# FACILITY REQUIREMENTS

6

# CONTENTS



# FIGURES

# TABLES

CHAPTER SIX

# REQUIREMENTS

To properly plan for the future of Idaho Falls Regional Airport, it is necessary to determine if the existing airport facilities are able to safely and efficiently accommodate current and forecasted levels of activity. Each of the facilities described in Chapter 4, Airside and Landside Inventory must be analyzed to determine if any improvements are needed to meet new or updated standards developed and adopted by the Federal Aviation Administration (FAA) or other regulatory agencies. This analysis will also be used to help determine if any new facilities are needed as a result of the sponsor's comprehensive plan or strategic vision and mission statements.

The main goal of this analysis will be to identify if improvements are needed, when they will be needed, and the purpose and need for these improvements. Each facility will be analyzed to determine its ability to safely and efficiently accommodate the forecasted activity levels discussed in Chapter 5, Forecast of Aviation Activity. They will also be examined to determine if they meet current FAA design standards, recommendations, requirements, and design considerations. Alternative methods of addressing these potential development projects will be discussed and evaluated in Chapter 7, Development Alternatives.

## 6.1. Summary of Existing Facilities and Recommendations

The following summarizes the airport facilities that were examined in this evaluation as well as the outcomes and recommendations that are discussed in this chapter.

### a. Airfield and Airspace Requirements

#### Airfield Capacity

- Demand is expected to remain within 15–19% of the annual service volume (ASV) for the 20-year planning period which means there is not a need to begin planning for capacity improvements.
- Runway 17/35 does not meet the requirements for a crosswind or secondary runway unless the FAA makes a specific determination stating the runway is required.

#### Runway Requirements

- Orientation and Designation: Runway designations for Runway 3/21 and Runway 17/35 do not need to change during the planning horizon.
- Length: The current length of Runway 3/21 and Runway 17/35 is adequate to support the critical aircraft throughout the 20-year planning horizon.
- Width: Runway 3/21 width meets design standards. Runway 17/35 width exceeds design standards by 15 feet.
- Displaced Thresholds and Declared Distances: IDA does not have any displaced thresholds or need to use declared distances for any runway.
- Runway line of sight: These requirements are met for individual runways but not for the two runways combined.
- Pavement Strength: The existing weight bearing capacity of Runway 3/21 and Runway 17/35 is adequate to support the critical aircraft.
- Potential Change in Critical Aircraft: Some design standards for Runway 3/21 would change if a Boeing 757F, or other ADG-IV aircraft, were to become the critical aircraft for air cargo operations.
- Runway Incursion Mitigation: The intersection of Runway 17/35 and Taxiway C should be reviewed for alternatives to eliminate Hot Spot 1.

#### Taxiway System Requirements

- Design Standards: IDA meets appropriate design standards for all design criteria *except* taxiway width and taxiway shoulder width. Due to the varying widths along the length of the taxiways, there are areas of the taxiway which meet appropriate design standards. However, the narrowest sections do not meet the minimum requirements for FAA design.
- Object Free Areas and Safety Areas: All object free areas and safety areas are within standards and contain no penetrations or incompatible land uses.
- Potential Change in Critical Aircraft: Some design standards would change if a Boeing 757F, or other ADG-IV aircraft, were to become the critical aircraft for taxiway design.

#### Airspace Requirements

- There are known penetrations in the airport's airspace. All penetrating objects depicted on the ALP should be eliminated.

### Precision Approach Path Indicator Clearance Surfaces

- All Part 77, approach and departure, and PAPI OCS/LSCS surfaces should be protected to the maximum extent possible.
- Existing obstructions should be eliminated or marked and lighted.

### Electronic, Visual, and Satellite Navigation Aids

- The 1,000-foot critical area for the VOR-DME contains general aviation hangars. This is preventing development of the cargo apron and the installation of a holding bay at the Runway 21 end.
- The VOR-DME should be either relocated or upgraded to a doppler VOR, which would reduce the size of the critical area by half.

### Air Traffic Control Tower

- Consideration should be given to finding an alternate site for the airport traffic control tower.

### Instrument Approach Procedures

- The current instrument approaches to Runway 3/21 at IDA are adequate to support aircraft operations through the 20-year planning period.
- Minimums can be improved by eliminating terrain obstructions for Runway 21 and adding an approach lighting system to Runway 3.

## b. Commercial Service Passenger Terminal Complex

### Commercial Apron Requirements

- Two gates will need to be added by 2026 to accommodate peak hour operations which would require an expansion of the terminal building and two additional aircraft parking spaces on the terminal apron.
- The additional parking spaces should accommodate the full range of aircraft expected to be used by the airlines during the planning horizon. This includes sufficient clearance for an ADG-IV aircraft taxiing on Taxiway A which may require shifting the vehicle service road.
- The deicing pad should be relocated outside the envelope of the gate parking positions.
- A covered lavatory dump should be considered.

### Passenger Terminal Building

- Virtually all of the functional areas in the terminal building need to be expanded or renovated if delays are to be avoided during the peak hour activity.
- Multiple large aircraft operating within the peak hour—due to airline scheduling or due to system delays—will significantly impact the airport's ability to safely and comfortably process passengers through the terminal building.

### On-Airport Circulation Roadways

- Consideration should be given to widening North Skyline Drive and reconfiguring the entry points to the parking lots to avoid extra traffic passing through the congested passenger pick-up and drop-off zones.
- Consideration should also be given to mitigating the sharp right turn vehicles have to navigate to exit the terminal circulation loop.

**Public Parking Facilities**

- Reconfiguration of the existing hourly and daily lots to allocate more spaces to economy will help relieve some pressure in the immediate term.
- By 2026, reconfiguration of the existing lots alone will not be adequate to support demand.
- Other parking lot locations, along with vertical development options, should be a priority.

**Employee Parking Facilities**

- The employee parking lot should be expanded, or other locations sought, in order to meet the estimated 305 spaces that will be needed by 2041.

**Rental Car Facilities**

- All of the functional areas related to the rental car ready/return and quick turnaround areas will exceed existing capacity by 2026.
- Alternative areas should be sought that will enable growth without impeding aeronautical development.

### c. General Aviation Requirements

**Aircraft Hangar Storage**

- Additional hangar space is needed at IDA through the entire planning horizon.

**Aircraft Tiedowns**

- There are adequate tiedowns to meet demand through 2031.
- Beyond 2031, the tiedown deficiencies could be met by reconfiguring the existing apron space with more efficient markings.

### d. Air Cargo Requirements

- The existing FedEx apron is adequate for the ATR-72.
- The current configuration of the cargo apron makes it difficult to maneuver a 757F; a type of aircraft frequently used by air cargo operators.
- Air cargo operators that use a 757F would need to either use a different facility or a new facility would need to be built.
- Additional apron space is needed for storage of ground service equipment (GSE).
- The capacity of the building will need to be expanded during the planning horizon.

### e. Support Facilities

**Aircraft Rescue and Firefighting**

- Consideration should be given to finding an alternate site for the ARFF station.
- Future locations should consider a live fire discharge area to properly contain and eliminate chemicals associated with firefighting operations.

**Fuel Storage**

- There is adequate fuel storage.

### Snow and Ice Control

- Space should be reserved for future expansion of the snow removal equipment (SRE) building.

### Ground Service Equipment Storage

- The size of the apron used to store GSE is adequate.
- Adding markings to delineate the GSE area would enhance circulation and efficiency.
- Future terminal expansions should include extra space and reconfiguration of the baggage makeup area to eliminate constraints.

### Fencing and Gates

- Airport fencing and gates may need to be added or relocated as development progresses.

### Lighting Vault and Emergency Generator

- The capacity and location of the lighting vault and emergency generator will need to be assessed periodically as lighting is added to the airfield and as the terminal is expanded.

### f. Utilities

- Additional service connections may be required for new development.
- Consideration should be given to adding EV charging stations at the airport.

### g. Stormwater

- Stormwater infrastructure should be improved as more impervious surface is added.
- Pipes dating to the 1940s should be replaced and the capacity increased.
- The main retention basin east of Foote Drive should be reviewed to determine if it is capable of accommodating airport development

### h. Land Use

- Federal and State Requirements: The city of Idaho Falls is compliant with federal and state requirements regarding airport land use policies and zoning. All policies and regulations should be reviewed periodically to ensure they are current and relevant as the airport experiences growth and changes.
- County Protections: The city and the airport should continue to work with Bonneville County to update its existing height restriction zoning ordinance and to adopt land use zoning to protect both the airport and surrounding community from incompatible land uses.
- Existing Incompatible Land Uses: There are incompatible land uses known to be located within the airport's RPZs.
- Potential Incompatible Land Uses: The airport should continue to seek ways to eliminate or mitigate existing incompatible land uses within the RPZ, and prohibit the introduction of new incompatible uses.
- On-Airport Wildlife Hazard Attractants: On-airport retention basins should be modified so they do not detain water for more than 48 hours.
- Off-Airport Wildlife Hazard Attractants: Proposed off-airport uses that may create a wildlife attractant should be reviewed by airport staff to assess if they comply with FAA guidance.

### i. Strategic Vision

- Any development at IDA should support the city's strategic vision and mission.

### j. Primary Management and Compliance Documents

- These documents should be reviewed annually and updated as necessary to remain valid. The city of Idaho Falls is currently updating the minimum standards as well as the rules and regulations for the airport.

### k. Emerging Trends

- Airport management should remain aware of newly emerging industry trends and how they might affect the airport.

## 6.1.1. Recommendations

- Relocate the ATCT to allow for terminal expansion.
- Relocate the ARFF station to allow for cargo expansion.
- Eliminate terrain obstruction at the Runway 21 end.
- Add approach lighting system to Runway 3 end.
- Assess drainage infrastructure capacity and structural integrity.
- Reconfigure parking lot access points from N. Skyline Drive.
- Add electric vehicle (EV) charging stations to parking lot expansions.

## 6.2. Airport Design and FAA Standards

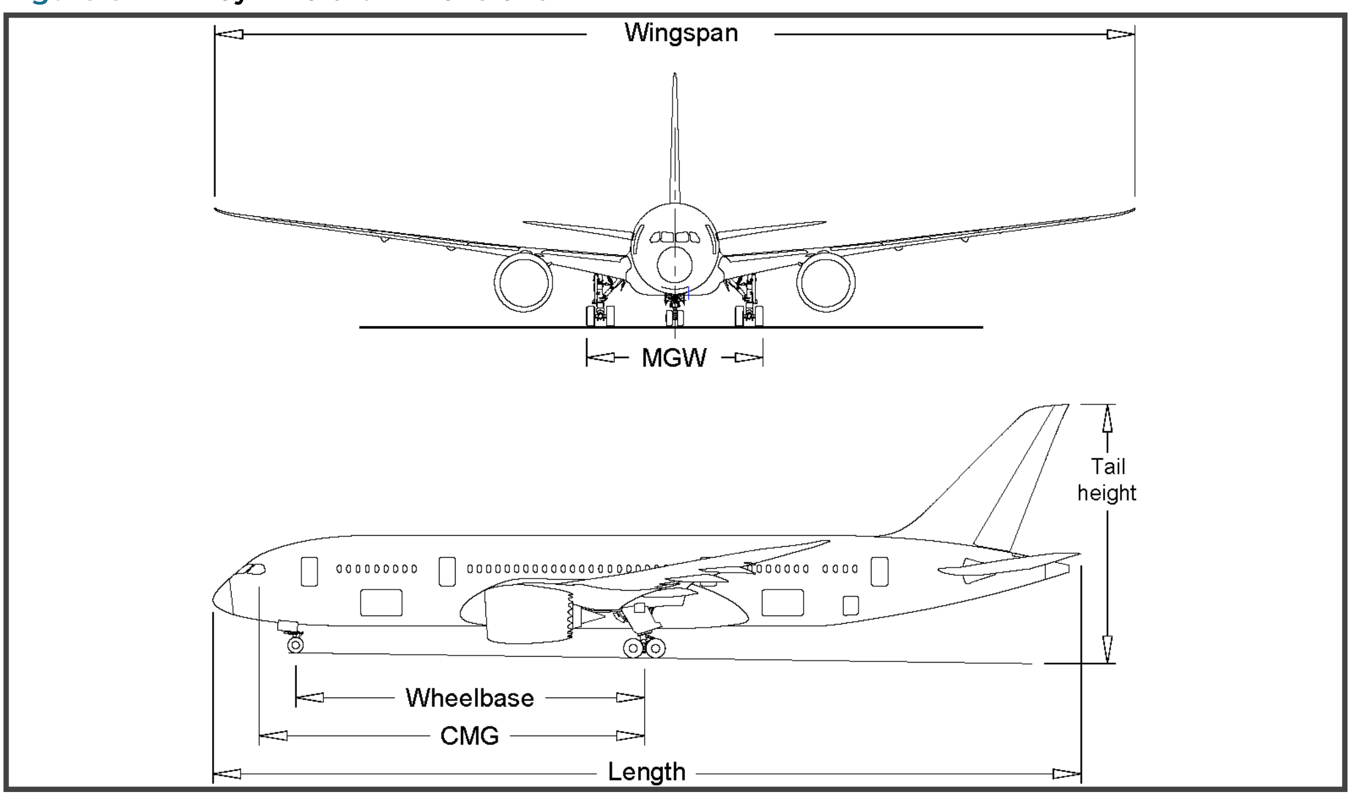
Effective airport design and planning helps to ensure airport facilities are able to meet current and future aviation needs and environmental considerations while maintaining acceptable levels of safety, efficiency, and capacity. The airport design process involves a series of steps to identify aviation demand at an airport and then apply the corresponding FAA standards to each of the airport's facilities. These steps generally include the following:

1. Identify the size, aircraft approach category, airport design group, and taxiway design group of the critical aircraft.
2. Identify reasonably attainable visibility minimums.
3. Identify the applicable runway design code.
4. Apply appropriate design standards contained within FAA Advisory Circular (AC) 150/5300-13B, *Airport Design*.[1]

### 6.2.1. Aircraft Classes, Categories, and Groups

The FAA has developed a coding system that allows airport planners and engineers to identify airport design criteria based on the operational and physical characteristics of the critical aircraft (Figure 6.1). The critical aircraft is the most demanding type of aircraft, or grouping of aircraft with similar characteristics, that make regular use of the airport. It can be a single aircraft or a composite of the most demanding characteristics from different aircraft. Incorporating the use of these characteristics as part of the coding system in this way helps airport planners and engineers design the airport to meet both current and future needs while also ensuring the correct design standards are applied.

**Figure 6.1: Key Aircraft Dimensions**




Source: FAA, AC 150/5300-13B, Figure A-1.

### a. Size, Weight, and Wake Turbulence Classifications

For capacity planning, the FAA uses four classifications based on an aircraft's physical aspects including its maximum certificated takeoff weight (MTOW), number of engines, and wake turbulence effect (Table 6.1).[2]

**Table 6.1: Aircraft Size, Weight, and Wake Turbulence Classifications**

| Aircraft Class | Maximum Certificated Takeoff Weight (MTOW) | Number of Engines | Wake Turbulence Classification |
|---|---|---|---|
| A | 12,500 pounds or less | Single | Small |
| B | 12,500 pounds or less | Multi | Small |
| C | 12,500 to 300,000 pounds | Multi | Large |
| D | More than 300,000 pounds | Multi | Heavy |

Source: FAA, AC 150/5060-5 *Airport Capacity and Delay*, Table 1-1.

### b. Aircraft Approach Category

The aircraft approach category (AAC) is designated by a letter and is based on the speed of an aircraft as it approaches a runway when landing (Table 6.2). It is generally used to help ensure an airport's runway safety areas can safely accommodate the critical aircraft.[3] (Like the aircraft size, weight, and wake turbulence classifications listed in Table 6.1, these are also designated by a letter so it is important to understand the distinction between the two.)

**Table 6.2: Aircraft Approach Categories**

| Category | Approach Speed |
|---|---|
| A | Less than 91 knots |
| B | 91 knots or more but less than 121 knots |
| C | 121 knots or more but less than 141 knots |
| D | 141 knots or more but less than 166 knots |
| E | 166 knots or more |

Source: FAA, AC 150/5300-13B *Airport Design*, Table 1-1.

### c. Airplane Design Group

The airplane design group (ADG) is designated by a Roman numeral and is based on an aircraft's wingspan or tail height; depending on which is most restrictive (Table 6.3). It is typically used to establish dimensional standards needed for adequate clearances.[4]

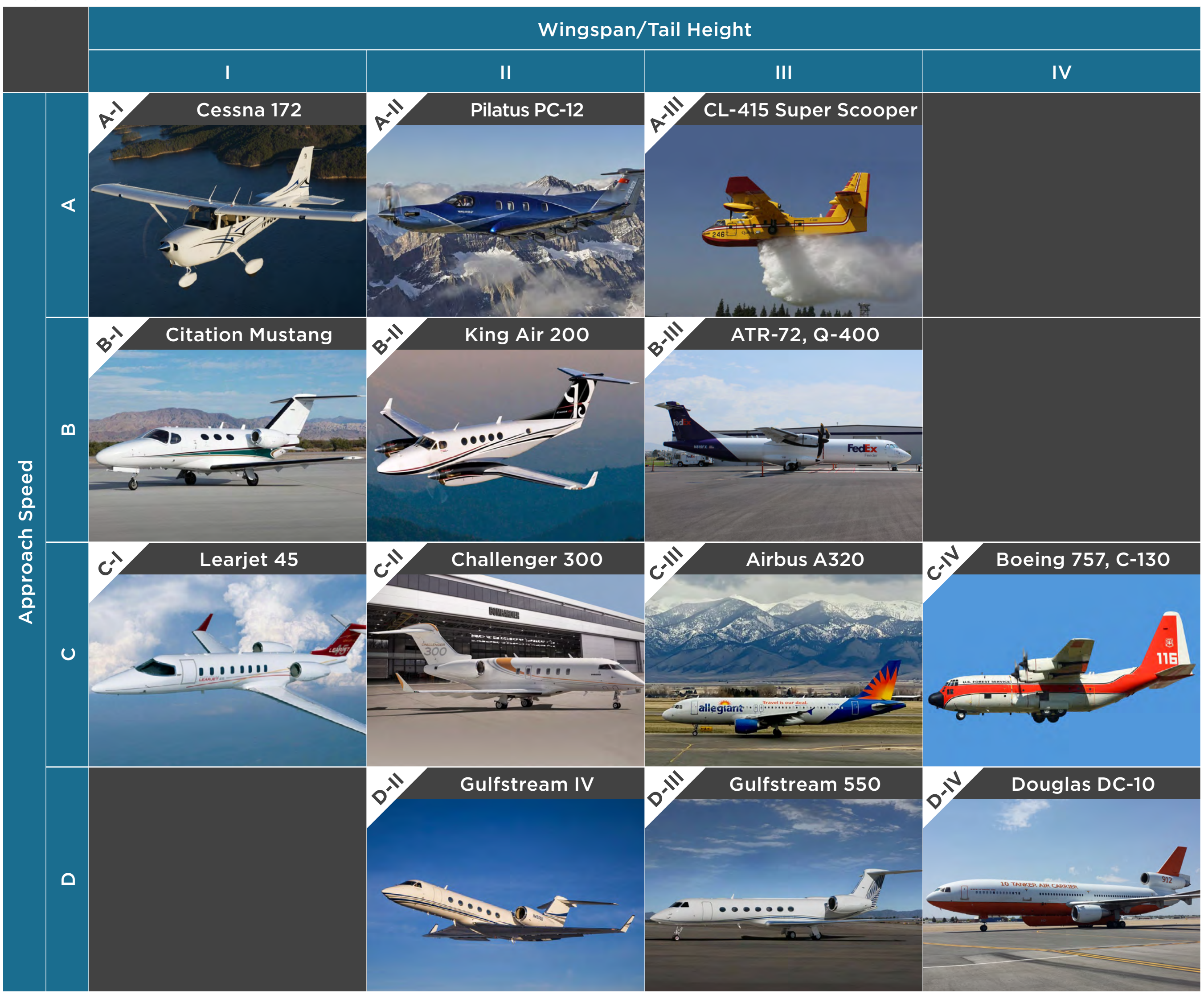
**Table 6.3: Airplane Design Groups**

| Group | Tail Height | Wingspan |
|---|---|---|
| I | < 20 feet | < 49 feet |
| II | 20 feet – < 30 feet | 49 feet – < 79 feet |
| III | 30 feet – < 45 feet | 79 feet – < 118 feet |
| IV | 45 feet – < 60 feet | 118 feet – < 171 feet |
| V | 60 feet – < 66 feet | 171 feet – < 214 feet |
| VI | 66 feet – < 80 feet | 214 feet – < 262 feet |

Source: FAA, AC 150/5300-13B *Airport Design*, Table 1-2.

Figure 6.2 illustrates representative aircraft for several AAC and ADG combinations.

**Figure 6.2: Representative Aircraft**

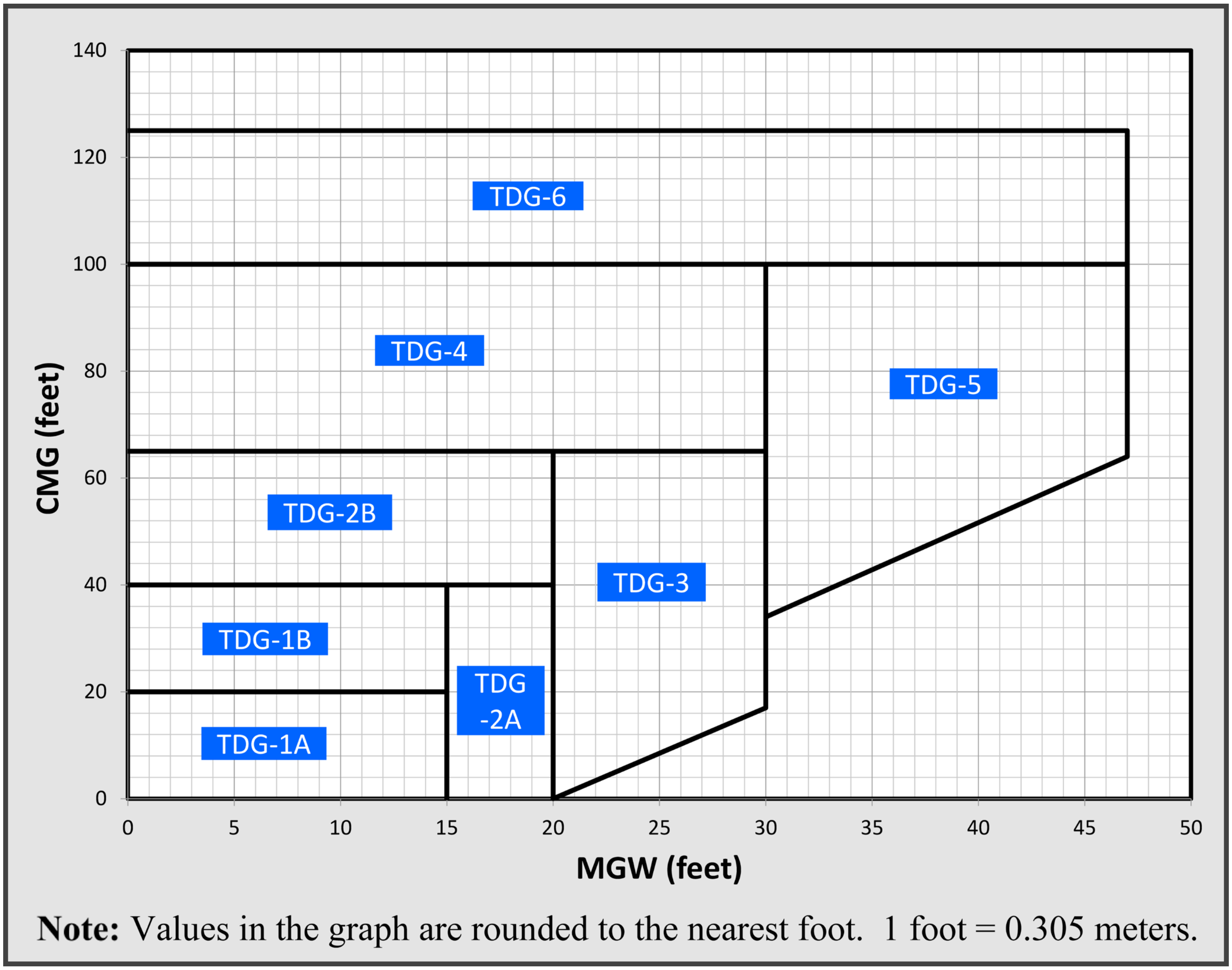



Source: Ardurra.

### d. Taxiway Design Group

The taxiway design group (TDG) is used to establish the correct design factors for taxiway width. As shown in Figure 6.3, it is based on the dimensions of an aircraft's landing gear. This includes the distance from the cockpit to the main gear (CMG) and the main gear width (MGW). Each taxiway at an airport can have a different TDG classification based on the size and type of aircraft expected to use a particular taxiway.[5]

**Figure 6.3: Taxiway Design Groups**




Source: FAA, AC 150/5300-13B, *Airport Design*, Figure 1-1.

### e. Visibility Minimums and Runway Visual Range Values

A runway's lowest visibility published on an instrument approach chart is used to determine its runway visual range (RVR) value. As shown in Table 6.4, a runway that does not have an instrument approach is classified as a visual runway and does not have an RVR value.

**Table 6.4: Visibility Minimums and Runway Visual Range Values**

| Runway Visual Range Value | Instrument Flight Visibility Category (statute miles) |
|---|---|
| VIS | Visual Approach Only |
| 5,000 feet | Not lower than 1 mile |
| 4,000 feet | Lower than 1 mile but not lower than 3/4 mile |
| 2,400 feet | Lower than 3/4 mile but not lower than 1/2 mile |
| 1,600 feet | Lower than 1/2 mile but not lower than 1/4 mile |
| 1,200 feet | Lower than 1/4 mile |

Source: FAA, AC 150/5300-13B *Airport Design*, Table 1-3.

### f. Runway Design Code

The runway design code (RDC) is used to establish the design characteristics for each runway. It is comprised of three components; AAC, ADG, and RVR. These are applied to individual runways which means each runway at an airport can have a different RDC.[67]

## 6.2.2. Critical Aircraft and Applied Airfield Design Criteria

### a. Commercial Service Critical Aircraft

The Airbus A320 was identified as the commercial service critical aircraft. As shown in Table 6.5, the A320 is a large aircraft with an AAC of C, an ADG of III, and a TDG of 3.

However, as previously mentioned in Section 5.14, Alaska Airlines recently began providing air service at IDA using the Bombardier Q-400 aircraft. The Q-400 has an AAC of B, an ADG of III, and a TDG of 5 which makes it the most demanding aircraft for taxiway design.

Therefore, design criteria associated with an AAC of C, an ADG of III, and a TDG of 5 were used for Runway 3/21; the commercial apron; and Taxiways A, A1–A6, C, and G because these areas are intended for use by commercial aircraft.

### b. Air Cargo Critical Aircraft

The ATR 72 was identified as the air cargo critical aircraft. The ATR 72 has an AAC of B, an ADG of III, and a TDG of 1B. These design standards were applied to the cargo apron.

However, as previously mentioned in Section 5.10.2, increasing levels of air cargo activity at the airport indicate there is a possibility that FedEx, UPS, or similar air cargo carrier will introduce new scheduled service at IDA using a Boeing B757F aircraft. The B757F has an AAC of C, an ADG of IV, and a TDG of 4 which would make it difficult for these carriers to use the cargo apron in its current configuration. If an ADG IV aircraft becomes the future critical aircraft, major airfield changes would need to take place.

### c. General Aviation Critical Aircraft

The Bombardier Challenger 300 was identified as the general aviation (GA) critical aircraft. It has an AAC of C, and ADG of II, and a TDG of 1B. These design standards were applied to the areas of the airport located south of the commercial apron including the main FBO apron and the south GA apron because these area are intended for use by GA aircraft (Figure 6.4).

While Runway 17/35 and the east GA apron are also intended for use by GA aircraft, they are intended strictly for light GA aircraft like a Cessna 182 which is considered to be a small aircraft with an AAC of A, an ADG of I, and a TDG of 1A. Therefore, these design standards were applied to Runway 17/35.

The east GA apron and the taxilanes east of Runway 17/35 (i.e., Taxiways B, B1 – B3, and C) were designed to AAC A, ADG-II, TDG 3 standards. This is discussed in additional detail in Section 6.3.3, Taxiway System Requirements.

**Table 6.5: Critical Aircraft Classifications**

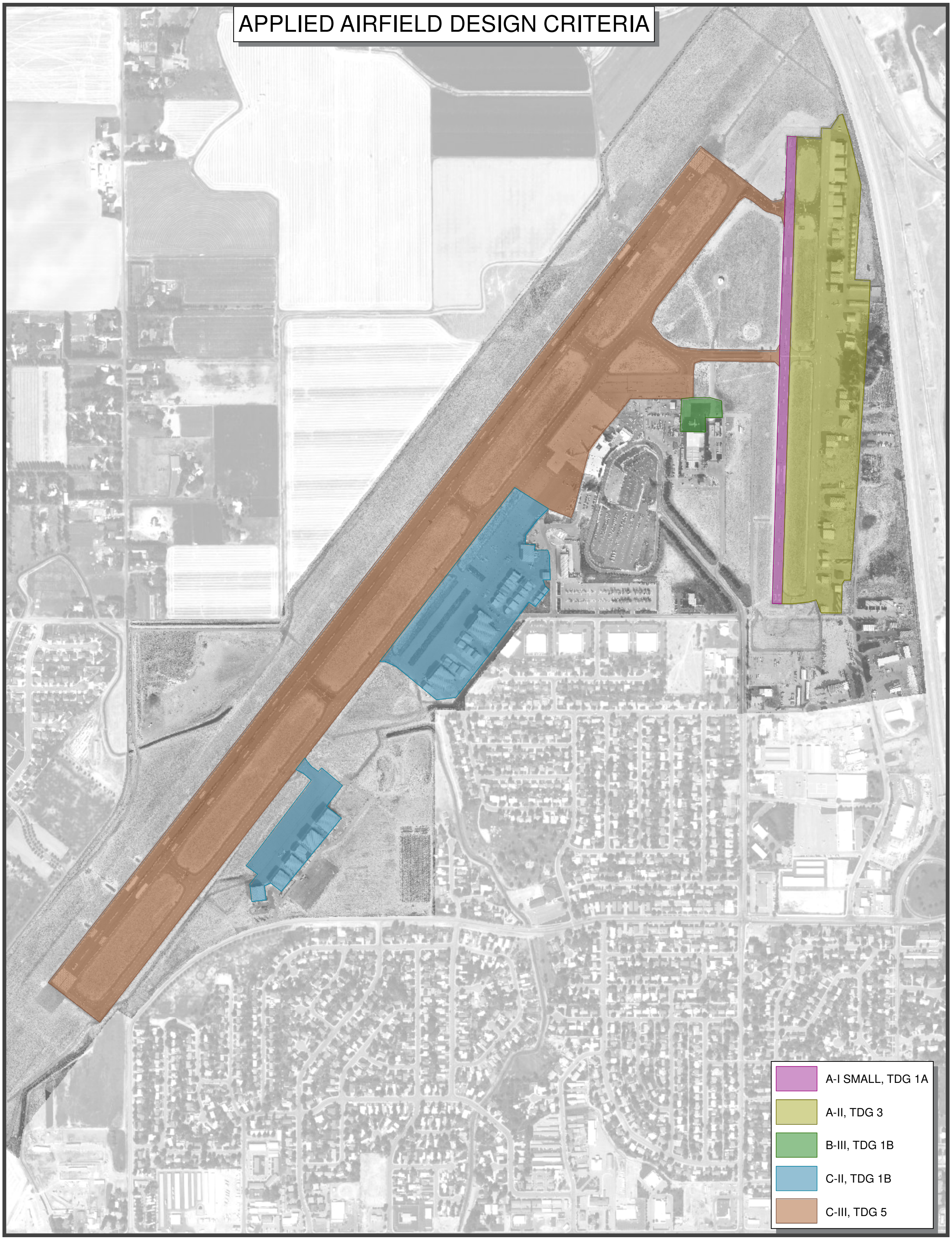
| Area | Aircraft | AAC | ADG | TDG |
|---|---|---|---|---|
| Commercial Service | Airbus A320 | C | III | 3 |
| Commercial Service Taxiways | Bombardier Q-400 | B | III | 5 |
| Air Cargo | ATR 72 | B | III | 1B |
| General Aviation | Bombardier Challenger 300 | C | II | 1B |

Source: FAA, AC 150/5300-13B *Airport Design*, Table 1-2.

### d. Runway Design Codes for Idaho Falls Regional Airport

- Runway 21 is intended to be used mainly by commercial service aircraft and has a published approach minimum of 1/2 mile or 2,400 feet. This combination means Runway 3/21 has an RDC of C-III-2,400.
- Runway 17/35 is intended to be used mainly by small general aviation aircraft with less than a 12,500-pound maximum takeoff weight and does not have an instrument approach procedure. This combination means Runway 17/35 has an RDC of A-I(small)–VIS.

**Figure 6.4:** Applied Airfield Design Criteria




Source: Ardurra.

## 6.3. Airfield and Airspace Requirements

The determination of airfield and airspace requirements includes conducting an assessment to determine the airport's ability to safely and efficiently accommodate the activity forecasted for the 20-year planning period, and then determine if all airport facilities are in compliance with FAA design and safety standards. The analysis is also used to help determine if and when improvements are needed to meet specific operational demands.[8]

### 6.3.1. Airfield Capacity

The most widely recognized and accepted method for conducting an airfield capacity analysis is found in FAA AC 150/5060-5, *Airport Capacity and Delay*. This methodology is used to determine the annual service volume (ASV) and hourly capacity to provide a reasonable estimate of an airport's annual capacity. This methodology accounts for differences in runway use, aircraft mix, and weather conditions encountered during the course of a typical year. The calculations derived from this method may be used if the conditions at the airport do not significantly differ from the capacity assumptions listed in the AC.

**Capacity assumptions are listed below:**

- Runway Use Configuration: Most runway layouts used at the airport can be approximated by one of the 19 runway-use configurations shown in the AC. IDA uses an open "V" configuration, number 14 for a south traffic flow, and number 15 for a north traffic flow.
- Percent Arrivals: Arrivals equal departures.
- Percent Touch and Goes: The percent of touch-and-go operations is within the limits shown in Table 2-1 of the AC. For IDA, touch-and-go operations are assumed to be local GA operations which make up approximately 22% of total operations which is within the limits.
- Taxiways: A full-length taxiway with ample runway entrance and exit taxiways, and no taxiway crossing problems.
- Airspace Limitations: There are no airspace limitations which would adversely impact flight operations or otherwise restrict aircraft which could operate at the airport.
- Runway Instrumentation: The airport has at least one runway equipped with an instrument landing system (ILS) and has air traffic control services.

**Annual service volume assumptions are listed below:**

- Weather conditions allowing for flights using instrument flight rules (IFR) occur roughly 10% of the time.
- The airport operates with the runway-use configuration which produces the greatest hourly capacity roughly 80% of the time.

#### a. Aircraft Mix Index

As previously mentioned in Table 6.1, the FAA classifies aircraft based on their maximum certified operational weight (excluding helicopter operations). The mix index is a calculated ratio of forecasted aircraft mix based on this weight classification system. The mix index increases as the number of heavier aircraft increases. This increase indicates a decrease in hourly capacity because the FAA requires heavier aircraft be spaced further apart from other aircraft for safety reasons.

The aircraft mix index is a mathematical expression of the aircraft mix. This equation is the percent of C aircraft (more than 12,500 pounds but less than 300,000 pounds) plus three times the percent of D aircraft (more than 300,000 pounds) which is written as %(C+3D). There are no Class D aircraft projected to use the airport so the equation can be simplified to %(C). The fleet mix forecast is used to calculate the mix index which is then used to determine airfield capacity. Based on the forecast, the mix index is projected to be between 58–60%. The mix index is expected to generally remain the same throughout the planning period.

### b. Annual Service Volume

Using runway configuration number 14 from the AC, which represents a south traffic flow, the ASV is calculated to be 220,000 operations. Using runway configuration number 15, which represents a north traffic flow, the ASV is calculated to be 215,000 operations. Since runway configuration number 15 results in a decrease in capacity compared to runway configuration number 14, runway configuration number 15 will be used to determine runway capacity at IDA.

#### Conclusion

IDA's annual service volume is 215,000 annual operations with an hourly capacity of 82 operations per hour for VFR conditions and 56 operations per hour for IFR conditions. As noted in Table 5.1, there was a total of 33,656 operations at IDA for 2021 which is approximately 15% of ASV. By 2041, this is forecasted to grow to 40,119 total operations which is approximately 19% of ASV.

An airport should begin planning to make capacity improvements when capacity reaches 60% of ASV. At 80%, plans should be complete, and construction should begin. At 100%, the airport has reached capacity and improvements should be completed to avoid delays. Demand is expected to remain within 15–19% of ASV for the 20-year planning period which means there is not a need to begin planning for capacity improvements.

### c. Capacity Analysis for a One-Runway Scenario

This scenario examines the airport's capacity using only Runway 3/21 and the existing mix index of 58–60%. Previous wind coverage analysis, which was discussed in Section 4.1.4. Wind Coverage, demonstrated that Runway 3/21 provides greater than 95% wind coverage in all weather conditions. Therefore, according to FAA Order 5100.38D, *Airport Improvement Program Handbook*, Table G-1, a crosswind runway is not required. However, a secondary runway could be justified if the primary runway is operating at 60% or more of its annual capacity, or when the FAA has made a specific determination that a secondary runway is required. In this scenario, the only parameters that changed was the runway configuration. Using runway configuration number 1 from the AC, which is a single runway, the ASV is 205,000 annual operations. This is approximately 16% of ASV for 2021 and 20% of ASV for 2041; well below 60% of ASV for the 20-year planning horizon.

#### Conclusion

Based on FAA requirements outlined in Table G-1 of FAA Order 5100.38D, *Airport Improvement Program Handbook*, Runway 17/35 does not meet the requirements for a crosswind or secondary runway unless the FAA makes a specific determination stating the runway is required.

### 6.3.2. Runway Requirements

The FAA has established design standards for nearly every aspect of airports. This includes navigable airspace, airside facilities, and landside facilities. Once the existing and future airport design classifications are determined, the applicable FAA design standards are applied to provide an acceptable level of safety at an airport. These standards, which are outlined in FAA AC 150/5300-13B, *Airport Design,* include dimensions for runway width, safety areas, separation distances from fixed or movable objects, and several other facets of airport layout.

Sponsors receiving federal funds are obligated by federal grant assurances to comply with FAA design standard, and identifying these standards is a core concept for every airport master plan. Applying FAA standards ensures that airport safety and design are congruent with the types of aircraft operations occurring at the airport.

Each design criteria includes associated safety area dimensional standards. Safety areas and object free areas surrounding a runway protect both airport operations and the community. Safety areas limit the accessibility and functionality of the property, establishing a protective buffer around the airport's operating surfaces. The following definitions describe the safety areas associated with a runway and their functionality.

#### Runway Object Free Area

A runway object free area (ROFA) is an area on the ground centered about the runway centerline. The ROFA enhances the safety of aircraft operations by requiring the area to be free of objects, except for objects that need to be located in the ROFA for air navigation (fixed-by-function) or aircraft ground maneuvering purposes.

#### Runway Obstacle Free Zone

A runway obstacle free zone (ROFZ) is a volume of airspace centered on the runway centerline. Its elevation is the same as the elevation of the nearest point on the runway centerline, and it extends 200 feet beyond each end of the runway. It must be clear of objects other than frangible NAVAIDs that need to be located in the OFZ because of their function.

#### Inner-Approach Obstacle Free Zone

The inner-approach obstacle free zone (IA-OFZ) is a defined volume of airspace centered on the approach area. It applies only to runways with an approach light system (ALS). The surface begins 200 feet from the runway threshold at the same elevation as the runway threshold and extends 200 feet beyond the last light unit in the ALS. Its width is the same as the ROFZ and rises at a slope of 50 to 1 from its beginning. At IDA, this applies only to Runway 21.

#### Inner-Transitional Obstacle Free Zone

The inner-transitional obstacle free zone (IT-OFZ) is a defined volume of airspace along the sides of the ROFZ and IA-OFZ. It applies only to runways with lower than 3/4 mile approach visibility minimums. Aircraft tails may not violate the IT-OFZ. For operations on runways used by large aircraft, where the visibility minimums are lower than ¾ mile but not lower than 1/2 mile, this surface begins at the edges of the ROFZ and IA-OFZ, then rises vertically for a height (H) calculated by the equation below, then slopes 6:1 out to a height of 150 feet above the airport elevation. At IDA, this applies only to Runway 21.

H(feet) = 61 – 0.094(Sfeet) – 0.003(Efeet). S is equal to the most demanding wingspan of the RDC of the runway, and E is equal to the runway threshold elevation above sea level.

At IDA, for an Airbus A320: H = 61–0.094(111.88)–0.003(4731.32) = 61–10.52–14.19 = 36.3 ft.

### Precision Obstacle Free Zone

The precision obstacle free zone (POFZ) is defined as a volume of airspace above an area beginning at the threshold, at the threshold elevation, and centered on the extended runway centerline. This surface is applicable to any runway served by a vertically-guided approach with landing minimums less than 250 feet or visibility less than 3/4 statute mile or RVR is less than 4,000 feet, and an aircraft is on final approach within two miles of the runway threshold. When the POFZ is in effect, a wing or fuselage-mounted horizontal stabilizer of an aircraft holding on a taxiway may penetrate the POFZ; however, neither the fuselage nor tail-mounted horizontal stabilizer may penetrate the POFZ. At IDA, this surface applies to Runways 3 and 21 when the criteria have been met.

### Runway Protection Zone

A runway protection zone (RPZ) is trapezoidal in shape and centered about the extended runway centerline. The function of an RPZ is to enhance the protection of people and property on the ground by limiting incompatible land uses and precluding activities involving congregations of people. It is desirable to clear the entire RPZ of all above-ground objects. Airport ownership of the entire RPZ is not always possible; however, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses and recommends airport owners should at least own the property under approach and departure areas. Coordination with the FAA is required should land use within an RPZ incorporate incompatible land uses.

### Runway Safety Area

A runway safety area (RSA) is a defined surface centered on and surrounding the runway that is prepared or suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, approach, or excursion from the runway. The RSA must be able to support, under dry conditions, snow removal and aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing major damage to the aircraft. Certain items are allowed to be in the RSA, as they are "fixed-by-function," such as a PAPI, REIL, and Approach Lighting System. At IDA, the supplemental wind cone for Runway 3 is located in the RSA but is not fixed-by-function.

Table 6.6 lists the existing conditions for Runway 3/21 alongside current design standards for this runway. Table 6.7 lists the existing conditions for Runway 17/35 alongside current design standards for this runway. Areas where the runways are not in compliance with these standards are also noted in these tables.

**Table 6.6: Runway 3/21 Design Standards and Compliance**

| Design Criteria | Existing 3/21 | RDC C-III-2400 Standards | Compliant |
|---|---|---|---|
| Runway Length | 9,002 | See Section 6.3.2 (c) | N/A |
| Runway Width | 150 | 150* | Y |
| Runway Shoulder Width | 20 | 25* | N |
| Blast Pad Width | N/A | 200* | N |
| Blast Pad Length | N/A | 200 | N |
| Crosswind Component | 16 KTS | 16 KTS | Y |
| RSA Length Beyond Runway End | 1,000 | 1,000 | Y |
| RSA Length Prior to Threshold | 600 | 600 | Y |
| RSA Width | 500 | 500 | Y |
| ROFA Length Beyond Runway End | 1,000 | 1,000 | Y |
| ROFA Length Prior to Threshold | 600 | 600 | Y |
| ROFA Width | 800 | 800 | Y |
| ROFZ Length Beyond Runway End | 200 | 200 | Y |
| ROFZ Width | 400 | 400 | Y |
| RWY 21 Inner Approach OFZ Width | 200 | 200 | Y |
| RWY 3 and 21 POFZ Length | 200 | 200 | Y |
| RWY 3 and 21 POFZ Width | 800 | 800 | Y |
| **RWY 3 RPZ** | | | |
| Approach Length | 1,700 | 1,700 | Y |
| Approach Inner Width | 1,000 | 1,000 | Y |
| Approach Outer Width | 1,510 | 1,510 | Y |
| Departure Length | 1,700 | 1,700 | Y |
| Departure Inner Width | 500 | 500 | Y |
| Departure Outer Width | 1,010 | 1,010 | Y |
| **RWY 21 RPZ** | | | |
| Approach Length | 2,500 | 2,500 | Y |
| Approach Inner Width | 1,000 | 1,000 | Y |
| Approach Outer Width | 1,750 | 1,750 | Y |
| Departure Length | 1,700 | 1,700 | Y |
| Departure Inner Width | 500 | 500 | Y |
| Departure Outer Width | 1,010 | 1,010 | Y |
| Centerline to Holding Position Marking | 250 | 250 | Y |
| Centerline to Parallel TWY Centerline | 400 | 400 | Y |
| Runway Gradient | 0.12% | 1.50% Max | Y |

* For airplanes with maximum certificated takeoff weight greater than 150,000 pounds.
Source: FAA, AC 150/5300-13B *Airport Design*, Table G-9.

Table 6.7: Runway 17/35 Design Standards and Compliance

| Design Criteria | Existing 17/35 | RDC A-I (Small)-VIS Standards | Compliant |
|---|---|---|---|
| Runway Length | 3,964 | See Section X | N/A |
| Runway Width | 75 | 60 | Y |
| Runway Shoulder Width | N/A | 10 | N |
| Blast Pad Width | N/A | 80 | N |
| Blast Pad Length | N/A | 60 | N |
| Crosswind Component | 10.5 KTS | 10.5 KTS | Y |
| RSA Length Beyond Runway End | 240 | 240 | Y |
| RSA Width | 120 | 120 | Y |
| ROFA Length Beyond Runway End | 240 | 240 | Y |
| ROFA Length Prior to Threshold | 240 | 240 | Y |
| ROFA Width | 250 | 250 | Y |
| ROFZ Length Beyond Runway End | 200 | 200 | Y |
| ROFZ Width | 250 | 400 | Y |
| RWY 17 and 35 Approach and Departure RPZ Length (visual) | 1,000 | 1,000 | Y |
| RWY 17 and 35 Approach and Departure RPZ Inner Width (visual) | 250 | 250 | Y |
| RWY 17 and 35 Approach and Departure RPZ Outer Width (visual) | 450 | 450 | Y |
| Centerline to Holding Position Marking | 125 | 125 | Y |
| Centerline to Parallel TWY Centerline | 270 | 150 | Y |
| Runway Gradient | 0.00% | 2.0% Max | Y |

Source: FAA, AC 150/5300-13B *Airport Design*, Table G-1.

### a. Runway 3/21 Compliance Scenario for ADG-IV Aircraft

The preferred forecast for air cargo includes a scenario that assumes FedEx, UPS, or another cargo carrier will introduce new scheduled service using a Boeing 757F aircraft to supplement existing cargo operations at IDA at approximately 100 annual operations. Should this scenario occur, the 757F would then become the critical aircraft for cargo operations when the 500 annual operations threshold is met. At that time, the following design standards for Runway 3/21 would change:

- IT-OFZ: H = 61 – 0.094(124.83) – 0.003(4731.32) = 61 – 11.73 – 14.19 = 35.1 feet.
- Crosswind component would increase from 16 knots to 20 knots. Runway 3/21 meets this requirement.

### b. Runway Orientation and Designation

The normal shifting of the magnetic poles can result in the need to renumber, or redesignate, airport runways. A review of the geodetic and magnetic headings for Runway 3/21 and Runway 17/35 indicate redesignation is not required for either runway during the planning horizon (Table 6.8).

**Table 6.8: Runway Designation**

| Current Runway Designation | 3 | 21 | 17 | 35 |
|---|---|---|---|---|
| Latitude | 43° 30′ 09″ N | 43° 31′ 19″ N | 43° 31′ 20″ N | 43° 30′ 41″ N |
| Longitude | 112° 05′ 07″ W | 112° 03′ 52″ W | 112° 03′ 42″ W | 112° 03′ 44″ W |
| Elevation | 4,741.99' | 4,731.32' | 4,731.10' | 4,731.23' |
| Geodetic Heading | 37° 54′ 38.87″ | | 1° 54′ 30.40″ | |
| Magnetic Heading (Current) | 26° 19′ 38.87″ | | 350° 19′ 30.40″ | |
| Magnetic Declination (Current) | 11° 35′ E | | | |
| Change/Year | 0° 6′ W | | | |
| Magnetic Declination (Future) | 9° 35′ E | | | |
| Magnetic Heading (Future) | 28° 19′ 38.87″ | | 352° 19′ 30.40″ | |

Source: NOAA; Ardurra.

### Conclusion

Runway designations for Runway 3/21 and Runway 17/35 do not need to change during the planning horizon.

### c. Runway Length

Many factors are used to help determine if a runway's length is suitable for airplane operations. These factors include the airport's elevation above mean sea level, average temperature, wind velocity, airplane operating weights, takeoff and landing flap settings, runway surface condition (i.e., dry or wet), effective runway gradient, presence of obstructions in the vicinity of the airport, and any locally imposed noise abatement restrictions. A given runway length may not be suitable for all aircraft operations. FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, provides recommendations for use in the design of civil airports.

Adequate runway length is an FAA recommendation, not a design standard. It is up to the pilot operating under the unique meteorological conditions and demands of a particular flight to determine the safety of the available runway length for the operation. However, it does remain a goal of the sponsor to provide a safe environment suited to the aircraft regularly operating at the airport.

The calculations for recommended runway length are driven by the airport's critical aircraft. For aircraft weighing more than 60,000 pounds, airport planning performance charts for individual aircraft were reviewed using conditions approximating the average temperature of the hottest month (86.2 F), and the airport's elevation of 4,744 feet.

According to FAA AC 150/5325-4B, runway length calculations for aircraft that weigh 60,000 pounds or more, as well as regional jets, are accomplished by using performance charts for the individual aircraft. This applies to the commercial airline critical aircraft, the Airbus A320, and the cargo forecast scenario using the Boeing 757F.

For the A320, Airbus performance charts from *Aircraft Characteristics: Airport and Maintenance Planning* were reviewed to determine the approximate runway length needed to operate at IDA during the summer. An A320 operating with a takeoff weight of 160,000 pounds at 86 F at IDA's field elevation results in a takeoff runway length of approximately 7,200 feet.

The cargo forecast scenario uses a Boeing 757F to supplement cargo operations at IDA. *Aircraft Characteristics: Airport and Maintenance Planning* for the 757-200/300 published by Boeing were reviewed to determine runway length requirements under certain conditions at IDA. A 757-200 equipped with Rolls Royce engines using a takeoff weight of 220,000 pounds and 20 degrees of flaps at 84 F (i.e., maximum temperature available for the 757-200) at IDA's field elevation results in a takeoff runway length of approximately 6,800 feet.

For aircraft that weigh less than 60,000 pounds, charts within AC 150/5325-4B can be used to generate runway lengths by grouping small aircraft that weigh less than 12,500 pounds, and large aircraft that weigh between 12,500 and 60,000 pounds.

It is assumed that not every aircraft will be able to take off from the existing runway during the hottest day at maximum takeoff weight. Accordingly, the curves in AC 150/5325-4B for large aircraft less than 60,000 pounds are provided for 75% of the fleet at 60 or 90% of useful load, and 100% of the fleet at 60 or 90% of useful load. The general aviation critical aircraft, the Bombardier Challenger 300, is listed in the AC Table 3-1 as being part of the 75% fleet. Using Figure 3-1 in the AC for 75% of the fleet at 90% useful load yields a runway length of 8,600 feet. The runway length for 100% of the fleet at 60% of useful load is 9,000 feet, while the runway length for 100% of the fleet at 90% of useful load is 10,400 feet. The current runway length of Runway 3/21 is 9,002 feet, which is adequate for 75% of the large aircraft fleet at 90% useful load and 100% of the fleet at 60% useful load.

For small aircraft that weigh less than 12,500 pounds, Figure 2-1 in AC 150/5325-4B provides curves for 95% and 100% of the small aircraft fleet. These aircraft would be expected to use Runway 17/35, which is 3,964 feet long. The curve for 95% of the small aircraft fleet results in a runway length of 5,800 feet, while the curve for 100% of the small aircraft fleet yields a runway length of 6,000 feet. Both lengths exceed the existing Runway 17/35 length; however, in cases where small aircraft need a longer runway, they can use Runway 3/21. As such, Runway 17/35 is considered adequate for use by small aircraft.

#### Conclusion

The current length of Runway 3/21 and Runway 17/35 is adequate to support the critical aircraft throughout the 20-year planning horizon.

### d. Runway Width

Runway 3/21 width meets design standards. Runway 17/35 exceeds design standards by 15 feet.

### e. Displaced Threshold and Declared Distances

When an object exists that is beyond the power of the owner to remove, relocate, or lower, a runway threshold may need to be relocated down the runway, which also relocates the protective airspace, keeping it clear of object penetrations. A relocated threshold is defined by the FAA as a displaced threshold. Thresholds may also be displaced for environmental considerations, such as noise abatement, or to provide the standards for RSA and ROFA lengths, and RPZ mitigation of incompatible land uses.

Displacement of the threshold reduces the length of runway available for landing and/or takeoff. Depending on the reason for displacement, the portion of the pavement beyond the runway threshold may be available for takeoffs in either direction or landings from the opposite direction.

Displaced thresholds are communicated to pilots through visual markings on the pavement, as well as distances published in the airport's chart supplement as declared distances. Declared distances are defined as follows:

#### Takeoff Run Available

The takeoff run available (TORA) is the runway length declared available and suitable for the ground run of an aircraft taking off.

#### Takeoff Distance Available

The takeoff distance available (TODA) is the TORA plus the usable length of any remaining runway or clearway beyond the TORA. The TODA may need to be reduced because of obstacles in the departure area.

#### Accelerate-Stop Distance Available

The accelerate-stop distance available (ASDA) is the runway plus stopway length declared available and suitable for the acceleration and deceleration of an aircraft aborting takeoff.

#### Landing Distance Available

The landing distance available (LDA) is the runway length declared available and suitable for landing an aircraft.

#### Conclusion

IDA does not have any displaced thresholds or need to use declared distances for any runway.

### f. Runway Line of Sight

For individual (non-intersecting) runways with a full parallel taxiway, the standard for line of sight (LOS) requirements is to ensure any point five-feet above the runway centerline is mutually visible with any other point five-feet above the runway centerline for a distance one-half the length of the runway. Runways 3/21 and 17/35 meet this requirement.

For non-intersecting, but converging runways at airports with part-time ATCT operations, FAA AC 150/5300-13B recommends providing a clear LOS from the V1 points of both runways, where V1 is the takeoff decision speed at which the pilot makes a decision to continue or discontinue the takeoff, for example as the result of an engine failure.[9] At IDA, it is possible to have aircraft taking off from Runway 35 and 3 at the same time and for those pilots to not see each other until one or both are airborne.

#### Conclusion

Runway LOS requirements are met for individual runways but not for both runways combined.

### g. Runway Pavement Strength

To meet the design life goals of the airport, runway pavements must be designed to physically withstand the weight of arriving, taxiing, and departing aircraft. This is calculated using a mix of aircraft. The maximum takeoff weight of the existing critical aircraft and those aircraft forecasted to use the airport must be considered to determine pavement strength requirements. The pavement must possess sufficient stability to withstand the abrasive action of traffic, adverse weather conditions, and other deteriorating influences.

Airport pavements degrade faster when over-stressed with loads beyond their design capability. Pavements are most stressed when aircraft loads are slowly applied, as in when an aircraft is taxiing or parked. Pavement loading is also a function of the number of pressure points, such that the more tires an aircraft has to distribute its load the less stress is exerted on the pavement. The current weight bearing capacity of Runway 3/21 is 140,000 pounds for single wheel, 175,000 pounds for a double wheel, and 270,000 pounds for a double tandem wheel configuration. For Runway 17/35, the weight bearing capacity is 43,000 pounds for single wheel, and 58,000 pounds for double wheel configuration.

The Airbus A320 has a maximum takeoff weight of 171,961 pounds and has a double wheel configuration. The 757-200F has a maximum takeoff weight of 255,500 pounds and has a double tandem wheel configuration. Both aircraft are below the weight bearing capacity of Runway 3/21. The Challenger 300 and ATR-72 weigh considerably less than the Airbus A320 and are well beneath the weight bearing capacity of Runway 3/21. Runway 17/35 is intended to support light general aviation aircraft, such as the Cessna 182, which has a maximum takeoff weight of 2,950 pounds and a single wheel configuration. This is below the weight bearing capacity of Runway 17/35.

#### Conclusion

The existing weight bearing capacities of Runways 3/21 and 17/35 are adequate to support the forecast aircraft through the planning horizon.

### h. Runway Incursion Mitigation

In AC 150/5300-13B, *Airport Design*, the FAA recommends the three-path concept for taxiway design. This concept is intended to prevent complex intersections that increase the possibility of pilot error and confusion which can lead to a runway incursion or accident. This design practice keeps taxiway intersections simple by providing pilots no more than three choices at an intersection—left, right, and forward. This also improves safety by allowing for proper placement of airfield markings, signage, and lighting.

Other measures that help reduce confusion and runway incursions are to avoid wide expanses of pavement at runway/taxiway intersections; limit runway crossings; avoid high-energy runway crossing intersections (i.e., An intersection within the middle third of a runway); increase pilot visibility by using 90-degree turns at runway entrance or crossing points; and eliminate direct runway access from a parking apron without requiring a turn.

#### Existing Conditions

- All intersections meet the three-path concept.
- There are no wide expanses of pavement at runway/taxiway intersections.
- There is one high energy runway crossing at the intersection of Taxiway C and Runway 17/35. This crossing also provides direct access to the runway from east general aviation parking apron. As previously mentioned in Section 4.5.9., Hot Spots, this intersection has been identified as Hot Spot 1 in the IDA Chart Supplement.

- All runway/taxiway intersections have 90 degrees turns. However, Taxiway B2, which is between Runway 17/35 and Taxiway A, has a bend just before the hold position marking.

**Figure 6.5: Runway 17/35, Taxiway C Intersection with Direct Apron Access**

Source: Ardurra.

### Conclusion

The intersection of Runway 17/35 and Taxiway C should be reviewed for alternatives to eliminate Hot Spot 1.

### 6.3.3. Taxiway System Requirements

Taxiways are defined paths that allow aircraft to move from one part of an airport to another. Like runways, taxiways have airport design standards, recommended practices, and design considerations based on the type of aircraft expected to use the taxiways. Taxiways should be designed for cockpit over centerline taxiing. This means the pavement should be sufficiently wide enough to allow a certain amount of aircraft wander from centerline. The allowance for wander is provided by the taxiway edge safety margin (TESM) which is measured from the outside of the design landing gear to the edge of the taxiway. Dimensional taxiway design standards are established based on an FAA grouping called taxiway design group (TDG). Like runways, taxiway design includes associated safety and object free areas to provide a safety buffer around movement areas determined based on the taxiway's design standard. Guidance from Chapter 4. Taxiway and Taxilane Design, of AC 150/5300-13B, *Airport Design*, was used to establish taxiway design standards.

**Taxiway/Taxilane Centerline to Fixed or Movable Object Separation**

The minimum distance between the centerline of a taxiway or taxilane to a fixed or movable object. Objects that are fixed-by-function are allowed within this area.

**Taxiway/Taxilane Safety Area**

The taxiway/taxilane safety area (TSA) is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft deviating from the taxiway.

**Taxiway/Taxilane Object Free Area**

The taxiway/taxilane object free area (OFA) is an area on the ground centered on a taxiway/taxilane centerline provided to enhance aircraft operations safety by remaining free of objects except for any objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

The airport design code and TDG associated with the identified critical aircraft at IDA (A320) is ADG III, TDG 3. As discussed in the forecast chapter, the FAA states that different critical aircraft may be identified to define separate elements of the airport design. The most demanding aircraft for taxiway requirements is the Q-400, which is operated by Alaska Airlines, with a TDG of 5. The west taxiway system of the airport was designed and built to TDG 5 standards to account for MD-80 and Q-400s operated previously. MD-80s have since been replaced by the A320, and Alaska Airlines intends to eliminate the Q-400 from their fleet by the end of 2023. Despite this, strong passenger growth in 2021 and 2022, added Q-400 service, and the potential for increased cargo operations by larger aircraft result in a need to plan accordingly. Therefore, taxiway design at IDA for the primary runway and movement areas continues to be defined by ADG III and TDG 5 standards.

For the taxiways and taxilanes supporting Runway 17/35, the taxiway design changes due to the types of aircraft and operations in that area. In 2019, a memorandum was submitted to the FAA explaining that this area of the airport supports significant tailwheel operations. The configuration of the gear orients the pilot at an upward angle, causing the engine cowling to obstruct a pilot's vision of the taxiway while operating on the ground. A taxiing technique used to overcome the visual obscuration is to taxi with a slight swerve left and right of the taxiway centerline. Because taxiways are designed for cockpit over centerline taxiing, a wider taxiway is needed to support tailwheel aircraft needing to taxi with a swerve. This is recognized in the AC. However, the AC does not provide further guidance for taxiway design for tailwheel aircraft. The 2019 memorandum recommends that the width of taxiways at IDA should be a minimum of TDG 3, which correlates to a width of 50 feet. The most recent ALP dated 2021 also identifies the design of this area as ADG II, TDG 3.

Table 6.9 outlines the existing conditions at IDA in comparison to the FAA design standards for ADG III, TDG 5 and ADG II, TDG 3 areas, according to the runways they directly support.

**Table 6.9: Taxiway Standards**

| Design Criteria | Runway 3/21 | | Runway 17/35 | | Meets Standards? | |
|---|---|---|---|---|---|---|
| | Existing | Standard | Existing | Standard | Rwy 3/21 | Rwy 17/35 |
| **Taxiway Protection Based on Airplane Design Group (ADG)** | | | | | | |
| **Standard Applied** | | **ADG III** | | **ADG II** | | |
| Taxiway Safety Area (TSA) Width | 118 ft. | 118 ft. | 79 ft. | 79 ft. | Y | Y |
| Taxiway Object Free Area (TOFA) | 171 ft. | 171 ft. | 124 ft. | 124 ft. | Y | Y |
| Taxilane OFA (TLOFA) | 158 ft. | 158 ft. | 110 ft. | 110 ft. | Y | Y |
| **Taxiway Separation** | | | | | | |
| Taxiway Centerline to Fixed or Movable Object | 93 ft. | 85.5 ft. | 65.5 ft. | 62 ft. | Y | Y |
| Taxilane Centerline to Fixed or Movable Object | 81 ft. | 79 ft. | 57.5 ft. | 55 ft. | Y | Y |
| **Taxiway Design Based on Taxiway Design Group (TDG)** | | | | | | |
| **Standard Applied** | | **TDG 5** | | **TDG 3** | | |
| Taxiway Width | Varies 60 ft. min. | 75 ft. | Varies 35 ft. min. | 50 ft. | N | N |
| Taxiway Edge Safety Margin | 14 ft. | 14 ft. | 10 feet | 10 ft. | Y | Y |
| Taxiway Shoulder Width | 20 ft. | 30 ft. | Varies 0–20 ft. | 20 ft. | N | N |

Source: FAA, AC 150/5300-13B

### Conclusion

IDA meets appropriate design standards for all design criteria except taxiway width and taxiway shoulder width, due to the varying widths along the length of the taxiways. There are areas of the taxiway which meet the standards. However, the narrowest sections do not meet the minimum requirements for FAA design. Additionally, all object free areas and safety areas are within standards and contain no penetrations or incompatible land uses.

### a. ADG-IV Taxiway Design Standards Scenario

In the event an ADG-IV aircraft becomes the critical aircraft for taxiway standards, the following taxiway design changes would occur:

- TSA: Increase from 118 feet to 171 feet.
- TOFA: Increase from 171 feet to 243 feet.
- TLOFA: Increase from 158 feet to 224 feet.
- Taxiway centerline to fixed or movable object: Increase from 85.5 feet to 121.5 feet.
- Taxilane centerline to fixed or movable object: Increase from 79 feet to 112 feet.

### 6.3.4. Airspace Requirements

Ensuring an airport's operational airspace is planned for and protected is necessary for the airport's long-term viability.

#### a. Part 77: Safe, Efficient Use and Preservation of the Navigable Airspace

Title 14 of the Code of Federal Regulations (CFR) Part 77, *Safe, Efficient Use and Preservation of the Navigable Airspace*, establishes standards for determining obstructions to airspace. Part 77 describes imaginary surfaces surrounding airports and specific to individual runways based on runway category and instrument approach (Figure 6.6).

The most precise existing or proposed instrument approach for the specific runway end determines the slope and dimensions of each approach surface. Any object, natural or man-made, that penetrates these imaginary surfaces is considered to be an obstruction.

**Primary Surface**

A rectangular area, symmetrically located along the runway centerline, that extends 200 feet beyond each runway threshold. The elevation of the Primary Surface is the same as the corresponding runway elevation. The most demanding existing or planned instrument approach for either runway end determines the Primary Surface width. In all cases, the width equals the inner width of the approach surface.

**Approach Surface**

A surface that begins at the ends of the Primary Surface and slopes upward, and flares outward horizontally at a predetermined ratio. The width and elevation at the inner Approach Surface conform to the Primary Surface. Slope, length, and width of the outer ends are governed by the runway service category, existing or proposed instrument approach procedure, and approach visibility minimums.

**Horizontal Surface**

An oval-shaped, level area situated 150 feet above the highest point on the airport's usable runways. The perimeter is established by swinging arcs of specified radii from the center of each end of the Primary Surface of each runway and connecting the adjacent arcs by lines tangent to those arcs. The arcs at either end will have the same value.

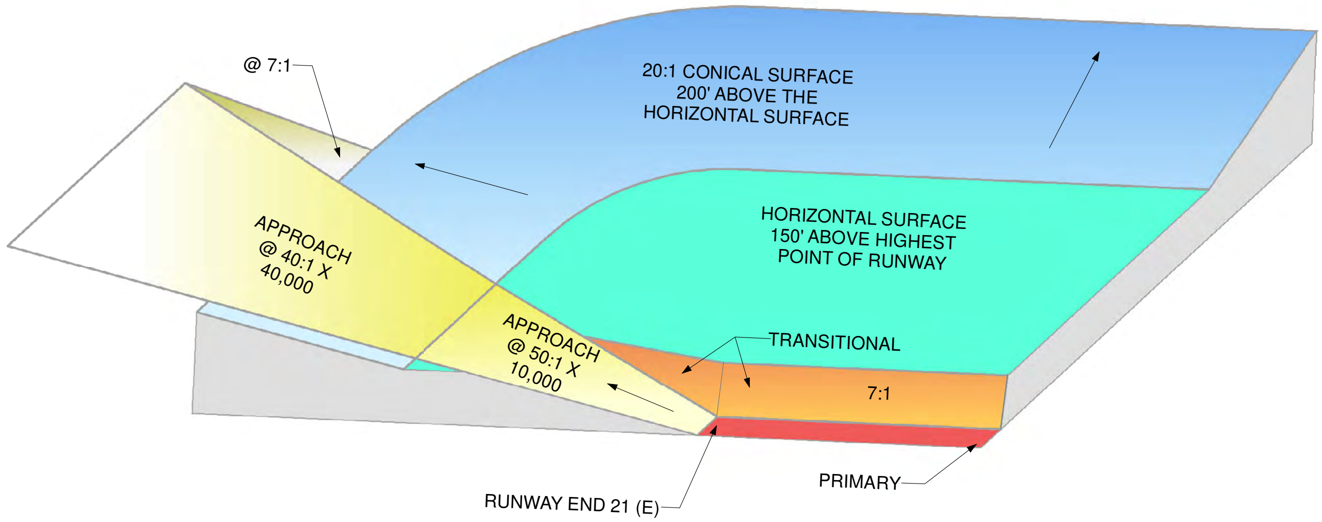
**Conical Surface**

A sloping area whose inner perimeter conforms to the shape of the Horizontal Surface.

**Transitional Surface**

An area beginning at the edge of the Primary Surface and slopes at a ratio of 7:1 (horizontal: vertical) until it intersects the Horizontal Surface.

## Figure 6.6: Part 77 Imaginary Surfaces




Source: 14 CFR Part 77; Ardurra.

The dimensions of IDA's Part 77 surfaces are listed in Table 6.10.

## Table 6.10: IDA Part 77 Dimensions

| Primary Surface | Runway 3/21 (Primary) | | Runway 17/35 | |
|---|---|---|---|---|
| Width | 1,000 feet | | 250 feet | |
| Length Beyond Runway End | 200 feet | | 200 feet | |
| **Horizontal Surface** | | | | |
| Height Above Airport Elevation | 150 feet | | 150 feet | |
| Radius Arc | 10,000 feet | | 5,000 feet (Encompassed by Runway 3/21) | |
| **Conical Surface** | | | | |
| Length | 4,000 feet | | 4,000 feet | |
| Slope | 20:1 | | 20:1 | |
| **Transitional Surface** | | | | |
| Slope | 7:1 | | 7:1 | |
| **Approach Surface Runway** | **RWY 3** | **RWY 21** | **RWY 17** | **RWY 35** |
| Inner Width | 1,000 feet | 1,000 feet | 250 feet | 250 feet |
| Outer Width | 4,000 feet | 16,000 feet | 1,250 feet | 1,250 feet |
| Length | 10,000 feet | 10,000 feet plus 40,000 feet | 5,000 feet | 5,000 feet |
| Slope | 34:1 | 50:1 then 40:1 | 20:1 | 20:1 |

Source: 14 CFR, Part 77

### b. Approach and Departure Standards

In addition to the Part 77 imaginary surfaces are the protective surfaces outlined in FAA AC 150-5300-13B, *Airport Design*, though they serve the same function for the protection of the use of the runway. The AC defines approach and departure surface dimensions based on the runway type, the approach category of the aircraft using the runway, and the runway's instrument approach minimums.

### c. Runway 3/21 Approach Surfaces

As previously summarized in Table 3.2, Instrument Approach Procedures, the approach procedure with the lowest minimum visibility requirement for Runway 3 is associated with the localizer performance with vertical guidance (LPV) approach which has a 3/4-mile visibility requirement. The approach procedure with the lowest minimum visibility requirement for Runway 21 is associated with the instrument landing system (ILS) approach which has a 1/2-mile visibility requirement.

The approach surface dimension standards for these approach types are listed in AC 150/5300-13B, "Table 3-4. APV and PA Instrument Runway Approach Surfaces" and illustrated in "Figure 3-7. Approach Procedure with Vertical Guidance (APV) and Precision Approach (PA) Instrument Runway Approach Surfaces." Both are included as Figure 6.7.[10] As shown in Figure 6.7, both of these approach types require approach Surface 5 and Surface 6.

## Figure 6.7: Instrument Runway Approach Surfaces

**Table 3-4. APV and PA Instrument Runway Approach Surfaces**

| Surface | Runway Type | Visibility minimums | A ft (m) | B ft (m) | C ft (m) | D [4] ft (m) | Slope |
|---|---|---|---|---|---|---|---|
| **Surface 5** | Approach end of runways providing ILS, MMLS, PAR, and localizer type directional aid with glidepath, LPV, LNAV/VNAV, RNP, or GLS. | ≥ ¾ statute mile (1.2 km) | 200 (61) | 400 (122) | 3,400 (1,036) | 10,000 (3,048) | 20:1 |
| | | < ¾ statute mile (1.2 km) | 200 (61) | 400 (122) | 3,400 (1,036) | 10,000 (3,048) | 34:1 |
| **Surface 6** | Approach end of runways providing ILS, MMLS, PAR, and localizer type directional aid with glidepath, LPV, LNAV/VNAV, RNP, or GLS. | All | 0 | Runway Width + 200 (61) | 1,520 (463) | 10,200 (3,109) | 30:1 |

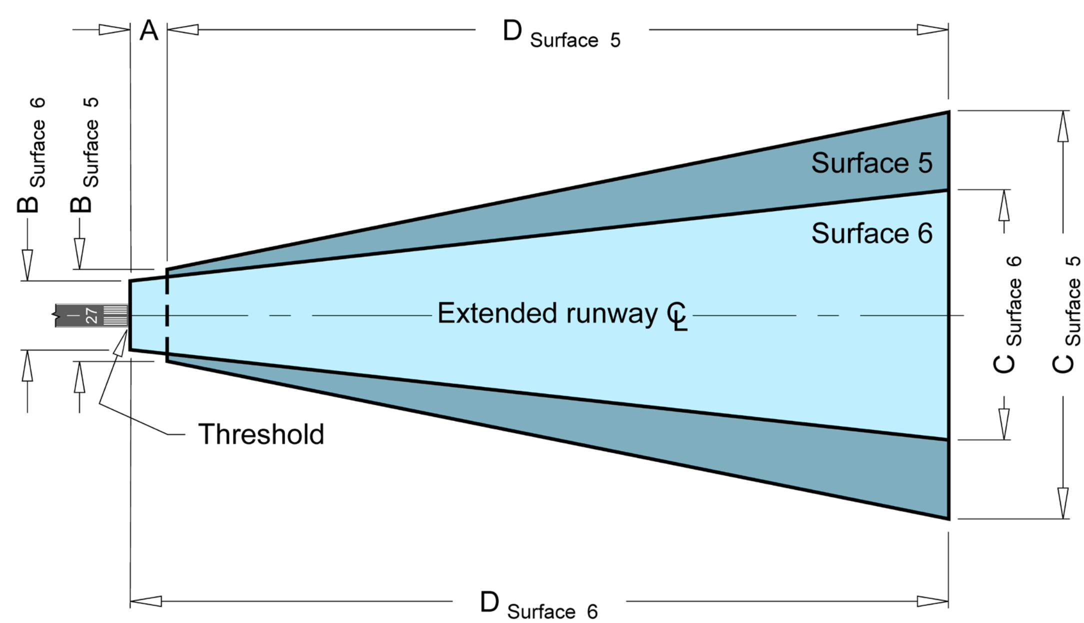
**Note 1:** Dimension A is relative to the runway threshold.

**Note 2:** Surface 5 represents the TERPS visual portion of the final approach segment. Surface 6 represents the TERPS Vertical Guidance Surface (VGS). Both surfaces apply for APV and PA procedures. Contact the Flight Procedures Team if existing obstacles penetrate this surface.

**Note 3:** The FAA assesses TERPS final approach segment criteria (e.g., W, X, Y surfaces) for all runway ends authorized for ILS, mobile microwave landing system (MMLS), precision approach radar (PAR), and localizer type directional aid with glide slope, LPV, and GLS procedures. Refer to FAA Order 8260.3 for additional information on TERPS surfaces.

**Note 4:** Represents a nominal value for planning purposes. The actual length depends on the precision final approach fix.

**Figure 3-7. Approach Procedure with Vertical Guidance (APV) and Precision Approach (PA) Instrument Runway Approach Surfaces**




**Note:** Refer to Table 3-4 for dimensional values.

Source: FAA, AC 150/5300-13B.

### d. Runway 17/35 Approach Surfaces

Approach surface dimension standards for visual approaches are listed in Table 3-2 and illustrated by Figure 3-5 from AC 150/5300-13B; both are included as Figure 6.8.[11]

Runway 17/35 is a visual runway intended for use by small aircraft (i.e., less than 12,500 pounds) with approach speeds of 50 knots or more. As shown in Figure 6.8, both runway ends require approach Surface 2.

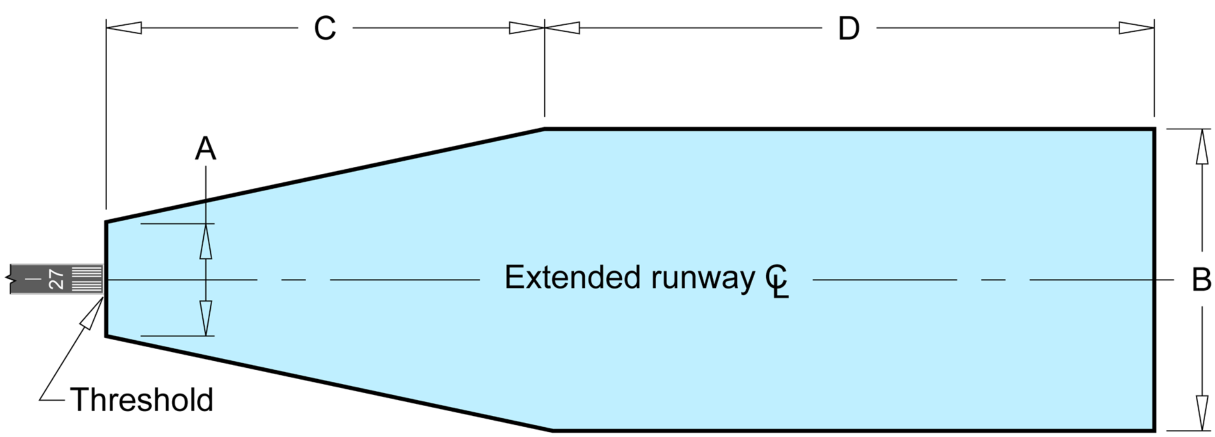
**Figure 6.8: Visual Approach Surfaces**

**Table 3-2. Visual Approach Surfaces**

| Surface | Runway Type | A ft (m) | B ft (m) | C ft (m) | D ft (m) | Slope |
|---|---|---|---|---|---|---|
| **Surface 1** | Approach end of runways serving small airplanes with approach speeds less than 50 knots. | 120 (37) | 300 (91) | 500 (152) | 2,500 (762) | 15:1 |
| **Surface 2** | Approach end of runways serving small airplanes with approach speeds of 50 knots or more. | 250 (76) | 700 (213) | 2,250 (686) | 2,750 (838) | 20:1 |
| **Surface 3** | Approach end of runway serving large airplanes (>12,500 lbs (5,669 kg)) | 400 (122) | 1,000 (305) | 1,500 (457) | 8,500 (2,591) | 20:1 |

**Note:** Approach surface begins at the runway threshold.

**Figure 3-5. Visual Approach Surfaces**




**Note 1:** Refer to Table 3-2 for dimensional values.
**Note 2:** Surface slopes upward and away from starting point.

Source: FAA, AC 150/5300-13B.

### e. Runway Departure Surfaces

Clear departure surfaces allow pilots to follow standard instrument departure procedures which assist pilots in avoiding obstacles during the initial climb from the terminal area. The FAA publishes these procedures in the *U.S. Terminal Procedures Publications* (TPP) which includes all instrument approach procedure (IAP) charts, departure procedure (DP) charts, standard terminal arrival (STAR) charts, charted visual flight procedures (CVFP), and airport diagrams for the entire United States. Unless otherwise stated in the TPP, the departure surface applies to all runways. For runway ends without an instrument departure surface, the airport operator coordinates with the FAA to identify it in the TPP as being not authorized for IFR departures.

Runway 17 is listed in the TPP as not having an instrument departure for environmental reasons. The instrument departure surface for Runway 3, Runway 21, and Runway 35 use the standards for Surface 7. These standards are listed in Table 3-5 from AC 150/5300-13B which is included as Figure 6.9. This is also illustrated by the accompanying figures from the AC, Figure 3-9 and Figure 3-11, which are included as Figure 6.10 and Figure 6.11.[12] The TPP also lists takeoff minimums and (obstacle) departure procedures. For IDA, it lists a pole as a takeoff obstacle for Runway 3 and vehicles, trees, and a pole as takeoff obstacles for Runway 35.

**Figure 6.9: Instrument Departure Surface Dimensions**

**Table 3-5. Instrument Departure Surface**

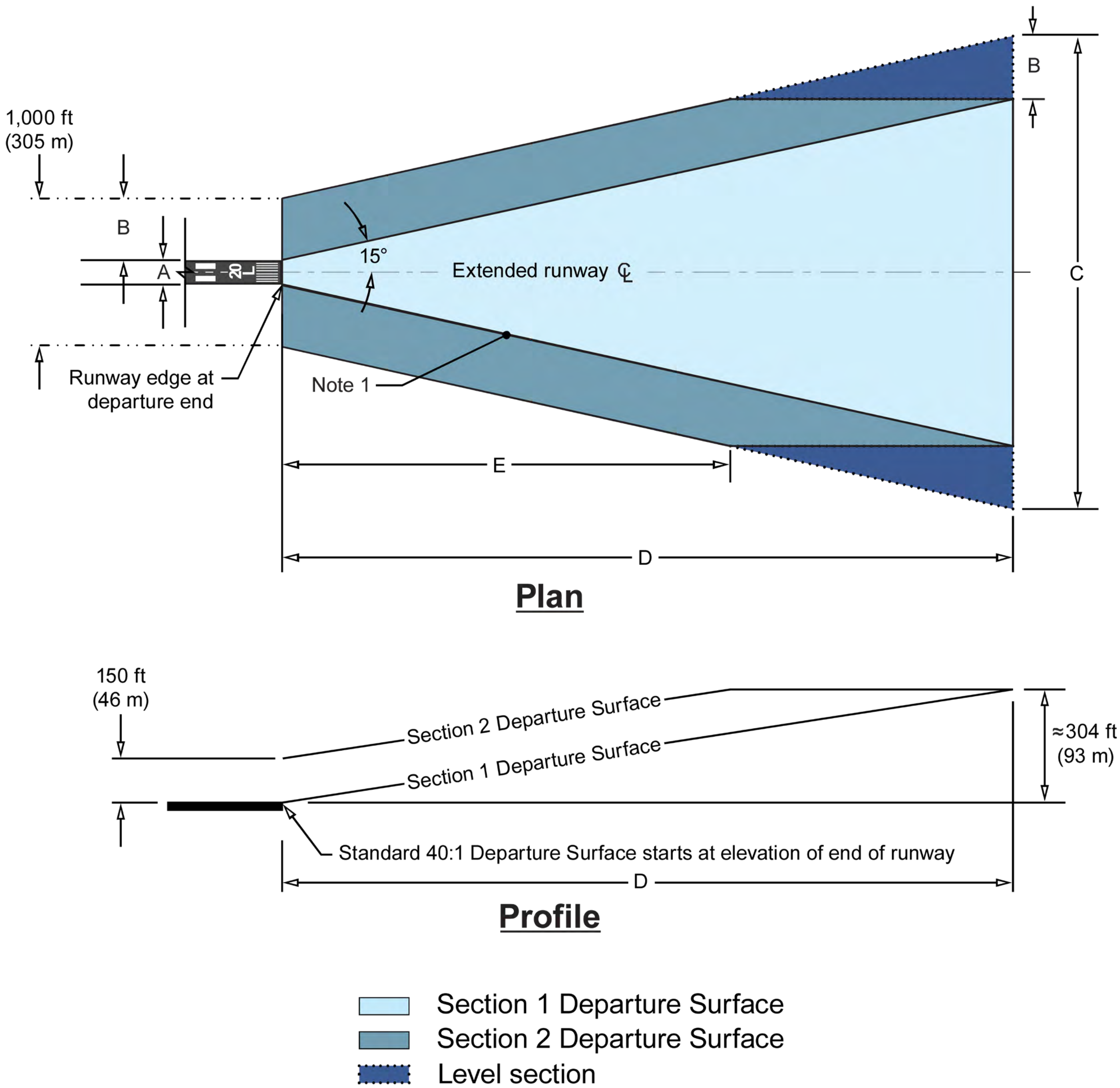
| Surface | Runway Type | A ft (m) | B ft (m) | C ft (m) | D[4] ft (m) | E ft (m) | Section 2 Angle θ[2] | Section 2 Transverse Slope m[2] |
|---|---|---|---|---|---|---|---|---|
| **Surface 7** | Runways providing instrument departure operations | 60 (18.3) | 470 (143) | 7,512 (2,290) | 12,152 (3,704) | 6,152 (1,875) | 17:7 | 3.13:1 |
| | | 75 (22.9) | 462.5 (141) | | | | 18.0 | 3.08:1 |
| | | 100 (30.5) | 450 (137) | | | | 18.4 | 3.00:1 |
| | | 150 (46) | 425 (130) | | | | 19.4 | 2.83:1 |
| | | 200 (61) | 400 (122) | | | | 20.6 | 2.67:1 |

**Note 1:** Section 1 of the departure surface starts at the DER elevation for the width of the runway and rises along the extended runway centerline at 40:1. Section 2 starts at an equal elevation to the adjoining Section 1. Section 2 continues until reaching 304 ft (93 m) and then levels off until reaching the line where Section 1 and Section 2 reach 304 ft (93 m) above DER elevation, then that part of Section 2 that leveled off continues at a 40:1 slope.
**Note 2:** See Figure 3-11 for a graphical depiction of these values.
**Note 3:** The start of the surface is relative to the departure end of the runway. For runways with published declared distances, the TODA indicates the beginning of the departure surface. See Figure 3-10.
**Note 4:** 12,152 feet (3,704 m) represents a 2 nm nominal value for planning purposes.
**Note 5:** For other runway width values, interpolation is required to determine the value of "B", the Section 2 angle, and the Section transverse slope.

Source: FAA, AC 150/5300-13B, Figure 3-9.

## Figure 6.10: Instrument Departure Surface Diagram

**Figure 3-9. Instrument Departure Surface**

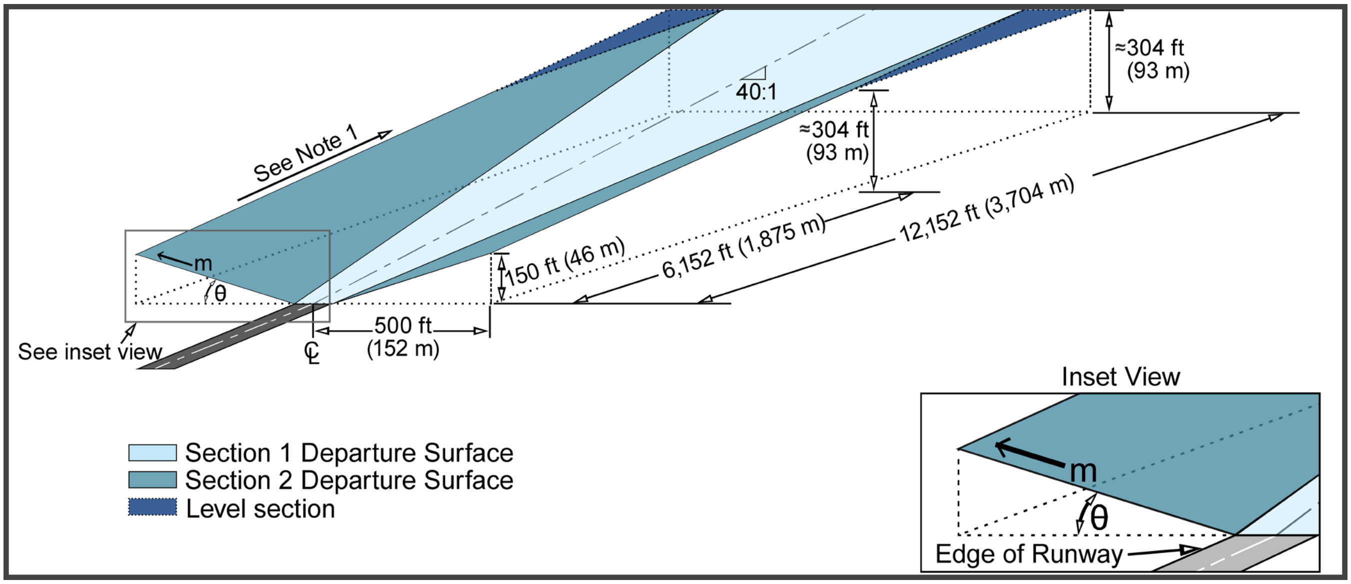



**Note 1:** The half-width of Section 1 is calculated by the formula:
Section $1_{\text{Half Width}}$ = (1/2 RWY Width) + (Tan 15° × X), where X = distance from the departure end of the runway.

**Note 2:** See Table 3-5 for dimensional values.

Source: FAA, AC 150/5300-13B.

**Figure 6.11: Departure Surface — Perspective View (Without Clearway)**




Note 1: The outer edge of the Section 2 Departure Surface has a slope of 40:1.
Note 2: The 304-foot (93 m) value represents the height above the DER.
Note 3: Refer to paragraph 3.6.2.1 for additional information.

Source: FAA, AC 150/5300-13B, Figure 3-11.

### 6.3.5. Precision Approach Path Indicator Clearance Surfaces

As previously discussed in Section 4.6.3., Precision Approach Path Indicators, each runway end is equipped with a precision approach path indicator (PAPI) that provide pilots with visual glideslope guidance during landing.

A PAPI obstacle clearance surface (OCS) is established to provide pilots with a minimum clearance over obstacles during approach. The surface begins 300 feet in front of the PAPI and extends outward vertically into the approach zone at an angle one degree less than the aiming angle of the third light unit for a four-light system or the outside light for a two-light system. The surface expands horizontally outward 10 degrees from each side of the extended runway centerline for four statute miles.

Since the OCS originates at the runway centerline, and PAPI light boxes are located off to the side of the runway, the light beams emitted from each PAPI light box can be well outside the OCS. This is why the obstacle clearance protection provided by the OCS survey is not entirely sufficient. In order to assure full obstacle clearance of the PAPI lights, a light signal clearance surface (LSCS) survey is required. Details of the LSCS survey process can be found in Engineering Brief Number 95, *Additional Siting and Survey Considerations for Precision Approach Path Indicator (PAPI) and Other Visual Glide Slope Indicators (VGSI)*.

When a PAPI is used on a runway that is also equipped with electronic ILS glideslope, such as Runway 21 at IDA, the PAPI visual glide path should coincide with the electronic glideslope. For those runways without an electronic glideslope, the PAPI glide path should produce the required threshold crossing height and clearance over obstacles in the approach for that runway. Threshold crossing height is the height of the lowest on-course signal at a point directly above the runway centerline and runway threshold. Threshold crossing height for small GA runways is typically 40 feet, while runways used by airlines range between 45 and 50 feet.

For Runway 3/21, both PAPI systems are set at a 3° visual glideslope with a 50-foot threshold crossing height. For Runway 17/35, the visual glideslope for Runway 17 is set at a 3° visual glideslope with a 40-foot threshold crossing height, and the visual glideslope for Runway 35 is set at a 3.5° angle with a threshold crossing height of 45 feet.

#### Conclusion

All Part 77, approach and departure, and PAPI OCS/LSCS surfaces should be protected to the maximum extent possible. Existing obstructions should be eliminated or marked and lighted.

### 6.3.6. Electrical, Visual, and Satellite Navigation Aids

Navigational aids (NAVAIDs) are visual or electronic devices that enhance safety for airport operations. There is a wide variety of communication, navigation, surveillance, and weather (CNSW) systems that assist pilots by locating the airport, updating weather conditions, or identifying the landing direction. As discussed in Section 4.6, IDA is outfitted with multiple NAVAIDs. These include an instrument landing system (ILS), runway end identifier lights (REIL), precision approach path indicators (PAPI), a segmented circle and wind cone, a very high frequency omnidirectional range with distance measuring equipment (VOR-DME), an airport beacon, an automated surface observing system (ASOS), a supplementary wind equipment F-420 (WEF) system, and a runway visual range (RVR) system. Every NAVAID has installment specifications that can include requirements for critical areas surrounding the equipment that must be kept clear of objects and obstructions. Table 6.11 lists the general function and any critical area requirements for each of these NAVAIDS.

**Table 6.11: NAVAID Requirements**

| Equipment | General Function | Critical Area Requirements | Compliant |
|---|---|---|---|
| **ILS**<br>1.Localizer<br>2.Glide Slope | Instrument Approach | • 2,000 feet long x 400 feet wide oriented towards the approach.*<br>• 2,000 feet long x 400 feet wide oriented towards the approach and 50 feet behind the antenna. | Y |
| REIL | Runway Identification | N/A | N/A |
| PAPI | Approach Slope Angle | N/A | N/A |
| VOR-DME | Navigation | 1,000 feet | N |
| Beacon | Airport Identification | N/A | N/A |
| ASOS | Weather Reporting | • Obstructions within a 500-foot radius are limited to 15 feet below the wind sensor.<br>• No hover or taxi operations within 100 feet.<br>• Ideally, obstructions are not higher than 10 feet below the sensor or within a 500–1,000-foot radius. | Y |
| F-420<br>Wind Sensor | Wind Indicator<br>Cross-Check | • Obstructions within a 500-foot radius are limited to 15 feet below the wind sensor.<br>• No hover or taxi operations within 100 feet.<br>• Ideally, obstructions are not higher than 10 feet below the sensor or within a 500–1,000-foot radius. | Y |
| RVR | ILS Visibility | N/A | Y |

*Critical area active during ILS operations.

Source: FAA Orders 6820.10, 6850.2B, 6560.10D, AC 150/5300-13B, U.S. Dept. of Commerce FCM-S4-2019

#### Conclusion

The 1,000-foot critical area for the VOR-DME contains general aviation hangars and impedes development of the cargo apron and the installation of a holding bay at the Runway 21 end. The VOR-DME should be either relocated or upgraded to a doppler VOR, which would reduce the size of the critical area by half.

### 6.3.7. Airport Traffic Control Tower

As previously discussed in Section 4.5.6, the airport traffic control tower (ATCT) was constructed in 1960 and currently occupies space within the passenger terminal. While the ATCT contributes to the safe operation and success of the airport, its current location restricts terminal expansion efforts required to meet passenger demand.

**Conclusion**

Consideration should be given to finding an alternate site for the airport traffic control tower.

### 6.3.8. Instrument Approach Procedures

As discussed in Section 3.3.2., Instrument Approach Procedures for Idaho Falls Regional Airport, there are currently eight instrument approach procedures to Runway 3/21. According to historic meteorological data at IDA, IFR conditions exist approximately 8% of the time. Runway 3/21 is properly equipped for instrument approaches to the runway with visibility minimums as low as 1/2 mile. By runway end, the ILS for Runway 21 lowest minimums are 250 feet height above touchdown (HAT) and 1/2-mile visibility. Runway 3 lowest minimums are achieved with the RNAV (GPS) Y with a HAT of 200 feet and visibility of 3/4 mile.

**Conclusion**

Given the percentage of IFR hourly observations and the aircraft expected to use the airport, the current instrument approaches to Runway 3/21 at IDA are adequate to support aircraft operations through the 20-year planning period. While the instrument approach procedures are adequate and appropriate, minimums can be improved by eliminating terrain obstructions for Runway 21 and adding an approach lighting system to Runway 3.

## 6.4. Commercial Service Passenger Terminal Complex

### 6.4.1. Commercial Apron Requirements

The commercial terminal apron is approximately 425,000 square feet and consists of both concrete and asphalt pavement. There are six aircraft parking positions serviced by three ground-level enclosed walkways (Gates A1–A3) and three upper-level passenger boarding bridges (Gates B1–B3).

Gates A1 and B1 are marked to accommodate regional jets. Gates A2, A3, B2, and B3 are marked for Airbus A320 and Boeing 737 aircraft. All ground-level gates have 110V and 240V power. Gates A2 and A3 have aircraft ground power units (GPUs). Each upper level gate is equipped with a GPU and pre-conditioned air (PCA) capable of serving all aircraft using the airport except the Q-400.

There are two potable water cabinets along the west face of the terminal building and one along the walkway to Gate A1. There are two remain overnight (RON) parking positions marked on the apron. A concrete deicing pad is behind Gate A1 that is unusable when an aircraft is parked at the gate. The airline lavatory dump is at the apron edge approximately 300 feet south of Gate A1.

According to the forecast, in 2021 the average number of commercial airline operations during the peak hour of the peak month was four. As shown in Table 6.12, this is expected to increase to six by 2026. To determine the number of gates that will be needed during the peak hour as a result of this increase, individual and combined airline schedules were taken into consideration as well as other factors such as delays, gate use agreements, and potential new flights. The calculation used to determine number of gates needed during the peak hour was the forecast peak hour operations plus a 30% surge factor.

**Table 6.12: Terminal Gate Requirements**

| Planning Year | Peak Hour Operations | Existing Gates | Required Gates | Gates Needed |
|---|---|---|---|---|
| 2021 | 4 | 6 | 5 | -1 |
| 2026 | 6 | 6 | 8 | +2 |
| 2031 | 6 | 6 | 8 | +2 |
| 2036 | 6 | 6 | 8 | +2 |
| 2041 | 6 | 6 | 8 | +2 |

Source: Ardurra.

#### Conclusion

Adding two gates requires an expansion of the terminal building itself and two additional parking spaces on the terminal apron. The additional parking spaces should accommodate the full range of aircraft expected to be used by the airlines during the planning horizon, up to and including the Airbus A320 and Boeing 737-900MAX. FAA AC 150/5300-13B recommends a minimum clearance of 25 feet between parking positions for an ADG-III aircraft. Parking positions should also allow enough clearance for an ADG-IV aircraft taxiing on Taxiway A, which may require shifting the vehicle service road. The deicing pad should be relocated outside the envelope of the gate parking positions. A covered lavatory dump should be considered.

### 6.4.2. Passenger Terminal Building

Terminal requirements in this section are the result of a focused planning study conducted by Alliiance at the same time as this airport master plan. The full technical report can be found in Appendix C, which provides a detailed explanation of the planning assumptions used and conclusions reached. Planning activity level assumptions for this section differ from the airport master plan forecast in that these terminal requirements consider the addition of two new airlines beyond the airport master plan forecast; one using a Boeing 737-700 and the other using an Embraer 145 regional jet. Two scenarios were considered; one with the new service occurring within the peak hour, and one occurring outside the peak hour. This was done because of the extreme sensitivity of the terminal facilities to peak hour passenger activity. The preferred scenario used for this section is with the new service occurring outside of the peak hour. Table 6.13 summarizes the peak activity levels used for generating the terminal planning requirements under this section, and Table 6.14 summarizes the trigger points for each terminal functional area.

**Table 6.13: Terminal Planning Peak Activity Levels**

| Year | Peak Hour | | Avg. Load Factor | Peak Month Avg Day | | Peak Month Enplanements | Annual Enpl. | CAGR |
|---|---|---|---|---|---|---|---|---|
| | Enpl. | Dep Ops | | Enpl. | Dep Ops | | | |
| **Historical** | **21.7%** | | | **27** | | **12.6%** | | |
| 2021 | 228 | 3 | 75.9% | 1,052 | 16 | 28,178 | 223,741 | |
| **Forecast** | **19.1%** | | | | | **11.1%** | | |
| 2026 | 302 | 4 | 79.0% | 1,581 | 23 | 49,011 | 441,541 | 1.3% |
| 2031 | 322 | 4 | 84.0% | 1,686 | 23 | 52,266 | 470,865 | 1.3% |
| 2041 | 366 | 4 | 95.0% | 1,919 | 23 | 59,489 | 535,937 | 1.3% |

Source: Alliiance

#### Conclusion

Virtually all of the functional areas in the terminal building need to be expanded or renovated if delays are to be avoided during the peak hour activity. One major contributing factor on terminal requirements is airline scheduling and aircraft types. Multiple large aircraft operating within the peak hour, either by schedule or by system delays, will cause significant impacts on the terminal's ability to safely and comfortably process passengers.

### Table 6.14: Terminal Planning Trigger Points

| Functional Area | 2021 | | Forecast | | |
|---|---|---|---|---|---|
| | Existing | Recommended | 2026 | 2031 | 2041 |
| **General** | | | | | |
| Annual Enplanements | 223,741 | - | 441,541 | 470,865 | 535,937 |
| Peak Hour Enplaned | 228 | - | 302 | 322 | 366 |
| Peak Hour Deplaned | 240 | - | 285 | 303 | 345 |
| **Gates/Aircraft Positions** | | | | | |
| Small Regional (Cessna/Metro) | - | - | - | - | - |
| Medium Regional (CRJ/ERJ) | - | - | - | - | - |
| Large Regional (Q400/E175/CRJ9) | - | 5 | 5 | 5 | 6 |
| Narrowbody (A320/B737W) | 6 | 1 | 1 | 2 | 2 |
| Total Aircraft Gates/Positions | 6 | 6 | 6 | 7 | 8 |
| **Public Space** | | | | | |
| Circulation Total (sf) | 20,431 | 21,570 | 24,280 | 26,980 | 29,720 |
| Ticket Lobby Circulation (sf) | 1,727 | 1,170 | 1,850 | 1,850 | 2,050 |
| Baggage Claim Circulation (sf) | 3,323 | 1,500 | 1,500 | 1,500 | 1,500 |
| Airside Concourse Circulation (sf) | 3,247 | 6,970 | 6,970 | 8,130 | 9,300 |
| General Public Circulation (sf) | 12,134 | 11,930 | 13,960 | 15,500 | 16,870 |
| **Security Screening Checkpoint (sf)** | **4,909** | **5,190** | **7,390** | **7,390** | **7,390** |
| Number of Lanes | 2 | 1 | 2 | 2 | 2 |
| Security Screening Area (sf) | 2,638 | 3,090 | 4,690 | 4,690 | 4,690 |
| Queuing Area (sf) | 777 | 600 | 1,200 | 1,200 | 1,200 |
| TSA Offices (sf) | 1,494 | 1,500 | 1,500 | 1,500 | 1,500 |
| **Queuing/Waiting Area Total (sf)** | **7,623** | **7,500** | **8,900** | **8,970** | **9,460** |
| Public Seating (sf) | 655 | 480 | 610 | 650 | 720 |
| Ticket Lobby/Kiosks (sf) | 2,558 | 2,010 | 3,180 | 3,180 | 3,510 |
| Baggage Claim Devices | 2 | 2 | 2 | 2 | 2 |
| Linear Frontage (public side) (lf) | 182 | 180 | 180 | 180 | 180 |
| Baggage Claim Hall (sf) | 4,410 | 4,500 | 4,500 | 4,500 | 4,500 |
| Meeter/Greeter Lobby (sf) | - | 510 | 610 | 640 | 730 |
| **Gate Lounges/Holdrooms Total (sf)** | **12,642** | **10,900** | **10,900** | **13,900** | **15,480** |
| Medium Regional (sf) | - | - | - | - | - |
| Large Regional (sf) | - | 7,890 | 7,890 | 7,890 | 9,470 |
| Narrowbody (sf) | - | 3,010 | 3,010 | 6,010 | 6,010 |
| **Restrooms Total (sf)** | **2,781** | **5,330** | **5,660** | **6,260** | **6,730** |
| Restrooms post security (sf) | 1,786 | 3,400 | 3,400 | 4,000 | 4,470 |
| Restrooms pre security (sf) | 855 | 1,530 | 1,860 | 1,860 | 1,860 |

Source: Alliiance

| Functional Area | 2021 | | Forecast | | |
|---|---|---|---|---|---|
| | Existing | Recommended | 2026 | 2031 | 2041 |
| Service Animal Relief Area (SARA) (sf) | 140 | 140 | 140 | 140 | 140 |
| Nursing Mothers' Room (sf) | - | 260 | 260 | 260 | 260 |
| **Airline Space Total (sf)** | **3,379** | **2,730** | **4,330** | **4,330** | **4,780** |
| Linear Ticket Counter Positions (kiosk) | 16 | 12 (0) | 19 (0) | 19 (0) | 21 (0) |
| Total Check-In Positions (kiosk) | 28 (12) | 15 (3) | 24 (5) | 24 (5) | 27 (6) |
| Total Linear Position Length (lf) | 114 | 78 | 124 | 124 | 137 |
| Counter Area (sf) | 1,052 | 780 | 1,240 | 1,240 | 1,370 |
| Airline Ticket Offices (ATO) (sf) | 2,327 | 1,950 | 3,090 | 3,090 | 3,410 |
| **Other Airline Space Total (sf)** | **5,920** | **8,080** | **9,000** | **10,020** | **10,290** |
| Outbound Baggage Makeup (sf) | 1,481 | 1,790 | 2,500 | 2,880 | 2,940 |
| Checked Baggage TSA Screening (sf) | 931 | 1,800 | 1,800 | 1,800 | 1,800 |
| Level 1 Inspection Units | 1 | 1 | 1 | 1 | 1 |
| Airside Operations/Storage (sf) | 1,137 | 1,330 | 1,330 | 1,790 | 1,960 |
| Inbound Baggage Claim, Secure (sf) | 341 | 2,200 | 2,200 | 2,200 | 2,200 |
| Baggage Circulation/Storage (sf) | 2,030 | 760 | 970 | 1,080 | 1,100 |
| Other Airline Offices & Support (sf) | - | 200 | 200 | 270 | 290 |
| **Pre-Security Concession Space (sf)** | **4,641** | **2,070** | **2,630** | **2,710** | **2,880** |
| Rental Car Counters | 4 | 4 | 4 | 4 | 4 |
| Rental Car Area/Offices (sf) | 1,028 | 1,030 | 1,030 | 1,030 | 1,030 |
| Rental Car Queue (sf) | 458 | 460 | 460 | 460 | 460 |
| Landside Concessions (sf) | 2,137 | 450 | 880 | 940 | 1,070 |
| Landside Support/Storage (sf) | 1,018 | 130 | 260 | 280 | 320 |
| **Post-Security Concession Space (sf)** | **3,157** | **2,330** | **4,590** | **4,900** | **5,580** |
| Airside Concessions (sf) | 2,213 | 1,790 | 3,530 | 3,770 | 4,290 |
| Airside Support/Storage (sf) | 944 | 540 | 1,060 | 1,130 | 1,290 |
| **Non-Public Space Total (sf)** | **23,388** | **17,560** | **19,930** | **21,320** | **22,520** |
| Airport Administration (sf) | 2,882 | 3,110 | 3,110 | 3,110 | 3,110 |
| Airport Police (sf) | 248 | 250 | 250 | 250 | 250 |
| FAA Tower (sf) | 2,787 | 700 | 700 | 700 | 700 |
| Restrooms (sf) | 114 | 110 | 220 | 220 | 220 |
| Circulation (sf) | 1,456 | 1,610 | 1,820 | 1,930 | 1,990 |
| Airport Maintenance/Support (sf) | 3,545 | 1,430 | 1,700 | 1,830 | 1,970 |
| Mechanical/Electrical/IT/Comm (sf) | 9,086 | 7,150 | 8,380 | 9,170 | 9,860 |
| Building Structure (sf) | 3,271 | 3,200 | 3,750 | 4,110 | 4,420 |
| **Total Functional & Support Area (sf)** | **85,600** | **80,060** | **93,860** | **102,670** | **110,410** |
| **Total Gross (sf)** | **88,871** | **83,260** | **97,610** | **106,780** | **114,830** |

Source: Alliiance

### 6.4.3. On-Airport Circulation Roadways

The terminal building, public parking lots, rental car parking, air cargo facility, and ARFF station can all be accessed via North Skyline Drive which enters airport property from the south. North Skyline Drive has two northbound lanes that converge into one lane at the airport entrance. As shown in Figure 6.12, drivers looking to access the cargo facility or ARFF station turn right onto Federal Way while passenger and rental car traffic continue to the terminal.

Traffic entering the main terminal area meets with terminal return traffic where it becomes two lanes. From this point, drivers looking to access the short-term daily parking lot take the first left and continue through a narrow access gate. However, the daily lot is typically unused and barricaded. Drivers looking to access the short-term hourly parking lot take the second left and continue through a narrow access gate. Drivers looking to access the rental car ready/return area take the right just prior to the arrivals curbside area. Just beyond the arrivals area is the departures curbside area.

The two lanes in front of the terminal building measure approximately 435 feet long—from the start of the arrivals area to the end of departures area. The curb in this section is marked to indicate the separate passenger pick-up and drop-off zones.

There is another decision point just beyond the departures area where drivers can access the daily or economy lots via a left turn or continue straight ahead. There is a second entrance to the economy lot prior to completing the circulation loop. The intersection at the end of the circulation loop allows drivers to either return to the terminal by continuing straight or make a sharp right turn to exit the airport.

This configuration requires drivers looking to access the primary entrance to the daily and economy parking lots to pass through the passenger pick-up and drop-off zones. This presents a pain point for these customers because vehicles are often stopped as pedestrians with luggage cross the road.

The configuration of North Skyline Drive—from International Way to the departures curbside area—has not changed significantly in more than 20 years despite significant passenger growth and expansions to the passenger terminal and public parking lots. During airline schedule surge periods, traffic along North Skyline Drive backs up from the terminal building off-airport beyond International Way.

#### Conclusion

Consideration should be given to widening North Skyline Drive and reconfiguring the entry points to the parking lots to avoid extra traffic passing through the congested passenger pick-up and drop-off zones. Consideration should also be given to mitigating the sharp right turn vehicles have to navigate to exit the terminal circulation loop.

**Figure 6.12:** Terminal Roadway and Parking Circulation


Source: Ardurra.

### 6.4.4. Public Parking Facilities

As previously mentioned in Section 4.9., Commercial Terminal Parking Areas, the public parking lot at the terminal is separated into three distinct parking areas; short-term hourly, short-term daily, and long-term parking (Figure 6.13). There are approximately 144 short-term hourly spaces, 291 short-term daily spaces, and 478 long-term spaces for a combined total of 913 spaces. Parking services are managed under contract by SP Plus Corporation (SP+).

Parking data provided by the airport's parking contractor, SP+, was used to analyze actual parking performance from each of the three areas. This data was then compared to the peak month enplanement data and projections from the focused terminal planning study forecast to determine parking needs at IDA through the planning horizon.

On average, there is a total of 400 cars parked per day during the peak month. As shown in Table 6.15, approximately 48% of these vehicles are parked in the hourly lot, 15% in the daily lot, and 38% use the long-term (i.e., economy) lot. It should be noted that these parking patterns did not account for the addition of Economy Lot 2, which added 240 to the airport parking lot inventory in mid-2022. Presently, there are 718 economy lot spaces.

**Table 6.15: Vehicle Parking Patterns**

| Parking Lot | Avg. Vehicles Per Day | Avg. Duration Parked | Avg. % of Passengers | Avg. % of Vehicles |
|---|---|---|---|---|
| Short-Term Hourly | 190 | 1 hr 10 min | 21% | 48% |
| Short-Term Daily | 60 | 1 day | 7% | 15% |
| Long-Term Economy | 150 | 4 days | 17% | 38% |

Source: SP+; Alliiance; Ardurra.

As shown in Table 6.15, the hourly lot has high turnover rate. In many cases, cars are parked in this lot for less than 30 minutes because the first half-hour is complimentary. This suggests the hourly lot is being used to drop off passengers and as a waiting area when picking up passengers. On average, cars are parked in the daily lot for one day. Cars are parked in the economy lot for an average duration of four days which means vehicles are stacking up over a rolling four-day average. To determine parking requirements for the hourly lot, peak hour enplanement levels were applied to the percentage of enplaned passengers using the hourly lot. For the daily requirements, peak day enplanement levels were applied to the percentage of enplaned passengers using the daily lot. For the economy lot requirements, peak day enplanement levels were applied to the percentage of enplaned passengers using the economy lot, times four days. The results are shown in Table 6.16.

**Table 6.16: Vehicle Parking Requirements**

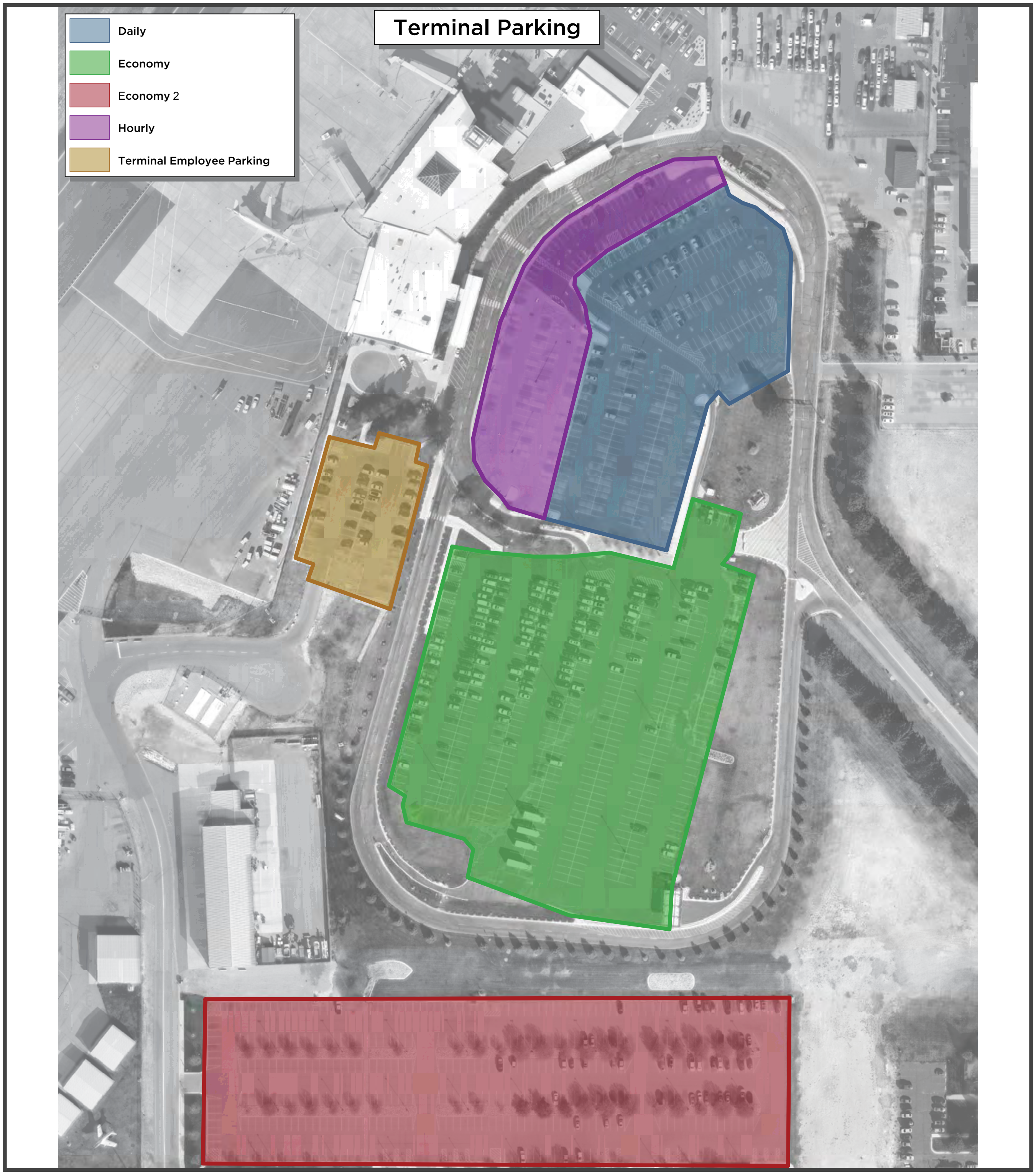
| Year | Hourly (144) | Daily (291) | Economy (718) | Combined (1,153) | Need (Economy) | Need (Overall) |
|---|---|---|---|---|---|---|
| 2021 | 48 | 60 | 694 | 802 | -24 | -351 |
| 2026 | 63 | 104 | 1,044 | 1,211 | 326 | 58 |
| 2031 | 67 | 111 | 1,113 | 1,291 | 395 | 138 |
| 2041 | 77 | 127 | 1,267 | 1,471 | 549 | 318 |

Source: Ardurra.

### Conclusion

Reconfiguration of the existing hourly and daily lots to allocate more spaces to economy will help relieve some pressure in the immediate term. By 2026, reconfiguration of the existing lots alone will not be adequate to support parking demand. Other parking lot locations, along with vertical development options should be a priority.

**Figure 6.13: Terminal Parking**




Source: Ardurra.

### 6.4.5. Employee Parking

The employee parking lot, which is located south of the terminal between North Skyline Drive and the terminal apron, currently has approximately 72 parking spaces. This parking lot is used both by airport employees and employees of companies affiliated with the airport. This includes the Transportation Security Administration (TSA), air traffic control (ATC), airlines, and concessionaires. The total number of employees using the parking lot is estimated to be between 200—250 during peak periods. It is assumed that employee parking needs will increase at the same rate as commercial operations. Using 250 parking spaces as the baseline, Table 6.17 shows the increased number of employee parking spaces required based on the CAGR of 1.0% forecasted for commercial operations.

**Table 6.17: Employee Parking Requirements**

| Year | Spaces Required (350 Square Feet per Stall) |
|---|---|
| 2021 | 250 |
| 2026 | 263 |
| 2031 | 276 |
| 2041 | 305 |

Source: Ardurra.

#### Conclusion

The employee parking lot should be expanded, or other locations sought, in order to meet the estimated 305 spaces that will be needed by 2041.

### 6.4.6. Rental Car Facilities

Requirements for rental car facilities at IDA are based on the results of a questionnaire completed by the rental car companies operating at the airport during the first quarter of 2022 which included Avis-Budget, Hertz, Enterprise, Alamo, and National. These requirements apply to the ready/return area as well as the quick turnaround area (QTA) where several car rental support functions are located including fuel dispensers, wash bays, maintenance bays, rental car overflow parking, and rental car employee parking (Figure 6.14). Table 6.18 summarizes the results of the questionnaire.

**Figure 6.14: Rental Car Facilities**


Source: Ardurra.

**Table 6.18: Rental Car Company Questionnaire Results**

| Area | Current | Desired |
|---|---|---|
| Ready/Return Area (spaces) | 100 | 250 |
| Quick Turnaround Area (QTA) | | |
| Fuel Dispensers | 4 | 7 |
| Wash Bays | 4 | 6 |
| Maintenance Bays | 3 | 5 |
| Overflow Spaces | 90 | 200 |
| Staging Spaces | 40 | 75 |
| Employee Spaces | 15 | 30 |

Source: Rental Car Questionnaire

Using partial data received from the rental car companies, the peak hour for rental returns during the peak month is 8 a.m., and the peak hours for car rentals is between 1–3 p.m.

Market share data for gross revenue of each rental car company during fiscal year 2021 was applied to data received from the questionnaire to determine that there is a daily average of 18 rental cars returned during the 8 a.m. hour of the peak month and a daily average of 13 cars rented during the peak hours of 1–3 p.m.

To determine ready/return space requirements, a 30% surge factor was applied to each average, then a two-hour utilization rate was used for returns, and a three-hour utilization rate was used for rentals to allow a buffer for potential delays during the peak periods. Future requirements were projected using forecast enplanement growth.

**Table 6.19: Rental Car Ready/Return Requirements**

| Year | Spaces Required (350 Square Feet per Stall) |
|---|---|
| 2021 | 98 |
| 2026 | 108 |
| 2031 | 118 |
| 2041 | 143 |

Source: Rental Car Questionnaire; Ardurra.

QTA requirements were projected using the forecast enplanement growth applied to the existing conditions, adding a 30% surge factor.

**Table 6.20: Rental Car Quick Turnaround Area Requirements**

| QTA | 2021 (Existing) | 2026 | 2031 | 2041 |
|---|---|---|---|---|
| Fuel Dispensers | 4 | 6 | 6 | 8 |
| Wash Bays | 4 | 6 | 6 | 8 |
| Maintenance Bays | 3 | 4 | 5 | 6 |
| Overflow Spaces | 90 | 129 | 141 | 170 |
| Staging Spaces | 40 | 57 | 63 | 76 |
| Employee Spaces | 15 | 21 | 24 | 28 |

Source: Rental Car Questionnaire; Ardurra.

### Conclusion

All of the functional areas related to the rental car ready/return and quick turnaround areas will exceed existing capacity by 2026. Alternative areas should be sought that will enable growth without impeding aeronautical development.

## 6.5. General Aviation Requirements

### 6.5.1. Aircraft Hangar Storage

There are currently 96 hangar spaces at IDA of varying sizes. Some of the hangars, such as those at Aero Mark, are capable of accommodating multiple aircraft. The *2020 Idaho Airport System Plan (IASP) Update* sets the objective for primary commercial airport hangar storage at 80% of based aircraft and 25% of transient aircraft. For this Airport Master Plan, the objective was 80% of based aircraft and 10% of transient aircraft, as it is assumed more GA transient aircraft requesting a hangar would use the main FBO on the west side of the airport, where the large hangars are located. Transient aircraft are assumed to be 70% of itinerant aircraft during the average day of the peak month (July). Itinerant aircraft were a combination of Air Taxi and GA itinerant operations from the forecast. Itinerant cargo and military are not included in the hangar requirement calculation. The based aircraft and fleet mix projections from the forecast, along with the aforementioned assumptions, were used to calculate the hangar requirements shown in Table 6.21.

**Table 6.21: Hangar Requirements**

| Year | Based Aircraft | Transient Aircraft | Spaces Required | Spaces Existing | Spaces Needed |
|---|---|---|---|---|---|
| 2021 | 100 | 4 | 104 | 96 | 8 |
| 2026 | 108 | 5 | 113 | 96 | 17 |
| 2031 | 116 | 5 | 121 | 96 | 25 |
| 2041 | 132 | 5 | 137 | 96 | 41 |

Source: Ardurra.

**Conclusion**

Additional hangar space is needed at IDA through the entire planning horizon.

### 6.5.2. Aircraft Tiedowns

Currently, there are 68 marked tiedown spaces at IDA. While there are large, unmarked sections of apron that could accommodate additional tiedowns, only marked spaces were considered to determine if the existing tiedown spaces are sufficient to accommodate forecasted demand.

The *2020 Idaho Airport System Plan* (IASP) set an objective for primary commercial airports to have enough marked tiedown spaces to accommodate 20% of based aircraft and 50% of transient aircraft. However, for this airport master plan, an objective of 20% of based aircraft and 75% of transient aircraft was determined to be more appropriate.

The based aircraft forecast, as discussed in Section 5.11, was used in this calculation along with the same transient aircraft assumptions used in the hangar requirements section. The resulting tiedown requirements are shown in Table 6.22.

**Table 6.22: Tiedown Requirements**

| Year | Based Aircraft | Transient Aircraft | Spaces Required | Spaces Existing | Spaces Needed |
|---|---|---|---|---|---|
| 2021 | 25 | 32 | 57 | 68 | (11) |
| 2026 | 27 | 35 | 62 | 68 | (6) |
| 2031 | 29 | 37 | 66 | 68 | (2) |
| 2041 | 33 | 40 | 73 | 68 | 5 |

Source: Ardurra.

#### Conclusion

There are adequate tiedowns to meet demand through 2031. Beyond 2031, the tiedown deficiencies could be met by using existing apron space with a more efficient use of markings.

## 6.6. Air Cargo Requirements

As previously discussed in Section 4.5.5., Air Cargo Facilities, FedEx operates the only air cargo facility at IDA. It has approximately 30,000 square feet of warehouse space, approximately 55,000 square feet of apron space with one marked aircraft parking space, 7,000 square feet of apron space used for ground service equipment (GSE) storage, 2,400 square feet of space used for receiving and office space, and a parking lot for FedEx employees with 75 parking spaces. Guidance from Airport Cooperative Research Program (ACRP) Report 143, *Guidebook for Air Cargo Facility Planning and Development*, was used to establish air cargo facility requirements.

To determine the amount of GSE apron space that will be required during the 20-year planning period, the ratio of annual tonnage per square foot was applied to the forecasted air cargo weights (converted to tons) established in Section 5.10., Air Cargo by Volume Forecast. To determine the amount of warehouse space required, the forecasted growth rate of 3.9% for air cargo by volume was applied to the square footage of the existing warehouse space.

**Table 6.23: Forecast Cargo Weight in Pounds and Tons**

| Unit of Weight | Base Year | Forecast Years | | |
|---|---|---|---|---|
| | 2021 | 2026 | 2031 | 2041 |
| Pounds | 6,288,882 | 9,952,995 | 11,072,550 | 13,488,226 |
| Tons | 3,144 | 4,976 | 5,536 | 6,744 |

Source: Ardurra.

**Table 6.24: Air Cargo Facility Requirements**

| Element | Existing | Required | Forecast Years | | |
|---|---|---|---|---|---|
| | 2021 | 2021 | 2026 | 2031 | 2041 |
| GSE Apron | 7,000 sq. ft. | 5,517 sq. ft. | 8,731 sq. ft. | 9,713 sq. ft. | 11,832 sq. ft. |
| Warehouse Space | 30,000 sq. ft. | 30,000 sq. ft. | 36,300 sq. ft. | 44,000 sq. ft. | 64,500 sq. ft. |

Source: ACRP Report 143; Ardurra, Aviation Forecast.

**Table 6.25: Apron Space Requirements**

| Aircraft | Length + Buffers | Wingspan + 25-foot Buffer | Tail Height | Required Apron |
|---|---|---|---|---|
| ATR 72 | 124.2 feet | 113.8 feet | 25 feet | 14,128 feet |
| Boeing 757-200 | 285.2 feet | 150 feet | 45.1 feet | 42,780 feet |

Source: ACRP 143, Tables 4-6 and 4-8.

### Conclusion

Additional apron space for GSE is needed immediately. Building capacity will need to be expanded during the planning horizon. The existing FedEx cargo apron is adequate for use by ATR-72 aircraft through the 20-year planning horizon. However, the FedEx apron is adjacent to the rental car area which makes it difficult to maneuver a 757F. If another air cargo carrier company operating the 757F, decides to add scheduled air cargo service to IDA, they will need to use a different facility.

## 6.7. Airport Support Facilities

Airport support facilities include infrastructure and equipment used for emergency response, fuel storage, access control, equipment storage, and airport maintenance which are vital in ensuring the smooth, efficient, and safe operation of the airport. While the FAA provides guidance for assessing the future needs of some aviation support facilities, interviews with airport management, tenants, and users is a more reliable way of understanding existing and future requirements for aviation support facilities.[13]

### 6.7.1. Aircraft Rescue and Fire Fighting Station

As previously discussed in Section 4.7.2., Aircraft Rescue and Fire Fighting, IDA is an aircraft rescue and fire fighting station (ARFF) Index B airport. This is adequate for the Airbus A320, and the ARFF index is not expected to change during the 20-year planning period. While these facilities are adequate, the current location inhibits growth of the cargo facility. Relocating the ARFF station closer to the midpoint of the air carrier runway, Runway 3/21, would reduce response times to that runway and allow for opportunities to expand the cargo facilities.

#### Conclusion

Consideration should be given to finding an alternate site for the ARFF station. Future locations should consider a live fire discharge area to properly contain and eliminate chemicals associated with firefighting operations.

### 6.7.2. Fuel Storage

As previously discussed in Section 4.5.8., Aircraft Fuel Facilities, the fuel farm currently has three underground storage tanks used for Jet A fuel that hold a total of 75,000 gallons, and two underground storage tanks used for avgas that hold a total of 37,000 gallons.

Fuel records provided by airport staff for 2021 show the peak month for Jet A fuel was July with 363,210 gallons pumped. The peak month for avgas was June with 13,519 gallons pumped. The five-day average for each fuel type was applied to the operations forecast to determine fuel storage requirements (Table 6.26).

**Table 6.26: Fuel Storage Requirements**

| Year | 5-Day Jet A Average | 5-Day Avgas Average |
|---|---|---|
| 2021 | 58,582 gallons | 2,253 gallons |
| 2026 | 61,571 gallons | 2,368 gallons |
| 2031 | 64,711 gallons | 2,489 gallons |
| 2041 | 71,481 gallons | 2,749 gallons |

Source: Airport Staff, Current Fuel Usage; Ardurra, Aviation Forecast.

#### Conclusion

There is adequate fuel storage to support the five-day fuel requirements for the entire 20-year planning period.

### 6.7.3. Snow Removal Equipment and Airport Maintenance Building

As previously discussed in Section 4.7.1., Snow and Ice Control, the current 15,000-square-foot snow removal equipment (SRE) building was constructed in 2010. It contains office space for operations and maintenance personnel. It is adjacent to an enclosed storage yard that is approximately 33,000 square feet. Both the building and yard are also used to store airport maintenance vehicles.

The building has six bays; two that allow pull-through access for large equipment. Two of the bays are used to store small equipment vehicles and to perform maintenance while the other two have a back-in design for large equipment. The building is 65 feet wide which does not allow double parking of large equipment with the snow removal attachments connected.

According to current guidance from FAA AC 150/5220-20A, *Airport Snow and Ice Control Equipment*, the airport is eligible for nine pieces of SRE.[14] These include one rotary plow, two displacement snowplows, three towed or self-propelled runway brooms with air blast, and three support vehicles for deicing or anti-icing chemical application. While the airport is eligible for nine piece of SRE, the building is not large enough to store all nine pieces in a ready-to-use state.

#### Conclusion

The actual size required to store all of the SRE depends on the layout selected. Space should be reserved for future expansion.

### 6.7.4. Ground Service Equipment Storage

The ground service equipment (GSE) used by the airlines is currently stored along the fence on the commercial apron to the south of the terminal building. There is a small, covered area outside of the baggage makeup bays that can be used to stage GSE to hook them up to baggage carts. This area is confined by the Gate A1 enclosed walkway which can reduce efficiency. This becomes especially noticeable when an aircraft is parked at the gate.

#### Conclusion

The size of the apron used to store GSE is adequate. Adding apron markings to delineate the GSE parking area would enhance circulation and efficiency. Future terminal expansions should include extra space and reconfiguration of the baggage makeup area to eliminate the constraints associated with Gate A1.

### 6.7.5. Fencing and Gates

The airport is fenced with a series of vehicle and pedestrian gates. As development progresses, airport fencing and gates may need to be added or re-aligned. Changes in security requirements also may dictate future fence and gate configuration needs.

### 6.7.6. Lighting Vault and Emergency Generator

The capacity of the regulators and emergency generator located in the lighting vault were not evaluated under this master plan. Future airfield development that includes additional lighting may require more capacity than provided by the existing lighting vault. Future terminal expansions may also require the lighting vault to be relocated elsewhere at the airport.

## 6.8. Utilities

As previously discussed in Section 4.14., Utilities, Water, sewer, communications, electrical, and natural gas are all available at the airport. There is sufficient capacity to accommodate growth. New development may require additional service connections, relocation, or extensions of these utilities. There are no electric vehicle (EV) charging stations at the airport.

**Conclusion**

Consideration should be given to adding EV charging stations at the airport.

## 6.9. Stormwater

Stormwater runoff at IDA is carried away by a series of inlets, swales, and culverts to two retention basins located on airport property where the water collects and then infiltrates into the soil. No stormwater runoff is treated at the airport or leaves the airport property through an outfall. Since no runoff leaves the airport through an outfall, the airport is not required to have a Storm Water Pollution Prevention Plan (SWPPP). Additionally, the airport is not part of the Idaho Falls MSA contributing area.

The main retention basin, which has been in use since at least the 1940s, is located to the east of Runway 17 between Foote Drive and Interstate 15. It receives runoff from the terminal area through a 27-inch concrete pipe that also dates back to the 1940s. This retention basin also receives runoff from International Way and the industrial park located just to its south (off-airport). The stormwater manholes located between the FBO and commercial apron have been known to overflow during heavy storm events due to surcharge of the 27-inch main line.

The second retention basin, which was constructed in 2006, is located to the east of Taxiway A between Taxiway A4 and Taxiway E. It receives runoff from the infield between Taxiway A and the FBO apron.

**Conclusion**

Stormwater infrastructure at the airport should be improved as more impervious surface is added. Pipes dating to the 1940s should be replaced and the capacity increased. The main retention basin east of Foote Drive should be reviewed to determine if it is capable of accommodating airport development.

## 6.10. Land Use

Land use is the term used to describe how property is currently being used and how it can be used in the future. The existing and planned land uses near an airport can impact the local community, airport operations, and potential growth.

Effective land use compatibility plans take both height and land use restrictions into consideration and are incorporated via local zoning laws. This type of proactive planning around an airport protects both the airport and the surrounding community. Furthermore, federal and state grant assurances require airport sponsors to operate and maintain the airport in a safe and serviceable condition, prevent and remove airport hazards, and take appropriate measures to ensure compatible land uses exist around the airport.

### 6.10.1. Federal Policies and Regulations

FAA Grant Assurance 20 requires airport sponsors to take appropriate action as needed to protect the airspace used for instrument and visual approaches by mitigating existing hazards and preventing the introduction of new hazards. Grant Assurance 21 requires airport sponsors to "…take appropriate action, to the extent reasonable, including the adoption of zoning laws, to restrict the use of land adjacent to or in the immediate vicinity of the airport to activities and purposes compatible with normal airport operations including landing and takeoff of aircraft."[15]

### 6.10.2. State Policies and Regulations

The Idaho Transportation Department (ITD) Division of Aeronautics published *Idaho Airport Land Use Guidelines* in 2016 to assist airport sponsors in meeting regulatory requirements for local land use planning. These regulatory requirements include, but are not limited to, protecting public airports, including a Public Airport Facilities Section "q" in comprehensive plans, notifying an airport operator of a pending land use action, and preventing the creation or establishment of aviation hazards. Additionally, when an airport sponsor accepts grant funding from ITD Aeronautics, it agrees to comply with certain grant assurances. State Grant Assurance 23 states, "The Sponsor should have compatible land use and height restrictive zoning for the airport to prevent incompatible land uses and the creation or establishment of structures or objects of natural growth which would constitute hazards or obstructions to aircraft operating to, from, on, or in the vicinity of the subject airport."[16]

### 6.10.3. City Land Use Protections

As mentioned in Section 4.2.1., City Land Use Protections, Idaho Falls City Code; Title 11, Chapter 5, Section 11-5-3 established an Airport Overlay Zone that addresses compatible land uses and height restrictions to protect normal aircraft operations and IDA's airspace as well as people and property on the ground. While the land use zone designations in the Airport Overlay Zone do not have the same names and dimensions as those recommended in *Idaho Airport Land Use Guidelines,* they do serve the intended purpose.

Idaho Falls adopted a new comprehensive plan, *Imagine IF, A Plan to Move Idaho Falls Forward Together*, February 24, 2022. Background studies completed for this plan included a section for the airport which is equivalent to the Section "q" required by Idaho Statute 67-6508q.

### 6.10.4. County Land Use Protections

The *Bonneville County Comprehensive Plan* recognizes the importance of the airport and in protecting the airport from "...the thoughtless development of neighboring lands."[17] In 1967, Bonneville County adopted an airport zoning ordinance to protect the airspace around the airport. This ordinance has remained unchanged since its adoption. However, the runway configuration has changed substantially since 1967. Additionally, the county has not enacted land use zoning that is compatible with the airport. As a result, the county approved a zoning change in 2020 that allowed a new residential subdivision to be located approximately 3,000 feet from the Runway 21-end.

#### Conclusion

As the airport sponsor, the city of Idaho Falls is compliant with federal and state requirements regarding airport land use policies and zoning. Policies and regulations should be reviewed periodically to ensure they are current and relevant as the airport experiences growth and changes. The city and the airport should continue to work with Bonneville County to update its existing height restriction zoning ordinance and to adopt land use zoning to protect both the airport and the surrounding community from incompatible land uses.

### 6.10.5. Incompatible Land Use in Runway Protection Zones

The FAA updated its runway protection zone (RPZ) design standards with its March 2022 release of AC 150/5300-13B, *Airport Design*. It also replaced its land use compatibility planning guidance with its September 2022 release of AC 150/5190-4B, *Airport Land Use Compatibility Planning* which replaced the former FAA memorandum, "Interim Guidance on Land Uses Within a Runway Protection Zone.

The FAA expects sponsors to take appropriate measures to protect against, remove, or mitigate land uses that introduce incompatible development within RPZs. This includes having or securing sufficient control of the RPZ, ideally through fee simple ownership, to include off-airport property within the RPZ. For existing incompatible uses within RPZs, the FAA expects airport sponsors to seek all possible opportunities to eliminate, reduce, or mitigate such uses by way of land acquisition, land exchanges, right-of-first-refusal to purchase, agreements with property owners on land uses, easements, or other similar measures. The FAA also expects sponsors to document their efforts to eliminate incompatible uses within the RPZ to demonstrate they are complying with the grant assurances. For proposed or new incompatible uses, the FAA expects sponsors to take active steps to prevent or mitigate such uses. Sponsors should actively monitor conditions and object publicly to proposed incompatible land uses and make it a priority to acquire land or otherwise establish land use and zoning controls that prevent incompatible uses. The FAA will consider financial assistance to an airport sponsor for land acquisition, even if the sponsor has no land use control (i.e., when the RPZ extends into another jurisdiction), but only if the sponsor demonstrates they are taking all appropriate steps available to enhance control and mitigate existing risks.[18]

### a. Existing Incompatible Land Uses

The following existing incompatible land uses are known to be located within the airport's RPZs:

- An industrial park located within the Runway 35 RPZ.
- Interstate 15 located within the Runway 17 RPZ.
- The soccer fields located within the Runway 3 RPZ.
- Interstate 15, railroad tracks, and Lindsay Blvd. are all located within the Runway 21 RPZ

### b. Potential New Incompatible Land Uses

The Idaho Transportation Department is in the process of conducting an environmental impact statement (EIS) for reconfiguration of the intersection of Interstate 15 and U.S. Highway 20. One of the alternatives may result in a substantial increase in traffic driving through the Runway 17 and Runway 21 RPZs. The remaining viable alternatives will require airport land. As a result, the airport and the FAA's Helena Airports District Office (ADO) are both serving as coordinating agencies for the EIS.

The FAA sees both a substantial increase in traffic within the RPZ and the introduction of a new road within the RPZ as unacceptable modifications to the land use within the RPZ. This has been communicated to the EIS team and will be taken into consideration as part of the evaluation of alternatives.

### Conclusion

The airport should continue to seek ways to eliminate or mitigate existing incompatible land uses within the RPZ, and prohibit the introduction of new incompatible uses. All steps being taken by the airport should be documented to demonstrate compliance with FAA grant assurances.

### 6.10.6. Wildlife Hazard Attractants

FAA AC 150/5200-33C, *Hazardous Wildlife Attractants on or near Airports*, provides guidance on land uses that have the potential to attract hazardous wildlife on or near airports. Airports, like IDA, that hold an Airport Operating Certificate issued under 14 CFR Part 139, may use the standards, practices, and recommendations contained in AC 150/5200-33C as a means of complying with the wildlife hazard management requirements of Part 139.[19]

For airports serving turbine-powered aircraft, the FAA recommends a separation distance of 10,000 feet from wildlife attractants. These can include municipal landfills, wastewater treatment facilities, and stormwater management facilities that create standing bodies of water. In order to protect approach and departure corridors, the FAA recommends a five-mile separation from the wildlife attractant and the nearest aircraft operating area.

#### a. On-Airport Attractants

- Stormwater runoff at IDA collects in a retention basin between Foote Drive and I-15 located behind the NOAA Air Resources Laboratory. The water collects into a standing body of water where it infiltrates into the soil. This standing body of water could be considered a wildlife attractant for the airport.

#### b. Off-Airport Attractants

- The Hatch Pit is a landfill operated by Bonneville County. It is located approximately 6,000 feet, or 1.2 miles, northwest of IDA's aircraft operating area and northern approach corridor.
- The City of Idaho Falls Wastewater Treatment Plant is located approximately 2.8 miles south of IDA.

#### Conclusion

On-airport retention basins should be modified so they do not detain water for more than 48 hours. Airport staff should make sure any proposed development is reviewed to determine if it would comply with FAA AC 150/5200-33C, *Hazardous Wildlife Attractants on or near Airports.*

IDA conducted a Wildlife Hazard Assessment (WHA) between 2002 and 2003. A Wildlife Hazard Management Plan (WHMP) was updated in 2020.

## 6.11. City of Idaho Falls Strategic Vision

*Imagine IF, A Plan to Move Idaho Falls Forward Together* is the city's comprehensive plan. It articulates the city's vision, mission, and commitment to community expectations. It also outlines the means of successfully implementing this plan.

### 6.11.1. City of Idaho Falls Strategic Vision

"The City of Idaho Falls promotes a welcoming, attractive, safe and diverse community. We embrace small town values, big city efficiencies and forward-thinking approaches to provide outstanding services and sustainable economic, social and recreational opportunities for our whole community."[20]

### 6.11.2. City of Idaho Falls Strategic Mission

"The City of Idaho Falls works to provide outstanding quality of life to all our community members and be a model organization with emphasis on leadership, strategic planning and partnership, community engagement, asset and financial management and project implementation.

We achieve our mission by:

- Supporting opportunities for diverse economic and social growth and development,
- Adopting forward-thinking housing, economic and growth policies and approaches,
- Acting proactively to plan, develop and maintain infrastructure,
- Leading in emergency response and public safety,
- Providing excellent social and recreational amenities and services,
- Fostering strategic partnerships,
- Managing operations,
- Listening to and engaging with all members of our community.
- Idaho Falls Commitment to Community Expectations:
- Access to culture, recreation, leisure, life-long learning opportunities,
- Attractive, clean, and livable community,
- Strong, stable, and vibrant economic growth and opportunity,
- Environmental sustainability and resource preservation,
- Well-planned growth and development,
- Reliable public infrastructure, transportation, and mobility,
- Safe and secure community,
- Fiscally responsible, transparent, and efficient governance,
- Equitable and fair access to City government and services and active community engagement."[21]

#### Conclusion

Any development at IDA should support the city's strategic vision and mission.

## 6.12. Primary Management and Compliance Documents

An airport's primary management and compliance documents (PMCD) are a collection of rules, regulations, policies, and standards that guide the management, operation, and development of the airport. These documents provide an effective framework for airport sponsors to comply with federal obligations, set expectations, and ensure airport access is fair, reasonable, and not unjustly discriminatory. Common PMCDs at all airports include minimum standards, rules and regulations, leasing and development standards, minimum insurance requirements, rates and fees, an airport master plan, and an airport layout plan. Commercial service airports also have an airport certification manual, airport security manual, and airport emergency plan.

### Conclusion

PMCDs should be reviewed annually and updated as necessary to remain valid. The city of Idaho Falls is currently updating the minimum standards and rules and regulations for the airport.

## 6.13. Emerging Trends

The aviation industry is always evolving, and these changes can affect the size, quantity, and type of airport facilities needed to accommodate future demand. These trends can include topics that have a direct relationship with future airport growth and development needs such as unmanned aircraft systems (UAS), vertiports, sustainable aviation fuels (SAF), and electric aircraft. They can also include topics that are less directly related such as electric vehicle and GSE integration which should be considered for inclusion as part of medium- and long-term planning. Moreover, trends with indirect ties to airports that are current social and political issues will likely lead to future financial and regulatory decisions at the federal, state, and local levels. These topics could include climate change and climate resilience; accessibility (e.g., ADA, wayfinding, gender-neutrality); social and economic justice; diversity, equity, and inclusion (DEI); and the ever-evolving impacts of COVID-19 which can include social distancing and touchless interfaces.

### Conclusion

Airport management should remain aware of newly emerging industry trends and how they might affect the airport.

# Endnotes


**1** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5300-13B, Airport Design." Page 2-3. March 31, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

**2** U.S. Department of Transportation. Federal Aviation Administration. "Airport Capacity and Delay." September 23, 1983. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5060_5.pdf.

**3** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5300-13B, Airport Design." Page 2-3. March 31, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

**4** Ibid.

**5** Ibid.

**6** Ibid.

**7** Ibid.

**8** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5070-6B, Change 2 to Airport Master Plans." Page 50. January 27, 2015. https://www.faa.gov/documentlibrary/media/advisory_circular/150-5070-6b-change-2-consolidated.pdf.

**9** U.S. Department of Transportation. Federal Aviation Administration. "Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25B." 2016. https://www.faa.gov/sites/faa.gov/files/2022-03/pilot_handbook.pdf.

**10** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5300-13B, Airport Design." Table 3-4 and Figure 3-7, Approach Procedures with Vertical Guidance (APV) and Precision Approach (PA) Instrument Runway Approach Surfaces. March 31, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

**11** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5300-13B, Airport Design." Table 3-2 and Figure 3-5, Visual Approach Surfaces. March 31, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

**12** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5300-13B, Airport Design." Table 3-5 and Figure 3-9. March 31, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5300-13B-Airport-Design.pdf.

**13** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5070-6B, Change 2 to Airport Master Plans." Page 63. January 27, 2015. https://www.faa.gov/documentlibrary/media/advisory_circular/150-5070-6b-change-2-consolidated.pdf.

**14** U.S. Department of Transportation. Federal Aviation Administration." Advisory Circular 150/5220-20A, Airport Snow and Ice Control Equipment." September 24, 2014.https://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_150_5220-20A.pdf.

**15** U.S. Department of Transportation. Federal Aviation Administration. "Assurances, Airport Sponsors." May 2022. https://www.faa.gov/sites/faa.gov/files/airports/new_england/airport_compliance/assurances-airport-sponsors-2022-05.pdf.

**16** T-O Engineers. "Idaho Airport Land Use Guidelines." State of Idaho. Idaho Transportation Department. Division of Aeronautics. Boise, Idaho. July 2016. https://itd.idaho.gov/wp-content/Aero/Publications/LandUse_Guidelines.pdf.

**17** Bonneville County. "Bonneville County Comprehensive Plan." January 5, 1995, Amended October 3, 2013. https://bonneville-county-planning-and-zoning-bonneville.hub.arcgis.com/pages/comprehensive-plan,

**18** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5190-4B, Airport Land Use Compatibility Planning." September 16, 2022. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150_5190_4b_Land_Use_Compatibility.pdf.

**19** U.S. Department of Transportation. Federal Aviation Administration. "Advisory Circular 150/5200-33C, Hazardous Wildlife Attractants on or near Airports." February 21, 2020. https://www.faa.gov/documentLibrary/media/Advisory_Circular/150-5200-33C.pdf.

**20** City of Idaho Falls. Community Development Services. "Imagine IF, A Plan to Move Idaho Falls Forward Together, City of Idaho Falls' Comprehensive Plan." Idaho Falls, Idaho. 2021. https://www.idahofallsidaho.gov/DocumentCenter/View/14027/ImagineIF?bidId=.

**21** Ibid.

INTENTIONALLY BLANK