1. Introduction

This chapter identifies facility recommendations and requirements to accommodate the forecasted level of demand at the Coeur d'Alene Airport (COE). These recommendations are developed in coordination with the aviation activity forecasts in **Chapter 2**; Airport management and stakeholders; Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B, *Airport Master Plans;* AC 150/5300-13, *Airport Design;* and AC 150/5060-6, *Airport Capacity and Delay*. Additional guidance comes from AC 150/5360-9, *Planning and Design of Airport Terminal Buildings at Non-hub Locations*; Airport Cooperative Research Program (ACRP) Report 25, *Airport Passenger Terminal Planning and Design Volume 1, Guidebook;* and the Transportation Security Administration (TSA) *Recommended Security Guidelines for Airport Planning, Design, and Construction.* This chapter is organized into the following sections.

- Airfield Demand and Capacity Analysis
- Airside Facilities
- General Aviation Facilities
- Support Facilities
- Airport Property
- Automobile Access and Parking
- Passenger Terminal Building

1.1 2008 Idaho Airport System Plan

The 2008 Idaho Airport System Plan (2008 Idaho Plan) recommended that COE increase the number of aircraft tie-down spaces and increase Runway Protection Zone (RPZ) control. These determinations were based on COE's classification in the 2008 Idaho Plan as a *Regional Business Airport*, which is an airport that "accommodates regional economic activities, connecting to state and national economies, and serves all types of general aviation aircraft. They also accommodate local business activities and various types of general aviation users."

The 2008 Idaho Plan recommends that *Regional Business Airports* provide aircraft tie-down spaces for 40 percent of the based aircraft fleet, and 50 percent of the transient fleet. The 2008 Idaho Plan identified 73 aircraft tie-down spaces at COE. The 2008 Idaho Plan indicates that COE had 141 based aircraft in 2007, which require 56 aircraft tie-down spaces. The 2008 Idaho Plan recorded 15,982 transient arrivals, which is an average of 43 per day, not considering peaking tendencies.

2009 FAA Enhanced Traffic Management System (ETMS) counts indicate that the peak month for COE, July, has 18 percent of the aircraft operations for the year, and the peak day has five percent of the peak month's operations. This indicated 288 transient operations, and 144 transient arrivals during a peak day. According to the 2008 Idaho Plan metric, COE needs 72 aircraft tie-down spaces for these transient aircraft. Transient and based aircraft tie-down space demand at COE is 128 spaces, meaning the 2008 Idaho Plan recommends 55 additional aircraft tie-down spaces. Tie-down recommendations are presented in **Section 4.1**.

The 2008 Idaho Plan recommends that *Regional Business Airports* control 100 percent of their RPZ. The 2008 Idaho Plan identified that COE has partial RPZ control. The Airport controls property within the Runway End 05 and Runway End 23 RPZs. 0.3 acres of the Runway End 01 RPZ, and 1.2 acres of the Runway End 19 RPZ not under Airport control. Airport property requirements are presented in **Section 6**.

1.2 Part 139 Certification

Federal Aviation Regulation (FAR) Part 139, *Certification of Airports*, outlines the requirements for commercial service airports. In 2010, COE did not have scheduled commercial passenger airline service, and operated under a Class IV Part 139 Certificate. Under a Class IV Part 139 certificate, COE cannot serve scheduled air carrier aircraft, and is certified to serve unscheduled passenger operations of aircraft designed for more than 31 passenger seats.

As it is anticipated that COE will see scheduled commercial passenger airline operations during the 20-year planning period, COE will require Part 139 Class I certification. In addition to the requirements of Part 139 Class IV certification, Part 139 Class I certification will require COE to add the following items.

- Procedures for avoidance of interruption or failure during construction work of utilities serving facilities or navigational aids (NAVAIDs) that support air carrier operations
- A snow and ice control plan
- Procedures for controlling pedestrians and ground vehicles in movement areas and safety areas
- Procedures for protection of NAVAIDs
- A description of public protection
- Procedures for wildlife hazard management
- Procedures for identifying marking, and lighting construction and unserviceable areas

The requirements for each element are contained in FAR Part 139. A Part 139 Class I certificate requires COE to apply for Part 139 recertification, and allow FAA inspection.

2. Airfield Demand and Capacity Analysis

AC 150/5060-5, *Airport Capacity and Delay,* defines capacity as "a measure of the maximum number of aircraft operations which can be accommodated on the airport or airport component in an hour." Methodology used to quantify capacity focuses on the annual service volume (ASV). AC 150/5060-5 defines ASV as "a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather condition, etc., that would be encountered over a year's time."

ASV is calculated by pairing COE's runway configuration to example runway configurations contained in AC 150/5360-5, and by generating a fleet mix index. The fleet mix index is found by multiplying the number of operations by aircraft that weight more than 12,500 pounds but less than 300,000 pounds, designated as *C*, plus three times the number of operations by aircraft that weight over 300,000 pounds, designated as *D,* then dividing this number by the airport's annual operations. Annual operations are the sum of operations conducted by single-engine aircraft that weigh 12,500 pounds or less, designated as *A*; multi-engine aircraft that weigh 12,500 pounds or less, designated as *B*; and *C* and *D* aircraft that weigh over 300,000 pounds. The runway configurations in AC 150/5060-5 have hourly capacities for visual flight rules (VFR) and instrument flight rules (IFR) operations, and ASV based on the fleet mix index.

D aircraft did not operate at COE in 2008, and it is not expected that *D* aircraft will operate at COE during the 20-year planning period.

To estimate the number of operations conducted by *C* aircraft, 2009 FAA Terminal Area Forecast (2009 TAF) based aircraft counts were used to establish percentages of aircraft types. It is expected that *single-engine piston*, *helicopter*, and *other* aircraft weigh 12,500 pounds or less, and that *multi-engine piston* and *jet* aircraft weigh more than 12,500 pounds but less than 300,000 pounds. The 2009 TAF indicates that in 2008, 30 out of 189 based aircraft were *multi-engine piston* or *jet*, which was used to extract that 16 percent of operations were by *C* aircraft. It is expected that 100 percent of military and commuter operations were by *C aircraft*. The fleet mix index for COE in 2008 was 34 percent. The 2008 fleet mix index determination is presented in **Table 3-1**.

Table 3-1: 2008 Fleet Mix Index Determination

Designation	GA Operations		Military		Air Carrier	Commuter	Total
	Local	Itinerant	Local	Itinerant			
A & B	31,304	49,897	0	0	0	0	81,201
C	5,096	8,123	0	1,428	0	27,200	41,847
D	0	0	0	0	0	0	0

Fleet Mix Index: C+(3*D)= 41,847+(3*0) = 41,847
41,847/ (41,847+81,201) = **34%**

AC 150/5060-5 uses the fleet mix index to generate an airport's hourly visual operations capacity, hourly instrument operations capacity, and ASV. There are two models in AC 150/5060-5 that are applicable to COE, depending on which runway ends are being used. When aircraft are arriving on, and departing from Runway Ends 01 and 05, a 34 percent fleet mix index generates an estimated capacity of 99 visual operations per hour, 57 instrument operations per hour, and an ASV of 220,000.

When aircraft are landing on, and departing from Runway Ends 19 and 23, a 34 percent fleet mix index generates an estimated capacity of 108 visual operations per hour, 57 instrument operations per hour, and ASV of 225,000.

COE had 123,048 aircraft operations in 2008, which is between 54 and 56 percent capacity of the ASV depending on which runways are in use. The 2009 TAF forecasts 197,141 aircraft operations in 2028, putting COE at 90 percent of ASV.

As aircraft operations approach airfield capacity, COE should consider capacity enhancements. It is anticipated that the implementation of the FAA's Next Generation Air Transportation System (NextGen) initiative will improve capacity in addition to enhancing safety and reducing fuel consumption. Airfield improvements, such as an air traffic control tower (ATCT) and high-speed runway exits will allow for local management of COE's airspace and further enhance existing airfield capacity.

3. Airside Facilities

Airside facilities support the movement of aircraft. These facilities include paved surfaces like the runways, aprons, and taxiways, and NAVAIDS like the very high frequency omni-directional range (VOR) antenna and instrument procedures.

3.1 Critical Aircraft

Airfield facility requirements are determined by the airport reference code (ARC), defined in **Chapter 1**. COE's ARC is determined by its critical aircraft. The critical aircraft for Runway 05-23 is the Bombardier Q400, which has an ARC of C-III. The critical aircraft for Runway 01-19 is the Dassault Falcon 900, which has an ARC of B-II. It is anticipated that COE may see service by larger aircraft within the C-III category during the 20-year planning period such as the Boeing 737 and MD-80. The future ARC for COE is C-III.

3.2 Runway Length

Runway length requirements are determined by analyzing the needs of the Airport's critical aircraft, and anticipating future needs. Length requirements are defined in AC 150/5325-4B, *Runway Length Requirements for Airport Design,* which states that "the recommended length for the primary runway is determined by considering either the family of airplanes having similar performance characteristics or a specific airplane needing the longest runway." Runway length requirements are presented for aircraft that weigh more than 60,000 pounds, and for aircraft that weigh 60,000 pounds or less.

The runway length requirements for COE are based on national and local trends of aircraft. The purpose of length requirements is so the Airport can plan for and protect the property necessary for a longer runway. Further study and justification will likely be required before implementing a longer runway.

3.2.1 Aircraft that Weigh More than 60,000 Pounds

AC 150/5325-4B indicates that aircraft with a maximum takeoff weight (MTOW) of over 60,000 pounds, and commercial jets that carry fewer than 100 passengers, should be evaluated in accordance with manufacturer specifications. Additionally, aircraft operators have specifications for runway length considering the length of haul, aircraft performance, pilot procedure, airport elevation, and ambient temperature. A range of runway lengths for the maximum takeoff weight are presented in **Table 3-2**.

Table 3-2: Take-off Runway Length for Aircraft Weighing Over 60,000 Pounds

Aircraft	Minimum Length (Feet)	Maximum Length (Feet)	ARC
Boeing 737 Series	6,500	13,000	C-III
Boeing MD-80	9,800	10,000	C-III
Gulfstream V	5,150	–	C-III
Bombardier Q400	3,000	6,500	C-III

Source: Boeing Company 2010, Bombardier Aerospace 1998, Gulfstream Aerospace 2010

COE's runway lengths are likely adequate for aircraft over 60,000 pounds that perform regular operations at the Airport. These existing operations are conducted by charter aircraft that are generally expected to not be loaded as heavily as scheduled commercial passenger airline service aircraft of the same type. Upon the introduction of scheduled commercial passenger airline service, it is recommended that COE coordinate with the aircraft operator to determine runway length.

3.2.2 Aircraft that Weigh 60,000 Pounds or Less

The FAA *Airport Design* computer program is used to estimate runway lengths for GA aircraft. The software separates aircraft into two categories: small airplanes that weigh 12,500 pounds or less, and large aircraft that weigh 60,000 pounds or less, grouped by family. A representative small airplane that uses COE is the Beechcraft King Air 200, and a representative large airplane that uses COE is the Dassault Falcon 900. Small airplane runway length requirements are determined by the airplane having less than 10 seats, or 10 or more seats. Large airplane length requirements are determined by whether that airplane is operating with 60 percent of its useful load or 90 percent of its useful load. GA runway lengths for COE are presented in **Table 3-3**.

Table 3-3: Take-Off Runway Length for Aircraft Weighing Less Than 60,000 Pounds

Aircraft Description	Length (Feet)
Small Airplanes with less than 10 passenger seats	4,500
Small Airplanes with 10 or more passenger seats	4,600
Large Airplanes, 60 percent useful load	6,530
Large Airplanes, 90 percent useful load	9,170

Source: FAA Airport Design Computer Program

Based on COE's elevation of 2,320 feet above mean sea level, a mean daily maximum temperature during the hottest month of 85 degrees Fahrenheit, and a 2,500 mile length of haul, operations by large GA aircraft at COE support a runway length of up to 9,170 feet. The FAA *Airport Design* computer program indicates that a 9,170 foot runway would accommodate 100 percent of large airplanes at 90 percent of their useful load. A 9,170 foot runway would likely enable large airplanes to reach cities in the continental U.S. from COE, without having to stop and refuel enroute. Without sufficient runway length, aircraft have to reduce their load to take-off safely, which is undesirable for aircraft operators.

It is recommended that COE consider a runway length of up to 9,170 feet, particularly if aircraft operators indicate they have to compromise their operations and reduce their loads when using the Airport.

3.3 Runway Width

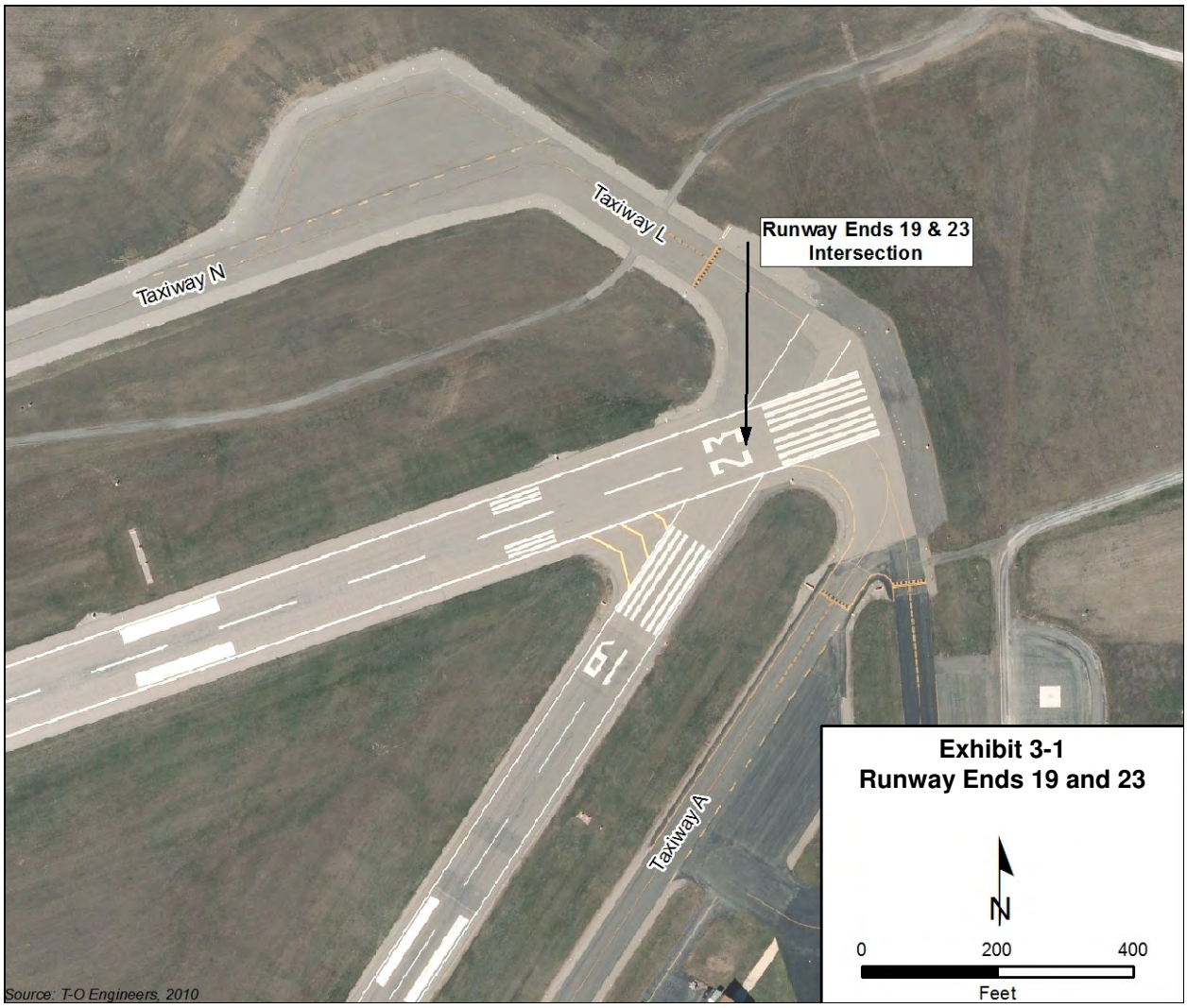
Runway widths are evaluated for Runways 01-19 and 05-23. AC 150/5300-13, *Airport Design*, defines the required runway widths by the aircraft design group (ADG) that the runway serves. Runways for ADG II should be 75 feet wide, and runways for ADG III should be 100 feet wide. Runway 01-19 is designed for ADG II, and is 75 feet wide. Runway 05-23 is designed for ADG III, and is 100 feet wide. No change to existing runway width is planned.

It is recommended that COE maintain the existing widths of Runways 01-19 and 05-23.

3.4 Runway Layout

Runway Ends 19 and 23 are positioned such that they effectively intersect with one another. This situation is confusing to pilots landing, taking-off, and taxiing, particularly to pilots unfamiliar with COE, at night, and during inclement weather. To enhance safety at the Airport, the runways ends should be separated through runway extension or displacement, so that the distinction is more apparent. The existing configuration of Runway Ends 19 and 23 is presented in **Exhibit 3-1**.

It is recommended that COE relocate one or both of Runway Ends 19 and 23.



3.4.1 Grass Landing Strip

COE has a diverse GA aircraft fleet mix. In addition to jets that require modern runway facilities, Northern Idaho is also home to bush planes that are designed to land on grass landing strips in the wilderness. These aircraft operate at COE, ferrying passengers and supplies to remote areas in the Pacific Northwest. Pilots of these types of aircraft prefer grass landing strips, as it is easier on their landing gear than pavement.

It is recommended that COE consider designating an area for a grass strip.

3.5 Taxiway System

COE has a taxiway system that provides direct access to Runway Ends 01, 05, and 23, and mid-runway exits along Runways 01-19 and 05-23.

3.5.1 Taxiway Width

AC 150/5300-13 indicates that taxiways for ADG II aircraft should be 35 feet wide, and taxiways for ADG III aircraft should be 50 feet wide. Aircraft having a wheelbase of 60 or more feet require 60 feet wide taxiways. A 35-foot taxiway width is appropriate for access taxiways to Runway 01-19, and a 50-foot taxiway width is appropriate for other taxiways. Existing taxiway widths are presented in **Chapter 1**, **Table 1-3**.

Taxiway widths at COE are adequate for the existing and planned ARC, C-III. Taxiways B, C, and E do not meet ADG III requirements; however, they serve an ADG II runway for which they are adequately wide.

It is recommended that COE maintain existing taxiway widths and design future taxiways to ADG III standards.

3.5.2 Taxiway Configuration

The existing taxiway configuration at COE provides access to the runway ends and mid-runway exits. There is no infield taxiway. There are taxiways that provide straight direct access from aircraft parking areas to the runways. There are runway entrance taxiways that are not perpendicular to the runway they serve. Facility requirements for COE's taxiway configuration intend to improve airfield circulation and safety.

The existing taxiway configuration at COE requires aircraft departing from Runway End 05 and arriving on Runway End 23 to taxi around the perimeter of the airfield to access the hangars and FBOs east of Runway 01-19. Runway 01-19 is between the Southside and Taxiway A. There is no mid-runway crossing for Runway 01-19. New taxiway connecters that pass through the infield will likely improve safety and circulation at COE.

It is recommended that COE develop infield taxiways along Runways 01-19 and 05-23.

Taxiways B and E provide straight direct access to Runway 01-19 from aircraft parking areas. FAA Engineering Brief (EB) 75, *Incorporation of Runway Incursion Prevention into Taxiway and Apron Design,* recommends that airports "avoid taxiway layouts providing straight direct access onto a runway from a terminal or parking apron area. Taxiway geometry should force the pilot to consciously make turns to promote situational awareness."

It is recommended that Taxiways B and E, or the apron taxilane adjacent to them, be reconfigured to eliminate straight direct access to Runway 01-19.

It is recommended that future taxiway developments avoid straight direct access between aircraft parking areas and Runway 05-23.

Right-angle taxiway intersections provide pilots with improved situational awareness, which is a key safety factor when approaching an active runway. When taxiways do not intersect runways at right-angles, the pilot's field of vision is reduced to one direction. EB 75 states that "right-angle taxiways are the recommended standard for all runway/taxiway intersections, except where there is a need for high-speed exit taxiways." EB 75 shows that "FAA studies indicate the risk of a runway incursion increases exponentially on angled (less than or greater than 90°) taxiways used for crossing the runway." The intersections of Taxiway D with Runway End 01, and Taxiway L with Runway End 23, are not at right angles.

It is recommended that runway access taxiways be reconfigured to right-angle taxiways, and that future access taxiways are designed to intersect the runways at a right angle.

Right-angle taxiways enhance situational awareness for pilots entering or crossing a runway, but require aircraft to reduce speed, turn, then apply engine thrust to regain taxiing speed. High-speed exit taxiways improve existing runway capacity by allowing aircraft to exit the runway more quickly, and eliminate some of the momentum lost compared to exiting the runway on a right-angle taxiway.

It is recommended the COE consider installing high-speed exit taxiways on the primary runway.

Taxiway A is 225 feet from Runway 01-19, while the standard runway-taxiway separation for B-II runways is 240 feet. It is recommended that COE consider relocating Taxiway A or Runway 01-19 to meet FAA separation standards.

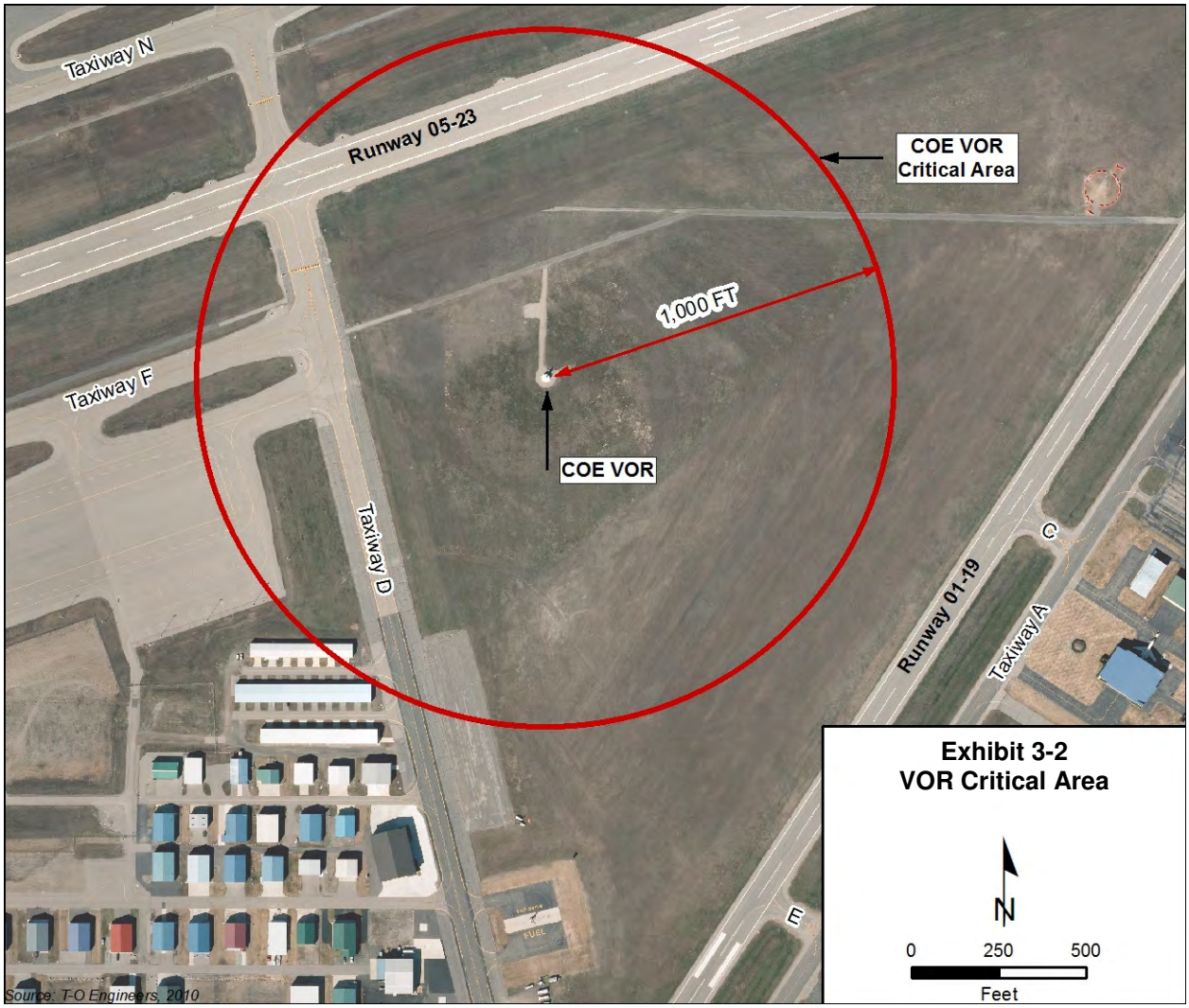
3.6 Design Standards and Part 77 Surfaces

FAA airport design standards are created for safe aircraft operations. AC 150/5300-13 identifies design standards of runway and taxiway safety area and object free area, obstacle free zone, runway protection zone, and runway end siting surfaces. FAR Part 77, *Objects Affecting Navigable Airspace,* identifies the airspace to be protected from obstructions, and includes the approach, primary, transitional, conical, and horizontal surfaces. Existing airport design standards and Part 77 surfaces are defined in **Chapter 1**, and surfaces are presented on the **ALP**.

3.7 Navigational Aids

AC 150/5070-6B, *Airport Master Plans*, defines NAVAIDs as "aids to navigation [that] provide pilots with information to assist them in locating the airport and to provide horizontal and/or positional guidance during landing." The type, mission, and volume of aeronautical activity, in association with airspace, meteorological conditions, and capacity data, determine the need for NAVAIDs.

COE has an on-airfield VOR NAVAID. This VOR supports the VOR IAP into COE Runway 05, the Localizer/ Distance Measuring Equipment (LOC/DME-A) approach into Sandpoint Airport (SZT), and is used to determine position under instrument flight rules (IFR) along low level routes, called victor routes. Victor routes do not use the COE VOR as a waypoint. VOR siting requirements restrict development and expansion within 1,000 feet of the VOR antenna. Removal or relocation would increase airside development opportunities. Nationwide, the FAA has begun to phase out funding and maintenance of VOR stations in favor of satellite-based global positioning system (GPS) navigation as part of NextGen. The configuration of the airfield around the existing VOR is presented in **Exhibit 3-2**.



As the national airspace system transitions from ground-based NAVAIDs to satellite-based NAVAIDs during NextGen, the COE VOR will be used less often for navigation and will become more of a development constraint. Removal or relocation of the VOR will open area for the development of an infield taxiway and aircraft parking aprons. These facility improvements will improve safety, circulation, and aircraft storage capacity at COE, on existing airport property.

It is recommended that COE coordinate with the FAA to remove or relocate the VOR.

3.8 Instrument Procedures

Instrument procedures are classified as departure procedures (DP) and instrument approach procedures (IAP). Instrument procedures are commonly used in all-weather conditions and are required under IFR conditions, when the cloud ceiling is less than 1,000 feet, and/or visibility is less than three miles. COE was under IFR conditions five percent of the time between 2000 and 2009. COE has one DP that provides direction for each runway end, and IAPs into Runway Ends 01 and 05.

As runways are extended or improved, COE's DP should be maintained to allow for instrument departure from the four runway ends.

Satellite-based navigation has become a priority for the FAA as NextGen is implemented. COE has one satellite-based IAP: an area navigation (RNAV) GPS with localizer performance and vertical guidance (LPV) IAP into Runway End 05. This procedure permits IAPs in visibility as low as a half mile, and a decision height of 200 feet above the runway threshold. Runway Ends 01, 19, and 23 do not have satellite-based IAPs.

It is recommended that Runway Ends 01, 19, and 23 be evaluated for satellite-based IAPs.

Runway Ends 01, 19, and 23 do not have approach lighting systems. Runway Ends 01 and 23 have runway end identifier lights; Runway End 19 does not. It is recommended that Runway Ends 01, 19, and 23 have approach lighting systems installed.

It is recommended that as runway ends are relocated, consideration is given to developing new satellite-based IAPs. The Airport should coordinate with the FAA Western Flight Procedures Office during the development of future IAPs.

3.9 Airport Traffic Control Tower

Increased aviation activity benefits from controlled communication. Forecasts anticipate COE's aircraft operations will grow at a compound annual growth rate (CAGR) of 2.4 percent through 2028. Potential scheduled commercial passenger airline service may increase the aircraft operations CAGR by 0.1 percent. It is recommended that COE consider an airport traffic control tower (ATCT) to manage operations in the air, and taxiing on the ground. Criteria for an ATCT are contained in FAA Order 6480.4A, *Airport Traffic Control Tower Siting Process*.

FAA Order 6480.4A recommends that ATCT siting should provide a site that will allow the shortest tower possible that meets the visibility, communication, navigation, and surveillance requirements. ATCT personnel must have "an unobstructed view of all movement areas of an airport, including all runways, taxiways, and any other landing areas." Tower siting requires a line of sight analysis (to be performed as part of a separate study) to determine if a particular location and tower height meet FAA criteria.

FAA sponsored tower development requires a benefit-cost analysis (BCA) (to be performed as part of a separate study), as outlined in FAA report APO 90-7, *Establishment and Discontinuance Criteria for Airport Traffic Control Towers*. Key criteria of a BCA are the number of averted accidents, the potential improvement in operational facility, and the cost of building, staffing, and maintaining the ATCT. The BCA influences whether a tower is necessary, and whether the FAA will pay for ATCT staff, or split this cost with COE.

It is recommended that the Airport preserve space for an ATCT, and maintain an unobstructed line of sight from this area to existing and future aircraft movement areas.

4. General Aviation Facilities

General aviation (GA) facilities support based and transient aircraft by providing storage, service, and fuel. GA facilities at COE are southeast of Taxiway A and west of Taxiway D.

4.1 Aircraft Parking and Storage

Based aircraft are stored in box hangar units and T-hangar units, and parked in tie-down spaces. Hangar units are located along taxiways and taxilanes, and tie-down spaces are located on aircraft aprons. Transient aircraft park on aircraft aprons when not in use.

4.1.1 Aircraft Hangar Units and Tie-Down Spaces

In 2008, COE had 189 based aircraft, 84 box hangar units, 72 T-hangar units, and 73 tie-down spaces. Aircraft parking and storage requirements are determined by maintaining the existing ratio between the number of available aircraft parking and storage facilities and the number of based aircraft, which is one aircraft parking and storage facility for every 0.83 based aircraft.

In 2008, 36 percent of aircraft storage units were box hangars, 32 percent were T-hangars, and 32 percent were tie-downs. The 2008 Idaho Plan recommended adding 55 additional tie-down spaces for a total of 128, however it is anticipated that future aircraft parking and storage will be distributed so that 45 percent of aircraft storage units are box hangars, 35 percent of aircraft storage units are T-hangars, and 20 percent of aircraft storage units are tie-down spaces. This change reflects forecasted growth in the number of based multi-engine and jet aircraft at COE.

Aircraft parking and storage recommendations are presented in **Table 3-4**.

Table 3-4: Aircraft Parking and Storage

Year	Based Aircraft	Box Hangars	T-hangar Units	Tie-down Spaces	Total
2008	189	84	72	73	229
2013	225	123	95	73	291
2018	268	145	114	73	333
2028	388	212	165	94	471

It is recommended that COE add 128 box hangars for a total of 212, 93 T-hangar units for a total of 165, and 21 tie-down spaces for a total of 94.

AC 150/5300-13, Appendix 5, recommends providing 300 square yards, which is 2,700 square feet, per tie-down space. This area includes the tie-down space, and separation space between the adjacent tie-down spaces. 21 tie-down spaces are expected to require 56,700 square feet of aircraft apron.

4.1.2 Aircraft Aprons

The Airport provides three aprons for aircraft parking, in addition to the six provided by airport tenants.

Apron area requirements are determined by maintaining the existing ratio between apron area and the number of itinerant operations, which in 2008 was one square foot of apron area for every 7.8 based aircraft. The 7.8:1 ratio is used to generate apron area requirements for the preferred aircraft operations forecast from **Chapter 2**. Transient aircraft apron requirements are added to the tie-down space apron requirements in **Section 4.1.1**. Aircraft apron area requirements are presented in **Table 3-5**.

Table 3-5: Aircraft Apron Area

Year	Itinerant Operations	Apron Area (Square Feet)
2008	86,648	656,550
2013	91,332	690,000
2018	96,395	730,000
2028	107,781	820,000

It is recommended that COE add 163,450 square feet of aircraft apron area for transient aircraft, and 56,700 square feet of aircraft apron area for tie-down spaces to the existing 656,550 square feet, for a total of 876,700 square feet.

4.2 Fixed Base Operators

There are three fixed base operators (FBOs) at COE, two of which sell fuel. Multiple FBOs keep fuel and service prices competitive with other airports, which benefits aircraft owners and pilots. Facility requirements for FBOs depend on equipment and services. New and expanded FBO buildings are expected as companies reach their capacity in their existing locations. Growth in GA activity on the Northside may encourage an additional FBO.

The FBO operators have indicated that they require more apron space adjacent to their facilities to accommodate their clientele, which supports a new or relocated FBO on the Northside. Apron development is discussed in **Section 3.9**.

It is recommended that COE preserve property for FBO expansion, or the relocation of an existing FBO.

5. Support Facilities

Support facilities provide emergency services, airport maintenance, and aircraft services. These facilities support day-to-day airport operations, and essential services during emergencies and inclement weather.

5.1 Aircraft Rescue and Firefighting

Aircraft rescue and firefighting (ARFF) services are required by Part 139. COE's Class IV Part 139 certification requires ARFF personnel to be present during operations by aircraft with more than 30 seats. ARFF equipment requirements, known as ARFF Index, are determined by the size of the largest aircraft that conducts an average of five daily departures.

It is anticipated that COE will maintain its existing ARFF Index of A. If scheduled commercial passenger airline operations begin at COE, the Airport may become an ARFF Index B or C, requiring up to three ARFF vehicles and an ARFF facility. In 2011, the Airport began building an ARFF building east of Taxiway D, north of Runway 05-23.

It is recommended that COE evaluate ARFF equipment capacity during preparation for scheduled commercial passenger airline service, and preserve property for facility expansion.

5.2 Airport Maintenance

Airport maintenance has indicated a desire to relocate staff and equipment from the existing off-airfield facility on the southwest corner of Ramsey Road and Wyoming Avenue to a new location on the airfield. This is intended to improve response time and increase efficiency by giving staff and equipment direct airfield access. Since airport maintenance staff operates the ARFF equipment, having maintenance staff on the airfield will improve the transition time from maintenance to ARFF.

It is recommended that COE consider relocating airport maintenance facilities to a new facility on the airfield, near the ARFF station.

5.3 Aircraft Deicing

COE's FBOs offer aircraft deicing services. In 2010, the U.S. Environmental Protection Agency (EPA) proposed new regulation intended to increase the amount of aircraft deicing fluid that airports need to collect. The new regulation is expected to impact airports with 1,000 or more annual jet departures, which COE exceeded in 2008. Potential facility implications include constructing deicing pads, and acquiring ground service vehicles that vacuum deicing fluid from airport pavements.

6. Airport Property

The existing runway protection zones (RPZ) for Runway Ends 01 and 19 are partially located off airport property. The 2008 Idaho Plan recommended that the Airport control all property within its RPZs. The development of instrument approach procedures (IAP) may increase the size of the RPZs associated with Runway Ends 01, 19, and 23. A relocation of the runway ends associated with a runway extension or threshold relocation will likely change the position of the RPZ. Planned RPZ locations and dimensions are included in **Chapter 4**, and on the **ALP**.

It is recommended that the Airport acquire property within the existing and planned RPZs to facilitate IAP development, and enhance operational safety. It is recommended that COE control the RPZs to protect against incompatible land use. It is recommended that COE consider acquiring property adjacent to the Airport as opportunities arise to accommodate airport development.

7. Automobile Access and Parking

The primary thoroughfare near the Airport is U.S. Highway 95. U.S. Highway 95 connects the Airport to the business districts of the City of Hayden and the City of Coeur d'Alene, and to Interstate 90 which provides access to Spokane, Washington, Missoula, Montana, and beyond.

7.1 Automobile Access

The Airport is surrounded by two-lane surface streets. From U.S. Highway 95, Miles, Lacey, and Wyoming avenues pass through residential neighborhoods towards the Southside and Eastside facilities at the Airport. Lancaster Road provides access to the Northside, passing through agricultural properties. Atlas Road and Huetter Road connect the Southside to the City of Hayden. Absence of a dedicated and preferred means of access to the Airport results in unnecessary traffic through residential areas.

It is expected that a preferred means of access to the Airport will reduce the volume of airport traffic passing through other residential areas, support business development at the Airport through facilitated access, and improve airport user experience.

It is recommended that the Airport coordinate with the City of Hayden and Kootenai County to identify preferred access routes, and to preserve and acquire right-of-way to widen the roads, and enhance traffic flow to the Southside, Eastside, and Northside airport facilities. It is recommended that signage identifying the preferred means of access to the Airport be placed on U.S. Highway 95 to encourage route utilization.

7.2 Employee, Visitor, and Tenant Automobile Parking

Employee and visitor parking areas are provided by airport businesses at their facilities. Hangar tenants generally drive onto the airfield to access their hangar. Airfield access by automobile is convenient for tenants, but can complicate airfield operations and safety.

It is recommended that the Airport provide parking lots near hangar areas for hangar tenants. It is expected that future airport employee and visitor parking will be provided by airport businesses.

8. Passenger Terminal Building

An airport's passenger terminal building is often the first representation of the community that visitors see upon arrival, and their last experience in the community upon departure. In recent years, passenger terminal buildings have transformed from check-in facilities, boarding gates, and baggage claim to a key part of the trip. Public perception of an airport's passenger terminal can shape how the public feels about the airport and the community. Passenger terminal buildings across the country have incorporated amenities such as restaurants, shops, and other passenger services to improve passenger experience, increase passenger dwell time, and improve airport profitability.

COE is able to function operationally without a formal passenger terminal building. It is anticipated that the Airport will see scheduled commercial passenger airline service commence within the planning period, at which time a formal passenger terminal building is recommended. The components of a passenger terminal building that would be necessary to handle the expected passenger volume are contained in the following sections. Primary guidance comes from AC 150/5360-9, *Planning and Design of Airport Terminal Building Facilities at Nonhub Locations;* the Airport Cooperative Research Program (ACRP) Report 25, *Airport Passenger Terminal Planning and Design Volume 1, Guidebook*; and the Transportation Security Administration's (TSA) 2006 *Recommended Security Guidelines for Airport Planning, Design and Construction*. Additional information comes from the International Air Transport Association's (IATA) *2004 Airport Development Reference Manual* (ADRM).

Based on the following sections, it is recommended that COE plan for a 14,000 square foot passenger terminal building. This floor space includes airline ticketing offices, check-in facilities, TSA and airline baggage processing facilities, TSA passenger screening facilities, passenger holdroom facilities, baggage claim facilities, and rental car facilities. The recommendation includes a waiting lobby and restrooms.

8.1 Airline Ticketing Offices and Check-in Facilities

Airline ticketing offices (ATOs) and check-in facilities are where passengers check their luggage, obtain a boarding pass, and get customer service. Airline employees have space behind the ticket counter for offices and baggage processing.

If a scheduled commercial passenger airline that operates aircraft with more than 30 seats begins operating at COE, baggage will require TSA screening. It is recommended that COE reserve an area behind the check-in counters for TSA screening equipment.

It is recommended that the passenger terminal building check-in and ATO areas to accommodate scheduled commercial passenger airlines that begin service at COE, and provide room for additional scheduled commercial passenger airlines.

AC 150/5360-9 recommends 4,600 square feet for airline and TSA baggage screening, check-in and queuing, and ATO area.

8.2 Security

Scheduled commercial passenger airline flights conducted using aircraft with more than 30 seats require TSA screening. Passenger terminal building area past the security screening checkpoint (SSCP) is *sterile*, while passenger terminal building area before the SSCP is *non-sterile*.

It is recommended that COE plan for one walk through metal detector (WTMD) and one baggage x-ray machine to process enplaning passengers. It is recommended that the COE preserve room to expand the SSCP to two WTMDs and two baggage x-rays as scheduled commercial passenger airline operations increase.

8.3 Passenger Holdroom and Boarding Gates

Passenger holdrooms occur on the sterile side of the SSCP, and generally include restrooms, concessions, and vending. Passenger holdroom size is determined by the number of passengers expected to be in the holdroom, and the space required for restrooms, concessions, and retail. Industry rule of thumb recommends 1,800 square feet of holdroom per passenger boarding gate to accommodate these facilities.

It is recommended that COE preserve property for holdroom expansion as passenger levels increase.

Passenger boarding gates provide egress between the holdroom and the apron. Passenger boarding gates can be passenger boarding doors (PBDs) at ground level, or passenger boarding bridges, which are generally elevated. The anticipated fleet mix and frequency of scheduled commercial passenger airline operations indicate that PBDs are most appropriate for COE. PBDs can double as emergency exits required to meet fire code.

It is recommended that 5,400 square feet be allocated to accommodate passenger holdroom facilities and three PBDs.

8.4 Baggage Claim

Baggage claim facilities will likely be used by scheduled commercial passenger airline operations using aircraft with more than 30 seats as passengers using smaller aircraft generally carry luggage out to the aircraft, and pick up luggage upon deplaning. It is anticipated that COE could see two flights with more than 30 seats arriving in an hour during the planning period.

It is recommended that COE provide one conveyer belt baggage claim system in the baggage claim area to accommodate peak hour arriving flights.

AC 150/5360-9 recommends 1,150 square feet of baggage claim area for the anticipated level of deplaning passengers.

8.5 Rental Car

Rental cars are a service that the Airport can provide visitors. Existing car rental services are offered by the Southfield and Resort Aviation FBOs. Having rental car facilities in the passenger terminal building with rental ready lots in an adjacent parking lot will improve customer experience.

It is recommended that the passenger terminal building incorporate rental car facilities into the passenger terminal building. Rental car counters are generally 10 feet deep and six feet wide. It is recommended that COE provide space for up to four rental car counters to accommodate anticipated demand and future expansion.

It is recommended that a dedicated rental car ready section be placed in the passenger terminal building parking lot.

Rental car counters will require 240 square feet of floor space.

8.6 Automobile Access and Parking

Passenger terminal building location will determine the access requirements. The proposed site may have existing road access, and may require road construction.

It is recommended that the Airport coordinate with the City of Hayden and Kootenai County regarding access.

Parking can be the largest revenue generator at airports. The passenger terminal building parking lot will consist of rental car, short-term, and long-term parking. Surface parking lots typically require 450 square feet per parking space, including room for automobile circulation within the lot. Some passengers will be picked-up and dropped-off, and not use parking facilities.

It is anticipated that niche market low cost carrier (NMLCC) scheduled commercial passenger airline service will operate two or three flights per week, requiring passengers to park for three to four days. Intrastate scheduled commercial passenger airline service will likely offer multiple flights per day, and passengers will park for a shorter period. It is anticipated that passengers on NMLCC flights will travel in groups of two or more as NMLCC passengers are general leisure travelers. Intrastate passengers are more likely to be traveling alone for business.

COE should provide as many parking spaces as seats on the largest aircraft expected to serve the Airport. This will provide parking for passengers of the aircraft, as well as passengers on other flights.

It is recommended that COE build a 67,500 square foot parking lot with 150 parking spaces, and protect adjacent land to expand the parking lot as passenger levels increase. It is recommended that COE consider providing covered parking spaces near the airport terminal building to increase revenue per space, and passenger convenience.

9. Summary

The following is a summary of the facility requirements included in this chapter.

It is recommended that the Airport:

Airfield

- Construct new airfield facilities to ARC C-III and B-II standards
- Protect land to extend Runways 01-19 and 05-23
- Maintain existing runway widths
- Relocate the intersection of Runway Ends 19 and 23 to enhance safety and utility
- Consider adding a grass strip
- Maintain existing taxiway width of Taxiways A, D, F, G, H, L, and N
- Construct infield taxiways
- Decouple Taxiways B and E between existing aprons and Runway 01-19
- Install high-speed exit taxiways on the primary runway
- Increase separation of Runway 01-19 and Taxiway A to meet FAA standards
- Coordinate with the FAA to remove or relocate the VOR
- Evaluate Runway Ends 01, 19, and 23 for satellite-based precision IAPs
- Upgrade light systems on Runway Ends 01, 19, and 23
- Evaluate position of an ATCT, and protect the line of sight
- Add 163,450 square feet of aircraft apron to the existing 656,550 square feet, for a total of 820,000 square feet

General Aviation

- Add 128 box hangars for a total of 212, 93 T-hangar units for a total of 165, and 21 tie-down spaces for a total of 94
- Protect property for FBO expansion or relocation

Support Facilities

- Evaluate ARFF vehicle capacity during preparation for scheduled commercial passenger airline service
- Relocate airport maintenance to a new facility with airfield access

Airport Property

- Acquire property within the existing and planned RPZs

Automobile Access and Parking

- Identify a preferred street of access routes to the Southside and Eastside facilities
- Mark access to the Southside, Eastside, and Northside facilities from U.S. Highway 95

Passenger Terminal Building

- Protect property to build a passenger terminal building and associated facilities