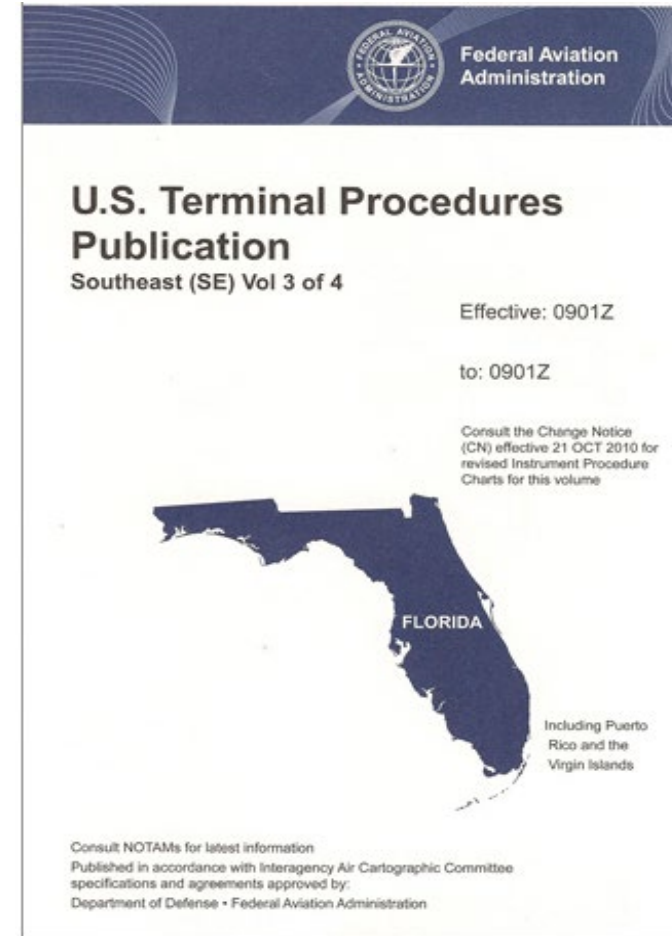
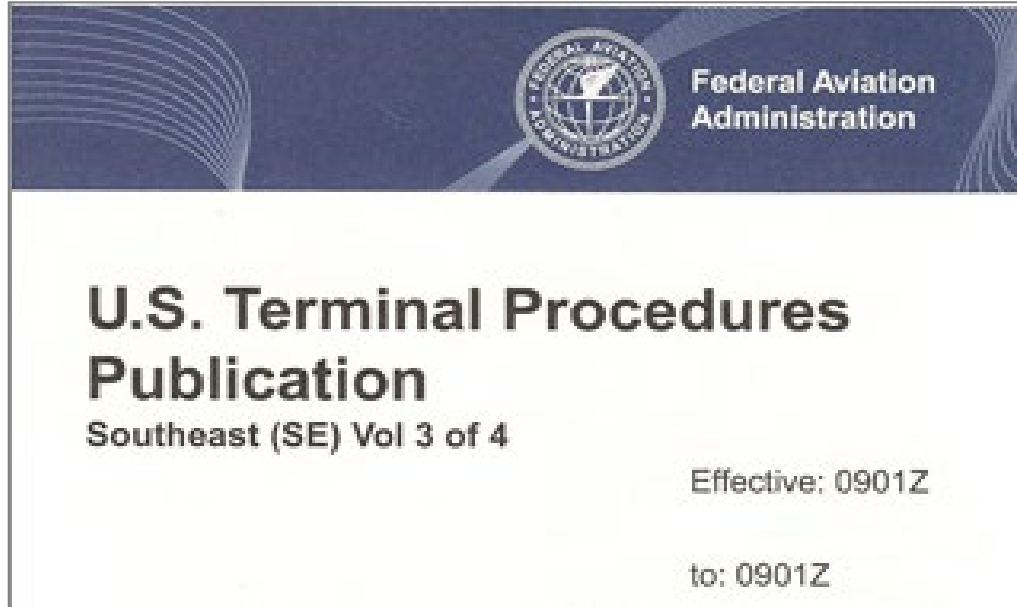
Part 77 – Strengths and Challenges

- Notification Surface
- Intended for airspace protection
- Airport development impacts
- Liability effects impacts





U.S. Terminal Procedures (TERPS)





INSTRUMENT APPROACHES – PART 77 SURFACES FROM AN IFR PILOT’S PERSPECTIVE

91.175(c)

- (c) **Operation below DA/DH or MDA.** Except as provided in [§ 91.176 of this chapter](#), where a DA/DH or MDA is applicable, no pilot may operate an aircraft, except a military aircraft of the United States, below the authorized MDA or continue an approach below the authorized DA/DH unless—
- (1) The aircraft is continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers, and for operations conducted under part 121 or part 135 unless that descent rate will allow touchdown to occur within the touchdown zone of the runway of intended landing;
 - (2) The flight visibility is not less than the visibility prescribed in the standard instrument approach being used; and
 - (3) Except for a Category II or Category III approach where any necessary visual reference requirements are specified by the Administrator, at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:
 - (i) **The approach light system, except that the pilot may not descend below 100 feet above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.**
 - (ii) *The threshold.*
 - (iii) *The threshold markings.*
 - (iv) *The threshold lights.*
 - (v) *The runway end identifier lights.*
 - (vi) *The visual glideslope indicator.*
 - (vii) *The touchdown zone or touchdown zone markings.*
 - (viii) *The touchdown zone lights.*
 - (ix) *The runway or runway markings.*
 - (x) *The runway lights.*





Inoperative Components

INOP COMPONENTS 18088

INOPERATIVE COMPONENTS OR VISUAL AIDS TABLE (For Civil Use Only)

Straight-in and Sidestep landing minimums published on instrument approach procedure charts are based on full operation of all components and visual aids associated with the particular approach chart being used. Higher minimums are required with inoperative components or visual aids as indicated below. If more than one component is inoperative, each minimum is raised to the highest minimum required by any single component that is inoperative. ILS glideslope inoperative minimums are published on the instrument approach charts as localizer minimums. This table applies to approach categories A thru D and is to be used unless amended by notes on the approach chart. Such notes apply only to the particular approach category(ies) as stated. Category E inoperative notes will be specified when published on civil charts. The inoperative table does not apply to Circling minimums. See legend page for description of components indicated below.

(1) ILS, PAR, LPV, GLS minima

Inoperative Component or Visual Aid	Increase Visibility
All ALS types (except ODALS)	¼ mile

(2) ILS, LPV, GLS with visibility minima of RVR 1800†/2000*/2200*

Inoperative Component or Visual Aid	Increase Visibility
ALSF 1 & 2, MALSR, SSALR	To RVR 4000† To RVR 4500*
TDZL or RCLS	To RVR 2400#
RVR	To ½ mile

#For ILS, LPV, GLS procedures with a 200 foot HAT, RVR 1800 authorized with use of FD or AP or HUD to DA.

19 JUL 2018 to 16 AUG

JL 2018 to 16 AUG 2018





Instrument Approach (Wx and Lighting)

EASTMAN, GEORGIA AL-5469 (FAA) 19059

LOC I-HUY 109.55	APP CRS 019°	Rwy Idg 6508	TDZE 300	Apt Elev 303	ILS or LOC RWY 2 HEART OF GEORGIA RGNL (E2M)
When local altimeter setting not received, use Dublin altimeter setting and increase all DA 52 feet and all MDA 60 feet; increase S-LOC 2 Cat C/D and Circling Cat C visibility 1/2 mile.			MALSR 		MISSED APPROACH: Climb to 800 then climbing right turn to 2000 on heading 180° and DBN VORTAC R-214 to CENVA INT and hold.
ATIS 119.425	JACKSONVILLE CENTER 127.575 269.025	HEART OF GEORGIA TOWER * 124.55 (CTAF) 0		GND CON 121.175	UNICOM 122.95

The diagram illustrates the instrument approach procedure. It starts at a 2000-foot altitude on a heading of 180 degrees. The flight path then turns right to intercept the DBN VORTAC R-214. Key frequencies and altitudes are marked: VIENNA (116.5 VNA, Chan 112), LOCALIZER (109.55 I-HUY), and DUBLIN (113.1 DBN, Chan 78). Altitudes of 1007, 792, and 335 are also indicated along the path.





Airport Alternate Information



ALTERNATE MINS

MM

20254

NAME

ALTERNATE MINIMUMS

EASTMAN, GA
HEART OF GEORGIA
RGNL (E2M)

ILS or LOC Rwy 2¹
RNAV (GPS) Rwy 2
RNAV (GPS) Rwy 20

¹NA when local weather not available.

²NA when control tower closed.





Part 77 – § 77.17 Obstruction Standards

An object constitutes an obstruction to navigation if:

- If 200 ft. above ground level or 200 ft. above the airport elevation (whichever is greater) up to 3 miles (for runway lengths > 3200 ft.) from the airport. Increase 100 ft. every mile up to a maximum of 499 ft.
 - Is 500 ft. or more above ground level at the object site
- If penetrates an imaginary surface (a function of the precision of the runway)
- If penetrates the terminal obstacle clearance area (includes initial approach segment)
- If penetrates the enroute obstacle clearance area (includes turn and termination areas of federal airways)





Airport Impacts and Liability

Effects of Obstructions to Air Navigation:

- Changes to Airport Minimums
- Displacement of the Runway Threshold
- Purchase/Condemnation of Neighboring Property
- Aviation Accidents
- Lawsuits due to Accidents





Airport Protections

Adoption of Zoning Ordinance:

- Require local developments to file FAA Form 7460.
- Make approvals conditional upon receipt of a favorable determination from the FAA.
- Implement Airport Overlay District and Define Imaginary Surfaces surrounding Airport.
- Implement Zoning restrictions based on prevention of obstructions to airspace and limitations within Airport Protection Zones.





7460: Notice of Proposed Construction or Alteration – On/Off Airport

Sponsor (person, company, etc. proposing this action) Sponsor:*

Construction / Alteration Information

Notice Of:*

Duration:*

if Temporary : Months: Days:

Work Schedule - Start: (mm/dd/yyyy)

Work Schedule - End: (mm/dd/yyyy)

Structure Details

State:*

Loc ID:*

Airport:

City:

Latitude:* ° ' " N

Longitude:* ° ' " W

Horizontal Datum:

Site Elevation (SE):* (nearest foot)

Structure Height (AGL):* (nearest foot)

Describe/Remarks *

Additional Location(s)

[Add New Location\(s\)](#)

Case Information

Component Type:*

Development Type:*

Other Desc:

Prior Study: -NRA

Documents: None

Project Documents: None

Proposed Frequency Bands

Select any combination of the applicable frequencies/powers to be evaluated by the FAA with your filing. If not within one of the frequency bands listed below, manually input your proposed frequency(ies) and power using the Add Specific Frequency link.

[Add Specific Frequency](#)

	Low Freq	High Freq	Freq Unit	ERP	ERP Unit
<input type="checkbox"/>	6	7	GHz	55	dBW
<input type="checkbox"/>	6	7	GHz	42	dBW
<input type="checkbox"/>	10	11.7	GHz	55	dBW
<input type="checkbox"/>	10	11.7	GHz	42	dBW
<input type="checkbox"/>	17.7	19.7	GHz	55	dBW
<input type="checkbox"/>	17.7	19.7	GHz	42	dBW
<input type="checkbox"/>	21.2	23.6	GHz	55	dBW
<input type="checkbox"/>	21.2	23.6	GHz	42	dBW
<input type="checkbox"/>	614	698	MHz	1000	W
<input type="checkbox"/>	614	698	MHz	2000	W
<input type="checkbox"/>	698	806	MHz	1000	W
<input type="checkbox"/>	806	901	MHz	500	W
<input type="checkbox"/>	806	824	MHz	500	W
<input type="checkbox"/>	824	849	MHz	500	W
<input type="checkbox"/>	851	866	MHz	500	W
<input type="checkbox"/>	869	894	MHz	500	W
<input type="checkbox"/>	896	901	MHz	500	W
<input type="checkbox"/>	901	902	MHz	7	W
<input type="checkbox"/>	929	932	MHz	3500	W
<input type="checkbox"/>	930	931	MHz	3500	W



FAA 7460 Process

Once the FAA as completed an aeronautical study, a determination is made regarding the impact to air navigation. One of three responses is typically issued:

- **No Objection** - “The subject construction did not exceed obstruction standards and marking/lighting is not required.”
- **Conditional Determination** - “The proposed construction/alteration would be acceptable contingent upon implementing mitigating measures (marking and lighting, etc.)“
- **Objectionable** - “The proposed construction/alteration is determined to be a hazard and is thus objectionable. The reasons for this determination are outlined to the proponent.”





INSTRUMENT APPROACHES – PART 77 SURFACES FROM AN IFR PILOT'S PERSPECTIVE

Being Good Neighbors

AIRSPACE NOTIFICATION REQUIREMENTS FOR Construction and Alteration Projects in Proximity to Cleveland's Airports

CLEVELAND HOPKINS INTERNATIONAL AND BURKE LAKEFRONT AIRPORTS

What Developers Need to Know

The informational brochure provides an overview of the Federal Aviation Administration's (FAA) airspace notification requirements for construction and alteration projects in the vicinity of the City of Cleveland's airports. The information in this brochure is intended for use as a guide to understanding the FAA's notification process. Project sponsors (e.g., developers) must coordinate notification requirements with current information from the FAA.

The Cleveland Airport System enhances your interest in building in the Cleveland area. To balance the economic benefits construction projects bring to the Cleveland area with the need to protect the safety of the navigable airspace surrounding Cleveland's airports—Cleveland Hopkins International Airport (CLE) and Lake County Airport (LCA)—the Cleveland Airport System prepared this informational brochure with the intent to:

- Educate developers about the requirements to notify the FAA of proposed construction and alteration projects meeting certain conditions.
- Provide an overview of the notification process to assist developers in the navigable airspace.
- Encourage developers to consider the effects on the safety of air navigation during conceptual project planning. Early coordination with the FAA can minimize risks to a project, such as design changes (e.g., reduced structure height) or delays of start of construction, which may result from an FAA determination of airspace impacts associated with the proposed project.

Overview of FAA notification requirements intended for informational purposes only. Project sponsors must contact notification requirements with current information from the FAA.

Need for Notification

The FAA's Obstruction Evaluation/Report Airport Analysis (OEAA) website (https://www.faa.gov/airports/obstruction) provides information on ways to determine if notification is required, including a Notice to Airmen (NTA) that project sponsors can use to determine the need for FAA notification.

Typical conditions that may require FAA notification for construction or alteration in proximity to CLE or LCA include, but may not be limited to:

- If the height of the new or altered structure will exceed 100 feet above ground level (AGL).
- If the construction or alteration will be within 200 feet of a runway or within 100 feet of a Class E airspace boundary.
- If the construction or alteration will be within 100 feet of a Class E airspace boundary.
- If the construction or alteration will be within 100 feet of a Class E airspace boundary.

Regulatory Context

The FAA's Obstruction Evaluation/Report Airport Analysis (OEAA) website (https://www.faa.gov/airports/obstruction) provides information on ways to determine if notification is required, including a Notice to Airmen (NTA) that project sponsors can use to determine the need for FAA notification.

Typical conditions that may require FAA notification for construction or alteration in proximity to CLE or LCA include, but may not be limited to:

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- If the construction or alteration will be within 100 feet of a Class E airspace boundary.
- If the construction or alteration will be within 100 feet of a Class E airspace boundary.

Hartsfield-Jackson Atlanta International Airport

Airspace Notification Requirements for Construction and Alteration Projects in Proximity to Hartsfield-Jackson Atlanta International Airport

What Developers Need to Know

NOTIFICATION PROCESS

All completion of the process for notifying the FAA of proposed construction or alteration is summarized in the following steps:

- STEP 1: Project sponsor contacts the FAA Form 7460-1 to the FAA, either electronically via the FAA's OEAA website or by mail to the FAA's OEAA website. The FAA issues a Notice to Airmen (NTA) within 45 days.**
- STEP 2: FAA conducts an Initial Assessment Study and determines if the structure would exceed obstruction standards. If not, the structure would not require notification. If yes, the structure would require notification. The FAA issues a Notice to Airmen (NTA) within 45 days.**
- STEP 3: Project sponsor contacts the FAA and either amends the structure to meet the standards or requests the FAA to conduct a more detailed study. The FAA issues a Notice to Airmen (NTA) within 45 days.**
- STEP 4: Project sponsor contacts the FAA and either amends the structure to meet the standards or requests the FAA to conduct a more detailed study. The FAA issues a Notice to Airmen (NTA) within 45 days.**

NOTES

1. The structure would not require notification if the structure would not exceed obstruction standards.
2. The structure would require notification if the structure would exceed obstruction standards.

Overview of FAA notification requirements intended for informational purposes only. Project sponsors must contact notification requirements with current information from the FAA.

Notification Process

All completion of the process for notifying the FAA of proposed construction or alteration is summarized in the following steps:

- STEP 1:** Project sponsor submits FAA Form 7460-1 to the FAA, either electronically via the FAA's OEAA website or by mail to the FAA's OEAA website. The FAA issues a Notice to Airmen (NTA) within 45 days.
- STEP 2:** FAA conducts an Initial Assessment Study and determines if the structure would exceed obstruction standards. If not, the structure would not require notification. If yes, the structure would require notification. The FAA issues a Notice to Airmen (NTA) within 45 days.
- STEP 3:** Project sponsor contacts the FAA and either amends the structure to meet the standards or requests the FAA to conduct a more detailed study. The FAA issues a Notice to Airmen (NTA) within 45 days.
- STEP 4:** Project sponsor contacts the FAA and either amends the structure to meet the standards or requests the FAA to conduct a more detailed study. The FAA issues a Notice to Airmen (NTA) within 45 days.

FAQs

What does a determination provide? An FAA determination does not give project sponsors approval for their construction of a structure. It only provides information on ways to determine if notification is required, including a Notice to Airmen (NTA) that project sponsors can use to determine the need for FAA notification.

When should the FAA be notified? Although the FAA defines minimum timing requirements for the submission of FAA Form 7460-1 to the FAA, the Cleveland Airport System encourages determining the need to notify the FAA and conducting project planning as early as possible. Early coordination can minimize risks to a project, such as design changes (e.g., reduced structure height) or delays of start of construction, which may result from an FAA determination of airspace impacts associated with the proposed project.

Who is required to notify the FAA? The project sponsor is required to submit all information to the FAA for review. The project sponsor is the individual or organization responsible for the construction or alteration project and the person of contact for additional coordination, if needed.

Will the FAA notify CLE or LCA of the proposed development? The FAA will notify CLE or LCA of a determination of Hazard if issued. However, the act of a determination being from 7460-1 does not trigger the FAA to notify an airport of proposed development.

Is it possible to apply for fast processing? Project sponsors can submit a request for expedited processing if the project is a high-priority project. The FAA will process the request on a case-by-case basis.

Resources for More Information

The FAA's Obstruction Evaluation/Report Airport Analysis (OEAA) website (https://www.faa.gov/airports/obstruction) provides information on ways to determine if notification is required, including a Notice to Airmen (NTA) that project sponsors can use to determine the need for FAA notification.

Aviation Terms

Obstruction - An object, such as a structure or construction equipment, that exceeds a Part 77 obstruction standard, including the generation of an imaginary surface.

Imaginary Surface - A surface defined by federal regulations that used to identify objects that exceed that surface and may, therefore, affect air navigation. Imaginary surfaces are, typically, three-dimensional slanted surfaces and are determined based on approach and departure aircraft operations.

Notice to Airmen (NTA) - A notice issued by the FAA to inform pilots of potential hazards to flight. The NTA is issued to pilots of aircraft operating in the vicinity of the structure or object that may affect air navigation.

Obstruction Standard - A standard used by the FAA to determine if a structure or object exceeds the height of the obstruction standard. The standard is based on the height of the structure or object and the height of the imaginary surface.

HEIGHT NOTIFICATION REQUIREMENTS

The graphics below illustrate the typical notification requirements associated with building in proximity to ATL. Note that requirements associated with other airports in the Atlanta area may be applicable.

REGULATORY CONTEXT

Operators within the navigable airspace in the vicinity of airports are governed by federal guidance: airspace obstruction standards defined in Title 14 Code of Federal Regulations Part 77 (Part 77), Safe, Efficient Use, and Preservation of the Navigable Airspace, and obstacle clearance requirements defined in FAA Order 8200.30, United States Standard for Terminal Instrument Procedures (TERPS). The FAA also defines land use restrictions in the immediate airport environs in FAA Advisory Circular 150/5300.13, Airport Design.

Part 77 and TERPS define imaginary airspace surfaces, which are three-dimensional slanted surfaces intended to protect operations within navigable airspace. The FAA considers these imaginary surfaces when evaluating the height of structures and other objects in the vicinity of airports that may be obstructions to air navigation.

TYPICAL PART 77 IMAGINARY SURFACES

NOTES

1. The 100-foot notification boundary represents the limits of the 100-foot surface.
2. Notification is required for any structure penetrating the 100-foot surface.
3. For an obstructions, regardless of surface, the height is 100 feet AGL.

RESOURCES FOR MORE INFORMATION

The FAA's Obstruction Evaluation/Report Airport Analysis (OEAA) website (https://www.faa.gov/airports/obstruction) provides information on ways to determine if notification is required, including a Notice to Airmen (NTA) that project sponsors can use to determine the need for FAA notification.

FAA CONTACTS

Obstruction Evaluation Group
 Federal Aviation Administration
 Atlanta Airports District Office
 1101 Columbia Ave., Suite 220
 College Park, GA 30337
 (404) 305-0797

FEDERAL REGULATIONS AND ORDERS

Part 77 - CFAI 14 CFR Part 77 link at: https://www.ecfr.gov/current/title-14-cfr-part-77

TERPS

FAA Order 8200.30, United States Standard for Terminal Instrument Procedures (TERPS)
 https://www.faa.gov/airports/obstruction/terminal-instrument-procedures-terps

APPROACH SURFACES

FAA Order 150/5300.13, Airport Design (FAA Advisory Circular 150/5300.13)
 https://www.faa.gov/airports/obstruction/airport-design

NOTES

1. The structure would not require notification if the structure would not exceed obstruction standards.
2. The structure would require notification if the structure would exceed obstruction standards.





ANY
QUESTIONS





Protect the Airspace & keep your community Vibrant

