Final Report

Master Plan Update
Aspen/Pitkin County Airport

THE Barnard Dunkelberg Company TEAM

MASTER PLAN UPDATE

Final Report

DECEMBER 2012

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Master Plan Update
Aspen/Pitkin County Airport

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THE **Barnard Dunkelberg Company** TEAM

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Executive Summary

As outlined in Federal Aviation Administration (FAA) Advisory Circular 150/5070-6A, Airport Master Plans, the initial step in the Master Plan process for Aspen/Pitkin County Airport is the collection and evaluation of information about the Airport and the area it serves. The inventory task for Aspen/Pitkin County Airport (ASE) is accomplished through physical inspection of the facilities, field interviews and surveys, telephone conversations, review of previous airport studies, and review of appropriate airport management records.

The objective of the inventory task is to document existing conditions, thereby providing the background information essential to the completion of the Master Plan Update. The inventory information covers a broad spectrum and includes information on the following airport elements:

- Airside and landside facilities and their uses
- Surface transportation data
- Air traffic activity data
- Auxiliary and service support facilities
- Weather data
- Other airport studies
- Airspace structures
- Available navigational aids (NAVAIDs)

A large volume of data was collected, reviewed, and analyzed during the inventory effort at Aspen/Pitkin County Airport. Much of the detailed information is presented and supplemented in subsequent chapters of this Master Plan Update, as appropriate, to support the various technical analyses required as part of this project.

This chapter presents an overall summary of the airport facilities and the community it serves, and is organized in the following sections:

1.1 History and Background

1.2 Facilities Inventory

1.3 Airport Traffic Control

1.4 Socioeconomic Trends

It is also important to note that this Inventory chapter was originally written in 2008 and was approved by both Pitkin County and the FAA. Where appropriate, changes since the original draft have been noted (e.g., the completion of the runway extension and changes in airlines and air service).

1.1 History and Background

This section describes the history of aviation in Aspen, geographical characteristics at and around the Airport, and pertinent operation information. The following subsections are addressed:

- History
- Location
- Existing Airport Environment
- Airport Ownership and Role

1.1.1 History

The history of flight in Aspen dates to 1946, when Walter Paepcke and John Spachner founded Aspen/Pitkin County Airport as a privately-owned, public-use, gravel landing strip. The primary user of the Airport at the time was the Aspen Institute, the forerunner to Aspen Airways. The original facility consisted of a log cabin terminal building and a gravel runway.

In 1956, Aspen Airport Corporation officially deeded the Airport to Pitkin County. This made the Airport a publicly-owned public-use airport, which is generally a primary requirement for federal participation in airport development.

In 1957, the Civil Aeronautics Administration and Pitkin County, as airport sponsor, funded the initial construction of Runway 15/33, a connecting taxiway, and an apron. This effort was led primarily by Commissioner Thomas J. Sardy. Runway 15/33 was originally 5,200 feet long and 60 feet wide.

In 1958 the Airport was officially dedicated as Aspen/Pitkin County (Sardy Field) Airport. In 1963, the runway was lengthened to 6,000 feet and, by 1969, the use of larger aircraft required it to be widened to 80 feet. Also, in 1969, the apron area was expanded to 400,000 square feet (SF).

During the 1970s, in order to focus on customer air service, Pitkin County planned and provided for centralized passenger service. A parcel of land containing approximately 29 acres was acquired to accommodate a new terminal building, and an aircraft parking apron was constructed in 1973 to serve the terminal. The new 17,500-square foot terminal building was constructed in 1976 and was the first commercial building in the United States to use passive solar heating.

In 1983, the Airport's runway was lengthened and widened to 7,006 feet long by 100 feet wide, with another runway extension being completed in the fall of 2011, bringing the runway length to 8,006 feet. The entire terminal area was redeveloped between 1986 and 1987 and included new vehicle access roadways and a terminal expansion to its present size of approximately 45,000 SF. In 1999, the aircraft parking area was again expanded to allow for more aircraft parking.

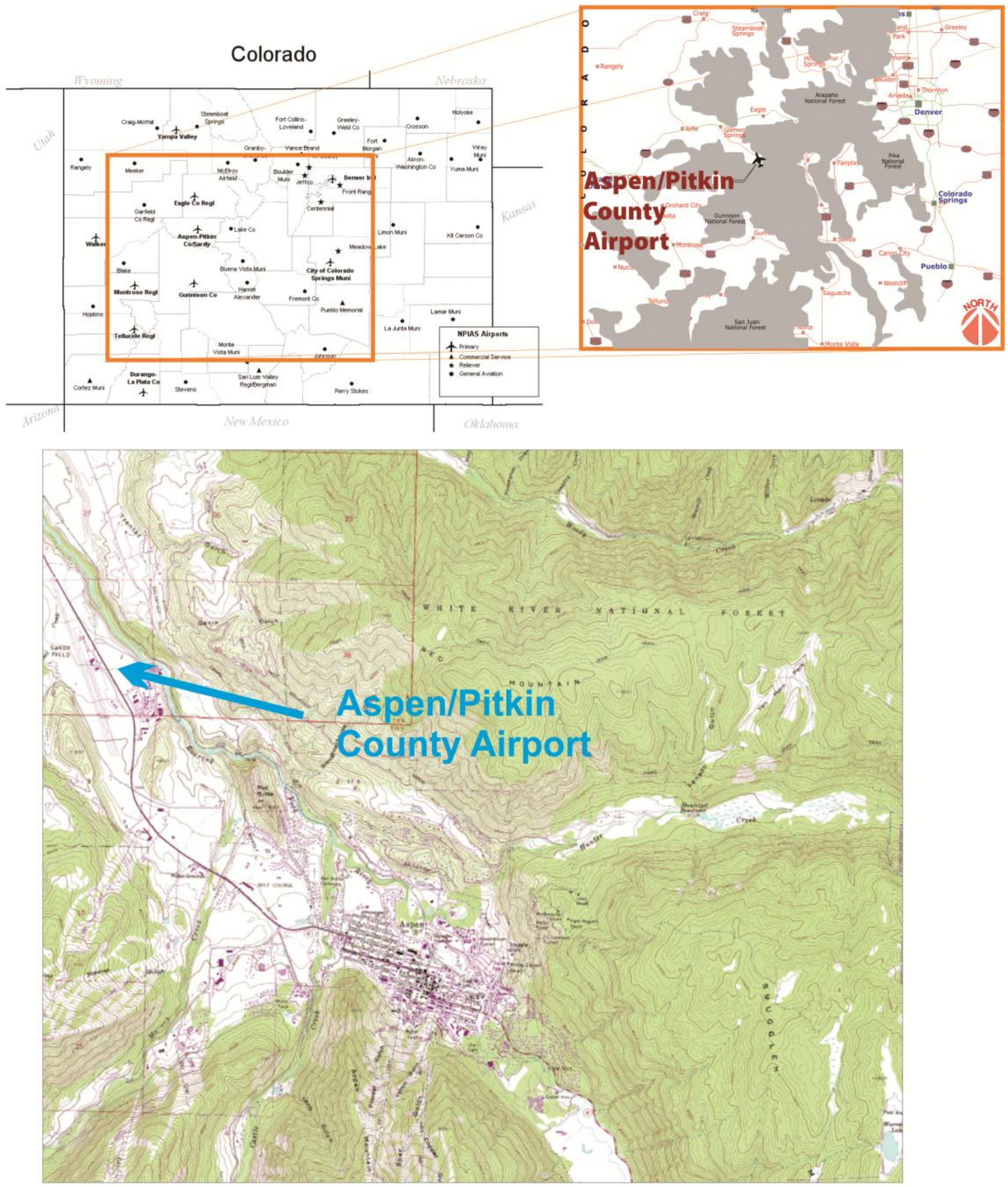
Between 2002 and 2007, the Airport underwent a series of projects, including a parallel taxiway relocation and the construction of a new aircraft parking ramp, aircraft holding position at the south end, and an Aircraft Rescue and Firefighting/Snow Removal Equipment facility [ARFF/SRE, known locally as the Airport Operations Center (AOC)]. In addition, Runway 15/33 underwent a rehabilitation that included paved shoulders, the partial relocation of the service road on the north end of the airfield, and grading of the safety area on the Airport's west side.

1.1.2 Location

Located high in the Rocky Mountains, Aspen is the 53rd largest city in the state and is surrounded by the White River National Forest. Two hundred miles southwest of Denver and 130 miles east of Grand Junction, it is at the southeastern end of the Roaring Fork Valley, which stretches from Glenwood Springs at the northwest end to Aspen at the southeast end. Aspen encompasses 3.66 square miles and is situated on a relatively flat valley floor surrounded on three sides by Aspen, Smuggler, and Red Mountains. The City was founded in 1880 and incorporated in 1881. Aspen is internationally renowned as a winter and summer resort area.

Aspen/Pitkin County Airport sits along Colorado Highway 82 in west-central Colorado. The area surrounding the Airport is the heart of Colorado's Rocky Mountain resort region. Vail is located approximately 35 miles northeast of the Airport (98 miles and approximately two hours by automobile), Crested Butte is approximately 20 miles to the southwest (177 miles and over three hours by automobile on a dirt road that is closed during winter months), and Steamboat Springs is approximately 75 miles to the north (151 miles and approximately three hours by automobile).

The Airport's relative location within the State of Colorado is illustrated in **Figure 1-1**.



Sources: Mead and Hunt, Inc.
USGS, Topographic Map
Airport Layout Plan

FIGURE 1-1

Location Map
Aspen/Pitkin County Airport

1.1.3 Existing Airport Environment

The terrain that surrounds Aspen is extremely varied. The airfield is on an area of land in the Roaring Fork Valley that slopes downward to the north from approximately 7,837 feet mean sea level (MSL) to 7,725 feet MSL. Mountainous terrain surrounds the area on all sides, with peaks exceeding 14,000 feet present within 15 miles of the Airport. The surrounding terrain plays an integral role in local weather patterns. The immediate area surrounding the Airport experiences a total annual precipitation of approximately 24 inches; total annual snowfall is approximately 174 inches.

Wind patterns typically follow the Roaring Fork Valley. Wind data for all weather conditions and Instrument Flight Rule (IFR) conditions are depicted in **Figure 1-2**. As shown, wind generally comes from the north-northwest or south-southeast.

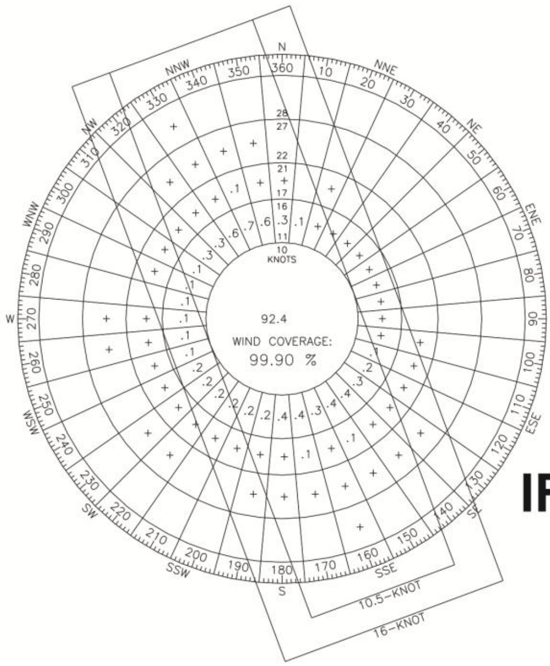
According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Aspen/Pitkin County Airport is situated on a composition of well-drained soils that include Kobar silty clay, Jodero loam, Morvbal loam, and Uracca. A biological inventory conducted at the Airport revealed several native populations of wheat grasses, needle and thread grasses, and sagebrush. Several tree species are also prevalent, including quaking aspen, narrowleaf cottonwood, blue spruce, Engelmann spruce, lodgepole pine, and crab apple. The biological inventory also noted several species of wildlife, including goose, vesper sparrow, American robin, broad-tailed hummingbird, Northern flicker, cliff swallow, common raven, brewer's blackbird, red-winged blackbird, elk, deer, red fox, and thirteen-lined ground squirrel.

1.1.4 Airport Ownership and Role

Aspen/Pitkin County Airport is owned by Pitkin County and operated by the Pitkin County Board of County Commissioners (BOCC), and is under the supervision of the Aviation Director and the County Manager's Office. The Airport is served by three airlines: Delta, United, and Frontier (since the initial writing of this chapter, Delta and Frontier have ceased service and American has initiated service).

The Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) identifies over 3,356 existing and 55 proposed airports that are significant to national air transportation and are therefore eligible to receive grants under the FAA Airport Improvement Program (AIP). The Airport serves commercial and passenger airlines, as well as private general aviation (GA) aircraft that are not used for military, charter, or scheduled flights. The 2009-2013 NPIAS lists Aspen/Pitkin County Airport as a Non-Hub, Commercial Service, Primary facility. The basic airport service provided to the community is Commercial Service – Primary. Commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements (approximately 380,000 in 2007), but have more than 10,000 annual enplanements, are categorized as non-hub primary airports. According to the 2009-2013 NPIAS Report, Aspen/Pitkin County Airport has the fourth most passenger enplanements in the state.

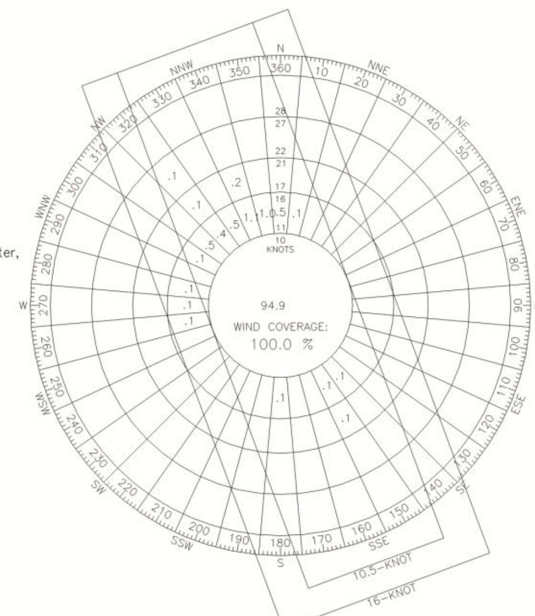
All Weather Conditions



RUNWAY	10.5-KNOT	16-KNOT
15/33	99.90%	99.83%
15*	77.44%	76.53%
33*	76.92%	76.26%

NOTE: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 72467, Aspen, Colorado.
Period of Record: 1993–2002. Total Observations: 60,392.
* – Maximum Tail Wind 5-Knots

IFR Weather Conditions



RUNWAY	10.5-KNOT	16-KNOT
15/33	99.90%	99.83%
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33*	76.92%	76.26%

NOTE: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 72467, Aspen, Colorado.
Period of Record: 1993–2002. Total Observations: 60,392.
– Ceiling of less than 1,000 feet, but equal to or greater than 200 feet and/or visibility less than 3 statute miles, but equal to or greater than 1/2 mile, max. tailwind component.
* – Maximum Tail Wind 5-Knots

Sources: Mead and Hunt, Inc.
National Climatic Data Center

FIGURE 1-2

Wind Data

Aspen/Pitkin County Airport

1.2 Facilities Inventory

In order to project future facility requirements at Aspen/Pitkin County Airport, on-site infrastructure must be examined and inventoried. This section identifies current airside and landside elements at the Airport. Airside facilities assist with the functionality of aircraft and include runways, taxiways, aprons, aircraft parking facilities, fueling and storage areas, airfield lighting, and aircraft navigational aids. Landside facilities directly support aircraft operations, and are generally accessible by the public and adjacent to public parking lots and roads. Such facilities generally include Airport terminal, ground access and circulation, automobile parking, and support facilities. The current Airport Layout Drawing is depicted in **Figure 1-3**.

General aviation amenities and the scheduled commercial passenger terminal could be considered either airside or landside facilities. For purposes of this report, both the passenger terminal building and general aviation facilities are categorized as airside.

1.2.1 Airside Facilities

Airside facilities in this inventory discussion include: runways, taxiways, apron and ramp areas, aircraft storage hangars, general aviation facilities, maintenance facilities, aircraft fueling facilities, airfield lighting, passenger terminal building, navigational aids, published procedures, operating constraints, obstructions, and Runway Protection Zones. The published Airport Diagram is shown in **Figure 1-4**.

Runways

Runway 15/33 is 7,006 feet long (now 8,006 feet), 100 feet wide, and runs north-south. It was resurfaced in 2007 with grooved asphalt, paved shoulders, and is equipped with a High Intensity Approach Lighting System with Sequenced Flashers (MALSF). Runway 15/33 has a weight bearing capacity of 80,000 pounds for aircraft with a single wheel landing gear configuration and 100,000 pounds for dual wheel configured aircraft. In addition, there are Runway End Identifier Lights (REILs) and a Precision Approach Path Indicator (PAPI) system and localizer with distance measuring equipment (DME) at the approach end to Runway 15.

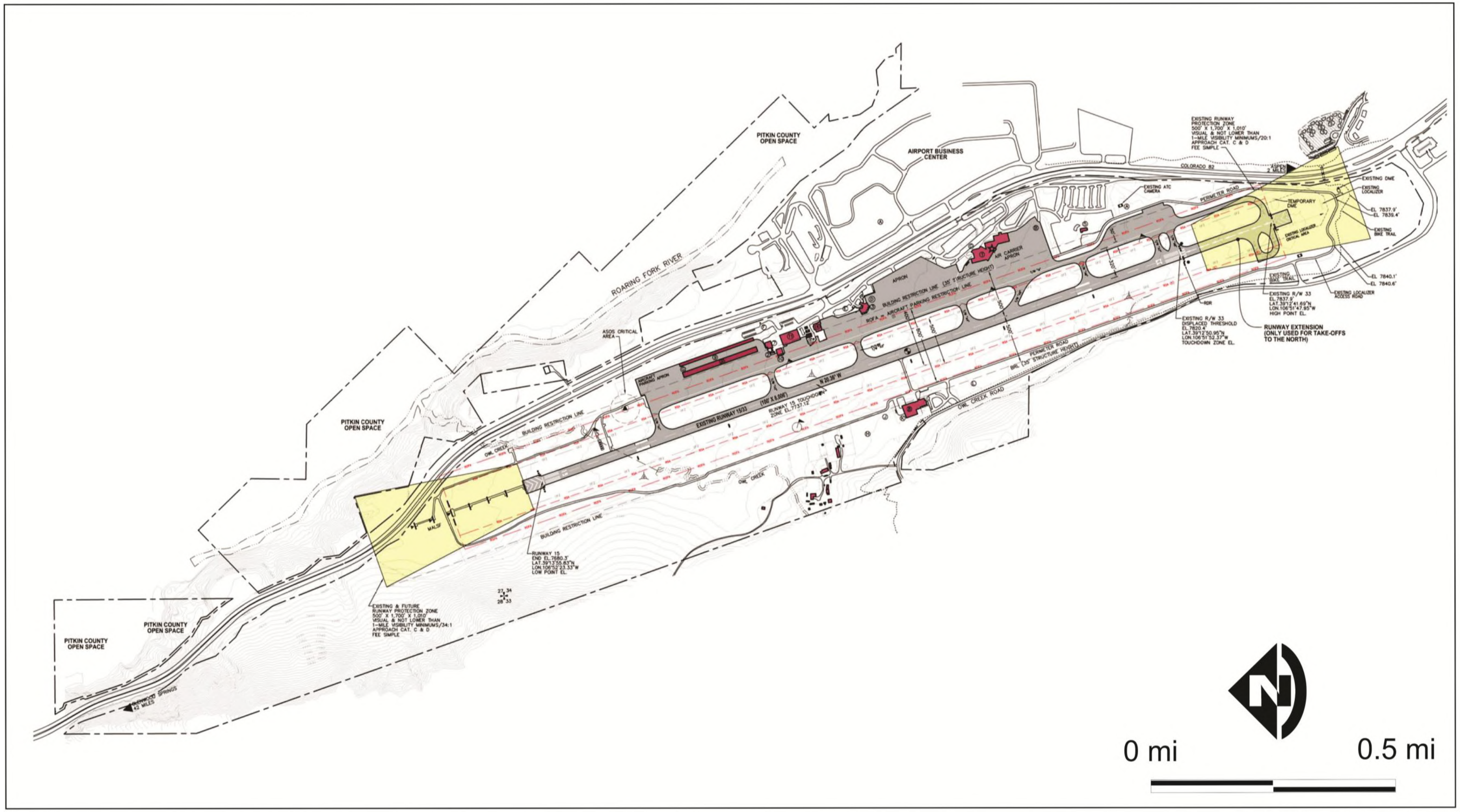
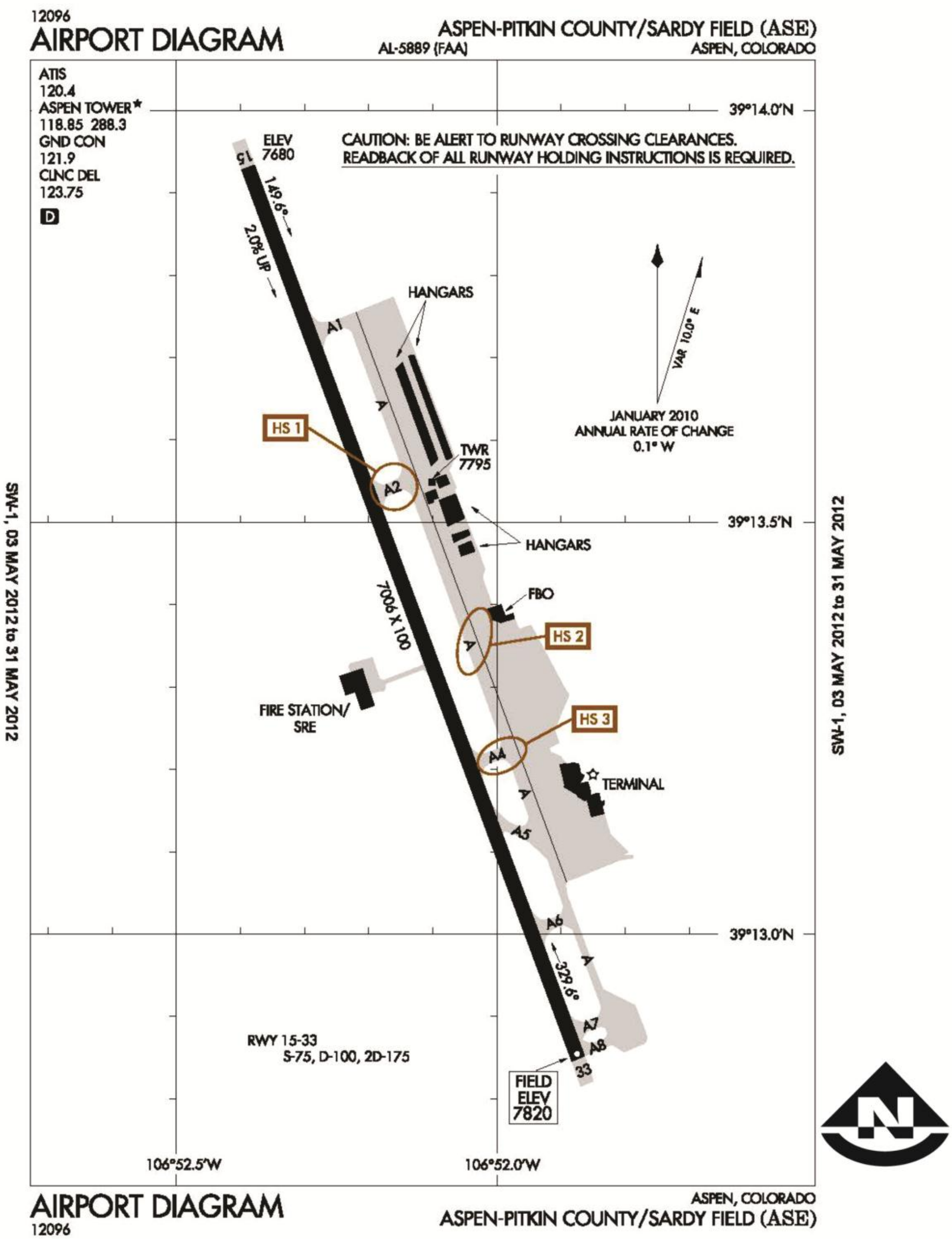


FIGURE 1-3

Airport Layout
Aspen/Pitkin County Airport



Source: www.airnav.com
Federal Aviation Administration
Note: Current Diagram Does Not Show Runway Extension to 8,006 Feet.

FIGURE 1-4

Airport Diagram
Aspen/Pitkin County Airport

The Airport Reference Code (ARC) for Runway 15/33 is D-III. This coding system is used to relate airport design criteria to the operational and physical characteristics of aircraft intended to operate at the Airport. The ARC has two components. The first component, depicted by a letter, represents the aircraft approach category as defined by the aircraft approach speed. The second component, depicted by a Roman numeral, represents the airplane design group as defined by the aircraft wingspan and tail height. Aircraft that have a wingspan longer than 95 feet are restricted from using the Airport per County ordinance.[1] The ARC system and its pertinence to the Airport are discussed further in *Chapter 3, Facility Requirements*.

Taxiways

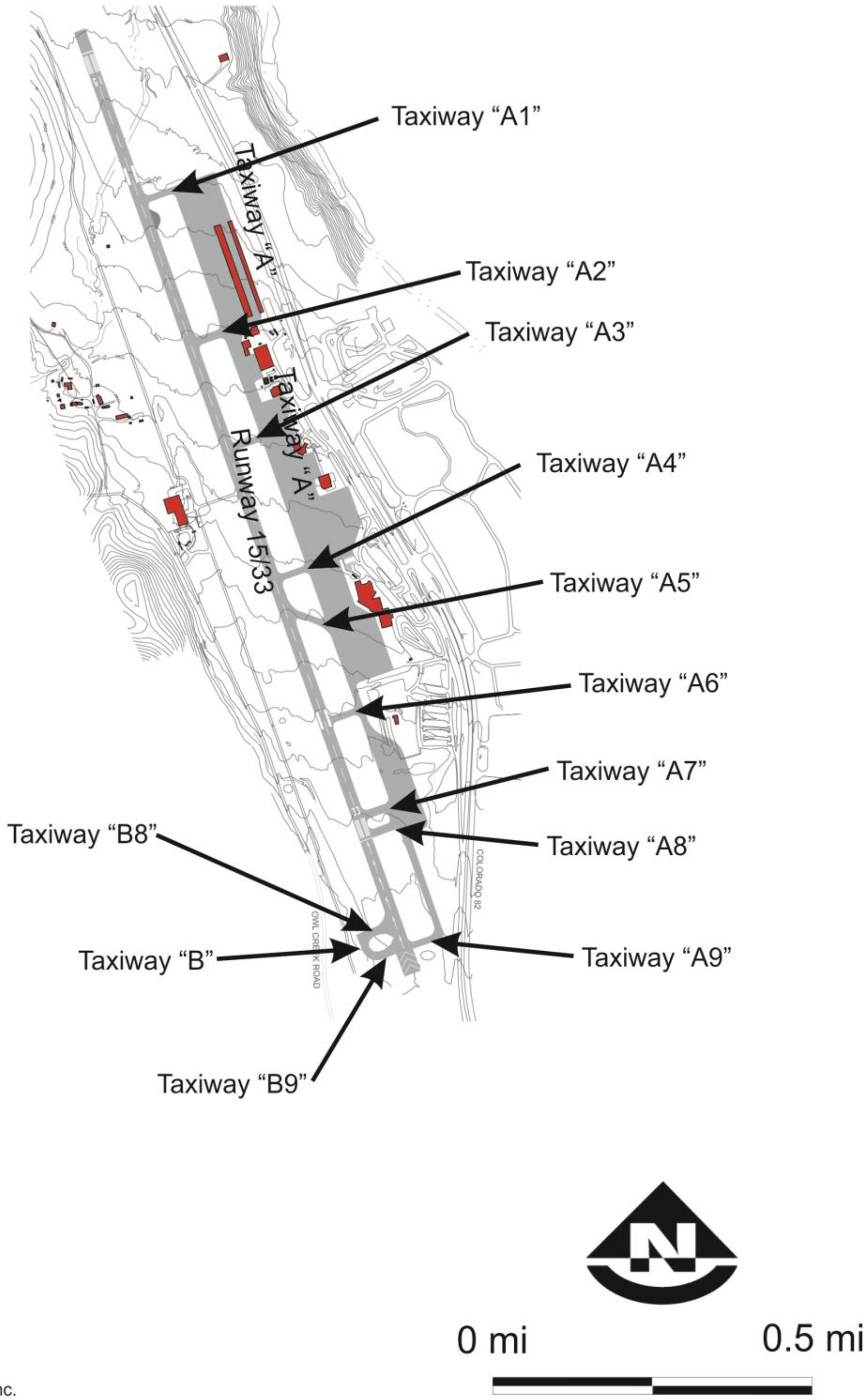
The taxiway system at Aspen/Pitkin County Airport provides access between runway surfaces and the aircraft parking and storage areas. Access to Runway 15/33 is provided by a partial parallel taxiway that is approximately 5,720 feet long and 50 feet wide. The taxiway has seven exits (“A1”, “A2”, “A4”, “A5”, “A6”, “A7”, and “A8”) that connect to Runway 15/33. The current Airport Layout Plan (ALP) depicts a future connecting taxiway; “A3” is located just to the east of the general aviation terminal building and scheduled for construction in 2012. Note, a 1,000-foot extension of the partial parallel taxiway and an additional three exit taxiways, along with a turn-out/hold taxiway loop on the west side, were constructed during the runway extension project.

The east side of the taxiway system connects to the terminal apron and general aviation area aprons. Taxiways are equipped with lighted guidance signs and medium intensity taxiway edge lights that enhance mobility and safety during evening operations. The taxiway system is detailed in **Figure 1-5**.

Aircraft Apron and Ramp Areas

Aircraft parking aprons at Aspen/Pitkin County Airport are located all along the east side of Taxiway “A” from Taxiway “A-1” to just south of the passenger terminal building. The terminal apron is approximately 318,000 SF in size and is located east of Taxiway “A,” adjacent to the west side of the passenger terminal building. The rest of the aircraft parking aprons primarily serve general aviation aircraft. With the addition of approximately 20,000 SF of general aviation pavement added in 2009, these areas, north of the terminal apron, total approximately 607,000 SF of parking and movement space. The southern portion of the general aviation apron can accommodate medium and large turboprop and jet aircraft, while the northern portion is used for smaller single engine and twin-engine prop aircraft. Aircraft parking areas are detailed in **Figure 1-6**.

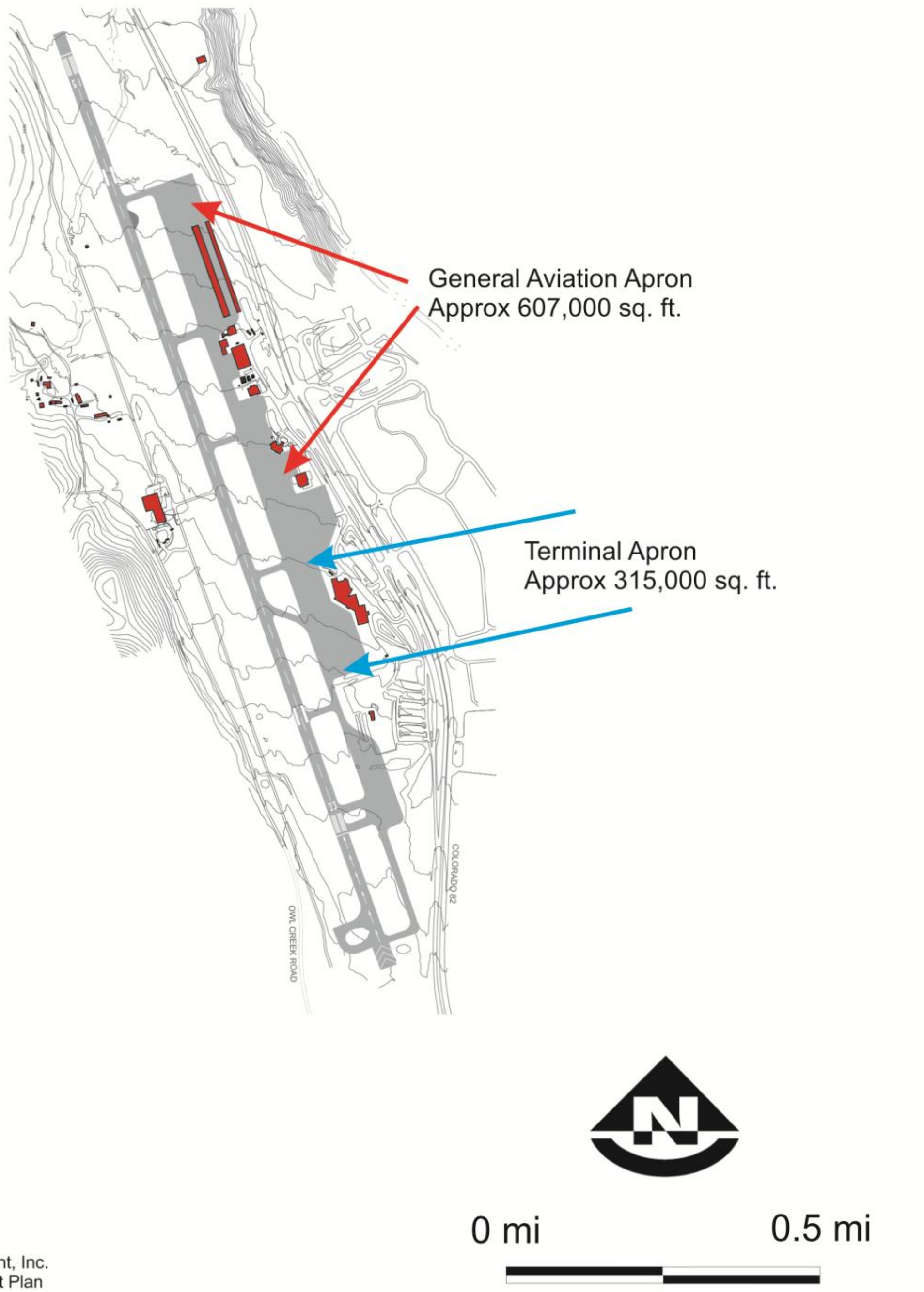
[1] *Pitkin County Land Use Code, Title 10*



Sources: Mead and Hunt, Inc.
Airport Layout Plan

FIGURE 1-5

Taxiway System
Aspen/Pitkin County Airport



Sources: Mead and Hunt, Inc.
Airport Layout Plan

FIGURE 1-6

Aircraft Parking
Aspen/Pitkin County Airport

Commercial Apron and Glycol Containment System

The commercial apron is marked to accommodate seven parked aircraft. With the introduction of Frontier Lynx Q-400 service, two positions were modified to allow for the larger wingspan aircraft. Deicing for both commercial and GA aircraft is performed on the southwest corner of the apron, as depicted in **Figure 1-7**.

FIGURE 1-7. COMMERCIAL APRON

Aircraft are deiced with a propylene glycol solution on the ramp adjacent to the passenger terminal building during periods when cold weather causes potentially hazardous ice buildup. Spent deicing fluid and associated runoff are collected via a trench drain on the apron after sheet flowing across the apron, and collected into a glycol containment system. Once collected, the fluid is stored in an approximately 20,000-gallon tank for disposal. The system has a valve that allows the runoff to bypass the containment facility and advance to the normal storm water outfall during periods when deicing is not necessary. Fluid is disposed of via tanker truck under contract and is disposed of outside of the county at an approved location. Significant amounts of runoff are collected in very small concentrations utilizing this system due to the expanse of collection area and limited deicing. Cost for disposal is per gallon, regardless of concentration. Any revisions that could reduce the amounts, increase the concentration, or provide an on-site treatment method could be considered beneficial to the community.

The commercial apron slopes at a 2.0% gradient from the taxiway towards the terminal building, exceeding the 1.5% FAA standard apron gradient for aprons for this class of aircraft. Additionally, per current National Fire Protection Association (NFPA) standards contained in NFPA 415: *Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways*, aprons shall slope away from structures with a minimum grade of 1.0% for 50 feet. The applicable text from NFPA 415 includes the following:

5.1 Aircraft Fueling Ramp Slope and Drain Design.

5.1.1* Aircraft fueling ramps shall slope away from terminal buildings, aircraft hangars, aircraft loading walkways, or other structures, with a minimum grade of 1 percent (1:100) for the first 50 ft (15.2 m). Beyond this distance, the ramp slope to drainage inlets shall be permitted to be reduced to a minimum of 0.5 percent (1:200).

5.1.2* Aircraft fueling ramp drainage as specified herein shall be accomplished by the provisions of 5.1.1 in conjunction with the following:
(1) The use of drain inlets with connected piping
(2) The use of open-grate trenches

5.1.3 Drainage inlets, where provided, shall be located a minimum of 50 ft (15.2 m) from structures outlined in 5.1.1.

5.1.4 The drainage system of any aircraft fueling ramp shall be so designed that the fuel or its vapor cannot enter into the drainage system of buildings, areas utilized for automobile parking, public or private streets, or the public side of airport terminal or aircraft hangar structures. In no case shall the design allow fuel to collect on the aircraft fueling ramp or adjacent ground surfaces where it could constitute a fire hazard.

5.1.5 The final separator or interceptor for the entire airport drainage system shall be designed to allow disposal of combustible or flammable liquids into a safely located, approved containment facility.

5.1.6 Grates and drain covers shall be removable to facilitate cleaning and flushing.

5.1.7* If open-grate drainage trenches are used as a collection means, such open trenches, including branches, shall not be over 125 ft (38 m) in length with a minimum interval of 6 ft (1.8 m) between open-trench sections to act as fire stops. Each 125 ft (38 m) section shall be individually drained through underground piping. Open trenches shall not be used where they are in the line of pedestrian or passenger traffic.

5.1.8 Underground piping and components used in drainage systems shall be noncombustible and inert to fuel.

In addition to the ramp gradient standard, there is a standard in NFPA 415 pertaining to window openings facing an aircraft ramp area. This standard is currently being met, but can affect the potential parking arrangement on the ramp in the future as facilities are upgraded. This standard is detailed below:

4.1.5 Glazing Material Covered Openings Facing the Ramp.

4.1.5.1 Openings covered with glazing material that have the lowest part of the glazing material not less than 7 ft (2.1 m) above each finished floor level shall not be required to comply with 4.1.5.3.

4.1.5.2 Openings covered with glazing material listed for use in a fire barrier and installed in accordance with the listing shall not be required to comply with 4.1.5.3.

4.1.5.3 Where potential fuel spill points are located less than 100 ft (30.5 m) horizontally from glazing material covered openings in airport terminal building walls facing the airport ramp, they shall be provided with an automatically activated water spray system in accordance with 4.1.5.3.1 or an automatically activated, listed fire shutter system in accordance with 4.1.5.3.2. *(See Annex C.)* **4.1.5.3.1** Where an automatically activated water spray system(s) is provided, it shall be installed in accordance with NFPA 15, *Standard for Water Spray Fixed Systems for Fire Protection*. **4.1.5.3.1.1** The system shall be designed to provide a density of at least 0.25 gpm/ft^2 [10.2 (L/min)/m^2] over the exterior surface area of the glazing material. **4.1.5.3.1.2** Where multiple water spray systems are used, the water supply shall be capable of supplying all systems that could be expected to operate as a result of one fire incident. **4.1.5.3.1.3** The detection system design analysis for the water spray system shall include consideration of false alarms and detector response time. **4.1.5.3.2** Where an automatically activated, listed fire shutter is provided, it shall be installed in accordance with its listing.

Push-back operations are considered risky during winter months due to ice, snow, and ramp gradient, limiting the effectiveness of ground-service equipment (GSE). Power-out procedures currently require high thrust levels from departing aircraft, and the terminal has sustained jet blast damage in the form of scouring, damaged flashing, and other damage.

Four uncovered aircraft loading ramps belonging to SkyWest Airlines are fixed on a pivot point for loading and unloading of CRJ-700 aircraft. These ramps are specifically used for this type of aircraft. Other aircraft use portable ramps or self contained aircraft stairs.

The Security Identification Display Area (SIDA) consists of the commercial apron and portions of the passenger terminal building. While properly credentialed GA pilots can be on the GA apron unescorted in the vicinity of their aircraft, they cannot be in the area of commercial aircraft for security reasons. All personnel that work on or around the commercial aircraft must undergo a background investigation and display an airport approved badge at all times. This fact limits the ability for GA parking to spill over into the commercial parking area. The SIDA area is shown in **Figure 1-8**.

FIGURE 1-8. SECURITY IDENTIFICATION DISPLAY AREA (SIDA)

General Aviation Facilities

The fixed base operator (FBO), Atlantic Aviation, provides services needed for general aviation and corporate aircraft, and operates from a 6,000-square foot general aviation terminal building. Their services include: jet fuel, avgas, oxygen, auxiliary power unit (APU), major and minor repairs, flight instruction, charters, complete on-board flight catering, car rentals, restaurant, flight planning room, passenger lounge, and aircraft tie-downs. The facility is open 6:00am-11:00pm, seven days per week, 365 days per year. In addition, Atlantic Aviation provides on-demand air charters with locally based aircraft and crew, as well as fuel for air carriers.

The potential opportunity for a second FBO will be assessed in this Master Plan Update. This will be examined in detail in Chapter 3, *Facility Requirements*, and Chapter 4, *Alternative Plan Concepts*.

Aircraft Storage Hangars

The FBO's facilities are located east of Runway 15/33 at the north end of the main general aviation apron. These facilities consist of three hangars that encompass approximately 30,000 SF. These are the only completely enclosed aircraft storage hangars at the Airport.

General aviation storage facilities also consist of two parallel rows of patio shelters, one double-sided unit with 36 aircraft bays, and one single-sided unit with 12 bays. There are 32 apron tie-down positions for based aircraft that are located north of the airport traffic control tower and west of the patio shelters on the far north end of the general aviation area. Currently, the County manages the patio shelters while the FBO manages the tie-down positions.

Ground Service Equipment (GSE)

All of the airlines require ground-based equipment to service their aircraft. These pieces of equipment provide aircraft support systems such as ground power, pre-conditioned air, potable water, and lavatory servicing, as well as baggage-related equipment such as tugs, carts, and conveyors. All aircraft currently park in a taxi-in/taxi-out configuration, so no push-back tugs are required. Unless the airlines are required to utilize push-back tugs at Aspen/Pitkin County Airport, the aircraft parking capacity is severely limited to accommodate the taxi maneuver.

All of the airlines park some GSE equipment outside of their ticketing office areas and at the gate areas. There is an additional area south of the terminal that is used to park GSE equipment for all of the airlines.

Most of the GSE currently in use operates on diesel or gasoline power; however, SkyWest has an electric baggage conveyor. As the community tries to reduce greenhouse gas emissions, more use of electric GSE would be desirable. Also, some of the services such as ground power and pre-conditioned air can be fed from the building as opposed to individual carts, which can significantly reduce local emissions from these sources. Providing GSE charging capabilities and/or covered storage for inclement weather would also help reduce emissions from cold starts.

Airport Operations Center

A new Airport Operations Center was built in 2006 that incorporated an Aircraft Rescue and Fire Fighting (ARFF) and Snow Removal Equipment (SRE) facility. The ARFF/SRE facility also has 3,000 SF of affordable housing units. A majority of the 30,000-square foot facility is built into the hillside to mitigate the visual impact of the building and to meet Pitkin County's planning and zoning requirements. The facility is located west of Runway 15/33 and is accessible by Owl Creek Road.

The exterior includes rust-colored metal siding, neutral-colored stone, and a size-masking layout. The building features energy efficient elements such as a sod roof that acts as a natural insulator and a wall of windows on the front that minimizes the need for electric lighting during the daytime. The building also has in-floor radiant heating that heats objects instead of the air. This minimizes the amount of heated air that escapes the building when the large doors are opened for equipment movements.

In addition to firefighting and snow removal equipment, the new facility contains 6,000 SF of administrative space that houses the Airport's operations staff. The facility includes full utilities (water, sewer, natural gas, electric, telephone, cable TV, fiber optic data) and emergency standby power. Construction of the new building required approximately 45,000 cubic yards of grading, which included grading approximately 500 lineal feet of perimeter road and associated parking lots, drainage systems, area lighting, fencing, sidewalks, retaining walls, and related items. The facility holds the full electrical vault, which includes runway and taxiway regulators. This project also incorporated a portion of duct and related infrastructure necessary to relocate the airfield lighting circuit upon construction.

Fueling Facilities

The Airport owns five above-ground storage tanks (AST), two of which are located together at the Airport Operations building. These tanks are generally used for the Airport's generators and heavy equipment. Two additional tanks are used by the rental car agencies. The final tank at the Airport, which is not owned by the FBO, is a day tank located at the FAA Airport Traffic Control Tower (ATCT). The FBO owns a total of eight tanks ranging from 1,000 gallons to 25,000 gallons (see **Table 1-1**). The FBO operates the fuel farm, which is located north of the general aviation terminal building.

Fuel transfer and storage operations at the Airport include transfer of bulk fuel to the fuel farm tanks, transfer of fuel from the fuel farm to mobile fuelers and operating equipment, and transfer from mobile fuelers to aircraft. The bulk transfer of fuel to the tanks is performed by a private company with direct supervision of the FBO. The transfer of fuel from the farm to the fuelers is also performed by the FBO. The FBO owns nine fuel transport trucks and three fueling trucks that range in size from 750 gallons to 5,000 gallons. When the fueling trucks are not in use, they are parked in front of a security fence, south of the fuel farm.

Table 1-1. Fuel Storage Facilities

Owner	Tank No.	Volume	Contents
FBO	1	25,000 gal	Jet A
FBO	2	2,000 gal	Gasoline
FBO	3	2,000 gal	Diesel
FBO	4	1,000 gal	Waste Oil
FBO	5	25,000 gal	Jet A
FBO	6	25,000 gal	Jet A
FBO	7	25,000 gal	Jet A
FBO	8	12,000 gal	Av Gas
FAA	9	1,000 gal	Diesel
Airport	10	1,500 gal	Gasoline
Airport	11	800 gal	Diesel
Airport	12	500 gal	Gasoline
Airport	13	6,000 gal	Gasoline
Airport	14	6,000 gal	Gasoline

Source: Airport Management Records.

In 2005, the Airport underwent a Corrective Action Plan for underground storage tanks (UST). This action was taken in response to a UST site that had been open for a number of years. Soil and water samples were taken at specific sites with potential for contamination. Samples were tested for benzene, toluene, ethylbenzene, xylene, total volatile petroleum hydrocarbons, and total extractable petroleum hydrocarbons. The Corrective Action Plan noted traces of ethylbenzene, xylene, total volatile petroleum hydrocarbons, and total extractable petroleum hydrocarbons.

In a letter dated June 30, 2009, the Colorado Department of Labor and Employment (Division of Oil and Public Safety) found that, with respect to USTs at the Airport, the source of contamination had been removed and no further investigation or remedial action was required.

Airfield Lighting

The runway is equipped with Precision Approach Path Indicator (PAPI) lights and an MALSF. Runway 33 is equipped with REILs.

Runway Protection Zones

The Runway Protection Zone (RPZ) is a trapezoid shaped area that is centered on the extended runway centerline. The function of the RPZ is to enhance protection of people and property on the ground, which is typically achieved by airport control through ownership of land. The RPZ is primarily used as a land use planning tool and should be kept clear of incompatible objects and activities. The current ALP depicts the RPZ with a dimension of 500 feet (inner width) by 1,000 feet (outer width) by 1,700 feet long.

Obstructions

The terrain and fences on the northwest corner of Aspen/Pitkin County Airport are considered FAR Part 77 obstructions. It is also important to note that the surrounding terrain does not allow for normal traffic patterns. High rates of climb and descent are required for pilots that operate at the Airport.

1.2.2 Landside Facilities

Landside facilities described in this section include the passenger terminal building and offices, automobile parking and access, and air cargo facilities.

Passenger Terminal Building and Offices

The existing terminal is a 45,000-square foot, single-level structure that is divided into three general areas: a ticketing area to the north, a departure area in the center, and a baggage claim area to the south. The terminal building sits near the middle of the airfield on the east side of the runway/taxiway complex. **Figure 1-9** depicts the terminal configuration with north oriented to the top of the photo.

FIGURE 1-9. TERMINAL AREA AERIAL PHOTO

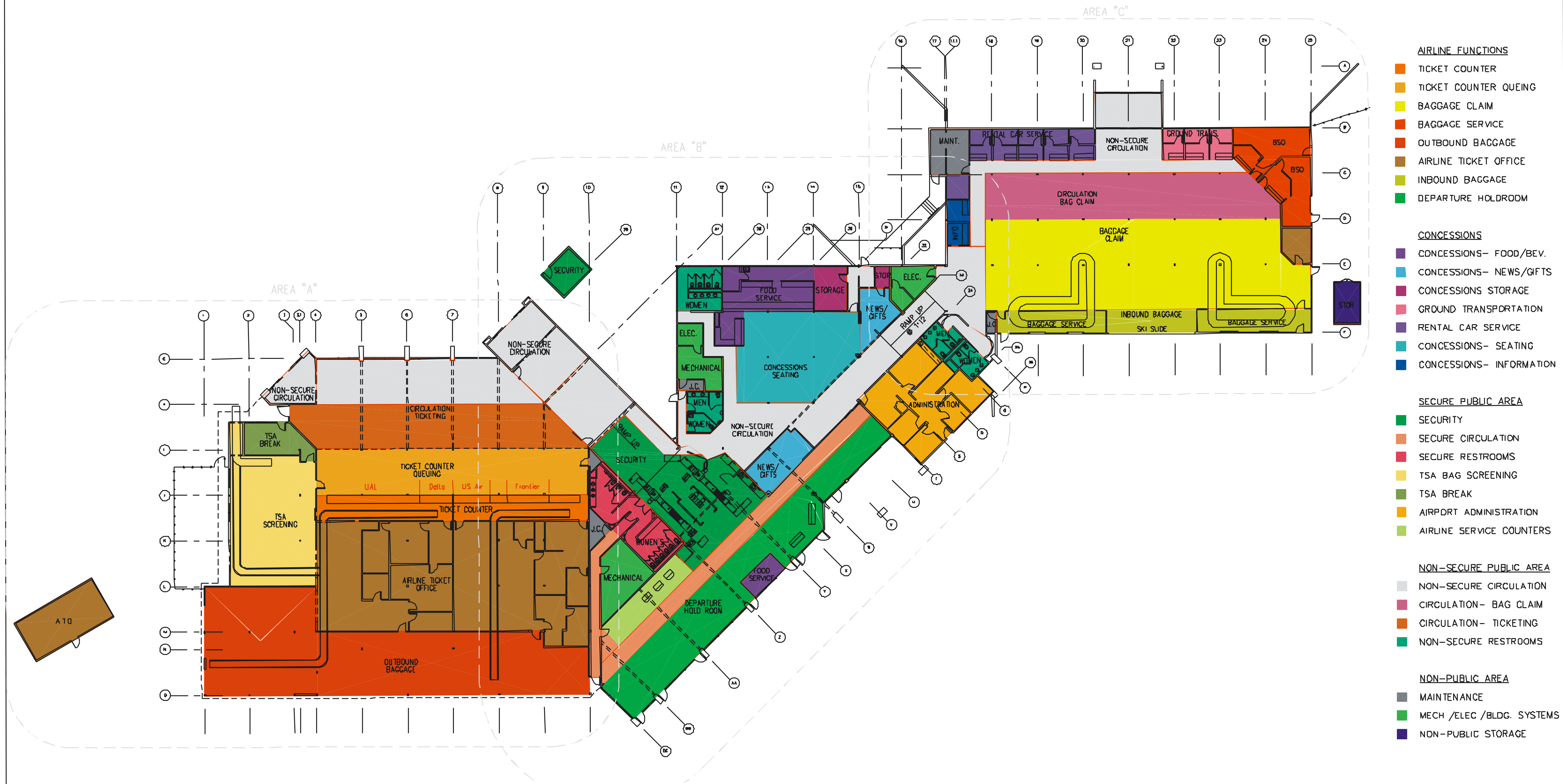
Level of Service

The existing passenger terminal was constructed in the 1970s and underwent a significant expansion in the 1980s. Several building functions, including Transportation Security Administration (TSA) and concessions, occupy space in several of the general building areas. The general building layout and circulation paths are not readily apparent to the passengers that are unfamiliar with the building due to the irregular configuration and increases in security screening required since 2001. This can be seen in the Overall Terminal Floor Plan, which is shown in **Figure 1-10**.

The following sections describe each function area of the terminal building and assign a level of service to that function. **Table 1-2** presents a summary of the level of service information presented in this text.

While the total circulation square footage within the facility is considered adequate, it has been designed inefficiently. The pathways to major areas of the building are meandering and hidden for the average visitor when they should be clear and intuitive.

Queuing delays are minimal, but queuing space is also minimal. Only through the effort of the Airport, airlines, and TSA are delays kept as small as possible. The exceptions to this are during times when multiple flights are scheduled close together. This strains many of the functions throughout the Airport, particularly restrooms, the departure lounges, and the entire baggage system including baggage screening and baggage claim.



Source: Aspen/Pitkin County Airport

FIGURE 1-10

Airport Terminal

Aspen/Pitkin County Airport

The International Air Transportation Association (IATA), along with the FAA, developed standards for use in analyzing space requirements at airports. IATA defines standards in relation to the "Level of Service" that is desired to be obtained by the airport operator. These service levels are discussed throughout this report as a means to assess the ability of the particular areas to comfortably perform their intended purpose. The service levels are as follows:

- **A – Excellent level of service. Conditions of free flow, no delays, and excellent levels of comfort.**
- **B – High level of service. Conditions of stable flow, very few delays, and high levels of comfort.**
- **C – Good level of service. Conditions of stable flow, acceptable delays, and good levels of comfort.**
- **D – Adequate level of service. Conditions of unstable flow, acceptable delays for short periods of time, and adequate levels of comfort.**
- **E – Inadequate level of service. Conditions of unstable flow, unacceptable delays, and inadequate levels of comfort.**
- **F – Unacceptable level of service. Conditions of cross-flows, system breakdowns, unacceptable delays, and unacceptable levels of comfort.**

While a service level of A results in the ultimate passenger comfort and convenience, maintaining this level of service during peak periods is cost prohibitive. A service level of C should be the minimum desired service level for the Airport during peak periods, with level B standards used where appropriate. The Airport passenger terminal currently operates at a C or D level, and the facility provides a reasonable level of comfort.

The ticketing area within the building is square in shape and contains the ticketing lobby, ticketing counters, Airline Ticketing Offices (ATO), outbound baggage make up, and TSA baggage screening areas. The ticketing lobby and baggage claim are accessed from a loop roadway that services the passenger drop-off and pickup curb. A second and separate loop road is provided for commercial vehicles at the south end of the terminal. Additional information regarding the Airport's roadway system is provided in subsequent sections of this document.

There are two doors to access the ticketing lobby from the curbside, one on the far north end of the building and one more central. The central door provides an entrance to a two-story atrium space with ample natural light and provides the main access to both the ticketing lobby and departure lounge areas. Neither door has an extended canopy structure to protect passengers from inclement weather during the passenger drop-off process.

Table 1-2. Terminal Area Level of Service	
Location	**IATA Level of Service**
Ticket Counters	B
Airline Ticketing Offices	C
Ticketing Lobby - Winter	D
Ticketing Lobby - Summer	B
Passenger Screening	B
Gates	C/D
Hold Rooms	C/D
Hold Rooms - During Delays	F
Overall Building Circulation	D
Food & Beverage (Non-Secure)	A
Food & Beverage (Secure)	D
News & Gift (Non-Secure & Secure)	A
Rental Car Offices	C
Rental Car Counter Area	A/B
Guest Services	D
Restrooms	C/D
Baggage Lobby – 1 Flight	C
Baggage Lobby – More than 1 Flight	E
Overall Airport Passenger Terminal	C/D

Source: Jviation Inc.

The center area of the terminal building is primarily a triangular block of space placed in between the ticketing lobby and the baggage claim areas. This space has been defined to include the TSA passenger screening checkpoint, secure and non-secure restrooms, secure and non-secure concessions, airport administration offices, mechanical rooms, and the secure departing passenger lounge spaces.

The baggage claim area is a rectangular space that contains Baggage Service Offices, two baggage claim devices, a ski/oversize item slide, and rental car counters directly opposite the claim devices. The curbside in front of the baggage claim area, like the drop-off curbside area, does not have a canopy to protect passengers while loading their luggage into transport vehicles. The terminal frontage is shown in **Figure 1-11** and **Figure 1-12**.

FIGURE 1-11. CENTRAL DEPARTING PASSENGER ENTRANCE

FIGURE 1-12. ARRIVING PASSENGER DOORS

Terminal Space Allocation

The passenger terminal building was thoroughly measured in order to develop accurate drawings and determine the space allocation for each functional area of the terminal. According to these measurements, the overall building comprises approximately 45,000 SF. The space allocation summaries for the areas are presented in **Table 1-4.**

TABLE 1-3. AREA TABULATION

Aspen / Pitkin County Airport

Terminal Building
Existing Facility Areas

Description		Existing
GROUND LEVEL		
Airline Functions		
Ticketing		1,035
Ticket Counters	*97'*	
Ticket Queuing		1,834
Baggage Claim		4,057
Baggage Claim Frontage	*224'*	
Baggage Service		793
Outbound Baggage		4,227
Airline Ticket Office		4,976
Inbound Baggage		1,050
Passenger Hold Room		2,160
Jet Gates	*4*	
Subtotal Airline Functions		**20,132**
Concessions		
Concessions (Food Service)		877
Concessions (Seating)		1,433
Concessions (News / Gifts)		567
Concessions (Storage)		263
Ground Transportation		318
Information		82
Rental Car Service		640
Subtotal Concessions		**4,180**
Secure Public Area		
Security		1,859
Secure Circulation		1,200
Secure Restrooms		673
TSA Bag Screening		1,700
TSA Break		312
Airport Administration		1,213
Airline Service Counters		387
Subtotal Secure Public Area		**7,344**
Non-Secure Public Area		
Circulation - Ticketing		1,704
Circulation - Bag Claim		1,899
Non-secure Circulation		7,036
Non-secure Restrooms		766
Subtotal Non-Secure Public Area		**11,405**
Non-Public Area		
Non-public Storage		167
Maintenance		834
Mech. / Elec. / Bldg. Systems		955
Subtotal Non-Public Area		**1,956**
Total		**45,017**
Grand Total		**45,017**

The 2004 Master Plan Update compared this figure to passenger enplanements to determine future square footage needs.

TABLE 1-4. 2004 MASTER PLAN PROJECTED TERMINAL NEEDS

	Existing	2000	2007	2012	2017	2022
Passenger Enplanements		214,816	250,000	276,020	304,749	336,467
Total Building Square Footage	43,840	73,100	83,900	84,500	100,400	102,000

Source: 2004 Master Plan prepared by the Barnard Dunkelberg & Company (BDC) Team.

As shown in Table 1-4, by the year 2022, the passenger terminal building would require more than a doubling of size to meet the desirable space requirements. Although the terminal is undersized in its present condition and use, the updated passenger forecasts that are presented in Chapter 2, *Forecasts of Aviation Demand*, represent a much more conservative long-term growth scenario. An analysis of space needs resulting from these forecasts will be provided in Chapter 3, *Facility Requirements.*

Ticketing Area

As of June 2012, the ticketing area is occupied by two airlines: United and American. Each airline has a leasehold for ticket counters and office and baggage makeup space. The associated passenger queuing areas in front of the counters are part of the general building areas and are not figured into the individual airline leases. The passenger check-in facility has self-service kiosks that allow for passenger check-in and e-ticket printing, as shown in **Figure 1-13**.

FIGURE 1-13. TICKETING LOBBY

Figure 1-14 depicts a drawing of the enlarged Terminal Floor Plan for Area “A,” which is in the north end of the terminal building. A large space uniquely enhanced with exposed wood beams and additional wood accents exemplifying the area is provided for those passengers waiting to check-in. The Airline

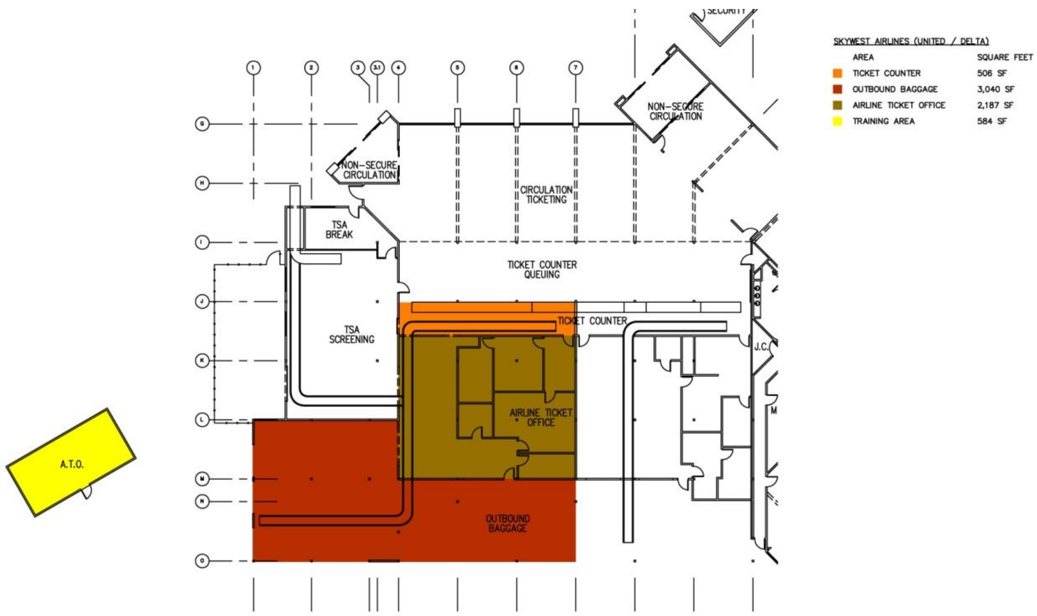
Ticketing Offices (ATOs) are directly behind the ticketing counters, along with baggage make-up spaces. TSA is in a space to the north and adjacent to the ticketing lobby.

FIGURE 1-14. AREA "A" TERMINAL FLOOR PLAN

SkyWest Airlines operates for United Air Lines at Aspen/Pitkin County Airport.

The lease areas for SkyWest (operating for United Air Lines) are depicted in **Figure 1-15**. At time of writing, exhibits for the recently added service for American Airlines were not available. Also, note that Frontier and Delta no longer serve the Airport. In addition to the areas inside the terminal, SkyWest has a training office located in a modular building outside of the terminal as depicted in yellow in **Figure 1-15**.

FIGURE 1-15. SKYWEST ATO LEASE AREA



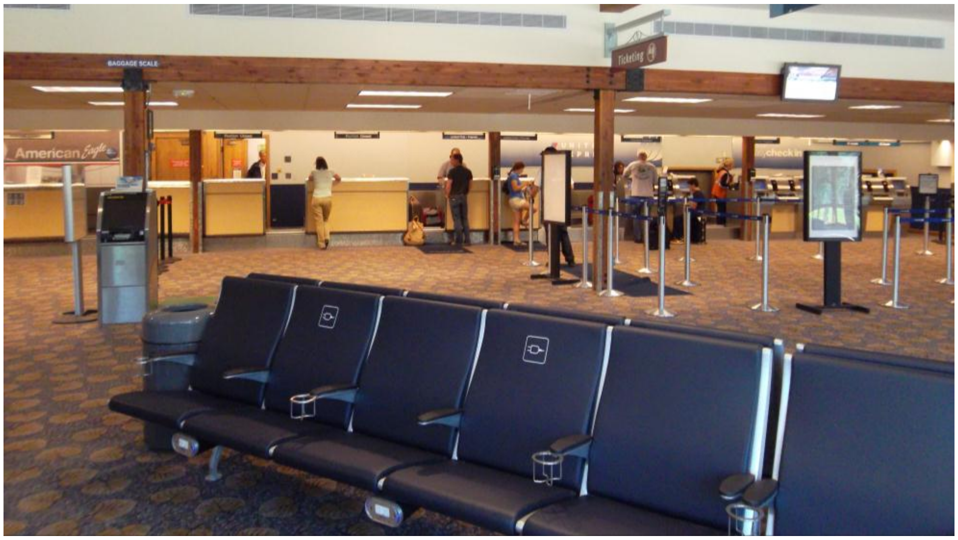
Ticket Counters

The overall length of the counters for all airlines is 96' 6." The counters and passenger queuing area are shown in **Figure 1-16**. Although the plastic laminate is showing some signs of wear and has chipped in a few locations, the counter finishes are in good condition and are not in need of replacing at this time. The ticket counters likely operate at level of service B according to IATA standards, with limited delays and a high level of comfort.

As previously mentioned, SkyWest operates all United Airlines flights. There are three ticket counters with five agent positions provided for United, along with four additional positions for self check-in. Each counter position is generally 7' 6" in length with baggage scale pass-through areas between counter positions. The pass-through scale areas are approximately 3' 0" in length, which results in approximately 40' of ticket counter frontage for United Air Lines. American Air Lines utilizes two counter positions configured for three ticketing agent positions and one baggage scale pass-through area, totaling 13' of linear counter frontage.

There are three extra agent positions and two baggage pass-through scale areas at the south end of the counter, which account for 26' of the overall ticketing counter length and is depicted in **Figure 1-16**. These spare positions allow for expansion of existing carriers or a new airline entrant.

FIGURE 1-16. TICKET COUNTERS



Airline Ticketing Offices

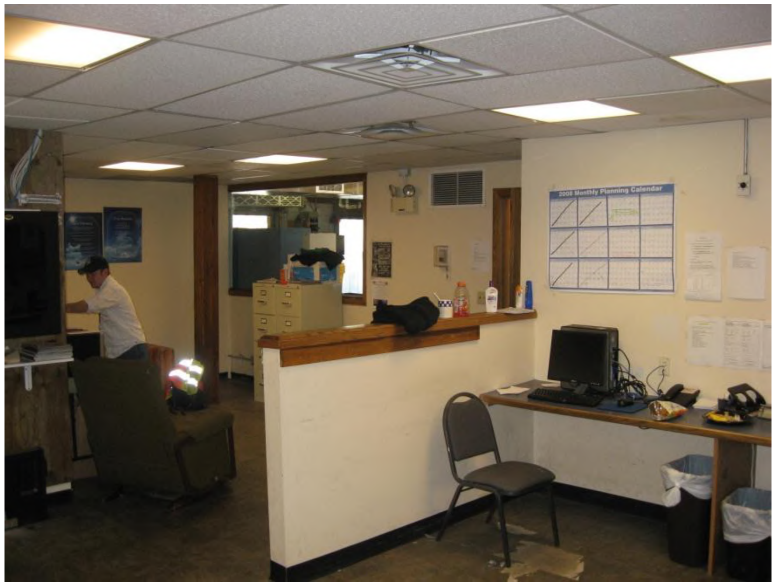
The ATOs are located directly behind the ticketing counter back walls. The ATO area is approximately 42' in depth and 103' wide overall, containing approximately 5,431 SF of total space for all airlines. The ATOs are used by the airlines for administration, office space, break areas, storage, and outbound baggage make-up.

SkyWest Airlines services United Airlines and occupies 2,509 SF of covered space for baggage service and 4,965 SF of enclosed space for a total of 7,474 SF of ATO space. There are 1,285 SF of enclosed ATO space and 819 SF of covered area for baggage service, for a total of 2,104 SF available for lease for an expansion of an existing airline, or a new entrant. American Airlines occupies 1,364 SF of enclosed ATO space, and 411 SF of exclusive outdoor space for a total of 1,775 SF of ATO space.

It should be noted that, in addition to the space inside of the terminal, SkyWest Airlines has a remote temporary building north of the terminal building providing an additional 540 SF of space used for training. This additional space is included in the 2,751 SF of SkyWest's ATO space.

The ATO spaces are a secure area requiring proper identification to access from the ticket counter area and ticketing lobby. The ATO areas are highly used and are generally in good condition. A typical ATO office can be seen in **Figure 1-17**.

FIGURE 1-17. AIRLINE TICKETING OFFICE



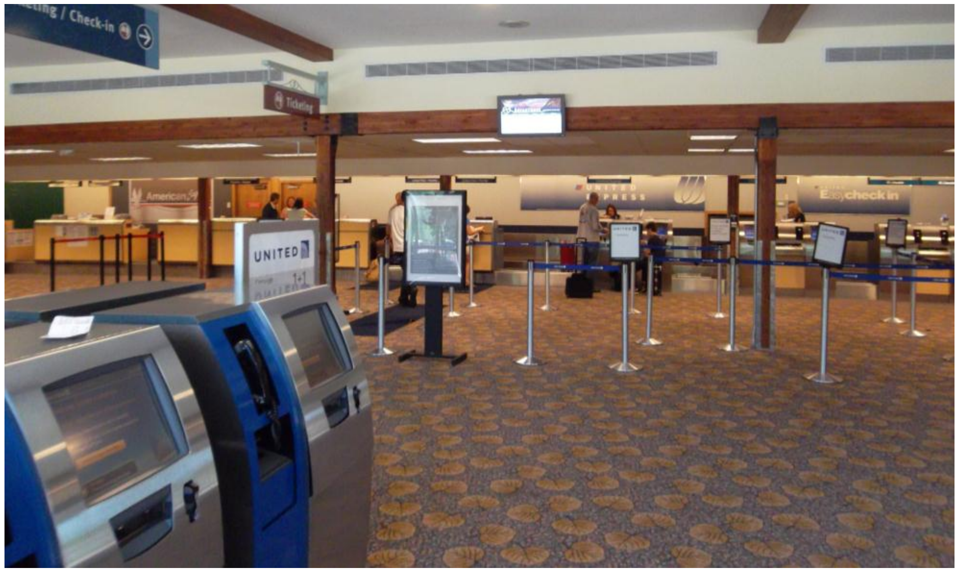
Ticketing Lobby

The ticketing lobby is a 51-foot by 103-foot space with a two-level ceiling as shown in **Figure 1-18**. The extra ceiling height and large windows make for a comfortable space with ample height to allow passengers to carry skis without hitting the ceiling. The light level within the ticketing lobby is good due to the large expanse of glass windows along the east side. The ticketing lobby was designed with approximately 17 feet of queuing depth for passengers and 35 feet of depth for circulation, but is currently using almost 27 feet of depth for queuing and 25 feet of depth for circulation, seating, and the self service kiosks. The lobby is in very good condition and a pleasant space for waiting for the next available ticketing agent.

The lobby can appear oversized during off-peak periods; however, during the winter months it can become crowded with large numbers of passengers with oversized baggage. The lobby likely operates with a level of service B during the off-peak months, but drops to a level of service D during the peak periods.

Outbound baggage screening methods are discussed in subsequent sections of this chapter.

FIGURE 1-18. TICKETING LOBBY



Outgoing Baggage Make-up

Mandated security enhancements following September 11, 2001 resulted in a major change for the outbound baggage processing function, due to the fact that all checked baggage must be screened for explosives. Like most airports, accommodating the increased security measures was an unanticipated and major change for Aspen/Pitkin County Airport. While processes have been developed to maximize baggage throughput and minimize delays, the existing system is not desirable for long-term operations.

Curbside check-in is a fairly popular option with the local community and goes directly to the TSA screening area. During peak periods, baggage can be screened by hand to supplement the automated screening.

When the carts are utilized, TSA systematically retrieves the carts and follows a process to screen the bags through the Explosive Detection System (EDS). Once bags have been cleared by TSA, they exit the room on a separate conveyor and are moved into the baggage make-up area, which is shown in **Figure 1-19**. This make-up area allows the airlines to stage carts along a belt and sort the bags for delivery to the appropriate aircraft using a tug. The old baggage make-up spaces are underutilized due to the current baggage system configuration, which cannot take advantage of them. Baggage make-up areas are used for GSE storage when not in use.

A portion of the baggage make-up area is not enclosed, but rather is under a covered roof structure. This covered area is approximately 4,300 SF and is used by all the airlines.

The current method of handling baggage is labor intensive and not employee friendly. With the constraints of the building configuration and location of available space, the system operates as best it can. Co-mingling of bags is a constant concern, along with use of United's leasehold for other airlines' needs.

FIGURE 1-19. OUTGOING BAGGAGE MAKE-UP AREA

Transportation Security Administration

TSA operates three primary spaces and one ancillary space within the terminal facilities: baggage screening, passenger screening, and a break/office area.

TSA Baggage Screening

The TSA baggage screening area is approximately 1,600 SF on the north end of the building, adjacent to the ticketing lobby, as shown in **Figure 1-20**. The baggage screening process involves passengers providing bags at the ticket counter and a conveyor moving bags to the appropriate TSA baggage screening area. Local TSA has recently upgraded to a Reveal CT-80XL unit, and a Reveal CT-80DR, which each have a minimum throughput of 130 bags per hour. In the baggage make-up area behind American's counter, TSA has a Reveal CT 80 for screening of a portion of the baggage. Once bags are screened by the appropriate units, they are either cleared and automatically sent on to the baggage make-up area or manually searched. Any bag that is manually searched must be cleared by TSA before it is placed back on the belt with other cleared bags and sent on to the make-up area.

With the recent upgrades, it is believed that overall throughput, including oversized items, is more efficient and maintenance is reduced.

The primary screening area has adequate space for the equipment and queuing process that TSA is currently employing, as well as a small break area/office next to it. However, it is not efficiently arranged for airline baggage or future expansion.

The current level of service in this secondary area is B.

FIGURE 1-20. TSA BAGGAGE SCREENING

Passenger Screening

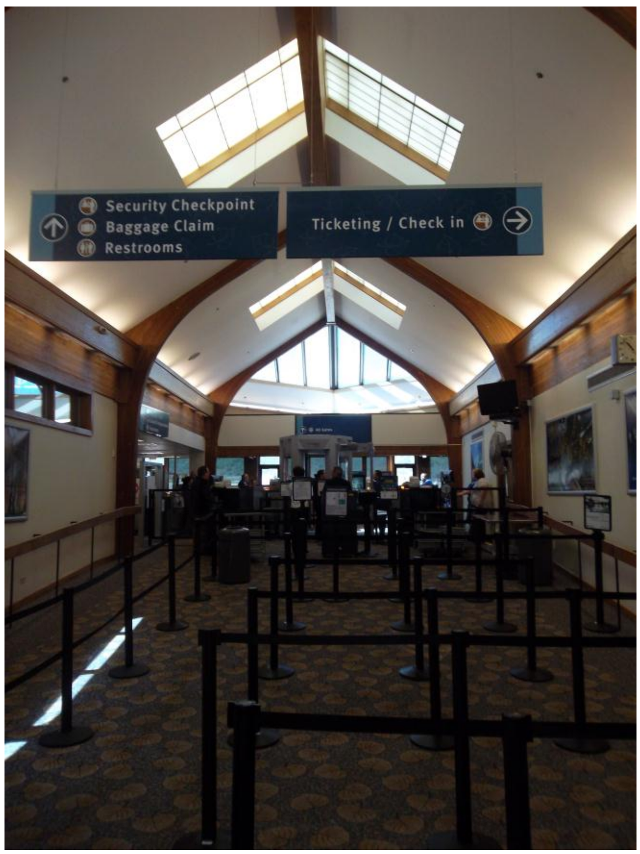
Passenger screening is accomplished in the main circulation corridor that connects the ticketing lobby to the departures lounge areas. This circulation space is also the connection from the ticketing area to the baggage claim area. The space is a long, wide corridor with a two-story sloped ceiling. Queuing area and lines obstruct the pathway to the baggage claim and other areas of the building. The queuing space is also on an extended ramp that may exceed current Americans with Disabilities Act (ADA) requirements. The total space is 2,800 SF and well lit with natural daylight, as seen in **Figure 1-21**. The security checkpoint occupies 950 SF of that area and queuing is about 400 SF.

TSA operates a two-lane checkpoint that has the capacity to process 400 passengers per hour based on TSA's standard of 200 passengers per hour, per lane. Although the standard may be 200 passengers per lane, it is unlikely that this level of processing can be reliably achieved. The checkpoint should be capable of processing a minimum of 240 passengers per hour. Based on this rate, the checkpoint has capacity, but could use additional space to process passengers on the composure side, or secure side, of the checkpoint.

The checkpoint composure side of the screening area is too small and too short for the screened passengers to have adequate time to collect their items. The composure side already extends into the holdroom area beyond the original limits and gives the departures' lounge areas an overall cramped feeling.

This checkpoint needs a larger area and more length to operate more efficiently, but this would negatively impact the other circulation areas. The current level of service for the checkpoint is likely a B, although airport management has noted that this figure may be high, particularly during periods of high activity.

FIGURE 1-21. PASSENGER SCREENING



Other TSA Lease Area (Administration)

TSA has a small area next to the screening room that is used for a break room and supervisor's office. The total space is only about 300 SF. Due to lack of available space at the Airport, TSA also occupies an office in the Aspen Airport Business Center (AABC). TSA staff travels to and from this office as necessary, primarily by foot or bicycle.

Gate Areas

The gate areas are within a group of spaces between the ticketing lobby and the baggage claim areas. The functions for this collection of spaces is the TSA passenger screening checkpoint (previously described), secure and non-secure restrooms, secure and non-secure concessions, airport administration offices, mechanical rooms, departure lounges, and gates (see **Figure 1-22)**.

FIGURE 1-22. AREA "B" TERMINAL FLOOR PLAN

Gates

The departure lounge area has five boarding doors, otherwise known as gates, and a single main arrival entry door. The three airlines that service Aspen use three of the five gates for passenger boarding access to the six power-in, power-out aircraft parking positions just outside the building. A typical boarding gate is shown in **Figure 1-23**. Depending on where an aircraft is parked, passengers must walk to the waiting aircraft, about 50 to 400 feet outside in the elements, without any type of protection or overhead roof. During inclement weather, large amounts of deicing chemicals are utilized on the ramp for aircraft deicing and pavement maintenance. This is routinely tracked onto the aircraft and into the terminal. Some people in the community, and visitors, believe that the passenger experience should involve exiting the plane in the elements, while others believe the passenger experience would be preserved if views were apparent during the deboarding of aircraft.

The airline podiums are partially located opposite their respective boarding gate, which makes for confusing circulation paths and crowding when departing passengers leave the building. The gates provide a C or D level of service because of the gate confusion and the fact that passengers must expose themselves to the weather to board the aircraft.

FIGURE 1-23. GATE DOOR

Holdrooms

There is one large, but narrow, combined holdroom for the five boarding doorways that provides approximately 2,100 SF of seating, queuing, and gate podium space. The square footage should be adequate for three 70-seat aircraft departing at the same time; however, the boarding area becomes congested very quickly when a single plane is departing due to the layout of concessions, podiums, seating, and the TSA checkpoint (see **Figure 1-24**). In many cases, five 70-seat aircraft queue very closely to one another, which easily overwhelms the space. Add frequent winter delays into the equation and the importance of enhancing the holdroom can easily be realized.

FIGURE 1-24. HOLDROOM

The seating area layout has been recently rearranged to improve circulation and reduce congestion; however, the narrowness of the space, along with the gate locations limits its usefulness. The consultant team has witnessed typical winter travel with a lack of seating and the impacts of the narrow space fully impacting the travelling public's experience. The narrow space, arrangement of furniture, concessions, and podiums made it very difficult to maneuver within the space. During winter peak weekends, maximum occupancy standards have been a concern of the Sheriff's office as TSA does not regulate passengers in this area. The Aspen/Pitkin County Fire Marshal has limited the holdroom to an occupancy of 316 individuals. The holdroom has been cleared due to over occupancy on multiple occasions.

The general condition of the holdroom is good, as it is well maintained and well lit. There are currently no ADA accessible restrooms within the space, and restrooms are accessed down a long narrow hallway. The overall space performs poorly for passengers trying to move within it. Therefore, the level of service is a D depending on the number of aircraft departing in a given hour, and declines to an F with departure delays.

Circulation

The non-sterile and sterile circulation within the terminal facilities is awkward and confusing to passengers unfamiliar with the facility. Despite improvements in way finding, passengers unfamiliar with the facility routinely get lost attempting to navigate from the baggage area to ticketing. The TSA baggage check, checkpoint arrangement, and the departures' lounge area layout create a terminal building that functions inefficiently. The building as a whole likely maintains a level of service C during most typical occupancy periods, however, quickly decreases to a D during summer and winter surges.

The main non-sterile circulation path leads from the main entry past the ticketing lobby to the departures' areas. This corridor has been partially filled in with the TSA checkpoint, which obstructs the pathway to the administration facilities and baggage claim area. These pathways are wide within the building, but are often hidden from view. The pathway is neither readily apparent nor intuitive for the passenger. The layout of the main entry and checkpoint areas are shown in **Figure 1-28**.

As mentioned above, the secure pathways to the holdrooms are obstructed by concessions, podiums, the TSA checkpoint composure area, and seating. This arrangement makes it difficult for passengers to flow within the space. Adding to this are the crossing paths of arriving and departing passengers. The pathways on the secure side of the building tend to be narrow and obstructed.

The access points to the building from arriving aircraft are delineated by apron pathways. Once inside, passengers are directed down a hallway to the baggage claim area. This hallway is narrow and can detract from the overall experience of entering or leaving Aspen through the Airport.

Concessions

The Terminal Building has a distribution of concession areas on both the sterile and non-sterile sides of the facility for passenger convenience. The non-secure side of the building contains news and gifts concessionaires, as well as a food and beverage vendor that was recently renovated. The sterile side of the building offers food and beverage, news, and gifts to passengers within the departures' lounge area.

Food and Beverage

A food and beverage vendor is located pre-security in a recently renovated space, allowing non-ticketed guests the use of the concessionaires. A common seating area of approximately 1,400 SF is available to patrons and any other airport visitor. The space is ample for this function and provides a high level of service A for its customers, as can be seen in **Figure 1-25**.

FIGURE 1-25. ASPEN BAR & GRILLE

A second vendor is located in the departures' lounge area on the secure side of the TSA checkpoint, a portion of which can be seen in **Figure 1-26**. This concessionaire is a movable vendor located in the middle of the seating area and occupies 125 SF. There is very little queuing space available in front of this vendor and no extra seating provided other than what is available in the holdroom. This tends to cause trash to be left in the holdroom seating area once passengers have left the lounge for their respective aircraft, and provides a low level of service D for passengers. However, it should be noted that it is preferable to have the concession available to passengers in this restricted fashion rather than have nothing at all.

News and Gifts

There are two gift shops located within the terminal that are operated by the same company. A small gift shop is located in the departures' lounge/holdroom area and occupies approximately 300 SF. This vendor retails magazines, books, and other small items that can be easily carried onto the aircraft. Of the two gift shops, the concessionaire indicates the secured location produces the most revenue for the company.

A second gift shop, which is pre-screening, occupies approximately 250 SF. It includes typical airport newsstand items along with gifts and items of regional interest and can be seen in **Figure 1-27**. Located across the main circulation corridor from the gift shop is the Airport Administration office.

Both gift shops offer a wide range of items for purchase by passengers and offer a high level of service A. The area dedicated to news and gifts appears appropriate for an airport of this size.

FIGURE 1-26. GIFT SHOP

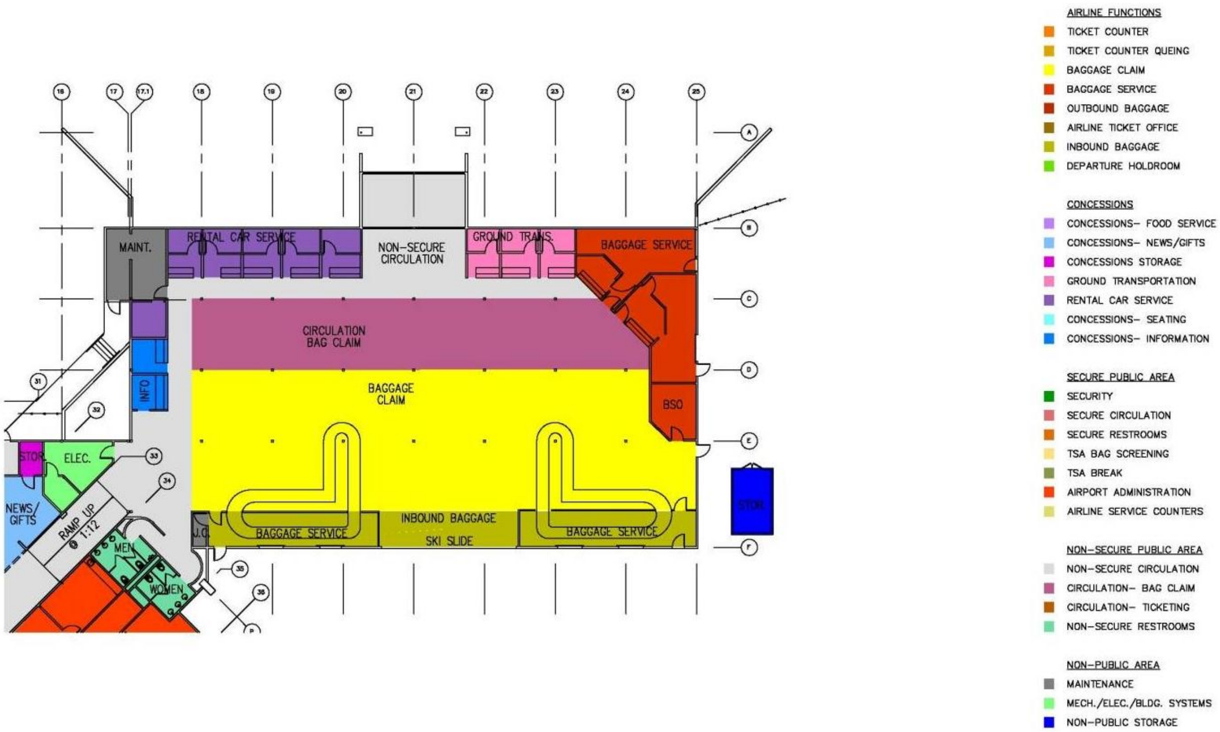
Rental Car Office/Counter

Six rental car counters are located across from the baggage claim devices. Current rental car agencies include Hertz, Budget, Avis, National, and Alamo (dual branded). Enterprise and Go Rentals provide services from off airport. Each agency has a small service counter with seven LF of frontage, a 50-SF office space, and a total area of only 100 SF. There are approximately five LF of queuing space in front of each counter (see **Figure 1-27**), but this queuing space can become restricted when large numbers of passengers and greeters are at the baggage claim devices. Agencies routinely store accessory items such as infant seats in the baggage area, adjacent to columns, due to a lack of storage area.

FIGURE 1-27. RENTAL CAR OFFICES/COUNTERS

These small counters provide a good level of service for visitor and businessmen, but the office storage and space is minimal. The lack of storage results in having infant seats stored in the traffic areas. It would be beneficial to double the area behind the counters to comfortably accommodate the rental car staff. Therefore, the level of service for the passengers is likely an A or B, but the overall level of service is probably a C. The layout of the rental car areas and the rest of the arriving passenger functions, such as baggage claim, are depicted in **Figure 1-28**.

FIGURE 1-28. AREA "C" TERMINAL FLOOR PLAN



Advertising

Terminal advertising consists of strategically placed rolling large format signs and static large format signs that allow for maximum utilization in a minimal amount of space. It has been expressed by airport management that, while advertising revenues are important, it is equally important to not give the terminal a feel of over-commercialization, which is a theme throughout the entire community. An example of an advertising sign is shown in **Figure 1-29**.

FIGURE 1-29. ADVERTISING AND OVERSIZE BAGGAGE SLIDE

Restrooms

The passenger terminal building has restrooms on both the sterile and non-sterile sides of the facility for passenger convenience. The non-sterile side of the building has restrooms located near the food and beverage concessionaire that are approximately 750 SF in size. The sterile set of restrooms is hidden down a long narrow corridor for use by passengers in the departures' lounge area and is not ADA compliant. These restrooms occupy 650 SF.

Both sets of restrooms are undersized for the facility and should be approximately twice their current size. Due to the size of each restroom, a low level of service D is provided to passengers during peak periods of operation when multiple aircraft are departing in the same time frame. The Airport has made improvements in recent years in an attempt to maximize its available space. These improvements include renovations, addition of another men's restroom, and a family restroom.

Baggage Claim Areas

The baggage claim area includes the following functions: Baggage Service Offices, two baggage claim devices, and rental car counters located opposite the claim devices.

Baggage Claim Devices/Office

Two flat plate claim devices are located on the opposite sides of the claim area with a stainless steel slide for odd-size items such as golf clubs and skis. Claims #1 and #2 have a perimeter of approximately 112 LF with baggage pick-up frontage for passengers of 73 LF. Each of the units is fed airside via tug and cart, where bags are placed directly onto the flat plate device.

The odd-size claim device is a stainless steel slide that has 34 LF of claim frontage. The slide is mainly used for skis and golf clubs, but will also accommodate other large items. This slide is an efficient way of handling oversize baggage and is utilized at many large and small airports. The slide is a double level arrangement that is sometimes questioned as to its usefulness with two levels. One of the oversize slides was shown previously in **Figure 1-29.**

The baggage claim devices that are in place provide a marginal level of service for passengers. Primary concern is the length of the flat plate devices, such that each device is not capable of handling more than one flight at a time. This results in confusion as carriers transfer between carousels, or wait for access to their preferred carousel. Another issue with the flat plate devices is that large bags tend to fall off the belt at the corners. Since Aspen is a ski resort destination, many passengers travel with very large bags during the winter season, causing bags to pile up on the floor. This can cause some congestion and confusion while passengers attempt to claim bags that have fallen off the flat plate claim belt.

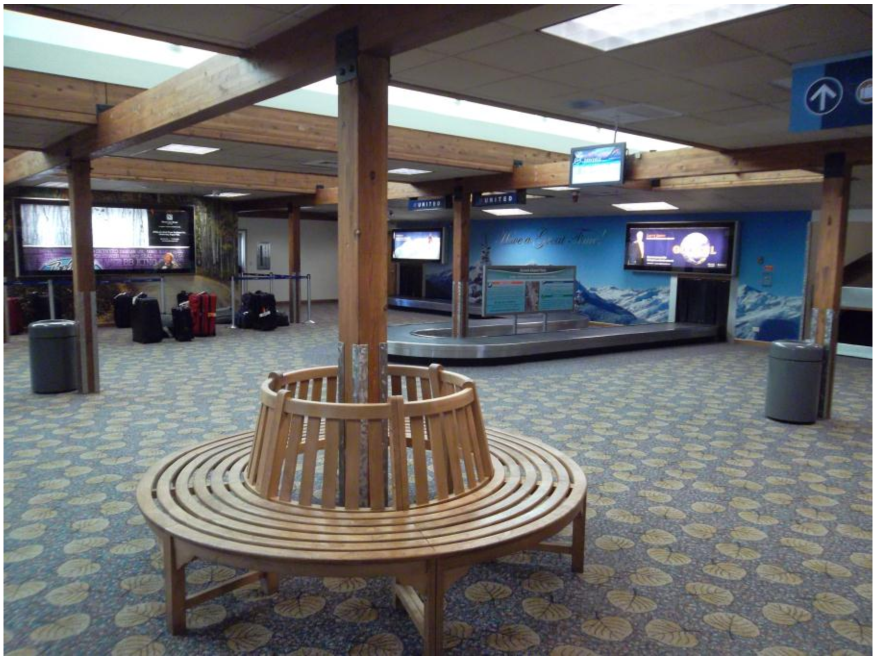
Baggage Lobby

The baggage claim area comprises approximately 2,900 SF and is shown in **Figure 1-30**. There is space for two Baggage Service Offices, each of which is about 400 SF. Two baggage claim belts are within this area, along with the offices and rental car counters that face this area.

The claim area is small for the volume of baggage and passengers. The ceiling height is low and does not have the advantage of the ticketing lobby height when it comes to managing skis. The space is well maintained and provides a level of service C as long as only one flight is in the baggage claim area at a time. The level of service drops to an F when passengers from more than one aircraft occupy the baggage claim area at the same time.

Baggage storage is a critical issue at times. To maximize the number of passengers that can be transported on an aircraft, many of the passengers' bags are often shipped via ground separately when weather disconnects passengers from baggage. These bags are currently stored on the ground on the far south end of the baggage lobby and are accessible to the general public, possibly creating a theft or security concern. No significant space is available to store these items securely in the current building, a fact that must be considered in any future expansions or terminal projects. This is a potential TSA concern.

FIGURE 1-30. BAGGAGE LOBBY



Guest Services

Guest Services occupies a small counter space in the baggage claim area that is 8' 6" long. The area occupies approximately 75 SF for four personnel. Like the rental car counters, there are approximately 5 LF of queuing space in front of each counter that becomes restricted when large numbers of passengers are at the baggage claim devices.

During flight arrivals, this small counter accommodates all four employees while they assist airport visitors. The counter restrictions during these periods affect both the guests and the staff. There is no associated office space for the storage of local area literature for guests or for personal effects' storage of the staff. The level of service for the passengers and staff is likely a D.

Airport Administration Offices

The Airport Administrative Offices utilize approximately 1,200 SF. The space consists of a conference room, several offices, a training room for security, and a reception area. The offices are in excellent physical condition with adequate furnishings, but the spaces are small. The current administration facilities lack a break room or restrooms, which must be utilized within the passenger areas of the terminal when needed. This can prove to be difficult and uncomfortable for the staff during busy periods. As the only conference room in the terminal, other space constrained tenants utilize the conference heavily, limiting use for administrative purposes. Badging traffic also provides for significant congestion. Currently, the administration offices are unable to accommodate an operations center or control room if desired in the future. If space cannot be found in the terminal for these functions, they may have to be located remotely, which is not a preferable solution.

Terminal Access Methods

To determine the types of future facilities required for landside functions, a thorough understanding of the ways that passengers get to and from the Airport must be known. The primary means of ground transportation include hotel and commercial shuttles, taxis, rentals cars, and friends/family.

Aspen/Pitkin County Airport is an extremely busy commercial service airport, in addition to having heavy activity of general aviation aircraft. Pitkin County is the center of local attractions such as Independence Pass, Maroon Bells, four ski areas, and the Aspen Institute, making the community the center for resort and business activity. For the purposes of understanding travel related to this Study, airline passengers have been broken into three categories: winter visitor, summer visitor, and local resident.

Winter Visitor

Aspen/Pitkin County Airport is situated within close proximity to four major ski mountains, making the typical winter visitor one likely to book a hotel room or rent/own a condominium for vacation purposes. With most of these visitors, skiing or other winter sports are the primary purpose of their trip. Most of the Aspen and Snowmass Village lodging is clustered in relative close proximity to the ski slopes, restaurants, and shopping; therefore, these visitors will often not rent a car due to the additional expense, hassle, and general lack of need. Consequently, with many of these visitors, shuttle vans or taxis are the primary means to get to and from the Airport. However, some people will prefer their own vehicle or are staying somewhere remote that requires an individual means of transportation.

Summer Visitor

The typical summer visitor is also on a vacation, but a higher percentage will typically rent a vehicle since the vacation is not centered around the ski slopes. However, commercial transportation is still frequently utilized. Although total enplanements are lower in the summer months than the peak winter months, the number of days that cars are rented is much higher during the comparative periods.

Local Resident

Local residents, both seasonal and permanent, have unique travelling habits. Due to the seasonality of the workforce, those who are employed in the area typically conduct their vacations during the off-seasons for tourism. Because of this dynamic, the parking lots at the Airport are often the fullest during the times when the least number of passengers are flying, including April, May, October, and November. These travelers also frequently rely on friends or family to get them to the Airport. Mass transit and taxis also account for a small number of these travelers. Thanksgiving has typically been a very high weekend as far as parking is concerned as many residents leave to other destinations.

Regional Road Network and Mass Transit

The only access to the terminal is via Highway 82, which is the highway that connects the Aspen area downvalley to Glenwood Springs and I-70. After almost 10 years of planning, a project to widen the highway to two lanes in each direction between Basalt and Buttermilk was completed in 2004. Presently, one lane in each direction is a dedicated High Occupancy Vehicle (HOV) lane that requires vehicles have two or more passengers during the morning commute upvalley and the afternoon commute downvalley. Due to congestion, parking, and emissions concerns, the HOV lanes are intended to encourage carpooling and mass transit ridership. From the Airport towards the Aspen area, a bus-only lane has recently been added to the road shoulder, reducing vehicle traffic to one lane, adjacent to the Airport. This change in traffic is intended to promote mass transit by restricting vehicle traffic into the town core. Summer traffic flow backs up at the current airport entrance from approximately 7-10am, and people looking for a quicker alternative are utilizing the airport frontage road to attempt to shorten their commute. Buses are generally filled with downvalley passengers by the time they reach the Airport.

The local mass transit agency is Roaring Fork Transportation Authority (RFTA), which is one of the largest public bus systems in the state, handling 4.13 million riders in 2011. RFTA is planning on expanding services by the implementation of Bus Rapid Transit (BRT). BRT will significantly enhance mass transit by providing the cost effectiveness and flexibility of busses, with the convenience and speed of similar rail-based systems. This is accomplished primarily by the implementation of efficiency increasing measures such as bus-only lanes, signal prioritization, and intersection bypass lanes, combined with passenger amenities including real-time bus locator services for waiting passengers via GPS, expanded stops, electronic fare processing, and wireless internet.

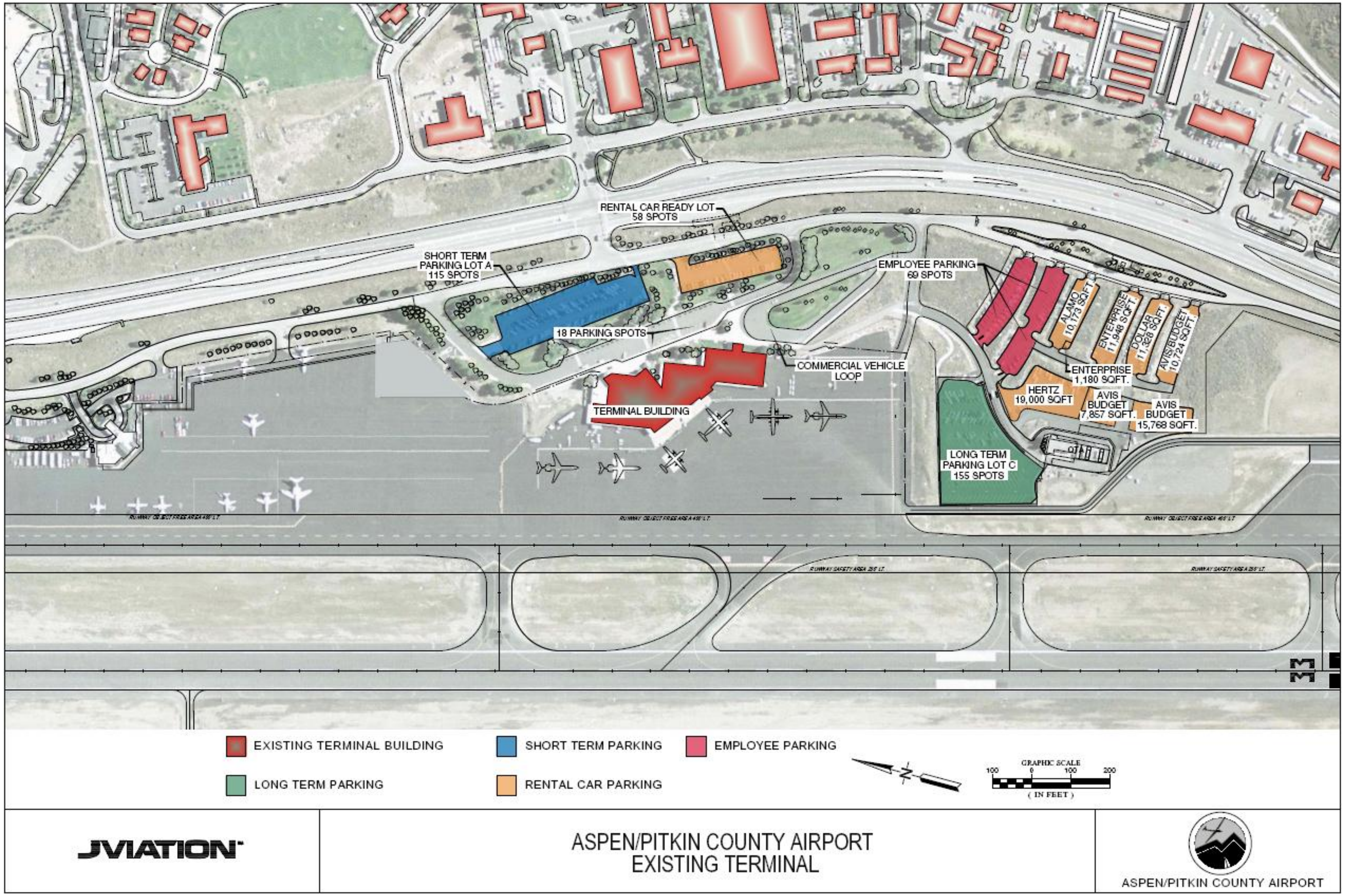
The BRT improvements may make mass transit a more desirable option for employees and passengers at the Airport. Ridership is rising again after a two-year decline following the recession that began in 2008. The Airport and its consultants worked with RFTA and Pitkin County Public Works toward defining the best locations for RFTA's BRT bus stations and the pedestrian crossing, which is planned in the AABC/Airport area. The intent was to coordinate these facilities in a way that best serves pedestrians, RFTA passengers and airport users. One of the outcomes of this effort is that RFTA has agreed to stagger the upvalley and downvalley BRT station locations in order to locate the station on the Airport side of the highway closer to the main passenger terminal. The Alternatives Chapter of this report shows how shifting the upvalley BRT station to the south can be taken advantage of to substantially improve convenience and the quality of the customer experience for airport users who may utilize transit. **Figure 1-31** shows Highway 82 southbound with (from left to right) the general use lane, the HOV lane, and the newly painted "bus-only" lane, as well as the pull-off and proposed BRT bus shelter for the Airport/AABC stop. It should be noted that the HOV lane transitions out at the Airport in favor of a dedicated bus lane.

FIGURE 1-31. HIGHWAY 82 SOUTHBOUND AT AIRPORT INTERSECTION

Terminal Circulation

Like most airports, the landside circulation consists of a loop road that provides access to parking and the curbside at the terminal frontage. The terminal circulation road is one way and begins on the north side at the frontage road, continuing to the south side of the terminal area. Access to and from short-term parking is provided near the beginning of this road. This configuration results in all traffic having to exit the parking lots prior to the curb frontage, which can add to congestion. The overall layout of the landside area is shown in **Figure 1-32**.

Figure 1-32. Overall Landside Layout



Curbside

The roadway adjacent to the curbside is shown in **Figure 1-33** and is paved for four lanes. Currently, the curbside consists of 18 diagonal back-in parking spots and two drive lanes. The furthest outside lane has been barricaded with large planters to restrict people from parking there and causing congestion in front of the terminal. The eastern-most lane is utilized more as a pass-through lane, while the middle lane is largely a maneuvering lane for accessing the curbside spaces. Frontage road speed is an ongoing concern for airport staff.

Automobile Parking

Parking at Aspen/Pitkin County Airport is comprised of five different lots consisting of short-term, long-term, rental car ready lot, rental car storage lot, and employee parking. The parking lots are color coded and labeled in **Figure 1-33**. Projections of demand-based parking requirements are described in Chapter 2, *Forecasts of Aviation Demand.*

Short-Term

The existing short-term lot (Lot A) provides 115 spaces for vehicles that will park for five days or less. Current rates for this lot are $12/day. Short-term parking usually handles the required demand; however, there are typically several times a year when the lots are over capacity.

FIGURE 1-33. ROADWAY ADJACENT TO CURBSIDE

Long-Term

There are 155 spaces available for vehicles parking longer than five days at a rate of $6/day in the long-term parking lot. The available spaces typically satisfy demand, but are exceeded several times per year during peak periods.

Rental Car Ready Lot

The rental car ready lot is located directly east of the terminal building and consists of 59 total parking spaces, which are reserved for cars that have been readied for rental. Each of the rental car agencies has been provided an allocation of spaces. Any vehicles that are required beyond the allocation for these lots must be accommodated in the storage lots; however, airport staff has allowed utilization of curbside diagonal parking to augment the cramped rental car ready lot. The rental car ready lot is approximately a level of service D, due to the size of spaces accommodated by the agencies. Spaces were recently restriped to promote the crosswalk through the lot, which accesses the RFTA bus stop. This reduced the overall size of each space, which is defined by lease.

Rental Car Storage Lot

Alamo, Enterprise, Dollar, Avis, Budget, and Hertz all have storage lots for their rental cars. These lots are not currently striped at the request of the agencies. Instead, they are leased on a square footage basis, which allows the agencies to utilize the areas as they wish. Agencies surge vehicles during the winter and summer months with extensive deliveries of vehicles, which are currently dropped on the frontage road and impede traffic. Delivery vehicles claim that they cannot properly maneuver in the rental car storage lots due to tight turning radiuses. In addition, the practice of surging vehicles results in numerous transport truck trips from Denver to Aspen. These truck trips consume large amounts of fuel and create significant impacts on Highway 82 in the Aspen Area and throughout the Roaring Fork Valley.

Employee Parking

Terminal employees are provided approximately 69 parking spaces. These spaces are for airport, airline, and concession employees. The employee parking is adequate for existing demand, but it may exceed supply as levels of aviation activity increase.

Commercial Vehicles

Commercial vehicles operate from a dedicated loop that is separate from the general public. This loop is controlled via an Automated Vehicle Identification (AVI) system that uses vehicle-based transponders to record the time commercial vehicles enter and exit the area for billing purposes. Each operator is assessed a trip charge based on rates and charges.

While providing a revenue stream, the AVI system also makes it easy to track the types and frequencies of commercial users, down to the individual company. **Table 1-5** breaks out the data recorded from June

2007 until May 2008 into six categories: Hotel/Lodging, Luxury Transportation/Shuttle, Off-Airport Rental Car (Advantage), Jet Charter Transportation, Taxi, and Miscellaneous. The Aspen Institute is a significant commercial operator and is collocated with the Aspen Meadows Resort; for this reason, it is included in the Hotel/Lodging category.

As can be seen in **Table 1-5**, the Hotel/Lodging category by far accounts for the largest number of commercial vehicle trips. The largest users within that category include the St. Regis, Aspen Institute/Meadows, Little Nell, Silvertree, and Hotel Jerome. The Luxury Transportation/ Shuttle category is the next largest category and accounts for approximately half of the Hotel/Lodging trips. The largest user in this category is Snow Limousine, which generated 6,250 trips during this time period.

TABLE 1-5. 2007 COMMERCIAL VEHICLE TOTALS

	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	TOTAL
Hotel/Lodging													
-Annabelle Inn	5	4	12	3	2	2	1	5	25	41	5	5	*110*
-Aspen Alps Condo Assoc	24	28	30	9	4	5	41	56	42	152	16	1	*408*
-Aspen Institute/Meadows	180	295	269	159	102	59	48	86	85	180	32	123	*1,618*
-Crestwood Lodge	3	15	19	9	7		20	58	42	83	7		*263*
-Destination Resorts		22				1							*23*
-Gant	104	100	105	40	43	31	63						*486*
-Hotel Jerome	67	119	93	86	79	94	79	94	80	162	47	3	*1,003*
-Hyatt	52	95	99	48	50	68	78	103	60	166	40	49	*908*
-Inn at Aspen	135	144	64	13	15	3	36	62	63	181	43		*759*
-Innsbruck						5	2	5	7	17	3	3	*42*
-Little Nell	115	173	177	109	93	78	69	77	72	315	77	18	*1,373*
-Molly Gibson Lodge	29	46	82	27	14	4	25	66	54	118	24	7	*496*
-Pokolodi	25	19	1			1	28	25	38	82	13		*232*
-Prospector Lodge	1	4	2	1	1			3	7	27	7	1	*54*
-Ritz Carlton Club	78	97	65	52	5	27	38	54	69	134	46	11	*676*
-Roaring Fork Club	3	8	1	6			3	1	6	4		3	*35*
-Silvertree Hotel	55	176	116	104		50	95	183	166	304	68		*1,317*
-Sky Hotel						17	56	64	89	233	32		*491*
-Snowmass Club	27	41	44	44	4	12	16	42	27	49	14	21	*341*
-Snowmass Hospitality LLC									6	11	4	2	*23*
-Snowmass Lodging Company	5	18	15	5	4	3	10	16	32	62	2	1	*173*
-Snowmass Mountain Chalet	29	48	16	6		6	37	46	37	96	8	1	*330*
-St. Regis	314	376	413	267	195	133	142	195	167	459	144	40	*2,845*
-Stonebridge Condos	2	19	7				12	36	20	67			*163*
-Stonebridge Inn	2	1	1				56	90	62	152	27	3	*394*
-Timberline Condo Assoc	6	20	26	6		19	55	97	60	144	18		*451*
-Timbers Club	38	61	50	65	9	14	73	108	68	137	24	4	*651*
TOTAL HOTEL/LODGING													*15,665*
Luxury Transportation/Shuttle													
-AAA Security Limousine, LLC				1	2	1			5	2			*11*
-All Mountain							1						*1*
-Alpine Limousine								1	14	24	3		*42*
-Aspen Snowmass Express					1								*1*
-Alpine Luxury Limo	1				2	1	1	3					*8*
-Aspen Snowmass Limo		2	1		3	1	7	21	33	68	14	5	*155*
-B-LineXpress LLC								11					*11*
-Black Diamond Limousine								2	1	7		1	*11*
-Colorado Mountain Express	16	13	7	13	6	4		4	31	9			*103*
-CTS		6	2	2	3	1	4	15	45	26	1	9	*114*
-LaCo Limo LLC									10	30	4		*44*
-Ozs Limo	2	5	1	1	2		6	8	5	9			*39*
-Ride Limousine		5					1	2	3	2			*13*
-Rocky Mountain Limousine, LLC	6	13	20	9	6	4	6	11	15	27	12	9	*138*
-Smiddy Limousine Corp.	54	83	27	15	12	10	32	49	40	88	11	1	*422*
-Snow Limousine, Inc.	434	569	616	317	211	277	535	699	605	1,379	370	238	*6,250*
-Star Limousine					1				1	11			*13*
TOTAL LUXURY TRANSPORTATION/SHUTTLE													*7,365*
Car Rental													
-Advantage Rent A Car								10	14	84	15	17	*140*
Jet Charter													
-AEXJet	8	2	2			4	1						*17*
Taxi													
-Hy-Mountain Transportation	1,041	1,503	1,466	957	682	602	673	1,114	936	2,466	808	523	*12,771*
Misc													
-Jays Valet									4	3			*7*
-Lonely Luggage							26						*26*
TOTAL MISC													*33*
TOTAL COMMERCIAL TRIPS													*35,991*

FIGURE 1-34. QTA

FIGURE 1-35. FUEL FACILITIES

Air Cargo Facilities

Currently, Aspen/Pitkin County Airport does not have an air cargo sorting/handling facility. Air cargo service is provided by contract carriers that operate general aviation aircraft, while mail and freight is handled by commercial passenger aircraft.

1.3 Airspace and Airport Traffic Control

Aspen/Pitkin County Airport, as with all airports, functions within the local, regional, and national system of airports and airspace. This section presents information regarding Aspen/Pitkin County Airport's airspace and airport traffic control, as described in the following subsections:

- Airport traffic service areas and aviation communications
- Airspace
- Navigational aids
- Published procedures
- Operating constraints

1.3.1 Airport Traffic Service Areas and Aviation Communications

FAA airport traffic controllers, stationed in Air Route Traffic Control Centers (ARTCC), provide positive airport traffic control within defined geographic jurisdictions. At the time this document was written, there were 22 established geographic ARTCC jurisdictions in the United States. Aspen/Pitkin County Airport falls under the Denver ARTCC, which includes airspace in all of Colorado and portions of Kansas, Nebraska, Wyoming, Utah, Arizona, and New Mexico. The portion of the Denver sectional aeronautical chart that includes Aspen/Pitkin County Airport is shown in **Figure 1-37**.

Aviation communication facilities associated with the Airport include the FAA ATCT (frequencies: 118.85, CTAF; 121.9, Ground Control; and 123.8, Approach Control) and an Aeronautical Advisory Station (UNICOM); frequency 122.95. In addition, the Airport has an Automated Terminal Information System (ATIS) that can be accessed on frequency 120.4. Denver Center ARTCC is accessed on frequency 134.5, and the Denver Automated Flight Service Station (AFSS) can be contacted on frequency 122.2.

1.3.2 Airspace

Aspen/Pitkin County Airport is a controlled airport with an FAA-operated ATCT located on the north end of the field. The facility is open from 7:00am to 10:00pm. The immediate area surrounding the Airport is Class D airspace (Class D airspace is that area from the surface to 2,500 feet above the airport elevation surrounding those airports that have an operational ATCT).

The Class D airspace extends from the airport elevation (7,820 feet MSL) to 10,300 feet MSL. The airspace is circular and extends five nautical miles from the center of the Airport. There is also a portion of Class E airspace associated with the Airport, which is designed to provide standard instrument approach procedures without imposing a communications' requirement on Visual Flight Rule (VFR) aircraft that operate in the area.

1.3.3 Navigational Aids

Navigational aids (NAVAIDs) include visual or electronic devices, either airborne or on the ground, that provide point-to-point guidance information or position data to an aircraft. NAVAIDs range from signal transmissions to lighting systems to signage and pavement marking. NAVAIDs support visual and instrument flight operations and aircraft ground movements, and also provide pilots with information such as weather data.

Several navigational facilities are available to pilots that use Aspen/Pitkin County Airport, many of which are also available to en route airport traffic.

The Airport is served by visual and instrument NAVAIDs, including the Red Table (DBL) VHF Omnidirectional Range/Distance Measuring Equipment (VOR/DME), two localizers (one on the airfield and one on Aspen Mountain, approximately four miles southwest), MALSF, PAPIs, a rotating beacon, and a lighted wind cone.

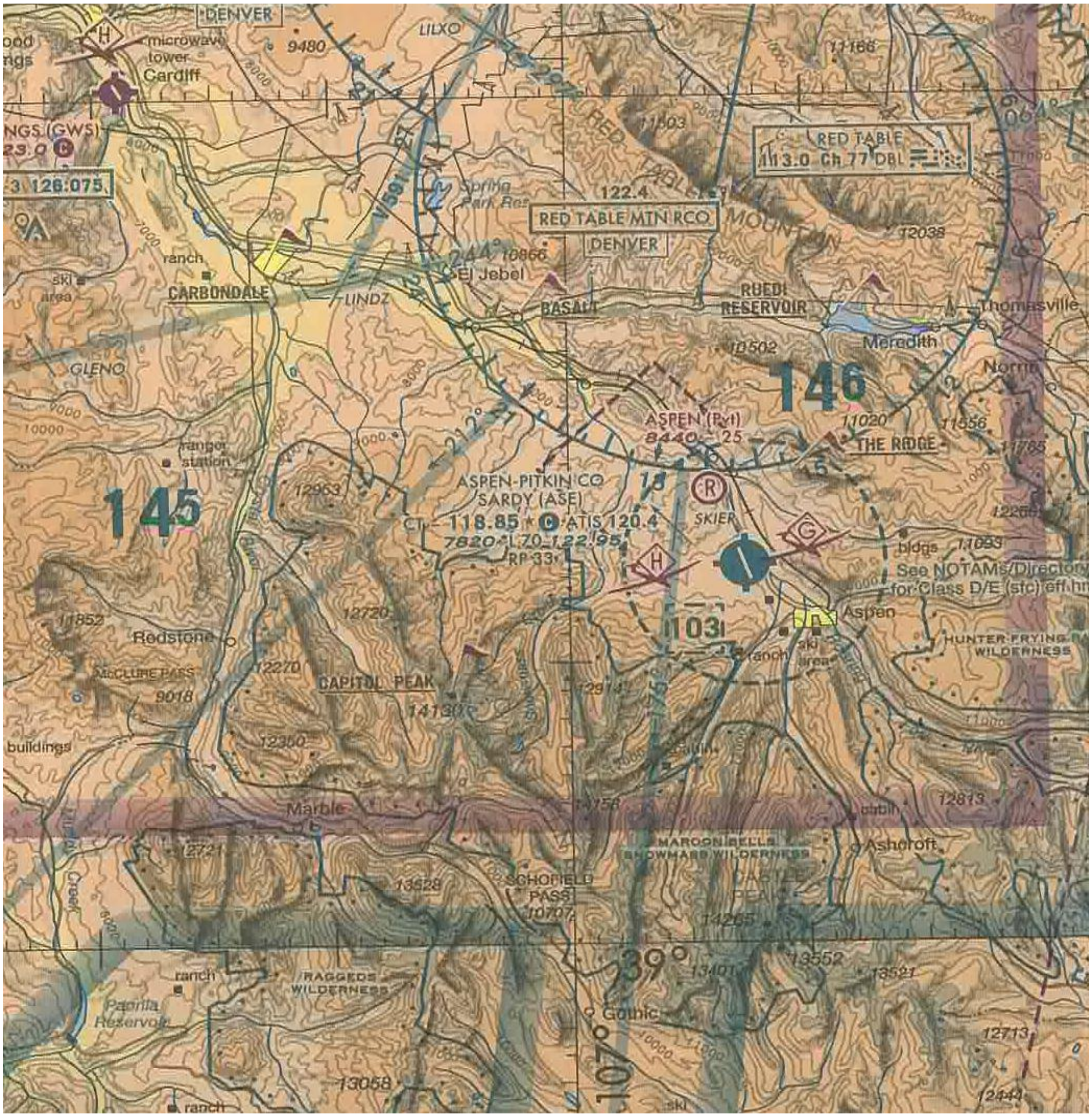
The PAPIs provide descent guidance for the visual segment of approaches on Runway 15. They are configured for a three-degree glide path angle. The PAPIs are unusable beyond four nautical miles from the threshold and seven degrees right of the runway's centerline because of hazardous terrain in the Airport's surrounding vicinity.

The Red Table VOR/DME provides the non-precision guidance for the VOR/DME instrument approach at the Airport, as well as en route guidance. The I-PKN localizer provides back course guidance and defines a path for aircraft to fly missed approach and departure procedures.

The REILs for the Runway 15 approach have been replaced by the aforementioned MALSF approach lighting system. The MALSF is an approach lighting system that stretches from the threshold of Runway 15 north, 1,400 feet along the extended centerline of Runway 15, and provides enhanced visual guidance to aircraft that make landing approaches to the Airport during periods of low visibility airport operating conditions.

It should be noted that Aspen/Pitkin County Airport does not have an Instrument Landing System (ILS), primarily because such a system cannot be configured for approaches to either end of the runway, due to the steep terrain that surrounds the Airport.

The I-PKN localizer antenna array was installed at the Airport in 2002. The second one is located atop nearby Aspen Mountain. Localizers are electronic navigation aids that transmit a radio signal to an airborne aircraft and provide horizontal guidance to join with and remain on a flight path that lines up with the extended centerline of a runway.



Source: U.S. Department of Transportation - Federal Aviation Administration
National Aeronautical Charting Office

FIGURE 1-36

Denver Sectional Aeronautical Chart

Aspen/Pitkin County Airport

Other NAVAIDs that are in operation at Aspen/Pitkin County Airport include four VHF VOR/DME and one VHF Omnidirectional Range with Tactical Air Navigation (VORTAC). The VOR/DME include: Red Table (DBL), frequency 113.00, located 13 nautical miles north-northwest of the Airport; Snow (SXW), frequency 109.20, located 25 nautical miles north-northwest; Blue Mesa (HBU), frequency 114.9, located 476 nautical miles south; and Rifle (RIL), frequency 110.6, located 44 miles west-northwest. The VORTAC Kremmling (RLG), frequency 113.80, is located 51 nautical miles northeast of the Airport.

1.3.4 Published Procedures

Aspen/Pitkin County Airport has several public visual and instrument arrival and departure procedures, including the VOR/DME or GPS-C approach, the Roaring Fork Visual Runway 15, the Aspen Two Departure, and the LINDZ Four Departure.

The VOR/DME or GPS approach at the Airport is classified as a non-precision circling approach that uses guidance from the Red Table VOR/DME for the final approach segment of the procedure and the I-PKN Localizer for missed approach guidance.

The Roaring Fork Visual Runway 15 approach is a procedure designed for all aircraft that operate in the area under VFR. The approach keeps aircraft from flying over critical terrain and populated areas, while making an approach to the Airport. Special Instrument Approach Procedures are defined as a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point where a landing may be made visually, as approved by the FAA for a specific operator. These procedures are not published for public use and do not appear in U.S. Terminal Procedures Charts.

In many cases, the specific aircraft is equipped with avionics that allow an approach to lower minimums than the published public approach, or allow for an instrument approach where no public use approach is available.

Special Instrument Approaches are approved for individual operators. Several Special Use Instrument Approaches have been developed for use at Aspen/Pitkin County Airport. These approaches are detailed in Chapter 3, *Facility Requirements*.

1.3.5 Operating Constraints

Due to the varying terrain that surrounds the Aspen area, the Airport has several operating constraints. One primary constraint is the inability to utilize an ILS for precision approach capabilities.

The rising terrain to the south typically prevents arrivals from that direction and departures in that direction (departing Runway 15, arriving Runway 33), though some commercial arrivals may fly in on Runway 33 depending on wind speed and direction. Therefore, the local airspace is primarily operated in a “Head to Head” or “Contra-Flow” manner. In other words, arrivals are from the north and departures are to the north. This limits the amount of available airspace and operating capabilities, especially during high-traffic periods or poor weather conditions.

The existing VOR/DME or GPS-C approach is based on circling criteria limiting minimum descent altitude. This procedure also requires aircraft to descend in the various segments of the approach up to 514 feet per nautical mile. This “quick decent” method can be difficult to navigate for pilots, especially in mountainous areas. The terrain also limits radar coverage from Denver Center. Because of this, the Airport experiences restricted arrival and departure rates during Instrument Flight Rules (IFR).

There are several restrictions on the airfield that, in turn, restrict the size of aircraft and operating hours for passenger operations. These restrictions are important to consider for terminal planning, due to the dependency with terminal size and operational characteristics.

The Airport’s parallel taxiway/runway separation is not in compliance with FAA standards. To accommodate aircraft and maintain an acceptable level of safety, the wingspan of aircraft that can operate at the Airport may not exceed 95 feet. This County ordinance limits commercial aircraft types to commuter or regional jet aircraft. The wingspan limitation can be found in the Pitkin County Code, Section 10.12.030(C) Wingspan Limitation.

There is also a weight restriction limiting aircraft to 100,000 pounds maximum landing weight or less. The weight restriction can be found in Section 10.12.030(D) of the Pitkin County Code.

In order to reduce the noise exposure to airport neighbors, a curfew is in place that restricts the hours of operation. The curfew is based on the noise levels that aircraft produce, with Stage I aircraft being the noisiest and Stage III being the quietest. The curfew reads as follows:

- *All Stage I aircraft operations prohibited; violators will be prosecuted.*
- *Stage II/III aircraft only from 7:00 AM Local Time to 30 minutes after sunset.*
- *Stage III aircraft only from 30 minutes after sunset to 11:00 PM Local Time.*
- *No departures allowed after 10:30 PM Local Time.*

Due to the single runway and surrounding terrain, Aspen/Pitkin County Airport’s Aircraft Arrival Rate (AAR) is only 20 aircraft per hour in VFR conditions and is further reduced to an AAR of six aircraft per hour during IFR conditions. In order to help manage the over-demand problem that is created by the AAR during the ski season, the FAA has instituted a slot program that allows aircraft operators to reserve a slot at a particular time. Since these slots have to be allocated amongst GA traffic, the number of aircraft that can be expected to arrive at one time is somewhat limited.

1.4 Socioeconomic Trends

In order to determine the needs of an airport, it is important to understand the community and surrounding area it serves. Socioeconomic information in this document provides a statistical snapshot of the community and identifies trends that may impact current and future aviation operations. Specific elements that are described include:

- **Population**
- **Employment**
- **Income**
- **Land Use and Urban Growth**

1.4.1 Population

The population of Pitkin County steadily increased at a 0.11 percent compound annual growth rate (CAGR) between 1998 and 2007 (see **Table 1-6**). This figure is a calculation of the year-over-year growth rate for a specific period of time. The formula smoothes variation to better identify future trends based on historic data. The County is expected to grow by 1.22 percent annually through the year 2027, when the population is expected to reach 19,140.[2]

Population change in Pitkin County does not reflect that of the State as a whole. According to the Colorado Division of Local Government, the state's population increased at a more rapid rate starting around 1991. Between 1991 and 2007, Colorado grew from 3,380,951 residents to 4,919,947, a CAGR of 2.37 percent. During that same time period, Pitkin's population grew from 13,127 to 15,029, a CAGR of 0.85 percent. Though several regions in the State are destinations for "baby-boomer" retirees, Pitkin County, specifically Aspen, has enacted several growth-limiting initiatives in an attempt to preserve the area's natural surroundings. It is expected that local population trends will continue and that Pitkin County will experience slow, steady growth in residents for the next 20 years.

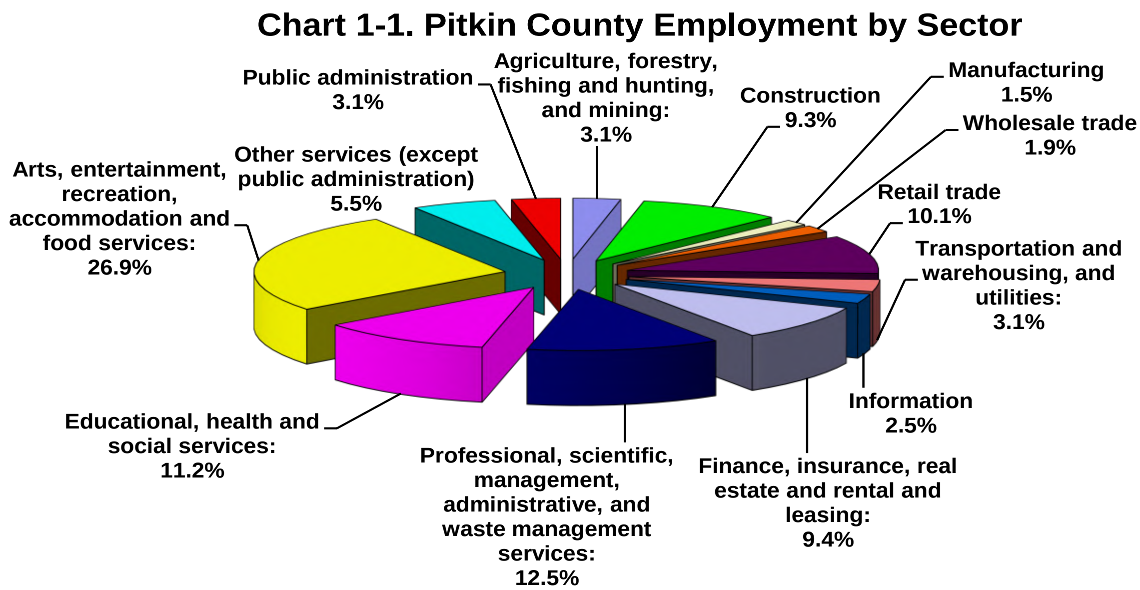
1.4.2 Employment

The types of jobs in an airport's service area affect aviation demand. Careers in manufacturing and service industries tend to generate more aviation activity than resource industries such as agriculture or mining. The most common areas of employment in Pitkin County include entertainment and accommodation services; educational health and social services; and professional, scientific, management, administrative, and waste management services (see **Chart 1-1**).

[2] Population estimates and projections for Pitkin County obtained from Woods & Poole, Inc.

Table 1-6. Pitkin County Historic and Projected Population	
Year	**Population**
Historic	
1998	14,886
1999	15,081
2000	14,777
2001	14,842
2002	14,882
2003	14,866
2004	14,748
2005	14,822
2006	14,798
2007	15,029
CAGR 1998-2007	0.11%
Projected	
2012	16,003
2017	17,011
2027	19,140
CAGR 2007-2027	1.22%

Source: Woods & Poole, Inc.



Source: U.S. Census 2000 Summary File 3

1.4.3 Income

Disposable income can be a good indicator of propensity to travel and general aviation aircraft purchases and use. Due to the recession, per capita income in Pitkin County decreased from $76,976 in 2000 to $71,044 in 2010, a -.80 percent CAGR (see **Table 1-7**). This trend is expected to reverse over the next 15 years, with a projected income of $85,420 in 2025 (CAGR of 1.24 percent). According to the Bureau of Economic Analysis, Pitkin County had the seventh-highest per capita income of any county in the United States as of 2010.

Evaluation of socioeconomic factors that influence aviation demand indicates that Pitkin County has a conservatively growing and affluent population, a diverse and stable workforce, and a steady economy. Linear growth in population and forecast per capita income suggest that significant changes in these areas are unlikely.

Table 1-7. Historic and Projected Income Per Capita	
Year	**Income Per Capita (2005 Dollars)**
Historic	
2000	$76,976
2001	$73,128
2002	$72,020
2003	$71,422
2004	$75,794
2005	$79,506
2006	$84,697
2007	$85,598
2008	$83,658
2009	$72,807
2010	$71,044
2011	$74,106
Projected	
2012	$72,523
2017	$75,010
2025	$85,420
CAGR 2000-2010	-.80%
CAGR 2010-2025	1.24%

Source: Woods & Poole, Inc.

Existing Land Use

The area that surrounds the Airport is zoned primarily for governmental/institutional purposes (primarily the Airport itself), as well as for open space/recreation, agriculture, and residential use. Surrounding residential development is very low-density.

Generally, compatible land uses in close proximity to an airport do not include schools, hospitals, housing, or places of assembly that may be sensitive to noise. The existing land use patterns in the areas that surround the facility are generally compatible with airport operations. Much of the land surrounding the Airport has been developed with golf courses, ski areas, and large-lot residential subdivisions. Large areas to the east and northeast remain in agricultural and low-density residential use.

East of the Airport is the AABC, a mixed use commercial/light industrial/residential complex. This development includes the North 40 residential subdivision, which is located directly east of the Airport's main terminal and long-term parking areas. The subdivision includes approximately 72 affordable housing units, as well as a remote classroom building for Colorado Mountain College called the Aspen Campus. At the time this document was written, at least two additional affordable housing projects were in this area, and additional units near the existing south holding apron were being considered. Due to its proximity to the terminal and general aviation areas, residents in the North 40 subdivision are exposed to impacts associated with airport operations that include noise and vibrations created by aircraft start-up, ground maneuvering, maintenance, Auxiliary Power Usage (APU), and engine run-up for aircraft takeoff or landing.

North of the Airport are several residential developments including the Brush Creek Village Subdivision and Woody Creek. Another small residential development known as the W/J Subdivision is also present and includes affordable housing units.

West and southwest of the Airport is primarily large-lot residential development. To the south are the Buttermilk Ski Area, Maroon Creek Club, Aspen Municipal Golf Course, and the city of Aspen itself. The City of Aspen comprises the majority of moderate and high-density residential development in the vicinity of the Airport and includes the Burlingame Affordable Housing Project, MMA Seasonal Housing Project, and Maroon Creek Club Employee Housing Project. These affordable housing developments are located southeast of airport property.

Existing Zoning

Pitkin County maintains land use jurisdiction for the Airport. Airport development is subject to "location and extents" review pursuant to Colorado Revised Statutes Section 30-28-110 and Pitkin County Land Use Code Section 2-30-30(h)(10). The purpose of this review is to determine whether the planned development is consistent with applicable master plans for the area. Applicable plans include the Aspen Area Community Plan, the Down Valley Plan, and, when completed, the West of Castle Creek Land Use Master Plan. Location and extents review is conducted by the Pitkin County Planning and Zoning Board. Under state law, the Board of County Commissioners may override a denial by the Planning and Zoning Board.

City of Aspen Zoning

Several districts are located near the Airport that are either fully developed or in the process of being developed. The primary development in this area is the Maroon Creek Club, which was approved in the early 1990s. This upscale golf course/residential project encompasses much of the area south of the Airport and beyond the Buttermilk Ski Area. In addition to the golf course and associated low-density residential lots, the development includes a large clubhouse facility surrounded by several pods of multi-family housing. Among these is the "Maroon Creek Club Employee Housing Project," which contains approximately 39 multi-family rental units. This portion of the project is located on the east side of Highway 82, directly across from the Buttermilk Ski Area base village. The bulk of the Maroon Creek Club's land is its golf course, which is zoned for open space and rural residential purposes. Nearby City zoning districts are shown in **Figure 1-38**.

The land west of Owl Creek Road, which provides access to the west side of the Airport and enters south of airport property, includes the steep hillsides below the West Buttermilk Subdivision. Though the terrain limits the number and size of units that can be built, this area represents the greatest potential for new development near the Airport. The entire hillside to the west is under an Aspen Valley Land Trust conservation easement that restricts construction of any structures. In addition, areas with slopes greater than 30 percent are severely restricted under Pitkin County Land Use Code. It should be noted that the area west of the Airport shown in **Figure 1-38** (Open Space) was recently de-annexed by the City of Aspen and was rezoned to Public-Institutional (P-I) by Pitkin County.

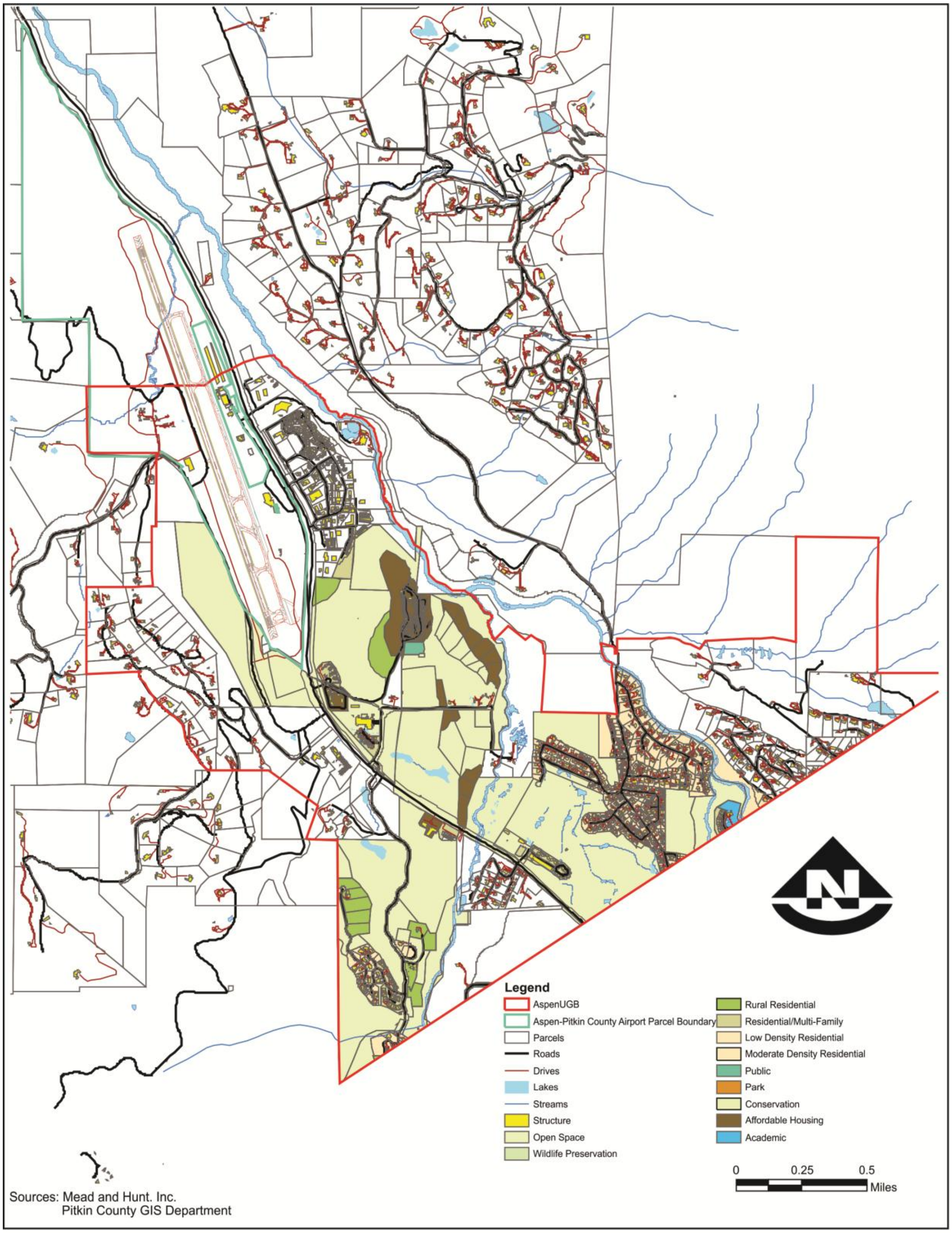


FIGURE 1-37

City of Aspen Zoning Map
Aspen/Pitkin County Airport

Pitkin County Zoning

The majority of the land immediately surrounding Aspen/Pitkin County Airport property is under jurisdiction of Pitkin County's zoning code and is zoned Agricultural/Residential and Low Impact Residential. A map of nearby Pitkin County zoning districts is presented in **Figure 1-39**. The Ski-Recreation (SKI-REC) district is located southwest of the Airport and includes the Buttermilk Ski Area. Any new development within this zone is subject to policies and limitations listed in the Master Plan for the Ski Area. Amendments to the Master Plan are subject to a land use review process that includes public hearings. The existing Buttermilk Master Plan was adopted in 1986 and has not undergone a major update since, though it has included minor amendments. A number of Master Plan updates have been submitted in draft form that included improvements to the Base Village area.

There is little potential for significant new development in the districts zoned Industrial or Business that would impact airport operations. These areas are confined within the AABC, which has already been developed. Any re-development in the AABC would likely be of a similar character as what currently exists with respect to impacts that affect the Airport. A significant amount of land is present in areas that are zoned Agricultural/Residential and Low Impact Residential; however, many factors make significant future development unlikely. Much of the surrounding terrain is confined within the Roaring Fork River Valley or is too steep to develop. Also, many areas have been developed to the maximum density limitations listed in Pitkin County's zoning code and further development would require rezoning.

The County is unlikely to approve a rezoning that would allow greater density in an area that is subject to the activity and impacts of airport operations. Specific criteria in the County Land Use Code (Section 7-90-20) are used to analyze the compatibility of proposed projects in the vicinity of the Airport, as well as prevent incompatible development. The County maintains a strict growth management program that limits the number of development rights that can be issued in a given year. The process for issuing these rights takes into account proximity to the Airport and potential impacts that could affect its operation. Development rights can be obtained through various exemptions, including Transferable Development Rights (TDRs) provisions, but these exemptions are subject to review by the County and potential conflicts with the Airport and its safe operation would be considered in the process.

The land that is zoned Agricultural/Residential PUD (Planned Unit Development) southeast of the Airport exhibits the greatest potential for residential development. Adjacent areas have been purchased by the City of Aspen. The area formerly known as the Burlingame Ranch has been subdivided and Phase 1 of the project completed. To date, these subdivisions include 84 affordable multi-family units. As of December 2008, Phase 2 and Phase 3 of the project had not been built and are under further consideration. This development and surrounding area is relatively close to the Airport and any future construction should carefully consider the issues associated with airport operations. It should be noted that Deer Hill provides a significant buffer from the Airport.

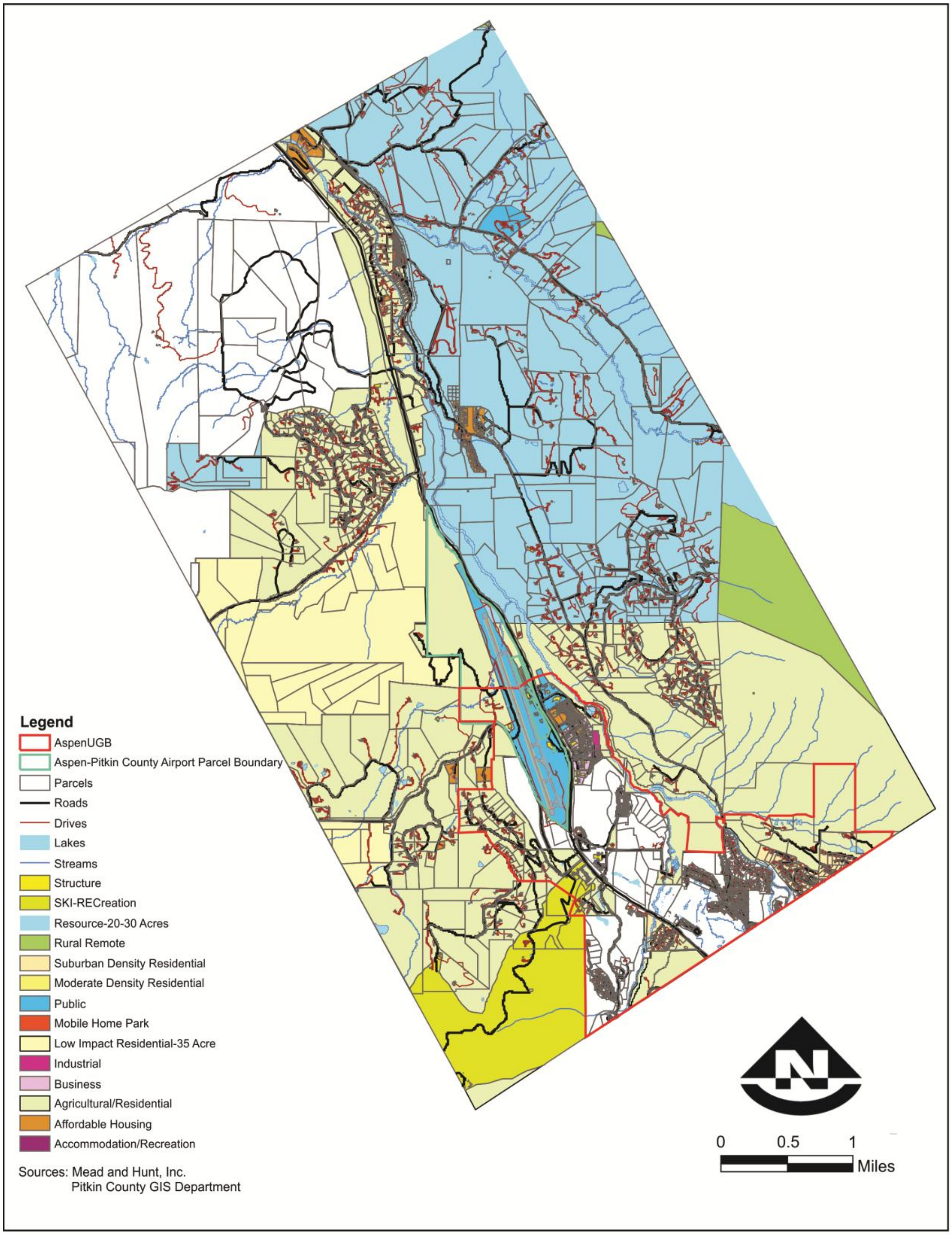


FIGURE 1-38

Pitkin County Zoning Map
Aspen/Pitkin County Airport

Future Land Use Planning

Several documents are in place that discuss future land use within the nearby vicinity of the Airport. These include the *2012 Aspen Area Community Plan* (AACP), which was recently adopted by the City of Aspen and Pitkin County, the *Down Valley Plan*, the *Woody Creek Master Plan*, and the *Brush Creek Master Plan*. Of these documents, the most important is the Aspen Area Community Plan (AACP).

2012 Aspen Area Community Plan (AACP)

The first AACP was adopted in 1993, updated in 2000, and updated again during the time this Master Plan Update was being developed. The AACP is a collaborative, character-based community plan for the Aspen area that helps guide decision making. The document incorporates: "Vision Statements" that reflect what the community aspires to be in the future; "Policy Themes" that outline ways the community can implement the Vision Statements; and "Interrelationships" that identify the profound impacts that may occur between each of the AACP chapter topics. The AACP is organized into these ten sections:

- The Aspen Idea
- Managing Growth for Community & Economic Sustainability
- West of Castle Creek Corridor
- Transportation
- Housing
- Parks, Recreation, Open Space & Trails
- Economy
- Environmental Stewardship
- Historic Preservation
- The Lifelong Aspenite

The sections significant to this Master Plan Update are Transportation, West of Castle Creek Corridor, and Housing. The following sections present information from the AACP for each of these topics.

Transportation

The AACP includes the following statement:

> ***"The airport is an important component of our multi-modal transportation system. We support its mission to provide safe, efficient, accessible, reliable and environmentally-responsible airport services and facilities. It is essential to integrate the airport with alternative modes of transportation to diminish reliance upon rental vehicles."***

The 2012 AACP also includes the following policies related to the Airport:

VII.1. Strengthen the Airport's role in the valley-wide regional transportation system.

VII.2. Increase the quality and availability of information on travel options.

VII.3. Improve the efficiency and reliability of Airport services while reducing environmental impacts.

VII.4. Improve the overall quality of the Airport experience in a manner that is consistent with our community character.

VII.5. Reduce the negative impacts of Airport operations on the surrounding area.

VII.6. Improve the convenience, efficiency, and environmental impacts of ground transportation options available at the Airport.

West of Castle Creek Corridor

This section of the AACP sets out the vision for the area west of Castle Creek to roughly the end of the Airport runway, including the Airport itself. The vision statement reads as follows:

> ***"The West of Castle Creek Corridor area should provide a transition from the rural expanses of Pitkin County to the urbanized atmosphere of downtown Aspen. The area should feature separate and recognizable nodes of unique uses and functions, and maintain a land use pattern and scenic quality along the Highway corridor that creates a distinct series of visual experiences that signal arrival to the Aspen Area."***

The AACP also includes several policies intended to guide the development of the West of Castle Creek Land Use Master Plan, which will be a more detailed, standards-oriented planning document than the AACP. The County is currently working on the West of Castle Creek Plan, which is intended to be adopted in August of 2012. When completed, this document is expected to include standards and criteria for development that will be applicable to the Airport.

Housing

The AACP affirms the community's long commitment to providing affordable housing as part of strategy to preserving Aspen as a strong diverse year-round community with a viable local workforce. Approximately 2,750 affordable housing units are present in the City of Aspen and Pitkin County. One-quarter of all affordable housing units have been created through mitigation requirements on new developments. Some of the Policy Themes that pertain to affordable housing include limiting affordable housing development to the area inside the Aspen Urban Growth Boundary (UGB), providing housing mitigation units on the same site as the development for which the housing mitigation is being required, and promoting broader support and involvement in the creation of non-mitigation affordable housing, including public-private partnerships. These policies and the community's general commitment to affordable housing will be a consideration for any Airport improvement projects that include new building square footage.

Down Valley Plan

The Down Valley Plan was adopted in 1987 and, though infrequently used as a policy guideline by the County, the document is technically in effect and includes policy recommendations that pertain to future development in the area north or “down valley” of Brush Creek Road, which includes the Woody Creek area. The plan’s “Future Land Use Map” designates much of the area north of the Airport and near Woody Creek as either Rural Residential (RR) or Agricultural/Wildlife/Reserve (AWR). The RR designation was intended for low-density residential development that was consistent with existing zoning. It should be noted that the Down Valley Plan was adopted prior to the establishment of the RR zoning designation. The AWR designation was intended to “strongly discourage” development and to maintain existing open agricultural lands for public open space, wildlife habitat, and agricultural uses.

State Highway 82/Entrance to Aspen Record of Decision Environmental Impact Statement (EIS)

State Highway 82/Entrance to Aspen Record of Decision EIS includes development policies that pertain to future land use and Airport operation. The document, which was coordinated by Pitkin County Public Works and the Colorado Department of Transportation, sets all access to and from Highway 82 and affects how future development can occur at the Airport. The Plan, which was re-evaluated in 2006-2007, describes provisions pertaining to intersection layout, parking, and landscape guidelines, as well as economic and environmental issues. This document should be referred to during the design stage of any planned improvements at the Airport.

Woody Creek Master Plan

The Woody Creek Master Plan was prepared by the Woody Creek Caucus with assistance from the Pitkin County Community Development Department and was adopted by the Planning Commission in 1991. Though this document is considered an amendment to the Down Valley Plan, it has not been endorsed by the Board of County Commissioners. The Woody Creek Caucus subsequently submitted an amendment to this plan to the County, but the amendment was never adopted and is considered unenforceable. Due to its proximity to the Airport, and the most utilized departure flight path, Woody Creek is an area that is impacted by aircraft-generated noise. The Woody Creek Master Plan contains policies and recommendations that pertain to this issue.

In general, the Woody Creek Master Plan seeks to preserve the area’s very low-density character by specifically prohibiting high-density housing development. The plan prohibits zoning changes that would result in increased density or population above what already exists. The plan also modifies the Down Valley Plan by eliminating the “cluster residential” zoning designation for the Pitkin Iron property in favor of the “rural residential” designation. This reduces the potential number of units on the Pitkin Iron site. The plan also prohibits the use of TDRs that would increase density.

The following are airport-specific policies that are listed in the Woody Creek Master Plan:

1. Support existing curfew differentiation, current operation hours, and previous noise abatement restrictions.
2. No expansion of ramp area or parking area for general aviation aircraft or of commercial facilities to service general aviation.
3. Support eliminating Stage 1 and Stage 2 aircraft (note that Stage 1 operations have subsequently been eliminated).

Brush Creek Master Plan

The Brush Creek area is currently part of the Down Valley Comprehensive Plan and includes the northern half of the Airport. The Brush Creek Master Plan embodies several Pitkin County land use policy guidelines. The primary objectives of the plan are to maintain the existing rural nature of the Brush Creek area through zoning and other land use controls. The plan's Future Land Use Map shows the Airport and areas north of the Airport along the Highway 82 corridor zoned for public use, and areas west of Highway 82 zoned for conservation and low-density use. There are no land use recommendations that are specific to the Airport.

Final Report

MASTER PLAN UPDATE

Master Plan Update
Aspen/Pitkin County Airport

Chapter 2

Forecasts of Aviation Demand

Executive Summary

Passenger and aircraft activity at Aspen/Pitkin County Airport has fluctuated in recent history. This is not an uncommon theme at many U.S. airports, as economic uncertainty and increased travel costs have impacted travel behavior. Despite rapid increases in fuel cost, airline bankruptcies, system-wide route restructuring, and aircraft fleet overhauls, the forecasts developed for this Master Plan Update suggest positive growth in passenger enplanements, the number of based aircraft, and total aircraft operations at the Airport over the next 20 years.

Aspen and the surrounding area are a prime destination market for tourism, which provides a certain level of protection from pitfalls such as reductions in air service. However, the constantly changing air transportation needs of communities and the dynamics of the airline industry create on-going challenges for smaller communities in the United States. These challenges and the importance of air service are magnified in Aspen because of its geography and the link between air service and the community's economic base.

Projections of short-, intermediate-, and long-term activity at the Airport that are based on 5-, 10-, and 20-year milestones (2012, 2017, and 2027) are presented in the table below.

Summary Forecast Table of Passenger Enplanements, Based Aircraft, and Aircraft Operations

	2006 (Actual)	2011 (Actual)	2012 (Projected)	2017 (Projected)	2027 (Projected)
Passenger Enplanements	203,516	223,078	229,984	250,452	295,542
Based Aircraft	83	100	90	95	107
Air Carrier Operations	5,411	9,682	8,486	9,145	11,125
Air Taxi Operations	13,847	8,654	12,702	13,100	13,445
General Aviation Operations	25,302	19,171	28,719	30,333	33,560
Military Operations	119	99	113	113	113
Total Aircraft Operations	44,679	37,605	50,020	52,691	58,244

Sources: Mead & Hunt, Inc., Airport Management Records.

This chapter was originally drafted in 2008 and relies on pre-2008 data as a basis for forecast projections. The forecasts were subsequently reviewed and approved by the FAA for use in this Airport Master Plan Update. While the intervening years have been eventful in terms of the national and local economy, actual enplanement data from 2011 and year-to-date enplanements from 2012 correlate closely to the forecast numbers contained in this chapter.

That being said, it is important to review the historic activity levels during the intervening years from when the forecasts were originally formulated and the initiation of the Master Plan's finalization process in May 2012. It is also important to provide an analysis of how the recent activity levels should affect the facility improvement recommendations, which are a result of this Master Plan Update. In the text below, data for annual historic levels for each aviation activity type (enplanements, aircraft operations, etc.) is provided for calendar years 2008 through 2011. In a summary at the end of this chapter, the recent activity levels are analyzed with regard to the effect on facility improvement recommendations.

Introduction

Aspen/Pitkin County Airport serves as a gateway to one of the most visited tourism destinations in the State. Because seasonal travel is so prevalent, it is important that the Airport be able to employ a reasonable balance of services and infrastructure during periods of peak and non-peak passenger activity. In order to provide a functioning plan that describes how to achieve this balance, forecasts of aviation activity are necessary. These projections estimate potential future activity levels through evaluation of historical data and the application of various projection models. The validity of these predictions is critical as changes in aviation demand also affect airport capital improvement programming, funding, and budgeting, as well as on-site facilities, services, and staff.

Forecasts of aviation activity serve as a guideline for demand-based implementation of airport improvement programs. While such information is essential for successful comprehensive airport planning, it is very important to recognize that forecasts are only approximations of future activity, based upon historical data and present conditions.

Projections of short-, intermediate-, and long-term activity at the Airport are based on 5-, 10-, and 20-year milestones (2012, 2017, and 2027), using 2006 as the base year of analysis. Year 2006 data generally serves as the base year of data as it is the most recent full calendar year for data. The Airport was closed from April 9, 2007 to June 7, 2007 for runway rehabilitation. As such, 2007 year data for passenger enplanements and aircraft operations does not accurately reflect typical levels of activity. In order to rectify this, 2006 is typically used as the base year of analysis, although 2006 data is occasionally supplemented with more recent 2007 or 2008 data where appropriate.

Projections of aviation demand are an important element of the master planning process as they provide the basis for several key analyses, including:

- Determining the role of the Airport, with respect to the type of aircraft to be accommodated in the future, within the confines and parameters of the existing airfield limitations[1]
- Evaluating the capacity of existing Airport facilities and their ability to accommodate projected aviation demand
- Estimating the extent of airside and landside improvements required in future years to accommodate projected demand

This chapter provides discussions of the methodologies and findings used for projecting passenger enplanements, aircraft fleet mix, aircraft operations, auto parking, peaking characteristics, and based aircraft at Aspen/Pitkin County Airport. The projections of aviation demand are documented in the following sections:

2.1 Role of the Airport

2.2 Industry Trends

2.3 Forecasting Approach

2.4 Passenger Enplanement Projections

2.5 Commercial Air Carrier Aircraft Operations and Fleet Mix Projections

2.6 Military Operations Projections

2.7 General Aviation Activity Projections

2.8 Operations Forecast by Aircraft Type

2.9 Aviation Demand Peaking Characteristics

2.10 Auto Parking Demand Projections

2.11 Aviation Demand Projections - FAA Comparison

2.12 Recent Activity Levels, Potential Effects on Facility Improvement Recommendations and Validity of Forecasts

2.1 Role of the Airport

Aspen/Pitkin County Airport is owned by Pitkin County and operated by the Pitkin County Board of County Commissioners. The Federal Aviation Administration (FAA) National Plan of Integrated Airport Systems (NPIAS) identifies over 3,000 airports significant to national air transportation, which are eligible

[1] It is important to note that dimensional criteria and county ordinance limit aircraft capacity by type at the Airport; this will be further addressed in proceeding sections of this Chapter.

to receive grants. Aspen/Pitkin County Airport serves commercial and passenger, as well as private General Aviation (GA) aircraft, which are not used for military, charter, or scheduled flights.

The 2007-2011 NPIAS lists Aspen/Pitkin County Airport as a Non-Hub, Primary facility. Commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements, but which have more than 10,000 annual enplanements, are categorized as non-hub primary airports. There are 243 non-hub primary airports that together account for three percent of nationwide enplanements.

In 2007, Aspen/Pitkin County Airport conducted a terminal survey in which 25 percent of respondents said they were a full-time resident, a second homeowner, or a business owner/operator in the County, 69 percent said they were visitors, while the remaining 6 percent replied “other”. Of those who had direct ties to the County, over 98 percent lived/owned property in Aspen, the Town of Snowmass Village, Basalt, or Unincorporated Pitkin County. Although most people who use Aspen/Pitkin County Airport are visitors to the area, the results of the survey reveal that the Airport’s service or “catchment” area lies almost entirely within the County.

Another important point to note is that respondents who had said they flew out of a nearby airport in the previous 12 months that was not Aspen/Pitkin County Airport had primarily been encouraged by more reasonable fares, more convenient flight schedules, and overall convenience at those facilities. This trend demonstrates that, in order to minimize “leakage” to other facilities, Aspen/Pitkin County Airport must continue to pursue/provide convenient, reasonably priced, sustainable air service.

As of June 2008, the Airport was served by four airlines: Frontier Airlines, United Airlines, US Airways, and Delta Air Lines (subsequently Frontier Airlines and Delta Airlines have stopped service at the Airport and American Airlines has added service). Initial airport inventory was conducted in June 2008; at that time, in an average weekday, the Airport typically had 17 scheduled daily departures. It should be noted, however, that especially during peak travel season and weekends, these numbers generally increase. March is historically the peak month for commercial service and in March 2008, the Airport had 26 average daily departures. In March 2012, the Airport had 29 average daily departures by commercial service aircraft.

2.2 Industry Trends

Projections of aviation demand presented in this chapter are primarily based on trends and patterns related to historical activity. However, it is also important to understand changes occurring locally, and those within the U.S. aviation industry as a whole. Local trends have an obvious effect on the use of the Airport, especially with regard to air service. Aspen-Snowmass and the surrounding area are a destination market, which garners significant attention with respect to long-term planning at the Airport. National trends in aviation are closely tied with cost, whether it is the price of a flight or cost of owning and operating an airplane. The following subsections provide some discussion of these perspectives.

2.2.1 Local Aviation Trends

The constantly changing air transportation needs of communities and the dynamics of the airline industry create an on-going challenge for smaller communities in the United States. However, the challenges and importance of air service are magnified in Aspen because of its geography and the link between air service and the community's economic base. Today, smaller communities are faced with intense competition for air service. Post September 11, 2001, airlines, struggling to remain in business, reduced capacity nationwide and focused on the performance of the high density markets. Smaller communities experienced dramatic reductions in service; while, at the same time, airlines were phasing lower capacity aircraft out of their fleets. Now, these challenges have been further compounded by the dramatic increase in the cost of fuel.

Air carrier service has fluctuated somewhat in recent years. The departure of Continental Airlines from its Denver hub in 1994 impacted Aspen air service. Another significant change that occurred at the Airport was the discontinuation of service to Minneapolis-St. Paul in April 2006. According to Airport records, between 1998 and 2005, Northwest Airlines service on the Avro RJ-85 aircraft to Minneapolis-St. Paul accounted for 15,000 to 17,000 annual passenger enplanements. This, along with the closure of the Airport for over two months may help explain the significant decrease in enplanements at the Airport from 2006 to 2007.

Market Considerations

Aspen/Pitkin County Airport serves a relatively small, highly affluent local population base consisting of many second-homeowners. Air travel demand is driven by a high ski season destination demand (December to March) and a small July to August peak driven by outdoor recreational activities (e.g., golfing, hiking) and summer cultural activities (e.g., Aspen Music Festival). Air travel demand in the remaining six months of the year is modest.

Due to the desirable destination market that the Airport serves, the affluent visitor base and users, and the high real estate values within the community, the Airport experiences a high number of business jet operations. The Airport is consistently one of the top destinations for fractional ownership and charter aircraft operators. During high travel weekends, the Airport's apron is at or near capacity. The affluent visitor base and users drive an extremely strong demand for business jet activity.

Regarding the commercial air service market, the Airport is well served. The Airport has recently received new air service to new and existing markets; however, like in most resort airports, airlines come and go from the Airport on a fairly regular basis. The following are additional local considerations that may impact passenger activity in the future:

- The inability of larger mainline jet aircraft to operate from Midwestern and eastern hubs at Aspen/Pitkin County Airport makes it difficult to measure peak ski season demand. Many Aspen visitors fly in to Denver and Eagle and drive to Aspen.
- Carriers still need high-value "feed" traffic to their hubs.
- The air service limitations compared to demand, the area's popularity, and the accompanying high visitor costs have combined to create high fares, yields, and revenue for the airlines that serve Aspen/Pitkin County Airport. This is particularly true of the airlines that best serve eastern markets.

Air Service Performance and Opportunities

From an air service planning perspective, Aspen's high fares and revenue potential provide a solid basis for maintaining existing air service and attracting expanded air service. Operational limitations and demand seasonality may be impediments in some instances. Overall, demand from eastbound destinations is strong, while demand from western points is limited. United's Aspen service has performed well in the Chicago, Denver, and Los Angeles markets, producing high load factors, fares, and revenue. These results suggest future service expansion in these markets. Most recently, American Airlines routes to Dallas/Ft. Worth and Los Angeles have proven to be successful.

Operational Limitations

The Airport has operational limitations, which are implemented though the Pitkin County Code. These limitations include a 100,000-pound max landed weight limitation, a 95-foot wingspan limitation, and a curfew. Some of these constraints have now been built into the airport facilities design (i.e., pavement strength, taxiway/runway separation, etc.). These limitations restrict the type and size of aircraft that can operate out of the Airport, as well as the hours of operation.

The ASE airspace is extremely crowded due to its relationship to the Denver International Airport and other mountain airports including those located in Eagle, Gunnison, Montrose, Grand Junction, and Rifle. As a result, during high traffic weekends, Aspen is managed under regional restrictions that work to maintain safe distances between planes that are traversing to these various locations. The FAA meters these aircraft, to ensure safe separation and a consistent flow of aircraft to each destination.

Multiple methods of controlling the flow of aircraft are employed. One method manages aircraft on a first-come-first-serve basis. When this method is employed, commercial airlines are treated the same as any other aircraft, similar to a bus travelling a section of roadway without a designated bus lane. During high-travel weekends, such as Presidents' Day weekend, the FAA will utilize what they refer to as the "special traffic management program." When this system is in use, aircraft operators must request one of a distinct number of landing positions available each hour. The slot system automatically reserves positions for all scheduled commercial airline flights, which reduces the ability for general aviation aircraft to operate in and out of Aspen Airport. Airspace limitations are based on the current air traffic control system, the accuracy of which requires certain separation distances between aircraft to maintain acceptable safety parameters.

Terrain surrounding the Airport also limits nearly all operations to a contra-flow operation. Aircraft typically takeoff and land into the wind, with both operations occurring in the same direction. At ASE, however, due to terrain located to the south of the Airport, aircraft arrive from the north and depart to the north in a contra-flow (i.e., head-to-head).

The operational characteristics at Aspen/Pitkin County Airport (i.e., runway/taxiway spacing, altitude, surrounding terrain, contra-flow use, weather, etc.) create significant capacity limitations.

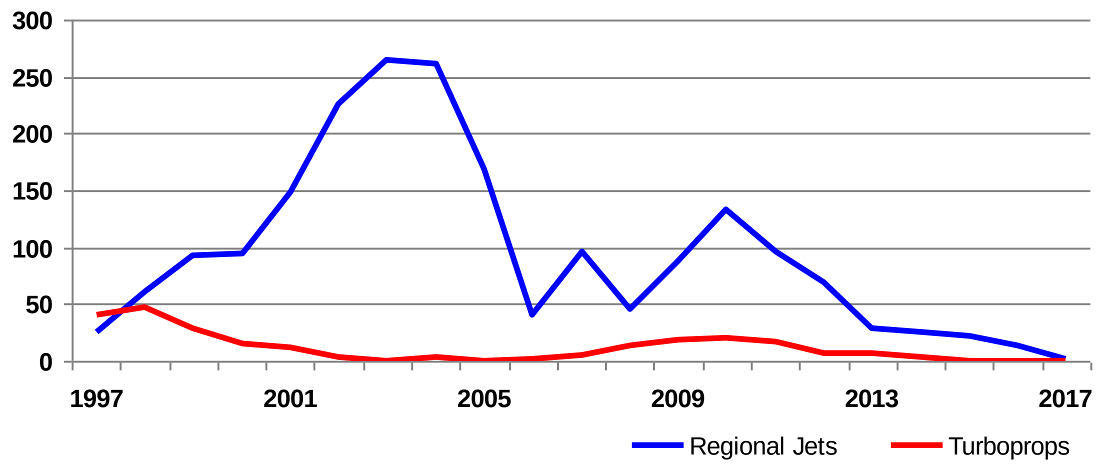
2.2.2 National Aviation Trends

Each year, the FAA publishes its national aviation forecast. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by State and local authorities, the aviation industry, and the general public.

One trend that is having a significant impact locally, as well as nationally, is the transition of airline fleet type and seat capacity, especially for airlines that provide air service to smaller communities like Aspen/Pitkin County. The type of aircraft an airline elects to use in a market, to a large extent, determines its chances of profitability and how the airline will price its tickets.

There is a significant difference in the operational economics of jet versus turboprop aircraft. Jet aircraft are most efficient operating at higher altitudes on longer stage lengths (distances). Turboprop aircraft are more efficient operating at lower altitudes and shorter stage lengths. Additionally, different aircraft types have different passenger seating capacities. In general, the more seats an aircraft has, the lower unit cost (cost per seat mile). This is an especially important point with respect to ticket pricing. Simply put, on a unit cost basis, airlines must charge more for tickets on aircraft that are served with smaller jet or turboprop aircraft and will not realize ticket prices comparable to larger markets with bigger aircraft and higher seating capacities. Historically, it has been typical for an airline to need at least 65 to 75 percent of its seats filled per flight to break even on costs; however, this may increase in the future. To demonstrate the effect this is having on the airline industry, annual historical and projected regional jet and turboprop orders are shown in **Chart 2-1**. Fleet mix assumptions and projections of commercial aircraft operations are presented in subsequent sections of this chapter.

Chart 2-1. Regional Jet and Turboprop Order Trends



Source: OAGBACK Aviation Solutions, May 2008

2.3 Forecasting Approach

A number of forecasting techniques may be used to project aviation activity that range from subjective judgment to sophisticated mathematical modeling. Since a large number of variables affect a facility plan, it is important that each one be considered in the context of its use in the plan.

The following sections provide an assessment of historical trends of aviation activity data at the local and national level. Aviation activity statistics on such items as passenger enplanements, aircraft operations, and based aircraft are collected, reviewed, and analyzed. As previously stated in Section 2.2, *Industry Trends*, there are a number of elements that may affect aviation demand. Therefore, socio-economic factors such as population, income, and tourism are also analyzed for the effect they may have had on historical and future levels of activity. The comparison of relationships among these various indicators provides the initial step in the development of realistic forecasts of aviation demand. It should be noted that the examination period for levels of activity vary due to availability of data and applicability of trends in historical figures.

In statistical analysis, correlation (often measured as a correlation coefficient) indicates the strength of a linear relationship between two independent variables. In this analysis, the Pearson product-moment correlation coefficient is calculated for each methodology. The closer the correlation coefficient is to 1.0, the stronger the correlation between the variables. Methodologies used to develop forecasts described in this section include:

- Time-series methodologies
- Market share methodologies
- Socio-economic methodologies

2.3.1 Time-series Methodologies

Historical trend lines and linear extrapolation are widely used methods of forecasting. These techniques utilize time-series types of data and are most useful for a pattern of demand that demonstrates a historical relationship with time. Linear extrapolation establishes a linear trend by fitting a straight line using the least squares method to known historical data. Historical trend lines used in this chapter examine historical compounded annual growth rates (CAGR) and extrapolate future data values by assuming a similar compounded annual growth rate for the future.

2.3.2 Market Share Methodology

Market share, ratio, or top-down models compare local levels of activity with a larger entity. Such methodologies imply that the proportion of activity that can be assigned to the local level is a regular and predictable quantity. This method has been used extensively in the aviation industry to develop forecasts for the local level. It is most commonly used to determine the share of total national traffic activity that will be captured by a particular region or airport. Historical data is examined to determine the ratio of local airport traffic to total national traffic. The FAA develops national forecasts annually in its FAA Aerospace Forecasts document. This data source is compared with historical levels of activity reported by Aspen/Pitkin County Airport.

2.3.3 Socio-economic Methodologies

Though trend line extrapolation and market share analysis may provide mathematical and formulaic justification for demand projections, there are many factors beyond historical levels of activity that may identify trends in aviation and impact on aviation demand locally. Socio-economic or correlation analysis examines the direct relationship between two or more sets of historical data. Local conditions that are examined in this chapter include population, per capita income, total retail sales, and availability of rental units. According to the 2004 Aspen/Pitkin County Airport Master Plan, over 3.5 million tourists visit Aspen and the surrounding region. The capacity and availability of rental properties and lodging are extremely important to the local economy and, in part, dictate incoming travel behavior. Based upon the observed and projected correlation between historical aviation activity and the socio-economic data sets, future aviation activity projections are developed.

2.4 Passenger Enplanement Projections

Enplanements are defined as the activity of passengers boarding commercial service aircraft that depart an airport. Enplanements include passengers on scheduled commercial service aircraft or non-scheduled charter aircraft. Enplanements do not include the airline crew.

Passenger enplanement data is provided to Airport management by commercial passenger service carriers, who maintain data as they transport people to and from the facility. The FAA has estimated figures on file called Terminal Area Forecasts (TAF); however, airport records are generally a more accurate source. It should also be noted that the TAF presents annual data for a fiscal year, while Airport records are for the calendar year. This is one reason there is often a discrepancy between reported annual totals. For projections presented in this chapter, historical data provided by the Airport is used.

Though recorded, deplanements are not specifically evaluated in this document, except for peak passenger deplanements. Because the Aspen/Pitkin County area is primarily a destination market, it is assumed that an arriving passenger will eventually return to the originating location and use the same airport. This means that enplanements roughly equal the number of deplanements.

This section examines data that pertains to passenger enplanements and describes enplanement projections in the following subsections:

- Enplanement history
- FAA TAF enplanement data and projections
- Applicable projection methodologies including trend line, market share, and socio-economic variable
- Method comparison and preferred projection methodology

2.4.1 Enplanement History

The number of passenger enplanements at the Airport has fluctuated significantly between 1995 and 2011 (see **Table 2-1**). The Airport and the FAA both record a negative compound annual growth rate (CAGR) during that time frame. The fluctuation in passenger enplanements is likely due to two primary factors. First, the Airport experienced changes in air service during this time period. Second, the Airport was closed from April 9, 2007 through June 7, 2007 for runway rehabilitation.

As also can be seen in **Table 2-1,** in the most recent past (2008 through 2011), the number of enplanements has not trended upward.

Table 2-1. Historical Passenger Enplanements	
Year	**Enplanements**
Historical	
1995	200,685
1996	210,672
1997	224,815
1998	248,510
1999	213,903
2000	214,816
2001	187,622
2002	183,704
2003	195,782
2004	185,801
2005	194,353
2006	203,516
2007	183,632*
CAGR 1995-2006	*0.13%*
CAGR 1995-2007	*-0.74%*
2008	*215,833*
2009	*207,227*
2010	*227,784*
2011	*223,078*

Sources: Airport Management Records, FAA.
**Note: Runway closed for 60 days for runway rehabilitation.*

Using the historic enplanement activity numbers through 2007 as a basis, this *Forecasts of Aviation Demand* chapter was produced and adopted by the FAA in 2008. It included the development of several precursor forecasting methodologies. Those methodologies included:

- FAA's Terminal Area Forecast (TAF)
- Historical Trend Line
- Market Share (what percentage of national enplanements is expected to be captured at ASE)
- Socio-economic Methodology – Population Variable
- Socio-economic Methodology – Per Capita Income Variable
- Socio-economic Methodology – Retail Sales Variable
- Socio-economic Methodology – Available Pillows (rental property and lodging unit occupancy)

As originally published, these precursor methodologies are provided in Appendix 1 of this report. The adopted enplanement forecast is provided below and utilizes a multi-average methodology.

2.4.2 Multi-average Methodology

A number of different forecasting techniques were used in the projection of enplanements. Redundancy has been achieved through the utilization of several forecasting techniques so as to minimize the uncertainty associated with the range of the forecast variables. The multi-average methodology represents the average of the various methodologies examined as part of this forecasting effort, with the exception of the FAA TAF, and is summarized in **Table 2-2**. The multi-average projection incorporates the influence of all the various projections and variables examined and results in a middle of the road forecast of demand. The multi-average methodology projects 229,984 enplanements in 2012; 250,452 in 2017; and 295,542 in 2027, resulting in a compound annual growth rate of 1.79%.

Table 2-2. Multi-Average Methodology

Year	Enplanements
Historical	
1995	200,685
1996	210,672
1997	224,815
1998	248,510
1999	213,903
2000	214,816
2001	187,622
2002	183,704
2003	195,782
2004	185,801
2005	194,353
2006	203,516
2007	183,632*
CAGR 1995-2006	*0.13%*
2008	*215,833*
2009	*207,227*
2010	*227,784*
2011	*223,078*
Projection	
2012	229,984
2017	250,452
2027	295,542
CAGR 2006-2027	*1.79%*

Sources: Airport Management Records, Mead & Hunt, Inc.
** Runway closed for 60 days for runway rehabilitation.*

There has been significant fluctuation in the number of enplanements in the last 12 years due to a number of factors. One of the variables that has remained constant in Pitkin County in recent years has been construction development. Because population and development management are likely to continue in and around Aspen in the future, this trend should continue to favor a similar inclination toward a steady increase in passenger enplanements.

Therefore, the Multi-average Methodology is the preferred enplanement forecast for the purposes of this Master Plan and for long-range planning. This methodology incorporates the influence of all the various projections and results in a “middle of the road” forecast of demand.

As can be noted in the table above, actual enplanements for calendar years 2008, 2009, 2010 and 2011 have trended closely to the forecasts prepared in 2008. The forecast estimated that the Airport would reach 229,984 enplanements by 2012. In calendar year 2011, the Airport enplaned 223,078 passengers.

2.5 Commercial Air Carrier Operations and Fleet Mix Projections

Projections of air carrier operations and fleet mix were developed using historical and expected trends in load factors, types of aircraft used, and average seats per departure. The following elements are presented in this section:

- **Commercial operations projections**
- **Air carrier fleet mix projections**

2.5.1 Commercial Operations Projections

Historical air carrier operations, as reported by the Airport, are shown in **Table 2-3.** This table also shows the number of scheduled air carrier operations as reported by *APGData*[2]*, Data Base Products, Inc*. It is important to present both figures as Aspen has a significant number of unscheduled flights. This is primarily due to heavy charter flight activity and fractional ownership aircraft that are recorded by the FAA as air taxi/commercial operations. The fractional ownership segment of the aviation market has grown significantly in the past decade both nationally and at Aspen, as is evident from the 15.2% CAGR in the number of unscheduled commercial operations at the Airport.

[2] *APGData provides schedule operations totals based upon airline schedules. These operations totals may be slightly different from actual operations due to flight cancellations.*

Table 2-3. Historical Commercial Operations					
Year	**Commercial Operations**	**Scheduled Commercial Operations**	**% Scheduled**	**Unscheduled Commercial Operations**	**% Unscheduled**
Historical					
1995	8,894	6,960	78.3%	1,934	21.7%
1996	10,166	7,372	72.5%	2,794	27.5%
1997	14,396	7,358	51.1%	7,038	48.9%
1998	15,708	7,072	45.0%	8,636	55.0%
1999	11,227	6,690	59.6%	4,537	40.4%
2000	14,831	7,670	51.7%	7,161	48.3%
2001	15,996	7,414	46.3%	8,582	53.7%
2002	16,936	7,266	42.9%	9,670	57.1%
2003	16,614	8,046	48.4%	8,568	51.6%
2004	17,701	8,306	46.9%	9,395	53.1%
2005	17,668	8,462	47.9%	9,206	52.1%
2006	19,258	10,088	52.4%	9,170	47.6%
2007	20,319*	10,622*	52.3%	9,697*	47.7%
CAGR 1995-2007	*7.13%*	*3.59%*		*15.20%*	

Sources: APGData, Airport Management Records, Mead & Hunt, Inc.
** Runway closed for 60 days for runway rehabilitation.*

Recent Historical Commercial Operations Information. Subsequent to publishing this Master Plan Update Forecast Chapter in 2008, actual annual commercial operations numbers have totaled:

Year	Annual Commercial Operations
2008	23,698
2009	21,053
2010	17,643
2011	18,336

As published in 2008, historical and projected data for scheduled air carrier operations at the Airport are presented in **Table 2-4** and **Chart 2-2**. It should be noted that load factors have fluctuated significantly throughout the study period, which is not unusual for a destination market with unpredictable winter weather. National trends show increasing load factors and average seats per departure as regional carrier load factors and that regional carriers are substituting larger regional jets that have 70-90 seats for smaller regional jets with 30-50 seats.

Given what is occurring nationally in terms of increasing load factors, along with the anticipated runway extension, which should help aircraft lift capacity on hot summer days when some aircraft are operationally limited, load factors at Aspen/Pitkin County Airport are projected to modestly increase through the planning period. However, as a recreation destination with large seasonality to passenger demand, load factor is anticipated to remain below national averages. Average seats per departure are projected to modestly increase though the planning period as larger regional jets continue to enter the regional carrier's fleet.

Passenger enplanements using the preferred methodology are presented in **Table 2-12** with historical and projected load factors. Scheduled operations are calculated by using the following formula:

Scheduled operations = [passenger enplanements/(avg. seats per departure x load factor)] x 2

Unscheduled operations including air taxi operations are calculated using the FAA's annual projected growth rate of GA and air taxi operations of 1.4 percent. This is a robust figure given escalating fuel prices, but it also recognizes the projected increase in the number of GA and fractional ownership aircraft, as well as the growing fleet of VLJs.

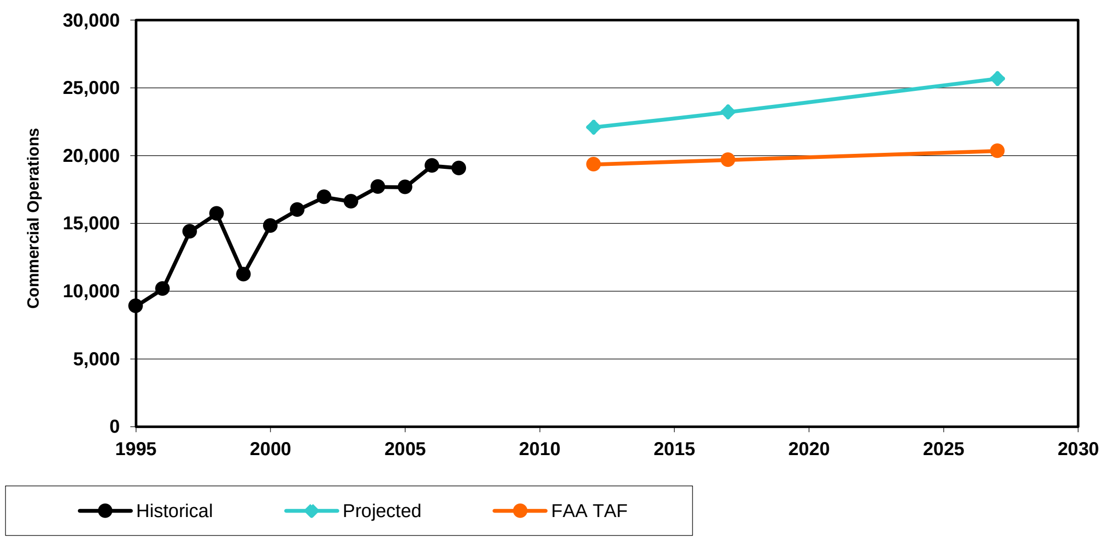
Scheduled and unscheduled operation projections are combined to produce total commercial operations. This methodology projects 21,188 total commercial operations in 2012; 22,245 in 2017; and 24,570 in 2027, resulting in a CAGR of 1.17 percent.

Table 2-4. Total Air Carrier, Air Taxi, and Commuter Operations						
Year	**Passenger Enplanements**	**Load Factor**	**AVG. Seats Per Departure**	**Scheduled Operations**	**Unscheduled Operations**	**Total Operations**
Historical						
1995	200,685	58.8%	98.0	6,960	1,934	8,894
1996	210,672	62.7%	91.1	7,372	2,794	10,166
1997	224,815	70.0%	87.3	7,358	7,038	14,396
1998	248,510	81.2%	86.5	7,072	8,636	15,708
1999	213,903	73.7%	86.7	6,690	4,537	11,227
2000	214,816	64.7%	86.6	7,670	7,161	14,831
2001	187,622	57.4%	88.1	7,414	8,582	15,996
2002	183,704	59.3%	85.3	7,266	9,670	16,936
2003	195,782	61.6%	79.0	8,046	8,568	16,614
2004	185,801	65.3%	68.5	8,306	9,395	17,701
2005	194,353	67.6%	68.0	8,462	9,206	17,668
2006	203,516	69.9%	57.7	10,088	9,170	19,258
2007	183,632*	61.8%	56.0	10,622*	8,456*	20,319*
CAGR 1995-2006	*0.13%*			*3.92%*	*15.20%*	*7.13%*
2011	***223,078***	***62.4%***	***70***	***10,218****	***8,377***	***18,595***
Projection						
2012	229,984	66.1%	57.4	12,123	9,065	21,188
2017	250,452	68.0%	58.8	12,528	9,717	22,245
2027	295,542	70.0%	63.0	13,403	11,167	24,570
CAGR 2006-2027	*1. 79%*			1.36%	0.94%**	1.17%

Sources: Airport Management Records, APGData, Data Base Products, Inc., Mead & Hunt, Inc.
**Runway closed for 60 days for runway rehabilitation.*
***1.4% CAGR 2007-2027 (FAA's annual projected growth rate for air taxi operations).*
****Source: FAA Traffic Flow Management System Counts.*
*****Source: FAA TAF 2012 Air Taxi Operations estimate.*

As can be noted in table above, the forecast indicates that commercial operations would reach 21,188 by 2012. The actual count for calendar year 2011 was 18,336. This lower than predicted number is due to the fact that the Airport is being served by aircraft with larger seating capacities than forecast (more of the commercial service aircraft serving the Airport are regional jets and less are smaller turboprop aircraft). This trend was identified in the forecast (see Air Carrier Fleet Mix Projections section below; however, it has occurred at a faster rate than predicted.). From a long-term facility planning perspective, the effect of this more rapid rate of change is insignificant.

Chart 2-2. Commercial Operations Projection



Sources: Airport Management Records, FAA Terminal Area Forecast 2008-2025, Mead & Hunt, Inc.

2.5.2 Air Carrier Fleet Mix Projections

In order to project future air carrier operations, the type and capacity of aircraft that will operate at the Airport must be determined. For the purposes of the Master Plan, passenger aircraft have been grouped into five categories based on the number of seats they are typically configured with.

Due to changes in operational costs and consumer travel behavior, airlines are faced with some critical decisions with respect to maximizing fleet efficiency and remaining sustainable. National trends and industry outlooks indicate that a number of air carriers that operate out of facilities like Aspen/Pitkin County Airport are reducing or eliminating fuel inefficient aircraft or ones that may not be filled to desired capacity from their fleet. These aircraft are being replaced with regional jets that have more seats and lower operational costs per passenger.

This has not yet been the case at Aspen/Pitkin County Airport as the average number of seats per commercial aircraft departure has diminished in recent years. In 2004, the average number of seats per departure was 68.5. In 2007, this figure had dropped to 56, a decline of approximately 18 percent. It is assumed that in the short-term, this decline will likely continue until a period of time when newer technologies and service route adjustments may see increased aircraft capacity. Projections of seats per departure and typical aircraft are presented in **Table 2-5**. Based on historical evidence and assumptions of local and national trends, aircraft that seat between 60 and 85 passengers have the majority of the current regional airline new aircraft orders and are projected to be the most used in the future. The average number of seats per departure is projected to increase to 57.4 in 2012, 58.8 in 2017, and 63.0 in 2027.

It should be noted that, since 2007, the seating capacities of the commercial service aircraft serving the Airport has increased. Currently, the CRJ-700 with a passenger seating capacity of 66 is the predominate commercial service aircraft serving ASE. The trend toward more service by regional jet aircraft with more seating capacity (e.g., the CRJ-700) was identified in the forecast; however, it has occurred at a faster rate than predicted. From a long-term facility planning perspective, the effect of this more rapid rate of change is insignificant.

Table 2-5. Projected Fleet and Seats per Departure

		Historical				Projected		
Seat Range	**Typical Aircraft**	**2004**	**2005**	**2006**	**2007**	**2012**	**2017**	**2027**
<20	*Beechcraft 1900, Jetstream 31*							
		0.0%	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
20-39	*Saab 340, DeHavilland DCH8-200*	1,446	1,491	2,203	1,749	1,818	1,691	1,139
		34.8%	*35.2%*	*43.7%*	*32.9%*	*30.0%*	*27.0%*	*17.0%*
40-59	*CRJ 200, Embraer 145*					0	0	0
		0.0%	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*
60-85	*CRJ 700, ERJ 170/175, Q400*	379	460	1,813	3,562	4,122	4,322	5,026
		9.1%	*10.9%*	*35.9%*	*67.1%*	*68.0%*	*69.0%*	*75.0%*
86-100	*Avro RJ, Embraer 190/195, CRJ 900*	2,328	2,280	1,028	0	121	251	536
		56.1%	*53.9%*	*20.4%*	*0.0%*	*2.0%*	*4.0%*	*8.0%*
Total Scheduled Departures		4,153	4,231	5,044	5,311	6,062	6,264	6,702
Average Seats Per Departure		68.5	68.0	57.7	56.0	57.4	58.8	63.0

Sources: Airport Management Records, APGData, Data Base Products, Inc., FAA Aerospace Forecasts 2008-2025, Mead & Hunt, Inc.

2.6 Military Operations Projections

Historically, military aircraft have not conducted a significant number of operations at the Airport. This is likely due to the altered terrain that surrounds the Airport, the unpredictable weather conditions, and the limited capacity of the airfield due to the fact that arrivals and departures are conducted in opposite directions. Military activity is primarily limited to contact approaches and fly-bys. The number of total military operations at the Airport has declined during the study period, from 239 in 1995 to 89 in 2007. Local and itinerant military operations are presented in **Table 2-6**. Military operations are not necessarily contingent upon the same influences as that of general aviation or commercial operations; therefore, it is projected that military operations will remain constant throughout the projection period at their 2001-2006 average levels.

Table 2-6. Military Operations Projection			
Year	**Itinerant Military Operations**	**Local Military Operations**	**Total Military Operations**
Historical			
1995	143	96	239
1996	164	150	314
1997	70	109	179
1998	66	42	108
1999	217	50	267
2000	167	72	239
2001	75	46	121
2002	92	36	128
2003	116	8	124
2004	72	22	94
2005	65	28	93
2006	68	51	119
2007	62	27	89
Avg. 2001-2006	**81**	**32**	**113**
2008	**--**	**--**	***107***
2009	**--**	**--**	***127***
2010	**--**	**--**	***118***
2011	**--**	**--**	***98***
Projection			
2012	81	32	113
2017	81	32	113
2027	81	32	113

Sources: FAA TAF, Mead & Hunt, Inc.

As can be noted in table above, historically, very few military operations are conducted at the Airport on an annual basis. This trend is expected to continue in the future. In 2011, 98 military aircraft operations were recorded. The forecast predicted that 81 military operations would be recorded in 2012.

2.7 General Aviation Operations Projections

General aviation is defined as that portion of civil aviation that encompasses all facets of aviation except commercial and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements must be projected.

The following elements are presented in this section:

- **Based aircraft projections**
- **Based aircraft fleet mix**
- **General aviation aircraft operations**

2.7.1 Based Aircraft Projections

There has been an overall decline in the number of based aircraft at the Airport during the study period from 102 in 1995 to 84 in 2007. Historically, there has been demand for additional hangars to be constructed at the Airport; however, the availability of land and community desires or expectations may limit the potential for development. It is generally recognized that the demand for general aviation hangar space is significantly greater than availability, and the number of based aircraft has been significantly limited by the availability of aircraft storage space. This makes it difficult to identify any significant trends when projecting the future number of based aircraft at this facility, as it is more dependent upon the availability of facilities and development areas available than on demand, particularly due to the large number of business jets that use the Airport.

For analysis purposes, several methodologies were examined to project based aircraft, including a market share, socio-economic population variable, and socio-economic income variable. These methodologies all result in very similar projections. As previously mentioned, Aspen and some other communities strive to control population and development in order to maintain the character of the area. Accordingly, the socio-economic population projection methodology is preferred. This projects a moderate compound annual growth rate of 1.23 percent in the number of based aircraft at the Airport commensurate with the projected increase in population and results in 90 in 2012, 95 in 2017, and 107 in 2027 (see **Table 2-7**).

It is recognized that the demand for based aircraft and hangars greatly exceeds the supply and what is projected by this methodology. Given the affluent community, high real estate values, and large amount of business jet traffic at the Airport, the demand for hangar space for business jets is high at the Airport. Airport Management reports that they receive 10 to 20 inquiries per year regarding the desire to lease or build corporate hangar facilities at the Airport. However, physical features, availability of land, and community desires or expectations are likely to limit hangar development and therefore based aircraft.

These based aircraft projections serve an analysis function within the context of this Master Plan, but are in no way indicative of the total demand for the number of aircraft storage facilities that may be attainable or desirable on the part of the Airport and the community.

Table 2-7. Based Aircraft Projection Summary

Year	Based Aircraft	FAA TAF Projection	Market Share Projection	Socio-economic Projection Population	Socio-economic Projection Income
Historical					
1995	102				
1996	102				
1997	102				
1998	102				
1999	103				
2000	103				
2001	83				
2002	83				
2003	84				
2004	83				
2005	83				
2006	83				
2007	84				
CAGR 1995-2007	*-1.60%*				
2011	*100*				
Projection					
2012		96	90	90	91
2017		107	97	95	98
2027		129*	107	107	113
CAGR 2007-2027		*2.12%*	*1.22%*	*1.23%*	*1.46%*

**Projected by Mead & Hunt through linear extrapolation of FAA projections.*
Sources: Woods and Poole Economics, Inc., FAA, Mead & Hunt, Inc.

With regard to a current number of total based aircraft, an exact count has not been recently conducted; however, airport and FBO staff indicate that there are approximately 100 aircraft currently based at the Airport as noted in the table above.

2.7.2 Based Aircraft Fleet Mix

A breakdown of historical and projected based aircraft fleet mix is presented in **Table 2-8**. The Airport has seen a decline in the percentage of multi-engine and jet aircraft during the study period and an incline in single engine aircraft. The FAA has reported that the continued introduction of VLJs, coupled with a strong market for business jets, will drive general aviation in upcoming years. Near-term, high fuel prices and economic concerns are dampening the general aviation industry, but the long-term outlook remains favorable.

Table 2-8. Based Aircraft Fleet Mix

Year	Single Engine	%	Multi-Engine	%	Jet	%	Other	%	Total
Historical									
1995	74	73%	13	13%	10	10%	5	5%	102
1996	74	73%	13	13%	10	10%	5	5%	102
1997	74	73%	13	13%	10	10%	5	5%	102
1998	74	73%	13	13%	10	10%	5	5%	102
1999	80	78%	11	11%	7	7%	5	5%	103
2000	80	78%	11	11%	7	7%	5	5%	103
2001	74	89%	5	6%	2	2%	2	2%	83
2002	74	89%	5	6%	2	2%	2	2%	83
2003	75	89%	5	6%	2	2%	2	2%	84
2004	74	89%	5	6%	2	2%	2	2%	83
2005	74	89%	5	6%	2	2%	2	2%	83
2006	74	89%	5	6%	2	2%	2	2%	83
2007	75	89%	5	6%	2*	2%	2	2%	84
CAGR 1995-2007	*0.11%*		*-7.65%*		*-12.55%*		*-7.35%*		*-1.60%*
2011	*85*	85%	*12*	12%	*2*	2%	*1*	1%	*100*
Projection									
2012	79	88%	5	6%	4	4%	2	0%	90
2017	82	87%	6	6%	5	5%	2	0%	95
2027	91	85%	8	7%	6	6%	2	0%	107
CAGR 2007-2027	*0.97%*		*2.04%*		*6.00%*		*0.34%*		*1.22%*

Sources: FAA Terminal Area Forecast June 2008, Mead & Hunt, Inc.

Note: Helicopters are not included in this table as there have not been any reported at the Airport during the study period and are not projected to increase in number.

**Airport Management has noted that as of August 2008, there were no longer 2 jet aircraft on-site.*

2.7.3 Historical General Aviation Aircraft Operations

General aviation operations have declined throughout the study period. The highest number of operations was in 1995 when 34,801 were recorded, and the lowest was 23,196 in 2007. This decline reflects other trends of travel behavior both locally and nationally with respect to general aviation. The cost of operation and ownership of aircraft has increased, which has impacted operations and hours flown nationally, though general aviation operations at Aspen/Pitkin County Airport are also limited by airspace capacity given the counter-flow operations at the Airport due to the surrounding terrain.

2.7.4 Methodologies

Because there has been a general downturn in GA operations, time-series projection methodologies will only extrapolate this trend. Therefore, two methodologies were examined to project GA activity. The first is the market share methodology, which compares local operations with national figures to determine the Airport's proportion. As shown, the Airport's market share has declined during the study period. Between 1995 and 2006, the Airport's average market share was 0.0816 percent. There is a correlation coefficient of 0.94 between total U.S. GA operations and Aspen/Pitkin County Airport GA operations from 2001 to 2006. The average market share from 1995 to 2006 is applied to national projections of aviation activity to predict 28,719 operations in 2012; 30,333 in 2017; and 33,560 in 2027, resulting in a CAGR of 1.35 percent.

The second is socio-economic population variable methodology, which compares annual general aviation operations to the population of Pitkin County to determine per capita GA. Between 1999 and 2001, annual GA operations declined by nearly 5,000 while local population increased slightly. There is a correlation coefficient of 0.56 between total GA operations and Pitkin County population from 2001 to 2006. Therefore, the average number of per capita GA operations for years 2001-2006, 1.84, is multiplied by population projections obtained by Woods & Poole, Inc. to determine GA operations projections. This methodology projects 29,418 GA operations in 2012; 31,269 in 2017; and 35,183 in 2027, which results in a CAGR of 1.58 percent.

2.7.5 Method Comparison and Preference

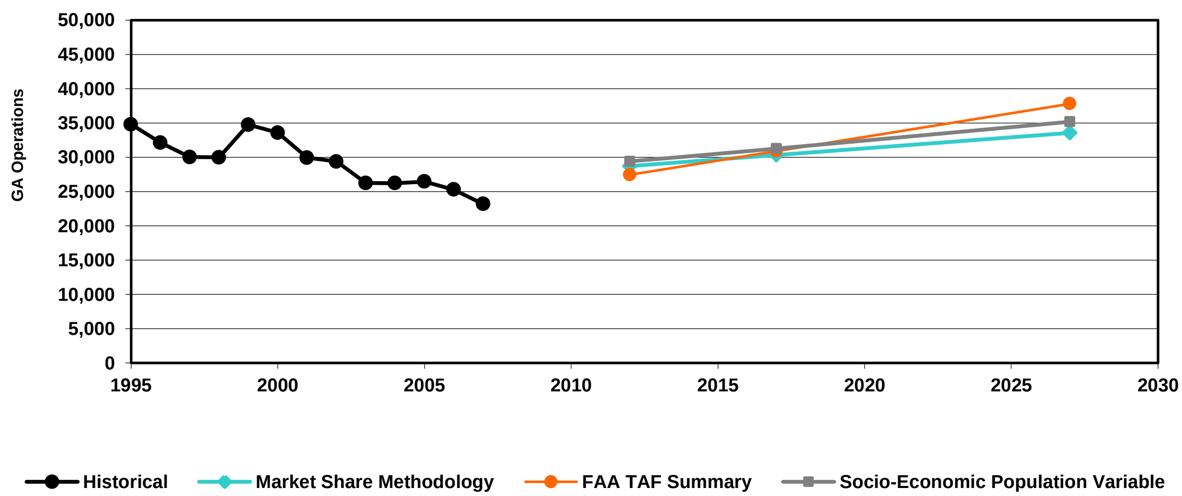
Projections of the methodologies presented in this section are shown in **Table 2-9** and **Chart 2-3**. As noted previously, the Airport's market share of GA operations has fluctuated significantly during the study period. However, between 2001 and 2006, the Airport's market share compared with the U.S. total has not varied significantly and garners a correlation coefficient of 0.94 during that time period. Therefore, the market share methodology is the preferred forecast for long-term planning purposes.

Table 2-9. General Aviation Operations Projections – Method Comparison				
Year	**GA Operations**	**FAA TAF Projection**	**Market Share Methodology**	**Socio-economic Population**
Historical				
1995	34,801			
1996	32,134			
1997	30,037			
1998	29,975			
1999	34,748			
2000	33,586			
2001	29,930			
2002	29,377			
2003	26,241			
2004	26,227			
2005	26,464			
2006	25,302			
2007	23,196*			
CAGR 1995-2007	*-2.54%*			
2008	***23,698***			
2009	***21,053***			
2010	***19,842***			
2011	***19,171***			
Projection				
2012		27,448	28,719	29,418
2017		30,899	30,333	31,269
2027		37,801	33,560	35,183
CAGR 2007-2027		*1.91%*	*1.35%*	*1.58%*

Sources: Airport Management Records, FAA TAF, Mead & Hunt, Inc.

* *Runway closed for 60 days for runway rehabilitation.*

Chart 2-3. GA Aircraft Operations Comparison



Sources: Airport Management Records, FAA Terminal Area Forecast 2008-2025, Mead & Hunt, Inc.

As noted in the table above, the number of general aviation operations at the Airport has declined since this Master Plan's forecasts were prepared and approved by the FAA in 2008. This decline is primarily in response to the economic downturn in recent years; however, the level of general aviation aircraft activity at Aspen/Pitkin County Airport is tracking with national trends. In calendar year 2011, there were 19,171 general aviation operations recorded at the Airport, while the Master Plan forecast indicated that there would be approximately 29,000 operations in 2012. The FAA expects general aviation activity to slowly increase over the next few years, with the most growth in activity occurring within the larger general aviation aircraft types, especially business jets. Although it is important to recognize the recent declining trend in general aviation activity, the effect on the recommendations for this master plan is insignificant. With regard to space reservation for future general aviation facilities in this master plan, facilities will only be built in response to a proposal from a project proponent and only after all local and federal approvals are received. As is noted in later chapters of this document, the majority of the space reservation programming for general aviation facilities is related to the potential for a second FBO serving the Airport.

2.7.6 Local/ Itinerant Operations

A summary of local and itinerant operations based on the preferred methodologies presented in this chapter is shown in **Table 2-20**.

The number of air carrier operations is defined by the FAA as commercial operations by aircraft with over 60 seats. **Table 2-13** presented the number of air carrier departures by seat group size. The number of total commercial operations remaining (presented in **Table 2-12**), after the subtraction of the air carrier operations, is the number of air taxi operations. The air taxi operations include scheduled operations by aircraft with 60 seats or under and unscheduled fractional ownership and charter aircraft.

Table 2-14 presented the projected number of local and itinerant military operations.

Table 2-19 presented the preferred general aviation operations projection (market share methodology). The local-itinerant split in general aviation operations from 1995-2006 has averaged 9.79 percent local and 90.21percent itinerant; this local-itinerant split has been maintained through the planning period.

Table 2-10. Local/Itinerant Operations

Year	Air Carrier	%	Air Taxi	%	Itin. GA	%	Itin. Military	%	Local GA	%	Local Military	%	Total
Historical													
1998	11,475	*25.1*	4,233	*25.1*	26,471	*57.8*	66	*0.1*	2,429	*5.3*	42	*0.1*	45,791
1999	7,363	*15.9*	3,864	*15.9*	25,807	*55.8*	217	*0.5*	3,024	*6.5*	50	*0.1*	46,242
2000	7,632	*15.7*	7,199	*15.7*	25,717	*52.9*	167	*0.3*	3,570	*7.3*	72	*0.1*	48,656
2001	6,988	*15.2*	9,008	*15.2*	27,546	*59.8*	75	*0.2*	1,952	*4.2*	46	*0.1*	46,047
2002	6,902	*14.9*	10,034	*14.9*	31,724	*68.3*	92	*0.2*	2,042	*4.4*	36	*0.1*	46,441
2003	6,580	*15.3*	10,034	*15.3*	30,016	*69.8*	116	*0.3*	1,737	*4.0*	8	*0.0*	42,979
2004	5,233	*11.9*	12,468	*11.9*	27,978	*63.6*	72	*0.2*	1,207	*2.7*	22	*0.0*	44,022
2005	5,130	*11.6*	12,538	*11.6*	27,335	*61.8*	65	*0.1*	1,305	*3.0*	28	*0.1*	44,225
2006	5,411	*12.1*	13,847	*12.1*	24,504	*54.8*	68	*0.2*	609	*1.4*	51	*0.1*	44,679
2007	6,378	*15.1*	12,700	*15.1*	25,020	*54.4*	45	*0.1*	1,157	*2.7*	29	*0.1*	42,348*
CAGR 1995-2006	*-8.97%*		*15.97%*		*-0.96%*		*0.37%*		*-15.9%*		*2.46%*		*-0.31%*
Projection													
2012	8,486	17.0%	12,702	25.4%	25,907	51.8%	81	0.2%	2,812	5.6%	32	0.1%	50,020
2017	9,145	17.4%	13,100	24.9%	27,363	51.9%	81	0.2%	2,970	5.6%	32	0.1%	52,691
2027	11,125	19.1%	13,445	23.1%	30,275	52.0%	81	0.1%	3,286	5.6%	32	0.1%	58,244
CAGR 2006-2027	*3.49%*		*-0.14%*		*1.52%*		*0.86%*		*8.36%*		*-2.22%*		*1.27%*

Sources: Airport management records, Mead & Hunt, Inc.

Note: Airport management historical operations records date to 1998.

**Airport was closed for 60 days for runway rehabilitation*

2.7.7 Instrument Operations

A specific element of this Master Plan is to develop instrument operations projections. According to the FAA, an instrument operation is an aircraft operation in accordance with an Instrument Flight Rule (IFR) flight plan or an operation where IFR separation between aircraft is provided by an air traffic control facility. Historical and projected instrument operations by type are presented in **Table 2-11**. Instrument operations projections are developed by multiplying the average percentage of instrument operations from 1995-2007 by the number of projected operations (presented in **Table 2-20** and in earlier sections). It should be noted that the number of instrument operations may exceed the number of aircraft operations due to missed approaches or other factors (i.e., air carrier operators are required to fly IFR during all passenger operations).

Table 2-11. Instrument Operations Projections

Year	Air Carrier	% Total	Air Taxi	% Total	General Aviation	% Total	Military	% Total
Historical								
1995	7,155	102.4%	1,332	69.9%	12,493	35.9%	53	22.2%
1996	7,051	97.7%	3,079	104.5%	13,699	42.6%	37	11.8%
1997	10,635	114.7%	4,225	82.5%	15,142	50.4%	15	8.4%
1998	11,463	99.9%	4,150	98.0%	16,918	56.4%	26	24.1%
1999	7,364	100.0%	3,840	99.4%	19,893	57.2%	40	15.0%
2000	8,554	112.1%	7,914	109.9%	22,613	67.3%	18	7.5%
2001	6,949	99.4%	8,991	99.8%	17,016	56.9%	28	23.1%
2002	6,826	98.9%	9,870	98.4%	16,766	57.1%	24	18.8%
2003	6,576	99.9%	10,028	99.9%	15,695	59.8%	19	15.3%
2004	5,222	99.8%	12,358	99.1%	16,968	64.7%	27	28.7%
2005	5,136	100.1%	12,563	100.2%	17,461	66.0%	16	17.2%
2006	5,412	100.0%	13,793	99.6%	18,045	71.3%	12	10.1%
2007	6,391*	100.2%	12,654*	99.6%	15,739*	67.9%	8*	10.8%
CAGR 1995-2006	*-2.51%*		*23.68%*		*3.40%*		*-12.63%*	
Avg. Percent 1995-2006		102.08%		96.77%		57.14%		16.85%
Projection								
2012	8,662	102.08%	12,292	96.77%	16,410	57.14%	19	16.85%
2017	9,335	102.08%	12,677	96.77%	17,332	57.14%	19	16.85%
2027	11,356	102.08%	13,011	96.77%	19,177	57.14%	19	16.85%
CAGR 2006-2027	*3.59%*		*-0.28%*		*0.29%*		*2.23%*	

Sources: Airport Management Records, FAA TAF, Mead & Hunt, Inc.

** Runway closed for 60 days for runway rehabilitation.*

2.8 Operations Forecast by Aircraft Type

Utilizing the projected number of aircraft operations by operation type (air carrier, general aviation, etc.) developed in the previous sections, this section presents the forecasts of operations by aircraft type.

Table 2-12 presents the number of operations by aircraft type. This table also shows the number of scheduled passenger air carrier operations as reported by *APGData, Data Base Products, Inc*., and the projections developed for these operations presented in a previous section.

Table 2-12. Operations Forecast by Aircraft Type

Operation Type	Representative Aircraft	Historical 2006	Historical 2007	Projected 2012	Projected 2017	Projected 2027	*CAGR 2006-2027*
Passenger Air Carrier / Commuter	0-20 Seats (Beech 1900)	0	0	0	0	0	-
	20-39 Seats (Saab 340, DCH8-200)	4,406	3,498	3,637	3,382	2,279	*-3.1%*
	40-59 Seats (CRJ, EMB145)	0	0	0	0	0	-
	60-85 Seats (Q400, CRJ700, ERJ170)	3,626	7,124	8,244	8,644	10,052	*5.0%*
	86-100 Seats (AvroRJ, CRJ900, ERJ190)	2,056	0	242	501	1,072	*-3.1%*
	Total Air Carrier / Commuter	*10,088*	*10,622*	*12,123*	*12,528*	*13,403*	*1.4%*
Air Taxi & GA Itinerant	Single Engine Piston	3,386	3,050	3,147	3,337	3,315	*-0.1%*
	Multi-Engine Piston	339	305	350	371	414	*1.0%*
	Turboprop	2,709	2,440	2,798	2,966	3,315	*1.0%*
	Business Jet	27,090	24,396	28,327	30,035	33,982	*1.1%*
	Helicopter	339	305	350	371	414	*1.0%*
	Total Air Taxi & GA itinerant	*33,863*	*30,495*	*34,972*	*37,080*	*41,442*	*1.0%*
Military Itinerant	UH-60, C-130	68	45	81	81	81	*0.9%*
	Total Itinerant	***44,019***	***41,162***	***47,176***	***49,689***	***54,926***	***1.1%***
General aviation Local	Single Engine Piston	548	1,041	2,530	2,673	2,957	*8.4%*
	Multi-Engine Piston	61	116	281	297	329	*8.4%*
	Total GA Local	*609*	*1,157*	*2,812*	*2,970*	*3,286*	*8.4%*
Military Local	UH-60, C-130	51	29	32	32	32	*-2.2%*
	Total Local	***660***	***1,186***	***2,843***	***3,001***	***3,317***	***8.0%***
	Total Annual Operations	**44,679**	**42,348**	**50,020**	**52,691**	**58,244**	***1.3%***

Sources: APGData, 2007 ASDI data, Mead & Hunt, Inc

The air taxi fleet is significant at Aspen, due to some charter flight activity, but most significantly due to the large number of fractional ownership aircraft that are recorded by the FAA as air taxi commercial operations. These fractional ownership aircraft are recorded as air taxi operations and tracked by the "N" number (aircraft registration number) assigned to these aircraft. Given that these aircraft are private, on-demand aircraft, this air taxi activity has a fleet mix very similar to that of the itinerant general aviation fleet. Therefore, for the purposes of forecasting operations by aircraft type, air taxi and general aviation itinerant activity have been summarized together.

The number of operations by aircraft type for unscheduled air taxi and general aviation operations in 2007 was generalized from data provided by Barnard Dunkelberg & Company (BDC). BDC had obtained current (2007) operations by aircraft type from the Federal Aviation Administration's (FAA's) Aircraft Situation Display to Industry (ASDI) data feed.

As noted in earlier sections, due to the desirable destination market that the Airport serves, the affluent visitor base and users, and the high real estate values within the community, the Airport experiences a high number of business jet operations. The Airport is consistently one of the top destinations for fractional ownership and charter aircraft operators. During high travel weekends the Airport's apron is at or near capacity. The affluent visitor base and users drive an extremely strong demand for business jet activity. This predominance of business jets is anticipated to continue through the planning period, and even become slightly more pronounced with the growing fleet of very light jets (VLJs).

Local general aviation activity is very limited and consists primarily of single engine piston operations.

Military activity is also very limited and is performed by a variety of military aircraft including the C-21 and the UH-60 Blackhawk helicopter, with no dominant aircraft types. Helicopter activity is generally related to search and rescue, medical flights, and film industry work.

2.9 Aviation Demand Peaking Characteristics

An important component of this Master Plan Update is identification of projected peak demand times and figures. These projections are important for various facility planning purposes. Facility and equipment requirements are often determined by peak passenger and operation activity in a given time frame. This section features annual, monthly, daily, and hourly peak figures for airport passenger activity (enplanements plus deplanements), passenger enplanements, and aircraft operations. Methodologies for base year 2007 are presented in the following sections:

- Enplanements and passenger activity
- Aircraft Operations

A summary of peak aviation activity is presented in **Table 2-13 and Table 2-14** at the end of section 2.9.1.

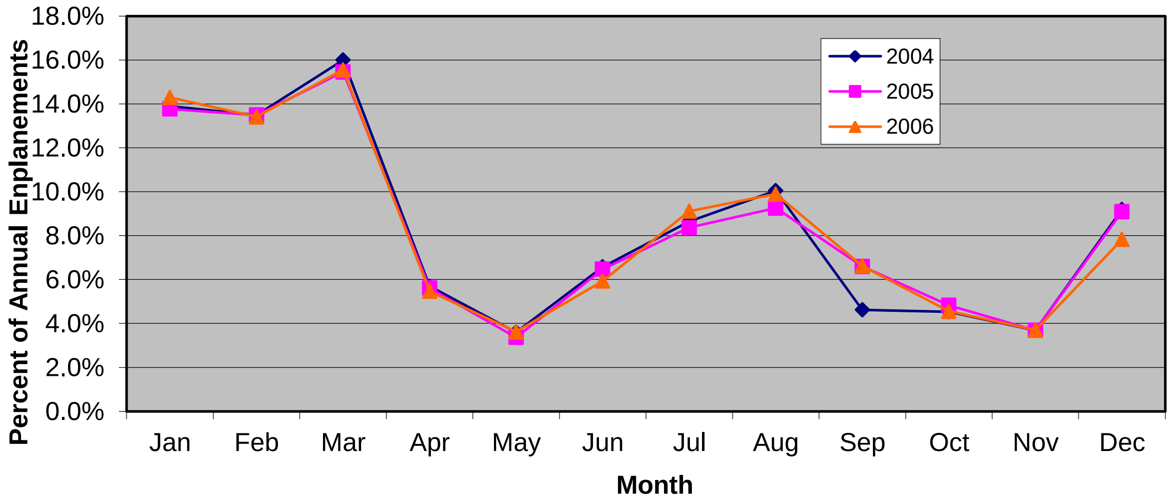
2.9.1 Peak Enplanements and Passenger Activity

The Airport records data for annual passenger enplanements and deplanements. Historically, March has been the busiest month in terms of passenger activity. The percentage of passenger enplanements in the peak month from 2004 to 2006 is shown in **Chart 2-5**. Between 2004 and 2006, the average percent of enplanements and deplanements that occurred in the peak month was 15.7 percent. To obtain peak month enplanements, this figure is applied to projected annual passenger enplanements that are presented in Section 2.4, *Passenger Enplanement Projections*.

Historically, peak month deplanements are approximately 4.6 percent lower than peak month enplanements. This figure is applied to peak month enplanements to determine peak month deplanements.

A summarization of peak month enplanement activity is shown in **Table 2-22**.

Chart 2-4. Peak Month Passengers

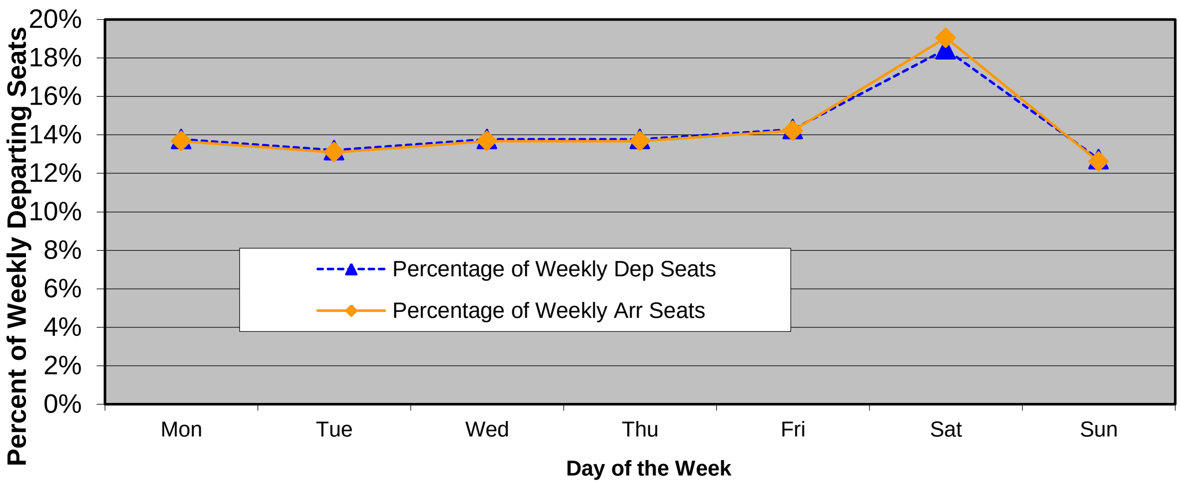


Sources: Aspen/Pitkin County Airport, Mead & Hunt, Inc. Note: The Airport was closed for 60 days in 2007.

Available schedule data obtained from APGData includes daily departure and arrival times, as well as aircraft seat capacity. The average monthly load factor for peak month (March) in base year 2007 is applied to all departing and arriving aircraft to determine the number of enplaned/deplaned passengers for each day of the week. Percentages of weekly seats by day in peak month are presented in **Chart 2-5**.

Figures for peak day in the peak month (PDPM), as well as average day in the peak month (ADPM), are presented in **Table 2-22**. The ADPM equals peak month figure divided by 31. PDPM historically occurs on a Saturday in March when 18.4 percent of seats each week occur. Peak month projections are divided by the number of weeks in March (4.4) and the average percent of Saturday enplanements that typically occur is applied.

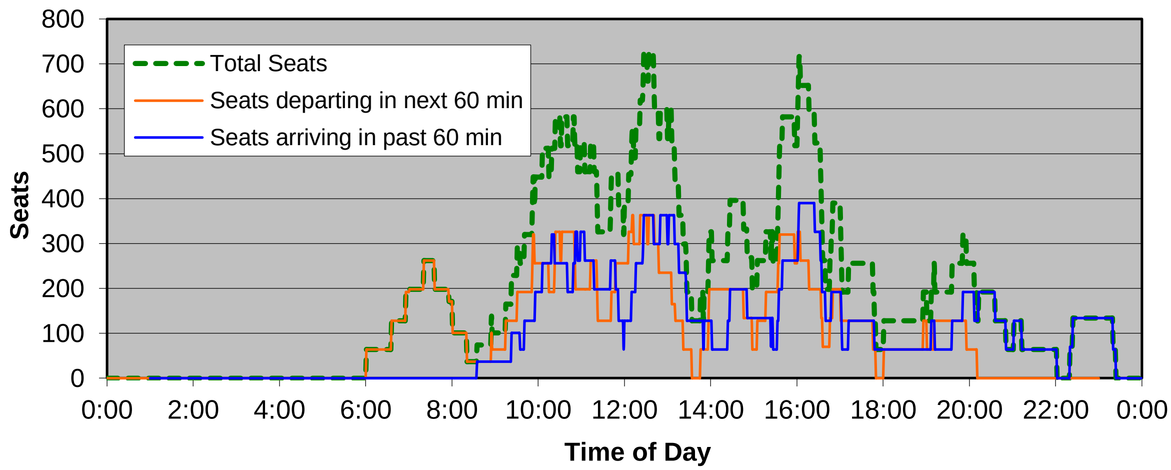
Chart 2-5. Peak Day Passengers



Sources: APGData, Mead & Hunt, Inc.

Peak hour activity during peak day and peak hour on an average day are shown in **Chart 2-6**. Data obtained from APGData reveals that the period when the most total passengers (enplaned and deplaned) passengers are at the Airport (15.9 percent of the daily total) is between 12:20pm and 1:19pm. Peak hour enplanements of departing passengers occurs from 12:31pm to 1:30pm and is also 15.9 percent of total daily enplanements. Peak hour deplanements or arriving passengers occurs from 3:25pm to 4:24pm and is 17.1 percent of total daily deplanements. To determine projections for peak hour on an average day, this percentage is applied to the average number of passengers on an average day and on an average Saturday (peak day) during the peak month.

Chart 2-6. Peak Hour Passengers



Sources: APGData, Mead & Hunt, Inc.

A summarization of peak hour passenger activity is shown in **Table 2-23**.

Table 2-13. Terminal Peak Enplanements and Passenger Activity				
Year	**Peak Factor**	**Enplanements**	**Deplanements**	**Passenger Activity Enplanements + Deplanements**
2006	Annual	203,516	197,787	401,303
	Peak Month (15.7%)	31,657	29,637	61,294
	Peak Month Avg. Day ((1)/31 = 3.2%)	1,021	956	1,977
	Peak Month Peak Day (1)	1,324	1,367	2,691
	Peak Hour Avg. Day (2)	162	163	326
	Peak Hour Peak Day (2)	211	234	445
2012	Annual	229,984	223,510	453,495
	Peak Month	36,036	34,382	70,417
	Peak Month Avg. Day	1,162	1,109	2,272
	Peak Month Peak Day	1,501	1,549	3,051
	Peak Hour Avg. Day	185	190	374
	Peak Hour Peak Day	239	265	504
2017	Annual	250,452	243,402	493,854
	Peak Month	39,243	37,441	76,684
	Peak Month Avg. Day	1,266	1,208	2,474
	Peak Month Peak Day	1,635	1,687	3,322
	Peak Hour Avg. Day	201	207	408
	Peak Hour Peak Day	260	289	549
2027	Annual	295,542	287,223	582,765
	Peak Month	46,308	44,182	90,490
	Peak Month Avg. Day	1,494	1,425	2,919
	Peak Month Peak Day	1,929	1,991	3,920
	Peak Hour Avg. Day	238	244	481
	Peak Hour Peak Day	307	341	648

Sources: Airport Administration Records, APGData, FAA TAF, Mead & Hunt, Inc.
Note: Historically, peak month passenger deplanements are approximately 4.6 percent lower than peak month enplanements. This figure is applied to peak month enplanements to determine peak month deplanements.
(1) 18.4% of weekly activity on typical Saturday, 4.4 weeks in peak month (March) = 4.2% of monthly passengers.
(2) Peak hour is 15.9% of daily enplanements, 17.1% of daily deplanements, 15.9% of total passengers.

2.9.2 Peak Aircraft Operations

Projected annual aircraft operations are presented in Section 2.5 of this chapter. Projections for total operations are based on the ratio of monthly to annual operations in base year 2007 and are shown in **Chart 2-7**. As shown in **Chart 2-7**, July typically represents the peak month in total operations, an average of 13 percent of annual operations. In July 2006, this included:

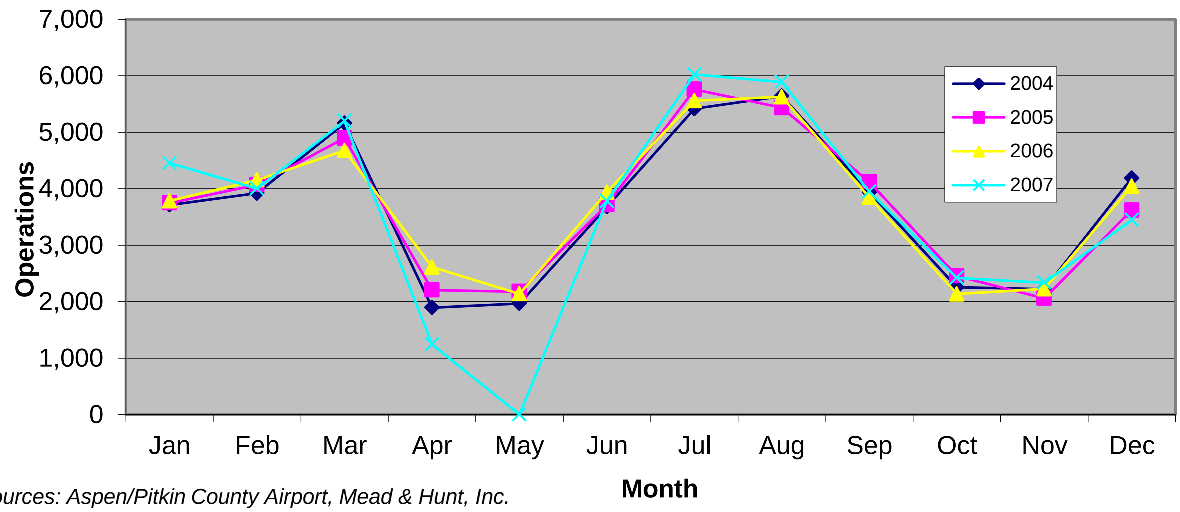
- 10.4 percent of the annual air carrier operations
- 13.9 percent of the annual air taxi/commuter operations
- 12.1 percent of the annual GA operations
- 9.6 percent of the annual military operations

The peak month for scheduled commercial activity occurs in March. In March 2006, this included:

- 17.1 percent of the annual air carrier operations
- 9.0 percent of the annual air taxi/commuter operations
- 9.8 percent of the annual GA operations
- 3.2 percent of the annual military operations

Preferred methodologies for annual commercial and general aviation operations are applied.

Chart 2-7. Total Monthly Airport Operations



Sources: Aspen/Pitkin County Airport, Mead & Hunt, Inc.
Note: The Airport was closed for 60 days in 2007.

Summaries for total and commercial peak month operations are shown in **Table 2-14**.

Peak day projections have been developed for this Master Plan Update. The number of peak month operations is divided by 31 to determine the average number of daily operations. Though passenger enplanements are not necessarily indicative of aircraft activity given the peaking that typically occurs on weekend activity, the same figure for peak day in peak month of 18.4 percent that occurs on a Saturday in March was applied to determine peak day peak month operations. This number may not reflect spikes in activity that may occur for special events or attractions that bring in a high proportion of general aviation activity, but when examined in conjunction with the average day during peak month figure, it provides a range of expected activity. Daily peak operations are summarized in **Table 2-14**.

Airline schedules from APGData were reviewed to determine peak hour scheduled operations. As was noted in Section 2.8.1, peak hour scheduled activity is approximately 15.9 percent of the daily total.

For non-scheduled activity, the Airport is closed from 2300 to 0700 and experience has shown that approximately 90 percent of total daily operations will occur between the hours of 7:00am and 7:00pm (12 hours) at a typical airport, and that the maximum peak hourly occurrence may be 50 percent greater than the average of the hourly operations calculated for this time period. Therefore, the Estimated Peak Hourly Demand (P) in a given month was determined by compressing 90 percent of the Average Daily Operations or Peak Daily Operations (D) in the peak month into the 12 hour peak use period, reducing that number to an hourly average for the peak use period, and increasing the result by 50 percent, as follows:

Where D = Average Daily Operations or Peak Daily Operations in a given month.
P = Peak Hourly Demand in a given month.
$P = 1.5\ (0.90D \div 12 \text{ hours})$

A summary table of projected peak passenger and aircraft activity is shown below.

Table 2-14. Peak Aircraft Operations

Year	Peak Factor	Air Carrier (March)	Air Carrier (July)	Air Taxi/Commuter (July)	GA (July)	Military (July)	Total (July)
2006	Annual	5,411	5,411	13,847	25,302	119	44,679
	Peak Month	927	560	1,919	3,070	9	5,558
	Peak Month Avg. Day	30	18	62	99	0	179
	Peak Month Peak Day	39	23	80	128	0	232
	Peak Hour Avg. Day	5	3	7	11	0	21
	Peak Hour Peak Day	6	4	9	14	0	27
2012	Annual	8,486	8,486	12,702	28,719	113	50,020
	Peak Month	1,451	883	1,753	3,475	11	6,121
	Peak Month Avg. Day	47	28	57	112	0	197
	Peak Month Peak Day	61	37	73	145	0	256
	Peak Hour Avg. Day	7	5	6	13	0	24
	Peak Hour Peak Day	10	6	8	16	0	31
2017	Annual	9,145	9,145	13,100	30,333	113	52,691
	Peak Month	1,564	951	1,808	3,670	11	6,440
	Peak Month Avg. Day	50	31	58	118	0	208
	Peak Month Peak Day	65	40	76	153	0	269
	Peak Hour Avg. Day	8	5	7	13	0	25
	Peak Hour Peak Day	10	6	9	17	0	32
2027	Annual	11,125	11,125	13,445	33,560	113	58,244
	Peak Month	1,902	1,157	1,855	4,061	11	7,084
	Peak Month Avg. Day	61	37	60	131	0	229
	Peak Month Peak Day	80	48	78	170	0	296
	Peak Hour Avg. Day	10	6	7	15	0	27
	Peak Hour Peak Day	13	8	9	19	0	36

Sources: Airport Administration Records, APGData, FAA TAF, Mead & Hunt, Inc.

2.10 Auto Parking Demand Projections

A specific element of this Master Plan Update is a forecast for parking spaces. This section presents public, employee, and rental car parking needs for 5-, 10-, and 20-year horizons.

2.10.1 Public Parking

Normally, parking analyses use an "average day peak month" (ADPM) as the design day for forecasts. At the time this document was developed, monthly historical parking data were not available. Therefore, for the purposes of this study, the peak day in 2007 was used as the design day. It is important to note that because Aspen/Pitkin County is primarily a destination market, peak periods of passenger activity do not generally correspond with peak periods of parking demand. This is because visitors generally rent cars or take shuttles or taxis to arrive at their final destination. Peak parking demand generally occurs in the "off-season" when stores and restaurants close or scale down and locals go on vacation. According to Airport staff, this typically occurs during September-November and April-June. For purposes of this study, the design day for peak parking demand is during the Thanksgiving Holiday 2007 (November 22-23).

This analysis includes a cushion of spaces beyond the actual forecasted demand. These "empty" spaces are needed to ensure good circulation and to curb the loss of some spaces due to incorrectly parked vehicles, minor construction, etc. It also ensures that, on most days, customers will be able to find parking without having to search for the last few spaces in the parking system. This can cause delays for people anxious to catch a flight, and thus provide a negative customer experience. The circulation cushion, also known as an effective supply cushion, allows the system to operate with maximum efficiency. Adversely, if a parking supply is built to accommodate the absolute peak demand and provide an effective supply cushion in addition, there will be a considerable number of spaces that sit empty many days of the year. Instead, it is recommended to build to design day conditions and allowing the effective supply cushion (15 percent of the total supply) to absorb the excess cars on the "spike" days per year. In other words, this analysis assumes that the maximum desired occupancy in long- and short-term parking lots is 85 percent.

According to airport staff, there are several occurrences per year that mirror the design day in that parking demand exceeds supply. On Thanksgiving Day 2007, demand exceeded capacity by approximately 8 percent for the short-term lot and approximately 13 percent for the long-term lot. These percentages are compared to annual passenger enplanements and extrapolated over 20 years. Long-term and short-term peak day parking projections are displayed in **Table 2-15**. Because peak day parking demand exceeded capacity a number of times in 2007, the effective supply of parking spaces equals the previously noted 15 percent cushion plus the number of spaces by which demand was exceeded. As shown, in order to accommodate peak day parking demand, the Airport currently needs a total of 31 additional spaces and will need an additional 166 spaces by 2027. In order to meet effective parking supply projections, the Airport currently needs 80 additional parking spaces and will need an additional 235 spaces by 2027.

Table 2-15. Public Parking Requirements – Peak Day Methodology				
		Long-term	**Short-term***	**Airport Total/ Spaces Needed ** **
Parking Inventory		*155*	*141*	*296*
2007	Enplanements***			196,105
	Peak Day Spaces Occupied	175	152	327
	Spaces per 1,000 Enplanements	0.892	0.775	1.667
	Projected Surplus/Deficit	-20	-11	**-31**
	Effective/Desired Supply	201	175	376
	Surplus/Deficit Needed to Meet Effective/Desired Supply	-46	-34	**-80**
2012	Projected Enplanements			229,984
	Spaces per 1,000 Enplanements	0.892	0.775	1.667
	Projected Spaces Occupied	205	178	383
	Projected Surplus/Deficit	-50	-37	**-87**
	Effective/Desired Supply	236	205	441
	Surplus/Deficit Needed to Meet Effective/Desired Supply	-81	-64	**-145**
2017	Projected Enplanements			250,452
	Spaces per 1,000 Enplanements	0.892	0.775	1.667
	Projected Spaces Occupied	223	194	418
	Projected Surplus/Deficit	-68	-53	**-122**
	Effective/Desired Supply	257	223	480
	Surplus/Deficit Needed to Meet Effective/Desired Supply	-102	-82	**-184**
2027	Projected Enplanements			295,542
	Spaces per 1,000 Enplanements	0.892	0.775	1.667
	Projected Spaces Occupied	264	229	493
	Projected Surplus/Deficit	-109	-88	**-197**
	Effective/Desired Supply	303	263	567
	Surplus/Deficit Needed to Meet Effective/Desired Supply	-148	-122	**-271**

Sources: Aspen/Pitkin County Airport, Mead & Hunt, Inc.
Notes:
** Following development of parking demand projections, the Airport converted 26 short-term parking spaces to general aviation parking ramp.*
*** These assumptions are based on a symmetrical increase for the peak design day, in this case, November 22-23, that is commensurate with projected annual growth.*
**** Estimated by Mead & Hunt to account for runway closure (183,632 actual).*

2.10.2 Employee Parking

According to Airport management, there are 69 parking spaces available for employees. During a recent survey there were about 120 employees and the lot was usually three-fourths full during shift overlap times. It is assumed that when there are 140 employees at the Airport, the employee lot is at full capacity, and during shift overlaps, all 69 spaces will be used.

It is reasonable to assume that if enplanements increase from 196,105 to 295,542 over the next 20 years, some additional airline staff will be necessary. For example, if the number of terminal employees increased at the same rate as enplanements, the size of the employee lot will also need to be expanded (see **Table 2-16**). For comparison, if the ratio of enplanements to employee vehicles parked in the employee lot in 2027 is identical to the ratios used in 2007, the vehicle demand for employee parking will increase from the current 69 spaces to 104 spaces in 2027 (35 more than the current supply).

Table 2-16. Employee Parking

	2007 (Actual)	**2012 (Projected)**	**2017 (Projected)**	**2027 (Projected)**
Enplanements	196,105*	229,984	250,452	295,542
Terminal Employees	140	164	179	211
Employees per 1,000 Enplanements	0.714	0.714	0.714	0.714
Employees Vehicles per 1,000 Enplanements	0.352	0.352	0.352	0.352
Vehicles in Employee Lot	**69**	**81**	**88**	**104**

Source: Aspen/Pitkin County Airport, Mead & Hunt, Inc.
** Estimated by Mead & Hunt to account for runway closure (183,632 actual).*

2.10.3 Rental Car Ready/Return and Storage

According to Aspen/Pitkin County Airport's 2007 Customer Facility Charge Report, there were 125,473 individual rental transaction days generated at the Airport in 2007. Based on data provided by on-site rental car agencies, there were an estimated 24,548 rental car transactions in 2007, which results in an average rental period of 5.1 days per transaction.

Since most cars are rented by deplaning passengers, the ratio of transactions to deplanements constitutes the consumer's propensity to rent. In 2007, there were 177,630 passenger deplanements and an estimated 24,548 transactions, which results in a 13.8 percent propensity to rent. This figure is applied to forecasted passenger deplanements from Section 2.9 to determine projected number of rental car transactions. Projected rental car transactions are shown in **Table 2-17**. It should be noted that this assumes that the Airport being closed for 60 days due to runway rehabilitation in 2007 affects passenger activity in the same fashion as rental car transactions. In other words, the proportion of deplaning passengers that rent cars should not be affected by an airport closure.

Table 2-17. Rental Auto Concessions (RAC) Transaction Demand – 2007-2027		
Year	**Deplanements**	**RAC Transactions**
2007	177,630	24,548
2012	223,510	30,889
2017	243,402	33,637
2027	287,223	39,693

Source: Airport Management Records, Mead & Hunt, Inc.

The number of vehicles in airport rental car fleets responds to the seasonal travel demand dynamics at that airport. In Aspen, rental fleet sizes during holiday and peak ski season are regularly three to four times the size than during non-peak periods. For rental car parking and long-term planning purposes, this section will emphasize the peak fleet sizes as reported by rental car agencies. According to interviews with rental car agency representatives in Aspen, the peak fleet size for 2007 at the Airport is estimated to have been 1,018 vehicles. This fleet size includes only on-Airport service providers. Peak rental car fleet sizes can be expected to increase in concert with the increase in transaction demand. The ratio of peak fleet size to rental car transactions in 2007 is applied to projected transaction figures to determine estimated peak fleet sizes in 2012, 2017, and 2027. Peak fleet sizes are presented in **Table 2-18**.

Table 2-18. Estimated RAC Fleet Sizes – 2007-2027		
Year	**Estimated RAC Transactions**	**Estimated Fleet Size**
2007	24,548	1,018
2012	30,889	1,281
2017	33,637	1,395
2027	39,693	1,646

Source: Mead & Hunt, Inc.

By determining the amount of the fleet that is in service at any particular time, the amount of land necessary to accommodate parking needs can be estimated. Utilization rates vary with regard to operational strategies employed by individual companies, the time of the year, and on weekends versus weekdays. For programming purposes, the utilization rates during peak months are the best indicators of facility requirements. Based upon interviews with rental car representatives, the average utilization rate during peak months is estimated to be approximately 74 percent.

There is no absolute measure for the optimal size of the ready/return parking facility, because agencies vary in terms of efficiency of using ready stalls based upon business approach, labor availability, fleet size, and proximity of available ready cars from storage lots. Several rental car companies that operate at the Airport expressed concerns about the current size of the ready/return lot in terms of adequacy to meet demand. Below are some of the sentiments that were expressed by tenants:

- The ready/return line is inadequate during normal and slow operating days. It becomes very difficult to operate during peak seasons. In addition, in an effort to maximize the number of parking stalls, the parking spaces are too small.

- The number of cars that are rented grows so quickly from the beginning of December to the holidays that it is hard to keep enough cars with the current divided lots. Additional storage space would be appropriate to minimize the need to truck-in or drive-in additional rental vehicles.
- Overflow space is very limited, especially in the winter months when plowed snow accumulates.
- During busy times, vehicles are parked on the frontage road as well as being double and triple parked. The ready/return is a dead-end lot, which adds to the congestion.

It is estimated that demand for space in this lot will follow the increase in fleet size. Projections of ready/return lot spaces are presented in **Table 2-19**. Accordingly, sized in terms of parking stalls, the ready/return lot should be expanded to 118 spaces by the end of the planning period.

Table 2-19. Ready/Return Parking Requirements

Year	Estimated Fleet Size	Ready/Return Lot Capacity	Total Spaces Required	Additional Spaces Required
2007	1,018	58	73	15
2012	1,281	58	92	34
2017	1,395	58	100	42
2027	1,646	58	118	60

Source: Mead & Hunt, Inc.

A utilization rate of 74 percent for peak periods results in a need to park no less than 26 percent of the fleet in the ready/return and storage lots available to the participating companies. The current ready/return facility has a capacity of 58 vehicles. Projections of the total amount of land required for overflow rental car parking is detailed in **Table 2-20**.

Table 2-20. Minimum Net Land Required for Overflow Storage (2007-2027)

Year	Estimated Fleet Size	Vehicle Storage Requirement	Land Area Required for Storage – SF (275 square feet per stall)	Land Area Required for Storage –SF (325 square feet per stall)
2007	1,018	265	72,787	86,021
2012	1,281	333	91,587	108,240
2017	1,395	363	99,738	117,872
2027	1,646	428	117,695	139,094

Source: Mead & Hunt, Inc.

2.11 Aviation Demand Projections - Summary

Passenger and aircraft activity at Aspen/Pitkin County Airport has fluctuated in recent history. This is not an uncommon theme at many U.S. airports, as economic uncertainty and increased travel costs have impacted travel behavior. Despite rapid increases in fuel cost, airline bankruptcies, system-wide route restructuring, and aircraft fleet overhauls, the forecasts developed for this Master Plan Update suggest positive growth in passenger enplanements, the number of based aircraft, and total aircraft operations at the Airport over the next 20 years. Aspen and the surrounding area are affluent and a prime destination market for tourism, which provides a certain level of protection from pitfalls such as reductions in air service.

Projections of short-, intermediate-, and long-term activity at the Airport that are based on 5-, 10-, and 20-year milestones (2012, 2017, and 2027) are presented in **Table 2-21**.

Table 2-21. Summary Forecast Table of Passenger Enplanements, Based Aircraft, and Aircraft Operations

	2006 (Actual)	2012 (Projected)	2017 (Projected)	2027 (Projected)
Passenger Enplanements	203,516	229,984	250,452	295,542
Based Aircraft	84	90	95	107
Air Carrier Operations	5,411	8,486	9,145	11,125
Air Taxi Operations	13,847	12,702	13,100	13,445
General Aviation Operations	25,302	28,719	30,333	33,560
Military Operations	119	113	113	113
Total Aircraft Operations	44,679	50,020	52,691	58,244

Sources: Mead & Hunt, Inc., Airport Management Records.

Table 2-22 presents a summary of the forecast activity levels and growth rates.

Table 2-22. FAA Template - Forecast Levels and Growth Rates							
AIRPORT NAME: Aspen/Pitkin County Airport, Aspen CO							
BASE YEAR: 2006					**Average Annual Compound Growth Rates**		
	2006	**2012**	**2017**	**2027**	**2012**	**2017**	**2027**
Passenger Enplanements							
Air Carrier & Commuter	203,516	229,984	250,452	295,542			
TOTAL	203,516	229,984	250,452	295,542	2.1%	1.9%	1.8%
Operations							
Itinerant							
Air carrier	5,411	8,486	9,145	11,125			
Commuter/air taxi	13,847	12,702	13,100	13,445	-1.4%	-0.5%	-0.1%
Total Commercial Operations	19,258	21,188	22,245	24,570	1.6%	1.3%	1.2%
General aviation	24,693	25,907	27,363	30,275	0.8%	0.9%	1.0%
Military	68	81	81	81	3.0%	1.6%	0.9%
Local							
General aviation	609	2,812	2,970	3,286	29.0%	15.5%	8.4%
Military	51	32	32	32	-7.6%	-4.2%	-2.2%
TOTAL OPERATIONS	44,679	50,020	52,691	58,244	1.9%	1.5%	1.3%
Based Aircraft							
Single Engine (Nonjet)	74	79	83	91	1.1%	1.1%	1.0%
Multi Engine (Nonjet)	5	5	6	8	1.2%	1.2%	2.0%
Jet Engine	2	4	5	6			
Helicopter							
Other	2	2	2	2	0.0%	0.6%	0.9%
TOTAL	83	90	95	107	1.4%	1.3%	1.2%
	2006	**2012**	**2017**	**2027**			
Average aircraft size (seats)							
Air carrier & Commuter	56.0	57.4	58.8	63.0			
Average enplaning load factor							
Air carrier & Commuter	68.5%	66.1%	68.0%	70.0%			
GA operations per based aircraft	306	320	318	313			

Table 2-23 presents a comparison of the Airport forecasts to the FAA TAF forecasts.

Table 2-23. Comparison of Airport Forecasts to TAF Forecasts – FAA Template

AIRPORT NAME: Aspen/Pitkin County Airport, Aspen, CO

Passenger Enplanements	Year	Airport Forecast	FAA TAF	AF/TAF (% Difference)
Base yr.	2006	203,516	202,137	0.7%
Base yr. + 6yrs.	2012	229,984	189,022	21.7%
Base yr. + 11yrs.	2017	250,452	196,214	27.6%
Base yr. + 21yrs.	2027	295,542	210,598	40.3%
Commercial Operations				
Base yr.	2006	19,258	19,009	1.3%
Base yr. + 6yrs.	2012	21,188	19,348	9.5%
Base yr. + 11yrs.	2017	22,245	19,681	13.0%
Base yr. + 21yrs.	2027	24,570	20,347	20.8%
Total Operations				
Base yr.	2006	44,679	44,464	0.5%
Base yr. + 6yrs.	2012	50,020	46,885	6.7%
Base yr. + 11yrs.	2017	52,691	50,669	4.0%
Base yr. + 21yrs.	2027	58,244	58,237	0.0%

Sources: FAA Terminal Area Forecast 2008-2025, Airport Administration Records, APGData, T-100 Data, Mead & Hunt, Inc.

The Airport's aggressive air service development has recently produced dramatic results in spite of the challenging commercial air service environment. The airfield constraints and air service limitations compared to demand, the area's popularity, and the accompanying high visitor costs have combined to create high fares, yields, and revenue for the airlines that serve Aspen/Pitkin County Airport.

The high fares and yields, which the Aspen market provides for the airlines, have insulated the Airport from a number of the ongoing commercial service cuts within the industry; in fact, Aspen is one of the few resort airports experiencing an increase in air service and available seats in 2008 as compared to 2007. 2008 enplanements through August are 26.7 percent above 2007 levels, and 11.4 percent above 2006 levels. Review of current airline schedules and scheduled seats for the remainder of 2008 indicates that 2008 enplanements will be near 230,600, or 25.6 percent above 2007's total. This anticipated level of 230,600 enplanements in 2008 far exceeds the TAF's projected enplanement level of 210,598 in 2027, indicating that the FAA's TAF projections need to be revised and updated to reflect the recent air service additions and commensurate increase in passenger enplanements.

2.12 Recent Activity Levels, Potential Effects on Facility Improvement Recommendations, and Validity of Forecasts

As stated in the Executive Summary at the beginning of this chapter, the forecast of aviation activity presented above relies on pre-2008 data for its historical basis. Forecasts are always prepared as an initial effort during an airport master planning process. In complex planning projects, it is not unusual for the time between initial analysis and final recommendations to be multiple years, as in the cast of the ongoing Aspen/Pitkin County Airport Master Plan Update. Although this extended time period is normal, it is important to examine the activity levels of the recent past to understand if any new and significant trends are being exhibited, which should be considered before final planning recommendations are formulated.

With that goal in mind, recent years' activity levels have been added at the beginning of each forecast section in this *Forecasts of Aviation Demand* chapter (i.e., 2.4.1 Enplanement History & Near-Term Enplanement Projections, 2.5.1 Commercial Operations Projection, 2.6 Military Operations Projections, 2.7.1 Based Aircraft Projections, and 2.7.3 Historical General Aviation Aircraft Operations). The following is a brief review of recent trends for each of these forecast sections, along with considerations related to final master planning recommendations:

- Passenger Enplanements. Actual enplanements have been tracking closely to the forecasts contained in this Airport Master Plan Update. The forecast estimated that the Airport would reach 229,984 enplanements by 2012. In calendar year 2011, the Airport enplaned 223,078 passengers.

- Commercial Passenger Aircraft Operations. The forecast indicates that commercial operations would reach 21,188 by 2012. The actual count for CY 2011 was 18,336. This lower than predicted number is due to the fact that the Airport is being served by aircraft with larger seating capacities than forecast (more of the commercial service aircraft serving the Airport are regional jets and less are smaller turboprop aircraft). This trend was identified in the forecast; however, it has occurred at a faster rate than predicted. From a long-term facility planning perspective, the effect of this more rapid rate of change is insignificant.

- Military Aircraft Operations Projections. Historically, very few military operations are conducted at the Airport (annually totaling around 100). This trend is expected to continue in the future. In 2011, 98 military aircraft operations were recorded. The forecast predicted that 81 military operations would be recorded in 2012.

- Based Aircraft. The number of based aircraft at the Airport has remained relatively stable since 1995, averaging around 90. Although no exact count has recently been conducted, airport and FBO staffs indicate that there are approximately 100 aircraft based at the Airport. The forecast predicted that there would be approximately 90 aircraft based in 2012.

- General Aviation Aircraft Operations. Primarily in response to the economic downturn in recent years, the level of general aviation aircraft activity at Aspen/Pitkin County Airport is tracking with national trends. In calendar year 2011, there were 19,171 general aviation operations recorded at the Airport, while the Master Plan forecast indicated that there would be approximately 29,000 operations in 2012. The FAA expects general aviation activity to slowly increase over the next few years, with the most growth in activity occurring within the larger general aviation aircraft types, especially business jets. Although it is important to recognize the recent declining trend in general aviation activity, the effect on the recommendations for this master plan is insignificant. With regard to space reservation for future general aviation facilities in this master plan, facilities will only be built in response to a proposal from a project proponent, and only after all local and federal approvals are received. As is noted in later chapters of this document, the majority of the space reservation programming for general aviation facilities is related to the potential for a second FBO serving the Airport.

In consideration of the above, the forecasts prepared and approved by the FAA in 2008 remain valid for use in this Master Plan Update and should be (have been) utilized as one basis for facility needs assessments and the related space reservation for potentially needed future facilities.

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Chapter 3

Facility Requirements

MASTERPLAN UPDATE

Facility Requirements

Executive Summary

Airport planning for facilities requirements is based upon the probable demand that may occur over time. Chapter 2, *Forecasts of Aviation Demand*, describes projections of aviation demand at Aspen/Pitkin County Airport for 5-, 10-, and 20-year time increments. This chapter provides an account of the existing condition of airside and landside facilities at Aspen/Pitkin County Airport and provides recommendations for facility requirements based on the projections contained in Chapter 2. These recommendations then provide the basis for alternatives related to airport needs, staffing, and funding.

The general elements that will be addressed in Chapter 3 include the following:

3.1 Airfield Demand/Capacity Analysis

3.2 Airfield Facility Requirements

3.3 Terminal Facility Requirements

3.4 General Aviation Facility Requirements

3.5 Support Facility Requirements

3.6 Additional Facility Requirements

In addition, a specific area of emphasis to be addressed in this Master Plan includes the evaluation of alternatives to provide for an additional fixed base operator (FBO) and related facilities.

3.1 Airfield Demand/Capacity Analysis

The purpose of the airfield demand/capacity analysis is to assess the capability of the airfield facilities to accommodate projected levels of aircraft operations. The Federal Aviation Administration (FAA) identifies two definitions of airfield capacity in FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*. The first definition of airfield capacity pertains to the maximum number of aircraft operations that a specific configuration can accommodate during a specified time interval of continuous demand (i.e., an aircraft is always waiting to depart or land). This level of capacity is influenced by weather conditions, number and configuration of exit taxiways, types of aircraft that use a facility, and air traffic control/airspace handling procedures.

The second definition of airfield capacity is the number of aircraft operations that may occur during a specific time that corresponds with an acceptable level of average annual aircraft delay. An important difference between these two measures of capacity is that one is defined in terms of delay, while the other is not. Among the reasons to determine delay is that each individual airfield has multiple factors that contribute to its ability to accommodate aircraft. Additionally, the relationship between demand and delay is significantly impacted by patterns of peak demand, which is also unique to a given airfield.

The following airfield capacity and delay components are used in this evaluation:

Peak Hour Capacity – The maximum number of aircraft operations that can occur in one hour under specific operating conditions assuming a continuous demand for service. This is also known as an airfield's maximum hourly throughput capacity.

Annual Service Volume (ASV) – Used by the FAA as an indicator of relative operating capacity. ASV is a reasonable estimate of an airport's annual capacity that accounts for differences in runway use, aircraft mix, weather conditions, etc. that would be encountered over a year's time. ASV assumes an acceptable level of aircraft delay as described in FAA AC 150/5060-5, *Airport Capacity and Delay*.

Average Annual Delay per Operation – This is an estimate of the average delay each aircraft operation will experience in a given year. Some operations, such as those that occur in peak periods of activity, would likely experience longer delays on average, while others, such as nighttime operations, would likely experience shorter average delays.

3.1.1 Factors Affecting Runway Capacity

A number of factors can impact airfield capacity and delay, including:

- Airfield layout and runway configuration
- Number and location of exit taxiways
- Runway use restrictions

- Runway use as dictated by wind conditions
- The percentage of time the Airport experiences poor weather conditions
- The level of touch-and-go activity
- Types of aircraft that operate at the Airport
- Surrounding terrain/local geography
- Changes in air traffic control procedures

Guidelines for calculating hourly capacities for various airfield configurations and flight conditions are provided in FAA AC 150/5060-5, *Airport Capacity and Delay*. Hourly capacity is defined as the maximum number of aircraft operations that can be accommodated on the runway system in one hour given a set of operating conditions. Utilizing the guidance found in FAA AC 150/5060-5, the 2004 Master Plan noted an Instrument Flight Rule (IFR) hourly capacity of 57 operations and a Visual Flight Rule (VFR) hourly capacity of 74 operations. These are the appropriate figures according to FAA for a typical single runway airfield configuration, but do not account for “contra flow” landings and takeoffs are not accounted for.

Aspen/Pitkin County Airport is unique in that it has a single runway that employs “contra flow” approaches and landings. All arriving aircraft must land southbound on Runway 15, while all departing aircraft must take off northbound from Runway 33. Approval from Pitkin County must be granted for exceptions to departures on Runway end 15. FAA methodologies for calculating airfield capacity and delay assume that aircraft arrivals and departures are conducted in a single direction on a given runway.

The 2004 Master Plan and this Master Plan Update recognize that, due to Aspen’s unique operating environment, the capacity calculations found in FAA AC 150/5060-5 are not appropriate for use at Aspen. Therefore, for purposes of this Master Plan Update, the hourly capacity of the airfield and its operating conditions is based on operations data provided by the FAA’s Air Traffic Activity Data System (ATADS). Because Aspen/Pitkin County Airport is a towered facility, aircraft operations are recorded on-site and made available through ATADS.

ATADS has daily, weekly, monthly, and yearly aircraft operation information dating to 1989. Since that time, the highest number of daily operations at the Airport was 464, which occurred July 28, 1993. Assuming that general operating conditions at the Airport remain relatively constant through time (hours of operation, runway configuration, etc.), this figure is used as the peak design day. The 464 daily operations correspond with an average hourly capacity of approximately 29 operations. According to the FAA’s Enhanced Traffic Management System Counts (ETMSC) database, since year 2000, the highest number of hourly aircraft operations to occur during the Airport’s 25 busiest days is 49, which occurred on December 27, 2001.

3.1.2 Annual Service Volume

ASV is a reasonable estimate of an airport's annual practical capacity. It accounts for differences in runway use, aircraft mix, weather conditions, pattern of demand (peaking), and other factors that impact an airport. The formula for calculating ASV contains three variables: C_w (weighted hourly capacity, calculated in Section 3.1.1); D (the ratio of annual demand to average daily demand in the peak month, calculated in Chapter 2 of this Master Plan Update); and, H (the ratio of average daily demand to average peak hour demand during the peak month). These variables are multiplied to obtain the ASV for the Airport. Weighted hourly capacity, $C_{w,}$ as calculated above was 52 operations per hour.

The Daily Demand Ratio (D) is the ratio of annual demand to average daily demand in the peak month. As described in Chapter 2, *Forecasts of Aviation Demand*, this figure has typically been 13 percent. Given that the peak month has 31 days, the average daily demand in the peak month is .419 percent of the annual activity. This results in a Daily Demand Ratio of 239.

The Hourly Demand Ratio (H) is the ratio of average daily demand to average peak hour demand during the peak month. Assuming that 90 percent of the Airport's daily operations occur between 7:00am and 7:00pm, it is estimated that 7.5 percent of the daily operations occur within the average peak hour. This results in an Hourly Demand Ratio of 13.3.

ASV for Aspen/Pitkin County Airport is defined as follows:

$ASV = C_w * D * H$
$ASV = 52 * 239 * 13.3$
$ASV = 165{,}292$ operations

The 2004 Master Plan shows an ASV of 195,000 operations. This is the appropriate figure according to FAA AC 150/5060-5, *Airport Capacity and Delay*, for a single runway airfield configuration but, as stated, this number does not account for "contra flow" landings and takeoffs.

3.1.3 Range of Delay

The second factor in determining an airport's practical capacity is to calculate the amount of delay an aircraft may experience at the facility, which is described in minutes per aircraft operation. The relationship between ratio of demand to ASV is shown in **Table 3-1**. As shown, delays during periods of peak activity can be up to 10 times greater than their average.

Table 3-1. FAA Estimated Delay Ranges

Ratio of Annual Demand to ASV	Average Aircraft Delay (min.)	Peak Delay Range for Individual Aircraft (min.)
0.1	0.05	0.0 - 0.5
0.2	0.10	0.5 - 1.0
0.3	0.20	1.0 - 2.0
0.4	0.25	1.5 –2.5
0.5	0.35	2.0 – 3.5
0.6	0.50	2.5 - 5.0
0.7	0.65	3.5 – 6.5
0.8	0.95	5.0 - 9.5
0.9	1.40	7.0 - 14.0
1.0	2.30	11.5 - 23.0
1.1	4.40	22.0 - 44.0

Source: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay.

Typically, planning standards indicate that when an airport's annual demand reaches 60 percent of its ASV, or an average of 0.5 minutes of delay per annual operation, additional airfield facilities to increase capacity should be planned. This is based on the need to complete a thorough investigation of alternatives and required environmental evaluations. When annual operations reach 80 percent ASV, new airport facilities should be programmed, or demand management strategies implemented. This is also meant to provide adequate time for planning and project implementation before demand exceeds capacity. It should be noted, however, that the definition of an airfield's practical capacity also includes an acceptable level of delay. Such levels can be somewhat subjective, and are generally defined by airport users and operators. For purposes of this analysis, the parameters described in **Table 3-1** will be used as appropriate meters of airfield capacity and demand at Aspen/Pitkin County Airport.

The Airport's calculated ASV and average aircraft delay projections are shown in **Table 3-2**. As shown, the Airport has typically operated at about 25-30 percent capacity. It is anticipated that, by year 2027, the Airport will operate at about 35 percent capacity, which results in a negligible expected aircraft delay (less than one-half minute).

Table 3-2. Demand Capacity and Delay - Summary

Year	Annual Demand	Ratio of Demand to ASV*	Average Aircraft Delay (min)
*Annual Service Volume (ASV) = 165,292			
Historical:			
1998	45,791	0.28	0.18
1999	46,242	0.28	0.19
2000	48,656	0.29	0.20
2001	46,047	0.28	0.19
2002	46,441	0.28	0.19
2003	42,979	0.26	0.17
2004	44,022	0.27	0.18
2005	44,225	0.27	0.18
2006	44,679	0.27	0.18
2007	42,348	0.26	0.17
2008	46,536	0.28	0.19
2009	40,924	0.25	0.16
Projected:			
2012	50,020	0.30	0.20
2017	52,691	0.32	0.21
2027	58,244	0.35	0.23

Sources: FAA Advisory Circular 150/5060-5, Airport Capacity and Delay, Aspen/Pitkin County Airport, FAA TAF.

Note: Projected aircraft operations are obtained from Chapter 2, Forecasts of Aviation Demand.

3.1.4 Runway Demand/Capacity Summary

Based on analysis conducted for this Master Plan Update, it is anticipated that the Airport's current airfield configuration will accommodate expected levels of aircraft activity. However, due to the "contra flow" flow and high approach minimums, current demand management strategies will need to continue to be used, particularly during peak activity periods or poor weather conditions.

3.2 Airfield Facility Requirements

Airfield facility requirements have been developed for the following functional areas:

- Airfield Layout
- Identification of Design Standards
- Runway Length
- Runway Width
- Pavement Strength
- Taxiway System
- Apron and Ramp Area Facility Requirements
- Airfield Safety Areas
- FAR Part 77 Surfaces
- Navigational Aids (NAVAIDS) and Instrumentation
- Airport Traffic Control Tower (ATCT)

3.2.1 Airfield Layout

Aspen/Pitkin County Airport has a single 8,006-foot, north-south runway that has the capacity to accommodate projected levels of operational demand through year 2027.

3.2.2 Identification of Design Standards

Significant elements in the planning and design of an airport include the role of the airport and the functional requirements of critical aircraft that operate there. The FAA outlines guidance for planning and design in several ACs, which promotes safety, economy, efficiency, and longevity of airport facilities.

For planning and design purposes, it is necessary to establish design standards that apply to operations and facilities at Aspen/Pitkin County Airport. The selection of the appropriate design standards for airfield facilities is based primarily upon the characteristics of the most demanding aircraft projected to use an airport on a regular basis, along with the types of approaches to be provided to each runway at the airport. The FAA typically defines regular use as the most demanding aircraft (or group of aircraft) that has at least 500 annual operations at an airport, or conduct regularly scheduled air carrier service.

FAA AC 150/5300-13, *Airport Design*, provides guidance for determining the Airport Reference Code (ARC). The ARC is a system developed by the FAA to relate airport criteria to the operational and physical characteristics of the aircraft at an airport. The ARC has two components that relate to the airport design aircraft. The first component, depicted by a letter, is the aircraft approach category and relates to certified aircraft approach speed. Generally, aircraft approach speed applies to runways and runway related facilities. Based on FAA AC 150/5300-13, *Airport Design,* aircraft are grouped into five categories:

- Category A: Approach speeds less than 91 knots.
- Category B: Approach speed of 91 knots or more, but less than 121 knots.
- Category C: Approach speed of 121 knots or more, but less than 141 knots.
- Category D: Approach speed of 141 knots or more, but less than 166 knots.
- Category E: Approach speed of 166 knots or more.

Aircraft Approach Categories A and B typically include small piston engine aircraft and a limited number of smaller, commuter turboprops and business jets having approach speeds of less than 121 knots. Category C consists of business jets, as well as commercial service regional and other commercial jet and propeller aircraft. Categories D and E include some business jet models and some high performance smaller jets, as well as larger jet aircraft generally associated with wide body commercial and/or military use.

The second component of the Airport Reference Code, depicted by a Roman numeral, is the airplane design group, which is categorized by wingspan or tail height. Where an airplane is in two categories, the most demanding category should be used. Aircraft wingspan primarily relates to separation requirements of taxiways and ramp space area, as shown in **Table 3-3**.

Table 3-3. Airplane Design Group (ADG)

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

Source: FAA AC 150/5300-13, Airport Design, 11/1/08.

ADG I and ADG II primarily include small piston aircraft, business jets, turboprop aircraft, and some commercial regional jets. ADG III includes large business jets and most regional and narrow body commercial aircraft. ADG IV and ADG V include large jetliners utilized for commercial service and military service. ADG VI only includes the largest transport aircraft such as the Airbus A380, Boeing B747-8, C-5 Galaxy, and Antonov An-124 Condor.

Aspen/Pitkin County Airport is currently classified as an ARC D-III airport. This classification was reviewed based upon the aircraft currently operating at, and projected to operate at, the Airport and was found to still be the appropriate design standard. The Airport currently has a 95-foot aircraft wingspan limitation and a 100,000 pound aircraft maximum landing weight restriction, which will remain in place throughout the planning period.

The most demanding aircraft with respect to approach speed were found to be Approach Category D business jet aircraft such as the Gulfstream G150, G200, G-II, G-IV, G-V, and the Learjet 31, 35, 40, 45, and 60. IFR flight plan data indicates that from March 1, 2008 to February 28, 2009 there were 749 departures from the Airport by Approach Category D aircraft, indicating that Approach Category D aircraft have regular use of the Airport.

Due to the 95-foot aircraft wingspan limitation, the largest aircraft operating at the Airport are the Bombardier Global Express with a wingspan of 94 feet, the Gulfstream G-V with a wingspan of 93.5 feet, and the DeHavilland Dash 8 Q-400, which has a wingspan of 93.3 feet.

Similarly, the 100,000-pound weight limitation restricts the aircraft that currently operate at the Airport to the Bombardier Global Express, with a maximum takeoff weight (MTOW) of 95,000 pounds; the Gulfstream G-V, with a MTOW of 90,900 pounds; and certain CRJ-700 models that have an MTOW of 84,500 pounds.

As passenger enplanements increase throughout the projection period, the number of available seats per aircraft is also expected to expand. This will likely be attributed to two factors. The first is that more fuel inefficient and smaller aircraft are being removed from air carrier fleets and replaced by regional jets. The second factor is that, even with the recently completed 1,000-foot runway extension, there are still operational restrictions on aircraft at the Airport that affect passengers and load factors. It is reasonable to expect that Aspen's status as a destination market with anticipated growth in passenger enplanements may result in airlines employing other or additional regional jet variations (that are within the Airport's wingspan and weight limitations), such as the Emb-170, Emb-175, CRJ-900, and CRJ-1000 at the Airport.

Long-term planning considerations at Aspen/Pitkin County Airport should include these regional jet variations, which are similar to the weights and dimensional characteristics of those aircraft currently operating at the Airport. The largest or critical of these have wingspans of up to 94 feet and MTOWs of up to 92,000 pounds.

A summary of critical aircraft design standards for long-term planning at Aspen/Pitkin County Airport is described in **Table 3-4**.

Table 3-4. Critical Aircraft Design Standards

Characteristic	Critical Aircraft	Value
Aircraft Weight	Various (CRJ700, CRJ1000)	92,000 pounds
Approach Speed	Various (G-II/IV/V, Lear45/60)	141-166 knots
Wingspan	Various (Q400, G-V, Global Exp)	94 feet
Tail Height	Q-400	27 feet 0 inches
Airport Reference Code	Various	D-III

Sources: Aviation Week & Space Technology 2008, www.airliners.net, Mead & Hunt, Inc.

FAA runway separation standards for D-III airports are described in AC 150/5300-13, Changes 1-15, *Airport Design*, and shown in **Table 3-5**.

Table 3-5. FAA Design Criteria

Criteria	Runway 15/33 FAA Standard	Actual
Airport Reference Code	D-III	D-III
Runway Centerline to:		
- Holdline	328[1]	272.5[2]
- Taxiway Centerline	478[1]	320[2]
- Aircraft Parking Area	578[1]	400
Runway Centerline to BRL	---	500

Sources: FAA Advisory Circular 150/5300-13, Changes 1-15, Airport Design, December 31, 2009; Airport Layout Plan, 2004; Jviation, Inc.; Mead & Hunt, Inc.
Notes:
[1]Per FAA design standard for approach category D, this includes an increase of 78' for an Airport Elevation of 7,820' (1 foot for each 100 feet above sea level).
[2]Approved modification of standard (97-DEN-178-NRA) – Completed for 320' runway to taxilane Building Restriction Line (BRL): The BRL encompasses the runway protection zones (RPZs), the runway object free area, the runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures, and areas required for Airport Traffic Control Tower clear line of sight.

3.2.3 Runway Length

An airport's required runway length is determined by its most demanding (current or projected) aircraft in its operational fleet. According to FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, when the maximum takeoff weight of a critical design aircraft exceeds 60,000 pounds or is considered a regional aircraft, the recommended runway length is determined based on individual airplanes. The length of a primary runway is determined by a specific model or group of aircraft that will conduct at least 500 operations annually. Takeoff length requirements are considered in the runway length analysis, as they generally require more runway length than landings.

For the purposes of this Master Plan Update, an analysis was conducted that calculated the required takeoff lengths for the most demanding types of aircraft that use, and could potentially use, Aspen/Pitkin County Airport. The two most demanding aircraft that currently operate at the Airport are the Canadair CRJ-700LR and the DeHavilland Dash Q400. As described in Chapter 2, *Forecasts of Aviation Demand*, larger regional jet aircraft (86-100 seats) are anticipated to conduct more than 500 operations at the Airport by 2027. As such, the runway length requirement for the Canadair CRJ 900LR is also described in this section.

Regional jets are assigned to the same category as airplanes with an MTOW over 60,000 pounds. Instead of identifying a grouping or family of aircraft that meet certain criteria, individual aircraft specifications are examined for required runway length. These specifications are listed in the manufacturers' Airport Planning Manual.

It should be noted that the FAA approved a modification of standards for the existing runway slope at the Airport. According to FAA design standards, the end quarter of a runway should have a slope no greater than 0.8 percent and the middle half of the runway should have a slope no greater than 1.5 percent. The existing runway ends at Aspen/Pitkin County Airport are listed with varying slopes above 1.2 percent and a 2 percent difference in slope overall.

Assumptions for Runway Length

The runway length calculation will use the following design conditions:

- Mean daily maximum temperature of hottest month at the Airport: **81.1º Fahrenheit**
- Airport Elevation: **7,820 feet Above Mean Sea Level (AMSL)**
- Maximum difference in runway centerline elevations: **140.1 feet**

The parameter airport temperature is used only for takeoff length determinations by setting it equal to the "mean daily maximum temperature of the hottest month at the Airport." According to the National Weather Service, the hottest month in Aspen is typically July. The mean daily maximum temperature in July is 81.1ºF. As noted in FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, it is acceptable for airport designers to use a Standard Daily Temperature chart that is approximately equal to the recorded value for the "mean daily maximum temperature of the hottest month at the Airport." As the mean daily maximum temperature of the hottest month in Aspen is 81.1ºF, the International Standard Atmosphere (ISA) + 25ºC (76.5ºF) cohort is used to determine recommended runway length at Aspen/Pitkin County Airport (see **Table 3-6**).

Table 3-6. Standard Day Temperature Chart – Elevation 7,820 ft.

Conditions	Degrees Fahrenheit
ISA	31.5
ISA + 8º C	45.9
ISA + 15º C	58.5
ISA + 20º C	67.5
ISA + 25º C	76.5
ISA + 30º C	85.5

Source: Bombardier, Inc.

As noted previously, the elevation of Aspen/Pitkin County Airport is 7,820 feet above mean sea level. Because of the effect of gravity, air is less dense at higher altitudes. Lift and drag vary directly with the density of air – as the air density increases, lift and drag increase; as the air density decreases, lift and drag decrease. If an airplane is to maintain its lift, the velocity of the air over the wings must be increased. Piston and turboprop aircraft lose efficiency at high altitudes because of the combination of engine power loss and because propellers are airfoils that suffer in the same manner as wings when operating in less dense air. The density altitude at Aspen/Pitkin County Airport will not allow the CRJ700 or the CRJ900 to takeoff at MTOW on the former 7,006-foot-long runway, which resulted in weight and operational restrictions on landing and departing aircraft at the Airport. The 1,000-foot extension of the runway in 2011 has significantly reduced these operations restrictions; however, the Airport still experiences payload restrictions during certain times of the year to certain destinations.

Required runway lengths for the Q400, the CRJ700, and CRJ900 with MTOW are shown in **Table 3-7**.

Table 3-7. Critical Aircraft Parameters

Aircraft	MTOW	Required Runway Length @ MTOW
Q400	61,700 pounds	7,900 feet
CRJ700	72,750 pounds	11,500 feet
CRJ900	82,500 pounds	Over 12,000 feet

Source: Airport Planning Manuals, FAA 150/5325-4B, Runway Length Requirements for Airport Design, Mead & Hunt, Inc.

As shown in **Table 3-7**, only the Q400 can operate at the Airport with MTOW given the current runway length; however, according to FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*, there is a necessary adjustment for runway length requirements that factors in the difference in elevation between runway centerlines. With the 141-foot difference between runway ends 15 and 33, the adjusted required runway length becomes 9,310 feet for the Q400, 12,910 for the CRJ700, and over 13,000 feet for the CRJ900.

The FAA also has a computer program that calculates recommended runway lengths for different categories of aircraft. These recommended lengths are shown in **Table 3-8**.

Table 3-8. FAA Recommended Runway Lengths	
Runway Requirement	**Recommended Runway Takeoff Length**
*Small airplanes with less than 10 passenger seats**	
75% of small airplanes	6,660 feet
95% of small airplanes	9,320 feet
100% of small airplanes	9,320 feet
Small airplanes with more than 10 passenger seats	9,320 feet
Large airplanes of 60,000 pounds or less	
75% of fleet / 60% useful load	9,100 feet
75% of fleet / 90% useful load	10,000 feet
100% of fleet / 60% useful load	12,400 feet
100% of fleet / 90% useful load	12,400 feet
Airplanes greater than 60,000 pounds	10,030 feet**

Source: FAA Airport and Runway Data computer program.
*Note: * Under 12,500 pounds.*
***Based on length of longest current haul of 1,303 miles (ASE-ATL).*

As is evident in **Tables 3-7** and **3-8**, the existing runway length of 8,006 feet is somewhat limiting with regard to takeoff weights available to some of the Airport users. However, it should also be noted that the runway extension completed in the fall of 2011 has been significantly beneficial.

3.2.4 Runway Width

According to FAA AC 150/5300-13, *Airport Design*, the minimum runway width for all Design Group III aircraft is 100 feet. Runway 15/33 is 100 feet wide and is expected to accommodate aviation demand throughout the projection period.

3.2.5 Runway Longitudinal Slope

According to FAA AC 150/5300-13, *Airport Design*, the maximum runway longitudinal slope for runways serving aircraft approach category C & D is 1.5 percent maximum for any section of the runway, and a maximum of 0.8 percent in the end quarter of the runway. The existing Runway 15/33 has a maximum slope of 2.39 percent and an overall slope of approximately 2 percent. The longitudinal centerline slope of the runway is not in conformance with FAA design standards. A modification of standards for the runway longitudinal slope was approved by the FAA on August 6, 1991 under airspace case 90-ANM/D-173-NRA. This modification to standard isn't deemed feasible to correct given the topography of the Airport, and is anticipated to remain in place through the duration of the planning period.

Runway Line-of-Sight

According to existing runway line-of-sight standards, any two points located five feet above the runway centerline must be mutually visible for the entire length of the runway. Based on numerous line-of-sight examinations, the Airport meets this criterion; however, there are line-of-sight deficiencies associated with the ATCT and the view to the south end of the runway. In order to mitigate these deficiencies, the Airport installed video cameras that increased the ability of local Airport Traffic Control Tower personnel to see aircraft on the south end of the Runway/Taxiway system and, thus, reduced the potential risk for incidents.

3.2.6 Runway Pavement Strength

An aircraft's gear type and configuration dictate how its weight is distributed to the pavement. Runway pavement strength at Aspen/Pitkin County Airport is rated for single wheel and dual wheel configurations (see **Table 3-9**).

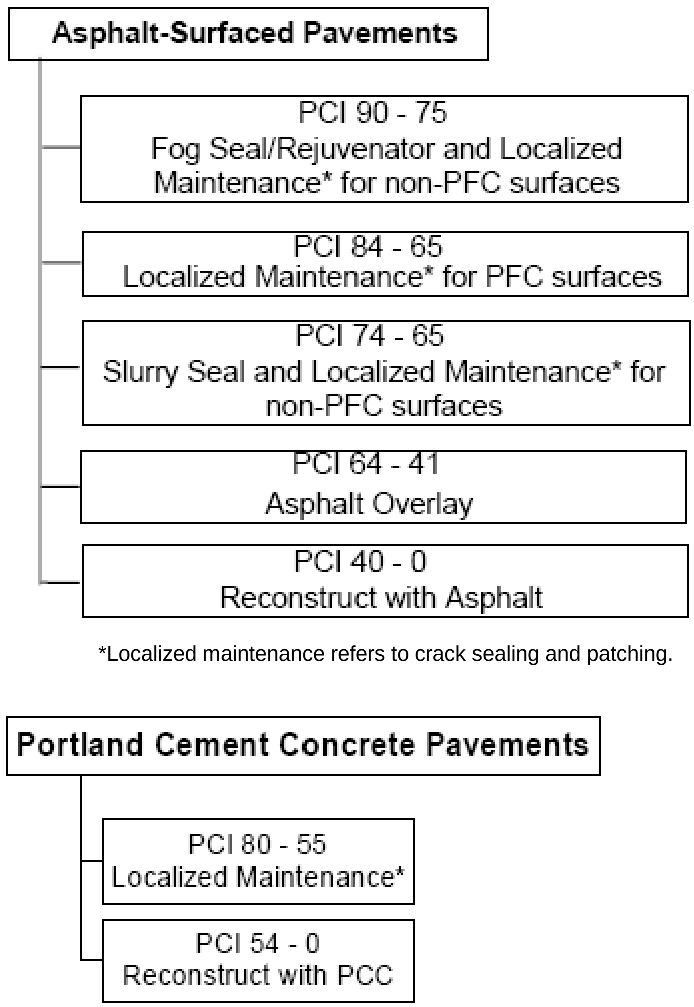
Table 3-9. Runway Pavement Strength	
Classification	**Runway 15/33**
Single Wheel (SW)	80,000 pounds
Dual Wheel (DW)	100,000 pounds

Source: FAA Form 5010, Airport Master Record.

According to the Aspen/Pitkin County Airport 2007 Pavement Evaluation and Pavement Management System Update, the existing runway encompasses approximately 800,000 square feet of surface area. Pavement conditions were evaluated using the Pavement Condition Index (PCI) procedure – the industry standard in aviation for visually assessing the condition of pavements. During a PCI inspection, inspectors identified signs of deterioration on the surface of the pavement. Pavement defects are characterized in terms of type of distress, severity level of distress, and amount of distress. This information is then used to develop a composite index (PCI number) that represents the overall condition of the pavement in numerical terms, ranging from 0 (failed) to 100 (excellent). In general terms, pavements above a PCI of 65 that are not exhibiting significant load-related distress will benefit from preventive maintenance actions, such as crack sealing and surface treatments. Pavements with a PCI of 40 to 65 may require major rehabilitation, such as an overlay. Often, when the PCI is less than 40, reconstruction is the only viable alternative due to the substantial damage to the pavement structure.

Overall, the existing runway and all individual sampled pavement segments received a PCI Index value of 100. No deficiencies pertaining to the runway were noted. The predicted composite PCI value for Runway 15/33 is 95 in 2010, 93 in 2011, and 90 in 2012. The Pavement Evaluation and Management System Update recommended a Pavement Maintenance and Rehabilitation Plan for both asphalt-surfaced and Portland Cement Concrete pavements. Recommended maintenance and rehabilitation parameters and action points are described in **Figure 3-1**. The Maintenance and Rehabilitation Plan pertains to all paved surfaces at the Airport.

Figure 3-1. Pavement Maintenance and Rehabilitation Plan



*Localized maintenance refers to crack sealing and patching.

*Localized maintenance refers to joint sealing, crack sealing, slab replacement, and patching.

3.2.6 Taxiway System

Access to Runway 15/33 is provided by a parallel taxiway that is approximately 5,720 feet long and 50 feet wide. FAA AC 150/5300-13, *Airport Design*, provides recommended taxiway design standards that include geometric layouts, separations, and pavement widths. For airports that accommodate airplane design group (ADG) III aircraft, the FAA recommends 400 feet of separation between a runway centerline and a taxiway centerline, and a taxiway width of 50 feet. In accordance with Change 15 of FAA AC 150-5300-13, *Airport Design*, minimum separation standards need to be adjusted for an airport's elevation.

For all airplane design groups that are aircraft approach category D, runway separation standards increase one foot for each 100 feet above sea level. Adjusted for the Airport's elevation (7,820 feet above MSL), the current runway centerline-taxiway centerline separation standard is 478 feet. Therefore, an updated modification to standards is required.

The recent taxiway relocation resulted in a runway/taxiway centerline separation of 320 feet. This 320-foot separation keeps the critical aircraft wingtip outside of the runway object free zone and was approved by the FAA with a modification to standard under airspace case 97-DEN-178 NRA. Though the Airport's parallel taxiway is not in compliance with FAA standards, the 320-foot runway to taxiway centerline separation coupled with the 95-foot wingspan restriction, maintains an adequate level of safety. Because the runway/taxiway separation cannot be increased, the FAA will not allow the wingspan restriction to be lifted unless existing FAA safety policies are modified.

According to the 2004 Master Plan Update, there are additional modifications of FAA standards. These are shown in **Table 3-10**.

Table 3-10. Modification of FAA Recommended Taxiway Design Standards

Item	Standard	Existing	Approved
Taxiway OFA (Parallel Taxiway 'A')	186 feet	169 feet	97-DEN-178-NRA
Taxiway Holdlines From Runway Centerline	328 feet	272.5 feet	97-DEN-178-NRA
Parallel Taxiway Longitudinal Gradient	Not to exceed 1.5%	2.25%	APR.22,2003 2003-ANM-24-NRA
Taxiway Safety Area Shoulder Transverse Gradient	3.0% - 5.0%	2.0%	APR.22,2003 2003-ANM-24-NRA

Source: 2004 Airport Layout Plan. FAA AC 150/5300-13, Airport Design.

According to the 2007 Pavement Evaluation and Management System Update, the Airport has approximately 450,000 square feet of paved taxiways. The composite PCI value for the entire taxiway system was 98, with individually sampled segments ranging in values from 89 to 100. The only taxiway distresses listed in the report were longitudinal/transverse cracking, which should be regularly inspected and maintained in accordance with the previously mentioned Pavement Maintenance and Rehabilitation Plan. Alternatives for improvements that coincide with FAA design standards will be presented in Chapter 4, *General Aviation Alternatives Analysis*.

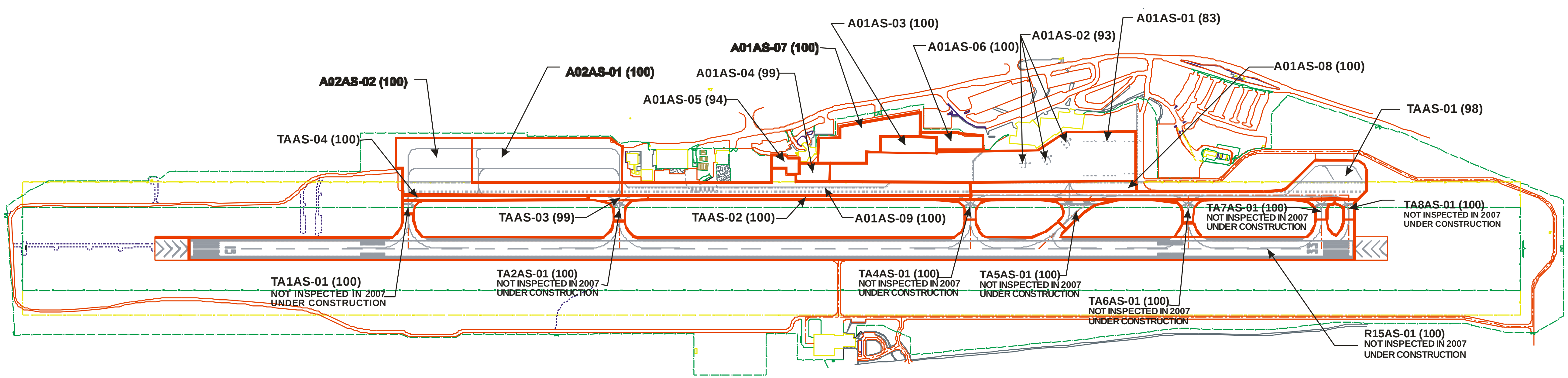
3.2.7 Apron and Ramp Area Facility Requirements

Aspen/Pitkin County Airport has two primary aircraft parking aprons. The terminal apron is located east of parallel Taxiway A and adjacent to the west side of the passenger terminal building. This apron encompasses approximately 318,000 square feet of aircraft parking and movement space. The second apron, which is connected to and north of the terminal apron, serves as the primary general aviation parking area. This apron and shelter area is approximately 607,000 square feet and provides aircraft parking and storage for both based and transient aircraft.

According to FAA AC 150/5300-13, when adjusted for elevation at Aspen/Pitkin County Airport, the FAA design standard for separation between runway centerline and aircraft parking areas is 578 feet. Due to the constrained site at Aspen/Pitkin County Airport, there are currently aircraft parking aprons at less than 578 from the runway centerline. The taxiway relocation project at the Airport resulted in a runway/taxiway centerline separation of 320 feet, and aircraft parking areas are located approximately 76 feet from the taxiway centerline. This separation distance keeps the aircraft parking areas outside the taxiway object free zone for aircraft with wingspans of 95 feet and under.

The 2007 Pavement Evaluation and Management System Update identifies nearly 1.2 million square feet of total apron/ramp space at Aspen/Pitkin County Airport. The composite PCI value for the entire apron system was 94, with individually sampled segments ranging between 77 and 100. Longitudinal/transverse cracking was noted in several areas, although only preventative maintenance was recommended in the report.

With the exception of Branch A01AS Section 1, predicted PCI values for apron areas through 2012 are listed as 84 or higher. A01AS-1, which primarily includes the commercial aircraft parking apron and southern portions of the general aviation parking apron, has a predicted value of 73 by 2012, which means it may require major rehabilitation in the short-term (5-10 years). PCI values are shown in **Figure 3-2**. Aircraft apron and parking requirements are discussed in subsequent sections of this chapter.



A - Apron
R - Runway
TA - Taxiway

Sources: Applied Pavement Technology, Inc.
Mead and Hunt

FIGURE 3-2

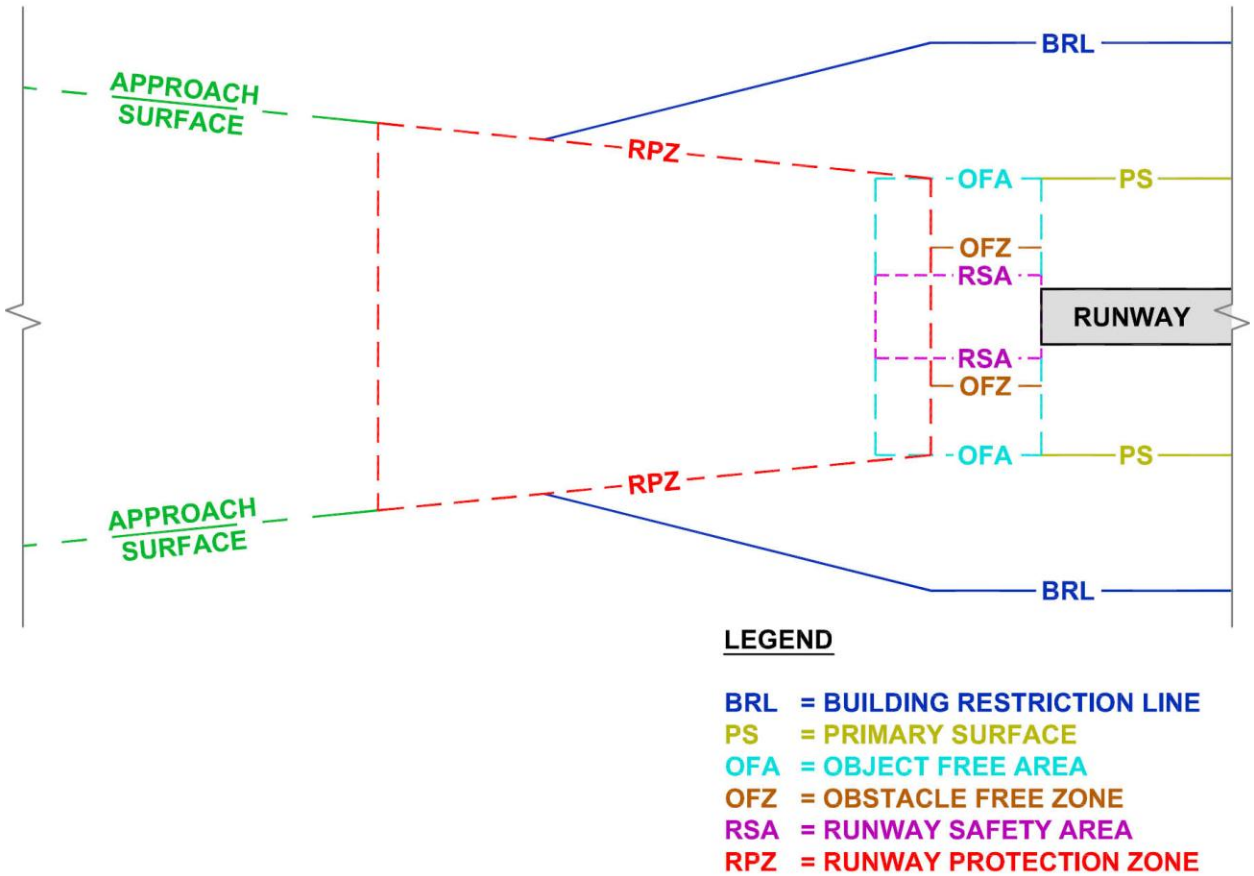
Pavement PCI Values
Aspen/Pitkin County Airport

3.2.8 Airfield Safety Areas

This section presents FAA design standards for various airfield safety areas as they relate to Aspen/Pitkin County Airport. A visual depiction of safety areas is shown in **Figure 3-3**. The following airfield safety areas are described in this section:

- Runway Protection Zone (RPZ)
- Runway Object Free Area (OFA)
- Runway Safety Area (RSA)
- Obstacle Free Zone (OFZ)
  - Runway OFZ
  - Inner-Approach OFZ
  - Inner-Transitional OFZ
- Taxiway Safety Area (TSA)
- Taxiway Object Free Area (TOFA)

Figure 3-3. Airfield Safety Areas



Runway Protection Zone

The Runway Protection Zone's function is to enhance the protection of people and property on the ground. It is trapezoidal in shape and centered about the extended runway centerline in the approach/departure area for each runway. The RPZ begins 200 feet past the end of the runway pavement useable for departures and landings. RPZ length and width dimensions are contingent on the type of aircraft that operate at a particular airport. Generally, as aircraft size increases and the type of approach becomes more precise, the dimensions of the RPZ increase.

Table 3-11 shows the FAA standard and existing dimensions of the RPZs for Runway 15/33.

Table 3-11. Existing Runway Protection Zone Dimensions				
Runway	**Approach Visibility Minimum**	**Surface**	**FAA Standard**	**ASE Actual**
Runway 15 (Approach & Departure RPZ)	Visual and not lower than 1-mile (Approach Category D)	Inner RPZ width (ft) Outer RPZ width (ft) RPZ length (ft)	500 1,010 1,700	500 1,010 1,700

Sources: FAA AC 150/5300-13, Airport Design.

The current Airport Layout Plan (ALP) depicts the RPZ with a dimension of 500 feet (inner width) by 1,010 feet (outer width) by 1,700 feet.

Land uses prohibited from the RPZ are residences and places of public assembly. (Churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons typify places of public assembly.)

State Highway 82 and the airport perimeter fence run through the existing RPZs off both ends of Runway 15/33 at Aspen/Pitkin County Airport; however, there aren't currently any prohibited or non-compatible land uses within the RPZs. According to FAA AC 150/5300, *Airport Design*, it is desirable to clear all objects from the RPZ; however, some uses are permitted, provided they do not attract wildlife, are outside of the Runway OFA, and do not interfere with navigational aids.

Runway Object Free Area

The runway OFA is a two-dimensional ground area centered on the runway. FAA standards prohibit parked aircraft and all above-ground objects within the OFA, except objects for air navigation or aircraft ground maneuvering purposes.

The length and width of the OFA are determined by the type of aircraft that are anticipated to use the runway. Dimensions are based on aircraft approach categories and approach visibility minimums. Runway 15/33 accommodates approach Category D aircraft, which merits an OFA width of 800 feet (centered on runway centerline) and a length of 1,000 feet beyond the runway end. The dimension standards are in compliance with FAA standards with the exception of a segment of the perimeter fence and Highway 82 within the northeast corner of the OFA. This portion of the OFA not in compliance with FAA standards was approved as a modification to standards by the FAA under airspace case 95-DEN-080-NRA.

Table 3-12 shows the FAA standard and existing dimensions of the OFA for Runway 15/33.

Table 3-12. Existing Object Free Area Dimensions

Runway	FAA Standard		ASE Actual	
	OFA Width	OFA Length beyond Rwy End	OFA Width	OFA Length beyond Rwy End
Runway 15/33	800 feet	1,000 feet	800 feet[1]	1,000 feet[1]

[1]The Runway OFA is in compliance with the exception of a segment of the perimeter fence and Highway 82 within the northeast corner of the OFA (approximately 315 feet from runway centerline and 850 feet from the runway end).

Runway Safety Area

The RSA is a two-dimensional ground area that surrounds the runway. The FAA mandates that the RSA be:

- **Cleared, graded, and free of potential hazardous surface variations and be properly drained.**
- **Capable of supporting snow removal equipment (SRE), aircraft rescue and firefighting (ARFF) equipment, and aircraft (without causing damage to the aircraft).**
- **Free of objects except those mounted on low-impact resistant supports whose location is fixed by function.**

Based on FAA criteria, the RSA for Runway 15/33 should be 500 feet wide, centered on the centerline, and extend 1,000 feet beyond the runway end. The RSA at Aspen/Pitkin County Airport is in compliance with FAA dimensional standards. **Table 3-13** shows the FAA standard and existing dimensions of the RSA for Runway 15/33.

Table 3-13. Existing Runway Safety Area Dimensions

Runway	FAA Standard		ASE Actual	
	RSA Width	RSA Length beyond Rwy End	RSA Width	RSA Length beyond Rwy End
Runway 15/33	500 feet	1,000 feet	500 feet	1,000 feet

Obstacle Free Zone

The OFZ is a three-dimensional segment of airspace that supports the transition for landing and departing aircraft. OFZ clearing standards prohibit aircraft from taxiing and parking in the OFZ. Only objects that are frangible mounted and needed for safety of taxiing aircraft are allowed to penetrate the OFZ. The OFZ is comprised of the runway OFZ, the inner approach OFZ, and the inner-transitional OFZ.

Runway OFZ

As defined by the FAA, the runway OFZ is an area of airspace centered above the runway centerline. The runway OFZ clearing standards prohibit aircraft parking and taxiing, as well as any objects that would penetrate the OFZ. Only NAVAIDS that are frangible mounted and fixed by location are permitted. The FAA design standards for the OFZ are 400 feet of width for runways that serve large aircraft over 12,500 pounds, such as Aspen/Pitkin County Airport. According to the existing ALP, the runway OFZ is compliant with FAA standards and no object penetrations exist. **Table 3-14** shows the FAA standard and existing dimensions of the OFZ for Runway 15/33.

Table 3-14. Existing Runway Object Free Zone Dimensions		
Runway	**FAA Standard OFZ Width**	**ASE Actual**
Runway 15/33	400 feet	400 feet

Taxiway Object Free Area

The taxiway OFA is centered on the taxiway centerline. The OFA is to be clear of service vehicle roads, parked aircraft, and all above-ground objects except for those that assist in air navigation or ground maneuvering movements. The FAA design standard width for Design Group III aircraft is 186 feet. The 95-foot aircraft wingspan restriction allows Aspen/Pitkin County Airport to apply a taxiway OFA of 76.5 feet from taxiway centerline, rather than the full ADG III design standard of 93 feet from centerline. The 2004 ALP for parallel Taxiway A currently denotes a Taxiway OFA of 169 feet, 93 feet on the runway side and 76 feet on the apron side.

Table 3-15 shows the FAA recommended and existing dimensions of the parallel taxiway OFA for Runway 15/33.

Table 3-15. Existing Taxiway Object Free Area Dimensions		
Runway	**FAA Standard OFA Width**	**ASE Actual**
Runway 15/33	186 feet	169 feet*

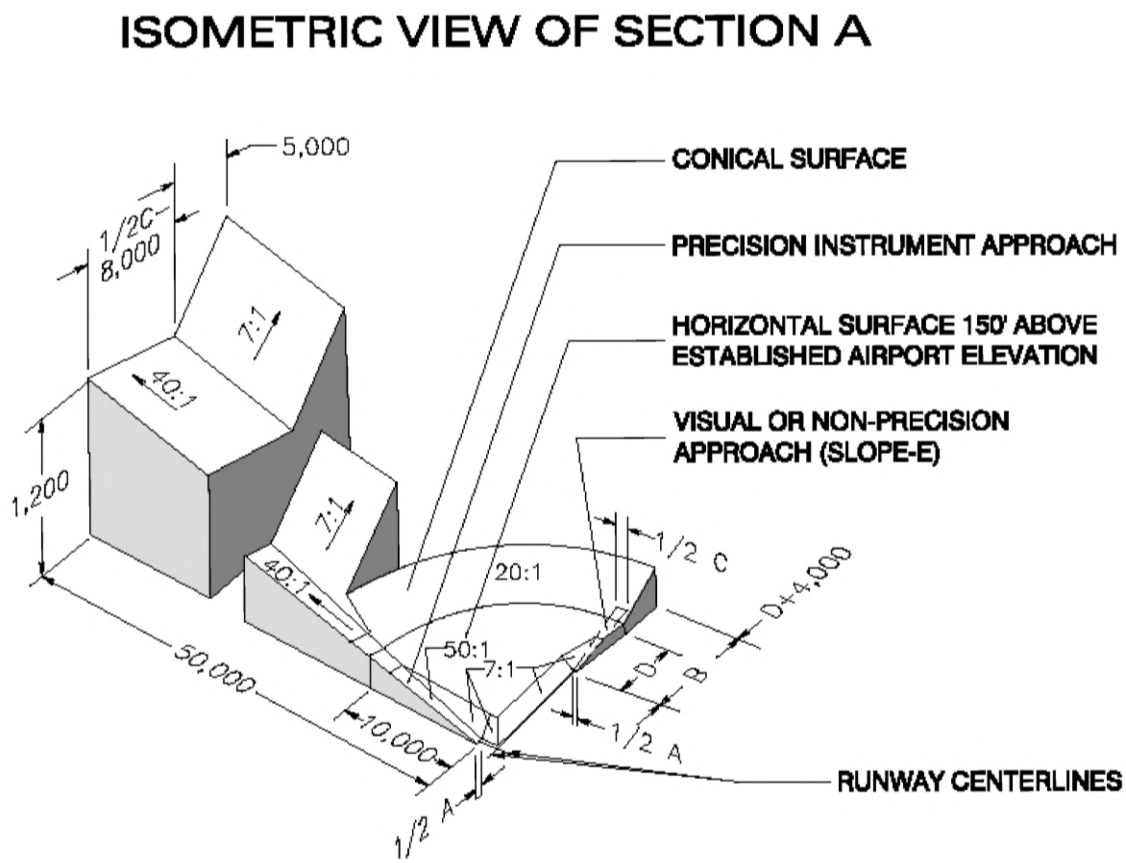
**Modification to Standard approved 97-DEN-178-NRA – 93 feet on runway side, 76 feet on apron side.*

3.2.9 FAR Part 77 Surfaces

Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*, establishes standards that determine which structures pose potential obstructions to air navigation. FAR, Part 77, Subpart C, Section 77.25, *Civil Airport Imaginary Surfaces*, defines a set of “imaginary surfaces” that surround an airport. A graphical depiction of FAR Part 77 surfaces is shown in **Figure 3-4**.

The description of the Part 77 imaginary surfaces from Section 77.25 is reproduced below:

Figure 3-4. Isometric View of Section A



"Sec. 77.25 Civil airport imaginary surfaces.

The following civil airport imaginary surfaces are established with relation to the Airport and to each runway. The size of each such imaginary surface is based on the category of each runway according to the type of approach available or planned for that runway. The slope and dimensions of the approach surface applied to each end of a runway are determined by the most precise approach existing or planned for that runway end.

(a) Horizontal surface. A horizontal plane 150 feet above the established airport elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary surface of each runway of each airport and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(1) 5,000 feet for all runways designated as utility or visual.

(2) 10,000 feet for all other runways. The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest determined for either end of the runway. When a 5,000-foot arc is encompassed by tangents connecting two adjacent 10,000-foot arcs, the 5,000-foot arc shall be disregarded on the construction of the perimeter of the horizontal surface.

(b) Conical surface. A surface extending outward and upward from the periphery of the horizontal surface at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

(c) Primary surface. A surface longitudinally centered on a runway. When the runway has a specially prepared hard surface, the primary surface extends 200 feet beyond each end of that runway; but, when the runway has no specially prepared hard surface, or planned hard surface, the primary surface ends at each end of that runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. The width of a primary surface is:

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

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

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

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

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

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

The width of the primary surface of a runway will be that width prescribed in this section for the most precise approach existing or planned for either end of that runway.

(d) Approach surface. A surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the primary surface. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end.

(1) The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of:

(i) 1,250 feet for that end of a utility runway with only visual approaches.

(ii) 1,500 feet for that end of a runway other than a utility runway with only visual approaches.

(iii) 2,000 feet for that end of a utility runway with a non-precision instrument approach.

(iv) 3,500 feet for that end of a non-precision instrument runway other than utility, having visibility minimums greater than three-fourths of a statute mile.

(v) 4,000 feet for that end of a non-precision instrument runway, other than utility, having a non-precision instrument approach with visibility minimums as low as three-fourths statute mile.

(vi) 16,000 feet for precision instrument runways.

(2) The approach surface extends for a horizontal distance of:

(i) 5,000 feet at a slope of 20 to 1 for all utility and visual runways.

(ii) 10,000 feet at a slope of 34 to 1 for all non-precision instrument runways other than utility.

(iii) 10,000 feet at a slope of 50 to 1 with an additional 40,000 feet at a slope of 40 to 1 for all precision instrument runways.

(3) The outer width of an approach surface to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(e) Transitional surface. These surfaces extend outward and upward at right angles to the runway centerline and the runway centerline extended at a slope of 7 to 1 from the sides of the primary surface and from the sides of the approach surfaces. Transitional surfaces for those portions of the precision approach surface that project through and beyond the limits of the conical surface extend a distance of 5,000 feet measured horizontally from the edge of the approach surface and at right angles to the runway centerline.

[Amdt. 77-9, 36 FR 5970, Apr. 1, 1971; 36 FR 6741, Apr. 8, 1971]"

An object that penetrates any of the Part 77 surfaces is defined as an "obstruction to air navigation." The existence of an obstruction constitutes a potential hazard to the safe arrival and departure of aircraft. Obstructions may alter an aircraft's approach or takeoff procedure, as well as pose a potential threat to safety if not eliminated or properly identified. The terrain and fences on the northwest corner of the Airport are considered FAR Part 77 obstructions; there is terrain and other objects surrounding the Airport on the west, south, and east sides that penetrate FAR Part 77 surfaces and limit permissible approach minimums.

3.2.10 Navigational Aids

NAVAIDs provide guidance for pilots during flight preparation and operation. The type, mission, and volume of aviation activity in association with airspace, meteorological conditions, and capacity data, determine the need and eligibility for NAVAIDs. The FAA describes NAVAID recommendations in FAA Handbook 7031.2, *Airway Planning Standard Number One*, and AC 150/5300-13, *Airport Design.* NAVAIDS will be discussed in three categorizations:

- Terminal Area NAVAIDs
- Electronic Approach NAVAIDs
- Visual NAVAIDs

Terminal Area NAVAIDs

Terminal Area NAVAIDs provide control for taxiing aircraft and maintain an orderly flow of airport traffic within a specified area. Terminal NAVAIDs assist to prevent collisions between aircraft during landing and take-off sequence, as well as to support sufficient maneuvering. Aspen/Pitkin County Airport is a controlled facility with an FAA-operated ATCT located on the north end of the airfield. The tower is operational between 7:00am and 10:00pm. The Airport is served by the Denver Center Air Route Traffic Control Center (ARTCC).

Electronic Approach NAVAIDs

Electronic Approach NAVAIDs assist aircraft during instrument approach procedures. An instrument approach procedure consists of a series of predetermined maneuvers that allow orderly transfer of an aircraft during instrument flight conditions to a point where a visual landing may be made.

The availability of instrument approach procedures permits aircraft landings during periods of limited visibility. The extent to which approach minimums, with respect to ceiling and visibility, can be lowered depends on available instruments upon which the approach procedure may be developed, and on obstructions in the approach and/or missed approach areas. Instrument approaches may be restricted to particular aircraft models or to certain flight crews that are certified to conduct such a procedure with the appropriate equipment.

A precision approach procedure provides a pilot with electronic glide slope (descent) and distance information, while a non-precision approach procedure does not offer glide slope and may or may not offer distance information. Aspen/Pitkin County Airport currently provides non-precision and visual approach procedures; however, steep terrain that surrounds the Airport has limited the approach minimums attainable and the ability to implement a precision approach with current technologies. Current instrument and visual NAVAIDs at Aspen/Pitkin County Airport are shown in **Table 3-16**.

Table 3-16. Existing and Proposed NAVAIDs & Lighting							
	Instrument NAVAIDs				**Visual NAVAIDs/Lighting**		
Runway	**LOC/DME**	**GPS-C**	**VOR**		**PAPI**	**MALSF**	**HIRL**
15	E	E	E		E	E	E
33		E					E

Notes:
E - Existing
P - Planned
LOC/DME – Localizer/Distance Measuring Equipment
GPS - Global Positioning System
VOR – Very-High Frequency Omni-Directional Range
PAPI - Precision Approach Path Indicator
HIRL –High Intensity Runway Lights
MALSF – Medium Intensity Approach Lighting System with Sequenced Flashing Lights

As shown in **Table 3-16**, several navigational facilities are in operation at Aspen/Pitkin County Airport. Many of these navigational aids are also available to en route airport traffic. The Airport is served by instrument NAVAIDs, including the Red Table (DBL) VHF Omnidirectional Range/Distance Measuring Equipment (VOR/DME), I-PKN Localizer, and Global Positioning System (GPS) approach procedure.

The Red Table VOR/DME provides non-precision guidance for the VOR/DME instrument approach at the Airport, as well as en route guidance. The Airport is served by two localizers that provide back course guidance and define a path for aircraft to fly missed approach and departure procedures. One localizer is located on the airfield and the other is situated atop Aspen Mountain, which is approximately four miles to the southeast of the Airport.

Additional NAVAIDs within the vicinity of Aspen/Pitkin County Airport include four VOR/DMEs and one VHF Omnidirectional Range with Tactical Air Navigation (VORTAC). The VOR/DMEs include: Red Table (DBL), frequency 113.00, located 13 nautical miles (NM) north of the Airport; Snow (SXW), frequency 109.20, located 25 NM north-northwest; Blue Mesa (HBU), frequency 114.9, located 47 NM south; and Rifle (RIL), frequency 110.6, located 44 NM west-northwest of the Airport. The VORTAC, Kremmling (RLG), frequency 113.80, is located 51 NM northeast of the Airport.

There are several published public visual and instrument arrival and departure procedures at Aspen/Pitkin County Airport, including the VOR/DME or GPS-C approach, the LOC/DME-E approach, the Roaring Fork Visual Runway 15, the Aspen Three Departure, the Sarrd One Departure, the LINDZ Five Departure, and the Pitkin One Departure (RNAV).

The VOR/DME or GPS approach at the Airport is classified as a non-precision circling approach that uses guidance from the Red Table VOR/DME for the final approach segment of the procedure and the I-PKN Localizer for missed approach guidance. The LOC/DME-E is also a non-precision circling approach; this approach uses the ASE Localizer for approach guidance and the I-PKN Localizer for missed approach guidance. Approach minimums are classified according to the height above ground that the aircraft can descend to before they must visually acquire the runway, and the visibility in miles that must be present to attempt the approach (i.e. 200 - ½ indicates that aircraft can descend to 200 above the runway touchdown zone elevation and there must be ½-mile visibility). The approach minimums for these two non-precision approaches are as follows:

- VOR/DME or GPS-C provides approach minimums of:
    - 2,400 – 2; Approach Category A and B
    - 2,400 – 3; Approach Category C
    - Not Available for Approach Category D
- LOC/DME-E provides approach minimums of :
    - 2,100 – 3; Approach Category A
    - 2,200 – 3; Approach Category B
    - 2,400 – 3; Approach Category C
    - Not available for Approach Category D

Typical precision approach minimums are 200-1/2; however, terrain surrounding Aspen/Pitkin County Airport limits the attainable approach minimums to the aforementioned minimums, much greater than the typical precision approach minimums attainable at most air carrier airports. As technology advances, the Airport, FAA, air carriers, and other users should continue to examine opportunities to improve minimums and aircraft visibility below existing instrument approach minimums and radar coverage floors.

Wide Area Multilateration (WAM) deployment around four airports in Colorado's Rocky Mountains has achieved Initial Operating Capability (IOC) from the Federal Aviation Administration (FAA). Yampa Valley Regional, Garfield County Regional, Steamboat Springs and Craig-Moffat County Airports now have surveillance coverage through the FAA Surveillance and Broadcast Services (FAA SBS) program office and Colorado Department of Transportation's Aeronautics Division (CDOT) Wide Area Multilateration Project. The system uses Multistatic Dependent Surveillance (MDS) to provide FAA air traffic controllers at the Denver Air Route Traffic Control Center with high accuracy, high availability surveillance to improve airspace capacity.

In Colorado's areas of rough and extreme terrain, existing en route radar experiences coverage gaps below 13,000 feet, resulting in procedural-based, "one-in/one-out" air traffic control operations during instrument climate conditions.

MDS uses multiple low-maintenance, non-rotating sensors to triangulate aircraft location based on transponder signals and to provide air traffic controllers with precise aircraft position and identification information, regardless of weather conditions. With a higher update rate and greater positional accuracy than traditional radar, MDS provides effective surveillance for increased safety, capacity, and efficiency of airspace and airports. Additionally, the MDS sensor supports Automatic Dependent Surveillance-Broadcast (ADS-B). [1]

ADS-B is a crucial part of the FAA's Next-generation Air Transportation System and the FAA is currently initiating its deployment throughout the national airspace system. ADS-B uses GPS satellite signals to provide air traffic controllers and pilots with much more accurate information that will help keep aircraft safely separated en route and on runways. Aircraft transponders receive GPS signals and use them to determine the aircraft's precise airborne position in the sky, which is combined with other data and broadcast out to other aircraft and airport traffic control facilities. ADS-B allows both pilots and controllers to see the same real-time displays of air traffic and geographic location, substantially improving safety.

ADS-B and Required Navigation Procedures (RNP) in the future may provide the ability to attain lower approach minimums through the use of more precise location information and through the use of turning or vectored approach procedures. The Airport should continue to pursue the lowest approach minimums attainable through these advancing technologies.

Visual Approach NAVAIDs

As shown in **Table 3-16**, the Airport is served by visual NAVAIDs that include Runway End Identifier Lights, Medium Intensity Approach Lighting System with Sequenced Flashing Lights (MALSF), Precision Approach Path Indicator Lights (PAPIs), a rotating beacon, and a lighted wind cone.

The PAPIs provide descent guidance for the visual approaches on Runway 15 and are configured for a three-degree glide path angle. They are unusable beyond four NM from the threshold and seven degrees right of the runway centerline. This is attributable to the varying terrain within the vicinity of the Airport. Runway 33 is equipped with High Intensity Runway Lights (HIRLs).

The Roaring Fork Runway 15 approach is designed for all approaching aircraft under Visual Flight Rules (VFR). The procedure is designed to keep aircraft from flying over critical terrain and populated areas while making an approach.

3.2.11 Airport Traffic Control Tower (ATCT)

Aspen/Pitkin County Airport is a controlled airport with an FAA-operated ATCT located on the north end of the field. The tower can see the end of the runway and taxiway, though it does not meet minimum tower requirements due to line-of-sight issues pertaining to the run up area. The installation of video cameras has mitigated this.

[1] Sensis Corporation.

3.3 Terminal Facility Requirements

Despite previous terminal expansion measures in 1986-1987, passenger demand at the Airport has outpaced facility capacity, putting a strain on Airport facilities and roadways during peak activity periods. The current spaces provided are also not laid out in an efficient manner, resulting in some spaces that are oversized and many spaces that are undersized to fulfill their intended function. As the building continues to age, the recurring costs to keep the facility in good repair will continue to increase without major investment in newer and more efficient building systems. This section identifies the needed improvements to the passenger terminal building that will allow the Airport to meet the needs of its users while improving energy efficiency and operational effectiveness.

A phased development program is recommended that includes new terminal facilities, aprons, and roadways. By constructing in carefully considered phases, modifications to the existing facility, or construction of a completely new facility, will ensure that there is no interruption to Airport services and revenue, and minimal disruption to passengers and tenants.

On March 31, 2009, preliminary discussions were held with Airport management and the County Commissioners to discuss goals and priorities for terminal improvements, as well as to review previously developed concepts. Based on this guidance, preliminary concepts were developed for public review and comment. The following goals were identified:

- "Rightsize" the terminal, airside, and landside facilities to match current and short-term passenger demand.
- Provide a means of expansion to accommodate the expected passengers through the planning period.
- Design efficient and sustainable facilities.
- Reduce passenger anxiety during all phases of travel, particularly during the drop-off, check-in, and screening processes.
- Support a high level of passenger service and create a positive and lasting first impression upon entering the community.
- Provide a non-confusing and legible roadway layout and way finding system.
- Improve the convenience and use of public transportation.
- Continue being a good neighbor to the residents of the valley and craft a plan that best serves local residents and visitors of the community.

Subsequently, facility requirements and planning assumptions were defined and reviewed with airport management during work sessions over several weeks. At the end of the process, there was consensus and clear direction from the staff on the requirements and assumptions for concept development. These concepts will be available for community input as the project proceeds.

The following sections discuss in detail the type and size of facility requirements needed to satisfy both current inadequacies and future requirements.

3.3.1 Terminal Tenant Requirements

On August 21, 2009, an interview was held with numerous tenants of the Aspen/Pitkin County Airport Terminal to receive feedback regarding the suitability of the Airport terminal to accommodate the present and future needs of its users. Discussions were held regarding an assessment of the current facility, from both an operations and maintenance standpoint and functional layout perspective. The input gathered has further contributed to the assessment of existing conditions, the determination of required facilities, and alternatives for improvement.

3.3.2 Food, Gift/News, and Concession Owners

All the terminal food, gift/news, and concessions are owned and operated by one company. Typically, there are three to four times more sales made on the secure side. These primarily consist of gift shop items, news, and non-sit down food establishments such as a snack bar and a coffee cart. The sponsor desires to have a full-service sit down restaurant on the non-secure side, and an increased space for gifts, news, and snack vendors on the secure side.

3.3.3 Airline Operators

The airline operations office area has inadequate space, and an inefficient layout. Ideally, this office space would facilitate flexibility. The offices are currently too small for staffing during peak seasons. Six managers often share one small room. The existing 10-ticket counter positions are sufficient to serve the current passenger load. This space need is expected to decline over the next several years as electronic check-in processes improve and the need to stop at a ticket counter is minimized. It was noted that all airline ground operations have employee crossover between carriers, therefore, maintaining fluid spaces in the operations area paramount. A desired improvement is to have an upgraded common data service as well that would increase the efficiency of all operations.

Another area in need of improvement is the holdroom. The lack of segregation of the boarding gates results in clustering and confusion among those waiting for flights. All flights board from doors that are too close together, which allows stagnation of passengers boarding differing flights, and which also results in passenger confusion and congestion. On occasion, the fire marshal has forced evacuation of the holdroom due to its occupation exceeding the maximum capacity. This causes numerous security concerns and further delays due to the need for re-screening. The holdroom is currently too crowded on peak weekends in the winter, even with no delays. Four to five flights at a time are typically waiting to board. Furthermore, there is only one holdroom service counter that houses too many staff, resulting in customer service that is perceived by passengers to be poor.

The inclusion of a small office room for airline administration/management on the holdroom level would be preferred. The airline operations currently perform employee training in the modular unit in the parking lot. A multi-purpose conference room included in a terminal addition could meet this need.

It should also be noted that the baggage service office is deficiently small. When weather causes significant delays, baggage trucks from Denver often deliver hundreds of bags at a time. There is presently no secure space to accommodate this influx of luggage and the bags end up being placed on the floor indefinitely for people to retrieve on the honor system. This presents both a potential security threat and a liability for the Airport. Ideally, a loading dock and secure storage room would be incorporated into the terminal.

3.3.4 Rental Car Operators

The rental car operators are not currently provided adequate space. They have significantly less space at this airport in terms of ready parking positions and equipment storage as they do at comparably sized airports.

The crowded condition at the rental counters, besides presenting a nuisance to customers, presents a potential privacy violation in that neighboring customers are put in a position where they could easily overhear/oversee sensitive information. Furthermore, storage for child seats is done in front of the counters or in an unheated shed in the parking lot because there is not enough room behind the counters. During peak hours, customer queuing can be 7-10 people deep.

The rental car operators have noted that there is a period of significant ramping up of fleet inventories in preparation for peak season. This results in rental cars being stacked along the frontage roads and on all available Airport land in December. Ideally, future development at the Airport could alleviate the tight constraints on the landside rental car space needs.

3.3.5 Transportation Security Administration (TSA)

One large constraint placed on the passenger terminal building has been the required adaptation of an older building to modern security standards and practices. The existing building was not designed to accommodate present standards and, as a result, the current security checkpoint encroaches on other spaces. This encroachment of one space into another reduces efficiency and causes the terminal to feel crowded.

Getting people through security is typically the pinch point. The TSA screeners should process 200 passengers per lane per hour; however, they typically only process 130. This is largely due to a higher-than-average bag count per passenger and an abundance of oversized baggage (skis, etc.) that slows the processing rate of the machines.

Occasional flooding has occurred at the passenger terminal building, which resulted in TSA employees running electrical screening equipment in standing water. TSA representatives have also witnessed handicapped passengers in wheelchairs tip over and roll out of control on the ramps within the terminal that are not compliant with the Americans with Disabilities Act (ADA).

3.3.6 Design Year Determination

The year 2017 was selected as the design year for the Terminal Area Plan concept development because it was determined to be the appropriate time frame for "rightsizing" the project. It is anticipated that the approval, design, and construction process for the development plan will take approximately five years to complete if started now (i.e., 2014 or 2015). A design year after 2017 would result in creating spaces that are too large based on projections that are too far into the future. An earlier year (prior to 2014 or 2015) would create spaces that are too small because they would be based on demand levels prior to construction.

3.3.7 Overall Space Requirements

Facility planning factors were developed specifically for each functional area of the passenger terminal building. These factors were then applied to the forecasted passenger demand levels discussed in Chapter 2, *Forecasts of Aviation Demand*, to estimate the future facility requirements. The derived facility needs are intended to be planning level estimates to approximate future sizing and costs. Actual facility requirements will be dependent on final terminal configuration and specific requirements of tenants and users as determined through the design process.

Planning factors are the "units of facility," such as square feet or linear feet that adequately serve a "unit of demand," such as a particular type of passenger (arriving or departing). The Aspen/Pitkin County Airport planning factors were specifically developed to reflect the unique operations of a Colorado mountain destination resort.

Activity levels at an airport are represented as Annual Enplaning Passengers (ANNEP), Peak Hour Originating Passengers (PHOP), Peak Hour Terminating Passengers (PHTP), and Peak Hour Passengers (PHP).

While annual traffic (ANNEP) is a useful benchmark for describing the activity from year to year, peak hour (PHOP and PHTP) activity is most important to determine the size of terminal facilities. For example, ticket counters and outbound baggage facilities primarily serve PHOP; whereas, baggage claim areas serve only PHTP. Some facilities, like restrooms, serve all types of passengers and are therefore sized to handle the highest peak hour passenger (PHP) demand. Peak 20-minute flight arrivals are considered in determining the sizing of baggage claim areas and the number and type of baggage claim devices.

Based on historical Airport activity, virtually all passengers at Aspen/Pitkin County Airport are assumed to be origination and destination (O&D) passengers. Connecting activity is expected to be minimal. Consequently, PHOP will, for practical purposes, equal PHTP.

Table 3-17 categorizes the anticipated square footage needs of the future terminal facilities for the selected design years based on the forecasts provided in Chapter 2, *Forecasts of Aviation Demand*. Additionally, the table depicts the current square footage allotment for each functional area based on a field survey conducted in June 2008.

The year 2008 is part of the facilities programming document because it allows a direct present comparison of hypothetical facilities requirements to the actual existing available square footage. This comparison allows airport management, tenants, and users to evaluate the proposed program in the context of existing needs and deficiencies. After determining the baseline requirements for each functional area, the future programs (2012, 2017, and 2027) were then adjusted to meet or exceed the specific needs of the Airport. 2011 actuals and 2012 YTD enplanement counts are consistent with the forecast numbers for 2012 in **Table 3-17**.

Table 3-17. Conceptual Terminal Facility Requirements

Description	Conceptual Planning Factor		Existing Terminal	2008 222,881 Enpl 215,713 Depl 179 PHOP 186 PHTP	2012 229,984 Enpl 223,510 Depl 185 PHOP 190 PHTP	2017 250,452Enpl 243,402 Depl 201 PHOP 207 PHTP	2027 295,542 Enpl 287,223 Depl 238 PHOP 244 PHTP
Airline Functions							
Ticket Counter Area	4.52	SF/PHO	1,035	809	834	907	1,073
Ticket Counter Length	*0.43*	LF/PHO	*97*	*77*	*80*	*86*	*102*
Ticket Counter Queuing	8.60	SF/PHO	1,834	1,539	1,589	1,727	2,044
Airline Ticket Office	12.91	SF/PHO	5,131	2,311	2,388	2,589	3,073
Curbside Baggage Check	0.84	SF/PHO	0	150	155	169	200
Baggage Claim Area	25.00	SF/PHT	4,057	4,650	4,875	5,175	6,100
Baggage Claim Frontage	*0.87*	LF/PHT	*224*	*162*	*170*	*180*	*212*
Baggage Service Office	6.00	SF/PHT	786	1,116	1,170	1,242	1,464
Outbound Baggage	32.26	SF/PHO	4,227	5,775	5,959	6,476	7,666
Inbound Baggage	12.50	SF/PHT	1,050	2,325	2,438	2,588	3,050
Airline Operations	0.0150	SF/ANN	5,131	3,343	3,445	3,757	4,426
Departures Lounges	945	SF/Gate	2,160	3,780	5,670	6,615	8,505
Jet Gates			*4*	*4*	*6*	*7*	*9*
Subtotal Airline Functions			**20,280**	**25,798**	**28,523**	**31,241**	**37,601**
Concessions							
Concessions (Food /	0.008	SF/ANN	877	1,783	1,840	2,004	2,364
Concessions (News / Gifts)	0.003	SF/ANN	567	669	690	751	887
Concessions (Concession	0.0015	SF/ANN	175	334	345	376	443
Concessions (Other)	0.0004	SF/ANN	1,433	89	92	100	118
Ground Transportation	0.0025	SF/ANN	318	557	575	626	739
Information	0.0018	SF/ANN	243	401	414	451	532
Rental Car Counters	0.0035	SF/ANN	567	780	805	877	1,034
Subtotal Concessions			**4,180**	**4,614**	**4,761**	**5,184**	**6,118**
Secure Public Area							
Security	1200	SF/Chkp	2,610	2,400	2,400	2,400	3,600
Circulation	945	SF/Gate	1,200	3,780	5,670	7,560	9,450
Restrooms	3.5	SF/PHP	673	1,278	1,309	1,428	1,684
TSA Bag Screen Room	1250	SF/MAC	1,700	1,250	3,750	3,750	5,000
TSA Offices	1.4	SF/PHO	312	251	259	281	333
TSA Break	2.94	SF/PHO	0	526	544	591	700
Airport Administration	0.011	SF/ANN	1,213	2,452	2,530	2,755	3,251
Other	0.0014	SF/ANN	387	312	322	351	414
Subtotal Secure Public			**8,095**	**12,248**	**16,784**	**19,116**	**24,431**
Non-Secure Public Area							
Circulation - Ticketing	10.74	SF/PHO	3,086	1,922	1,987	2,159	2,556
Circulation - Baggage Claim	15	SF/PHT	2,872	2,790	2,925	3,105	3,660
Circulation - General	0.025	SF/ANN	3,930	5,572	5,750	6,261	7,389
Restrooms	3.5	SF/PHP	766	1,278	1,309	1,428	1,684
Other (Unassigned)	0.0014	SF/ANN	0	312	322	351	414
Subtotal Non-Secure Public			**10,654**	**11,874**	**12,292**	**13,304**	**15,702**
Non-Public Area							
Loading Dock	0.003	Of Total	0	164	187	207	252
Storage	0.01	Of Total	167	545	624	688	839
Maintenance	0.01	Of Total	686	545	624	688	839
Mech. / Elec. / Bldg. Systems	0.12	Of Total	955	6,544	7,483	8,261	10,062
Miscellaneous	0.025	Of Total	0	1,363	1,559	1,721	2,096
Subtotal Non-Public Area			**1,808**	**9,162**	**10,476**	**11,566**	**14,087**
Grand Total			**45,017**	**63,696**	**72,836**	**80,435**	**97,967**

PHOP – Peak Hour Originating Passenger
PHTP – Peak Hour Terminating
ANNEP – Annual Enplanements
PHP – Peak Hour Passenger

Source: Jviation, Inc.

3.3.8 Existing Terminal and 2009 Program Comparison

Table 3-18 lists the existing terminal spaces and those determined to be required to satisfy 2008 demand. With this information, the Airport, airlines, and tenants can evaluate the proposed program in the context of their current space needs. If needed, the program planning factors can be adjusted to reflect current and projected future space requirements. The “difference” column highlights the surpluses or deficiencies of each area. Overall, the existing terminal is approximately 40 percent smaller than it should have been in 2008, based on passenger activities levels and input from the Airport, airlines, and tenants.

Seven areas of the existing terminal are deficient by more than half of what is needed to properly serve the traveling public. The area dedicated to building systems is about 1/6 of the space needed. The storage areas and secure circulation are lacking by more than 200 percent each. The inbound baggage area, airport administrative offices, food and beverage concession areas, and TSA office space are all 50 percent of what is needed.

3.3.9 Existing Terminal and 2017 Program Comparison

The existing terminal compared to the estimated 2017 requirements is shown in **Table 3-19**. The future proposed terminal requirements are approximately 80 percent greater than the existing terminal space. Almost all areas of the existing terminal are, at a minimum, half of the area required to meet 2017 requirements. This overall space deficiency will have significant impact on the airport staff, airlines, tenants, and passengers that use the terminal. Because of the congestion created by this lack of space, the traveling public may seek alternate methods of transportation to the Roaring Fork Valley.

Table 3-18. 2008 Facility Requirements Comparison			
Terminal Building			
Conceptual Facility Requirements Comparison - 2009			
Description	Existing Terminal	2009 Space Requirements	Difference
Airline Functions			
Ticket Counter Area	1,035	798	237
Ticket Counter Length	*97*	*76*	21
Ticket Counter Queuing	1,834	1,520	314
Curbside Baggage Check	50	149	-149
Baggage Claim Area / Oddsize Area	4,057	4,575	-518
Baggage Claim Frontage	*224*	*159*	65
Baggage Service Office	786	1,098	-312
Airline Operations / Airline Ticket Office	5,131	5,628	-497
Outbound Baggage	4,227	5,701	-1,474
Inbound Baggage	1,050	2,288	-1,238
Departures Lounges (Holdrooms)	2,160	3,780	-1,620
Jet Gates	*4*	*4*	0
Subtotal Airline Functions	**20,280**	**25,537**	**-5,257**
Concessions			
Concessions (Food / Beverage)	877	1,786	-909
Concessions Other (seating / ATM)	1,433	89	1,344
Concessions (News / Gifts / Sundry)	567	670	-103
Concessions (Concession Storage)	175	335	-160
Ground Transportation	318	558	-240
Information	243	402	-159
Rental Car Counters	567	781	-214
Subtotal Concessions	**4,180**	**4,620**	**-440**
Secure Public Area			
Security	2,610	2,400	210
Circulation	1,200	3,780	-2,580
Restrooms	673	1,257	-584
TSA Bag Screen Room	1,700	1,250	450
TSA Offices / Break	312	768	-456
Airport Administration	1,213	2,455	-1,242
Other / Airline Service Counters	387	312	75
Subtotal Secure Public Area	**8,095**	**12,222**	**-4,127**
Non-Secure Public Area			
Circulation - Ticketing	3,086	1,901	1,185
Circulation - Baggage Claim	2,872	2,745	127
Circulation - General	3,930	5,580	-1,650
Restrooms	766	1,257	-491
Other	0	312	-312
Subtotal Non-Secure Public Area	**10,654**	**11,795**	**-1,141**
Non-Public Area			
Loading Dock	0	163	-163
Storage	167	542	-375
Maintenance	686	542	144
Mech. / Elec. / Bldg. Systems	955	6,501	-5,546
Miscellaneous	0	1,354	-1,354
Subtotal Non-Public Area	**1,808**	**9,101**	**-7,293**
Grand Total	**45,017**	**63,276**	**-18,259**

Source: Jviation, Inc.

Table 3-19. 2017 Facility Requirements Comparison			
Terminal Building			
Conceptual Facility Requirements Comparison - 2017			
Description	Existing Terminal	2017 Space Requirements	Difference
Airline Functions			
Ticket Counter Area	1,035	907	128
Ticket Counter Length	*97*	*86*	11
Ticket Counter Queuing	1,834	1,727	107
Curbside Baggage Check	50	169	-169
Baggage Claim Area /	4,057	5,175	-1,118
Baggage Claim Frontage	*224*	*180*	44
Baggage Service Office	786	1,242	-456
Airline Operations / Airline	5,131	6,346	-1,215
Outbound Baggage	4,227	6,474	-2,247
Inbound Baggage	1,050	2,588	-1,538
Departures Lounges	2,160	6,615	-4,455
Jet Gates	*4*	*7*	-3
Subtotal Airline Functions	**20,651**	**31,241**	**-10,961**
Concessions			
Concessions (Food /	877	2,004	-1,127
Concessions Other (seating /	1,433	100	1,333
Concessions (News / Gifts /	567	751	-184
Concessions (Concession	175	376	-201
Ground Transportation	318	626	-308
Information	243	451	-208
Rental Car Counters	567	877	-310
Subtotal Concessions	**4,180**	**5,184**	**-1,004**
Secure Public Area			
Security	2,610	2,400	210
Circulation	1,200	7,560	-6,360
Restrooms	673	1,428	-755
TSA Bag Screen Room	1,700	3,750	-2,050
TSA Offices / Break	312	872	-560
Airport Administration	1,213	2,755	-1,542
Other / Airline Service	387	351	36
Subtotal Secure Public	**8,095**	**19,116**	**-11,021**
Non-Secure Public Area			
Circulation - Ticketing	3,086	2,159	927
Circulation - Baggage Claim	2,872	3,105	-233
Circulation - General	3,930	6,261	-2,331
Restrooms	766	1,428	-662
Other	0	351	-351
Subtotal Non-Secure Public	**10,654**	**13,304**	**-2,650**
Non-Public Area			
Loading Dock	0	207	-207
Storage	167	688	-521
Maintenance	686	688	-2
Mech. / Elec. / Bldg. Systems	955	8,261	-7,309
Miscellaneous	0	1,721	-1,721
Subtotal Non-Public Area	**1,808**	**11,566**	**-9,758**
Grand Total	**45,017**	**80,411**	**-35,394**

Source: Jviation, Inc.

3.3.10 Detailed Analysis of Major Functional Areas

This section provides an analysis of the passenger terminal's functioning areas, including:

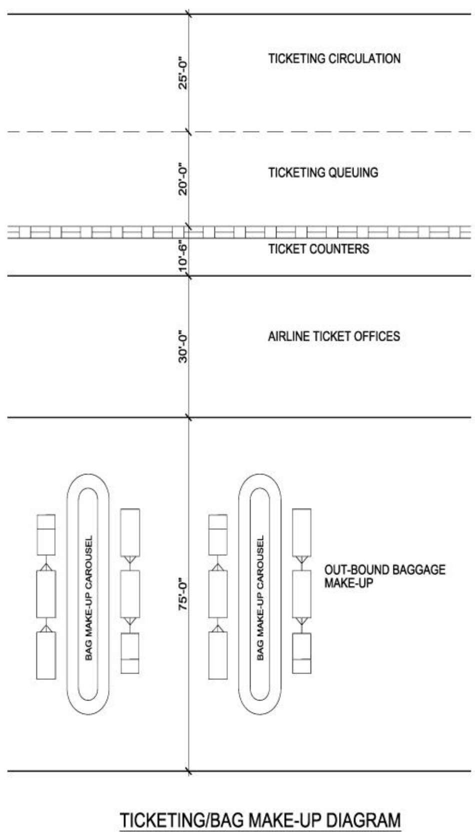
- Ticketing Area
- Ticketing Counters
- Ticket Counter Queuing
- Ticketing Circulation
- Airline Ticketing Offices and Airline Operations Space
- Outbound Baggage Make-Up
- TSA
- Passenger Screening
- Other TSA Lease Areas
- Gate Areas
- Gates/Jet Bridges
- Departure Lounges
- Gate Area Circulation
- Concessions
- Food/Beverage
- News/Gifts
- Guest Services/Information
- Advertising
- Restrooms
- Baggage Claim Area
- Baggage Claim Devices
- Baggage Service Offices (BSO)
- Airport Administration Offices
- Non-Public Areas

Ticketing Area

The ticketing area functions include ticketing counters, passenger queuing, airline ticket offices, and outbound baggage handling operations. In general, the ticketing functions at Aspen/Pitkin County Airport perform adequately within the space provided; therefore, current space allocations were used as a baseline to determine future needs. In other words, as enplanements grow in the future, the ticketing area functions increase proportionally to peak hour passengers.

The following sections provide descriptions of each component of the ticketing area, assuming standard Airport trends. **Figure 3-5** depicts a diagram of how the different components interrelate in an ideal situation.

Figure 3-5. Ticketing Area Diagram



Source: Jviation, Inc.

Ticketing Counters

The length of the ticket counter is a function of the number of passengers (PHOP) who use the counter for ticketing and baggage check-in. The existing terminal facilities have 97 linear feet (LF) of ticketing counter. Approximately 80 LF of the existing ticketing counter is being used by the airlines, leaving 17 LF for a new entrant or expansion of the current airlines.

Since the current counter space appears adequate and well utilized, the planning factor for ticket counter length was adjusted to reflect this adequacy. As a result, the 2008 programming table reflects this adjustment and recommends a length of 77 feet, or about 4.5 square feet (SF) for each PHOP. The adjusted planning factor results in a required length of 86 LF for the design year, 2017, which is less than the existing counter space available. The tables indicate that 102 LF of counter will be ultimately required in 2027.

The area for the space behind the ticket counter is based on the ticket counter length multiplied by the actual depth of 10.5 feet from the front of the counter to the rear wall. This space is where the agents operate during the check-in procedure.

Ticket Counter Queuing

Passenger queuing in front of the counter equals the ticket counter length multiplied by a recommended depth of 20 feet. With the square footage of this area divided by the number of PHOP, approximately 8.6 SF are provided for each PHOP. Since there is existing counter space that is unused, the existing queuing space is more than is needed for the next 10 years due to the excess 11 feet of ticketing counter requirement. However, if a new airline enters the market or an existing airline expands their ticketing space, queuing space will become more congested as that area in front of the unused ticket counters is lost.

Circulation - Ticketing

The ticketing circulation area is located directly behind the passenger queuing area. It is part of the ticket lobby and includes the areas between vestibules for seating and remote check-in kiosks. This area equals the typical length of the ticket counter multiplied by 20 to 25 feet. The projected 2017 square footage requirements are 2,159 SF, as compared to the existing 3,086 SF. Therefore, the existing ticketing circulation space exceeds the projected requirements for 2017. Additionally, it exceeds the ultimate 2027 theoretical requirement of 2,556 SF. The excess of space in the circulation area creates an opportunity to reconfigure the entire space to better allocate it amongst circulation and queuing needs.

Airline Ticketing Offices (ATO) and Airline Operations Space

The ATO space requirements equal the ticket counter length multiplied by the recommended depth of 30 feet. This space is affected by originating passengers, so PHOP is used to determine the space allotment.

Airline operations spaces include employee facilities, administrative offices, maintenance, catering, and storage. The space requirements of these facilities are affected by the total number of passengers coming and going from the Airport. Therefore, ANNEP is used in determining the needed space.

Based on the figures shown in **Table 3-19**, the 2009 ATO and airline operations spaces appear to be adequate. However, input from airport staff and tenants indicate that arrangement of the existing ATO and airline operations spaces are inefficient and inadequate. The ATO and operations spaces will be 20 percent, or 1,215 SF, deficient by 2017.

Outbound Baggage Make-up

The outbound baggage space requirement equals the ticket counter length multiplied by the recommended depth of 75 feet.

The existing space dedicated to outbound baggage make-up is adequate; however, most of the space is located under a canopy and exposed to the extreme cold temperatures in the winter, which is a detriment to the baggage handling equipment and airline crews.

The program for 2009 recommends an area of 5,700 SF, which is 1,500 SF more than exists today. The recommended area for design year 2017 is 6,474 SF, which is 50 percent more area than the existing area.

TSA Baggage Screening

A full automated Checked Baggage Inspection System (CBIS) is desired to replace the current semi-automatic system of baggage screening. This system would include automated conveyors along the wall behind the ticketing counters, allowing ticketing agents to place checked baggage directly onto the conveyors. These conveyors will carry the checked baggage to the Baggage Handling System (BHS) area where diverters will direct baggage to Explosive Detection System (EDS) units. Once screened at the EDS units, cleared bags will be automatically moved along conveyors to the baggage make-up area. Bags that are alarmed at the EDS units will be diverted onto conveyors to the Explosives Trace Detection (ETD) area, where bags will be manually searched and scanned for explosives. Bags cleared at the ETD area will be placed on an automated conveyor that carries the bags to the baggage make-up area.

Based on the forecasts presented in Chapter 2, *Forecasts of Aviation Demand*, it is anticipated that no more than seven or eight gate positions will be active at any given time. At this level of activity, there will be around 529 bags per hour, depending on the distribution of passenger check-in times, entering the TSA CBIS, as shown in **Table 3-20**. EDS units process approximately 400 bags per hour; therefore, it is recommended that two EDS units be installed with the BHS. The second unit will be the back-up unit, in the event one unit is down and being serviced.

Table 3-20. TSA EDS Units

TSA EDS Units Conceptual Terminal Facility Requirements Passenger Arrival Distribution % Time Before Departure (minutes)	Airlines Passenger % (Average Airport)	Total Bags	Required EDS	Restricted Check-in Distribution	Total Bags	Required EDS	Restricted Check-in Distribution	Total Bags	Required EDS
160	5.4%	28.58	0.43						
150 - 160	1.4%	7.41	0.11						
140 - 150	4.9%	25.93	0.39						
130 - 140	5.8%	30.69	0.46						
120 - 130	9.4%	49.74	0.75						
110 - 120	13.9%	73.56	1.10						
100 - 110	12.8%	67.74	1.02	10.0%	52.92	0.79			
90 - 100	12.3%	65.09	0.98	10.0%	52.92	0.79			
80 - 90	9.9%	52.39	0.79	10.0%	52.92	0.79	20.0%	105.8	1.59
70 - 80	12.1%	64.03	0.96	15.0%	79.38	1.19	25.0%	132.3	1.99
60 - 70	7.4%	39.16	0.59	20.0%	105.8	1.59	20.0%	105.8	1.59
50 - 60	2.0%	10.58	0.16	25.0%	132.3	1.99	25.0%	132.3	1.99
40 - 50	2.0%	10.58	0.16	7.5%	39.69	0.60	7.5%	39.69	0.60
30 - 40	0.7%	3.70	0.06	2.5%	13.23	0.20	2.5%	13.23	0.20
20 - 30	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00
20 -	0.0%	0.00	0.00	0.0%	0.00	0.00	0.0%	0.00	0.00
Total	**100.0%**	**264.6**		**100.0%**	**264.6**		**100.0%**	**264.6**	

Assumptions	
Bags per Passenger	2.4
Load Factor	0.90
Seat per aircraft	70.00
Checked Baggage	0.50
Gates	7.00
Total Bags	529.20
EDS processing Rate per minute	6.66
EDS processing Rate per 10 Minutes	66.60

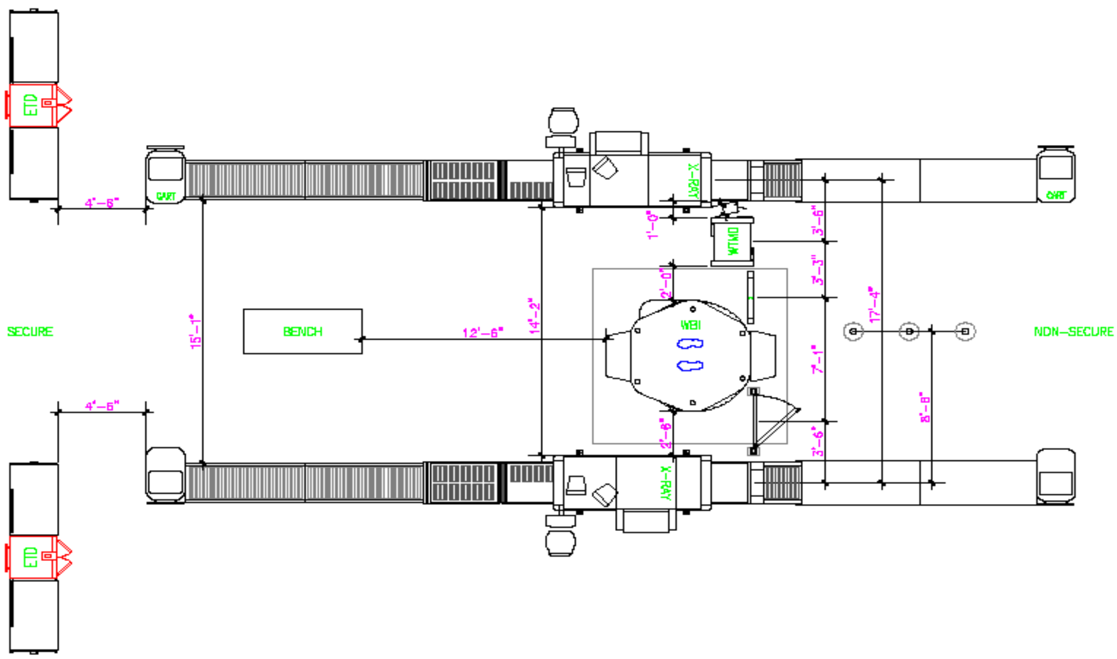
Source: Jviation, Inc.

Passenger Screening

TSA passenger security screening takes place in the terminal before passengers enter into the secure concourse holdrooms. In the future, depending on the selected terminal improvement alternative, screening may continue to occur in its present location, be relocated to a new first level location in the current building, or it could occur on the second level of a loading bridge equipped new facility. As discussed in Chapter 1, *Inventory*, the current screening location creates a pinch point for passenger circulation and results in queuing on an interior ramp.

Regardless of the alternative chosen, ample queuing space with stanchions leading to the checkpoint lanes, separate from lobby circulation space, will be needed to accommodate the waiting passengers at peak times. A minimum of 300 SF of queuing space is recommended in front of each screening lane. The 2008 Forecast update shows Peak Hour Average Day (PHAD) enplanements of 201 passengers for 2017. TSA reports a processing rate of 200 passengers per hour for each security screening lane. **Figure 3-6** shows the configuration of two screening lanes, which will be sufficient to process passengers even at peak times. It is recommended that the TSA security screening checkpoint space be sized to accommodate three lanes to allow for future expansion when needed. This space will also allow for a private screening room at the checkpoint and accommodate future changes in equipment sizes. The present screening area accommodates two lanes with the aforementioned problems in passenger circulation and queuing; however, three lanes could not be provided without major modifications to other existing spaces.

Figure 3-6. TSA Screening Area



Source: Jviation, Inc.

Other TSA Lease Area

The 2009 Programming Document (**Table 3-21**) indicates that TSA requires additional space for a training room, a break room, and office space. These spaces do not need to be adjacent to the TSA security screening spaces.

Table 3-21. TSA Checkpoint

TSA Checkpoint

Conceptual Facility Requirements 2017

Passenger Arrival Distribution %

Time Before Departure (minutes)	Airlines Passenger % (Average Airport)	Total Passengers	Required Checkpoints	100 min. Distribution	Total Passengers	Required Checkpoints	90 min. Distribution	Total Passengers	Required Checkpoints	90 min. Distribution	Total Passengers	Required Checkpoints
150 - 160	5.4%	10.8	0.3									
140 - 150	1.4%	2.81	0.1									
130 - 140	4.9%	9.85	0.3									
120 - 130	5.8%	11.6	0.3									
110 - 120	9.4%	18.8	0.6									
100 - 110	13.9%	27.9	0.8									
90 - 100	12.8%	25.7	0.8	10.0	20.	0.6						
80 - 90	12.3%	24.7	0.7	10.0	20.	0.6						
70 - 80	9.9%	19.9	0.6	10.0	20.	0.6	20.0%	40.20	1.2			
60 - 70	12.1%	24.3	0.7	15.0	30.	0.9	25.0%	50.25	1.5			
50 - 60	7.4%	14.8	0.4	20.0	40.	1.2	20.0%	40.20	1.2	22.5%	45.23	1.4
40 - 50	2.0%	4.02	0.1	25.0	50.	1.5	25.0%	50.25	1.5	27.5%	55.28	1.7
30 - 40	2.0%	4.02	0.1	7.5	15.	0.5	7.5%	15.08	0.5	22.5%	45.23	1.4
20 - 30	0.7%	1.41	0.0	2.5	5.0	0.2	2.5%	5.03	0.2	27.5%	55.28	1.7
20 -	0.0%	0.00	0.0	0.0	0.0	0.0	0.0%	0.00	0.0	0.0%	0.00	0.0
Total	**100.0%**	**201.**		**100.**	**20**		**100.0%**	**201.0**		**100.0%**	**201.0**	

Assumptions

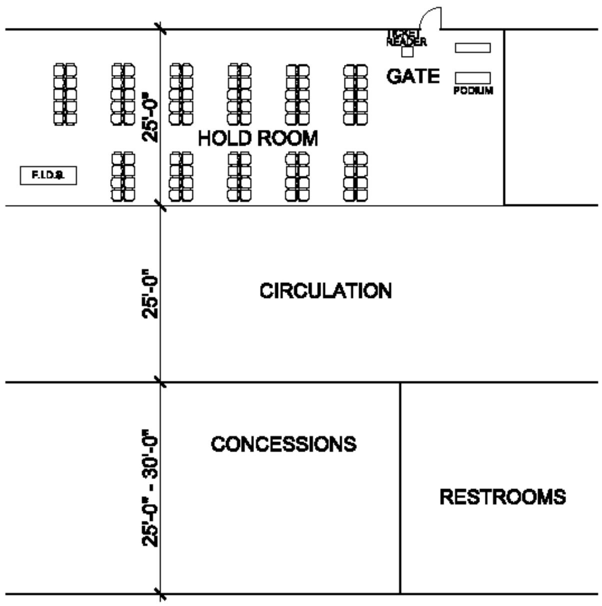
Peak Hour Originating Passengers	201.0
Total	201.0
Processing rate per hour	200.0
Checkpoint processing Rate per minute	3.33
Checkpoint processing Rate per 10	33.33

Source: Jviation, Inc.

Gate Areas

The gate areas are secure public areas that include gates, departure lounges (holdrooms), secure concessions, and secure circulation. The gate areas represent the single largest undersized existing area at the Airport. This undersizing will continue to compound as passenger levels increase into the future. **Figure 3-7** depicts a typical gate area configuration.

Figure 3-7. Typical Gate/Hold Room Diagram



GATE/HOLD ROOM DIAGRAM

Source: Jviation, Inc.

Gates/Jet Bridges

The forecasts in Chapter 2 indicate that, in 2017, eight aircraft parking positions (gates) will be required for Peak Hour – Average Day and 10 will be required for the Peak Hour – Peak Day. The existing terminal only has four actual gates; however, parking is available for six aircraft. Therefore, the existing terminal concourse facilities and accompanying apron will need to be expanded to accommodate the projected future passenger activity.

As part of any expansion plans to the existing terminal or new facilities, it would normally be recommended that jet bridges be added to the gates for increased passenger comfort and level of service. However, input from the community indicates a preference for avoiding the use of jet bridges. It's recommended that jet bridges be assumed for space planning purposes. This would reserve the ability for the community to consider jet bridges during the design and engineering phase of the terminal project. Mimicking the outdoor boarding experience will be explored through smart design in Chapter 4, *General Aviation Alternatives Analysis*. One benefit of loading bridges is that aircraft support systems, such as ground power and Preconditioned Air (PC Air), can be supplied from the building to the aircraft without the need to run emission-creating diesel powered carts. The pros and cons of both types of boarding will be evaluated in the next chapter of this study.

Departure Lounges

The forecasts presented in Chapter 2 project that 69 percent of the commercial aircraft that operate at the Airport will be CRJ-700 or similar equipment. Space requirements for each lounge are based on 15 SF per passenger multiplied by a 70-seat passenger aircraft (CRJ-700) multiplied by a 0.9 load factor. Fifteen SF per passenger provide adequate space for seating, circulation, and a gate podium. With this calculation, departure lounges are recommended to be 945 SF each.

The existing four departure lounge areas total 2,160 SF at four gates, or 540 SF per departure lounge. This is approximately eight SF per passenger, which is less than half the recommended area per passenger. The existing departure lounges are more than 40 percent too small (1,620 SF) for use today. By 2017, the departure lounges will be four times too small for the projected passenger activity.

The 2004 Master Plan recommends larger departure lounges to provide more than enough seating for all passengers delayed in the Airport due to common weather delays. This document recommends smaller departure lounges so that some of the passengers would seek out alternate seating areas located in the food and beverage concession areas. This should promote higher concession sales and increase revenues.

Circulation – Gate Areas

The gate area circulation is secure, meaning it is beyond the TSA screening checkpoint. The secure circulation is recommended to be 25 feet wide to accommodate both passenger flow and wheelchairs for the handicapped and elderly. The existing area has 1,200 SF of circulation space, but should have approximately 3,780 SF of circulation based on the planning factors used. This means that the existing facility impedes passenger flow to and from the departure gates. The facility will require 7,560 SF of circulation space by 2017.

Concessions

Terminal concessions spaces are for food and beverage vendors, news and gift shops, and rental car agencies that primarily serve passengers using the terminal.

Planning factors for food/beverage, news/gift/sundry, rental car, and other concessions are based on ANNEP, since their annual revenue potential is tied to total volume of passenger traffic. The planning factors for this report are typical of airports similar to Aspen/Pitkin County Airport.

It is recommended that 80 to 90 percent of concessions should be located in the secure area of the terminal to take advantage of the passengers waiting for their flight after passing through the TSA screening areas. This activity is increasing because passengers prefer to go through the screening areas and wait, rather than remaining in non-secure areas, unless there is a longer, known delay time.

It should be noted that, particularly during slower times of year, non-hub airports such as Aspen/Pitkin County Airport may not be able to support concessions in both secure and non-secure areas.

Food & Beverage

It is recommended that food and beverage concessions be located near departure lounges or high-traffic areas to maximize exposure to passengers. Presently, the Aspen/Pitkin County Airport passenger terminal has 877 SF of concession space—a combined bar and restaurant in the non-secure area occupies 750 SF and a small 127-square foot snack bar is in the holdroom. The 2009 and 2017 programs require 1,786 SF and 2,004 SF of concession space, respectively. As previously mentioned, this growth would ideally occur on the secured side of the screening area.

News and Gifts

This category includes newsstands and gift, retail, and specialty shops. The existing terminal has 567 SF of space (about half located in the secure area). This is comparable to the 2009 program requirement for 670 SF. The 2017 program recommends 751 SF of area dedicated to this function.

Rental Car Office/Counter

The existing rental car facilities, located in the baggage claim area, have 567 SF of space for five "On-Airport" companies. Each company has a counter with a small office. The tenants have indicated that this office space is inadequate. The 2009 program suggests this area be 781 SF. Although the additional square footage is relatively small (214 SF), the extra space would add approximately five feet of depth to the office areas, making them a more usable size of approximately 10 by 12 feet.

Guest Services/Information

The existing guest services/information area occupies a small 243-square foot space, similar to the rental car counters. The existing space is too small for the current staffing and storage requirements. The planning factor was adjusted to reflect the need for additional square footage. The 2009 program was adjusted to provide 402 SF, addressing the need for additional counter space and storage. The 2017 program requires 451 SF for this area.

Advertising

Advertising typically uses available wall areas and free-standing kiosks placed in highly visible areas. No floor area is specifically provided or dedicated to advertising in any of the program tables.

Restrooms

The program area for restrooms has been divided between secure and non-secure locations within the terminal. The planning factor used for secure and non-secure restrooms is based on PHP since both originating and terminating passengers will be using the restrooms simultaneously. The planning factor takes into account ADA compliance, janitor closets, and vestibules associated with the restrooms.

Non-Secure

The existing terminal has 766 SF of restrooms compared to the projected requirement for 2009 of 1,257 SF. By 2017, the restrooms will need to be approximately twice their current size, or 1,428 SF.

Secure

The existing 673 SF of restroom facilities do not meet the current forecasted demand for space of 1,257 SF on the 2009 program. The 2017 program requirement for secure restrooms is 1,428 SF. Current secured restrooms are located down a long narrow corridor, and are somewhat intimidating to seek out.

Baggage Claim Area

This category includes circulation in the baggage claim lobby, as well as seating alcoves, vestibules, escalators, and elevator lobbies.

General circulation in the baggage claim lobby includes the areas between vestibules for seating, hotel, ground transportation, information, and access to baggage services. The baggage claim lobby circulation assumes a clear space 25 feet wide alongside the baggage claim area, the full length of the baggage claim lobby, and around the baggage carousels (see **Figure 3-8**).

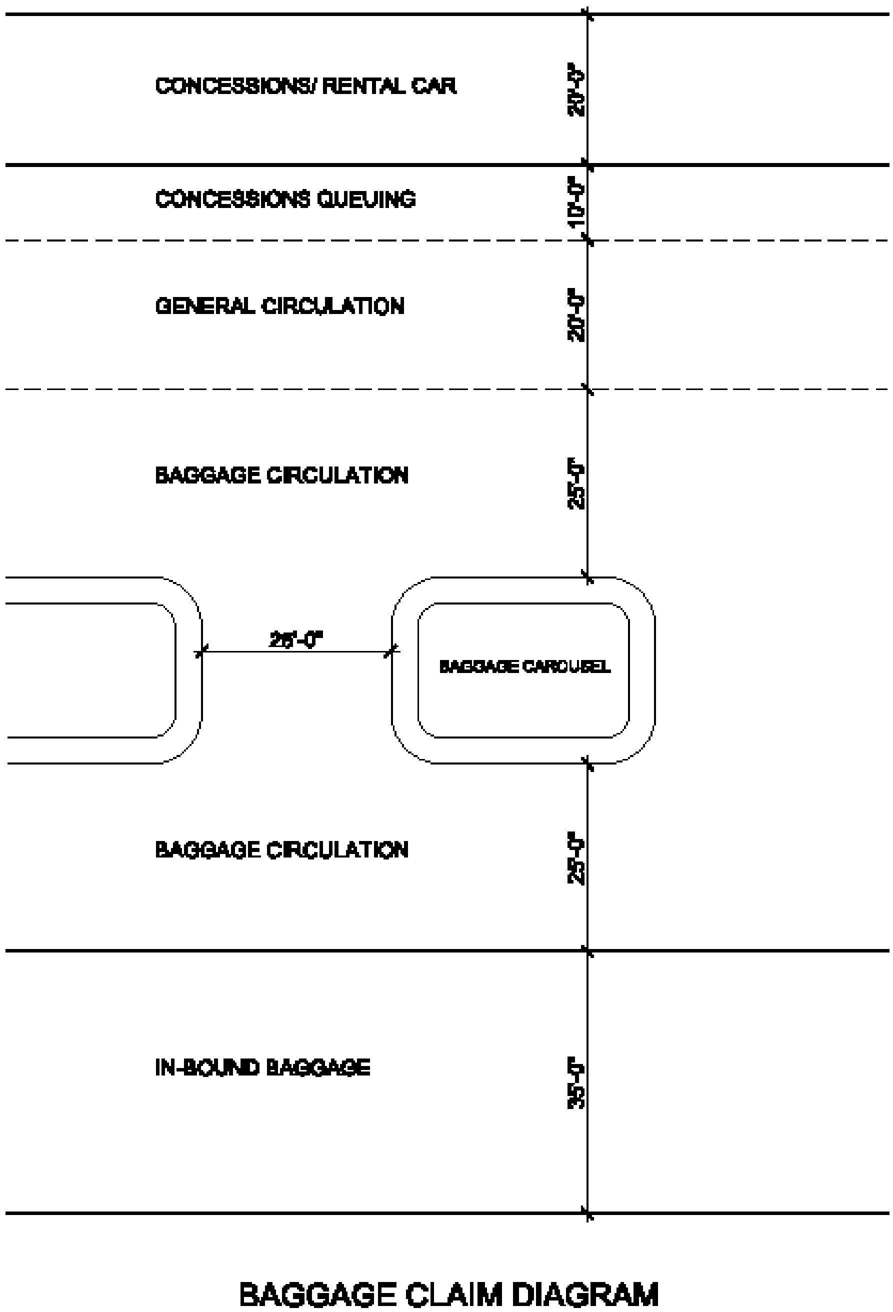
Baggage Claim Devices

The 2004 Master Plan recommends automated baggage claim carousel devices. Sloped plate devices are recommended because they allow passengers to circulate completely around the devices for maximum frontage and allow multiple bags to stack up on the carousel. The 2008 Forecast for PHAD deplanements for 2017 is 207 passengers. The 2009 program document indicates that 159 LF of frontage should be provided. Two large baggage carousel devices with approximately 130 LF of frontage each are recommended to expedite baggage retrieval and prevent congestion.

A separate baggage claim device and area are recommended for oversized bags because oversized baggage would be problematic on the carousel devices. Given that Aspen/Pitkin County Airport is a ski resort destination airport, oversized baggage with ski equipment will be common.

The inbound baggage area (where baggage is off-loaded from carts onto inbound baggage conveyors) is based on a module 35 feet by 75 feet for each claim device, which allows room for the conveyors and tug circulation. The inbound baggage area requires direct airside access for the tugs and carts and should be adjacent to the baggage claim area so there are shorter conveyor distances, which will reduce system costs.

Figure 3-8. Baggage Claim Diagram



Source: Jviation, Inc.

Baggage Service Office

BSO areas are based on modules typical at other airports, taking into consideration the airline's operation. The 2009 program recommends that BSOs be adjacent to the baggage claim area. This adjacency creates a shared baggage claim lobby space for circulation, and is convenient for passengers with baggage concerns to access the BSO. These areas will include a service counter, offices, and storage space for baggage.

The planning factor for the BSO was adjusted to reflect the large number of bags that need to be stored at the Airport due to weather delays, cancellations, passenger misconnects, and late arrivals. These factors require that a larger than normal amount of secure baggage storage space be provided.

The existing BSO has 786 SF of secure baggage storage. The 2009 program was adjusted to provide 30 percent (1,098 SF) more space. The 2017 program uses the same planning factor and predicts the need for 1,242 SF.

Airport Administration Offices

The area dedicated to administrative offices varies widely between airports. The planning factor used in this document to estimate the required square footage for the office area is based on annual enplanements and reflects the level of administrative staff needed for the volume of passenger traffic.

The administrative offices at Aspen/Pitkin County Airport currently occupy 1,200 SF. The 2009 program estimates that the office area should be approximately 2,500 SF.

The planning factor for the administrative area was adjusted to increase the space to address the desire for some larger spaces. The administration needs additional space for restrooms, a larger conference room, a larger reception area, a file/copy room, and a communication center.

Non-Public Areas

Non-public areas include loading dock areas; maintenance areas; and space for mechanical, electrical, and building systems. Planning factors for the other non-public spaces were estimated based on typical use factors at other comparable airports, which vary significantly. For example, mechanical, electrical, and building system space typically ranges from 5 to 12 percent of the total building area. Twelve percent was selected for the Airport.

The existing passenger terminal has approximately 955 SF of building system space for electrical and mechanical spaces. Much of the existing mechanical equipment is located on the rooftop of the terminal. This type of installation of equipment shortens its useful life, due to exposure to the elements and the difficulty of accessing the equipment for servicing. The 2009 program estimates that the terminal building should have 6,704 SF dedicated to building systems. The 2017 program estimates that the facility will need 8,489 SF of space to support the projected passenger activity levels. Both future program estimates take into account mechanical areas that are enclosed and protected from the elements.

A comparison of each area of the existing terminal to the selected program years for the same spaces is shown in **Table 3-22**.

3.3.11 Airside Passenger Terminal Facility Requirements

The airside includes the areas beyond the Airport's fence, where the aircraft and support equipment park and operate.

Commercial Apron

The existing commercial apron encompasses approximately 318,000 SF. The forecasts presented in Chapter 2 indicate that, in 2017, eight air carrier aircraft will be present during the average peak hour and 10 may be present at extreme peak times. It is recommended that a parking capacity be provided to be able to board at least the eight aircraft, with the other two being able to stage in a Remain Overnight (RON) area. By 2027, aircraft parking needs will increase to nine gated aircraft.

GSE Parking

A service vehicle route will be defined in the proposed new terminal design to allow GSE vehicles to circulate around the airside of the terminal without interfering with the aircraft gate positions. This service vehicle route will also provide secure, gated access to and from the landside roadways.

The new terminal apron needs to accommodate at least eight gate positions with either loading bridges or ground loading. Each of the gate positions will require service from an aircraft tug, a hydrant fueling truck, a GPU cart, a lavatory service truck, a bag loading conveyor vehicle, baggage tugs, and baggage carts.

It is assumed that the aircraft tugs are the type that use the weight of the aircraft to maneuver it into position, and that each tug can serve two gate positions without causing delay. It is also assumed that the fueling trucks and lavatory service trucks can serve at least two gate positions without causing delay.

Table 3-22. Facility Requirements Comparison

Terminal Building						
Conceptual Facility Requirements Comparison						
Description	Existing Terminal	2006 Space Requirements	2008 Space Requirements	2012 Space Requirements	2017 Space Requirements	2027 Space Requirements
Airline Functions						
Ticket Counter Area	1,035	732	809	834	907	1,073
Ticket Counter Length	*97*	*70*	*77*	*80*	*86*	*102*
Ticket Counter Queuing	1,834	1,393	1,539	1,589	1,727	2,044
Curbside Baggage Check	50	136	150	155	169	200
Baggage Claim Area /	4,057	4,075	4,650	4,875	5,175	6,100
Baggage Claim Frontage	*224*	*142*	*162*	*170*	*180*	*212*
Baggage Service Office	786	978	1,116	1,170	1,242	1,464
Airline Operations / Airline	5,131	5,144	5,654	5,833	6,346	7,499
Outbound Baggage	4,227	5,226	5,775	5,959	6,474	7,666
Inbound Baggage	1,050	2,038	2,325	2,438	2,588	3,050
Departures Lounges	2,160	3,780	3,780	5,670	6,615	8,505
Jet Gates	*4*	*4*	*4*	*6*	*7*	*9*
Subtotal Airline Functions	**20,280**	**23,502**	**25,798**	**28,523**	**31,241**	**37,601**
Concessions						
Concessions (Food /	877	1,628	1,783	1,840	2,004	2,364
Concessions Other (seating	1,433	81	89	92	100	118
Concessions (News / Gifts /	567	611	669	690	751	887
Concessions (Concession	175	305	334	345	376	443
Ground Transportation	318	509	557	575	626	739
Information	243	366	401	414	451	532
Rental Car Counters	567	712	780	805	877	1,034
Subtotal Concessions	**4,180**	**4,213**	**4,614**	**4,761**	**5,184**	**6,118**
Secure Public Area						
Security	2,610	2,400	2,400	2,400	2,400	3,600
Circulation	1,200	3,780	3,780	5,670	7,560	9,450
Restrooms	673	1,141	1,278	1,309	1,428	1,684
TSA Bag Screen Room	1,700	1,250	1,250	3,750	3,750	5,000
TSA Offices / Break	312	703	777	803	872	1,033
Airport Administration	1,213	2,239	2,452	2,530	2,755	3,251
Other / Airline Service	387	285	312	322	351	414
Subtotal Secure Public	**8,095**	**11,798**	**12,248**	**16,784**	**19,116**	**24,431**
Non-Secure Public Area						
Circulation - Ticketing	3,086	1,740	1,922	1,987	2,159	2,556
Circulation - Baggage Claim	2,872	2,445	2,790	2,925	3,105	3,660
Circulation - General	3,930	5,088	5,572	5,750	6,261	7,389
Restrooms	766	1,141	1,278	1,309	1,428	1,684
Other	0	285	312	322	351	414
Subtotal Non-Secure	**10,654**	**10,699**	**11,874**	**12,292**	**13,304**	**15,702**
Non-Public Area						
Loading Dock	0	151	164	187	207	252
Storage	167	502	545	624	688	839
Maintenance	686	502	545	624	688	839
Mech. / Elec. / Bldg.	955	6,025	6,544	7,483	8,261	10,062
Miscellaneous	0	1,255	1,363	1,559	1,721	2,096
Subtotal Non-Public Area	**1,808**	**8,436**	**9,162**	**10,476**	**11,566**	**14,087**

Table 3-22. Facility Requirements Comparison						
Terminal Building						
Conceptual Facility Requirements Comparison						
Description	Existing Terminal	2006 Space Requirements	2008 Space Requirements	2012 Space Requirements	2017 Space Requirements	2027 Space Requirements
Grand Total	**45,017**	**58,647**	**63,696**	**72,836**	**80,411**	**97,939**

Source: Jviation, Inc.

The two airlines (SkyWest and American Airlines) serving Aspen/Pitkin County Airport will have an aircraft tug, a bag loading conveyor vehicle, at least two baggage tugs, and at least five baggage carts. It is assumed that it would be extremely rare for all gates to be occupied simultaneously. The total estimated number and types of GSE vehicles to serve the above-stated aircraft are as follows:

- Aircraft tugs - 4
- Hydrant fueling trucks - 3
- GPU carts - 6
- Lavatory service trucks - 2
- Bag loading conveyor vehicles - 4
- Baggage tugs - 8
- Baggage carts - 24

Covered parking for some of the large GSE vehicles should be provided as part of the new terminal facilities. In addition to this GSE parking, the outbound baggage and inbound baggage spaces should accommodate baggage tugs and carts within the enclosed areas. It is expected that the remainder of the GSE vehicles will be parked outside of the terminal building.

Charging stations should be provided adequately to allow a large number of electric powered GSE vehicles to be used, assuming discussions on charges, uses, and type of equipment can be defined.

3.3.12 Landside Passenger Terminal Facility Requirements

The landside includes the areas within the Airport's fence, which includes Airport access, auto parking, circulation, and terminal building operating systems.

Airport Access

Access to the passenger terminal will continue to be provided from Highway 82. The primary passenger terminal access off of Highway 82 will continue to be at Baltic Avenue. A second access point is planned closer to Aspen near the BMC West property. Details regarding the BMC West intersection have not yet been determined. The terminal improvement alternatives and all future drawings will reflect the Baltic Avenue and BMC West locations.

Terminal Circulation Road Requirements

For the foreseeable future, the commercial and GA facilities will remain on the east side of the Airport in the same general area as they are now. Additional future GA development may occur on the west side of the Airport, north of the ARFF/SRE Building, but it is envisioned that substantial GA use would still occur on the east side.

Terminal roadways must be designed and constructed to accommodate the anticipated demand smoothly and efficiently with an easy to follow, intuitive layout and way finding system. It is recommended that vehicle entrance access to the passenger terminal facility continue to be from Highway 82, primarily from an intersection north of the terminal building. Vehicles should enter from either northbound or southbound lanes. This three-lane north intersection will include two lanes for traffic entering the Airport property and one lane for exiting traffic. A second intersection from Highway 82 will be south of the terminal and will provide two lanes for exiting the airport property and one for entering the airport property. This intersection will allow vehicles to access northbound or southbound Highway 82. The medians at Highway 82 will need to be modified to accommodate these intersections, including new left-turn lanes into the Airport and allowing left turns out of the Airport.

Curbside

To determine the future curb requirements for the terminal, both the *physical parameters* of the curb (curb length and number of lanes) and *operational factors* (lane utilization and curbside management and control) were considered. Lane utilization is particularly important, as a given curbside roadway system serves both a passenger service function (loading/unloading of passengers at the curb) and a vehicular movement function (through movement to gain access to the curb and to leave the curb).

The following list of factors that influence curb requirements were used as input in the analysis:

- **Forecasts of O&D Peak Hour Passenger activity**
- **Mode Shares** (Source: Airport Traffic Data Survey, 2003 and Airport Master Plan, 2004)**.**
- **Vehicle Occupancies** (Source: Airport Traffic Data Survey, 2003 and Airport Master Plan, 2004)**.**
- **Dwell Times** (Source: Airport Master Plan, 2004 and industry standards)**.**

Curb demand is dependent on the number and types of vehicles that enter the system during the peak hour, as well as the time each type of vehicle dwells on the curb. Dwell times are variable, and have changed at most airports since the increase in airport security resulting from the events of September 11, 2001. Following a traffic data survey conducted at the Airport in 2003, it was concluded that frequent flight delays result in a “clustering” of activity on the curb front, significantly affecting the existing curb demand. This variable has been accounted for in the forecasting. All inputs to the analysis were assumed to remain constant throughout the forecast period.

The new terminal curb system is envisioned to be a single level curb roadway, with departures located on the upstream end of the curb and arrivals located on the downstream end of the curb. A three-lane, public curb roadway is planned to serve private vehicles, taxis, limousines, commercial vehicles, hotel shuttles, and courtesy shuttles. Grade level separation with an upper and lower curbside for personal versus commercial vehicles may be desirable.

In the single level lane configuration, the right lane closest to the terminal functions as the vehicle loading/unloading lane, while the left lanes operate essentially as through-traffic lanes. All departures-related traffic must bypass the arrivals curb segment, and all arrivals-related traffic must bypass the departures curb segment. As such, it is necessary that the leftmost lane, the third lane, be devoted exclusively to through-traffic movement. It is planned that all commercial modes, including rental car shuttles, hotel shuttles, and courtesy shuttles, stop twice – first to drop off passengers along the departures curb segment, and then to pick up passengers along the arrivals curb segment.

Also, because the arrivals and departures curb segments are contiguous, it is likely that some spillover of vehicle loading/unloading onto the adjacent curb segment will occur during times of heavy arrivals traffic or heavy departures traffic. All staging activity for commercial vehicles should be conducted at an upstream commercial vehicle parking area in the vicinity of the terminal to minimize their actual dwell time at the curb and improve the overall capacity. Additionally, a park-and-wait lot for private vehicles upstream from the terminal is desirable to reduce the demand for private vehicle parking at the curb, especially during flight delays to reduce the clustering effect.

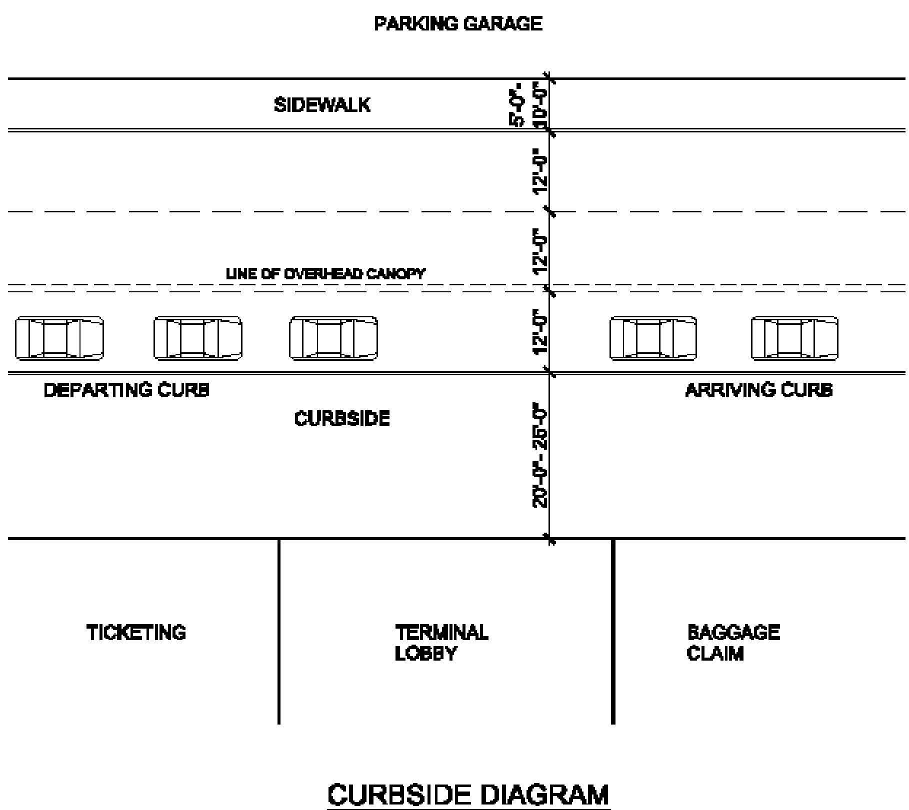
There are currently 20 curbside private vehicle stalls at the Airport. Terminal curbside capacity is a function of linear length of curb and number of peak hour passengers on the peak day, and is dependent on the number and types of vehicles entering the system. By using this information, and the current forecasting from Chapter 2, in 2017 there will be a demand for 30 private curbside stalls, resulting in 660 LF of curb (see **Table 3-23**). The private vehicle park-and-wait lot would reduce this demand by approximately 50 percent, resulting in 330 LF of curb. By 2017, 700 LF of curb will be required for commercial vehicles. The commercial vehicle parking area will reduce this demand by approximately 50 percent, resulting in 350 LF of curb. It is recommended that approximately 55 percent of the total curb stalls be allocated to the arrivals curb, and 45 percent be allocated to the departing curb.

Table 3-23. Private Vehicle Curbside Parking			
Year	**Peak Hour Peak Day**	**Total Curb**	**Total Linear Feet of**
2006	445	24	540
2012	504	28	600
2017	549	30	660
2027	648	36	780

Source: Mead & Hunt, Inc.

When comparing curb capacity to future demand, a volume/capacity ratio less than 0.90 indicates that curb capacity in the proposed design is adequate to handle demand in the forecast year. The smaller the volume/capacity ratio, the more desirable the level of service. Given the proposed curb length and lane configuration, the curb would be expected to operate at a reasonable level of service through year 2017. See **Figure 3-9** for typical curbside configuration.

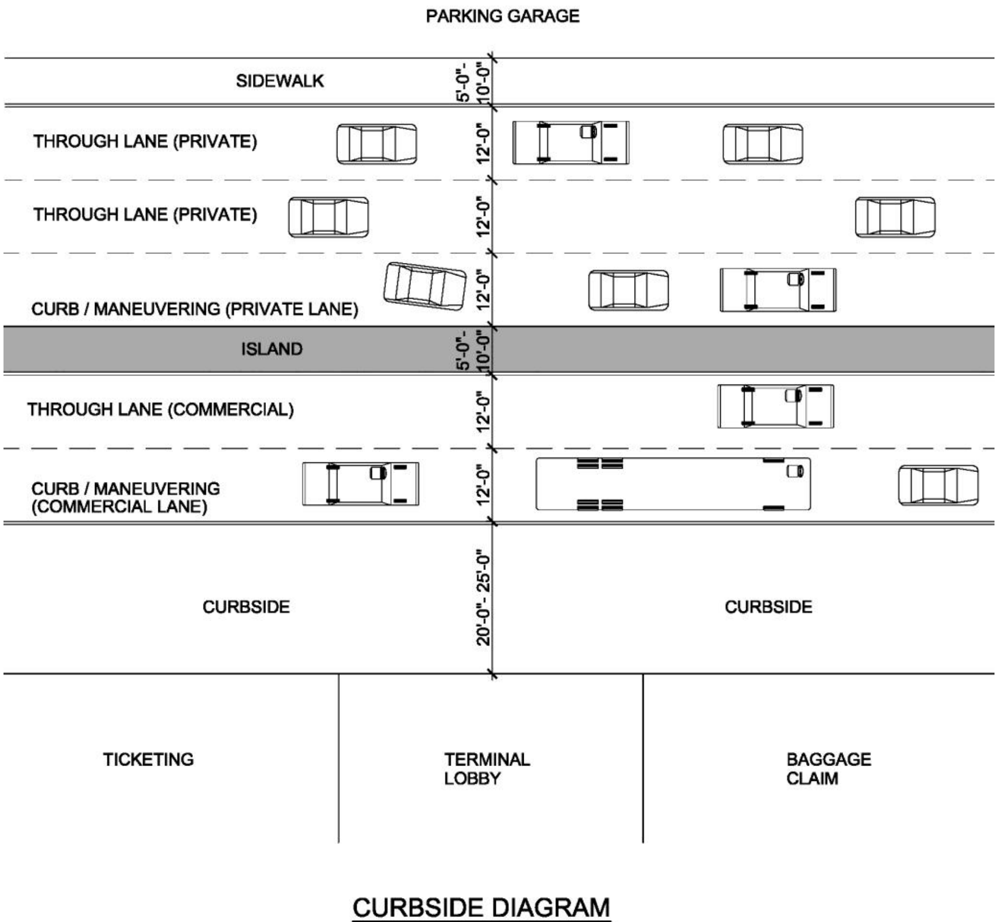
Figure 3-9. Curbside Diagram



Source: Jviation

An additional curbside configuration is shown in **Figure 3-10**. This diagram illustrates a separation between commercial and private lanes with an island dividing them. There is a curb/maneuvering lane for both commercial and private vehicles, which allows individuals to be dropped off at curbside while through lanes provide access around the stopped vehicles. There is one through lane for commercial vehicles and two through lanes for private vehicles.

Figure 3-10. Alternative Dual Curbside Diagram



Source: Jviation, Inc.

Auto Parking

Data presented in Chapter 2, *Forecasts of Aviation Demand*, indicates that, for 2017, a total of 257 long-term and 223 short-term stalls will be needed to accommodate the demand, for a combined total of 480 parking stalls. Forecasts also indicate that, for 2017, 88 stalls will be needed for employee parking, as shown in **Table 3-24**. Additionally, 2017 forecasts indicate that 150 ready/return rental car stalls and 97,000 SF for rental car overflow storage parking will be needed. Furthermore, the Airport will reserve room for 225 Roaring Fork Transportation Authority (RFTA) parking stalls and commercial development will require 244 stalls. The sum total for all of these stated parking needs for 2017 is 1,550 parking stalls, shown in **Table 3-24**. These numbers are further examined and refined in Chapter 5.

A potential structure with the ability to accommodate a total of 1,500 parking stalls will be evaluated. In addition to including short-term and long-term passenger parking, rental car parking, and employee parking, a structure could help to alleviate other valley parking needs and provide parking as an intercept lot for public transit to Aspen and/or parking for employees and customers of the Aspen Airport Business Center on the east side of Highway 82. This has been further addressed in Chapter 5.

Table 3-24. Parking Requirements

Parking Requirements

Conceptual Facility Requirements

Description	Existing Terminal	2006 Parking Stall Requirements	2009 Parking Stall Requirements	2012 Parking Stall Requirements	2017 Parking Stall Requirements	2027 Parking Stall Requirements
Airline						
Short Term	141*	157	173	205	223	263
Long Term	155	181	199	236	257	303
Employee	69	72	78	81	88	104
Rental Car Ready	58	81	89	112	150	226
Rental Car	265	294	323	333	363	428
RFTA Park-n-ride	0	0	0	160	225	205
Commercial	0	0	0	143	244	184
Total Parking	**688**	**785**	**862**	**1,270**	**1,550**	**1,713**

Source: Mead & Hunt, Inc.

**Note: As of November, 2009 the Airport had converted one of the long-term parking lots to GA apron. There are currently 115 short-term parking spaces.*

Ground Transportation

The terminal curbside will serve privately owned vehicle drop-off and pick-up, taxis and limousines, and commercial vehicles, including rental car shuttles, hotel shuttles, and courtesy shuttles. These services were explained in the previous section. Space will be reserved on the Airport to accommodate parking for the Roaring Fork Transit Authority (RFTA) passengers to allow the potential for park-and-ride transit use in the future as identified in the Aspen Area Community Plan (2012).

RFTA's Bus Rapid Transit (BRT) system is nearing construction and the Airport has been working with RFTA and Pitkin County Public Works to refine the location and design of the stations that will serve the Airport and the Aspen Airport Business Center AABC. A proposed grade-separated pedestrian crossing is also planned in this area and will be coordinated with the RFTA BRT stations. The conceptual alternatives discussed in Chapters 4 and 5 have incorporated a pedestrian connection between the terminal building and the BRT Stations/Pedestrian crossing.

The existing transit right-of-way along Highway 82 will be maintained in the Airport Master Plan to allow for future dedicated transit systems. A parking structure at the Airport could be designed to accommodate a weather protected connection between the RFTA BRT stations or other future transit technologies that might utilize the reserved transit corridor.

Building Systems/Code Compliance Analysis

In order to understand the maintenance and upgrade needs of the terminal, a review of the building life safety/fire protection, mechanical systems, and electrical systems was performed by BCER, Inc. Numerous deficiencies were noted in the various systems, with many of those deficiencies related to ongoing preventative maintenance and operational procedures. A summary of each area is provided in the following text.

One deficiency is the lack of current, up-to-date building information, including electrical, mechanical, and plumbing plans and diagrams. It is recommended that a consultant be hired to consolidate all of the existing information and prepare new drawings based on field surveys and measurements. This information will be invaluable for all future design projects in the terminal.

The BCER report included an assessment of current inadequacies, as well as estimated costs, to bring the problem areas into code compliance and/or meet recommendations.

Life Safety/Fire Protection

A total of approximately $1,497,500 in upgrades to the life safety/fire protection systems was identified. A summary of findings includes:

- Upgrade ramp at the entrance to the ticketing area and modify restrooms to meet ADA requirements ($200,000)
- Upgrade fire protection sprinkler system to a fully automatic system and replace existing sprinkler heads ($155,000)
- Install fire protection standpipe system ($20,000)
- Install exterior deluge system on apron facing windows if fueling is to be performed within 100 feet of the terminal face ($150,000)
- Install fire hydrants to the airside and increase the diameter of the water supply main to eight inches from six inches ($200,000)
- Correct maintenance deficiencies and upgrade fire alarm system ($200,000)
- Improve and repair fire area separations as they are inadequate and/or inoperable ($150,000)

- Provide permanent safe rooftop access to rooftop HVAC units ($50,000)

Mechanical Systems

A total of approximately $535,500 in mechanical system improvements was identified. A summary of major findings includes:

- Prepare accurate mechanical system and controls drawings ($15,000)
- Ductwork modifications in the baggage and operations areas ($50,000)
- Current boiler plant improvements, and replace boiler by 2017 ($270,000)
- Repair and upgrade other minor issues

Electrical Systems

A total of approximately $363,000 in electrical system improvements was identified. Major findings include:

- Prepare electrical system record drawings, including one-line drawings and panel schedules ($20,000)
- Remediate electrical deficiencies and replace broken electrical devices ($8,000)
- Perform thermal imaging scan of all major electrical equipment ($10,000)
- Repair roof conduits ($25,000)
- Remove abandoned electrical equipment, conduit, and wiring ($20,000)
- Test all egress lighting and replace, repair, or supplement as needed ($30,000)
- Perform lighting study to determine proper higher efficiency lighting and maximize daylight harvesting ($15,000)
- Provide emergency power to vital areas via a generator ($175,000)
- Repair and upgrade other minor issues

Sustainable Design and Energy Efficiency

Airport management has stated that improving the efficiency and sustainability of the terminal is an imperative goal for any improvements that are to be undertaken. Many technologies and building materials exist that will, for example, improve heating and cooling efficiency, lighting requirements, and improve indoor air quality for occupants. These improvements all come at a cost up front, but that cost often can be recovered in the efficiency gains and resultant decrease in utility expenditures. By realizing these efficiencies, not only does sustainable building improve the environment and create good public relations, but it makes good business sense.

Pitkin County and the City of Aspen have jointly created and adopted an Efficient Building (EB) program to encourage sustainable and efficient construction in the County. Additionally, the U.S. Green Building Council (USGBC) has a process for certifying “green” buildings known as the Leadership in Environmental and Energy Design (LEED) program. Both of these programs have similar elements and intent, with a higher level of compliance being given for a larger number of points that are accumulated by instituting “green” practices in design and construction.

Where one or more programs are to be followed, early identification of goals for sustainable development is imperative. By knowing the extent to which sustainable practices are desired, the program can be custom tailored from the beginning to make use of any possible design credits that can be easily implemented.

3.4 General Aviation Facility Requirements

General aviation facility requirements presented in this section include aircraft parking apron/ramp areas, aircraft storage facilities, and general aviation terminal facilities.

3.4.1 Aircraft Parking Aprons

It is difficult to quantify future general aviation parking needs at the Airport. The Aspen area is a prime destination market, which generates a high level of transient activity. The high proportion of transient aircraft increases demand for additional parking space, which is limited by a lack of available land on the east side of the runway.

As mentioned in previous sections of this document, the primary general aviation apron is located north of the terminal apron. The apron includes approximately 607,000 square feet of apron that are used primarily for transient aircraft. Although some transient aircraft may be parked in areas that typically house based aircraft, spatial demand is calculated for both aprons for the purposes of this document. Thirty-two uncovered apron tie-down positions for based aircraft are located on the far north end of the general aviation area, north and west of the patio shelters.

The Fixed Base Operator (FBO) provides aircraft maintenance, aircraft fueling, flight training, and other amenities, including aircraft parking. The FBO has indicated that, generally, current demand for aircraft parking is being met. In a typical year, there are approximately three or four peak periods of general aviation activity when the Airport may have over 100 stored aircraft, utilizing essentially all of the available apron space. The FBO and Airport management have indicated that the Airport is currently at, or very near, capacity with respect to aircraft parking needs. Therefore, it is anticipated that increases in future itinerant operations and based aircraft will need additional facilities to be accommodated.

A list of aircraft that typically operate or are anticipated to operate at Aspen/Pitkin County Airport is shown in **Table 3-25**. The dimensional criteria of these aircraft will be used to calculate future apron and hangar demand.

Table 3-25. Typical Operating Aircraft

Aircraft Category	Aircraft Type	Length (ft.)	Wingspan (ft.)	Aircraft L x W	Hangar Space (SF)*
Jet	Gulfstream V	96.4	93.3	8,999	11,513
Jet	Citation X	72.2	63.9	4,613	6,443
Jet	Beechjet 400	48.4	43.5	2,106	3,393
Jet	Lear 35	48.7	39.5	1,922	3,151
Jet	*Average*	*73.1*	*66.8*	*5,397*	*7,279*
Multi	King Air 300	43.8	54.5	2,389	3,795
Multi	King Air 100	39.9	45.9	1,833	3,071
Multi	Piper Cheyenne	34.7	42.7	1,479	2,616
Multi	Piper Seneca	28.5	38.9	1,109	2,128
Multi	*Average*	*36.7*	*45.5*	*1,703*	*2,902*
Single	Cessna 206	35.8	28.3	1,012	1,944
Single	Cessna Centurion	28.2	36.8	1,035	2,018
Single	Piper Cherokee	24.3	30.0	728	1,570
Single	Piper Comanche	25.0	36.0	900	1,840
Single	Piper Super Cub	22.4	35.3	790	1,693
Single	*Average*	*27.1*	*33.3*	*893*	*1,813*

Sources: www.airliners.net, Mead and Hunt, Inc.
**Required hangar space assumes a five-foot buffer for the aircraft's wings and tail, and a 10-foot buffer for the nose.*

Projections of apron space demand reflect anticipated increases of based aircraft and itinerant operations presented in Chapter 2, *Forecasts of Aviation Demand*. Calculations to determine additional apron demand are based upon the following assumptions and planning ratios:

- As per FAA AC *150/5300-13, Airport Design, Appendix 5*, the average number of projected daily general aviation operations in the peak month is increased by 10 percent to obtain the number of operations on a typical busy day.

- Because general aviation aircraft parking facilities are at, or near, capacity, the amount of apron space needed is determined by applying the percent increase in the projected number of aircraft that will be on the apron on a typical busy day to the existing apron area.

Additional transient aircraft apron space demand is shown in **Table 3-26**. As shown, an additional 70,622 SF of apron space will be needed in 2012; 104,676 SF in 2017; and, 172,784 SF in 2027.

Table 3-26. Transient Apron Space Requirements

		Projected		
		2012		2027
Relevant				
Busy Day General Aviation	109	123	130	144
Based	83	90	95	107
Apron Space Recommended				
Transient Aircraft Apron	535,36	605,98	640,04	708,14
Additional Aircraft Apron Recommended	0	70,62	104,67	172,78

Sources: FAA Advisory Circular 150/5300-13, Airport Design. Mead & Hunt, Inc.

3.4.2 Based Aircraft Storage Hangars

The Airport has one FBO whose facilities are located on the east side of the runway. These facilities include three aircraft hangars that comprise approximately 30,000 SF. Typically, storage building or hangar requirements at an airport are contingent on the composition of the size and type of aircraft that use the facility, as well as the climate of the surrounding area. Due to a lack of aircraft storage hangars, the majority of based and transient aircraft at Aspen/Pitkin County Airport are stored on uncovered tie-downs or patio shelter type units. These patio shelters include one double-sided unit with 36 aircraft bays and one single-sided unit with 12 bays. Thirty-two uncovered apron tiedown positions for based aircraft are also located on the far north end of the general aviation area, west of the patio shelters. As the Airport experiences extended periods of inclement weather, the majority of the based aircraft owners who use the apron or patio shelters would prefer to have fully enclosed storage facilities if they were available.

Calculations to determine additional aircraft storage hangar needs are based on the following assumptions and planning ratios:

- T-hangar/patio shelter spaces are assumed to be of standard size (1,400 SF recommended per aircraft).
- Corporate hangars are sized to accommodate the average space required by aircraft category as shown in **Table 3-25**; 1,800 SF per single engine aircraft, 2,900 SF per multi-engine aircraft, and 7,300 SF per jet/turboprop aircraft. These dimensions include a five-foot buffer for the aircraft's wings and tail, and a 10-foot buffer for the nose.

Calculations also include the following planning ratios as to the type of storage facility to plan for based aircraft type:

- Single engine: 60 percent are stored in a hangar; 95 percent T-hangars/shelter units; and, 5 percent corporate hangars.
- Multi-engine: 90 percent are stored in a hangar; 30 percent T-hangars/shelter units; and, 70 percent corporate hangars.
- Jet/Turboprop: 100 percent are stored in corporate hangars.

Additional hangar/shelter demand is shown in **Table 3-27**.

Table 3-27. Additional Aircraft Hangar/Patio Shelter Space Demand

	Factor	Existing	Projected Additional Demand 2012	2017	2027
Increase Based Aircraft Hangar Demand		*0*			
Single Engine	60%		3	5	10
Multi-Engine	90%		0	1	2
Jet/Turboprop	100%		2	3	4
Total Increased Based Aircraft Demand			**5**	**9**	**16**
Aircraft Storage					
T-Hangar/Patio Shelter Units		*48*			
Single Engine	95%		3	5	9
Multi-Engine	30%		0	0	1
Total T-Hangar/Patio Shelter Unit Demand			**3**	**5**	**10**
Corporate Hangars		*0*			
Single Engine	5%		0	0	1
Multi-Engine	70%		0	1	1
Jet/Turboprop	100%		2	3	4
Total Corporate Hangar Space Demand (sf)			**14,600**	**24,800**	**33,900**

Sources: FAA Advisory Circular 150/5300-13, Airport Design. Mead and Hunt.

It should be noted that the space planning ratio used for each type of hangar and aircraft does not include the lead-ins, access, taxilanes, or taxiways to access the hangars. It represents only the building for the storage of the aircraft. Taxilane, taxiway, and aircraft hangar access will be required for all units planned and further discussed in Chapter 4, *General Aviation Alternatives Analysis*. These numbers are in addition to the existing 32 uncovered tie-down positions and 48 patio shelter units, which are less preferable to aircraft owners than fully enclosed hangar facilities. The majority of tie-down apron and patio shelter users would prefer to have fully enclosed units; therefore, the development of aircraft hangar alternatives should also examine alternatives to provide fully enclosed units for more of the existing based aircraft as well.

It should also be noted, as mentioned in Chapter 2, *Forecasts of Aviation Demand*, 90 based aircraft are projected at the Airport in 2012, 95 are projected in 2017, and 107 are projected in 2027. Historic facility limitations have impacted the current number of based aircraft and actual demand is likely much greater than these figures. Therefore, the demands set forth in **Table 3-26** are likely conservative, and actual additional demand could be two to three times the projected additional demand if additional facilities were to be offered.

3.4.3 General Aviation Terminal Facilities

The Airport's existing general aviation terminal facilities include a 6,000-square foot terminal building operated by the FBO and auto parking facilities. The auto parking serving the general aviation facilities includes a lot north of the GA terminal building with approximately 44 parking spaces, and the GA terminal loop and a lot to the south of the GA terminal building provides approximately another 28 parking spaces. There is also underground parking at the FBO, which has capacity for up to 12 spaces, although, four of those are typically used for equipment storage. The amount of parking for the existing GA facilities is well undersized to meet the current needs of the employees, passengers, and pilots. During peak periods, there is regularly a need for up to 100 additional spaces to accommodate the privately owned and rental car vehicles to support these users.

A specific task of this Master Plan Update is to examine the suitability of portions of the Airport for a second FBO.

As part of receiving funds through the FAA Airport Improvement Program, airport sponsors are required to sign documents that ensure the airport will be used for the public good. These documents are known as grant assurances. Of the grant assurances, two pertain to FBOs and minimum standards:

Grant Assurance 22 – Economic Non-Discrimination [2]

a. (The airport sponsor) will make the airport available as an airport for public use on reasonable terms and without unjust discrimination to all types, kinds and classes of aeronautical activities, including commercial aeronautical activities offering services to the public at the airport.

b. In any agreement, contract, lease, or other arrangement under which a right or privilege at the airport is granted to any person, firm, or corporation to conduct or to engage in any aeronautical activity for furnishing services to the public at the airport, the sponsor will insert and enforce provisions requiring the contractor to-

- furnish said services on a reasonable, and not unjustly discriminatory, basis to all users thereof, and
- charge reasonable, and not unjustly discriminatory, prices for each unit or service, provided that the contractor may be allowed to make reasonable and nondiscriminatory discounts, rebates, or other similar types of price reductions to volume purchasers.

[2] *Statutory Reference: 49 U.S.C. 47107 / Regulatory Reference 14 CFR Parts 150 - 169*

c. Each fixed base operator at the airport shall be subject to the same rates, fees, rentals, and other charges as are uniformly applicable to all other fixed base operators making the same or similar uses of such airport and utilizing the same or similar facilities.

d. Each air carrier using such airport shall have the right to service itself or to use any fixed base operator that is authorized or permitted by the airport to serve any air carrier at such airport.

e. Each air carrier using such airport (whether as a tenant, non tenant, or subtenant of another air carrier tenant) shall be subject to such nondiscriminatory and substantially comparable rules, regulations, conditions, rates, fees, rentals, and other charges with respect to facilities directly and substantially related to providing air transportation as are applicable to all such air carriers, which make similar use of such airport and utilize similar facilities, subject to reasonable classifications such as tenants or non tenants and signatory carriers and non signatory carriers. Classification or status as tenant or signatory shall not be unreasonably withheld by any airport, provided an air carrier assumes obligations substantially similar to those already imposed on air carriers in such classification or status.

f. (The airport sponsor) will not exercise or grant any right or privilege that operates to prevent any person, firm, or corporation operating aircraft on the airport from performing any services on its own aircraft with its own employees (including, but not limited to maintenance, repair, and fueling) that it may choose to perform.

g. In the event the sponsor itself exercises any of the rights and privileges referred to in this assurance, the services involved will be provided on the same conditions as would apply to the furnishing of such services by commercial aeronautical service providers authorized by the sponsor under these provisions.

h. The sponsor may establish such reasonable, and not unjustly discriminatory, conditions to be met by all users of the airport, as may be necessary for the safe and efficient operation of the airport.

i. The sponsor may prohibit or limit any given type, kind, or class of aeronautical use of the airport if such action is necessary for the safe operation of the airport, or necessary to serve the civil aviation needs of the public.

Grant Assurance 23 – Exclusive Rights [3]

> (The airport sponsor) will permit no exclusive right for the use of the airport by any person providing, or intending to provide, aeronautical services to the public. For purposes of this paragraph, the providing of the services at an airport by a single fixed based operator shall not be construed as an exclusive right if both of the following apply:
>
> - It would be unreasonably costly, burdensome, or impractical for more than one fixed base operator to provide such services, and
> - If allowing more than one fixed base operator to provide such services would require the reduction of space leased pursuant to an existing agreement between such single fixed base operator and such airport.
>
> (The airport sponsor) further agrees that it will not, either directly or indirectly, grant or permit any person, firm, or corporation the exclusive right at the airport to conduct any aeronautical activities, including, but not limited to, charter flights, pilot training, aircraft rental and sightseeing, aerial photography, crop dusting, aerial advertising and surveying, air carrier operations, aircraft sales and services, sale of aviation petroleum products whether or not conducted in conjunction with other aeronautical activity, repair and maintenance of aircraft, sale of aircraft parts, and any other activities that because of their direct relationship to the operation of aircraft can be regarded as an aeronautical activity, and that it will terminate any exclusive right to conduct an aeronautical activity now existing at such an airport before the grant of any assistance under Title 49, United States Code.

The FAA has advised that airport sponsors can maintain compliance with these Grant Assurances in part by maintaining and implementing reasonable minimum standards for commercial aeronautical activities and by negotiating in good faith for the lease of suitable space with those who are willing and qualified to provide commercial aeronautical products and services. While there has been a single FBO operating at the Airport for the last several decades, the County has received informal inquiries from FBO operators since the time of the last Master Plan Update about the potential for a second FBO at the Airport. In addition, the analysis described in this Section 3.4 has revealed that existing and forecast future Airport users would benefit from certain additional GA facilities. The County accordingly determined that this Master Plan Update should include a detailed examination of the suitability of various areas of the Airport for a second FBO that meets or exceeds the Airport Minimum Standards. These alternatives are identified and examined in Chapter 4, *General Aviation Alternatives Analysis*.

Minimum facilities for an FBO in Pitkin County are defined by Title 10 of the Pitkin County Code (Section 10.40.020). The following minimum facilities are required to qualify as an FBO within Pitkin County and to provide such services:

---

[3] *Statutory Reference: 49 U.S.C. 47107 / Regulatory Reference 14 CFR Parts 150 - 169*

- GA terminal building of exactly 5,000 SF
- Clear span hangar of exactly 14,400 SF
- Maintenance hangar of exactly 5,000 SF
- GA aircraft parking ramp of approximately 280,000 SF
- Paved aircraft tie-down parking area of 22,000 SF for a minimum of 30 spaces
- Motor vehicle parking for 60 vehicles
- Aviation fuel farm with (3) 20,000 gallon Jet A tanks and (1) 10,000 gallon Avgas tank

Alternatives for providing adequate space and facilities for an additional FBO will be examined in Chapter 4, *General Aviation Alternatives Analysis*.

3.5 Support Facility Requirements

This section presents support facility requirements at Aspen/Pitkin County Airport, which include the following elements:

- Air Cargo Facility Requirements
- ARFF Facilities
- Airport Maintenance and SRE Facilities
- Airport Perimeter Road

3.5.1 Air Cargo Facility Requirements

Air cargo service at Aspen/Pitkin County Airport is provided by contract carriers that operate general aviation aircraft. Historically, commercial passenger aircraft at the Airport have handled air mail and small package freight, which is expected to continue. According to the FAA Terminal Aerospace Forecasts 2009-2025, U.S. domestic air cargo Revenue Ton Miles (RTMs) are projected to increase 2.5 percent annually until 2025. Air cargo operations will likely continue to be provided by small general aviation aircraft such as the Cessna Caravan. The Airport should provide space for staging and parking for one or two of these types of aircraft.

3.5.2 Aircraft Rescue and Firefighting Facilities (ARFF)

Operators of Part 139 airports are required to provide ARFF services during air carrier operations that require a Part 139 certificate. Aspen/Pitkin County ARFF services are located west of Runway 15/33. As mentioned in Chapter 1, *Inventory*, a new ARFF and SRE facility was finished in 2007. The ARFF/SRE portion of the new Airport Operations Center building is approximately 16,000 SF.

ARFF requirements for Aspen/Pitkin County Airport are defined in FAR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*. Requirements for determining the Airport's ARFF index are based on the combination of the length of operating air carrier aircraft and average daily departures. Average daily departures are based on the longest aircraft that has a minimum of five daily departures at the Airport. As noted in previous sections of this Master Plan Update, the DeHavilland Dash 8 (Q400) and the Canadair CRJ 700 both operate at the Airport. Both of these aircraft fall within the Index B categorization, which accommodates aircraft between 90 and 126 feet in length.

An Index B facility must include either of the following: (1) One vehicle carrying at least 500 pounds of sodium-based dry chemical or halon 1211, and 1,500 gallons of water, and the commensurate quantity of aqueous film-forming foam (AFFF) for foam production, or (2) two vehicles; one carrying the aforementioned extinguishing agents, and the other carrying an amount of water and the commensurate quantity of AFFF so that the total quantity of water for foam production carried by both vehicles is at least 1,500 gallons.

According to the Operations Department at Aspen/Pitkin County Airport, two ARFF vehicles are currently in use: a 1993 Oshkosh TB-1500 ARFF Truck listed in fair condition, and a 2009 Oshkosh Stryker 1500 ARFF Truck listed in excellent condition. These vehicles fulfill the Index B facility requirements. It should be noted that classifications for the ARFF vehicles have been updated to coincide with National Fire Protection Association (NFPA) 403: Standard for Aircraft Rescue and Fire-Fighting Services at Airports as "Class 4" vehicles.

Based on the types of aircraft that are projected to operate at the Airport during the projection period, an Index B categorization is sufficient for purposes of long-range planning.

3.5.3 Airport Perimeter Service Road

The Airport is served by an approximately three-mile-long, fenced-in perimeter road that provides sufficient airfield access. A portion of the road on the northwest side of the airfield is located within the object free area and should be relocated outside of the OFA. The relocation of this portion of road has been planned for, but has been delayed by funding. It should be noted that, if the proposed 1,000-foot runway extension were constructed, the service road would likely need to be relocated to provide the same level of access. A perimeter service road should be maintained to provide ground vehicles access around the airfield without having to cross the Airport's runway or taxiway, except when necessary. Owl Creek Road also provides public access to the ARFF/SRE and Airport Operations Center on the west side of Runway 15/33.

3.6 Additional Facility Requirements

Affordable housing and sustainability are expected to be addressed in this Master Plan Update as a reflection of Pitkin County's long history of mitigating for the impacts of public projects. The process of determining the appropriate employee housing contribution associated with any recommended improvements at the Airport take into consideration existing (to be replaced) and proposed floor area for each of the alternatives.

As mentioned in previous sections of this document, the Airport has identified the area west of Runway 15/33 for potential development. However, portions of this area contain significant development constraints (see **Figure 3-11**)including steep slopes (greater than 30 percent), wildlife habitat areas, the historic Airport Ranch site, severe wildfire hazard areas, and the riparian setback requirements associated with Owl Creek, which runs through the area.

Based on a review of the Colorado Division of Wildlife maps, the only regulated mapped habitat types that encroach on airport property include “Elk Severe Winter Range” and “Elk Winter Concentration Area.” These habitats are mapped for an area just west of the west side development area on the Airport and would not impact potential development. The only restriction in the Pitkin County Land Use Code related to these habitat types is that construction activity is limited to April 1 through November 31 within an area ¼-mile from the mapped habitat. This ¼-mile buffer area includes most of the Airport; however, most outdoor construction is not feasible during this time frame.

An initial assessment reveals that there are approximately 28.1 acres of developable land when these constraining factors are accounted for. If these areas are designated for airside-related uses, construction of a parallel taxiway may be required to provide access. If a west side taxiway were constructed with a 400-foot-from-runway centerline separation, the total amount of developable land is reduced to 22.8 acres. This figure may increase or decrease depending on several factors, including whether the FAA will apply the existing east side runway-taxiway separation modification to standards to the west side as well. It should be noted that since the Airport is a public facility and as such is exempt from most of the provisions of the Pitkin County Land Use Code. Therefore, the development constraints depicted in **Figure 3-11** represent guidelines that reflect community sensitivities and which the County has honored in the construction of past public facilities. Alternatives for development and land availability are discussed in Chapter 4, *General Aviation Alternatives Analysis*.

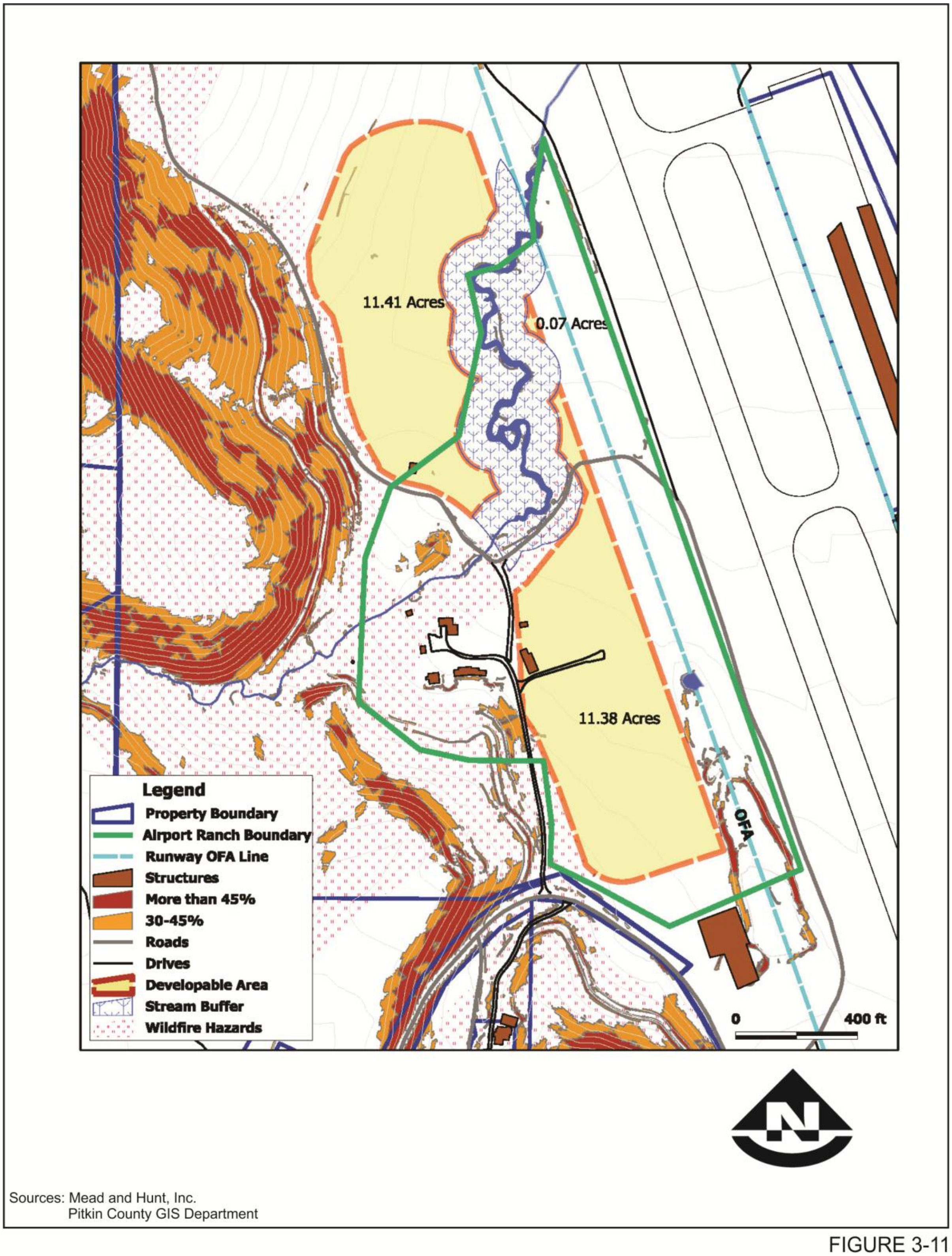


FIGURE 3-11

Potential West Side Development Areas

Aspen/Pitkin County Airport

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Chapter 4

General Aviation Alternatives Analysis

MASTER PLAN UPDATE

4.1 Introduction/Purpose

The purpose of this chapter is to present alternatives for the layout of (space reservation for) potentially needed long-term improvements at Aspen/Pitkin County Airport in the context of the Airport's mission statement: *To provide safe, efficient, and environmental responsible airport services that meet or exceed our community's expectations.* This chapter also includes a description of the process by which alternatives were initially generated and then refined and screened to establish the Preferred Alternative. The screening process incorporated input from the community, as well as the professional judgment of the project consultant team. Screening criteria were developed containing both quantitative and qualitative measures and considering technical standards established by the FAA and the minimum standards contained in Title 10 of the Pitkin County Code.

The options presented in this chapter are based on projected airport needs with substantial community input generated in a number of ways. Meetings were conducted with the Master Plan Study Committee. Additionally, a series of design charrette (brain storming) sessions were conducted with interested parties and stakeholders, and two public meeting/open house workshops were conducted with interested citizens. Based on an understanding of community concerns and interests, sustainability was also considered in both developing and screening the alternatives/options. Aspen Pitkin County Airport staff initiated a Sustainability Plan during preparation of the Master Plan. Sustainability is a holistic approach to managing an airport so as to ensure the integrity of the Economic Viability, Operational Efficiency, Natural Resources Conservation, and Social Responsibility (EONS) of the Airport.[1] Until the evaluation of future development alternatives, the Plan focused on construction and operational practices at the Airport. The Master Plan development alternatives evaluation represented the opportunity to broaden the Sustainability Plan to include the consideration of future airport facilities.

The County has embraced sustainability principles in the initial formulation of alternatives through the consideration of community sensitivity to airport issues; aviation design standards; financial; and site characteristics related to environmental concerns, existing physical features, and site improvement

[1] *The Sustainable Aviation Guidance Alliance (SAGA), http://www.airportsustainability.org.*

aesthetics. These factors embrace the County's commitment to sustainability principles that strive to balance financial, operational, environmental, and social needs.

It is important to note at the outset that the Airport is contained in a small land area. Because of the limited land area available and the absolute necessity for proposed airport improvements to be planned in a manner that is environmentally appropriate and acceptable to the community, efficient use of the airport site is critical. This could mean that some forecast needs, particularly those related to general aviation facilities, will continue to be unmet.

Ultimately, the Pitkin County Board of County Commissioners (BOCC) is responsible for making decisions about the Airport. That being said, and recognizing the need to make an informed decision about the Airport Master Plan, the BOCC directed that the Airport Master Plan Update be driven by an open, intensive, and extensive community input process. The review of Master Plan alternative options contained in this chapter is a critical component of that community input process.

4.2 Alternative Analysis Evaluation Factors

The goal was to develop alternatives that are sustainable – meeting the Airport's existing and future needs, while also meeting the existing and future needs of the community. Some of the factors used to evaluate alternatives can be expressed quantitatively to enable comparison of alternatives. Those factors include:

- **Long-term facilities need projections.**
    - ✓ Additional general aviation aircraft parking apron – 193,000 SF
    - ✓ Additional small general aviation aircraft storage units – 10 units
    - ✓ Additional large general aviation aircraft hangar area – 124,800 SF
- **Existing Minimum Standards for Fixed Base Operators (FBO) facilities. Each FBO will provide a minimum of the following:**
    - ✓ Office/terminal – 5,000 SF
    - ✓ Clear span hangar – 14,400 SF
    - ✓ Maintenance shop – 5,000 SF
    - ✓ Aircraft ramp parking, circulation and staging – 280,000 SF
    - ✓ Tie-down area – 30 spaces
    - ✓ Motor vehicle parking - 60 spaces
    - ✓ Aviation fuel farm – 3/20,000 gallon Jet A tanks & 1/20,000 gallon Avgas tank

With other factors, a more qualitative review is called for. These include:

- Operational Considerations: How many FBOs are accommodated? Is helicopter parking accommodated and is it separated from fixed wing aircraft parking? Is additional aircraft parking provided that will lessen the incentive to drop passengers and depart for another regional airport, only to return when passengers are ready to leave the Aspen area (referred to as a drop-and-go operation)?
- Efficient Use of Airport Property: As referred to in the introduction, because of the airport's limited land area, efficient land use and highest/best land use issues are critical considerations.
- Economic Considerations: Although a detailed financial plan will be prepared on the final Airport Master Plan Update proposal, at the alternative analysis stage, it is most critical to understand generalized capital improvement costs associated with each alternative, revenue generation potentials associated with each alternative, implications for phasing (timing and order) of the capital improvements projects specified for each alternative, and potential funding strategies.
- Implementation Feasibility Considerations: The operational and financial implications of adding another FBO, including consideration of the FBO Minimum Standards that are established under Pitkin County Code.
- Aesthetic/Visual: The community has indicated that understanding and minimizing potential visual impacts are critical considerations in programming for future airport improvements.

Site Analysis. Still other factors (physical constraints, environmental considerations, and FAA planning guidelines) can best be identified within the context of the Site Analysis that was prepared as a precursor to alternative analysis. The features that are recognized in the site analysis are taken as "givens" in setting the parameters for where and how future airport improvements might be sited in the Master Plan alternatives. The Site Analysis is presented graphically in the following **Figure 4-1**, entitled ***ON-AIRPORT LAND USE ANALYSIS - EXISTING AND POTENTIAL***.

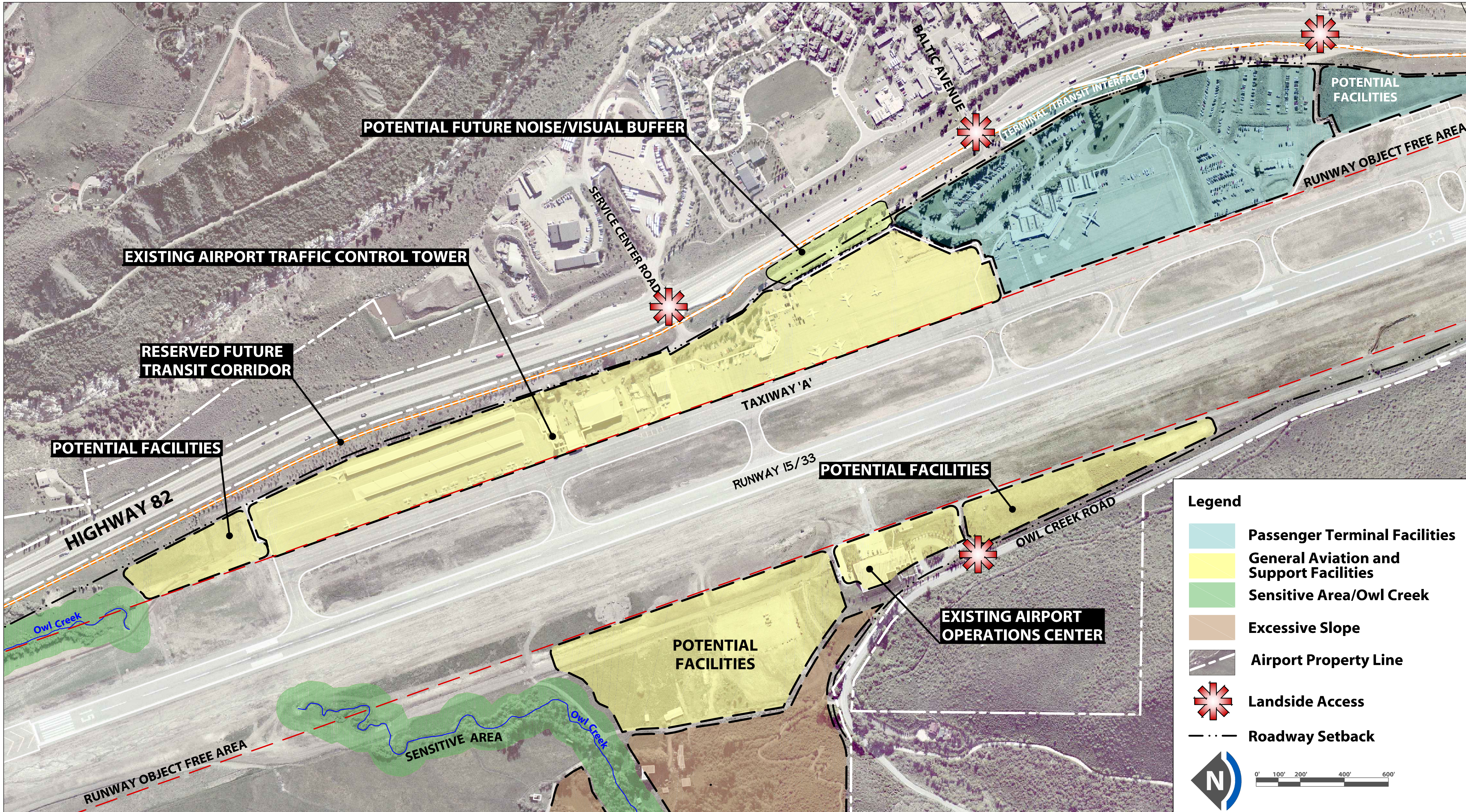
Sustainability. Sustainability factors have been included in the development and screening of potential alternatives. Sustainability is not just about dealing with climate change or environmental factors. Alternatives that are sustainable should help further economic prosperity, social responsibility, and environmental stewardship. These factors were used to compare the alternatives and to help guide decision making.

In addition to integrating sustainability principles into the process of developing and evaluating alternatives described here, a separate section will be dedicated to describing additional specific actions the County could examine to make the Airport more sustainable during day-to-day operations and during the design process if any of the chosen alternatives are implemented.

4.2.1 Relationship to Airside Plan and the Passenger Terminal Area Planning Effort

This chapter deals primarily with general aviation landside development at the Airport. More detailed Passenger Terminal Area alternatives are reviewed in the following chapter. As used in this chapter, the term "landside" represents all on-airport property that is outside of the runway and taxiway operating environment (the area immediately surrounding the runway and taxiway that, by FAA planning guidelines, should be clear of objects other than operating aircraft). With the recently completed runway extension project, the physical parameters of the airport's ultimate runway and taxiway system are set, with the possible exception of a west side taxiway system that is included in some of the alternative options described below.

Four potential passenger terminal area improvement options were reviewed with the Study Committee, the public, and the BOCC in October 2011. For the purposes of this chapter, the four Terminal Area Alternative options have been reduced to two conceptual improvement envelopes. One envelope reflects the area to be reserved if the existing terminal building is reused, rehabilitated and expanded; the other if the terminal building is replaced with a new structure (see **Figures 4-2** and **4-3, TERMINAL BUILDING REUSE ENVELOPE ANALYSIS** and **TERMINAL BUILDING REPLACEMENT ENVELOPE ANALYSIS**).



Master Plan Update

Figure 4-1
On-Airport Land Use Analysis Existing & Potential

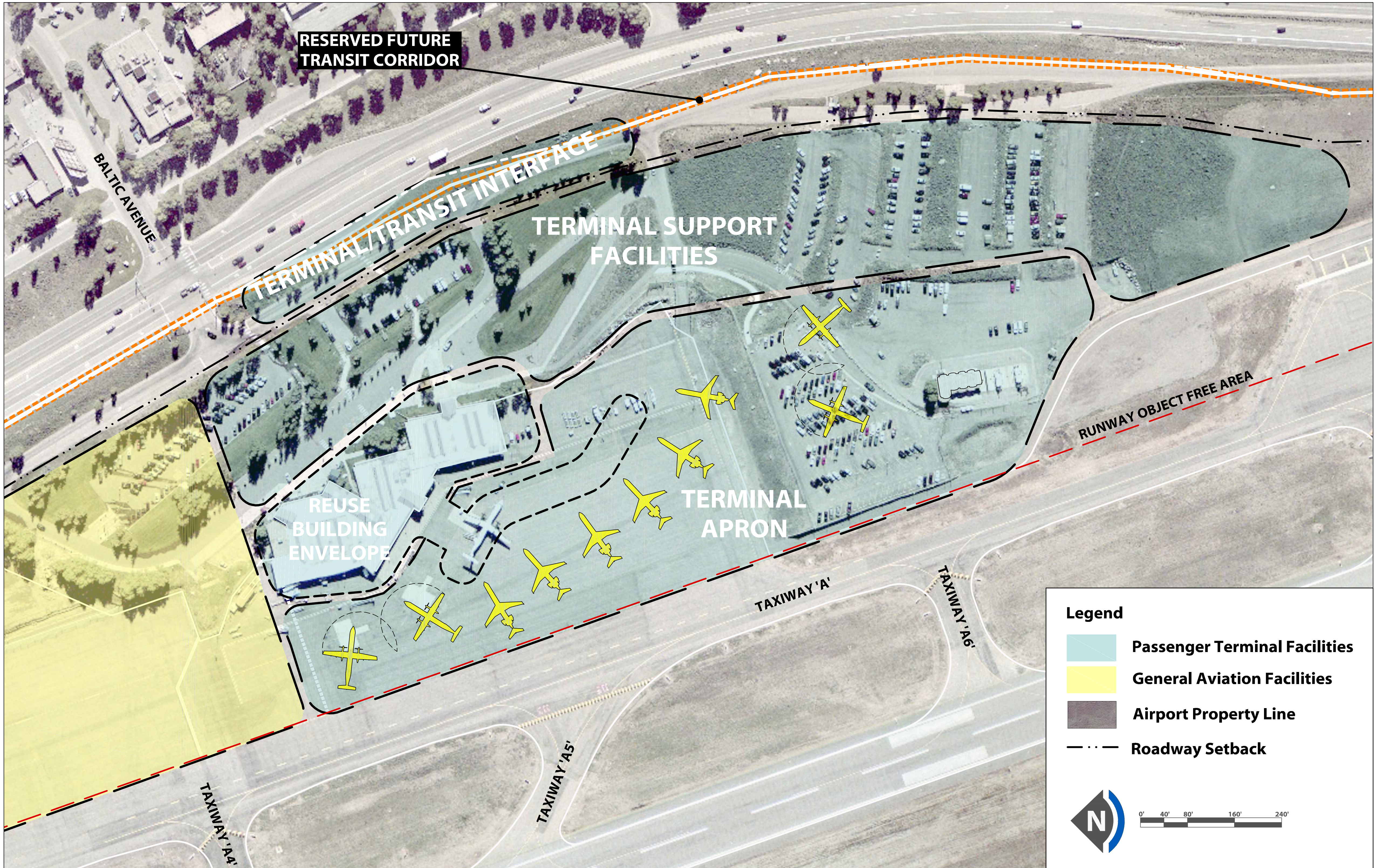


Figure 4-2
Terminal Building Reuse Envelope Analysis

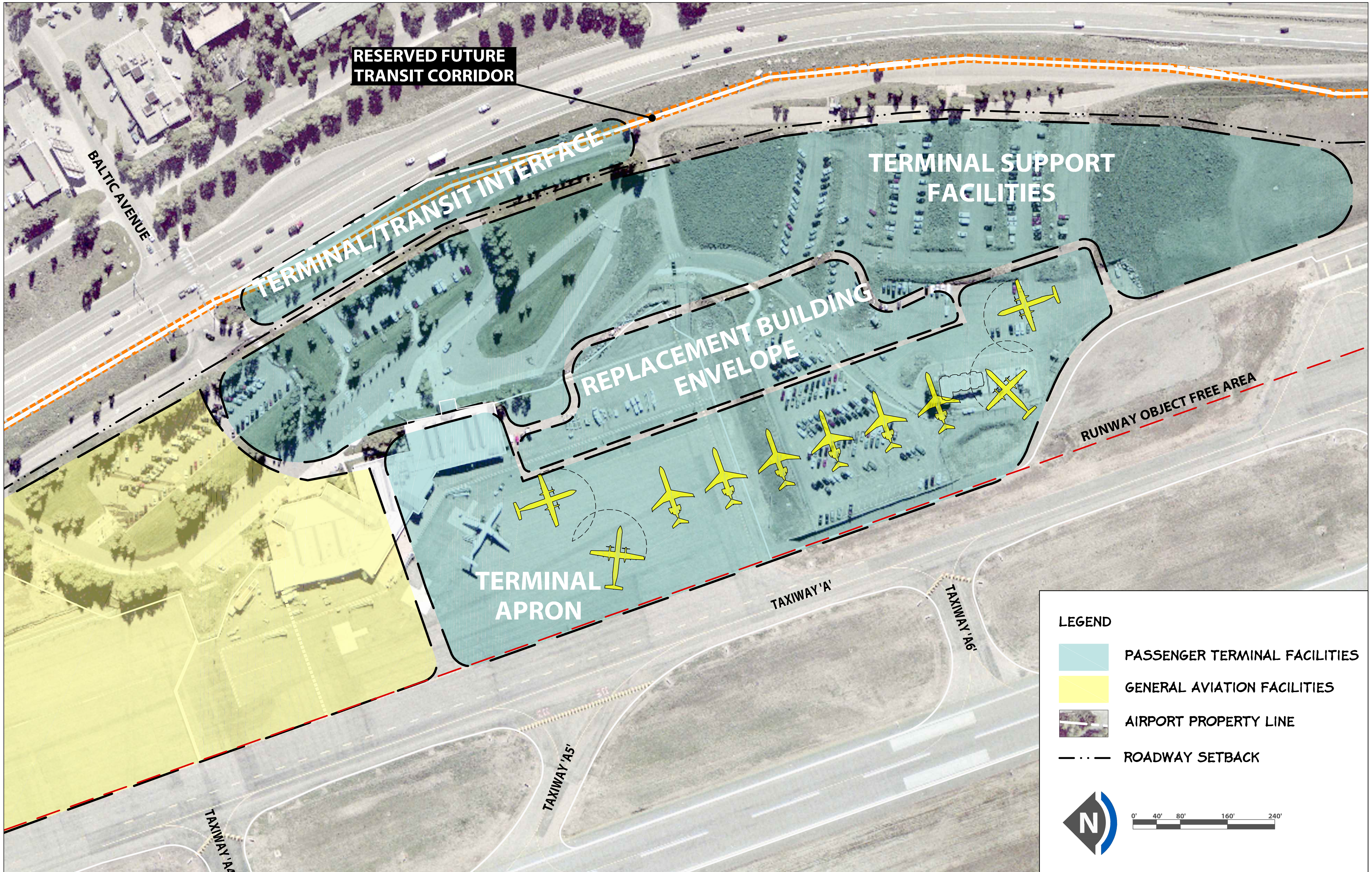


Figure 4-3
Terminal Building Replacement Envelope Analysis

4.3 Concept Creation Process

The alternative concepts presented in this chapter were developed and prepared over the course of several months with substantial public involvement. In early 2011, eleven facility planning charrette sessions were conducted to obtain public and stakeholder input regarding alternative ways of addressing passenger terminal area landside improvements. The alternative concepts incorporate feedback received at these public charrette exercises.

The format of the charrettes included a brief introduction presentation to provide background on the planning process and issues. The participants were then split into small groups, each typically with 4 to 8 participants, for tabletop planning exercises. The tabletop exercises were led by a facilitator and focused on specific objectives.

A wide range of people were identified to participate in the charrettes, resulting in a variety of perspectives and ideas with respect to improvements at the Airport. The participants included:

- **Planners and Architects**
- **Airport Tenants and Pilots**
- **General Public**
- **Lodging and Restaurant Industry Representatives**
- **Homeowners Associations and Caucuses**
- **Aspen Airport Business Center and Surrounding Business Representatives**
- **City of Aspen and Pitkin County Staff**

Charrette (brain storming) sessions held in January 2011 involved 76 participants, and charrette sessions held in March 2011 involved 34 participants. The charrette (brain storming) exercises revealed common, recurring themes regarding both the passenger terminal (the themes for the passenger terminal area are presented in the next chapter) and general aviation (GA) areas. The following sections summarize these common GA themes.

General Aviation Area Charrette Theme Summary

The majority of opinions expressed at the charrettes supported improvement of the Airport as necessary to meet the community's aviation needs; however, this was not a unanimous sentiment. Specific themes discussed and incorporated into the GA concepts encompassed the sustainability factors including functionality, balance between the east and west sides of Runway 15/33, reducing visual and environmental impacts, and phasing improvements over time. Below is a summary of the major GA themes identified.

Current GA Facilities and Second Fixed Base Operator (FBO)

- Competition generated by a second FBO was generally viewed as positive, although, there were also many who felt that a second FBO should only be constructed if required by the FAA.
- It was generally viewed as important to support GA users, including high end customers.
- The space needed for commercial passenger activity was viewed as a much higher priority than GA space needs.
- The overall goal for the Airport should be to function properly and generate adequate revenue for its operations.
- It was noted that a lack of GA facilities may lead to additional operations as aircraft must go elsewhere for parking and storage.
- The existing patio shelters do not provide much protection from the weather.

Improvements on East Side versus West Side of Runway 15/33

- The first priority for the east side should be passenger terminal needs.
- The west side provides the only space adequate to meet aviation needs.
- The west side provides opportunities for hangars to be hidden from the view of State Highway 82.
- Phased development and construction makes sense.
- Development potential on the east side should be fully realized before going to the west side.
- A second FBO on the east side could utilize existing infrastructure.
- Hangars on the east side could provide a noise buffer to the North 40 residential area.
- The need for a parallel taxiway was brought up as a potential added cost to west side improvements.
- Several people brought up concerns about environmental impacts and constraints on the west side of the airfield such as grading requirements, open space reductions, drainage and impacts to Owl Creek, impacting the Airport Ranch, and improvements near elk habitat areas.

Functional and Aesthetic Relationships for GA Facilities

- New building design should be sensitive to visibility, aesthetics, and lighting.
- Underground parking could reduce development footprint and reduce impervious surface coverage.
- Bunkered hangars could be built on the west side to maintain existing topography, grading, and be hidden from view.
- Aircraft storage hangars would reduce/minimize the need for deicing chemicals and running auxiliary power units.
- Uses such as rental car storage could be located off-site (at ABC).
- Employee housing could be located on Airport property, or off Airport property at locations such as the ABC. It should be noted that employee housing on Airport property was discussed, but this is in contravention to current FAA guidance.

4.4 Initial General Aviation Landside Alternative Concepts

Using the ideas generated in the charrette sessions, during Study Committee meetings, and from the community participants, the consultant team created a number of alternative concepts that, as stated above, consider space reservation for terminal area improvements. Preliminary analysis focused on reserving space for facilities potentially needed based on aviation activity forecasts. After refinement and community input, the landside alternative concepts discussed in this chapter recognize that the Airport has a limited resource with regard to land; and, in light of other sustainability considerations such as community sensitivities, aviation design standards, site characteristics, and environmental considerations, practical alternative concepts may only partially accommodate projected general aviation demand.

Key features considered in Landside Alternative concepts include:

- **Landside access**. The primary passenger terminal access off of Highway 82 will continue to be at Baltic Avenue, with future access closer to Aspen near the BMC West property. The primary general aviation access point will continue to be at Service Center Road. The State Highway 82 Access Control Plan (ACP) was developed over several years with numerous work sessions with the Board of County Commissioners and public comments sessions.
- **Terminal area improvement envelope** [the area that will be utilized for the passenger terminal building, the terminal aircraft parking apron, and all passenger terminal support facilities (parking, access, rental car facilities, etc.)]. Two passenger terminal improvement concepts were defined in the previous illustrations, entitled **TERMINAL BUILDING REUSE ENVELOPE ANALYSIS** and **TERMINAL BUILDING**

REPLACEMENT ENVELOPE ANALYSIS. Each of the Initial Alternative Concepts uses one of these two terminal building envelopes.

- **The number and location of Commercial Aviation Facilities/Fixed Base Operators (FBOs).**
- **General aviation aircraft parking area.** The facility needs projection indicates that the Airport should have 193,000 additional square feet of aircraft parking area.
- **Aircraft hangars for small general aviation aircraft.** The facility needs projection indicates that the Airport should have 10 additional hangar units for small general aviation aircraft.
- **Aircraft hangars for larger general aviation aircraft.** The facility needs projection indicates that the Airport should have 124,800 additional square feet of hangar area for larger general aviation aircraft.

It is important to note that the four Alternative Concepts described below represent a logical compilation of individual features; however, they are just that, a compilation of individual features. In other words, features from each Alternative Concept can be mixed and matched with features from another Alternative Concept.

4.4.1 Alternative Concept 1 (Status Quo)

Alternative Concept 1 is based on maintaining the configuration of airport facilities for the most part as they currently exist, but identifies some improvement potentials. First, even with the reuse and expansion of the existing terminal building, it appears the reconfiguration opportunities of the passenger terminal area will likely allow for general aviation aircraft parking improvements in the area north of the terminal building improvement envelope. In addition, improvements are recommended for the general aviation parking and roadway system; and, it is recommended that the fuel farm area be consolidated or relocated to avoid impinging on the Building Restriction Line. No additional west side improvements are contemplated in Alternative Concept 1, although reservation of space is recommended for future aeronautical use.

This alternative is illustrated in **Figure 4-4**, **ALTERNATIVE CONCEPT 1**.

Key evaluation criteria:

- **Operational.** Minimal changes to existing operational patterns; therefore, this alternative does not offer operational/safety enhancement features.
- **Efficient use of airport property.** Enhanced by converting area currently being used for passenger terminal to aircraft parking apron; however, the existing

General Aviation/FBO Terminal building is located in an area that might be best utilized for aircraft parking apron (highest and best use).

- **Economic/financial implications.** Positive: minimal capital improvement projects programmed. Negative: no additional facilities are programmed that might result in a significant increase in future revenue for the Airport.
- **Implementation Feasibility Considerations.** This alternative does not provide for a second FBO; therefore, there are no considerations that might affect FBO minimum standards.
- **Aesthetic/Visual.** In general, there are few aesthetic/visual issues associated with the alternative. It does recognize the need for a visual/noise barrier along the east side of the general aviation aircraft parking area.
- **Environmental.** Improvements would be made primarily within pre-disturbed ground. It would result in some additions to impervious surface area, approximately 93,978 square feet.

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBO(s).** One.
- **Achieves aircraft parking apron projection.** No.
- **Achieves small aircraft storage hangar projection.** No.
- **Achieves large general aviation aircraft hangar area**. No.
- **Achieves Minimum Standards for FBO facilities.** Yes.

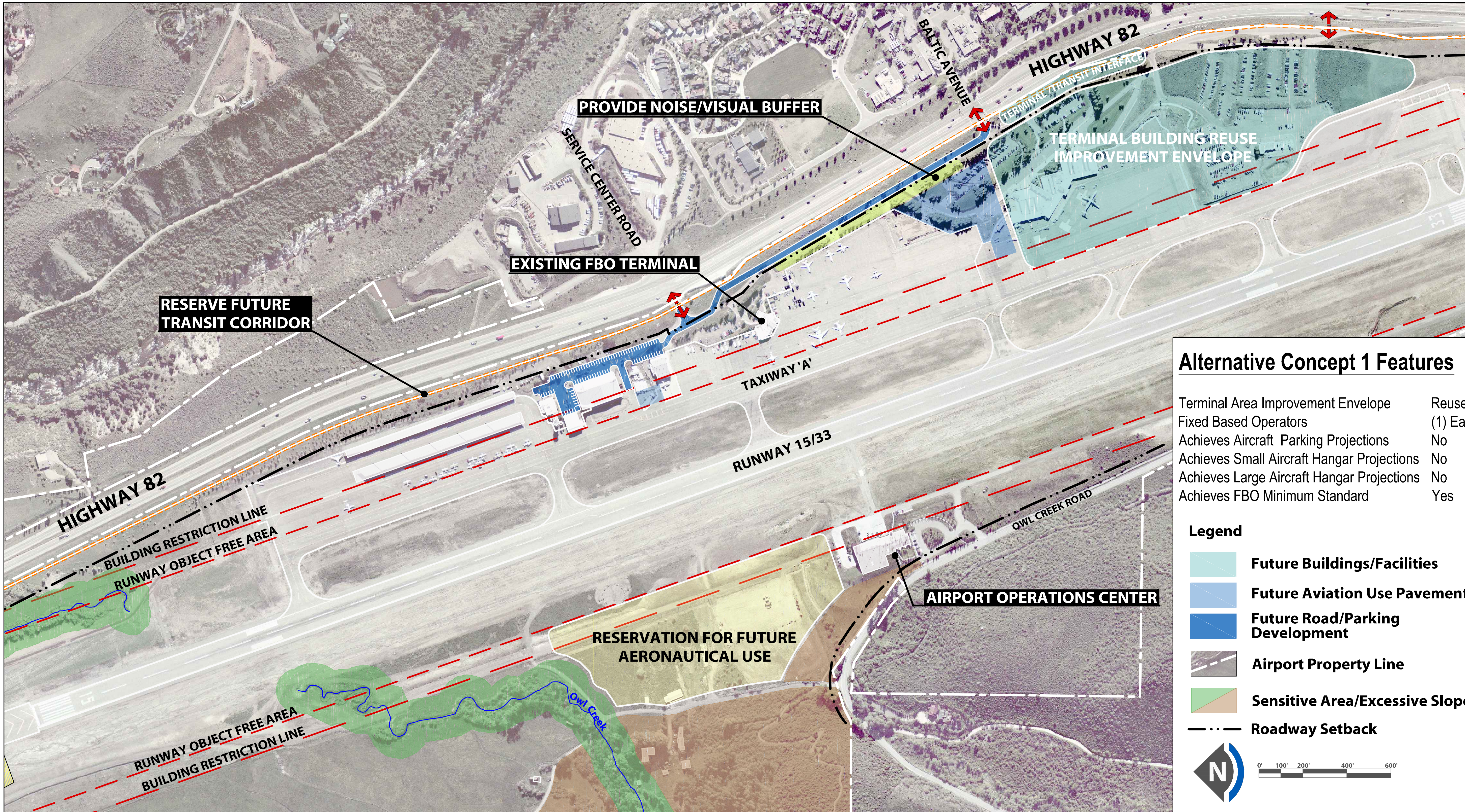


Figure 4-4
Alternative Concept 1
Status Quo

4.4.2 Alternative Concept 2 (Two FBOs on the East Side and General Aviation on the West Side)

Alternative Concept 2 is based on the provision of two FBO/commercial aviation areas on the east side of the Airport (see **Figure 4-5, ALTERNATIVE CONCEPT 2)**. The first commercial aviation/FBO facility remains in its existing location, while the second is located immediately north of the Replacement Terminal Improvement Envelope. The location of commercial aviation/FBO #2 will provide the opportunity to share automobile parking facilities with the passenger terminal. At the north end of the east side area, it is recommended that the existing patio hangars be improved and possibly enclosed. On the far north end, an area has been identified to construct new small aircraft hangars, along with an area to accommodate additional aircraft parking, including helicopter parking.

Parking and hangars for larger general aviation aircraft are recommended for the west side of the Airport, which will require the construction of a parallel taxiway system on the west side of the runway. The proposed development on the west side of the Airport is proposed in an area that is not affected by excessive slope or drainage concerns. In addition, the proposed west side development does not encroach on the riparian area adjacent to Owl Creek.

Key evaluation criteria:

- **Operational.** Factors that might be considered operational/safety enhancements with Alternative Concept 2:

  - ✓ Separates helicopter parking from fixed wing aircraft parking.

  - ✓ With additional aircraft parking area, the GA ramp will be operationally more efficient and be less prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.

  - ✓ Staff with the Federal Aviation Administration has expressed concerns about the operation of two FBOs on the east side of the Airport. With increased vehicular and aircraft activity associated with two east side FBOs in a limited physical area, increased congestion will likely lead to safety concerns.

- **Efficient use of airport property.** Enhanced by converting area currently being used for passenger terminal facilities to aircraft parking apron. However, the existing General Aviation/FBO Terminal building will continue to function as it does today and it is located in an area that might be better utilized for aircraft parking and circulation (highest and best use).

- **Economic/financial implications.** Negative: significant capital improvement projects programmed with Alternative Concept 2 include the west side taxiway, construction of aircraft parking apron, construction of commercial aviation/FBO facilities (private sector money), and construction of hangars (private sector money). Positive: additional commercial aviation facilities, aircraft parking areas, and hangars could result in significant sources of future revenue for the Airport.

- **Implementation Feasibility Considerations.** This alternative suggests that there will be two FBOs on the east side of the Airport. One would continue to operate out of the existing FBO Terminal, while a second is programmed to be located in the area adjacent to the passenger terminal improvement envelope. This would result in the FBOs sharing the itinerant aircraft parking ramp, which is probably not ideal.

  In addition, if there are two FBOs on the east side of the Airport, it will not be possible to meet the established Minimum Standard requirements for facilities (as listed on page 4-2) in a manner that is responsive to community concerns and achieves the master planning goal of reducing the operational complexity of the general aviation development area.

- **Aesthetic/Visual.** As with Alternative 1, the need for a visual/noise barrier along the east side of the general aviation aircraft parking area is recognized in Alternative 2. Improvements on the west side of the Airport will be, for the most part, screened from views from Owl Creek Road and the structures on the west side will be sited and constructed so as to be minimally visually intrusive when viewed from the east.

- **Environmental.** Improvements on the east side would primarily be made within pre-disturbed ground. Development on the east side would result in approximately 209,028 square feet of impervious surface. Development on the west side would result in an additional 788,771 square feet of impervious surface area, resulting in increased run-off, but would avoid Owl Creek and the wetlands associated with Owl Creek.

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBO(s).** Two.
- **Achieves aircraft parking apron projection.** Yes.
- **Achieves small aircraft storage hangar projection.** Yes.
- **Achieves large general aviation aircraft hangar area**. Yes.
- **Achieves critical Minimum Standards for FBO facilities.** No.

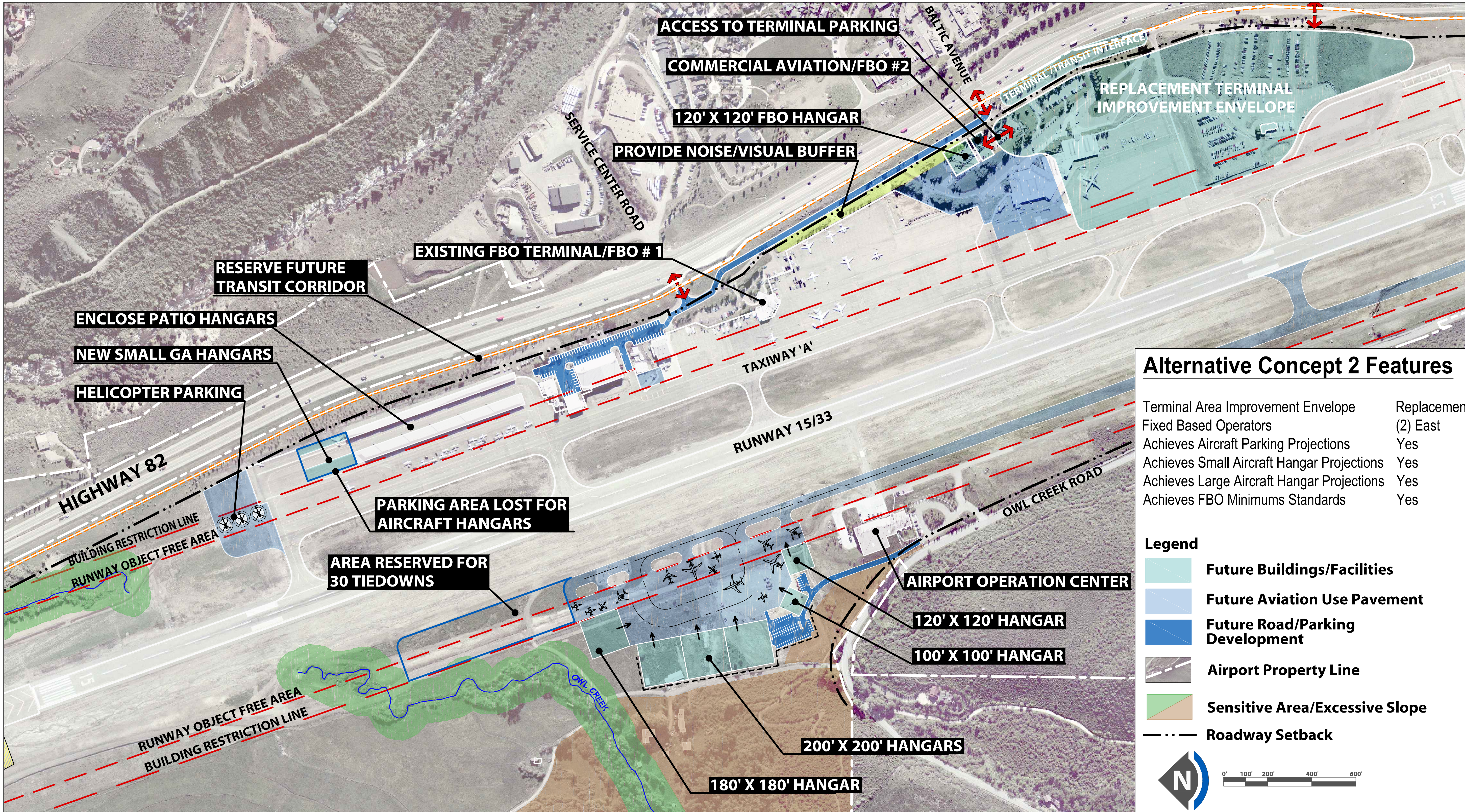


Figure 4-5
Alternative Concept 2
Two FBOs on East Side / General Aviation on West

4.4.3 Alternative Concept 3 (One FBO on the East Side and One FBO on the West Side)

Alternative Concept 3 is based on the provision of two FBO/commercial aviation areas (one on the east side and one the west side) and is illustrated in **Figure 4-6**, entitled **ALTERNATIVE CONCEPT 3**. The first commercial aviation/FBO facility is located immediately north of the Replacement Terminal Improvement Envelope, which provides the opportunity to share automobile parking facilities with the passenger terminal. The second commercial aviation/FBO facility is to be located just north of the existing Airport Operations Center building on the west side of the Airport.

The proposed removal of the existing FBO Terminal in Alternative Concept 3 will allow for increased pavement for aircraft parking. An area for additional aircraft parking (including helicopters) is identified at the far north end of the east side aviation-use area. This alternative also includes the reconfiguration of the fuel farm area to avoid impinging on the Building Restriction Line. Alternative Concept 3 also recommends relocation of the existing ground service equipment building.

The on-airport roadway connecting the Baltic Avenue Intersection with the Service Center Road intersection is removed in Alternative Concept 3. This will potentially allow for an enlarged area for the provision of a noise/visual buffer between the aircraft parking apron and the neighbors on the east side of Highway 82.

In addition to the commercial aviation/FBO area on the west side of the Airport, parking and hangars for larger general aviation aircraft are recommended in Alternative Concept 3. Improved aviation facilities on the west side will result in the need for a parallel taxiway system on that side of the runway. The proposed development on the west side of the Airport is located in an area that is not affected by excessive slope or drainage concerns. In addition, the proposed west side development does not encroach on the riparian area adjacent to Owl Creek.

Key evaluation criteria:

- **Operational.** Factors that might be considered operational/safety enhancements with Alternative Concept 3:
  - ✓ Separates helicopter parking from fixed wing aircraft parking.
  - ✓ With additional aircraft parking area, the GA ramp will be operationally more efficient and be less prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.
- **Efficient use of airport property.** Efficient use of airport property is enhanced by converting the area currently being used for passenger terminal to aircraft parking apron and identifying this area to be the future site for the east side General Aviation Terminal/FBO. By relocating the existing General Aviation/FBO Terminal building the area around the existing building can be used for aircraft parking and circulation (the highest and best use for the area).

In addition, Alternative 3 suggests that the existing ground service equipment building be relocated to the east side of the ATCT, with the existing site being converted to aircraft parking apron (the highest and best use for the site).

- **Economic/financial implications.** Negative: significant capital improvement projects programmed with Alternative Concept 3 include west side taxiway, construction of aircraft parking apron, construction of commercial aviation/FBO facilities (private sector money), and construction of hangars (private sector money). Positive: additional commercial aviation facilities, aircraft parking areas, and hangars could result in significant sources of future revenue for the Airport.

- **Implementation Feasibility Considerations.** This alternative suggests that there will be two FBOs in the future, one on the east side of the Airport and one on the west. This would result in both FBOs having enough area to achieve existing Minimum Standard requirements for facilities.

- **Aesthetic/Visual.** As with previous Alternatives, the need for a visual/noise barrier along the east side to the general aviation aircraft parking area is recognized in Alternative 3. Improvements on the west side of the Airport will be, for the most part, screened from views from Owl Creek Road and the structures on the west side will be sited and constructed so as to be minimally visually intrusive when viewed from the east.

- **Environmental.** Improvements on the east side would primarily be made within pre-disturbed ground. Development on the east side would result in approximately 239,053 square feet of impervious surface. Development on the west side would result in an additional 833,020 square feet of impervious surface area, resulting in increased run-off, but would avoid Owl Creek and the wetlands associated with Owl Creek, as well as the historic property.

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBOs.** Two.
- **Achieves aircraft parking apron projection.** Yes.
- **Achieves small aircraft storage hangar projection.** No.
- **Achieves large general aviation aircraft hangar area.** Yes.
- **Achieves critical Minimum Standards for FBO facilities.** Yes.

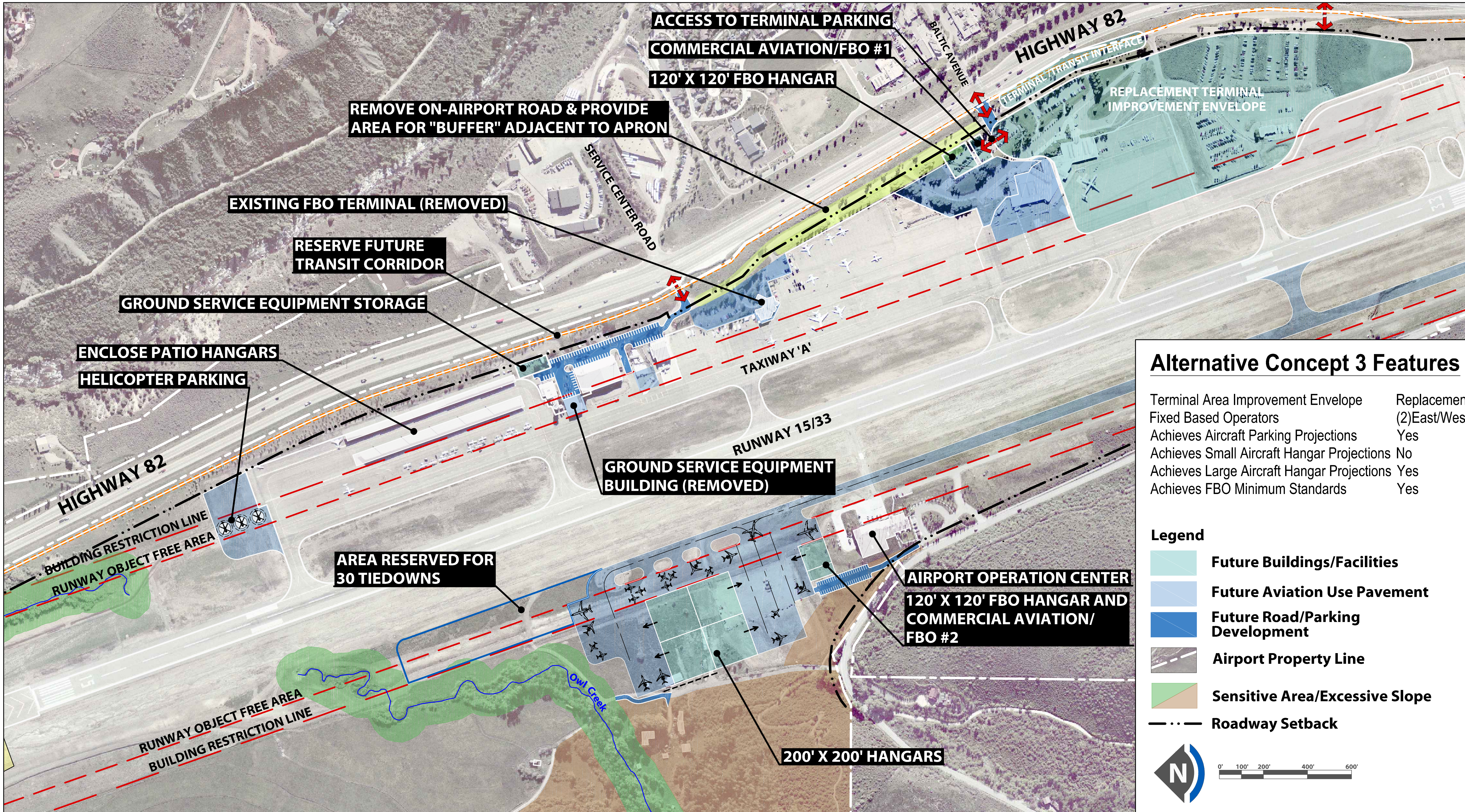


Figure 4-6
Alternative Concept 3
One FBO on East and One FBO on West

4.4.4 Alternative Concept 4 (Two FBOs on the East Side)

Alternative Concept 4 is based on the provision of two FBO/commercial aviation areas on the east side of the Airport and is illustrated in **Figure 4-7**, **ALTERNATIVE CONCEPT 4**. The first commercial aviation/FBO facilities are proposed to be located in the general vicinity of the existing FBO terminal, but are relocated to the east to allow for increased area for aircraft parking. The second commercial aviation/FBO facility is to be located toward the north end of the east side aviation-use area and would require the relocation of several small general aviation hangars to allow room for adjacent aircraft parking area.

An area for additional aircraft parking (including helicopters) is identified at the far north end of the east side aviation-use area. In addition to recommending the reconfiguration of the fuel farm area in respect of the Building Restriction Line, Alternative Concept 4 also recommends the removal of the existing ground service equipment building.

The on-airport roadway connecting the Baltic Avenue Intersection with the Service Center Road intersection is removed in Alternative 4. This will allow for a large aircraft hangar improvement area, which would be designed to provide a noise/visual buffer between the aircraft parking apron and the neighbors on the east side of Highway 82. The new east side hangars will share automobile parking area within the passenger terminal improvement envelope.

Key evaluation criteria:

- **Operational.** Operational/safety factors that should be considered with Alternative Concept 4:
  - ✓ Separates helicopter parking from fixed-wing aircraft parking.
  - ✓ Although some additional aircraft parking area is added with this alternative, much is also lost due to the line of new hangars that are proposed parallel to highway 82; thus, with essentially no net gain in aircraft parking area, the GA ramp will remain prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.
  - ✓ Staff with the Federal Aviation Administration has expressed concerns about the operation of two FBOs on the east side of the Airport. With increased vehicular and aircraft activity associated with two east side FBOs in a limited physical area, increased congestion will likely lead to safety concerns.
- **Efficient use of airport property.** Because of the loss of effective aircraft parking area, overall, Alternative 4 does not make efficient use of airport property.
- **Economic/financial implications.** Positive: there will be no significant capital improvement projects programmed on the west side with Alternative Concept 4.

Negative: the additional commercial aviation facilities and hangars (private sector money) on the east side of the airport could result in significant sources of future revenue for the Airport.

- **Implementation Feasibility Considerations.** This alternative suggests that there will be two FBOs on the east side of the Airport. One would continue to operate in the vicinity of the existing FBO Terminal, while a second is programmed to be located in the area adjacent to the existing patio hangars. Although some of the patio hangars would be relocated to provide some itinerant aircraft parking apron adjacent to FBO terminal #2, it would not be enough to satisfy Minimum Standards requirements and would likely result in the FBOs sharing the aircraft parking ramp, which is not ideal. In addition, if there are two FBOs on the east side of the airport it will not be possible to meet the established Minimum Standard requirements for facilities in a manner that is responsive to community concerns and achieves the master planning goal of reducing the operational complexity of the general aviation development area.

- **Aesthetic/Visual.** As with previous alternatives, the need for a visual/noise barrier along the east side of the general aviation aircraft parking area is recognized in Alternative 2 and would be resolved with the construction of hangars between the aircraft parking ramp and Highway 82.

- **Environmental,** Improvements would be made primarily within pre-disturbed ground and would result in approximately 263,557 square feet of impervious surface area on the east side (not considering any additional developments to the west side).

As illustrated, key quantitative measures:

- **Number Fixed Base Operators/FBO(s).** Two.
- **Achieves aircraft parking apron projection.** No.
- **Achieves small aircraft storage hangar projection.** No.
- **Achieves large general aviation aircraft hangar area.** Yes*.
- **Achieves critical Minimum Standards for FBO facilities.** No.

* 90% of Projection.

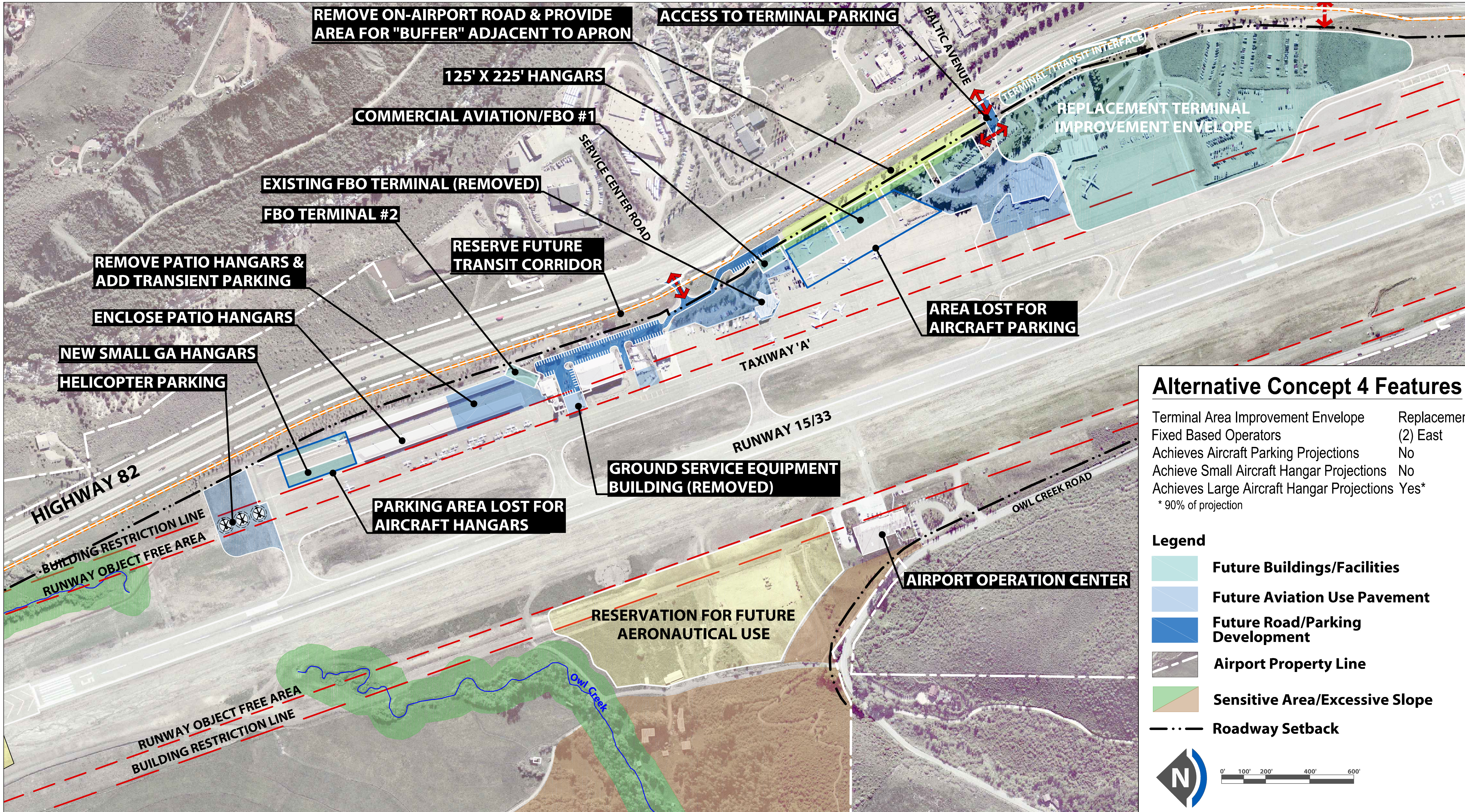


Figure 4-7
Alternative Concept 4
Two FBOs on East Side/
No West Improvements

4.5 Refined Concepts

The initial Master Plan Update landside improvement concepts were the subject of Study Advisory Committee and Public Open House meetings in early November 2011. These meetings were well publicized and attended (32 people attended the Study Committee meeting and 33 attended the Public Open House), and comments were documented in writing. In addition, the initial alternatives were discussed with the Pitkin County Board of County Commissioners and the City of Aspen City Council. Comments from these meetings, as well as in depth discussions with County staff, provided the background necessary to further refine the alternatives. Many significant comments were provided; several that are most noteworthy are listed below:

- The planning process for the Master Plan Update is valued by the community.
- The interface with transit is important.
- The need for aircraft parking areas and aircraft storage hangars is recognized, however, the need to, at a minimum, preserve and, if possible, increase the amount of itinerant aircraft parking area is deemed most critical.
- If there are general aviation improvements programmed for the west side of the Airport, they should include an FBO and fuel storage facilities to provide services to west side tenants.
- There was support for the noise/visual buffer between the east side aircraft parking apron and Highway 82.
- Extensive development of aircraft storage units adjacent to Highway 82 may be visually/aesthetically unacceptable.
- Keep the Airport affordable for general aviation users and tenants.
- The proposed location for helicopter parking is too far north and too far away from landside access, particularly if use by emergency medical services aircraft is taken into consideration.
- The placement of a GA/FBO terminal adjacent to the terminal improvement envelope is a good idea.
- Placement of aircraft storage units adjacent to the existing main aircraft parking apron is not a good idea. This will significantly reduce the amount of parking area that can be used for itinerant aircraft.
- The existing GA/FBO terminal sits in the middle of an area that could be used for aircraft parking (highest and best use).
- Cost of west side improvements is a concern.
- The size and related visual mass of west side hangars shown on initial Alternative Concepts 2 & 3 are concerns.

- The "status quo" alternative is not good planning.
- The Automated Surface weather Observation Station at the north end of the aircraft parking apron would need to be relocated if aircraft parking apron is extended to the north.
- The close proximity of new (or relocated) buildings to the existing Airport Traffic Control Tower may be an issue in consideration of new FAA security management.
- There was a preference for the replacement of the passenger terminal building vs. the reuse/renovation/expansion of the existing building.

In consideration of these comments and others provided in the Study Committee and Public Open House forums, refined concepts were developed and are presented below. The refined concepts described below were the result of a screening process conducted by the project consultant team and the airport staff in order to narrow the alternatives that justify further evaluation. That process included an evaluation of the alternatives described in Sections 4.4.1 through 4.4.4 of this chapter based on how well they compared with public input gathered through the master plan process to this point, as well as for compliance with FAA technical standards and the minimum standards contained in Title 10 of the Pitkin County Code. This technical screening also considered the overarching criteria of advancing alternatives that best meet the purpose and need of the Airport Master Plan Update. This screening resulted in Alternative Concept 4 being eliminated from further consideration and elements of other alternatives being combined or altered in response to public input or technical criteria. Alternative Concept 4 was eliminated in response to concern expressed by the public regarding the visual impacts associated with the row of aircraft hangars proposed along Highway 82 between Baltic Avenue and the existing FBO terminal.

4.5.1 Refined Alternative Concept A (Status Quo +)

Refined Alternative Concept A is based on maintaining the configuration of airport facilities for the most part as they currently exist (similar to initial Alternative Concept 1), but identifies some improvement potentials; which, from input received on the Initial Alternatives, are most important (see **Figure 4-8**). First, even with the reuse and expansion of the existing terminal building, it appears the reconfiguration opportunities of the passenger terminal area will likely allow for general aviation aircraft parking improvements in the area north of the terminal building improvement envelope. The general aviation/FBO terminal should also be relocated to the area directly north of the terminal reuse envelope. This will not only allow the new GA/FBO terminal to share automobile parking facilities, it will also allow additional area in the vicinity of the existing GA/FBO terminal to be used for aircraft parking apron, and provides the potential to create an aircraft storage hangar improvement area near the Service Center Road airport entry. In addition, improvements are recommended for the general aviation parking and roadway system. It is recommended that the fuel farm area be reconfigured and that the ground service equipment Building be relocated to avoid impinging on the Building Restriction Line. With the exception of a programmed expansion of the Airport Operations Center (AOC) building, no additional west side improvements are contemplated in this Refined Alternative Concept A, although reservation of space is recommended for future aeronautical use.

Key evaluation criteria:

- **Operational.** Factors that might be considered operational/safety enhancements with Refined Alternative Concept A:
  - ✓ Separates helicopter parking from fixed wing aircraft parking.
  - ✓ With additional aircraft parking area, the GA ramp will be operationally more efficient and be less prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.
- **Efficient use of airport property.** Enhanced by converting area currently being used for passenger terminal to aircraft parking apron, and by relocating the GA/FBO terminal to a location that is adjacent to the passenger terminal improvement envelope.
- **Economic/financial implications.** Positive: minimal capital improvement projects programmed. Negative: limited additional facilities are programmed that could result in significant sources of revenue.
- **Implementation Feasibility Considerations.** This alternative does not provide for a second FBO; therefore, there are no considerations that might FBO minimum standards.
- **Aesthetic/Visual.** In general, there are few aesthetic/visual issues associated with the alternative. It does recognize the need for a visual/noise barrier along the east side of the general aviation aircraft parking area.
- **Environmental.** Improvements would be made primarily within pre-disturbed ground and would result in approximately 166,106 square feet of additional impervious surface area (not considering any improvements on the west side; i.e., the AOC improvements).

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBO(s).** One.
- **Achieves aircraft parking apron projection.** Yes.
- **Achieves small aircraft storage hangar projection.** No.
- **Achieves large general aviation aircraft hangar area.** No.
- **Achieves critical Minimum Standards for FBO facilities.** Yes.

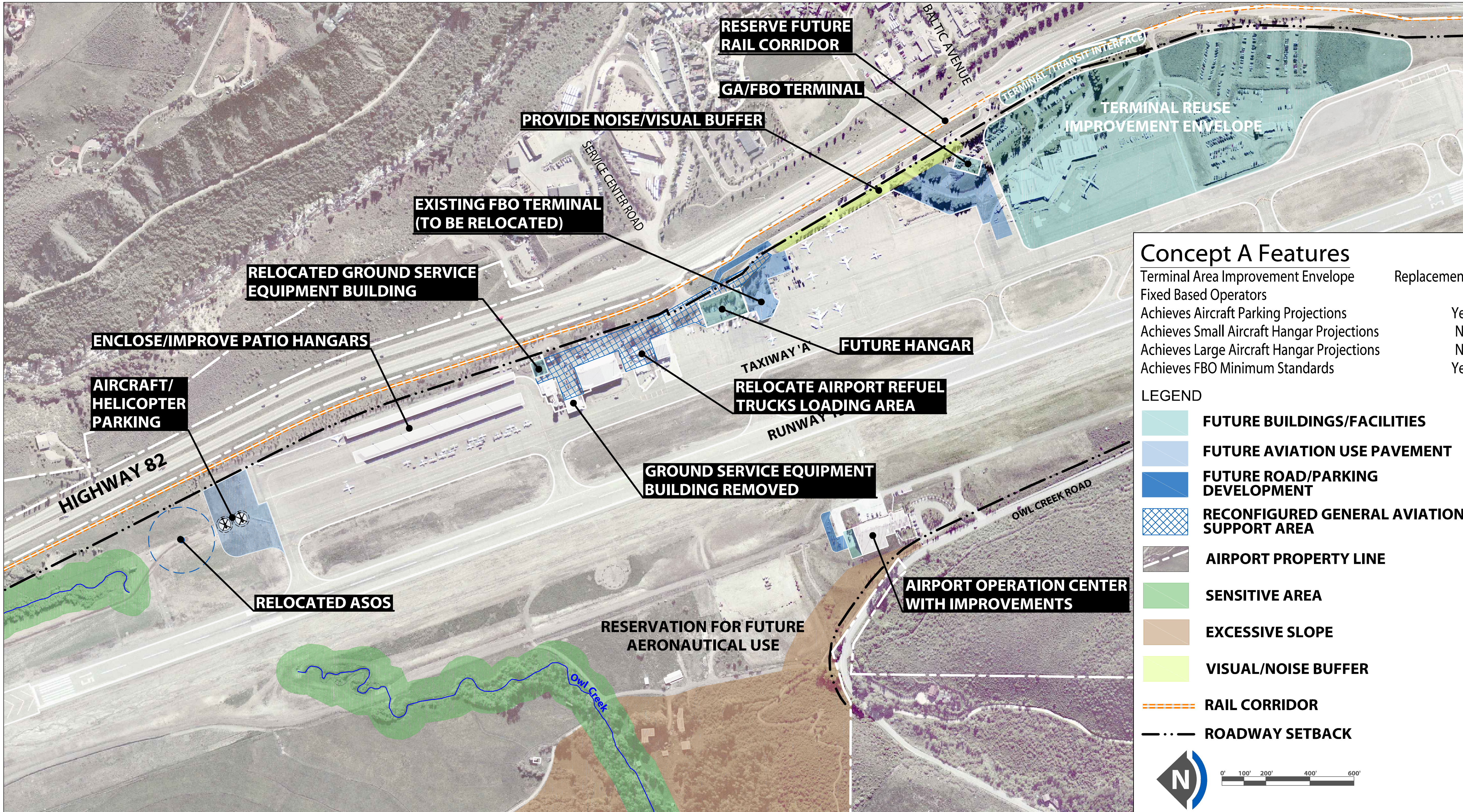


Figure 4-8
Refined Alternative Concept A (Status Quo +)

4.5.2 Refined Alternative Concept B (Two FBOs on the East Side)

Refined Alternative Concept B is based on the provision of two FBO/commercial aviation areas on the east side of the Airport and, therefore, it is similar in concept to initial Alternative 2. This alternative is illustrated in **Figure 4-9**. The first commercial aviation/FBO facility is proposed to be located at the south end of the aircraft parking apron, adjacent to the terminal improvement envelope. The second commercial aviation/FBO facility is to be located toward the north end of the east side aviation-use area and would require the relocation of several small general aviation hangars to allow room for adjacent aircraft parking area.

An area for additional aircraft parking (including helicopters) is identified at the far north end of the east side aviation-use area. Because of the potential for excellent landside and airside access, the fuel storage area is recommended to be relocated to an area just south of the Service Center Road airport entrance, and the existing fuel storage area can be used for a new aircraft storage hangar site. Concept B also recommends the relocation of the existing ground service equipment building.

When compared with Refined Alternative Concept B, Initial Alternative Concept 2 included a large hangar (120' x 120') near the second FBO terminal at the Baltic Avenue entrance, which has been eliminated in Refined Alternative Concept B due to input received that this area would be better suited for aircraft parking apron. Alternative Concept 2 also included GA hangar facilities and aircraft parking apron on the west side of the runway. This was eliminated from Refined Alternative Concept B based on input received during the last Open House, which suggested that if there were going to be GA facilities on the west side they should be full-service facilities that include an FBO terminal. Refined Alternative Concept B also differs from Alternative Concept 2 in that the existing FBO terminal is relocated to the area near the south end of the patio shelters. This was done in order to open up additional aircraft parking potential in the area of the existing FBO terminal facility, as well as to have the northernmost FBO terminal facility closer to the aircraft parking apron and patio shelters that it would be serving. These efficiencies were deemed necessary for an alternative that included two FBOs on the east side. Given that the noise buffer along Highway 82 has been supported by the community, it was carried from Alternative Concept 2 and is shown in Refined Alternative Concept B.

Key evaluation criteria:

- **Operational.** Several operational/safety factors should be considered with Refined Alternative Concept B:
  - ✓ Separates helicopter parking from fixed wing aircraft parking.
  - ✓ With additional aircraft parking area, the GA ramp will be operationally more efficient and be less prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.

- ✓ Staff with the Federal Aviation Administration has expressed concerns about the operation of two FBOs on the east side of the Airport. With increased vehicular and aircraft activity associated with two east side FBOs in a limited physical area, increased congestion will likely lead to safety concerns.

- **Efficient use of airport property.** Enhanced by converting area currently being used for passenger terminal to aircraft parking apron, and by relocating the GA/FBO terminal to a location that is adjacent to the passenger terminal improvement envelope.

- **Economic/financial implications.** Positive: there will be no significant capital improvement projects programmed on the west side with Refined Alternative Concept B. Negative: the limited additional commercial aviation facilities and hangars on the east side of the Airport could result in some sources of future revenue for the Airport.

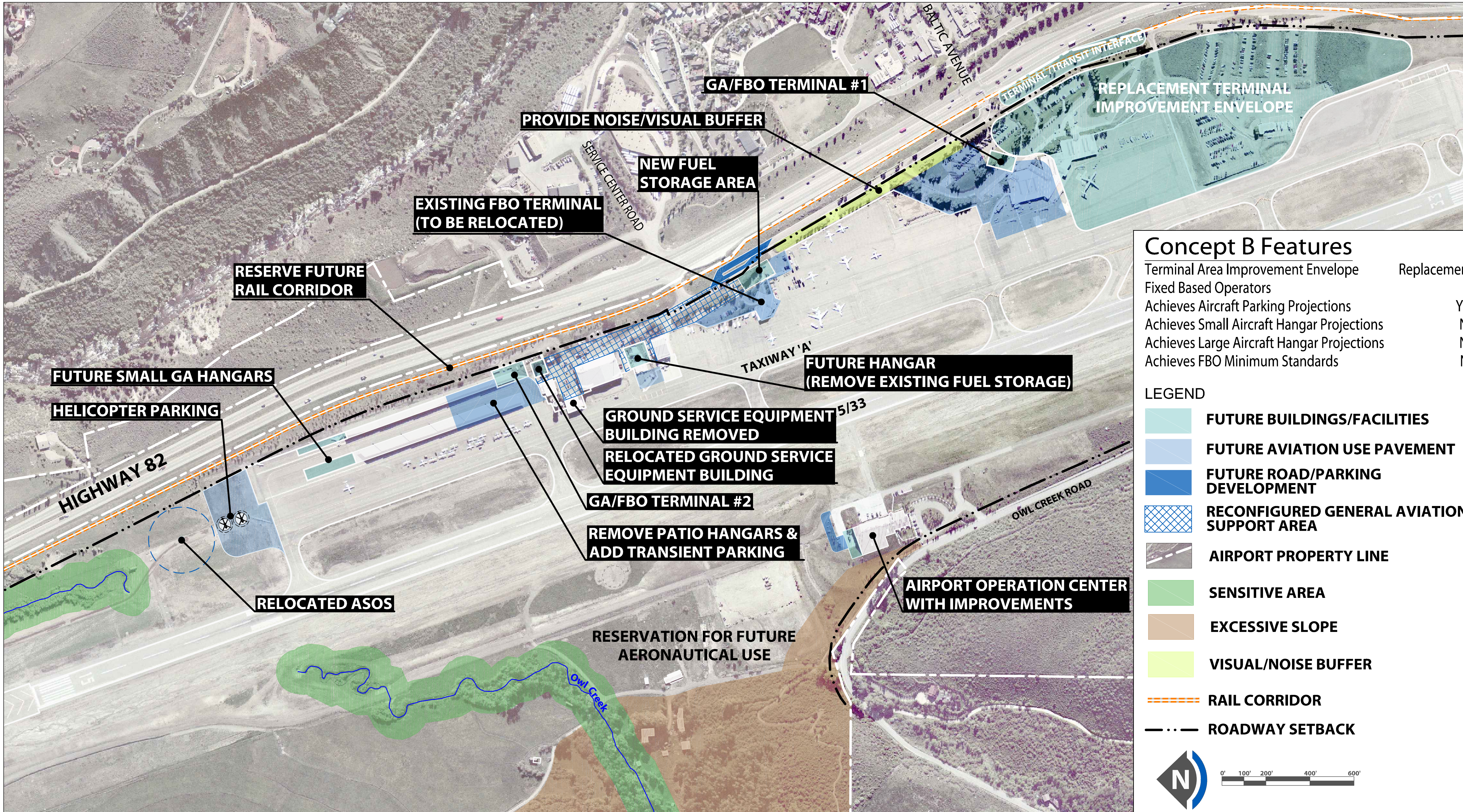
- **Implementation Feasibility Considerations.** This alternative suggests that there will be two FBOs on the east side of the Airport. Although some of the patio hangars would be relocated to provide some itinerant aircraft parking apron adjacent to FBO terminal #2, it would not be enough to satisfy Minimum Standards requirements and would result in the FBOs sharing the aircraft parking ramp, which is probably not ideal. In addition, it there are two FBOs on the east side of the Airport, it will not be possible to meet the established Minimum Standard requirements for facilities in a manner that is responsive to community concerns and achieves the master planning goal of reducing the operational complexity of the general aviation development area.

- **Aesthetic/Visual.** As with previous alternatives, the need for a visual/noise barrier along the east side of the general aviation aircraft parking area is recognized in Refined Alternative Concept B.

- **Environmental.** Improvements would be made primarily within pre-disturbed ground and would result in approximately 257,459 square feet of impervious surface area on the east side (not considering any improvements on the west side; i.e., the AOC improvements).

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBO(s).** Two.
- **Achieves aircraft parking apron projection.** Yes.
- **Achieves small aircraft storage hangar projection.** No.
- **Achieves large general aviation aircraft hangar area.** No.
- **Achieves critical Minimum Standards for FBO facilities. No.**



Concept B Features

Terminal Area Improvement Envelope	Replacement
Fixed Based Operators	2
Achieves Aircraft Parking Projections	Yes
Achieves Small Aircraft Hangar Projections	No
Achieves Large Aircraft Hangar Projections	No
Achieves FBO Minimum Standards	No

Figure 4-9
Refined Alternative Concept B (Two FBOs on East Side)

4.5.3 Refined Alternative Concept C (One FBO on the East Side and One FBO on the West Side)

Refined Alternative Concept C is based on the provision of two FBO/commercial aviation areas (one on the east side and one the west side) and is illustrated in **Figure 4-10** (similar to initial Alternatives 2 & 3). The first commercial aviation/FBO facility is located immediately north of the Replacement Terminal Improvement Envelope, which provides the opportunity to share automobile parking facilities with the passenger terminal. The second commercial aviation/FBO facility is in the new general aviation improvement area on the west side of the Airport, north of the AOC building and south of the Owl Creek riparian area. The proposed relocation of the existing FBO Terminal in this alternative will allow for increased pavement for aircraft parking and the potential for an improvement area that could be utilized for an aircraft storage hangar. An area for additional aircraft parking (including helicopters) is identified at the far north end of the east side aviation-use area. This Alternative also includes the reconfiguration of the fuel farm area to avoid impinging on the Building Restriction Line. Refined Alternative Concept Plan C also recommends relocation of the existing ground service equipment building.

This Alternative recognizes the need to provide a noise/visual buffer between the aircraft parking apron and the neighbors on the east side of Highway 82.

In addition to the commercial aviation/FBO area on the west side of the Airport, parking and hangars for larger general aviation aircraft are recommended in Refined Alternative Concept C. Improved aviation facilities on the west side will result in the need for a parallel taxiway system on that side of the runway. The proposed development on the west side of the Airport is located in an area that is not affected by excessive slope or drainage concerns. In addition, the proposed west side development does not encroach on the riparian area adjacent to Owl Creek.

To the south of the existing AOC facilities, this alternative provides an area for a fuel storage facility and a parking area for emergency medical services aircraft (helicopters and fixed wing). Both the fuel storage area and the emergency services aircraft parking area can be provided with good landside access in this location. It is also noted that the emergency medical services aircraft parking area could double for use as a west side aircraft deice apron when needed.

Refined Alternative Concept C combines elements of Initial Alternative Concepts 2 and 3. This alternative reflects input received from the community that indicates a preference for a full-service FBO with fuel sales on the west side if GA facilities are developed there. The hangar size and arrangement on Refined Alternative Concept C reflect further analysis regarding the market preferences for hangar space both in term of size as well as configuration. The large block of hangars shown in Alternative Concept 3 was identified as having operational limitations, as well as being difficult to deal with from a visual impacts standpoint. Refined Alternative Concept C also incorporates input received from the local emergency medical community after the original concepts were prepared regarding the benefits of incorporating an emergency service helicopter/fixed wing aircraft parking area. For several reasons, including the desire to isolate this facility from other aircraft operations as much as possible, it was determined that the west side of the Airport is the preferred location for the emergency medical services aircraft parking facility. The concept location for the west side fuel storage facility was located adjacent to the existing AOC entry to minimize the length of the interior site roadway that will need to be traveled by over-road fuel trucks. If additional improvements are built on the west side, the existing AOC landside vehicle entry will continue to be used as the only entry point off of Owl Creek Road for all west side facilities.

Key evaluation criteria:

- **Operational.** Several factors might be considered operational/safety enhancements with Refined Alternative Concept C:
  - ✓ Separates helicopter parking from fixed wing aircraft parking.
  - ✓ With additional aircraft parking area, the GA ramp will be operationally more efficient and be less prone to congestion problems that can contribute to flight delays for both commercial passenger aircraft and GA aircraft.
- **Efficient use of airport property.** Efficient use of airport property is enhanced by converting the area currently being used for passenger terminal facilities to aircraft parking apron and identifying this area to be the future site for the east side General Aviation/FBO Terminal. By relocating the existing General Aviation/FBO Terminal building, the area around the existing building can be used for aircraft parking and circulation (the highest and best use for the area) and could also have the potential as a site for an aircraft storage hangar.

  In addition, this Alternative suggests that the existing ground service equipment building be relocated to the east side of the ATCT, with the existing site being converted to aircraft parking apron (the highest and best use for the site).
- **Economic/financial implications.** Negative: significant capital improvement projects programmed with Alternative C include west side taxiway, construction of aircraft parking apron, construction of commercial aviation/FBO facilities (private sector money), and construction of hangars (private sector money). Positive: additional commercial aviation facilities, aircraft parking areas, and hangars could result in significant sources of future revenue for the Airport.
- **Implementation Feasibility Considerations.** This Alternative suggests that there will be two FBOs in the future, one on the east side of the Airport and one on the west. This results in both FBOs having enough area to achieve Minimum Standard requirements for facilities.
- **Aesthetic/Visual.** As with previous Alternatives, the need for a visual/noise barrier along the east side of the general aviation aircraft parking area is recognized in Refined Alternative Concept C. Improvements on the west side of the Airport for the most part will be screened from views from Owl Creek Road

and the structures on the west side will be sited and constructed so as to be minimally visually intrusive when viewed from the east.

- **Environmental.** Improvements on the east side would primarily be made within pre-disturbed ground. Development on the east side and west sides would result in an additional 1,160,358 square feet of impervious surface area, resulting in increased run-off, but would avoid Owl Creek and the wetlands associated with Owl Creek.

As illustrated, key quantitative measures:

- **Number of Fixed Base Operators/FBOs.** Two.
- **Achieves aircraft parking apron projection.** Yes.
- **Achieves small aircraft storage hangar projection.** Yes.
- **Achieves large general aviation aircraft hangar area.** Yes.
- **Achieves critical Minimum Standards for FBO facilities.** Yes.

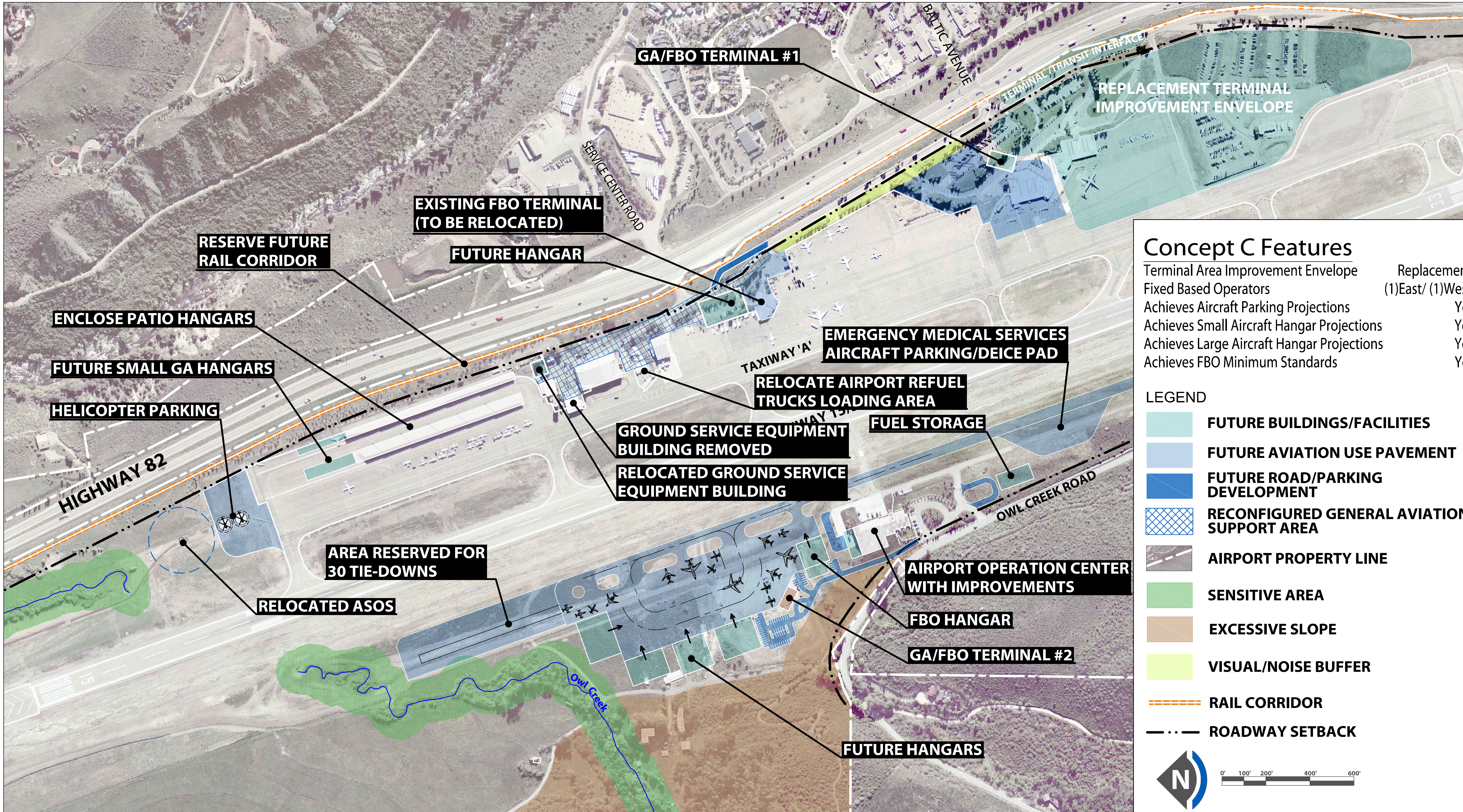


Figure 4-10
Refined Alternative Concept C
One FBO on East Side and One FBO on West Side

4.6 Preferred General Aviation (GA) Alternative Concept

Following discussions in a work session with the Board of County Commissioners on February 7, 2012, a final alternative concept was formulated and it is graphically presented in the following illustration, **Figure 4-11**, entitled ***ALTERNATIVE CONCEPT C1***. In recognition of the evaluation criteria and key quantitative measures presented with each refined alternative, discussion during the meeting on February 7th indicated that there could be a preference for Alternative C (see **Figure 4-10**); however, it was also recognized that the size and quantity of the west side improvements shown in Alternative C might be out of sync with community sensitivities.

Throughout the master planning process, the Master Plan Study Committee, the public, and the County Commission have consistently provided direction reflecting the value of smart and managed growth at the Airport. To that end, the preferred general aviation alternative is Alternative Concept C1, which does not show hangar improvements beyond those associated with meeting the minimum requirements for FBO facilities.

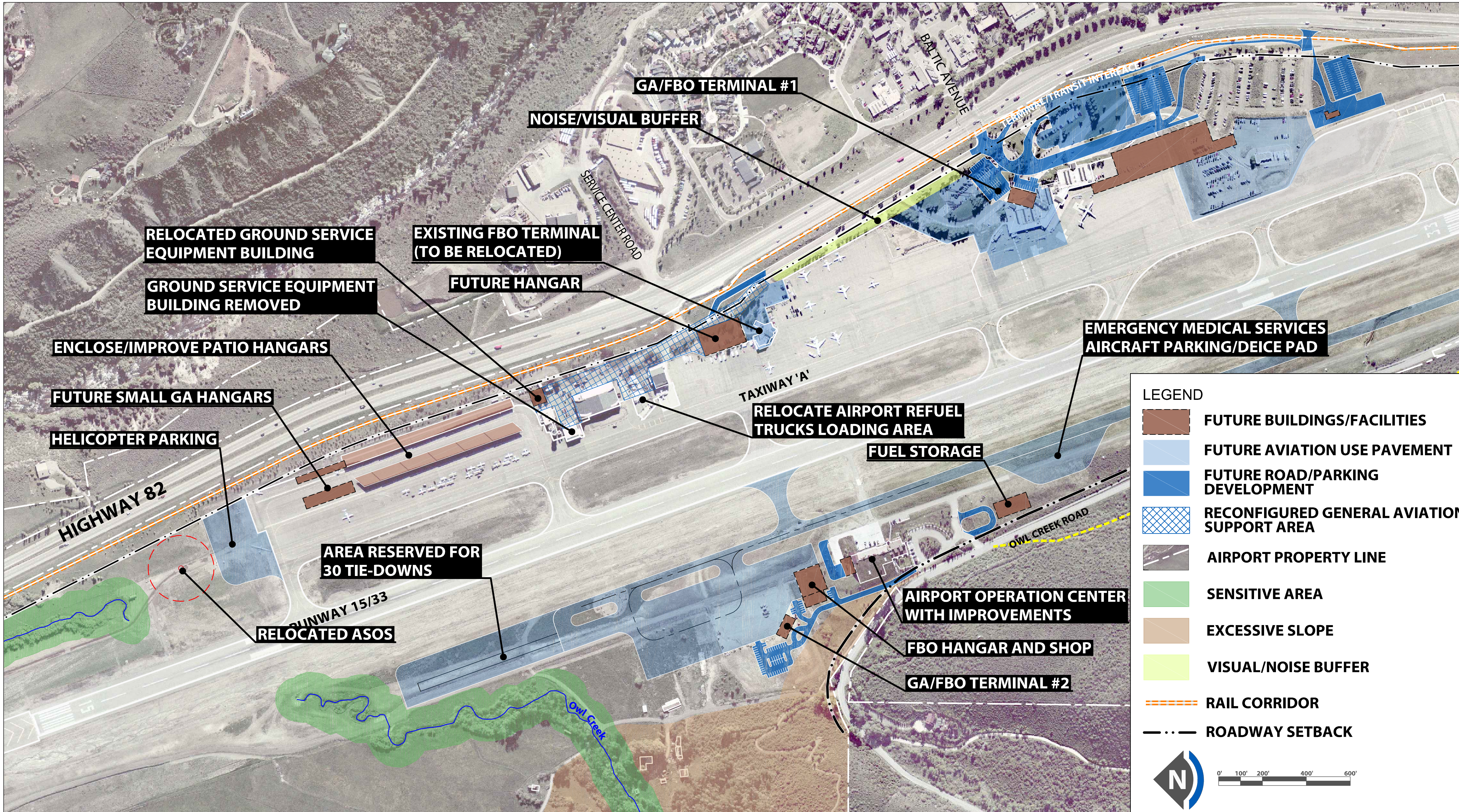


Figure 4-11
Alternative Concept C1
One FBO on East Side and One FBO on West Side

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Chapter 5

Terminal Area Plan Alternatives

MASTERPLAN UPDATE

Terminal Area Plan Alternatives

5.1 Introduction/Purpose

As noted in Chapter 4, the Terminal Area Plan Alternative options for the Airport were developed within the context of the Airport's mission statement: To provide safe, efficient, and environmentally responsible airport services that meet or exceed our community's expectations. The Terminal Area serves all commercial air carrier operations and associated activities including parking, transit connections, ticketing, baggage handling, concessions, ground transportation, security, passenger hold rooms, commercial ramp activities, and airport administration.

As discussed in Chapter 3, the existing terminal is approximately 40% smaller than what has been identified for it to operate in accordance with the Airport's mission statement. This percentage was determined by passenger activity levels and forecasts, along with input from the Airport, airlines, and tenants. Also indicated in Chapter 3, there are seven areas where the existing terminal is deficient by more than half the area identified to properly serve the traveling public.

Nine concepts were generated through the input process. These were reduced through evaluation and the four remaining alternatives presented here are based on projected needs and community input generated at meetings of the Master Plan Study Committee, a series of design charrettes sessions, survey responses, and two public meeting/open house sessions. In addition, the options take into consideration community sensitivity to airport issues, aviation design standards, existing physical features, access to public transit, and site improvement aesthetics.

The Terminal Area is restricted by several existing geographic factors. The location of Highway 82 and Taxiway "A" creates a building envelope that minimizes the area on the airport property where terminal area functions can be efficiently and sustainably located. The access points that have been identified for the Airport also limit possibilities at the Airport. This could mean that some forecasted needs, particularly those related to vehicle parking facilities, will continue to be unmet.

The Pitkin County Board of County Commissioners (BOCC) is responsible for making decisions with regard to the Airport. Recognizing the need to make an informed decision about the Airport Master Plan, an open, intensive, and extensive community input process has been an integral component of this planning program. This effort has incorporated such things as tenant and user surveys, planning charrettes, committee input, elected official input, civic groups and neighborhood input, open houses, and facility tours. The review of Terminal Area Plan alternative options contained in this chapter directly results from that community input process.

5.2 Alternative Analysis Evaluation Factors

In a later portion of this chapter, each of the alternative concept plans will be comparatively analyzed against a list of evaluation factors. Some of the factors can be quantitatively compared. Those long-term terminal area factors include:

- **2017 total terminal square footage – 80,435 SF**
- **Current parking stalls – 1,300 spaces**
  - ✓ Parking garage (minimize surface parking) – yes or no
- **2017 aircraft gates and associated hold room space allocation – 8 gates**
- **Commercial ramp aircraft parking locations – 10 spaces**
- **Provide future connection to public transit**

With other factors, a more qualitative review is essential. These include:

- **Operational Considerations.** Does the terminal space allow for efficient and safe operations of the airlines and maintenance staff? Does the roadway and public access system provide clear and efficient routes for the traveling public? Is the commercial aircraft ramp laid out in a manner that allows safe and efficient aircraft operations? Is the auto parking and pedestrian access located in areas that minimize distances from the terminal?
- **Efficient Use of Airport Property.** As referred to in the introduction, because of the airport's limited land area, efficient land use and highest/best land use issues are critical considerations.
- **Economic/Financial Implications.** Although a detailed financial plan will be prepared on the final Airport Master Plan Update proposal, at the alternative analysis stage, it is most critical to understand generalized capital improvement costs associated with each alternative, revenue generation potentials associated with each alternative, implications for phasing (timing and order) of the capital improvements projects specified for each alternative, and potential funding strategies.
- **Implementation Feasibility Considerations.** This factor mainly revolves around the implications that phasing of facilities will have on airport operations and the traveling public. Financial feasibility of alternatives will be addressed for the final Airport Master Plan Update proposal once determined.

- **Aesthetic/Visual.** The community has indicated that aesthetic and visual impacts are critical considerations in programming for future airport improvements.

Site Analysis. Still, other factors (physical constraints, Pitkin County Land Use Codes, and FAA planning guidelines) can best be identified within the context of the Site Analysis that was prepared as a precursor to alternative analysis. The features that are recognized in the site analysis are taken as givens in setting the parameters for where and how future terminal area improvements might be sited on the constrained Terminal Area. The constrained area (yellow) represents those factors that significantly limited the concept area (airfield, Highway 82 roadway and setback, and general aviation activity area). See below for the resulting unconstrained area that was utilized as the envelope for the Terminal Area concepts.

Figure 5-1. Terminal Area Site Analysis

5.3 Concept Creation Process

As previously stated, the public input taken in the development of concepts was a critical component of the overall process. These efforts were reflective of the community's practice of engaged public involvement. As noted in Chapter 4, Section 4.3, the concept creation process for the Terminal Area Plan was conducted simultaneously with the General Aviation Area concept development. Eleven planning charrettes were held in early 2011and provided an opportunity for public and stakeholders to put "pen to hand" (as seen below) and provide extensive conceptual ideas to the Terminal Area.

The format of the charrettes included a brief introduction presentation to provide background on the planning process and issues. The participants were then split into small groups, each typically with four to eight participants, for tabletop planning exercises. The tabletop exercises were led by a facilitator and focused on specific objectives.

A wide range of people were identified to participate in the charrettes, resulting in a variety of perspectives and ideas with respect to improvements at the Airport. The participants included:

- **Planners and Architects**
- **Airport Tenants and Pilots**
- **General Public**
- **Lodging and Restaurant Industry Representatives**
- **Homeowners Association and Caucuses**
- **Aspen Airport Business Center and Surrounding Business Representatives**
- **City of Aspen and Pitkin County Staff**

Charrette (brain storming) sessions held in January 2011 involved 76 participants, and charrette sessions held in March 2011 involved 34 participants. The sessions revealed common, recurring themes regarding both the passenger and general aviation (GA) areas (presented in the previous chapter). The following sections summarize these common Terminal Area Plan themes.

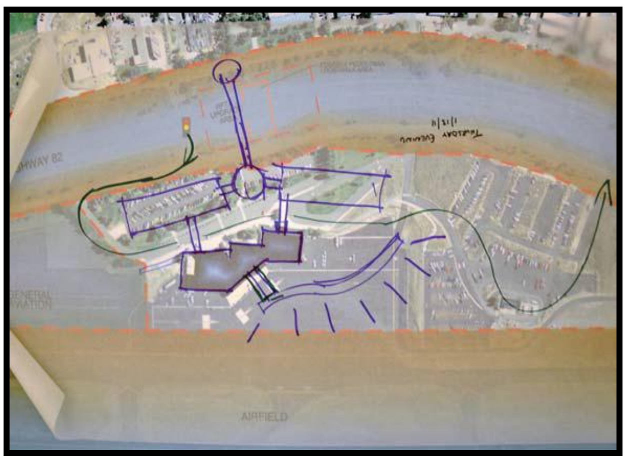
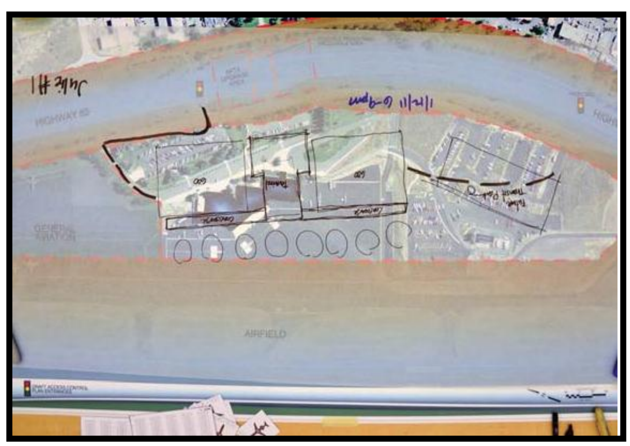


Figure 5-2. Terminal Area Charrette Themes

The majority of opinions expressed at the charrettes supported improvement of the Airport as necessary to meet the community's aviation needs; however, this was not a unanimous sentiment. Specific themes discussed and incorporated into the Terminal Area concepts included ease of access to transit, consolidation of parking, visual impacts, and phasing options. Below is a summary of the major Terminal Area themes that were identified by the public.

Existing Terminal Building

- The smaller, quaint feel is generally liked.
- Majority of people do not feel any attachment to the current building or feel a need to save it.
- Majority of attendees thought that the outside boarding/deboarding was unique and something they would like to preserve rather than upgrade to loading bridges.



People understood the need to mitigate safety concerns.

- A strong majority agreed that the secured holdroom can get very cramped and lacks adequate concessions.
- Baggage that stacks up in the claim area is a concern.
- Maintaining a view of the mountains is important.
- Aesthetically, most people agreed that the terminal should blend, rather than be an architectural statement for the entrance to Aspen.

Parking/Ground Transportation

- Consolidation of parking (short-term, long-term, rental car, FBO) is good, as long as it is not more visible.
- Several people showed concern for the ultimate 1,474 parking space need projected.
- It is frustrating to people when parking fills up.
- The curbside parking is a huge benefit that customers seem to enjoy.
- Commercial operators need more space for drop offs and pickups.

Transit

- The importance of connecting the terminal with RFTA is universal.
- Consideration of the Airport as a “Transportation Hub” was brought up by some attendees. This would involve a plaza or similar type of arrangement that one would immediately stop into upon getting off the bus.
- Everyone seemed to agree that the Baltic/Highway 82 intersection is very unsafe and the grade separation crossing is needed.
- A strong transit connection with efficient service was desired by most. There are a variety of hurdles to implementing a successful transit system to the Airport including baggage handling, difficulty connecting to Snowmass Village, transporting visitors from in-town transit stations to lodges and hotels, among others.
- All methods to get people to and from the Airport (transit, private vehicle, shuttle/taxi, and rental car) were discussed with people ranking importance of each for both locals and visitors. Most people seemed to accept that you are always going to have people who want to drive, rent a car, etc., and all modes have to be accommodated to some degree.
- Using the Airport as an RFTA intercept lot did not seem to generate too much interest.

Unique and Interesting Ideas

- Use of the Airport as a transportation hub, beyond simply an interface to flights.
- Baggage delivery and drop off areas at or near hotels.
- Heated pavement and/or covered walkways to and from aircraft parking positions.

5.4 Initial Terminal Area Alternative Concepts

Once the nine alternatives proposed were formalized, these were reviewed by the consultant team for similarities to other alternatives and the following additional criteria.

Key features considered in the Terminal Area Alternative concepts include:

- **Highway Access.** The primary access to the Terminal Area off of Highway 82 will continue to be at Baltic Avenue, with future access closer to Aspen near the BMC West property. Both intersections will be full movement signalized accesses. This coincides with recommendations for the Highway 82 access control plan, which was adopted in 2012.
- **Transit Connection.** Promoting connections to public transit along Highway 82 will be maintained and space preservation for future transit methods will be maintained.
- **Terminal.** The terminal will remain open at all times. The terminal should accommodate a minimum of 80,435 SF and should be expandable for future growth.
- **Commercial Apron.** The commercial apron should be sized to accommodate 10 parked commercial airplanes at full build-out.
- **Parking.** A minimum of 1,117 parking spaces should be provided to accommodate the existing need at the Airport. 1,300 stalls are generally required in the 2017 time frame.
- **Highway 82 Setback.** Although the Airport is not subject to the Pitkin County Land Use Code, a 100-foot setback should be maintained from the CDOT right-of-way for any above grade structure. This setback was specified in the 2004 Airport Master Plan Update.

Upon review, five alternatives were removed from consideration. Of these, four alternatives were deleted as being extremely similar to other terminal alternatives. One was deleted due to inefficiencies and similarities to other alternatives.

The remaining concepts developed in the public process are discussed in more detail in Section 5.4. Each alternative develops unique features regarding utilization of structures, terminal operations, and traffic circulation patterns. The interaction between these various features directly impacts the safety, efficiency, and environmental footprint of the facility and is generally evaluated as an integrated plan. Each refined concept was considered as a holistic approach to the terminal area.

5.5 Refined Concepts

The four selected concepts (Concepts 1, 2, 7, and 9) were further developed by the design team to show a higher level of detail, and to include more accurate information. Each has been configured to ensure the functional spaces could be reasonably accommodated within the proposed footprint. An analysis of each of these four concepts is included below, with refined concept drawing images for each.

5.5.1 Alternative Concept 1

Alternative Concept 1 locates the terminal building and parking structure within the limited depth of the site, between Highway 82 and the runway. The new Terminal is located south of the existing Terminal. The vehicle access points from Highway 82 are located to reduce traffic congestion at existing intersections that serve the shopping area to the east of the new Terminal, between the Terminal and Highway 82. The placement of the new Terminal allows for the operations to continue at the existing Terminal throughout the construction process with minimal impact to the flying public.

Key Evaluation Criteria:

- **Operational.**
  - **Terminal.** This terminal building is theoretically a two-level structure, with approximately 80,000 SF of space with much of the facility below grade supporting back of house operations. The compact terminal is efficient in terms of space utilization and functional adjacencies. This allows the traveling public to move through the terminal quickly. The compact nature lends itself to an efficient and simple structure for airlines and airport staff to operate within. New construction allows for more efficient space allocation. Lower maintenance costs, associated with more efficient mechanical systems and building materials, will be realized in this scenario.
  - **Roadway System/Access.** The roadway system provides drivers ample time to make the necessary decisions and allows for simple way-finding signage. This simple connecting road allows for vehicles to re-circulate without having to re-enter the highway.
  - **Apron/Aircraft Parking.** The two-level design has the advantage of resolving existing apron sloping issues and a simplified accommodation of jet bridges, if desired. The second level of the concourse provides gates for six aircraft parking gates, planned to accommodate CRJ-700 aircraft, and four power-in/power-out aircraft parking positions, planned to accommodate Dash-8 Q400 turbo prop aircraft, which are larger than the standard regional jet. At least six of the ten parking positions will require push-back of aircraft.
  - **Auto Parking/Pedestrian Access.** A three-level parking structure is sized to accommodate up to 1,500 parking stalls. This concept provides covered pedestrian access from Highway 82 to the terminal.
- **Efficient Use of Airport Property.** This concept is located within the limited depth of the site, between Highway 82 and the runway. The two-story plan minimizes building

footprint. Additionally, the parking garage and location of terminal allows for maximization of aircraft parking.

- **Economic/Financial Implications.** The compact nature of the design will be economical to construct.
- **Implementation Feasibility Considerations.** This design will allow the existing terminal facilities to remain in operation during construction. It also will allow for phased construction without impacting the existing terminal facility. Moreover, the design allows for phasing implementation of the project that can be suspended at the end of any phase with minimal impacts on the efficiency of the operation.
- **Aesthetic/Visual.** The rectangular nature of the footprint does not respond to the natural environment in aesthetic terms in its simplest form. However, this is an issue that could be addressed during the architectural design phase if this alternative were selected to go forward. This concept preserves the scenic views of the mountains to the southwest from the terminal. Its proximity to Highway 82 minimizes visual impacts.

Key quantitative measures:

- **Achieves projected 2017 terminal space needs (80,000 SF).** Yes.
- **Achieves projected 2017 parking stall needs (1,300 stalls).** Yes.
- **Achieves project 2017 aircraft parking gate/hold room needs (8 gates).** Yes.
- **Garage/underground parking.** Yes.
- **Future connection to public transit.** Yes.

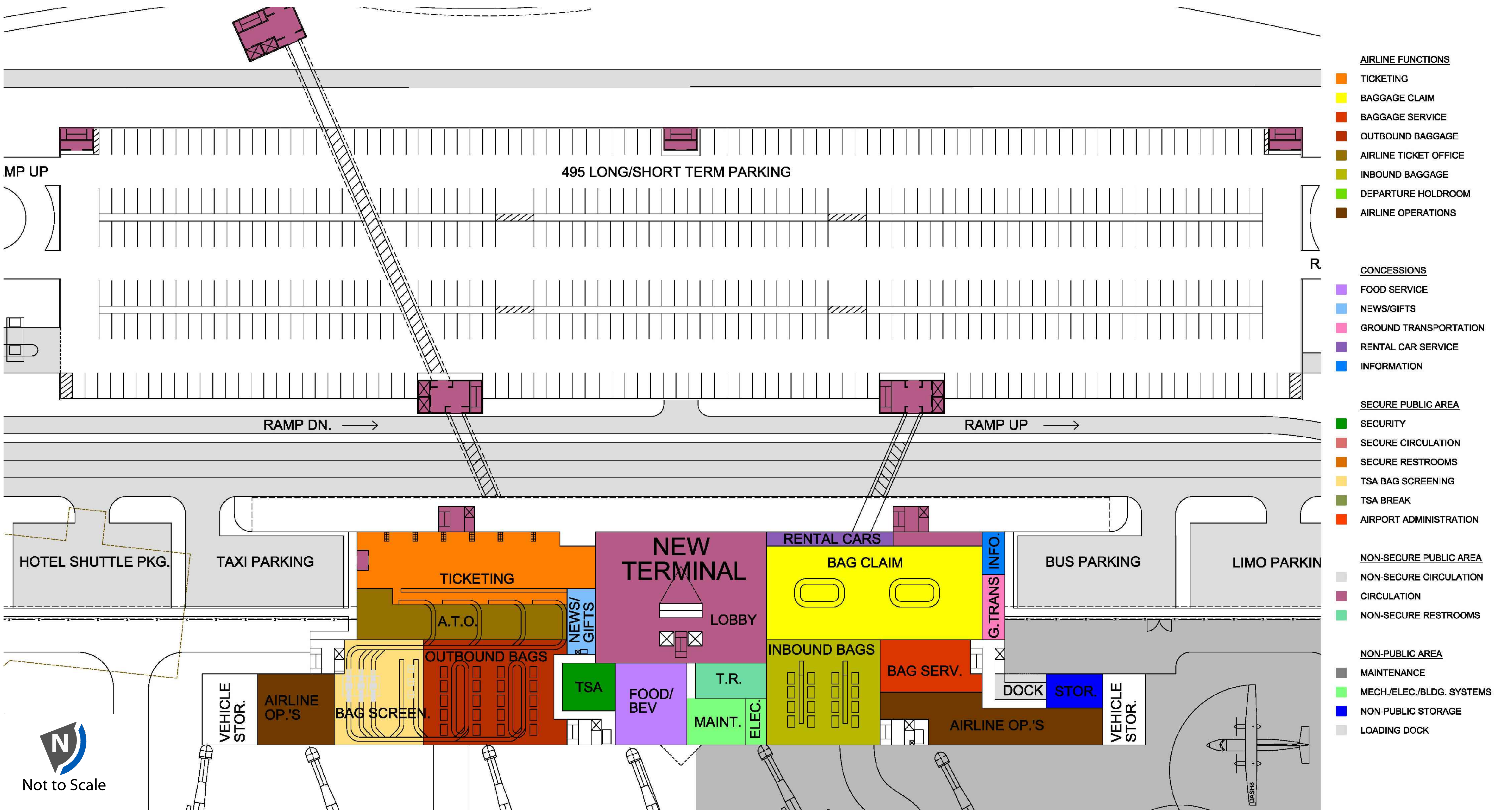


Figure 5-3
Terminal Area Planning - Concept 1

5.5.2 Alternative Concept 2

Similar to all of the alternatives, this concept locates the terminal building and parking structures to fit within the limited depth of the site between Highway 82 and the runway. The roadways are configured to reduce traffic congestion at existing intersections that serve the business area to the East. Two new three-level parking structures are proposed for functional reasons. A portion of the new Terminal will extend between, and divide, the two new parking structures.

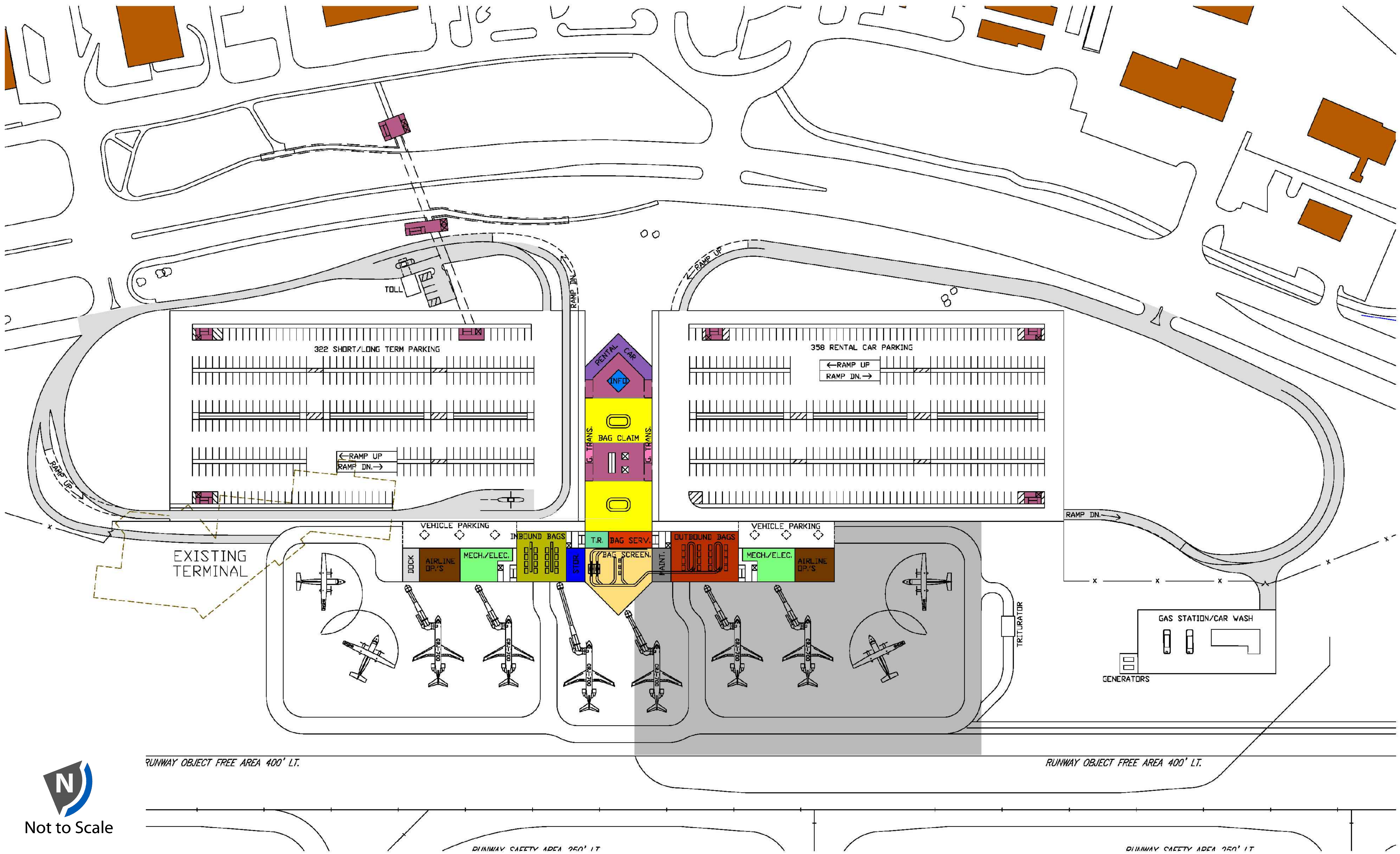
Key Evaluation Criteria:

- **Operational.**
  - **Terminal.** This terminal building is a single level structure containing approximately 80,000 square feet. This terminal concept is designed in the shape of a "T", with a perpendicular extension to the east and the concourse portion is parallel to the runway. This design will require more baggage conveyor length than other concepts. The linear nature of the design should limit the amount of airline equipment movement required. This concept separates commercial traffic from pedestrian drop-off and pick-ups. New construction allows for more efficient space allocation. Lower maintenance costs associated with more efficient mechanical systems and building materials will be realized in this scenario.
  - **Roadway System/Access.** The roadway system poses challenges with having two separate loop roads, which can be less intuitive for travelers to navigate. Traffic circulation is proposed to be divided into commercial vehicles and passenger vehicles, with primary south facing views obscured on the down-valley exit from the facility.
  - **Apron/Aircraft Parking.** The two-level design has the advantage of resolving existing apron sloping issues and a simplified accommodation of jet bridges if desired. The second level of the concourse provides gates for six aircraft parking gates, planned to accommodate CRJ-700 aircraft, and four power-in/power-out aircraft parking positions, planned to accommodate Dash-8 Q400 turbo prop aircraft, which are larger than the standard regional jet. At least six of the ten parking positions will require push-back of aircraft.
  - **Auto Parking/Pedestrian Access.** This concept provides two, three-level parking structures with approximately 1,500 parking stalls. The adjacency of the parking garage to the terminal is a distinct advantage for passengers that utilize onsite parking. This concept provides covered pedestrian access from Highway 82 to the terminal and separates private pickup and drop off traffic from ground transportation and rental car traffic, providing more convenient terminal curbside access for all transit types.
- **Efficient Use of Airport Property.** This concept is located within the limited depth of the site, between Highway 82 and the runway. The two-story plan minimizes building footprint. Additionally, the parking garage and terminal location allows for maximization of aircraft parking.

- **Economic Financial Implications.** The “T” shape will be less cost effective because of the increased perimeter walls and likely the extensive use of glass in this concept (to take advantage of natural light on the north facing exposure). The two loop roads and the two separate parking structures will be more costly to construct and maintain.
- **Implementation Feasibility Considerations.** This concept allows for continued use of the existing Terminal while the new one is constructed. However, phasing of the double-loop roadway and parking structures will be challenging.
- **Aesthetic/Visual.** The “T” shape of this concept pushes the structure of the terminal closer to Highway 82, increasing visual impacts. Extensive use of glass could be utilized to maximize views and use of natural light. Landscaping features would surround and cover the parking structures.

Key Quantitative Measures:

- **Achieves projected 2017 terminal space needs (80,000 SF).** Yes.
- **Achieves projected 2017 parking stall needs (1,300 stalls).** Yes.
- **Achieves project 2017 aircraft parking gate/hold room needs (8 gates).** Yes.
- **Garage/underground parking.** Yes.
- **Future connection to public transit.** Yes.



AIRLINE FUNCTIONS
- TICKETING
- BAGGAGE CLAIM
- BAGGAGE SERVICE
- OUTBOUND BAGGAGE
- AIRLINE TICKET OFFICE
- INBOUND BAGGAGE
- DEPARTURE HOLDROOM
- AIRLINE OPERATIONS

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SECURE PUBLIC AREA
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- TSA BAG SCREENING
- TSA BREAK
- AIRPORT ADMINISTRATION

NON-SECURE PUBLIC AREA
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- NON-SECURE RESTROOMS

NON-PUBLIC AREA
- MAINTENANCE
- MECH./ELEC./BLDG. SYSTEMS
- NON-PUBLIC STORAGE
- LOADING DOCK

Figure 5-4
Terminal Area Planning - Concept 2

5.5.3 Alternative Concept 7

In this concept, the existing one-level terminal building is renovated and expanded to the South and East, and a new two-level concourse is added to the West. The roadways are configured to reduce traffic congestion at existing intersections that serve the Aspen Airport Business Center to the East with a point of entry to the North and a point of exit to the South. A new three-level parking structure would be added between the highway and the Terminal, to the Southeast of the Terminal. A rental car fuel station and car wash facility have been included at the South side of the property.

This concept utilizes the existing terminal structure, and still meets the projected needs for the Airport.

Key Evaluation criteria:

- **Operational.**
  - **Terminal.** This concept reuses and reconfigures the existing terminal building adding necessary space to accommodate 80,000 SF and a second story for the concourse. Although primarily a single level structure, the existing terminal currently has three building elevations. This concept maximizes the reuse of spaces and adjacencies within the existing terminal. The compact nature of the terminal lends itself to an efficient and simple structure for the Airport and tenants to operate within. The separation of the terminal from the concourse will require greater movement of airline and airport equipment, and will require longer baggage handling conveyors or baggage tug and cart operation to move luggage and cargo. Additionally, the terminal and baggage claim are at a considerable distance from public transit waiting areas. The repurposing of space within the existing terminal is difficult due to elevation differences.
  - **Roadway System/Access.** The roadway system provides drivers ample time to make the necessary decisions and allows for simple way-finding signage. The simple connecting road allows for vehicles to re-circulate without having to re-enter the highway.
  - **Apron/Aircraft Parking.** The two-level design has the advantage of resolving existing apron sloping issues and a simplified accommodation of jet bridges if desired. The second level of the concourse provides gates for six aircraft parking gates, planned to accommodate CRJ-700 aircraft, and four power-in/power-out aircraft parking positions, planned to accommodate Dash-8 Q400 turbo prop aircraft, which are larger than the standard regional jet. At least six of the ten parking positions will require push-back of aircraft.
  - **Auto Parking/Pedestrian Access.** The three-level parking structure has been sized to accommodate 1,500 parking stalls. This concept places the parking garages further from the terminal building than other concepts. Covered pedestrian access from Highway 82 to the terminal is provided.

- **Efficient Use of Airport Property.** This concept is located within the limited depth of the site, between Highway 82 and the runway, although further down valley than other concepts. This concept minimizes the ability to increase the size of the General Aviation Ramp on the east side of the airfield in relation to other alternatives.
- **Economic/Financial Implications.** The re-use of the existing facilities will result in construction cost savings, as long as the existing terminal can be closed temporarily. However, closure of the terminal results in significant loss of revenue for the County and businesses in the community. In order to minimize overall costs, the facility would be reconstructed utilizing phased construction, in three to five phases, resulting in an overall cost equal to, or exceeding, some of the new construction alternatives.
- **Implementation Feasibility Considerations.** This concept will require complex phasing to maintain ongoing operations during construction. The construction will be time consuming and expensive to maintain the current level of service to the general public. This concept allows for phased process to continue operations during construction. It will be a challenge to maintain operation during the phased renovation and expansion of the Terminal. This design is expandable for the future.
- **Aesthetic/Visual.** The community is already comfortable with the impacts of the existing terminal location. Landscaping features would surround the parking structures, and the upper levels will also include landscaping.

Key Quantitative Measures:

- **Achieves projected 2017 terminal space needs (80,000 SF).** Yes.
- **Achieves projected 2017 parking stall needs (1,300 stalls).** Yes.
- **Achieves project 2017 aircraft parking gate/hold room needs (8 gates).** Yes.
- **Garage/underground parking.** Yes.
- **Surface parking.** Yes.
- **Future connection to public transit.** Yes.

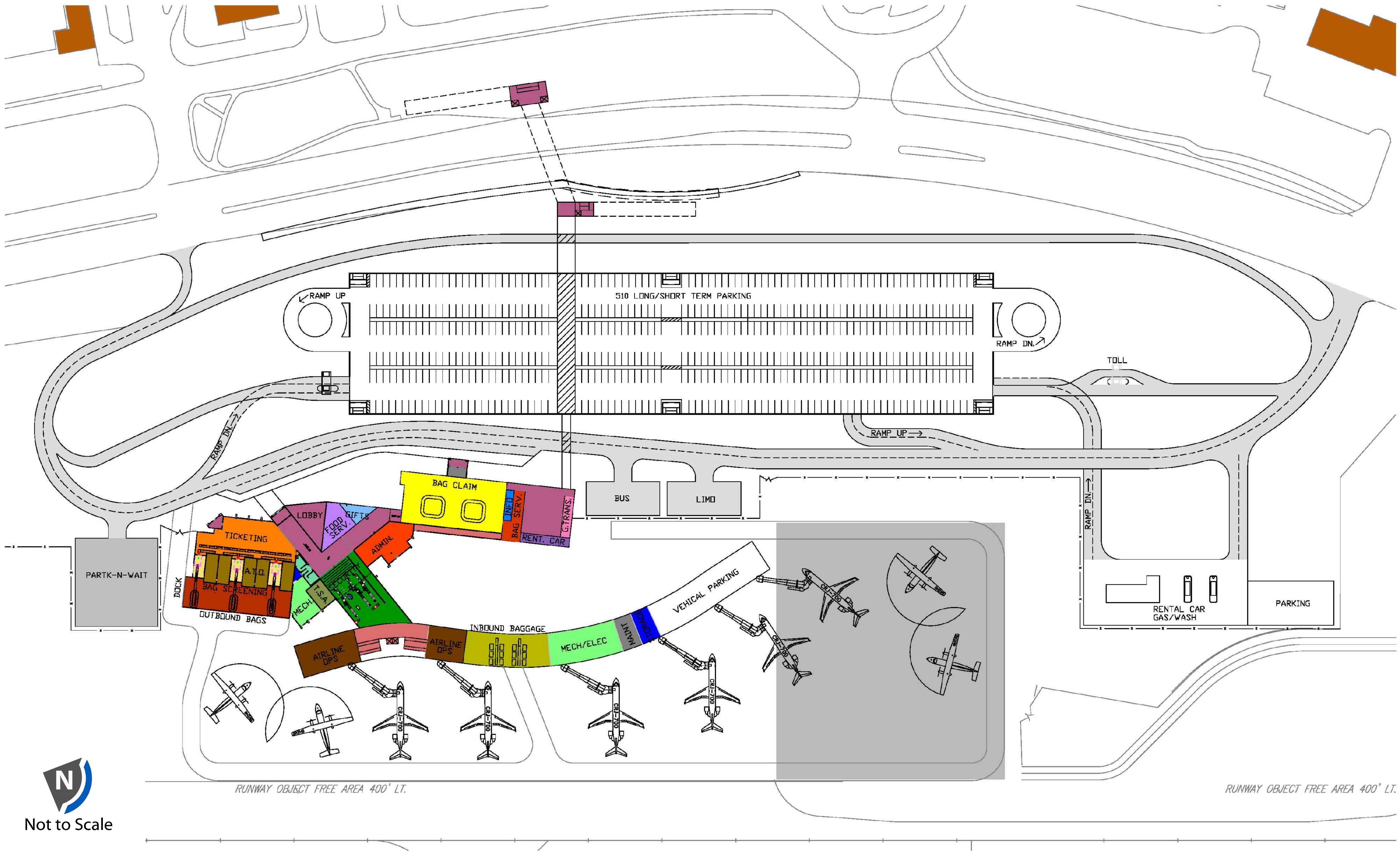

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Figure 5-5
Terminal Area Planning - Concept 7

5.5.4 Alternative Concept 9

In this concept, a new two-level terminal building is located to fit within the limited depth of the site between Highway 82 and the runway. The roadways are configured to reduce traffic congestion at existing intersections that serve the Aspen Area Business Center to the East with a new entrance access to the North and a new exit access to the South. A one-way loop road circulates around the new Terminal and parking structure providing convenient access to all of the facilities. A new three-level parking structure will be added. Portions of the new terminal building are tied to the new parking structure, and enclosed pedestrian access is provided from the east side to the west side.

Key Evaluation Criteria:

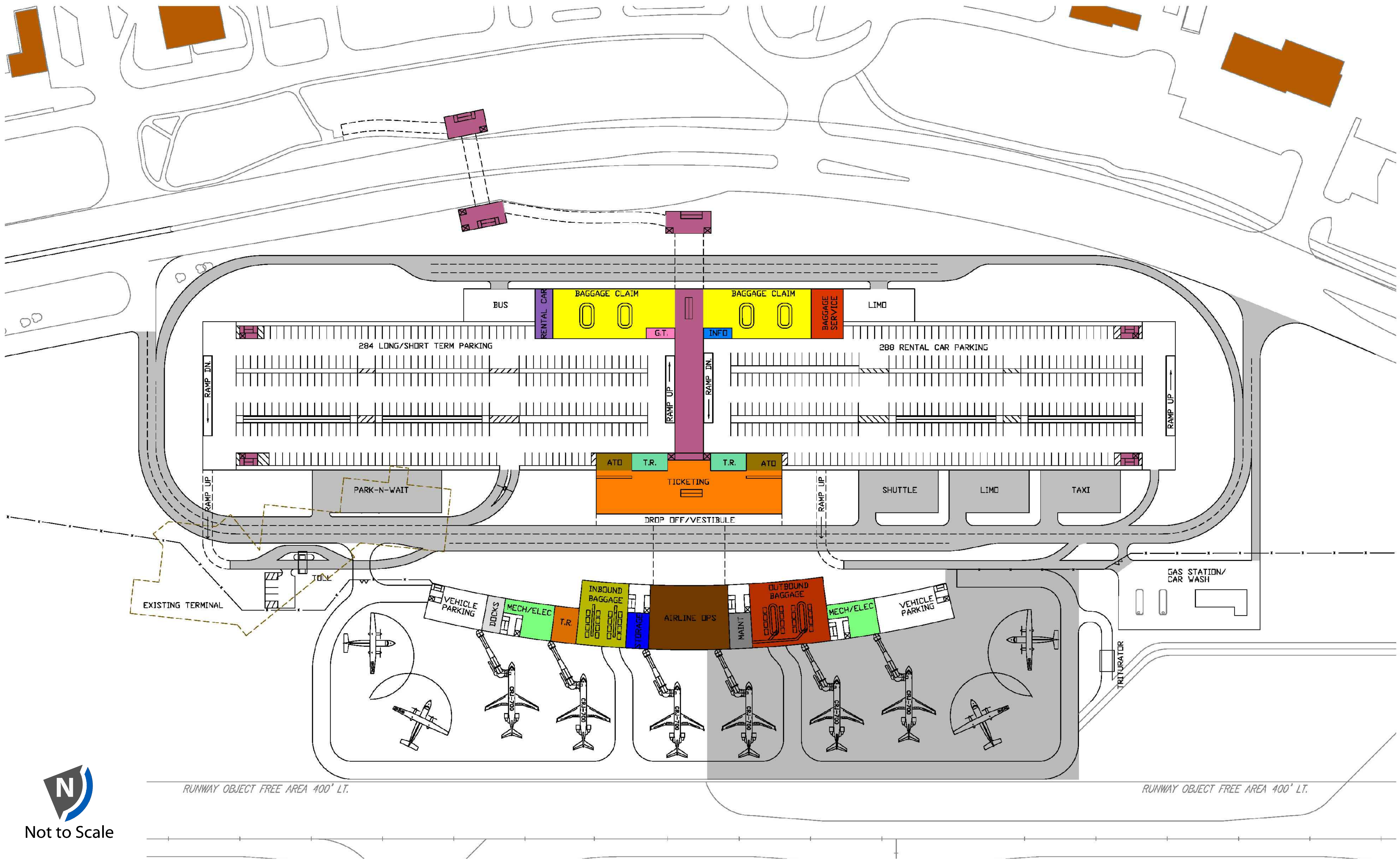
- **Operational.**
  - **Terminal.** This terminal building is a single structure, with approximately 100,000 SF of space to accommodate additional circulation. This concept spreads out the operation of each functional area of the Airport, which will be less efficient. The de-construct nature of the design will increase the movement required of people, equipment, and baggage. The design of this concept places the baggage claim area adjacent to public transit, making access to transit safe and convenient for passengers. This concept also requires the longest runs of baggage conveyors of any of the concepts.
  - **Roadway System/Access.** The roadway system provides drivers ample time to make the necessary decisions. The single, one-way, loop roadway provides straight forward way-finding and signage, but requires drivers to offload passengers on the driver's side of the vehicle.
  - **Apron/Aircraft Parking.** The two-level design has the advantage of resolving existing apron sloping issues and a simplified accommodation of jet bridges, if desired. The second level of the concourse provides gates for six aircraft parking gates, planned to accommodate CRJ-700 aircraft, and four power-in/power-out aircraft parking positions, planned to accommodate Dash-8 Q400 turbo prop aircraft, which are larger than the standard regional jet. At least six of the ten parking positions will require push-back of aircraft.
  - **Auto Parking/Pedestrian Access.** A three-level parking structure could accommodate 1,500 parking stalls. The central interior circulation path provides climate controlled access and ties all the functional areas seamlessly together. The adjacency of the parking garages to the terminal is an advantage for passengers that utilize on-site parking. However, the parking garage adjacent to the terminal possesses a challenge with respect to the requirement for blast protection against the possibility of a bomb in a parked vehicle.
- **Efficient Use of Airport Property.** This concept is located within the narrower portion of the site, between Highway 82 and the runway. The two-story plan minimizes

building footprint. Additionally, the parking garage and location of terminal allows for maximization of aircraft parking.

- **Economic/Financial Implications.** The spread-out nature of the design will be more costly, due to the amount of building perimeter with the extensive use of glass to take advantage of natural light), and increased distances for circulation and routes and baggage conveyors. This design will be difficult to phase the building and roadway construction without closing the existing terminal operations for a short period of time.
- **Implementation Feasibility Considerations.** This concept allows for a complex phased process to continue airport operations during construction. However, maintaining vehicle roadway access throughout the construction process will be challenging.
- **Aesthetic/Visual.** The de-construct design allows for smaller buildings placed over a wide area, which would help to break up the forms and blend them with the landscape and take advantage of the natural environment and views. Extensive use of glass could be utilized to maximize views and use of natural light. This design concept is placed closest to Highway 82, increasing visual impacts.

Key Quantitative Measures:

- **Achieves projected 2017 terminal space needs (80,000 SF).** Yes.
- **Achieves projected 2017 parking stall needs (1,300 stalls).** Yes.
- **Achieves project 2017 aircraft parking gate/hold room needs (8 gates).** Yes.
- **Garage/underground parking.** Yes.
- **Surface parking.** Yes.
- **Future connection to public transit.** Yes.



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- MECH./ELEC./BLDG. SYSTEMS
- NON-PUBLIC STORAGE
- LOADING DOCK

Figure 5-6
Terminal Area Planning - Concept 9

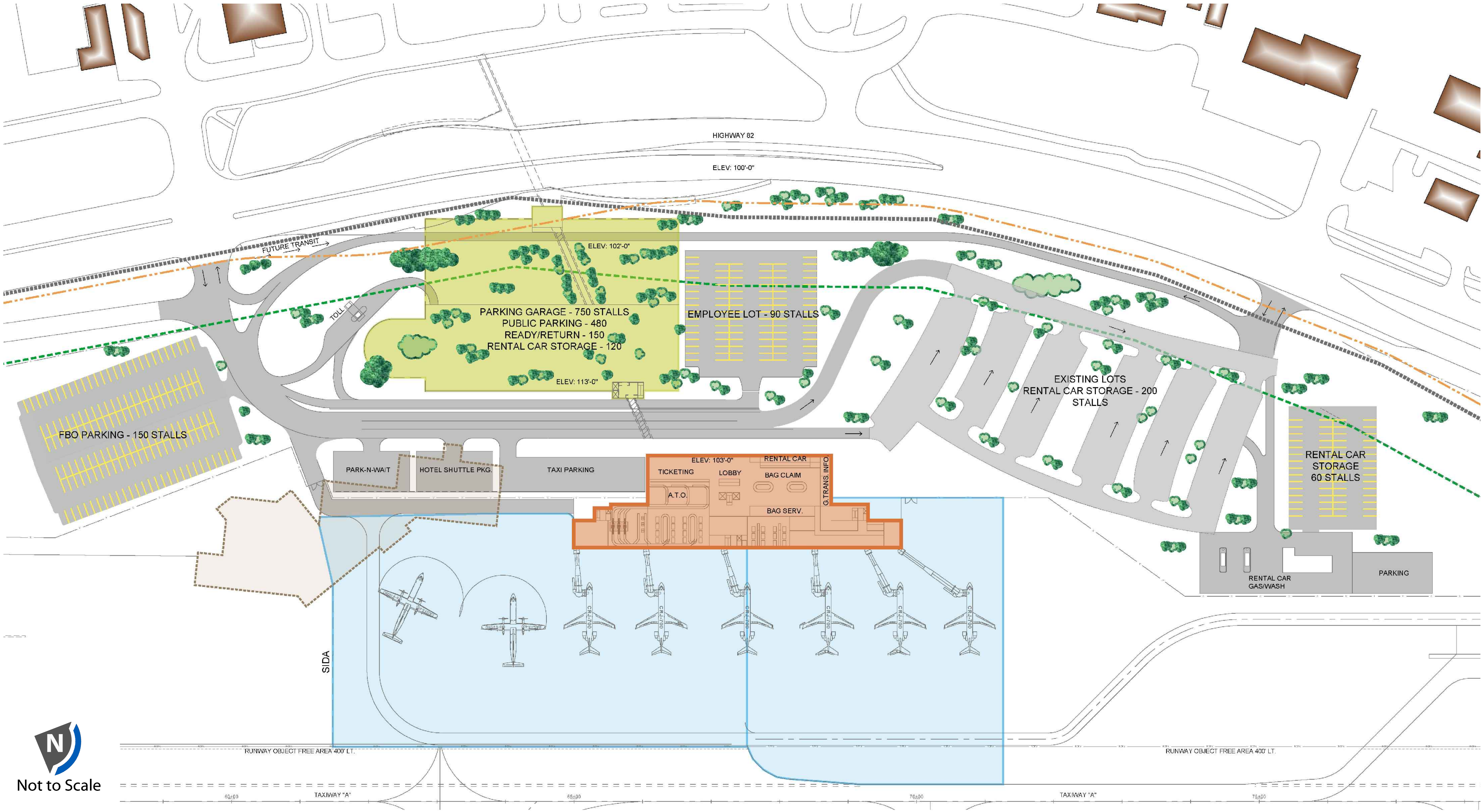
5.5.5 Preferred Terminal Area Plan Alternative Concept

As a result of the extensive public input, the BOCC examined a series of concerns including the issue of reuse of the existing terminal, the mix of surface parking and structured parking, and the massing and size of a new terminal. Further refinement was done to provide a mix of surface and structured parking and a stepped-back two-story structure designed to further minimize the visual impact from Highway 82. The Terminal Plan alternatives were evaluated on several key elements as summarized in the following matrix.

Terminal Plan Alternatives Comparison Matrix

	1 Simple	2 The "T"	7 Reuse	9 Segmented
Efficient Use of Terminal Space	□			
Customer Experience	□	□		□
Visual Impact from Hwy 82	□		□	
Minimizes Disruption to Passengers	□	□		□
Energy Efficient Facility	□	□		□
Minimizes Traffic on Hwy 82	□		□	□
Minimizes Lighting Impacts	□		□	

The BOCC found Alternative 1 "Simple" as keeping in concert with public input, professional planning methods, and community values. As such, the Terminal Area "Simple" Alternative was identified as the preferred Terminal Area Alternative Concept to be carried forward with the General Aviation alternative entitled Alternative Concept C1.



Master Plan Update

Figure 5-7
Terminal Area Planning - Alternative 1 "Simple"

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Chapter 6

Recommended Improvement Plan

MASTER PLAN UPDATE

Recommended Improvement Plan

6.1 Introduction/Purpose

As noted in Chapter 4 and Chapter 5, the Master Plan's Recommended Improvement Plan uses general aviation *Alternative C1, One FBO on East Side and One FBO on West Side*, along with *Terminal Planning - Alternative 1 "Simple"* as the basis for long-term space reservation concepts for the futurelayout of airport facilities.

The purpose of this chapter is to provide a specific listing of the improvement features identified on the preferred alternatives, to provide an illustration of the combined alternatives on one graphic image, and to provide a recording of approval conditions provided by the Board of County Commissioners (in consideration of input from referral agencies). The information contained in this chapter is included elsewhere throughout this Airport Master Plan Update Report and has been consolidated here for ease of use. It should be noted that the descriptions of the recommended improvements provided in this chapter are for space reservation purposes. The Airport acknowledges that some of the details provided in this chapter, such as the square footage for the passenger terminal building, will be refined during subsequent phases of the planning and design process for specific improvement projects. The *RECOMMENDED IMPROVEMENT PLAN* is graphically illustrated at the end of this chapter.

6.2 Recommended Improvement Plan Features

Airside Facilities (runways and taxiways). No change to the existing runway configuration (100' x 8,000') is identified on the Recommended Plan. In addition, other than the potential for a west side taxiway system (see description below), no significant change to the airport's taxiway configuration is identified in the Recommended Improvement Plan. Because the same basic airfield configuration will remain, no change will be made in the existing prohibitions on (1) aircraft with wingspans greater than 95 feet, and (2) aircraft weighing more than 100,000 pounds maximum gross landed weight.

Passenger Terminal Area. The terminal area improvements are based on the recommendation that space be reserved for a relocated passenger terminal building, with the eventual removal of the existing terminal building. This recommendation recognizes that the existing terminal building is operationally inadequate even for current demand. The current facility is undersized, poorly designed, functionally obsolete, and deteriorating. The Master Plan Update process also determined that, for a variety of reasons, including cost and construction impacts, development of a new terminal is a superior solution to renovation and expansion of the existing terminal. It is anticipated that the replacement terminal building will be located directly up valley (south) of the existing building and that the new building will be a phased development, utilizing some features of the existing structure as portions of the new structure are built. Other terminal area space reservations include:

- Replacement Terminal Building – 80,000 SF.
- Parking – 1,300 stalls, partially contained in a parking structure.
- Passenger loading gates (doors) and commercial service aircraft parking positions – Eight.
- Transit – provided ability to accommodate future connections.
- Access – The terminal area will continue to be accessed from Highway 82 at the existing Baltic Avenue intersection. The Recommended Improvements Plan also shows a second access to the terminal area at a future intersection across from the BMC/Pro-Build driveway entrance. This location was identified as a future fully controlled intersection in the most recent Access Control Plan for this segment of Highway 82. Details regarding the design of this intersection and when it will be constructed have not yet been determined. The Airport will coordinate with the Colorado Department of Transportation (CDOT) and Pitkin County Public Works as planning for this intersection moves forward.

General Aviation Areas. On the east side of the Airport, the basic recommendation is to make efficient use of the limited amount of existing area available for general aviation use. This recommendation was made after a thorough evaluation of the potential for accommodating a second FBO on the east side determined that this option would not meet FAA objectives for safety, would increase aircraft congestion and the operational delays that accompany it, and would not protect the interests of local pilots (i.e., greater loss of patio shelters, increased congestion, etc.). The recommended layout for the east side recognizes that the provision of additional area for aircraft parking is critical. Additional aircraft are proposed to be accommodated primarily in the area that will be made available with the reconfiguration of the passenger terminal facilities. Other east-side general aviation facility space reservation recommendations include:

- Relocate the existing FBO/general aviation terminal to the area on the north end of the reconfigured passenger terminal improvement envelope.
- Create a potential new hangar site with the relocation existing FBO terminal.
- Reconfigure the general aviation support area to efficiently accommodate landside access/vehicle parking and remove facilities that impinge on the aircraft circulation and parking area (i.e;
  relocate the existing ground service equipment building, and reconfigure the

existing fuel storage area).

- Identify potential small general aviation hangar improvements, including an area for approximately 10 new hangars and the potential to improve or enclose the existing patio hangars.
- Identify potential area for new aircraft parking on the north end of the east-side aviation use area.

On the west, the recommendation recognizes that the Airport might accommodate a second FBO at some point in the future and, if so, the best option is to place those facilities on the west side of the Airport. The recommendation also recognizes that the west side of the Airport has environmentally sensitive areas, which could be impacted by the construction of future improvements. Therefore, these areas should be carefully analyzed in association with any contemplated disturbance. These environmentally sensitive areas include the Owl Creek riparian corridor and Airport Ranch historic structures on the north and steep terrain to the west. Space reservation recommendations on the west side of the Airport include:

- A parallel taxiway system that will extend from the south end of the runway to the potential new aircraft parking area north of the Airport Operations Center.
- FBO facilities that meet minimum standards:
  - GA terminal – 5,000 SF
  - Hangar – 14,400 SF
  - Maintenance shop – 5,000 SF
  - Aircraft ramp, parking, circulation, staging - 280,000 SF
  - Aircraft tie-down – 30 spaces
  - Vehicle parking – 60 spaces
  - Fuel storage – 60,000 Jet A, 10,000 AvGas

- Access to and from Owl Creek Road using the established Airport Operations Center driveway.
- An emergency medical services aircraft parking apron.
- Airport Operations Center improvements.

6.3 BOCC Conditions of Approval

The Pitkin County Board of County Commissioners established the following conditions to provide clear direction regarding implementation of the Recommended Improvements Plan described in this chapter. While many of the issues discussed in these conditions would be addressed during required environmental reviews, the BOCC wanted to ensure that the items listed below are addressed as specific projects move forward:

1) The sponsor is committed to ensuring that future development on the west side of

the Airport respects the highest possible standard for protection of Owl Creek and the associated riparian corridor while working within FAA safety guidelines and requirements, including those related to on-airport wildlife attractants. This objective will be achieved through a multi-tiered approach. The first tier involves a thorough analysis of the corridor and potential impacts through the environmental review process that would be required in association with any west-side projects that require federal funding. The second tier would be to ensure compliance with the setback requirements described in items “a” and “b” below in association with the design and development of any facilities on the west side. The third tier would involve the use of best management practices during the construction and operation of any west-side facilities.

a) All development on the west side of the Airport shall be setback a minimum of 100 feet from the centerline of Owl Creek. Additional setback may be required as determined through evaluation of an analysis as described in item b as follows.

b) Any proposal for development on the west side of the Airport shall be accompanied by a riparian habitat analysis, prepared by a qualified wildlife biologist, which provides a summary of the extent and condition of the riparian area in the vicinity of the project, and which addresses the following criteria for consideration of an increase to the minimum 100-foot setback:

    1. Slopes adjacent to the protected feature equal or exceed thirty (30) percent.
    2. Highly erodible soils or unstable stream bank conditions are present.
    3. The proposed use of the property presents a significant special hazard to water quality or wetlands (e.g., storage or handling of hazardous or toxic materials).
    4. The 100-year or intermediate regional flood zone exceeds the minimum 100-foot setback requirement.
    5. Additional area is needed to protect existing trees, shrubs, or other natural features that provide for stream bank stability, habitat enhancement for aquatic environments, and riparian area protection.
    6. Habitat for plant, animal, or other wildlife species listed as threatened or endangered by the United States Fish and Wildlife Service exists.
    7. Habitat for plant, animal, or other wildlife species listed by the State of Colorado as rare, threatened, or endangered, or species of special concern.

8. Additional area is needed to prevent or minimize flood damage by preserving storm and flood water storage capacity.
9. Additional area is needed to protect fish spawning, breeding, nursery, and feeding grounds.

2) Traffic impacts on Owl Creek Road will be addressed as part of an environmental analysis associated with any related projects requiring federal funding on the west side of the Airport. In addition, any proposals for a fixed base operator on the west side of the Airport shall include a traffic analysis that addresses traffic impacts and contains recommendations for measures to mitigate those impacts, including any necessary improvements to Owl Creek Road.

3) Improvements at Aspen/Pitkin County Airport, including the commercial passenger terminal, should result in a facility that is safe, efficient, and expresses the community's high standards for architectural quality, environmental sensitivity, neighborhood compatibility, and sustainability.
The architecture should emphasize these values while retaining the Airport's current low-key aesthetic qualities and modest visual impact. To help achieve this objective, the Airport, with community input, shall draft and present, to the BOCC, a set of design guidelines to govern all future improvements at the Airport.

4) The Planning & Zoning Commission will review each phase of improvements in more detail through the Location and Extent Review process, described in the Pitkin County Land Use Code. The purpose of the Location and Extent Review is to determine if specific improvements are generally consistent with the applicable adopted master plans. More generally, improvements will be subject to all applicable requirements of the Pitkin County Code.

5) The Airport will undertake a study of best practices for mass transit service at other similar airports. The Airport shall define specific measures to encourage the use of alternative modes of transportation and to diminish reliance upon rental vehicles and increased parking. One specific alternative that will be explored is the feasibility of final-destination bag delivery for airport arrivals, to make it more convenient for arriving airline passengers to utilize public transportation.

6) As a matter of practice, the Airport shall engage in innovative and collaborative processes to address any differences between FAA standards and community values.

7) The Recommended Improvement Plan and Airport Layout Plan show the alignment of the portion of the planned "Airline Trail" located on Airport property and a potential future trail on the west side of Owl Creek Road to link Sky Mountain Park with the

base of the Buttermilk Ski Area. The Airport will assist in the process of establishing any required legal mechanisms to accommodate these future trails.

8) The Airport, Pitkin County, Roaring Fork Transit Agency, and Colorado Department of Transportation shall continue to coordinate as the terminal, BRT stations, and pedestrian underpass designs progress to ensure that these projects are linked and integrated.

9) Additional noise monitoring and/or noise modeling may be required prior to construction of projects that may change the noise exposure from aircraft operating on the ground, and shall be required for any projects that affect the "Noise Sensitive Uses" designated in the Master Plan. The monitoring or modeling shall determine if there are any significant noise effects associated with those improvements and, if so, mitigation of such noise levels will be explored.

10) In order to ensure adequate consideration and preservation of the historic Airport Ranch site, the following language from the *Environmental Overview* chapter of the Master Plan Update will be adhered to:

*"Historical, Architectural, Archaeological, and Cultural Resources Section 106 of the National Historic Preservation Act requires federal agencies, or their designated representatives, to take into account the effects of their undertakings on historic properties, which include archaeological sites, buildings, structures, objects, or districts. Based on a historic and cultural resources survey of the Airport, one site (Airport Ranch) has been identified as officially eligible for inclusion in the National Register of Historic Places (**Figure 6-4**). Ranch related resources include a log house, log shed, frame barn, hip roof frame house, approximately four frame sheds, one metal shed, and a modern trailer. An additional log outbuilding and concrete block pump house were also identified as associated with the Airport Ranch in a 2009 survey. Portions of this site could be impacted by the west side recommended alternatives. Because this site is officially determined to be eligible for the NRHP, it will need to be taken into account in future airport activities to ensure compliance with Section 106. Coordination with the State Historic Preservation Officer and the Pitkin County Historic Preservation Officer will be required prior to any construction actions. Should the State Historic Preservation Officer determine that the Airport Ranch site does not justify further consideration, proposed improvement projects near the Airport Ranch site will still be referred to the Pitkin County Historic Preservation Officer for consideration. Additionally, although there are no other known sites eligible for inclusion in the NRHP, should any construction activity expose buried archaeological material, work will stop in that area and the FAA and the Colorado Historical Society will be contacted."*

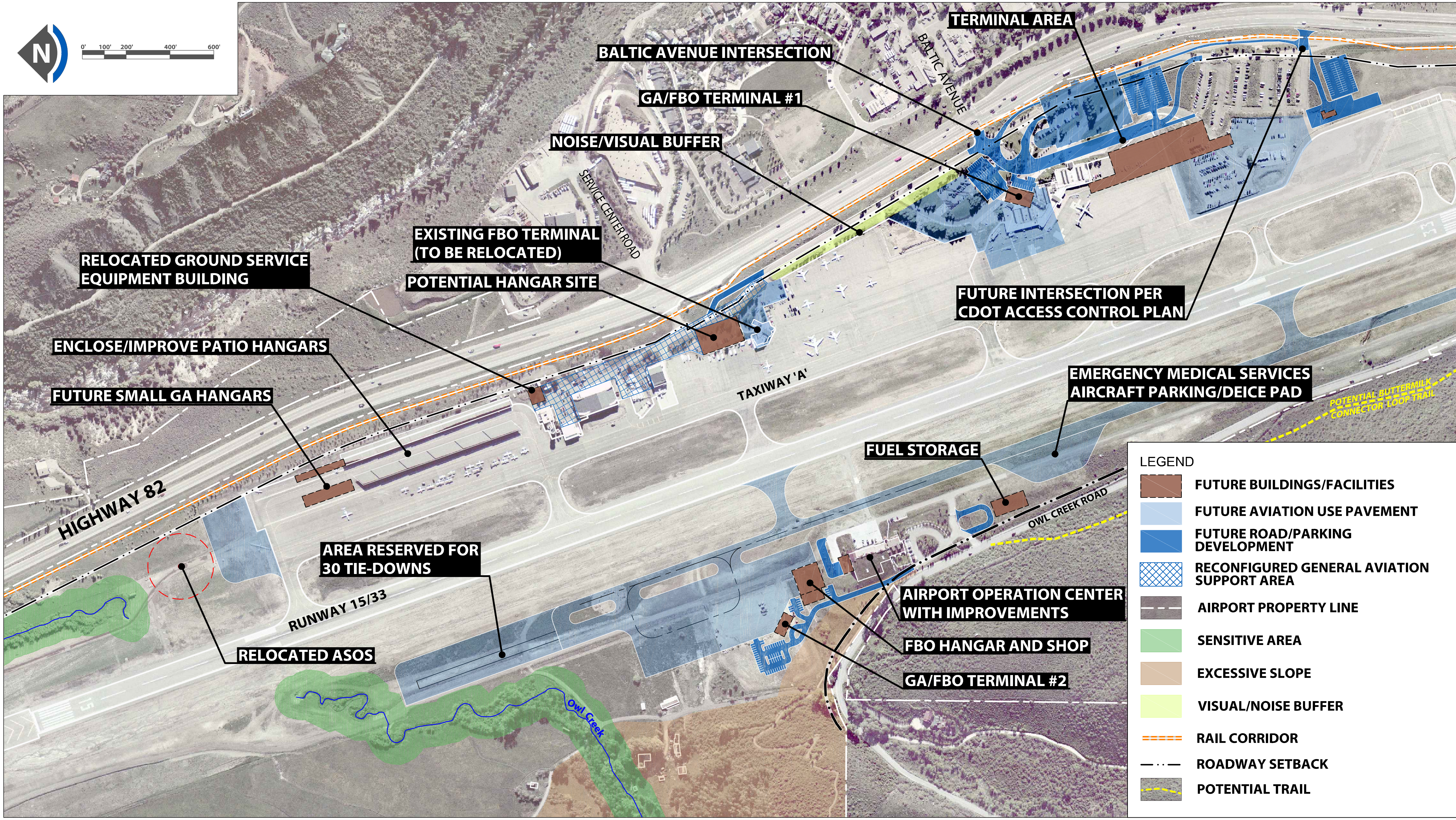


Figure 6-1
Recommended Improvement Plan

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Chapter 7
Environmental Overview

MASTER PLAN UPDATE

CHAPTER 7. Environmental Overview

7.1 Introduction/Purpose

The following narrative presents an analysis and inventory of environmental information gathered through research and data collection. The purpose of this analysis and inventory is to provide preliminary information concerning environmental resources in an effort to define and identify critical resources that would need to be addressed in the preparation of environmental documentation for the airport facility improvements recommended in this Master Plan Update.

Alternatives involving the future configuration of facilities at the Airport have been reviewed in previous chapters. The primary changes recommended in this Master Plan Update include phased redevelopment of the east side with a new passenger terminal and reconfiguration of the aircraft apron. The terminal area redesign also includes adding a parking structure and reconfiguring the existing surface lots to accommodate future parking needs. Space is also being reserved for improvements on the west side of the runway, including the potential addition of a west side parallel taxiway and the addition of an FBO with an aircraft storage hangar.

7.2 Existing Conditions

Aspen/Pitkin County Airport (ASE) is located adjacent to Colorado Highway 82 in west-central Colorado, 36 miles southeast of Glenwood Springs. The Airport is surrounded by the Rocky Mountains and four ski resorts. In addition to skiing, the area has many other local attractions including the Maroon Bells, Independence Pass, the Aspen Music Festival, and the Aspen Institute. This community is a center of summer and winter resort and business activity.

The Airport plays a dual role in the community, both as a busy commercial service airport and as a center for general aviation activity. The Airport is one of the most important transportation components of the area’s economy. Aspen/Pitkin County Airport is situated closer to a major ski area than any other commercial service airport in North America.

By air, Vail is located approximately 35 miles to the northeast of the Airport (98 miles and approximately two hours by automobile), Crested Butte is approximately 20 miles to the southwest (177 miles and over three hours by automobile), and Steamboat Springs is approximately 75 miles to the north (151 miles and approximately three hours by automobile). Surface transportation is provided via Highway 82 to Airport Road.

ASE has an elevation of 7,820 feet above mean sea level (AMSL). The Airport consists of one runway with a partial parallel taxiway and connecting taxiways that provide aircraft access to the terminal and other facilities. The runway is 8,006 feet long and 100 feet wide and is designated Runway 15/33. The recommended improvements include areas on the west side of the runway, as well as an apron development on the northeastern side and redevelopment on the east side FBO/Terminal areas.

7.3 Future Conditions

The following future conditions discussion is based on the assumption that all the projects included in the proposed 20-year capital funding plan are implemented. An analysis of the potential environmental impacts of implementing these projects allows for the identification of any potentially significant environmental concerns and also allows for the identification of the level of documentation required to receive environmental clearance for each project. It is anticipated that at least two reasonably foreseeable projects will require the preparation of Environmental Assessments (EAs), including the construction of the Parallel Taxiway and the Terminal Expansion.

7.4 Noise

Noise is generally defined as unwanted sound and, as such, the determination of acceptable levels is subjective. The day-night sound level (DNL) methodology is used to determine both the noise levels resulting from existing conditions and the potential noise levels that could be expected to occur with the recommended improvements. The basic unit in the computation of DNL is the Sound Exposure Level (SEL). An SEL is computed by adding the "A" weighted decibel level [dB(A)] level for each second of a noise event above a certain threshold ("A" weighted refers to the sound scale pertaining to the human ear). For example, a noise monitor located in a quiet residential area [40 dB(A)] receives the sound impulses of an approaching aircraft and records the highest dB(A) reading for each second of the event as the aircraft approaches and departs the site. Each of these one-second readings is then added logarithmically to compute the SEL.

The computation of DNL involves the addition, weighting, and averaging of each SEL to achieve the DNL level in a particular location. The SEL of any single noise event occurring between the hours of 10:00 p.m. and 7:00 a.m. is automatically weighted by adding 10 dB(A) to the SEL to account for the assumed additional irritation perceived during that time period.

All SELs are then averaged over a given time period (day, week, year) to achieve a level characteristic of the total noise environment. Very simply, a DNL level for a specified area over a given time is approximately equal to the average dB(A) level that has the same sound level as the intermittent noise events. Thus, a DNL 65 level describes an area as having a constant noise level of 65 dB(A), which is the approximate average of single noise events even though the area would experience noise events much higher than 65 dB(A) and periods of quiet.

The main advantage of DNL is that it provides a common measure for a variety of differing noise environments. The same DNL level can describe both an area with very few high level noise events and an area with many low level events. DNL is thus constructed because it has been found that the total noise energy in an area predicts community response.

DNL levels are usually depicted as grid cells or contours. Grid cells are squares of land of a specific size that are entirely characterized by a noise level. Contours are interpolations of noise levels based on the centroid of a grid cell and drawn to connect all points of similar level. Contours appear similar to topographical contours and form concentric "footprints" about a noise source. These footprints of DNL contours drawn about an airport are used to predict community response to the noise from aircraft using that airport.

Computer Modeling. The DNL noise contours displayed here were generated using the Integrated Noise Model (INM) Version 7.0c, specifically developed by the Federal Aviation Administration (FAA) for modeling the noise environment at airports. The program is provided with standard aircraft noise and performance data, which can be tailored to the characteristics of individual airports. The INM program requires the input of the physical and operational characteristics of the airport. Physical characteristics include runway end coordinates, displaced thresholds, airport elevation, and temperature. Operational characteristics include aircraft mix, flight tracks, and runway utilization. Optional data that that can be incorporated in the model includes approach and departure profiles, approach and departure procedures, and aircraft noise curves.

None of the recommended alternatives in this Master Plan would directly alter the number, flight pattern, or type of aircraft at ASE. As a result, there would not be any substantial changes to the noise contour related to aircraft arriving/departing the Airport. Therefore, the aircraft operations were modeled for the future year 2027 and the noise contours are depicted in **Figure 7-1**. No homes or other noise sensitive uses are contained within the 65 DNL and greater contour. However, the future reconfiguration of portions of the Airport, along with the potential for creating an apron and partial parallel taxiway on the west side of the Airport, may change the noise pattern from aircraft operating on the ground (engine run-ups and taxiing). Therefore, additional noise monitoring and/or noise modeling may be required prior to construction of these projects to determine if there are any significant noise effects associated with these improvements. Additionally, as a result of the voluntary noise abatement procedures as part of the Fly Quiet Program at the Airport, the number of high single events has generally decreased over time, as well as the annual DNL noise level and the change in the size of the noise contours (as seen in **Figure 7-2**).

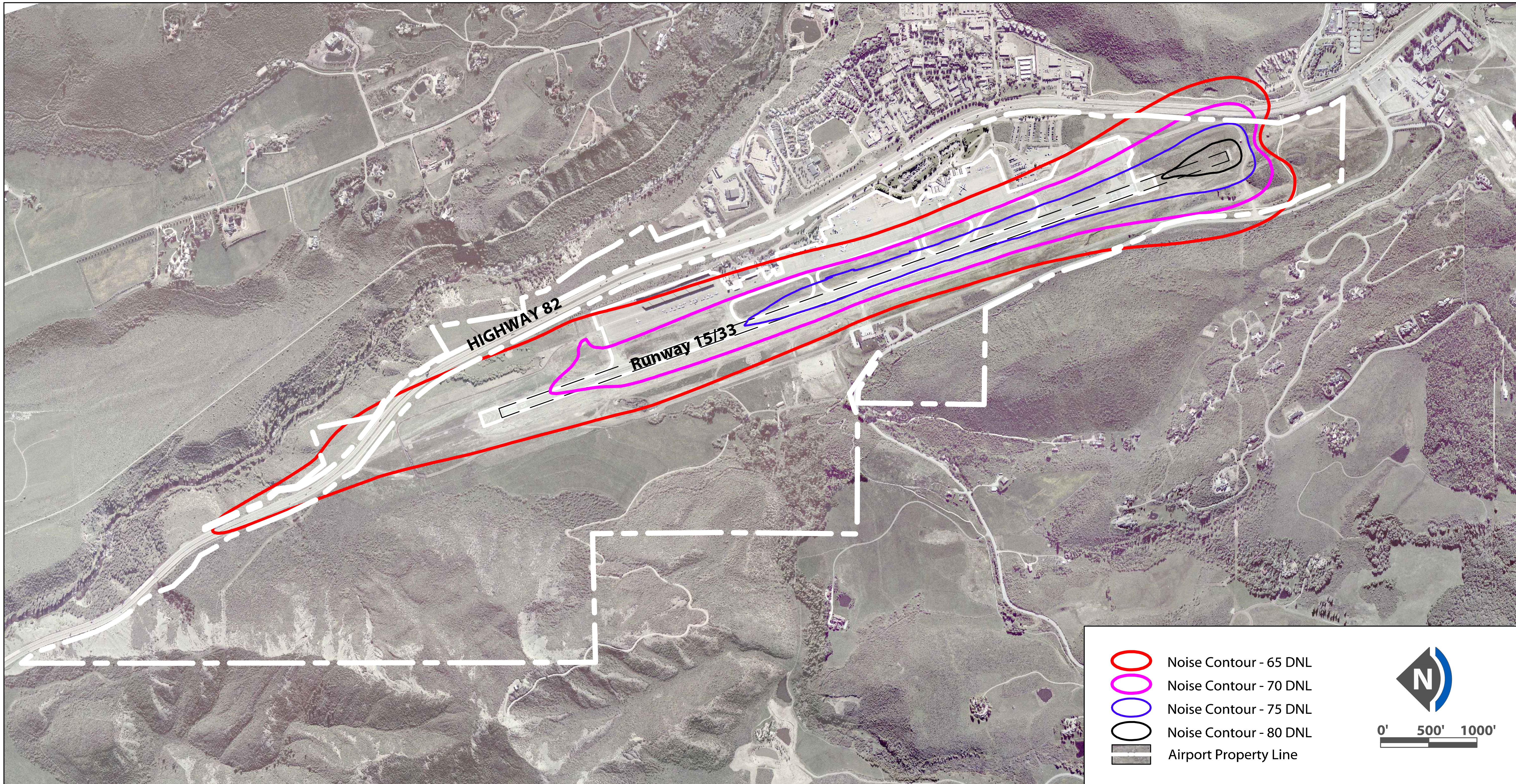
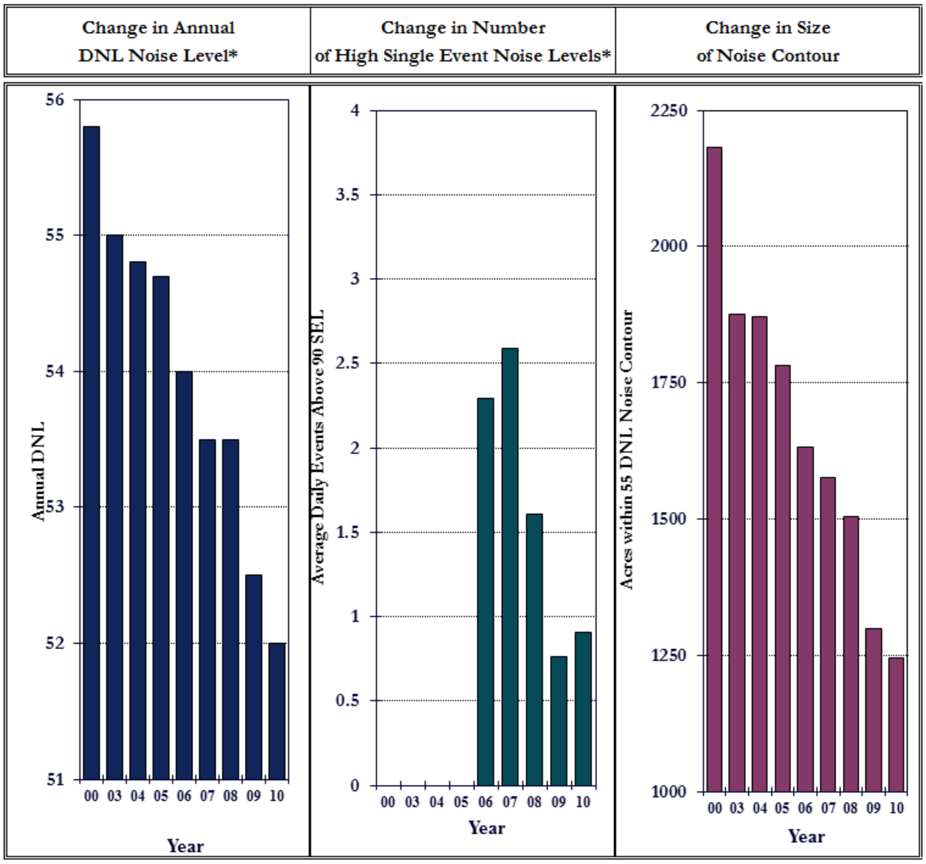


Figure 7.1
Future 2027 Noise Contours

Figure 7-2. Historic Airport Noise Comparison



** DNL and SEL Noise Events from Woody Creek Measurement Site*
Year Around Measurements of Hight Noise Events at Wood Creek Started in 2006

7.5 Compatible Land Use

The recommended alternatives areas include the western segment of airport property, generally consisting of the area between the end of the existing runway and Owl Creek Road, as well as the eastern side of the Airport including the replacement terminal envelope. The major land uses in the airport environs include government/institution (primarily the Airport itself), open space/recreation, agriculture, and residential uses. Much of the area surrounding the Airport is developed with golf courses, ski areas, commercial/business areas, and low density residential estates. The vast majority of the residential development is generally low density. Large tracts of land used for agriculture and low-density residential are located to the north and northeast of the Airport.

Directly east of the Airport is the Aspen Airport Business Center (AABC), which is a mixed-use commercial/light industrial/residential complex. The closest school to the Airport is Colorado Mountain College (CMC), located directly across Highway 82 in the Aspen Airport Business Center. The CMC building also contains the Aspen Santa Fe Ballet School. There is also a large area of open space located immediately east of the Airport on the east side of Highway 82. This land was acquired by the Pitkin County Open Space and Trails Board and includes land on both sides of the Roaring Fork River. This open space area provides a buffer between the Airport and other residential uses located further to the east.

The White River National Forest also lies approximately 1.5 miles east of the Airport on the eastern side of the Roaring Fork River. In addition, there are several areas of designated open space near the Airport. Cozy Point South (located at the southwest corner of Highway 82 and Brush Creek Road) contains approximately 130 acres and Cozy Point (located along the west side of Highway 82 north of Brush Creek Road) contains approximately 168 acres. Both of these open space parcels are located north of the Airport and beyond Shale Bluffs.

There are also several residential developments to the north of the Airport. These subdivisions include the Brush Creek Village Subdivision, Woody Creek, and the W/J Subdivision. The W/J Subdivision is an area that includes both affordable housing units and free-market residences.

Largelot residences make up the majority of the land use to the west and southwest of the Airport. South of the Airport are the Buttermilk Ski Area, Maroon Creek Club, the Aspen Municipal Golf Course, and the City of Aspen itself. Also south of the runway on-airport is a segment of the Owl Creek bike path.

Within the City of Aspen, near the Airport, there are some moderate and high-density housing. Two affordable housing developments, the Burlingame Seasonal Housing/MAA Affordable Housing Project and Maroon Creek Club Employee Housing Project are both located southeast of airport property.

The City and County zoning regulations include an aggressive growth management program establishing an annual limit on the number of development rights issued for new residential dwelling units and commercial square footage. These zoning restrictions have helped slow the spread of sprawl along Highway 82, near the Airport. The physical limitations of the area surrounding the Airport, the ownership patterns, existing land uses, and the current land plan and zoning of both jurisdictions help to guide future development in the area.

Establishing land use compatibility within airport environs is the responsibility of local authorities, but should be based on a recognized standard. Federal Aviation Regulations (FAR) Part 150 *Land Use Compatibility Guidelines* are the acknowledged standard by the federal government regarding aircraft noise at airports. The following illustration, entitled *LAND USE COMPATIBILITY MATRIX*, indicates those land uses that are compatible within certain DNL noise contours. It identifies land uses as being compatible, incompatible, or compatible if sound attenuated.

The guidelines can act as a guide to the City and County for establishing sensible land use planning and control practices, and, as a tool for comparing relative land use impacts resulting from the recommended alternatives. It must be remembered that the DNL noise contours do not delineate areas that are either free from excessive noise or areas that will be subjected to excessive noise. In other words, it cannot be expected that a person living on one side of a DNL noise contour will have a markedly different reaction than a person living nearby, but on the other side. What can be expected is that the general aggregate community response to noise within the DNL 65 noise contour, for example, will be less than the public response from the DNL 75 noise contour.

The area between the 60 and 65 DNL noise contours is an area within which most land uses are compatible, but is an area where single event noise complaints are often received. The area between the 65 and 70 DNL noise contours is an area of significant noise exposure, where many types of land uses are normally unacceptable and where land use compatibility controls are recommended. Finally, the area inside the 70 and 75 DNL noise contour identifies land uses that are subjected to a significant level of noise, and the sensitivity of various uses to noise is increased. None of the recommended projects in this Master Plan are expected to increase noise to levels above 65 DNL to any noise sensitive uses. However, as stated in the noise section, due to potential changes in ground run-up and taxiing location, additional modeling may be required during the environmental review.

Pitkin County also regulates development in the vicinity of the Airport based on the desire to protect residential and other noise sensitive land uses from airport noise. Section 7-90-20 (c) of the Pitkin County Land Use Code (LUC) contains standards for development within "noise influence areas."

The following excerpt from the LUC defines the development limitations relative to the DNL noise contours:

> ***"(2) Areas within DNL Contour Sixty-five (65): In areas within DNL Contour 65, all uses other than public airport and transportation uses, short-term accommodations, office buildings, retail facilities, movie theaters, restaurants and certain open space uses (including agriculture and recreation uses not causing high concentrations of people) are prohibited. Areas between DNL Contours Sixty and Sixty-five (60-65): In areas within DNL Contour Sixty to Sixty-five (60-65), uses such as schools, churches, hospitals, libraries, auditoriums and outdoor amphitheaters and concert halls are not recommended uses.***
>
> ***(3) Areas within DNL Contour Fifty-five (55): In all areas within the 55 DNL Contour, the granting and recordation of an Avigation Easement shall be required prior to construction of any new or expanded use. Such Avigation easements shall grant the right of flight over the land, together with the right to cause noise, vibrations, smoke, fumes, flare, dust, fuel particles and all other effects of aircraft operations.***
>
> ***(4) Residential uses shall be designed and constructed to minimize impacts of aircraft noise, by utilizing techniques that will reduce interior noise levels by not less than 20 dbA or other suitable evidence that noise annoyance can be mitigated."***

These regulations help ensure that future incompatible development will not be allowed to encroach upon the Airport.

Figure 7-3. Land Use Compatibility Matrix

LAND USE	BELOW 65	65-70	70-75	75-80	80-85	OVER 85
		YEARLY DAY-NIGHT NOISE LEVEL (DNL) IN DECIBELS				
RESIDENTIAL						
Residential, other than mobile homes and transient lodgings	Y	N(1)	N(1)	N	N	N
Mobile home parks	Y	N	N	N	N	N
Transient lodgings	Y	N(1)	N(1)	N(1)	N	N
PUBLIC USE						
Schools	Y	N(1)	N(1)	N	N	N
Hospitals and nursing homes	Y	25	30	N	N	N
Churches, auditoriums and concert halls	Y	25	30	N	N	N
Governmental services	Y	Y	25	30	N	N
Transportation	Y	Y	Y(2)	Y(3)	Y(4)	Y(4)
Parking	Y	Y	Y(2)	Y(3)	Y(4)	N
COMMERCIAL USE						
Offices, business and professional	Y	Y	25	30	N	N
Wholesale and retail-building materials, hardware and farm equipment	Y	Y	Y(2)	Y(3)	Y(4)	N
Retail trade-general	Y	Y	25	30	N	N
Utilities	Y	Y	Y(2)	Y(3)	Y(4)	N
Communication	Y	Y	25	30	N	N
MANUFACTURING AND PRODUCTION						
Manufacturing, general	Y	Y	Y(2)	Y(3)	Y(4)	N
Photographic and optical	Y	Y	25	30	N	N
Agriculture (except livestock) and forestry	Y	Y(6)	Y(7)	Y(8)	Y(8)	Y(8)
Livestock farming and breeding	Y	Y(6)	Y(7)	N	N	N
Mining and fishing resource production and extraction	Y	Y	Y	Y	Y	Y
RECREATIONAL						
Outdoor sports arenas and spectator sports	Y	Y(5)	Y(5)	N	N	N
Outdoor music shells, amphitheaters	Y	N	N	N	N	N
Nature exhibits and zoos	Y	Y	N	N	N	N
Amusements, parks, resorts and camps	Y	Y	Y	N	N	N
Golf courses, riding stables and water recreation	Y	Y	25	30	N	N

Numbers in parentheses refer to NOTES.

The designations contained in this table do not constitute a Federal determination that any use of land covered by the program is acceptable or unacceptable under Federal, State or local law. The responsibility for determining the acceptable and permissible land uses and the relationship between specific properties and specific noise contours rests with the local authorities. FAA determinations under Part 150 are not intended to substitute federally determined land uses for those determined to be appropriate by local authorities in response to locally determined needs and values in achieving noise compatible land uses.

TABLE KEY

SLUCM	Standard Land Use Coding Manual.
Y(Yes)	Land Use and related structures compatible without restrictions.
N(No)	Land Use and related structures are not compatible and should be prohibited.
NLR	Noise Level Reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.
25, 30 or 35	Land Use and related structures generally compatible; measures to achieve NLR of 25, 30 or 35 dB must be incorporated into design and construction of structure.

NOTES

(1) Where the community determines that residential or school uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) of at least 25 dB to 30 dB should be incorporated into building codes and be considered in individual approvals. Normal residential construction can be expected to provide a NLR of 20 dB, thus, the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. However, the use of NLR criteria will not eliminate outdoor noise problems.

(2) Measures to achieve NLR of 25 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(3) Measures to achieve NLR of 30 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(4) Measures to achieve NLR of 35 dB must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas or where the normal noise level is low.

(5) Land use compatible provided that special sound reinforcement systems are installed.

(6) Residential buildings require an NLR of 25.

(7) Residential buildings require an NLR of 30.

(8) Residential buildings not permitted.

7.6 Air Quality

The recommended alternatives outlined in this Airport Master Plan are not expected to have a significant impact on the long-term air quality in the vicinity of the Airport. According to the U.S. Environmental Protection Agency (EPA), Pitkin County is an attainment area with federal health-based air quality standards known as the National Ambient Air Quality Standards (NAAQS). A non-attainment area is defined as a locality where air pollution levels persistently exceed the NAAQS. The EPA normally makes this designation only after air quality standards have been exceeded for several consecutive years.

The majority of the State of Colorado is classified by the U.S. Environmental Protection Agency (EPA) as an attainment area for all National Ambient Air Quality Standards (NAAQS) criteria pollutants – carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, and lead. Attainment areas are areas where pollutant levels have not exceeded the set NAAQS, designed to protect public welfare and health. The only non-attainment areas in Colorado are located on the Front Range (near the Denver area), approximately 200 miles east of Aspen. Pitkin County is currently in attainment for all NAAQS criteria pollutants. However, previously, Pitkin County was designated as a nonattainment area for PM_{10}. In 2003, Pitkin County regained attainment status and is currently in a 10-year maintenance plan to ensure that the area stays within NAAQS.

The forecast 2027 annual general aviation operations are well below the threshold (180,000 general aviation operations and 1.3 million passengers, according to the *Air Quality Procedures for Civilian Airports and Air Force Based Handbook*) required to do a NAAQS assessment. However, a conformity analysis conducted to ensure actions included in a non-attainment or maintenance area “conforms” to any relevant State Implementation Plan (SIP) may be required because Pitkin County is considered a maintenance area.

Short-term air quality impacts may be expected from heavy equipment pollutant emissions, fugitive dusts resulting from cut and fill activities, and the operation of portable concrete batch plants. Compliance with all applicable local, state, and federal air quality regulations and permitting requirements will be the responsibility of all contractors.

7.7 Water Quality

The main water feature in the airport environs is the Roaring Fork River, which flows north, eventually meeting up with the Colorado River in Glenwood Springs. There are several tributaries of the river on and near airport property. Owl Creek runs from the southwest to the northeast on airport property, crossing the runway and eventually discharging into the Roaring Fork River.

According to the United States Geological Survey (USGS), the western part of Pitkin County is located within the Colorado plateaus aquifers system, but this aquifer system does not lie beneath the study area. A surficial, mountainous aquifer associated with the Roaring Fork River underlies the area just north of the Airport and the City of Aspen. However, this area is not considered to be a major aquifer because the alluvium in the valley is too thin, narrow, and discontinuous.

The Airport is next to the Buttermilk Water District. Water is supplied by the City of Aspen to the District. According to the 2008 field survey by Ozark Underground Laboratory, Inc., this district serves 77 house lots plus the Airport Operations Center. The water distribution facilities are located on the southern end of the Airport.

In general, the airport property has a consistent gradual slope, following the grade of the Valley north, toward the Town of Basalt. Aspen/Pitkin County Airport has a Stormwater Management Plan. The Airport's stormwater is conveyed east from airport buildings, roads, and parking areas to a drainage swale along the west side of the Airport Frontage Road. The swale is a combination of open ditches and culverts under roadways. Stormwater runoff collected on the east side of the Airport eventually flows into the open meadow north of the FBO apron. The remaining water that does not percolate into this open meadow flows into the Owl Creek drainage; this creek eventually flows into the Roaring Fork River.

Additionally, an irrigation channel (some of which is underground in a 24-inch +/- pipe) lies along a portion of Owl Creek Road near the airport fence, west of the Airport. This irrigation ditch provides seasonal runoff water to the Airport Ranch area of the Airport. Water from this irrigation ditch helps to flood irrigate the pastures and meadows of Airport Ranch.

The recommended actions are not likely to impact any of these sensitive areas. In fact, consideration has been given to avoiding these sensitive areas in the alternatives development process of the Airport Master Plan. As outlined in County regulation, a 100-ft barrier on either side of Owl Creek has been designated as a sensitive area. The recommended actions would avoid this area, thus reducing any potential runoff impacts to Owl Creek and the connected Roaring Fork River.

Any construction projects requiring earthwork will result in some erosion and sedimentation. However, the contractors would be required to follow guidelines outlined in the Federal Aviation Administration's Advisory Circular 150/5370-10A, *Standards for Specifying Construction of Airports*, which is the FAA's guidance to airport sponsors concerning protection of the environment during construction. Final plans and specifications for any project will incorporate the provisions of AC 150/5370-10A to ensure minimal impact due to erosion, air pollution, sanitary waste, and the use of chemicals.

7.8 Historical, Architectural, Archaeological, and Cultural Resources

Historical, Architectural, Archaeological, and Cultural Resources Section 106 of the National Historic Preservation Act requires federal agencies, or their designated representatives, to take into account the effects of their undertakings on historic properties, which include archaeological sites, buildings, structures, objects, or districts. Based on a historic and cultural resources survey of the Airport, one site (Airport Ranch) has been identified as officially eligible for inclusion in the National Register of Historic Places (**Figure 7-4**). Ranch related resources include a log house, log shed, frame barn, hip roof frame house, approximately four frame sheds, one metal shed, and a modern trailer. An additional log outbuilding and concrete block pump house were also identified as associated with the Airport Ranch in a 2009 survey. Portions of this site could be impacted by the west side recommended alternatives. Because this site is officially determined to be eligible for the NRHP, it will need to be taken into account in future airport activities to ensure compliance with Section 106. Coordination with the State Historic Preservation Officer and the Pitkin County Historic Preservation Officer will be required prior to any construction actions. Should the State Historic Preservation Officer determine that the Airport Ranch site does not justify further consideration, proposed improvement projects near the Airport Ranch site will still be referred to the Pitkin County Historic Preservation Officer for consideration. Additionally, although there are no other known sites eligible for inclusion in the NRHP, should any construction activity expose buried archaeological material, work will stop in that area and the FAA and the Colorado Historical Society will be contacted.

7.9 Fish, Wildlife, and Plants

The *Endangered Species Act*, as Amended, requires each federal agency to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of habitat of such species. Much of the Airport currently consists of disturbed ground with little native habitat, with the exception of the sensitive area near Owl Creek, which would be avoided by the recommended actions. No listed endangered, threatened, or special status species are commonly found within the project area. Correspondence from the Colorado Natural Heritage Program (CNHP) during the 2010 Runway Extension Environmental Assessment, and review of the U.S. Fish & Wildlife (FWS) ECOS site, provided information regarding threatened, endangered, and candidate species, as well as natural heritage elements. Based on correspondence, there are no known occurrences of threatened or endangered species, or significant natural areas, within the proposed boundaries of the Airport. The FWS and the CNHP identified only one federally listed endangered, threatened, or rare species occurring within two miles of the project area in Pitkin County, Colorado. The species is the Canada lynx (*Lynx Canadensis,* federally endangered), whose last observation occurred in 1969. However, before any of the recommended improvements could be undertaken, the Airport would need to determine if these threatened and endangered species are located on airport property within the space reservation area.

7.10 Floodplains and Wetlands

Wetlands are basically defined as areas inundated by surface or groundwater, with a frequency sufficient to support vegetation or aquatic life requiring saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, sloughs, river overflows, mud flats, and natural ponds. Wetlands also include estuarine areas, tidal overflows, shallow lakes and ponds with emergent vegetation, and wetland ecosystems, including those areas that affect, or are affected by, the wetland itself (e.g., adjacent uplands or regions upstream and downstream).

A wetland delineation in 2008 indicated that there are several wetlands on airport property. A large, 2.7-acre emergent wetland with diverse wetland plant species is located at the southern boundary of the Airport. Wetland vegetation includes water sedge, sedge species, poison hemlock, tall fringed bluebells, reed canary grass, arctic rush, and curly dock. Hydrology is supplied by an unnamed drainage ditch and natural topographic runoff.

Additionally, there is a small 0.02-acre wetland near the unnamed drainage ditch on the southwestern corner of airport property, a 0.31-acre wetland in the Owl Creek channel in the northeastern corner of airport property, and a 0.03-acre wetland along the banks of Owl Creek located on the western side of airport property. Although most of these wetlands would likely be avoided by the recommended improvements, if any of the wetlands would be impacted, construction permitting would need to address Section 404 of the Clean Water Act and either an individual or nationwide permit may be required. **Figure 7-4** illustrates the location of the wetland areas on airport property, along with other sensitive resources.

Floodplains are those areas subject to a one percent or greater chance of flooding in any given year. According to FEMAs floodplain maps, the 100-year floodplain from Owl Creek intersects airport property; however, this floodplain is located on the northern side of the property (west and east of the runway). The western portion is within the sensitive area north of the recommended improvements actions on the west side of the property (**Figure 7-4**). The eastern portion is on the northern end, and is also located within the sensitive area buffer on either side of Owl Creek, and is located north of the area reserved for helicopter parking, and would likely not be impacted. Drainage and floodplains should be taken into account during the design of any improvements on the Airport.

7.11 Wild and Scenic Rivers

According to a listing of Wild and Scenic Rivers compiled and managed by the Army Corps of Engineers, the Bureau of Land Management, the National Park Service, the U.S. Forest Service, and the U.S. Fish and Wildlife Service, there are no wild and scenic rivers located within the vicinity of Aspen/Pitkin County Airport. Therefore, there will not be any impacts to a nationally significant river resource associated with any of the recommend improvements.

7.12 Section 4(f) Property

Section 4(f) of the Department of Transportation Act (recodified at 49 USC, Subtitle I, Section 303) provides that no publicly owned park, recreation area, wildlife or waterfowl refuge, or land of a historic site that is of national, state, or local significance will be used, acquired, or affected by programs or projects requiring federal assistance for implementation. There are two potential resources in the project area that are potential Section 4(f) properties: the Airport Ranch Historic Site and the Owl Creek Recreational Path. The recommended improvements will likely not change the use of any portions of the Owl Creek Recreational Path and would, therefore, not likely trigger Section 4(f). Any recommended park or recreation improvements in the vicinity of the Airport should be coordinated with airport staff and the Federal Aviation Administration, and will be developed in a manner that is compatible with the Airport.

However, the Airport Ranch Historic Site could potentially be impacted by portions of the recommended improvements on the west side. Because this site is officially eligible for inclusion in the National Register of Historic Places, if the site is directly impacted by any recommended projects resulting in a change in use, a Section 4(f) statement may be required showing that there is no feasible or prudent alternative that avoids impacts to this resource.

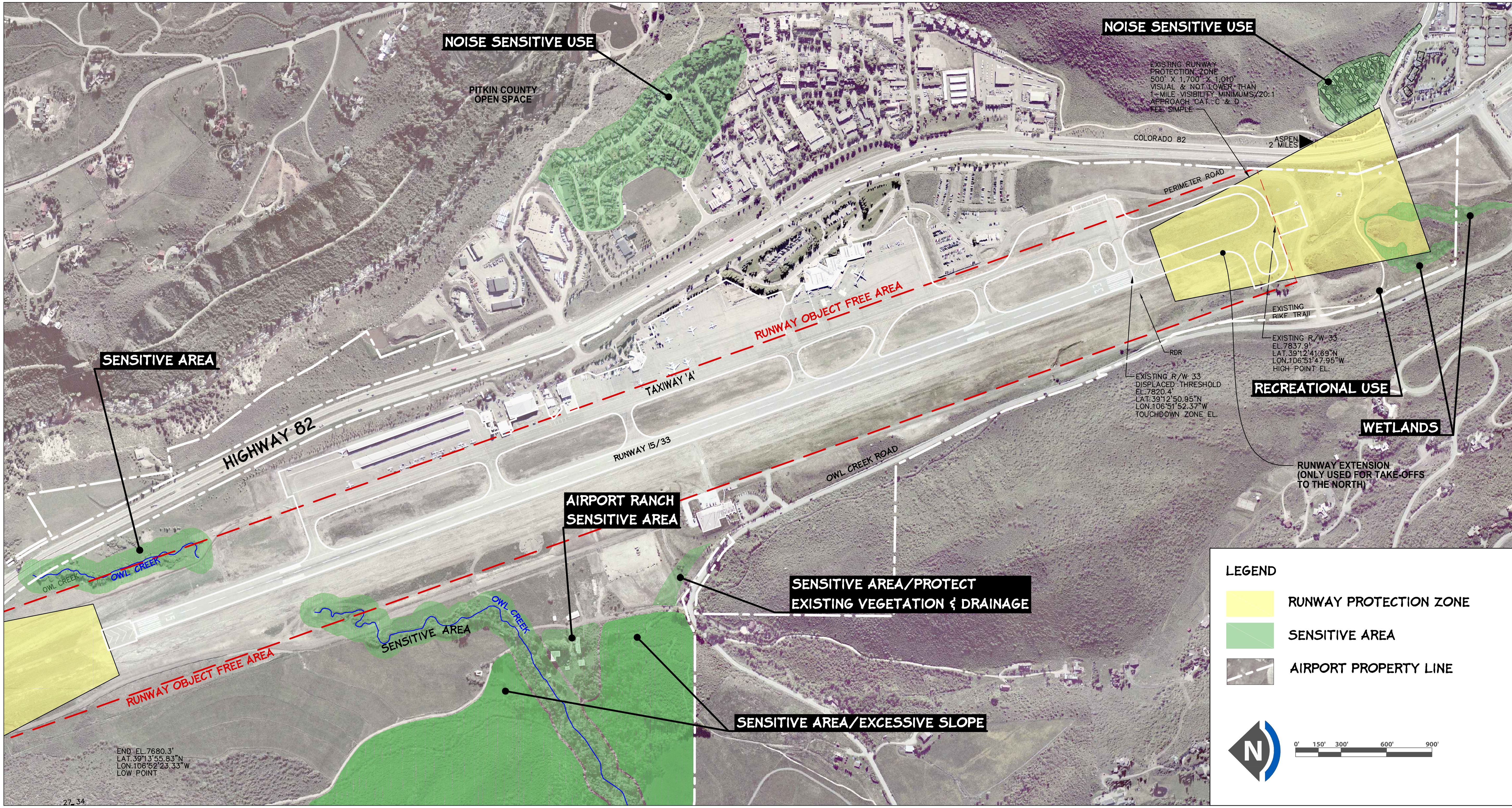


Figure 7-4
Sensitive Environmental Resources

7.13 Hazardous Materials, Pollution Prevention, and Solid Waste

No hazardous substances and/or wastes will be generated from any improvements recommended in this Airport Master Plan. However, construction activities can generate hazardous wastes, and some construction materials constitute hazardous substances. These include fuel, oil, lubricants, paints, solvents, concrete-curing compounds, fertilizers, herbicides, and pesticides. Proper practices can be implemented to prevent, or minimize, the potential for these hazardous substances to be released into the environment, and are included below. A new fuel facility on the west side is included among the recommended improvements and all proper practices would need to be implemented to reduce potential release of hazardous materials during construction and operation of the facility. Due to the addition of the facility, as well as potential expansion of apron space and the west side parallel taxiway, the Airport would need to update their Spill Prevention, Control and Countermeasure (SPCC) plan as well as their Stormwater Pollution Prevention Plan (SWPPP).

Chemicals, petroleum-based products, and waste materials, including solid and liquid waste, should be stored in areas specifically designed to prevent discharge into storm water runoff. Areas used for storage of toxic materials should be designed with full enclosure in mind, such as the establishment of a dike around the perimeter of the storage area. Construction equipment maintenance should be performed in a designated area and control measures, such as drip pans to contain petroleum products, should be implemented. Spills should be cleaned up immediately and disposed of properly. Additionally, all construction projects should follow the Airport's Sustainable Construction Management Plan, to reduce potential construction-related impacts.

7.14 Farmlands

The Farmland Protection Policy Act (FPPA) is intended to minimize the impact of federal programs on the unnecessary and irreversible conversion of farmland to nonagricultural uses. The FPPA includes prime farmland, unique farmland, and farmland of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can include forest land, pastureland, cropland, but not water-related or urbanized land.

According to the Natural Resources Conservation Service (NRCS) soil survey, there are many different types of soils on airport property and in the project area. Specifically, soils located within the airport study area belong in the Jerry-Uracca-Mergel association, which are gently sloping to very steep, well-drained, deep soils, on alluvial fans, terraces, valley sides, and hills. According to the NRCS soil survey, none of the land located within the area is considered to be prime farmland. Therefore, the recommended improvements would not impact any prime or unique farmlands or farmlands of statewide or local importance.

7.15 Light Emissions and Visual Impacts

The primary sources of light emissions from airports are the federally required lighting for security, obstruction identification, and navigation. The runway currently is equipped with Medium Intensity Runway Lights (MIRL). Runway 15 has Precision Approach Path Indicator (PAPI) lights and a Medium Intensity Approach Lighting System with Sequenced Flashing Lights (MALSF). Runway 33 is equipped with Runway End Identifier Lights (REILs). The Runway End Identifier Lights (REILs) for the Runway 15 approach have recently been replaced by an MALSF approach lighting system. The MALSF is an approach lighting system that stretches from the threshold of Runway 15 north, 1,400 feet along the extended centerline of Runway 15, and provides enhanced visual guidance to aircraft making a landing approach to Aspen/Pitkin County Airport during periods of low visibility airport operating conditions.

FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, states that because of the relatively low levels of light intensity compared to background levels associated with airport development actions, light emissions impacts are unlikely to have an adverse impact on human activity or the use or characteristics of the protected properties (such as residences or other light sensitive uses).

The issues of visual or aesthetic impacts are inherently difficult to define because they involve personal, subjective viewpoints. Aesthetic impacts deal mainly with the extent that a proposed project contrasts with the existing environment and whether the surrounding communities find this contrast objectionable. The Aspen Area Community Plan (2012), which was adopted in spring 2012, is the current adopted master plan for the area that includes the Airport. The AACP includes broad recommendations regarding the community's desire to preserve and enhance views of the natural environment along Highway 82 in the area west of Castle Creek, which includes the Airport. In addition, the County is currently working on a master plan, which will be referred to as the West of Castle Creek Land Use Master Plan. When completed, this document is expected to include standards and criteria for development. These standards and criteria will likely include provisions concerning site design, landscape plantings, and outdoor lighting. The implementation of any of the recommended improvements would be subject to compliance with the West of Castle Creek Land Use Master Plan once it has been adopted.

7.16 Summary

On a project-specific basis, each improvement specified in this Airport Master Plan, which receives federal funding or requires a change to the Airport Layout Plan, requires environmental clearance prior to implementation. The environmental documentation required to receive the clearance differs with the complexity of the project and the anticipated level of environmental impacts. This documentation can range from a Categorical Exclusion for simple projects to a full Environmental Impact Statement for projects with potentially significant impacts.

The purpose of this *Environmental Overview* chapter in the Airport Master Plan is to attempt to uncover any potentially significant environmental concerns that might greatly influence the ability to implement one or more of the recommended improvement projects and determine the level of environmental documentation required.

As stated previously, potential environmental concerns are associated with development on the west side area, due to the proximity of Owl Creek, proximity of residential structures, and the presence of the Airport Ranch Historic Site. However, no significant environmental concerns that cannot be addressed or mitigated below significant thresholds have been identified during this planning process. Environmental Assessments for both the parallel taxiway and the terminal project have been included in the capital funding plan provided in a later chapter of this Master Plan Update.

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Chapter 8

Sustainable Opportunities

8.1 Introduction/Purpose

Pitkin County is proud of its role in promoting environmental stewardship and sustainability. As stewards of the environment, the County has considered the environmental impact and sustainability of the Airport Master Plan Update recommended development plan, and has favored actions and projects that enhance or protect the environment, while achieving the Airport's mission and goals. This Chapter describes the sustainability opportunities associated with the development recommendations contained in this Master Plan Update and identifies other opportunities for sustainability initiatives at Aspen/Pitkin County Airport.

It is important to note that Aspen/Pitkin County Airport (ASE) is land constrained. As a result, one of the core values of the Airport Master Plan Update process was, by necessity, to ensure that the Airport's current and forecast needs are accommodated in the most efficient and sustainable manner on the available land. The idea of reserving room for subsequent generations to adapt the Airport for future needs and technologies was also considered. As a result, sustainability was a key focus in the alternatives evaluation as described in Chapters 4 and 5. Regardless of which alternative is selected for implementation, this chapter identifies additional projects and initiatives that would improve overall airport sustainability.

8.2 Context for Sustainability at the Airport

Pitkin County has voluntarily undertaken the preparation of a Sustainability Plan for Aspen/Pitkin County Airport, which is ongoing. In developing that plan, the County is establishing a sustainability policy and sustainability goals that were considered during preparation of the Airport Master Plan. This section summarizes the Airport Sustainability Plan policy and goals.

Aspen/Pitkin County Airport is an important part of the transportation infrastructure of the Roaring Fork Valley. The County's adopted mission statement for the Airport is:

> ***To provide safe, efficient and environmentally responsible airport services and facilities that meet or exceed our community's expectations.***

This mission statement is the foundation for the Airport's sustainability policy and plan.

Sustainability Policy: As an important gateway to the Valley, Aspen/Pitkin County Airport is committed to a sustainable future by:

- **Setting a high standard for customer satisfaction and security.**
- **Maintaining a safe and efficient airport that meets the needs of the Roaring Fork Valley.**
- **Demonstrating environmental stewardship and community/social responsibility.**

The Sustainability Program is expected to evolve over time in response to local needs and available resources. The Plan framework includes long-term and short-term goals and metrics to measure the success of the goals as they are implemented. These goals are:

Goal 1: To have a complete and fully functioning sustainability plan by 2012.

Goal 2: Continue to purchase 100% green energy and reduce the Airport's energy consumption relative to 2007 levels.

Goal 3: Continue to minimize off-airport noise impacts.

Goal 4: Reduce demand for water and other non-energy natural resources through conservation techniques.

Goal 5: Meet the Western Climate Initiative emission reduction goals by 2020 (reduce greenhouse gas emissions 15% below 2005 levels by 2020).

Goal 6: Become a regional leader in the airport industry in reducing waste generation and reduce waste sent to landfills through recycling programs and waste reduction efforts.

Goal 7: Increase the use of environmentally and socially responsible products.

Goal 8: Incorporate sustainable planning, design, and construction practices into all airport maintenance and development projects.

Goal 9: Promote awareness of sustainability among airport employees, tenants and users, and Roaring Fork businesses and communities.

Goal 10: Promote and facilitate intermodal, transit and shuttles, and reduce vehicle emissions.

Goal 11: Strive for new facilities to be "net zero" energy consumers.

8.3 Sustainability Opportunities Associated with the Master Plan Development Recommendations

One part of the Sustainability Plan that the County has completed is a set of recommended sustainability construction practices. Implementation of the Master Plan Update recommendations represents an opportunity to use sustainability construction practices that reduce environmental effect, increase local economic prosperity, and increase the social benefits that the Airport contributes to the Valley.

The existing Sustainability Construction Management Plan initiatives and checklist will be used for any construction activities completed at the Airport, including the construction of any of the recommended improvements included in this Master Plan Update.

In addition to implementing the construction-based sustainability practices, opportunities may exist to initiate other sustainability initiatives due to implementation of the Master Plan Update alternatives. The following provides a range of opportunities that should be factored into the design and engineering of new facilities recommended by the Master Plan Update, as well as some additional opportunities. This list is not intended to be exhaustive, and additional sustainability considerations are being examined further as part of the Sustainability Management Plan for the Airport.

- **Commercial Airline Terminal Area Opportunities**
  - ✓ Electrical Energy Reduction: Development of a new terminal represents the opportunity of reducing the airport's consumption of energy (primarily electrical), as the terminal represents about 68% of total airport electrical energy consumption. Initiatives or techniques available to reduce energy use are:
    - Siting of the terminal to maximize use of natural lighting and solar energy.
    - Installation of energy efficient heating, cooling, and lighting; examine ways to reclaim wasted energy.
    - Commitment to meet energy star requirements.
    - Strive to have the new terminal be state of the art with regard to energy-use conservation.
    - Installation of meters for tenant space that associates electrical use with the leasehold.
    - Incorporation of design features that require reduced heating (or cooling) such as window glazing, insulation, variable flow air handlers, domestic hot water system heated using solar thermal, etc.
    - Installation of ground power and preconditioned air for aircraft to reduce the use of aircraft auxiliary power units (APUs).
    - Installation of energy efficient equipment in tenant space.

  - Establishment of Ground Support Equipment (GSE) power and storage resources including electrical charging stations and space allocation that reduces building heat loss.
  - Track monthly utility charges in order to determine where updates may provide the most energy and financial benefits to the Airport.
  - Examine use of alternative energy methods, including micro-turbines, biomass fuels, solar, etc.

- ✓ Use of green materials in the construction process: Green materials represent those that have the lowest environmental footprint (in production and transport), highest social value (possibly generating employment in the State and mountain region), and least cost. Pitkin County could require a life-cycle cost analysis to be conducted associated with the final project design/materials.
- ✓ Waste reduction and recycling:
  - Incorporate waste/recycling options into the space design for tenants and public use.
  - Encourage airline flight waste recycling through provision of facilities for segregation.
  - Implementing waste minimization program for paper, cardboard, aluminum cans, plastic bottles, plastic sheets, fluorescent tubes, lube oil, food waste for composting, etc.
- ✓ Water conservation:
  - Establishment of water conservation techniques internal to the terminal (i.e., low flow fixtures and motion sensors), as well as associated with new landscaping.
  - Use of computer-controlled, “smart” irrigation systems for terminal area landscaping.
  - Green roofs and limited landscaping that features xeriscape and drought-tolerant species as appropriate, while still meeting the community’s visual values.
- ✓ Incorporation or expansion of water quality controls into new or expanded de-icing spots/pads for the collection and treatment of deicing fluids.
- ✓ Ground Transportation-related opportunities:
  - Improve Highway 82 and airport access/parking with any updates to the Terminal Area.
  - Implement a no-idling policy at the existing or new proposed Airport drop-off/pick-up areas.

  - Availability of space that provides for priority locations for ground transportation service providers that incorporate the greatest amount of sustainability initiatives in the service delivery to the Airport (i.e., close parking for electrical vehicles, closest pickup spot dedicated to lower emissions/higher MPG vehicles).
  - Better incorporation of public transportation into the ground access system, parking, and terminal interface as part of any Terminal Area improvements.
  - Use of gray/storm/recycled water for irrigation and recycled water for rental car washes.
- ✓ Improved public space for: Concession opportunities, meeter-greeter/traveler welcoming and drop-off, public art display, information displays, etc. to enhance traveler experience.

- **General Aviation Facilities**
  - ✓ Create a visual and/or noise barrier along Highway 82 from the GA aircraft apron.
  - ✓ Placement of apron facilities further from residential uses located east of Highway 82, with noise walls to protect the lower density residential areas to the west.
  - ✓ Installation of energy efficient lighting in any existing or constructed hangars or FBO facilities.
  - ✓ Use of green materials in the construction process.
  - ✓ Incorporate waste/recycling options into the space designs and identify recycling locations that promote recycling materials taken off private general aviation aircraft.
  - ✓ Establishment of water conservation facilities (i.e., low flow fixtures) including irrigation associated with new landscaping.
  - ✓ Use of landscaping that reduces water use.
  - ✓ Implement a no-idling policy at the GA parking lot and drop off/pick up areas, including signage.
  - ✓ Incorporate Sustainability requirements into leases with any Fixed Base Operators; these could include requiring use of electric Ground Support Equipment and hookups, recycling requirements, lighting/energy efficiency requirements, anti-idling requirements, etc.
  - ✓ Update Voluntary Noise Abatement Program with any changes to General Aviation area layout (east or west) to reduce impacts on local community residents.

- **Other Opportunities for Sustainability Initiatives**
  - ✓ Continue Fly-Quiet Program to reduce noise impacts on nearby residents.

- ✓ Paving of all unpaved roads and parking areas to reduce entrained particulate matter/fugitive dust; use pervious pavement where feasible.
- ✓ Using residual airport lands and new facilities, identify possibilities for the development of renewable energy programs (solar, wind, geothermal); examine potential partnerships with energy firms to accomplish renewable energy programs in the most financially sustainable way, in concert with local land use and objectives.
- ✓ Implement public art program at the Airport working with local businesses and schools to enhance community relationships and traveler experience.
- ✓ Invite design and communication competitions with local schools on aspects of proposed airport facilities.
- ✓ Sponsor a cleanup day and contribute substantially to charity.
- ✓ Host a "public" day for tours of any new improvements to the Airport.
- ✓ Establish airport sustainability internships, stewardships, and/or public education programs. Partner with local schools to assist with airport programs or create a Competition for ideas.

In summary, there are a wide range of options available to Pitkin County to increase the sustainability of the Airport as recommendations of the Master Plan are implemented. The extent to which these initiatives are implemented will be based partially on funding. For new construction, the feasibility of the initiatives will need to be examined in further detail during the design phase.

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Chapter 9
Improvement Program

MASTER PLAN UPDATE

9.1 Introduction

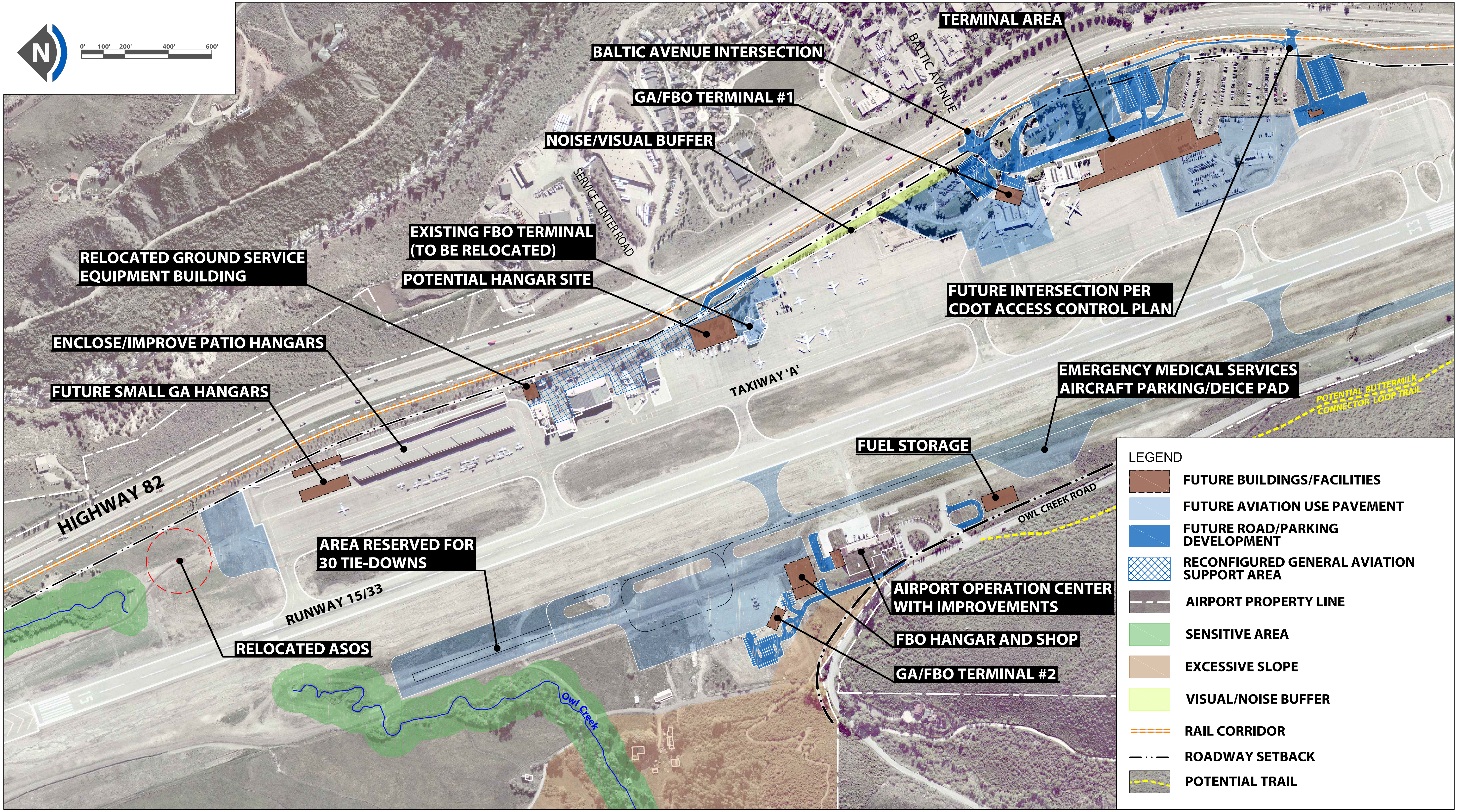
The long-term improvement program or Capital Improvement Program (CIP) for Aspen/Pitkin County Airport is intended to establish a strategy to fund airport improvements and maximize the potential to receive federal and state grant funds, while also establishing a financially prudent plan for improvement funding on a local level. This programming effort is a critical component of the Master Plan Update for the Federal Aviation Administration (FAA), the Colorado Division of Aeronautics, and the local sponsor (Pitkin County). From the FAA's perspective, the CIP provides a detailed listing of projects and costs that is critical for their use in establishing priorities and budgeting expenditures at this Airport, when compared with the needs of other airports. From the local sponsor's perspective, the CIP identifies improvement needs and allows budgeting/financial decisions to be made with a comprehensive understanding of financial implications.

The overall concept is to maximize the opportunities to receive federal and state grants, within the context of, and in recognition of, the amount of local funds that are available for capital needs. Although the CIP will be used for programming by the FAA, there is no financial commitment for the federal government or Pitkin County to provide funding for the CIP.

The basic structure of the Development Program/CIP is established in this chapter, with a detailed financial analysis being provided in the next chapter (Chapter 10, *Financial Implementation Analysis*).

9.1.1 Conceptual Development Plan

The improvement program is based on the conceptual development plan and is illustrated in **Figure 9-1**. The Recommended Improvement Plan is a combination of the preferred general aviation alternative (see **Figure 4-11, page 4-36**) and the preferred terminal area plan alternative (see **Figure 5-7, page 5-20**).



Master Plan Update

Figure 9-1
Recommended Improvement Plan

9.2 Project List and Implementation Schedule

Using the documentation previously presented regarding anticipated facility demands, along with preliminary engineering analysis, a list of capital improvement projects has been assembled. The projects for the first five years are listed in priority order by year. In the second and third phases (years 6-20), the projects are listed without year designators. It is anticipated that the project phasing will invariably be altered as local and federal priorities evolve over the coming months and years.

The details of the Development Program (including a capital improvement project list, project cost estimates, a finalized phasing list, and a financial feasibility analysis) have been formulated in consideration of comments received from airport staff, the FAA, County Management, the Study Committee, and the public.

9.2.1 Cost Estimates

Cost estimates for individual projects, based on current construction unit costs, have been prepared. These estimates are intended to be used for planning purposes only and should not be construed as construction cost estimates, which can only be compiled following the preparation of detailed engineering design documents.

9.2.2 Terminal Area Capital Improvement Program (CIP) Projects

During the initial effort to define project costs and phasing for the terminal improvement projects, a five-phase program was identified that was anticipated to be spread out over several years as dictated by financial feasibility. To prepare the Financial Implementation Plan (Chapter 10), projects were re-arranged to best fit with financial realities related to anticipated funding availability. Therefore, as you will see in the following tables, initially anticipated phasing, phase numbers, and project sequence have been modified to the degree necessary to match the financial plan (please refer to the Financial Implementation Analysis provided in Chapter 10).

The following table (**Table 9-1**) provides a summary listing of the phased terminal area improvement projects with estimated project costs (in 2012 dollars), along with the federal fiscal year when construction of each project is anticipated to be funded. Please refer to Chapter 10 for a listing of anticipated funding sources for the projects.

Table 9-1. Terminal Area Plan Project Costs

PHASE 1 - EXISTING PASSENGER APRON RECONSTRUCTION

Year	No.	Project Description	Cost
2014	T1.0	Existing Commercial Apron Reconstruction	$6,013,875
		Sub-Total/PHASE 1 Projects	**$6,013,875**

PHASE 2 - NEW TERMINAL CONCOURSE

Year	No	Project Description	Cost
2013	T2.1	New Terminal Concourse Airline Functions - Part 1	$1,185,000
2013	T2.2	New Terminal Concourse Baggage Security Screening - Part 1	$57,300
2013	T2.3	New Terminal Concourse Concessions - Eligible - Part 1	$35,581
2013	T2.4	New Terminal Concourse Concessions - Ineligible - Part 1	$23,285
2013	T2.5	New Terminal Concourse Public Areas - Part 1	$615,213
2013	T2.6	New Terminal Concourse Non-Public Areas - Eligible - Part 1	$131,389
2013	T2.7	New Terminal Concourse Non-Public Areas - Ineligible - Part 1	$1,018
2015	T2.1	New Terminal Concourse Airline Functions - Part 2	$10,665,000
2015	T2.2	New Terminal Concourse Baggage Security Screening - Part 2	$515,700
2015	T2.3	New Terminal Concourse Concessions - Eligible - Part 2	$320,229
2015	T2.4	New Terminal Concourse Concessions - Ineligible - Part 2	$209,562
2015	T2.5	New Terminal Concourse Public Areas - Part 2	$5,536,913
2015	T2.6	New Terminal Concourse Non-Public Areas - Eligible - Part 2	$1,182,497
2015	T2.7	New Terminal Concourse Non-Public Areas - Ineligible - Part 2	$9,160
		Sub-Total/PHASE 2 Projects	**$20,487,847**

PHASE 3 - NEW AUTO ROADS & PARKING

Year	No.	Project Description	Cost
2014	T3.1	Main Terminal Access & Loop Roads - Part 1	$109,980
2014	T3.2	Public Parking Access Roads - Part 1	$12,938
2014	T3.3	RAC Parking Access Roads - Part 1	$24,120
2014	T3.4	FBO Facility Access Roads - Part 1	$5,625
2014	T3.5a	Auto Parking Garage - Public (480 spaces) - Part 1	$2,100,000
2014	T3.5c	Auto Parking Garage - RAC (270 spaces) - Part 1	$1,181,250
2014	T3.6a	Auto Parking Surface - Employee (90 spaces) - Part 1	$168,750
2014	T3.6b	Auto Parking Surface - RAC (60 spaces) - Part 1	$112,500
2014	T3.6c	Auto Parking Surface - FBO (80 spaces) - Part 1	$150,000
2014	T3.7	RAC Support Facilities- Part 1	$238,970
2014	T3.8	Landscaping - Part 1	$112,500
2014	T3.9	Site Demolition - Eligible - Part 1	$8,640
2014	T3.10	Site Demolition - Ineligible - Part 1	$322,610
2016	T3.1	Main Terminal Access & Loop Roads - Part 2	$989,820
2016	T3.2	Public Parking Access Roads - Part 2	$116,438
2016	T3.3	RAC Parking Access Roads - Part 2	$217,080
2016	T3.4	FBO Facility Access Roads - Part 2	$50,625
2016	T3.5a	Auto Parking Garage - Public (480 spaces) - Part 2	$18,900,000
2016	T3.5c	Auto Parking Garage - RAC (270 spaces) - Part 2	$10,631,250
2016	T3.6a	Auto Parking Surface - Employee (90 spaces) - Part 2	$1,518,750
2016	T3.6b	Auto Parking Surface - RAC (60 spaces) - Part 2	$1,012,500
2016	T3.6c	Auto Parking Surface - FBO (80 spaces) - Part 2	$1,350,000
2016	T3.7	RAC Support Facilities- Part 2	$2,150,730

Year	No.	Project Description	Cost
2016	T3.8	Landscaping - Part 2	$1,012,500
2016	T3.9	Site Demolition - Eligible - Part 2	$77,758
2016	T3.10	Site Demolition - Ineligible - Part 2	$2,903,492
		Sub-Total/PHASE 3 Projects	**$45,478,826**

PHASE 4 - NEW COMMERCIAL APRON

Year	No.	Project Description	Cost
2017	T4.0	New Commercial Apron Construction	$4,648,901
		Sub-Total/PHASE 4 Projects	**$4,648,901**

PHASE 5 - NEW TERMINAL COMPLETION

Year	No.	Project Description	Cost
2016	T5.1	New Terminal Airline Functions - Eligible - Part 1	$657,947
2016	T5.2	New Terminal Airline Functions - Ineligible - Part 1	$14,344
2016	T5.3	New Terminal Passenger & Baggage Security Screening - Eligible - Part 1	$161,016
2016	T5.4	New Terminal Passenger & Baggage Security Screening - Ineligible - Part 1	$36,563
2016	T5.5	New Terminal Concessions - Eligible - Part 1	$81,738
2016	T5.6	New Terminal Concessions - Ineligible - Part 1	$4,106
2016	T5.7	New Terminal Public Areas - Part 1	$553,475
2016	T5.8	New Terminal Non-Public Areas - Eligible - Part 1	$465,206
2016	T5.9	New Terminal Non-Public Areas - Ineligible - Part 1	$97,353
Mid	T5.1	New Terminal Airline Functions - Eligible - Part 2	$5,921,522
Mid	T5.2	New Terminal Airline Functions - Ineligible - Part 2	$129,094
Mid	T5.3	New Terminal Passenger & Baggage Security Screening - Eligible - Part 2	$1,449,141
Mid	T5.4	New Terminal Passenger & Baggage Security Screening - Ineligible - Part 2	$329,063
Mid	T5.5	New Terminal Concessions - Eligible - Part 2	$735,638
Mid	T5.6	New Terminal Concessions - Ineligible - Part 2	$36,956
Mid	T5.7	New Terminal Public Areas - Part 2	$4,981,275
Mid	T5.8	New Terminal Non-Public Areas - Eligible - Part 2	$4,186,853
Mid	T5.9	New Terminal Non-Public Areas - Ineligible - Part 2	$876,181
		Sub-Total/PHASE 5 Projects	**$20,717,471**

LONG-TERM PHASE

Year	No.	Project Description	Cost
Long	T6.1	Phase 3b – Long-Term Development (if needed)	$23,518,506
		Sub-Total/LONG TERM PHASE Projects	**$23,518,506**
TOTAL TERMINAL DEVELOPMENT PHASES			**$120,865,426**

Notes: All Cost Estimates in 2012 Dollars.
Mid = Mid-Term projects to be funded between 2018 and 2022.
Long = Long-Term projects to be funded between 2023 and 2032.

9.2.3 Other Capital Improvement Program (CIP) Projects

A listing of CIP projects was also developed for potentially needed airport facilities that are not directly associated with the passenger terminal. The following tables (**Tables 9-2, 9-3 and 9-4**) provide a summary listing of the phased improvement projects with estimated project costs (in 2012 dollars), along with the federal fiscal year when construction of each project is anticipated to be funded. Please refer to Chapter 10 for a listing of anticipated funding sources for the projects.

Table 9-2. Phase I (years 2012-2017), Master Plan Project Costs (Short-Term Projects)

	Project Description	Total Estimated Cost
SHORT-TERM PROJECTS		
2012		
A.1	Airfield Pavement Maintenance	$780,114
A.2	EA for Terminal Area Improvements	$2,190,000
A.3	EA for West-Side Parallel Taxiway	$575,000
OC1	Other Capital Projects	$4,035,481
	Sub-Total/2012 Projects	**$7,580,595**
2013		
A.4	Airfield Pavement Maintenance	$200,000
OC2	Other Capital Projects	$416,841
	Sub-Total/2013 Projects	**$616,841**
2014		
A.5a	Airfield Pavement Maintenance	$200,000
A.5b	Airfield Pavement Rehabilitation	$398,132
A.6	Construct Buffer Between Existing Terminal & GA Apron	$3,263,700
A.7	Construct West-Side GA Parallel Taxiway & Connectors	$10,160,000
A.8	Construct West-Side GA Access Roadway & Parking	$1,939,604
A.9	Construct West-Side GA Aircraft Parking Apron (280,000 SF)	$9,411,535
A.10	Construct West-Side FBO Terminal (5,000 SF)	$1,138,500
A.11	Construct West-Side FBO Shop Hangar (5,000 SF)	$1,019,286
A.12	Construct West-Side FBO Storage Hangar (14,400 SF)	$2,732,400
A.13	Construct West-Side GA Fuel Storage Area	$2,511,472
A.14	Construct West-Side GA Aircraft Tiedowns (30)	$2,570,232
OC3	Other Capital Projects	$2,144,299
	Sub-Total/2014 Projects	**$37,489,160**
2015		
A.15	Airfield Pavement Maintenance	$150,000
OC4	Other Capital Projects	$1,745,307
	Sub-Total/2015 Projects	**$1,895,307**
2016		
A.16	Construct AOC SRE Storage Improvements	$3,231,417
A.17	Airfield Pavement Maintenance	$0
OC5	Other Capital Projects	$913,439
	Sub-Total/2016 Projects	**$4,144,856**
	TOTAL	**$51,726,759**

Notes: All Cost Estimates in 2012 Dollars.

Table 9-3. Phase 2 (years 2018-2022), Master Plan Project Costs (Mid-Term Projects)

	Project Description	Total Estimated Cost
MID-TERM PROJECTS		
B.1	Airfield Pavement Rehabilitation	$669,467
B.2	Construct Aircraft Parking Apron/GSE Building Removal	$108,113
B.3	Construct New GSE Storage Building	$880,440
B.4	Install Runway 15 Touchdown Zone Lighting	$1,360,255
B.5	Movement Area Incursion Improvements/Fuel Storage Area Relocation	$2,225,168
B.6	Construct GA Roadway & Parking Support East-Side Area	$534,748
B.7	Relocate Segmented Circle & Wind Sock	$9,488
B.8	Relocate Existing FBO Terminal Next to Passenger Terminal	$1,894,494
B.9	Construct GA Parking Apron Next to Passenger Terminal	$2,612,660
B.10a	Airfield Pavement Maintenance	$1,250,000
B.10b	Airfield Pavement Rehabilitation	$0
OC6a	Other Capital Projects - 2017	$584,476
OC6b	Other Capital Projects - 2018	$1,240,741
OC6c	Other Capital Projects	$3,210,000
	TOTAL	**$16,580,050**

Notes: All Cost Estimates in 2012 Dollars.

Table 9-4. Phase 3 (years 2023-2032), Master Plan Projects Costs (Long-Term Projects)

	Project Description	Total Estimated Cost
LONG-TERM PROJECTS		
C.1	Construct Conventional Hangar Near Existing FBO Terminal	$3,795,000
C.2	Relocate ASOS	$79,063
C.3	Construct Aircraft Parking Apron North of Patio Hangars	$1,225,856
C.4	Improve/Replace Existing Patio Hangars	$7,077,188
C.5	Construct Small GA Hangars (10 Units)	$2,083,016
C.6a	Taxiway Lighting System Rehab	$350,000
C.6b	Runway Lighting System Rehab	$350,000
C.7	EMS Aircraft Parking/Deice Pad	$2,398,316
C.8a	Airfield Pavement Maintenance	$2,403,869
C.8b	Airfield Pavement Rehabilitation	$5,044,165
OC7	Other Capital Projects	$5,000,000
	TOTAL	**$29,806,473**
	TOTAL SHORT-, MID- AND LONG-TERM DEVELOPMENT PROGRAM	**$98,113,282**

Notes: All Cost Estimates in 2012 Dollars.

9.2.4 Airport Capital Improvement Program (ACIP)

To assist the Federal Government in its effort to provide grant funding to the most needed projects within the national/regional airport system, airport staff keeps on file with the FAA an up-to-date ACIP. The ACIP is similar in format to the tables presented previously. The purpose of the proposed project list, phasing, and costs is to provide a progressive projection of capital needs, which can then be utilized in local and federal financial programming. It is realized that, as soon as this long-range planning document is published, the project list starts to be out of date; therefore, it will always differ to some degree with the Airport's ACIP on file with the FAA.

9.2.5 Phasing Plans

To supplement the information provided by the project list and project cost estimates, phasing illustrations have been prepared. The following illustrations (**Figures 9-1 and 9-2**) indicate the suggested phasing for the proposed improvement projects throughout the 20-year planning period.

The plans represent a suggested schedule; however, variance from it may be necessary, especially during the latter time periods. Attention has been given to the first five years because the projects outlined in this time frame include many critical improvements. The demand for particular facilities and the economic feasibility of their development are to be the prime factors influencing the timing of individual project construction.

Of note, with regard to terminal area plan phasing:

The recommended alternative would phase out the existing terminal building and construct a replacement slightly to the South. This would locate the new terminal at the optimal part of the Terminal Area Site where pedestrian, automotive, and aircraft circulation can be best accommodated, and a strong connection to mass transit systems can be incorporated.

Descriptions of work in the phases:

Phase 1. This phase includes the reconstruction of the existing commercial aircraft apron adjacent to the existing terminal to correct the grade issues in this part of the site.

Phase 2. This phase includes the construction of the new concourse with a temporary building connection to the existing terminal. This concourse will include holdrooms, secure concessions, and restrooms. The concourse will benefit the existing building by freeing up space for the TSA screening area to relocate off of the ramp it currently occupies.

Phase 3. This phase includes the construction of the new terminal loop roadway system, the green roof parking garage, and the relocated rental car service facility. The existing surface lots in the South Terminal area will remain in use during this phase for use of the FBO and the rental car agencies. Additional surface lot parking will be constructed to serve the FBO, employees, and rental cars.

Phase 4. This phase includes the construction of the new commercial apron to the South. This will allow the commercial airline traffic to shift the center of their operations to the South, which will make additional apron space available for the GA aircraft.

Phase 5. This phase includes the completion of the new terminal building, and the demolition of the existing terminal. This will complete the relocation of the terminal functions into the new facility, and the site of the existing terminal building will be cleared for the expansion of the FBO.

Phase 6. This phase includes the construction of the FBO terminal building and additional GA apron in the site cleared by the existing terminal building. A noise buffer will also be constructed to mitigate noise that may be directed across the highway.

Ultimate. This phase is comprised of the reservation of the areas in the site for their ultimate condition. This includes the elimination of the existing surface parking lots, the potential expansion of the green roof parking garage, and the re-alignment the southern portion of the terminal loop roadway.

9.3 Financial Plan and Implementation Strategy

Funding sources for the Capital Improvement Program depend on many factors, including Airport Improvement Program (AIP) project eligibility, the ultimate type and use of facilities to be developed, debt capacity of the airport, the availability of other financing sources, and priorities for scheduling project completion. For planning purposes, assumptions were made related to the funding source of each capital improvement. This is discussed in the following chapter, entitled *Financial Implementation Analysis*.

If aviation demands continue to indicate that improvements are needed, if the proposed improvements prove to be locally acceptable (including environmental considerations), and if the capital improvement financial implications remain reasonable, individual improvement projects may be moved forward by Pitkin County into the normal local approval processes that are required before any project can be built. However, it must be recognized that this is only a programming analysis and not a commitment on the part of the FAA or Pitkin County. If paying for the cost of an improvement project is not financially feasible, it will not be moved forward.

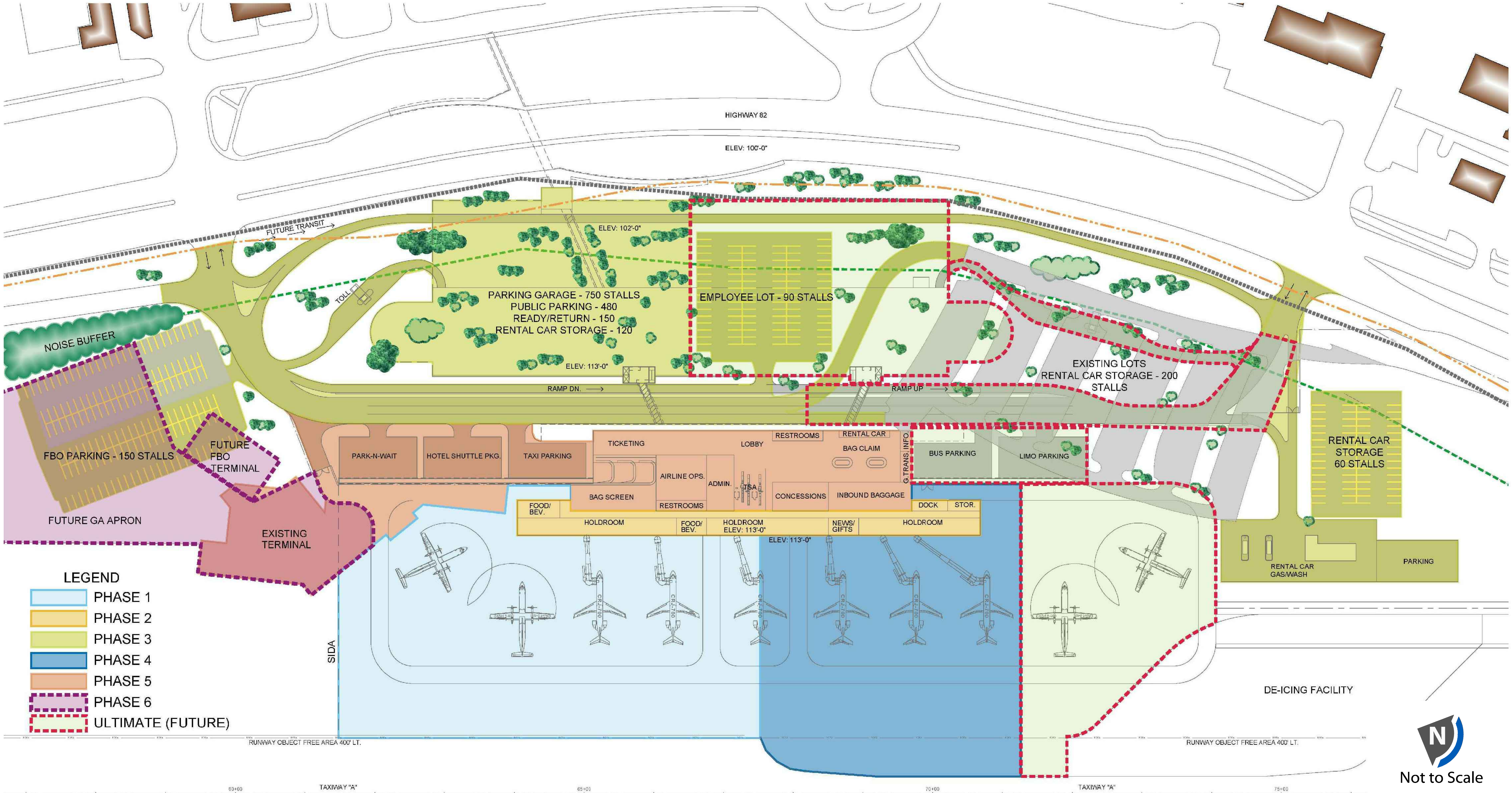
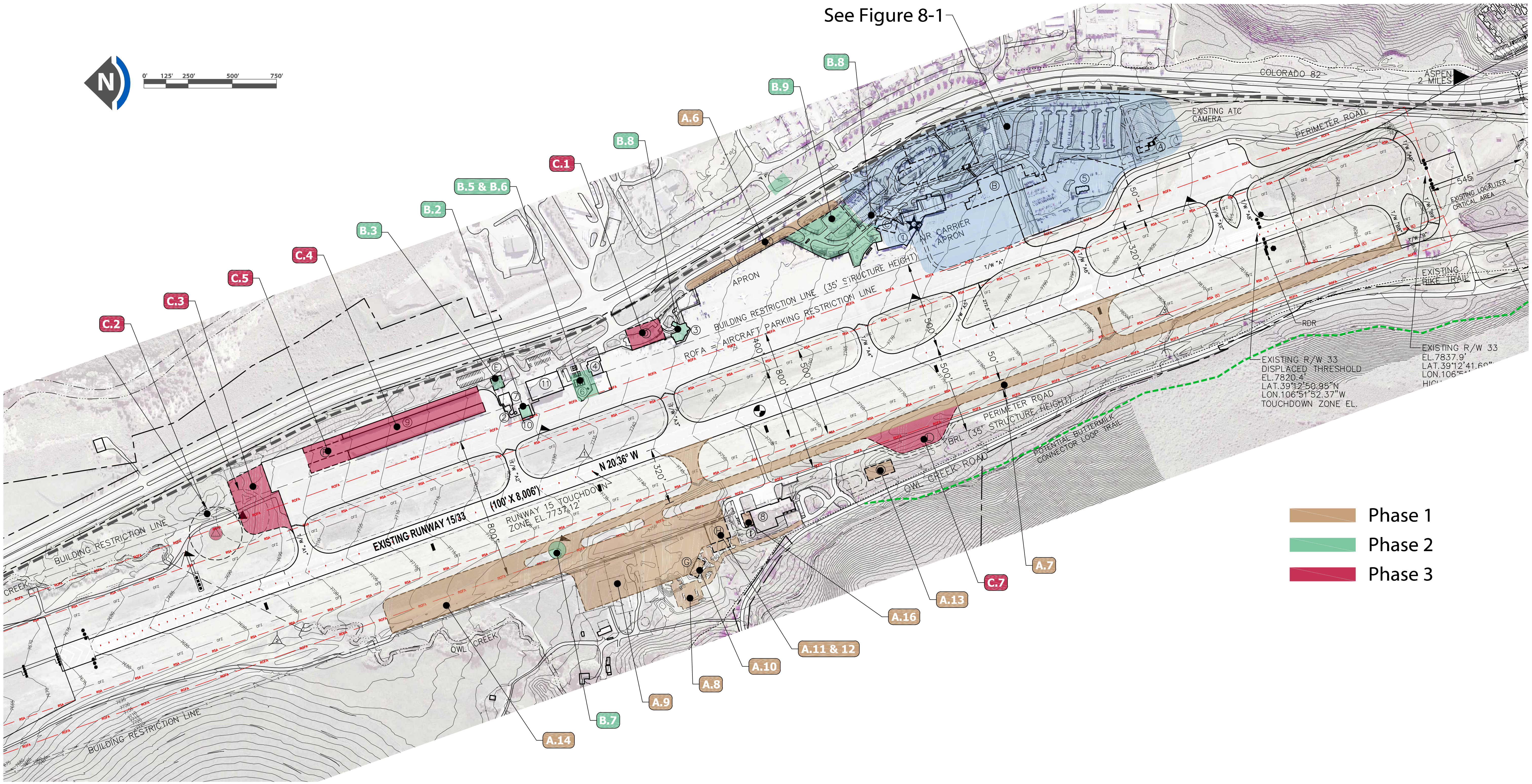


Figure 9-2
Terminal Area Phasing Plan



Master Plan Update

Figure 9-3
Phasing Plan

Final Report

Master Plan Update
Aspen/Pitkin County Airport

MASTERPLAN UPDATE

Chapter 10

Financial Implementation Analysis

10.1 Introduction

The purpose of this chapter is to evaluate Aspen/Pitkin County Airport's (ASE) capability to fund the Master Plan Capital Improvement Program (CIP) and finance Airport operations during three phases of capital development. The Master Plan CIP includes a particular focus on the potential development of new and expanded passenger terminal area facilities (the Terminal Area Plan) as well as new and expanded general aviation operations and support facilities. The development phases include a five-year period from 2012 to 2016 (Short Term), a five-year period from 2017 to 2021 (Intermediate Term) and a ten-year period from 2022 to 2031 (Long Term). The analysis includes generation of a detailed Financial Plan prepared annually for the Short Term period and in summary for the Intermediate and Long Term periods. Objectives for developing the plan include presenting the results of the implementation evaluation and providing practical guidelines for matching an appropriate amount and timing of financial resources with the planned use of capital funds. Detailed tables of projections for the capital program, operating expenses, operating revenues and cash flow are provided to support the Financial Plan Summary which presents the results of this evaluation.

Based on the assumptions underlying the Financial Plan summarized in the **Financial Plan Summary** (**Section 10.5.7**), implementation of the Master Plan/Terminal Area Plan CIP is financially reasonable if ASE can obtain awards for the indicated amount of needed AIP discretionary grant funding and if aviation market conditions occur in the Short-Term to drive demand for significant private third party investment to improve and expand the Airport's general aviation facilities.

10.2 Background

Funding capital projects for airport development is unique in the aviation industry. The majority of public-use airports in the United States are owned and operated by local governmental entities. Since required capital improvements are such significant expenditures, the Federal Aviation Administration (FAA) has provided a substantial portion of the funding with grants and other funding programs for many years. The FAA Airport Improvement Program (AIP) provides grants for eligible projects on a 90% grant/10% local match basis for airports such as ASE. The FAA also administers the Passenger Facility Charge program, which allows airports to charge fees to airlines that provide additional financial support for capital projects. Other funding sources for airport capital projects typically include state aviation grants, airport revenues, and tax exempt debt issued by the airport or its local government sponsor. All these funding sources have been used in the past and are planned for use in the future to support ASE capital projects.

10.3 Overall Approach

Our overall approach for conducting the Financial Implementation Analysis included the following steps:

- **Gathering and reviewing key Airport documents related to historical financial results, capital improvement plans, operating budgets, regulatory requirements, Airport/County policies, airline agreements, and other operating agreements with Airport users.**
- **Interviewing key Airport management and County officials to gain an understanding of the existing operating and financial environment, relationships with the airlines, and overall management philosophy.**
- **Reviewing the aviation traffic forecast previously developed by the Master Plan engineering consultant.**
- **Reviewing the recommended Capital Improvement Program (CIP), individual project cost estimates, and preferred development schedules provided by the Master Plan engineering consultant that are anticipated for the 20-year planning period, and projecting the overall financial requirements for implementation of the program.**
- **Evaluating the eligibility requirements of the various funding sources for each of the individual projects included in the initially proposed CIP.**
- **Applying available eligible funding sources to projects on a preliminary basis with a strategic emphasis toward achieving the maximum funding benefit for the overall capital program.**
- **Identifying potential debt funding needs and evaluating the feasibility of issuing Airport debt to implement the overall capital program including an assessment of the financial prudence of projected debt service coverage ratio results.**
- **Evaluating potential funding opportunities and financing structures from private third parties and intermediary project developers for capital projects that are appropriate for such funding.**
- **Conducting numerous preliminary CIP review/revision meetings with key Airport/County staff and the engineering consultant to identify preferred funding sources and to resolve any initial annual funding shortfalls.**

- **Completing the capital funding analysis by developing a financing plan that prudently matches projected capital expenditures with the availability of appropriate capital funding sources.**
- **Analyzing historical operations and maintenance expenses, developing operations and maintenance expense growth assumptions, considering expense increases due to facility expansions and new development, reviewing assumptions with Airport/County staff, and projecting future operations and maintenance expenses for the planning period.**
- **Analyzing historical revenue sources, reviewing the Airport's existing rates and charges methodology, developing revenue growth assumptions, considering revenue increases due to facility expansions and new development, reviewing assumptions with Airport/County staff, and projecting future airline and non-airline revenues for the planning period.**
- **Determining the financial impact of the proposed capital program on the Airport's airline cost per enplaned passenger, evaluating the result, and advising Airport management on strategy for imposing rates and charges that support successful implementation of the program.**
- **Advising Airport staff and the engineering consultant on capital project descriptions and overall program drawings that support the most beneficial opportunity to achieve maximum federal funding eligibility.**
- **Completing results of the analysis in a Financial Plan Summary that evaluates the overall financial reasonableness of the preferred Master Plan CIP, which includes significant Terminal Area Plan development.**

10.4 Capital Funding Sources

In the past, the Airport has used a combination of FAA Airport Improvement Program (AIP) entitlement and discretionary grants, Colorado DOT Aeronautics grants, passenger facility charges, revenue bond debt financing, rental car customer facility charges, private third party financing, and cash reserves/net operating revenues to fund capital improvements. These funding sources will continue as the Airport's primary sources to finance the Master Plan Capital Improvement Program (CIP).

10.4.1 Airport Improvement Program Grants

The Airport receives grants from the Federal Aviation Administration (FAA) to finance the eligible costs of certain capital improvements. These federal grants are allocated to commercial passenger service airports through the Airport Improvement Program (AIP). AIP grants include passenger entitlement grants, which are allocated among airports by a formula that is based on passenger enplanements and discretionary grants, which are awarded in accordance with FAA guidelines. In February 2012, after several years of continuing budget resolutions in Congress, the FAA Modernization and Reform Act of 2012 was enacted and authorizes funding for the AIP through September 30, 2015. Under this AIP re-authorization legislation, eligible projects are funded on a 90% AIP grant/10% local match basis for small and non-hub airports. Under this authorization, the Airport is projected to receive current year entitlements of about $1.9 million in 2012 and future annual grants, which are projected to grow to $2.4 million by 2031 - the end of the planning period. Non-hub airports (those with annual enplanements up to about 360,000 passengers) can accumulate up to three years of unspent entitlements, plus the current year, before the awards are revoked. For 2011, the Airport had accumulated about $250,000 in unspent entitlements that are carried forward and available for expenditure in 2012. The implementation analysis assumes the application of AIP passenger entitlement funds will be about $10.1 million during the Short-Term planning period, $10.4 million during the Mid-Term, and $15.5 during the Long-Term.

The approval of AIP discretionary funding is based on a project eligibility ranking method the FAA uses to award grants, at their discretion, based on a project's priority and importance to the national air transportation system. In the past, the Airport has received significant discretionary funding support for various eligible capital projects. It is reasonable to assume that the Airport will receive additional discretionary funding during the planning period for higher priority, eligible projects, such as the commercial terminal apron projects, environmental assessments, and west side taxiway development. The analysis also assumes that the Terminal Area Plan completion of the new terminal expansion during the Mid-Term will also receive favorable consideration for significant discretionary funding under the AIP re-authorization enacted in February 2012. The implementation analysis assumes the application level of AIP discretionary funds will be about $17.3 million during the Short-Term, about $24.7 million during the Mid-Term, and none during the Long-Term planning periods. Since the future availability of AIP discretionary grants is not certain until an actual grant is awarded, it should be noted that any CIP projects, which have discretionary funds indicated as a funding source in the implementation plan, may need to be delayed until such funds actually become available.

The implementation analysis further assumes that the current AIP program will continue to be extended beyond 2015, through 2031, and that future program authorizations will provide substantially similar funding levels as it currently does and as it has historically provided since AIP was established in 1982, along with its predecessor programs since the end of World War II (Federal-Aid Airport Program in 1946 and the Planning Grant Program/Airport Development Aid Program in 1970).

10.4.2 Colorado Department of Transportation (CDOT) - Aeronautics Division Grants

The Colorado Department of Transportation Division of Aeronautics provides Discretionary Aviation Grants for airport projects from a portion of the state sales tax collected on aviation fuel. Grants are approved for projects including those that are AIP eligible, aviation pavement maintenance projects, and various other aviation projects. For AIP eligible projects, state grant awards for up to 50% of an airport's local match requirement are allowed. Non-Revenue producing projects that are not AIP eligible (but are still eligible for state funding) may also receive up to 80% funding (with a 20% local match) for the total cost of approved projects. Historically, ASE has received a range of $400,000 to $1.4 million per year in funding support from the State Aeronautics Division. In recent years, the accumulation of state aviation funds has appeared to be growing beyond historical grant levels for appropriate airport projects. The Master Plan CIP includes several projects during the planning period that are assumed to be partially funded from state grants - $7.9 million in the Short-Term period, $1.7 in the Mid-Term, and $900,000 in the Long-Term.

10.4.3 Passenger Facility Charges (PFC)

The Aviation Safety and Capacity Expansion Act of 1990 established the authority for commercial service airports to apply to the FAA for imposing and using a Passenger Facility Charge (PFC) of up to $3.00 per enplaned passenger. With the passage of AIR-21 in June 2000, airports could apply for an increase in the PFC collection amount from $3.00 per eligible enplaned passenger to $4.50. The proceeds from PFCs are eligible to be used for AIP eligible projects and for certain additional projects that preserve or enhance capacity, safety, or security; mitigate the effects of aircraft noise; or, enhance airline competition. PFCs may also be used to pay debt service on bonds (including principal, interest, and issue costs) and other indebtedness incurred to carry out eligible projects. In addition to funding future planned projects, the legislation permits airports to collect PFCs to reimburse the eligible costs of projects that began on or after November 5, 1990.

Since 1993, ASE has submitted five PFC applications that are closed and three (PFC #6, #7, and #8) that are currently open and in effect. The current collection authority for the open applications is $13,799,054, of which over $2.4 million has been disbursed. (PFC #8 was recently approved in February 2012 with a collection authority of $3.2 million.) The current PFC collection level is $4.50 and the charge expiration date is estimated to be February 1, 2016.

The implementation analysis assumes that the Airport will submit additional PFC applications and amendments, as required for various eligible projects listed in the CIP, to ensure that the collection of PFC revenues continues beyond the authorized charge expiration date through the end of the twenty-year planning period in 2031. The implementation analysis specifically assumes that a PFC application will be submitted and approved by the FAA that includes authority to fund an $11.5 million debt issue in 2015, with an additional $10.9 million in interest and issue costs that will primarily support financing of PFC eligible components the Terminal Area Plan concourse development and terminal expansion projects during the Short-Term/Mid-Term planning periods. The implementation analysis further assumes that PFCs will be used on a pay-as-you-go basis to fund an additional $870,000 during the Short-Term, $409,000 during the Mid-Term, and $667,000 during the Long-Term to provide local match amounts for various other AIP/PFC eligible projects.

10.4.4 Debt Financing

In the past, the Airport has used revenue bond debt financing to fund capital improvements that could not be funded by other means. The Airport's current sound financial condition (with a minimal level of outstanding debt), the availability of future PFC revenues, and the level of net operating revenues generated annually allows the Airport to consider debt for needed capital projects. As noted in **Section 10.4.3** above, the implementation analysis assumes the Airport will issue $11.5 million in eligible project financing that can be serviced with PFC revenues. Also, the analysis projects that the Airport's financial position will be sufficiently strong to issue an additional $38.5 million in debt in 2015 to be serviced with net revenues that is planned to be used for ineligible CIP project financing.

10.4.5 Rental Car Customer Facility Charges (CFC)

In 1998, ASE established a $3 "Facility Use Fee" per rental car transaction day (also referred to as a "Customer Facility Charge") that is charged to customers renting vehicles at the Airport. The fee is used by the Airport to support capital expenditures for improving/expanding rental car facilities and other appropriate projects as considered necessary by the Airport. The fee was increased in May 2006 to $4.50 and again in December 2012 to $5.50. These fees are collected by the rental car concessionaires on behalf of the Airport and are remitted to the Airport on a monthly basis. The Master Plan CIP includes projects to expand rental car parking facilities that are assumed to be funded with CFCs and cash reserves.

10.4.6 Private Third Party Financing

Many airports use private third party financing when the planned improvements will be primarily used by a private business or other organization, especially if the airport is unable to make such an investment or if it is logically more advantageous for the airport to seek private funding. Projects of this kind typically include hangars, FBO facilities, cargo facilities, exclusive aircraft parking aprons, industrial development areas, non-aviation commercial areas, and various other projects. Such projects are most often not eligible for federal funding. The implementation analysis assumes that private third parties will provide financing for construction of the west side FBO/general aviation development at an estimated cost of $22.4 million during the Short-Term planning period. The analysis also assumes private investment will fund a new GSE storage building and east side FBO facility improvements totaling about $3.3 million during the Mid-Term, with an additional $18.3 million for east side hangar development and improvements during the Long-Term planning period. If market demand does not attract this level of private investment during the anticipated time frames, the associated projects will be delayed until demand warrants development.

10.4.7 Cash Reserves/Net Operating Revenues

Due to long-term sound financial management policies, the Airport has accumulated over $11 million in working capital reserves at the beginning of 2012 and anticipates generating $1-2 million in net operating revenues in both 2013 and 2014. Beginning in 2015, the implementation analysis projects that significant additional rental and fee revenues will be derived from the development of new and expanded facilities in the Master Plan CIP, to result in generating annual net revenues of about $5 million growing to over $9 million by the end of the planning period in 2031. Consequently, the analysis projects that the Airport will produce sufficient operating cash flow from reserves and net revenues to adequately service debt and fund over $50 million in capital project costs, while maintaining positive year end cash balances throughout the 20-year planning period.

10.5 Financial Analysis and Implementation Plan for the Master Plan Capital Improvement Program

This analysis, along with the detailed tables presented at the end of Chapter 9, provides the results of evaluating the financial reasonableness of implementing the Master Plan Capital Improvement Program, including the preferred terminal area and general aviation facility concepts during the planning period from 2012 through 2031.

10.5.1 Estimated Terminal Area Development Costs

Detailed capital cost estimates for planned improvements to the Terminal Area were presented in **Table 9-1** at the end of Chapter 9. The capital expenditure estimates provided in this Table include construction costs, as well as implementation contingencies and soft costs. Estimates are based on 2012 base year dollars, with no adjustments for inflation in future years of the development period. A summary of this Table is presented in **Exhibit 10-1** below.

Exhibit 10-1. Summary of Estimated Terminal Area Development Costs

		Funding Eligibility	
Terminal Area Plan Phases	**Total Costs (1)(2)**	**AIP/PFC**	**Ineligible**
Phase 1 - Existing Pax Apron Reconstruction	$6,013,875	$6,013,875	$0
Phase 2 - New Terminal Concourse	20,487,847	20,244,820	243,027
Phase 3 - New Roads & Auto Parking			
Phase 3a - Short Term Development	45,478,826	1,186,198	44,292,628
Phase 3b - Long Term Development	23,518,506	0	23,518,506
Total Phase 3	**68,997,332**	**1,186,198**	**67,811,134**
Phase 4 - New Commercial Apron	4,648,901	4,648,901	0
Phase 5 - New Terminal Completion	20,717,471	19,193,809	1,523,662
Total Terminal Area Plan Costs	**$120,865,426**	**$51,287,604**	**$69,577,822**

Source: Leibowitz & Horton AMC Analysis.
Notes: (1) All costs are based 2012 dollars without adjustment for inflation.
(2) Includes construction costs, program management, architectural/engineering, CM and 15% contingency.
(3) Addition errors are due to rounding of calculated amounts.

As shown in **Exhibit 10-1** above, the implementation analysis indicates that 42% (about $51.3 million in uninflated dollars) of the total estimated Terminal Area development costs will be eligible for AIP/PFC funding - the majority of these costs are related to the commercial terminal apron (Phases 1 and 4) and the new terminal building development (Phases 2 and 5). The remaining 58% of Terminal Area development costs (about $69.6 million in uninflated dollars) will not be eligible and would need to be funded from Airport cash reserves and net operating revenues - the majority of these costs are related to development of access roads and automobile parking facilities (Phase 3).

10.5.2 Estimated Project Costs and Development Schedule

The Capital Improvement Program (CIP) Estimated Project Costs and Development Schedule are derived from previous results of the Master Plan engineering analysis. The CIP for capital expansion and improvement projects is projected on an annual basis for the Short-Term planning period from 2012 through 2016, in total for the Mid-Term planning period from 2017 through 2021, and in total for the Long-Term planning period from 2022 through 2031. For each of these planning periods, **Table 9-2** (provided at the end of Chapter 9) presents the Capital Improvement Program, including estimated costs and anticipated development schedule for the Terminal Area Plan projects, as well as the Other Capital Projects in the CIP that are not related to terminal facilities.

As was shown in **Tables 9-1 and 9-2** (in Chapter 9), the total estimated cost of projects is $218,978,708 in 2012 dollars ($120,865,426 in Terminal Area Plan costs and $98,113,282 in Other Capital Project costs). The estimated costs for projects scheduled during the period 2012 through 2031 are adjusted by an assumed 2.5% rate of annual capital inflation. The resulting total project costs escalated for inflation are $262,643,719 ($150,407,591 in Terminal Area Plan costs and $112,236,128 in Other Capital Project costs). **Exhibit 10-2** presents a summary of the Table and provides a comparison of 2012 base year costs with escalated costs adjusted for inflation for each of the planning periods.

Exhibit 10-2. Summary of Base Year and Escalated Costs for the Capital Program

Planning Periods	2012 Base Year Costs	Total Escalated Costs
Terminal Area Plan Costs (2012 to Mid-Term)	$120,865,426	$150,407,591
Other Capital Project Costs:		
Short-Term Projects (2012 to 2016)	$51,726,759	$53,841,430
Mid-Term Projects (2017 to 2021)	16,580,050	18,343,801
Long-Term Projects (2022 to 2031)	29,806,473	40,050,897
Total Other Capital Project Costs	$98,113,282	$112,236,128
Total Project Costs	**$218,978,702**	**$262,643,719**

Source: Leibowitz & Horton AMC Analysis.

10.5.3 Debt Capacity and Debt Funding Requirements

The funds flow upper section of **Table 10-2** provides an overall analysis of the annual availability of the Airport's various funding sources, along with an indication of the adequacy of cash flow (both capital and operating) to meet funding needs of the capital program. The preferred project development schedule presented in the lower section of **Table 10-2** indicates significant funding needs to support development and expansion of the new terminal building and development of automobile parking facilities during the Short-Term planning period. Because the key funding sources are not available in the amounts needed to develop projects on a pay-as-you-go basis, these terminal and parking expansion objectives cannot be achieved without debt financing. The Airport's current debt capacity is based on the Airport's level of cash flow available to service debt while still maintaining a sound financial condition. The Airport's cash flow available sources to pay debt service for these projects are future PFC revenue, CFC revenue, and its net operating revenue. ASE's current level of PFC revenue is approximately $900,000 per year, its CFCs are $600,000 per year, and its net operating revenue is projected to be $5 million per year beginning in 2015 - these cash flows would thus provide a total of about $6.5 million per year available to pay debt service. **Table 10-3a** provides a summary level debt service schedule for the PFC eligible debt (to support the new terminal building financing need) assuming a net proceeds requirement of $11.5 million, a 1/1/2015 issue date, a 5.0% interest rate, a 25-year term, and level annual debt service payments. Issue costs and debt service reserve requirements were estimated at an additional $1.1 million on the date of issue. For the PFC Debt Issue, this would result in debt service payments of about $896,000 per year. **Table 10-3b** provides a summary level debt service schedule for the Parking Facility Debt (to support the new automobile parking financing need) assuming a net proceeds requirement of $38.5 million, a 1/1/2015 issue date, a 5.0% interest rate, a 25-year term, and level annual debt service payments. Issue costs and debt service reserve requirements were estimated at an additional $3.8 million on the date of issue. For the Parking Facility Debt Issue, this would result in debt service payments of about $3.0 million per year. Thus, the total required debt service payments for both issues would be about $3.9 million per year compared with the availability of $6.5 million in cash flow from PFCs, CFCs, and net operating revenue. The Airport could reasonably manage this level of debt funding within a financially prudent capital implementation plan. This debt issue structure results in an approximate debt service coverage ratio ranging from 1.7x in 2016 growing to about 1.9x in 2018.

10.5.4 Sources and Uses of Capital Funding

Funding sources for the Master Plan CIP and the Terminal Area Plan projects depend on many factors, including AIP and PFC project eligibility, the ultimate type and use of facilities to be developed, management's current and desired levels of the Airport's airline cost per enplaned passenger, the availability of other financing sources, and the priorities for scheduling project completion. For master planning purposes, assumptions were made related to the funding source of each capital improvement.

Table 10-2 lists each of the CIP projects, their estimated costs (escalated annually for inflation) and the assumed funding sources and amounts. In the Short-Term planning period (2012 to 2016), it was assumed that the Terminal Area Plan terminal building and commercial aircraft apron projects would be funded primarily with AIP entitlement and discretionary grants, CDOT Aeronautics grants, and PFCs (debt and PAYG). It was assumed that the Terminal Area Plan automobile parking and roadway facilities would be funded cash reserves, net operating revenues, and Parking Facility Debt. Various airfield pavement projects were assumed to be funded with AIP entitlement and discretionary grants, CDOT grants, and PAYG PFCs for local match. Pavement maintenance projects were assumed to be funded with Airport cash reserves. The west side FBO/general aviation development was assumed to be funded with private third financing.

In the Mid-Term planning period (2017 to 2021), it was assumed that airfield pavement and other eligible projects would be funded with AIP entitlements, pay-as-you-go PFCs, and CDOT grants. Private third party funding was assumed for general aviation-related projects and GSE equipment projects. Pavement Maintenance projects were assumed to be funded with Airport cash reserves.

In the Long-Term planning period (2022 to 2031), a significant number of projects were related to airfield pavement and apron improvements. These projects were assumed to be funded with AIP entitlements, CDOT grants, and PAYG PFCs. The Long-Term period also included several million dollars in general aviation hangar facilities, which were assumed to be financed from private third party sources.

A summary of the sources of capital funding by type and uses of capital funding by planning period for the Master Plan CIP and the Terminal Area Plan is presented below in **Exhibit 10-3**.

Exhibit 10-3. Summary of Sources and Uses of Capital Funding

Sources of Capital Funding (2012 to 2031):		
	AIP Entitlement Grants	$36,069,971
	AIP Discretionary Grants	41,934,744
	Colorado DOT - Aeronautics Division Grants	10,517,342
	Passenger Facility Charges (Debt)	21,259,396
	Passenger Facility Charges (PAYG)	2,210,297
	Private Third Party Financing	46,028,747
	Cash Reserves/Net Operating Revenues	104,623,222
	Total Sources of Capital Funding	$262,643,719
Uses of Capital Funding:		
	Terminal Area Plan Costs (2012 to Mid-Term)	$150,407,591
	Other Capital Project Costs:	
	Short Term Projects (2012 to 2016)	$53,841,430
	Intermediate Term Projects (2017 to 2021)	18,343,801
	Long Term Projects (2022 to 2031)	40,050,897
	Total Other Capital Project Funding	$112,236,128
	Total Uses of Capital Funding	**$262,643,719**

Source: Leibowitz & Horton AMC Analysis.

Note: Addition errors are due to rounding of calculated amounts.

10.5.5 Projected Operations and Maintenance Expenses

Operations and maintenance expense projections for the Short-Term, the Mid-Term, and the Long-Term planning periods are based on ASE's current budget, the anticipated impacts of inflation, aviation traffic increases, facility improvements, and the recent experience of other similarly-sized airports.

Operations and Maintenance Expense Projection Assumptions. Operations and maintenance expense growth assumptions, as reflected in **Table 10-5**, were developed to project ASE's operating expenses during the planning period. Actual amounts for 2009 and 2010, estimates for 2011, and budgeted amounts for 2012 provide a comparison with expenses that are projected for the period 2013 through 2031. Expenses for the period 2013 through 2015 are based on projections provided in the County's 2012 budget report. Beginning in 2016, the projection for the following expense categories is based on the County's projected amounts for 2015 and an annual inflation growth rate of 3%:

- **Terminal**
- **ARFF**
- **Roadway**
- **AOA**
- **AOC Building**
- **Parking**
- **Security**
- **Administration**
- **Projects**
- **Cost Centers**

Additionally, the expense projection includes single year increases due to facility expansions in the capital program that are planned for the terminal in 2016 and 2018, for the Airport Operating Area (AOA) in 2015, and for automobile parking in 2017.

Projection of Operations and Maintenance Expenses and Operating Expenses per Enplaned Passenger. The projection of operations and maintenance expenses is provided in **Table 10-5**. As shown in the table, total operating expenses are expected to decline from $7,335,852 budgeted for 2012 to $7,141,394 projected for 2016, with a total of $34,495,819 during the five-year Short-Term period. During the five-year Mid-Term period, expenses are projected to total $39,584,240 and during the ten-year Long-Term period, expenses are projected to total $98,971,967. The overall growth rate of expenditures during the projection period is 2.3% per year.

Table 10-5 also provides a comparison of the Airport's total operating expenses per enplaned passenger versus the industry average for non-hub airports. The Airport's operating expense per enplaned passenger is projected to grow from $31.90, budgeted for 2012, to an average of $33.73 during the Long-Term planning period. During the same period, the industry average for non-hub airports ranges from $29.00 in 2012 to an average of $44.67 during the Long-Term period [Sources: FAA Air Carrier Activity Information System (ACAIS) enplanement database and non-hub airport annual financial report #127 from the FAA Compliance Activity Tracking System (CATS)]. This comparison shows that operating expenses are in line with those of other similarly-sized airports during the Short-Term period and are projected to be substantially below other airports for the Mid- and Long-Term periods. These statistics indicate that ASE's operating expenses appear to be cost-efficient compared with other similarly-sized non-hub airports for the long-term future.

10.5.6 Projected Operating Revenues

Operating revenue projections for the Short-Term, the Mid-Term, and the Long-Term planning periods are based on ASE's current budget, the anticipated impacts of inflation, aviation traffic increases, anticipated user fee and tenant rental adjustments, facility improvements, and the recent experience of other similarly-sized airports.

Operating Revenue Projection Assumptions. **Table 10-6** presents actual, estimated, budgeted, and projected operating revenues for ASE for the period 2009 through 2031. Actual amounts for 2009 and 2010, estimates for 2011, and budgeted amounts for 2012 provide a comparison with revenues that are projected for the period 2013 through 2031. Revenues for the period 2013 through 2015 are based on projections provided in the County's 2012 budget report. Annual growth assumptions from 2016 through 2031 for the following revenue categories are provided below:

- **Airline Operating Revenues**
  - ✓ Landing Fees - Projections are based on the County's 2015 estimate with a 3% annual inflation rate, plus increases in aircraft landed weight using annual growth at ½ the rate of Master Plan forecast passenger enplanements. This reflects the airlines' practice of managing increased load factors before additional flights are provided.
  - ✓ Terminal Rent - Projections are based on the 2015 estimate and 3% annual inflation thereafter.

- **Non-Airline Operating Revenues**

_ GA Landing Fees - Projections are based on the 2015 estimate with a 3% annual inflation rate, plus increases in aircraft landed weight using annual growth at ½ the rate of Master Plan forecast passenger enplanements.

- Fuel Flowage Fees - Projections are based on the 2015 estimate with a 3% annual inflation rate, plus increases in aircraft landed weight using annual growth at ½ the rate of Master Plan forecast passenger enplanements to approximate growth in the volume of fuel delivered.
- FBO Rents - Based on the 2015 estimate and 3% annual inflation thereafter. Additionally, the revenue projection includes rental increases in 2015 that reflect the planned capital program development of west side general aviation facilities and the expansion of east side general aviation facilities.
- Patio Shelters Maintenance Fees - Based on the 2015 estimate and 3% annual inflation thereafter.
- Rental Car Concession Fees - Based on the 2015 estimate and 3% annual inflation, plus the annual rate of forecast enplanement growth.
- Rental Car Space Rent - Based on the 2015 estimate and 3% annual inflation thereafter.
- Bar and Restaurant Concession Fees - Based on the 2015 estimate and 3% annual inflation, plus the annual rate of forecast enplanement growth.
- Bar and Restaurant Space Rent - Based on the 2015 estimate and 3% annual inflation thereafter.
- Gift Shop Concession Fees - Based on the 2015 estimate and 3% annual inflation, plus the annual rate of forecast enplanement growth.
- Gift Shop Space Rent - Based on the 2015 estimate and 3% annual inflation thereafter.
- Ground Transportation Concession Fees - Based on the 2015 estimate and 3% annual inflation, plus the annual rate of forecast enplanement growth.
- Public Parking Fees - Based on the 2015 estimate and 3% annual inflation, plus the annual rate of forecast enplanement growth. Additionally, the revenue projection includes parking fee increases in 2017 that reflect the capital program development of expanded parking facilities.
- Advertising Concession Fees - Based on the 2015 estimate and 3% annual inflation thereafter.
- Other Concession Rentals - Based on the 2015 estimate and 3% annual inflation thereafter.
- Other Revenues - Based on the 2015 estimate and 3% annual inflation thereafter.

- **Other Non-Operating Revenues**

- Investment Income - Projections are based on the 2015 estimate and fixed thereafter.
- State Fuel Excise Tax - Projections are based on the 2015 estimate with a 3% annual inflation rate, plus increases in aircraft landed weight using annual growth at ½ the rate of Master Plan forecast passenger enplanements.
- State Fuel Sales Tax Rebate - Projections are based on the 2015 estimate with a 3% annual inflation rate, plus increases in aircraft landed weight using annual growth at ½ the rate of Master Plan forecast passenger enplanements.
- Proceeds from F/A Disposition - Based on the 2015 estimate and fixed thereafter.

Projection of Operating Revenues, Airline Cost per Enplaned Passenger, and Operating Revenues per Enplaned Passenger. The projection of operating revenues is provided in **Table 10-6**. As shown in the table, airline revenues are expected to grow from $3,123,984 budgeted for 2012 to $3,628,605 projected for 2016, with a total of $17,016,504 during the five-year Short-Term planning period. During the five-year Mid-Term period, airline revenues are projected to total $20,127,397 and, during the ten-year Long-Term period, revenues are projected to total $52,238,334. The overall annual growth rate for airline revenues is 3.6%. Non-Airline revenues are expected to grow from $4,326,462 budgeted for 2012 to $8,085,505 projected for 2016, with a total of $29,597,420 during the Short-Term period. During the Mid-Term period, non-airline revenues are projected to total $46,689,697 and, during the Long-Term period, revenues are projected to total $122,914,061. The overall annual growth rate for non-airline revenues is 6.5%. Non-Operating revenues are expected to decline from $508,398 budgeted for 2012 to $370,654 projected for 2016, with a total of $1,927,489 during the Short-Term period. During the Mid-Term period, non-operating revenues are projected to total $2,035,320 and, during the Long-Term period, revenues are projected to total $5,188,796. The overall annual growth rate for non-operating revenues is 0.9%. Total Airport revenues are expected to grow from $7,958,844 budgeted for 2012 to $12,084,765 projected for 2016, with a total of $48,541,413 during the Short-Term period. During the Mid-Term period, revenues are projected to total $68,852,414 and, during the Long-Term period, revenues are projected to total $180,341,191. The overall annual growth rate for total revenues is 5.3%.

Table 10-6 also provides a comparison of the Airport's airline cost per enplaned passenger versus the average for other non-hub airports that support resort oriented communities and businesses. The airline cost per enplaned passenger (airline fees and rentals divided by enplaned passengers) is a measure airlines use to compare their cost of operations among the airports they serve. ASE's airline cost per enplaned passenger is projected to range from $13.58 budgeted for 2012 to an average of $17.80 during the Long-Term planning period. During the same period, the industry average for a sample of non-hub resort airports ranges from $15.73 in 2012 to an average of $24.24 during the Long Term (Source: FAA ACAIS enplanement database and non-hub, resort airport annual financial reports #127 from the FAA CATS). This result shows that current and projected airline rates & charges at ASE are in line and below those of other similarly-sized resort airports throughout the twenty-year planning period.

Table 10-6 also provides a comparison of the Airport's total operating revenue per enplaned passenger versus the industry average for non-hub airports. ASE's total operating revenue per enplaned passenger is projected to grow from $32.40 budgeted for 2012 to an average of $59.69 during the Long-Term planning period. During the same period, the industry average for non-hub airports ranges from $32.98 in 2012 to an average of $50.81 during the Long-Term (Sources: FAA ACAIS enplanement database and non-hub airport annual financial report #127 from the FAA CATS). These statistics show that current and projected total revenues at ASE are currently higher and are projected to remain higher than other similarly-sized airports throughout the planning period. This result is partially due to the nature of rates, fees, and rental levels that can be realized at a successful resort oriented airport such as Aspen/Pitkin County Airport.

10.5.7 Financial Plan Summary

The Financial Plan Summary presented in **Table 10-7** includes projection totals for Operating Cash Flow and Capital Cash Flow. In the Operating Cash Flow section, revenues and expenses are summarized from **Tables 10-5** and **10-6**. As shown in **Table 10-7**, cash flow from operations is positive for every period of the projection. The Capital Cash Flow section provides the matching of capital project expenditures with the availability of capital funds, so that positive cash flows result throughout the 20-year planning period.

The Capital Cash Flow section of **Table 10-7** summarizes the results of analysis from **Tables 10-2** and **10-4**. In **Table 10-2**, an approach was provided for scheduling capital expenditures to match the availability of capital funding. **Table 10-4** provided an approach for matching specific capital funding sources with each of the Master Plan and Terminal Area Plan projects. Based on the assumptions underlying the Financial Plan summarized in **Table 10-7**, implementation of the Master Plan/Terminal Area Plan CIP is financially reasonable if ASE can obtain awards for the indicated amount of needed AIP discretionary grant funding, and, if aviation market conditions occur in the Short Term to drive demand for significant private third party investment in the west side and east side FBO/general aviation facility developments.

Key assumptions supporting the reasonableness of the overall Financial Plan relate to the availability and timeliness of the funding sources that have been identified. Receiving awards for at least $10.4 million in AIP discretionary grants during the Short-Term will be essential to support efficient implementation of the Terminal Area Plan without delay. Receiving awards for an additional $9.6 million in discretionary grants during the Short-Term for the west side general aviation parallel taxiway, $22.4 million in private third party financing driven by market demand for development of the west side FBO/general aviation facility will be needed for implementing those projects. These funding sources will also be necessary to support the production of additional Airport rental revenues to sufficiently service the Parking Facility Debt Issue so that the ineligible parking development projects can be financed within the time frames that are planned.

During the Mid-Term, $19.9 million in discretionary grants will be necessary for the feasibility of implementing the terminal building expansion. Without this funding, the planned timing of the expansion will be delayed.

It must be noted that AIP discretionary funding is not certain until the actual award is received from the FAA. If the indicated level of AIP discretionary funding is not available in the time frames indicated, then specific projects to which the funding is applied may need to be delayed or cancelled. Similarly, it should be noted that private investment in Airport facilities depends on favorable market demand conditions - if these conditions do not occur, then the investment necessary for implementation of the associated projects may not be available in the time frames that are planned. If the private development does not occur when anticipated, then operating revenues generated by these facilities will not be available to support the debt service necessary for financing the associated projects.

Additionally, the Financial Plan relies on achievement of the Master Plan forecast of aviation activity. Actual aviation traffic may temporarily vary from the projected levels of activity without an adverse impact on the capital program. If decreased traffic levels occur and persist, implementation of all the proposed projects may not be financially feasible. It should also be noted, however, that if the forecast activity levels are not met, then a number of the planned capital improvements may not be necessary.

10.6 Financial Analysis Tables

Financial analysis **Tables 10-1** through **10-7** are presented on the following pages.

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

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Table 10-1

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Terminal Area Development Costs

15-May-12

Terminal Area Plan Phases	Terminal Building Sq Ft	Construction Costs (1)	Soft Costs (2) 25%	Total Costs	Funding Eligibility AIP/PFC	Funding Eligibility Ineligible
Phase 1 - Existing Pax Apron Reconstruction						
Existing Commercial Apron Reconstruction	-	$4,811,100	$1,202,775	$6,013,875	$6,013,875	
Phase 2 - New Terminal Concourse						
Airline Functions						
Main Level:						
Airline Operations	4,697	$1,526,525	$381,631	$1,908,156	$1,908,156	
Outbound Baggage	3,563	1,157,975	289,494	1,447,469	1,447,469	
Inbound Baggage	2,457	798,525	199,631	998,156	998,156	
Baggage System Equipment	-	2,027,200	506,800	2,534,000	2,534,000	
Second Level:						
Passenger Holdrooms	9,907	3,219,775	804,944	4,024,719	4,024,719	
Loading Bridges	-	750,000	187,500	937,500	937,500	
Total Airline Functions	20,624	$9,480,000	$2,370,000	$11,850,000	$11,850,000	
Baggage Security Screening						
Main Level:						
TSA Baggage Screening Room	2,292	$458,400	$114,600	$573,000	$573,000	
Concessions						
Second Level:						
Concessions (Food/Beverage)	1,164	$186,248	$46,562	$232,810	$232,810	
Concessions (News/Gift/Sundry)	615	98,400	24,600	123,000	123,000	
Concessions Tenant Finish	-	115,638	28,910	144,548		144,548
Concessions (Kitchen/Storage)	314	70,639	17,660	88,298		88,298
Total Concessions	2,093	$470,925	$117,731	$588,656	$355,810	$232,846
Public Areas						
Main Level:						
Temporary Connector to Existing Terminal	4,500	$1,237,500	$309,375	$1,546,875	$1,546,875	
Secure Public Restrooms	1,526	495,950	123,988	619,938	619,938	
Second Level:						
Holdroom Circulation	9,810	3,188,250	797,063	3,985,313	3,985,313	
Total Public Areas	15,836	$4,921,700	$1,230,425	$6,152,125	$6,152,125	$0
Non-Public Areas						
Main Level:						
Loading Dock	368	$55,200	$13,800	$69,000	$68,470	$530
Airport Storage	548	82,200	20,550	102,750	101,960	790
Building Maintenance	582	87,300	21,825	109,125	108,286	839
Mech/Elect/Building Systems	1,028	334,100	83,525	417,625	414,415	3,210
Airport Vehicle Storage	1,003	150,450	37,613	188,063	186,617	1,446
Site Demolition	-	350,000	87,500	437,500	434,137	3,363
Total Non-Public Areas	3,529	$1,059,250	$264,813	$1,324,063	$1,313,885	$10,177
		Support Space Eligibility Allocation %s >>			99.2%	0.8%
Total Phase 2 - New Terminal Concourse	44,374	$16,390,275	$4,097,569	$20,487,844	$20,244,820	$243,023
		80.0%	20.0%	100.0%	98.8%	1.2%
					Phase 2 Eligibility	

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

ASE_MP-TAP_FAB.123 Table 10-1

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Terminal Area Development Costs

15-May-12

Terminal Area Plan Phases	Terminal Building Sq Ft	Construction Costs (1)	Soft Costs (2) 25%	Total Costs	Funding Eligibility AIP/PFC	Funding Eligibility Ineligible
Phase 3 - New Auto Roads & Auto Parking						
Phase 3a - Short Term Development						
Main Terminal Access & Loop Roads	-	$879,840	$219,960	$1,099,800	$1,099,800	
Public Parking Access Roads	-	103,500	25,875	129,375		129,375
RAC Parking Access Roads	-	192,960	48,240	241,200		241,200
FBO Facility Access Roads	-	45,000	11,250	56,250		56,250
Auto Parking Garage:						
Public (480 spaces)	-	16,800,000	4,200,000	21,000,000		21,000,000
Employee (0 spaces)	-	0	0	0		0
RAC (270 spaces)	-	9,450,000	2,362,500	11,812,500		11,812,500
FBO (0 spaces)	-	0	0	0		0
Auto Parking Surface:						
Employee (90 spaces)	-	1,350,000	337,500	1,687,500		1,687,500
RAC (60 spaces)	-	900,000	225,000	1,125,000		1,125,000
FBO (80 spaces)	-	1,200,000	300,000	1,500,000		1,500,000
RAC Support Facilities	-	1,911,760	477,940	2,389,700		2,389,700
Landscaping	-	900,000	225,000	1,125,000		1,125,000
Site Demolition	-	2,650,000	662,500	3,312,500	86,398	3,226,102
Phase 3b - Long Term Development	-	18,814,805	4,703,701	23,518,506		23,518,506
Added Garage Spaces>PUB+69, EMP+88, RAC+243, FBO+150=+550 new + 750 Phase 3a = 1,300 Total at Completion						
Total Phase 3 - New Roads & Auto Parking	-	$55,197,865	$13,799,466	$68,997,331	$1,186,198	$67,811,133
		Demolition Area Eligibility Allocation %s >>			2.6%	97.4%
Phase 4 - New Commercial Apron						
New Commercial Apron Construction	-	$3,719,121	$929,780	$4,648,901	$4,648,901	
-	-	0	0	0	0	
Total Phase 4 - New Commercial Apron	-	$3,719,121	$929,780	$4,648,901	$4,648,901	

ASE_MP-TAP_FAB.123

Table 10-1

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Terminal Area Development Costs

15-May-12

Terminal Area Plan Phases	Terminal Building Sq Ft	Construction Costs (1)	Soft Costs (2) 25%	Total Costs	Funding Eligibility AIP/PFC	Ineligible
Phase 5 - New Terminal Completion						
Airline Functions						
Main Level:						
Airline Ticket Counter Area	989	$321,425	$80,356	$401,781	$401,781	
Airline Ticket Counter Queuing Area	1,773	576,225	144,056	720,281	720,281	
Airline Ticket Office	2,295	631,125	157,781	788,906	788,906	
ATO Tenant Finish	-	114,750	28,688	143,438		143,438
Baggage Claim Area	5,100	1,657,500	414,375	2,071,875	2,071,875	
Baggage Service Offices	1,419	461,175	115,294	576,469	576,469	
Outbound Baggage	2,114	687,050	171,763	858,813	858,813	
Inbound Baggage	371	120,575	30,144	150,719	150,719	
Curbside Baggage Check	180	58,500	14,625	73,125	73,125	
Second Level:						
Loading Bridges	-	750,000	187,500	937,500	937,500	
Total Airline Functions	14,241	5,378,325	1,344,581	6,722,906	6,579,469	143,438
Passenger & Baggage Security Screening						
Main Level:						
TSA Baggage Screening Room	1,265	$253,000	$63,250	$316,250	$316,250	
Second Level:						
Passenger Screening Area	3,185	1,035,125	258,781	1,293,906	1,293,906	
TSA Offices/Break Room	900	292,500	73,125	365,625		365,625
Total Pax & Baggage Security Screening	5,350	$1,580,625	$395,156	$1,975,781	$1,610,156	$365,625
Concession Areas						
Main Level:						
Rental Car Counters	1,308	$425,100	$106,275	$531,375	$531,375	
Ground Transportation	704	228,800	57,200	286,000	286,000	
Concessions (Storage)	219	32,850	8,213	41,063		41,063
Total Concessions Areas	2,231	$686,750	$171,688	$858,438	$817,375	$41,063
Public Areas						
Main Level:						
Airport Information Booth	480	$156,000	$39,000	$195,000	$195,000	
Circulation	6,458	2,098,688	524,672	2,623,359	2,623,359	
Temporary Connector to Existing Terminal	(4,500)	0	0	0	0	
Second Level:						
Circulation	5,007	1,627,113	406,778	2,033,891	2,033,891	
Secure Public Restrooms	1,680	546,000	136,500	682,500	682,500	
Total Public Areas	9,124	$4,427,800	$1,106,950	$5,534,750	$5,534,750	$0
Non-Public Areas						
Main Level:						
Airport Vehicle Storage	851	$127,650	$31,913	$159,563	$158,336	$1,226
Landscaping	-	750,000	187,500	937,500		937,500
Existing Terminal Building Demolition	-	440,000	110,000	550,000	545,772	4,228
Site Demolition	-	750,000	187,500	937,500	930,294	7,206
Second Level:						
Airport Administration	2,960	962,000	240,500	1,202,500	1,193,257	9,243
Building Maintenance	231	34,650	8,663	43,313	42,980	333
Mech/Elect/Building Systems	4,419	1,436,175	359,044	1,795,219	1,781,420	13,799
Total Non-Public Areas	8,461	$4,500,475	$1,125,119	$5,625,594	$4,652,059	$973,534
		Support Space Eligibility Allocation %s >>			96.4%	3.6%
Total Phase 5 - New Terminal Completion	39,407	$16,573,975	$4,143,494	$20,717,469	$19,193,809	$1,523,659
		80.0%	20.0%	100.0%	92.6%	7.4%
					Phase 5 Eligibility	
Total Terminal Area Plan Costs	83,781	$96,692,336	$24,173,084	$120,865,420	$51,287,604	$69,577,816
		80.0%	20.0%	100.0%	42.4%	57.6%
					Terminal Area Cost Eligibility	

Notes:
(1) Estimated construction costs are based on 2012 dollars with no adjustment for inflation.
(2) Soft costs include program management, architecture/engineering, CM and 15% contingency.

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Table 10-2

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Project Costs and Development Schedule

15-May-12

Capital Improvement Program	Funding Schedule: Short Term 2012	2013	2014	2015	2016	Total	Mid Term 2017-2021	Long Term 2022-2031	Total Funding
Funds Used for Capital Improvement Projects			total debt proceeds =	$50,000,000					
AIP Entitlement Grants	$2,214,477	$1,940,006	$1,975,917	$1,996,484	$2,017,405	$10,144,288	$10,411,648	$15,514,036	$36,069,971
AIP Discretionary Grants	1,080,263	890,737	15,293,410	0	0	17,264,410	24,670,335	0	41,934,744
CDOT Grants	1,400,000	1,500,000	1,500,000	1,500,000	2,000,000	7,900,000	1,699,895	917,446	10,517,342
Passenger Facility Charges (@$4.50)	1,115,110	888,374	903,652	919,193	935,001	4,761,330	4,916,832	13,791,531	23,469,693
PFC Eligible Debt Proceeds (25 yrs, 5.0%) Thru 2040	0		0	11,486,188	0	11,486,188	0	0	11,486,188
Less Principal Payments	0	0	0	(132,314)	(264,629)	(396,943)	(1,535,353)	(10,697,665)	(12,629,961)
Rental Car Customer Facility Charges	610,000	604,724	633,578	663,808	695,481	3,207,590	3,744,106	9,346,678	16,298,374
Private 3rd Party Financing (P3P)	0	0	22,402,507	249,542	1,647,741	24,299,790	3,423,592	18,305,364	46,028,747
Parking Facility Debt Proceeds (25 yrs, 5.0%) Thru 2040	0	0	0	38,513,812	0	38,513,812	0	0	38,513,812
Less Debt Service	0	0	0	(1,502,381)	(3,004,762)	(4,507,143)	(15,023,809)	(55,588,092)	(75,119,043)
SIB Loan Debt Service	(364,817)	(214,526)	(214,527)	(214,525)	0	(1,008,395)	0	0	(1,008,395)
Net Operating Cash Flow	622,992	1,421,591	1,999,573	5,058,067	4,943,371	14,045,595	29,268,175	81,369,224	124,682,993
Funds Available Current Year	6,678,025	7,030,906	44,494,110	58,537,873	8,969,608	125,710,522	61,575,421	72,958,523	260,244,465
Beginning Cash Balance/Funds Carried Over from Prior Year	11,019,878	10,117,308	14,431,369	8,560,664	45,030,631	11,019,878	1,421,499	14,824,712	11,019,878
Funds Used Current Year	(7,580,595)	(2,716,845)	(50,364,815)	(22,067,906)	(52,578,740)	(135,308,901)	(48,172,207)	(79,162,611)	(262,643,719)
Funds Carried Over to Next Year	$10,117,308	$14,431,369	$8,560,664	$45,030,631	$1,421,499	$1,421,499	$14,824,712	$8,620,624	$8,620,624
Rough Est DSC >>		13.59x	16.49x	3.07x	1.69x				

Capital Project Description	2012 Base Year Costs	Estimated Project Costs and Development Schedule: Short Term 2012	2013	2014	2015	2016	Total	Mid Term 2017-2021	Long Term 2022-2031	Total Escalated Costs
TERMINAL AREA PLAN PHASES										
Phase 1 - Existing Pax Apron Reconstruction										
T1.0 Existing Commercial Apron Reconstruction	$6,013,875	$0	$0	$6,318,327	$0	$0	$6,318,327	$0	$0	$6,318,327
Phase 2 - New Terminal Concourse										
T2.1 Airline Functions	$11,850,000	$0	$1,214,625	$0	$11,485,039	$0	$12,699,664	$0	$0	$12,699,664
T2.2 Baggage Security Screening	573,000	0	58,733	0	555,352	0	614,085	0	0	614,085
T2.3 Concessions-Eligible	355,810	0	36,471	0	344,852	0	381,322	0	0	381,322
T2.4 Concessions-Ineligible	232,846	0	23,867	0	225,675	0	249,542	0	0	249,542
T2.5 Public Areas	6,152,125	0	630,593	0	5,962,649	0	6,593,242	0	0	6,593,242
T2.6 Non-Public Areas-Eligible	1,313,885	0	134,673	0	1,273,420	0	1,408,093	0	0	1,408,093
T2.7 Non-Public Areas-Ineligible	10,177	0	1,043	0	9,864	0	10,907	0	0	10,907
Total Phase 2 - New Terminal Concourse	$20,487,844	$0	$2,100,004	$0	$19,856,850	$0	$21,956,854	$0	$0	$21,956,854
Phase 3 - New Auto Roads & Parking										
Phase 3a - Short Term Development										
T3.1 Main Terminal Access & Loop Roads	$1,099,800	$0	$0	$115,548	$0	$1,092,576	$1,208,124	$0	$0	$1,208,124
T3.2 Public Parking Access Roads	129,375	0	0	13,592	0	128,525	142,118	0	0	142,118
T3.3 RAC Parking Access Roads	241,200	0	0	25,341	0	239,616	264,957	0	0	264,957
T3.4 FBO Facility Access Roads	56,250	0	0	5,910	0	55,881	61,790	0	0	61,790
T3.5 Auto Parking Garage:										
T3.5a Public (480 spaces)	21,000,000	0	0	2,206,313	0	20,862,064	23,068,376	0	0	23,068,376
T3.5b Employee (0 spaces)	0	0	0	0	0	0	0	0	0	0
T3.5c RAC (270 spaces)	11,812,500	0	0	1,241,051	0	11,734,911	12,975,962	0	0	12,975,962
T3.5d FBO (0 spaces)	0	0	0	0	0	0	0	0	0	0
T3.6 Auto Parking Surface:										
T3.6a Employee (90 spaces)	1,687,500	0	0	177,293	0	1,676,416	1,853,709	0	0	1,853,709
T3.6b RAC (60 spaces)	1,125,000	0	0	118,195	0	1,117,611	1,235,806	0	0	1,235,806
T3.6c FBO (80 spaces)	1,500,000	0	0	157,594	0	1,490,147	1,647,741	0	0	1,647,741
T3.7 RAC Support Facilities	2,389,700	0	0	251,068	0	2,374,003	2,625,071	0	0	2,625,071
T3.8 Landscaping	1,125,000	0	0	118,195	0	1,117,611	1,235,806	0	0	1,235,806
T3.9 Site Demolition-Eligible	86,398	0	0	9,077	0	85,831	94,908	0	0	94,908
T3.10 Site Demolition-Ineligible	3,226,102	0	0	338,942	0	3,204,912	3,543,854	0	0	3,543,854
Phase 3b - Long Term Development Added Garage Spaces>PUB+69, EMP+88, RAC+243, FBO+150=+550 new + 750 Phase 3a = 1,300 Total at Completion	23,518,506	0	0	0	0	0	0	0	33,231,034	33,231,034
Total Phase 3 - New Auto Roads & Parking	$68,997,331	$0	$0	$4,778,119	$0	$45,180,102	$49,958,221	$0	$33,231,034	$83,189,255
Phase 4 - New Commercial Apron										
T4.0 New Commercial Apron Construction	$4,648,901	$0	$0	$0	$0	$0	$0	$5,259,805	$0	$5,259,805
-	0	0	0	0	0	0	0	0	0	0
Total Phase 4 - New Commercial Apron	$4,648,901	$0	$0	$0	$0	$0	$0	$5,259,805	$0	$5,259,805
Phase 5 - New Terminal Completion										
T5.1 Airline Functions-Eligible	$6,579,469	$0	$0	$0	$0	$726,250	$726,250	$6,867,150	$0	$7,593,400
T5.2 Airline Functions-Ineligible	143,438	0	0	0	0	15,833	15,833	149,709	0	165,542
T5.3 Passenger & Baggage Security Screening-Eligible	1,610,156	0	0	0	0	177,731	177,731	1,680,559	0	1,858,290
T5.4 Passenger & Baggage Security Screening-Ineligible	365,625	0	0	0	0	40,358	40,358	381,612	0	421,970
T5.5 Concessions-Eligible	817,375	0	0	0	0	90,223	90,223	853,114	0	943,337
T5.6 Concessions-Ineligible	41,063	0	0	0	0	4,533	4,533	42,858	0	47,390
T5.7 Public Areas	5,534,750	0	0	0	0	610,933	610,933	5,776,752	0	6,387,685
T5.8 Non-Public Areas-Eligible	4,652,059	0	0	0	0	513,500	513,500	4,855,466	0	5,368,967
T5.9 Non-Public Areas-Ineligible	973,534	0	0	0	0	107,460	107,460	1,016,101	0	1,123,561
Total Phase 5 - New Terminal Completion	$20,717,469	$0	$0	$0	$0	$2,286,821	$2,286,821	$21,623,321	$0	$23,910,142
Total Terminal Area Plan Costs Before Financing	$120,865,420	$0	$2,100,004	$11,096,446	$19,856,850	$47,466,923	$80,520,223	$26,883,126	$33,231,034	$140,634,383
Financing Costs for Debt Serviced with PFCs	-	0	0	0	315,749	631,498	947,247	2,945,281	5,880,680	9,773,208
Total Terminal Area Plan Costs	$120,865,420	$0	$2,100,004	$11,096,446	$20,172,599	$48,098,421	$81,467,471	$29,828,407	$39,111,714	$150,407,591

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ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

Table 10-2

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Project Costs and Development Schedule

15-May-12

	Funding Schedule								
	Short Term						Mid Term	Long Term	Total
Capital Improvement Program	2012	2013	2014	2015	2016	Total	2017-2021	2022-2031	Funding
Funds Used for Capital Improvement Projects		total debt proceeds =		$50,000,000					
AIP Entitlement Grants	$2,214,477	$1,940,006	$1,975,917	$1,996,484	$2,017,405	$10,144,288	$10,411,648	$15,514,036	$36,069,971
AIP Discretionary Grants	1,080,263	890,737	15,293,410	0	0	17,264,410	24,670,335	0	41,934,744
CDOT Grants	1,400,000	1,500,000	1,500,000	1,500,000	2,000,000	7,900,000	1,699,895	917,446	10,517,342
Passenger Facility Charges (@$4.50)	1,115,110	888,374	903,652	919,193	935,001	4,761,330	4,916,832	13,791,531	23,469,693
PFC Eligible Debt Proceeds (25 yrs, 5.0%) Thru 2040	0		0	11,486,188	0	11,486,188	0	0	11,486,188
Less Principal Payments	0	0	0	(132,314)	(264,629)	(396,943)	(1,535,353)	(10,697,665)	(12,629,961)
Rental Car Customer Facility Charges	610,000	604,724	633,578	663,808	695,481	3,207,590	3,744,106	9,346,678	16,298,374
Private 3rd Party Financing (P3P)	0	0	22,402,507	249,542	1,647,741	24,299,790	3,423,592	18,305,364	46,028,747
Parking Facility Debt Proceeds (25 yrs, 5.0%) Thru 2040	0	0	0	38,513,812	0	38,513,812	0	0	38,513,812
Less Debt Service	0	0	0	(1,502,381)	(3,004,762)	(4,507,143)	(15,023,809)	(55,588,092)	(75,119,043)
SIB Loan Debt Service	(364,817)	(214,526)	(214,527)	(214,525)	0	(1,008,395)	0	0	(1,008,395)
Net Operating Cash Flow	622,992	1,421,591	1,999,573	5,058,067	4,943,371	14,045,595	29,268,175	81,369,224	124,682,993
Funds Available Current Year	6,678,025	7,030,906	44,494,110	58,537,873	8,969,608	125,710,522	61,575,421	72,958,523	260,244,465
Beginning Cash Balance/Funds Carried Over from Prior Year	11,019,878	10,117,308	14,431,369	8,560,664	45,030,631	11,019,878	1,421,499	14,824,712	11,019,878
Funds Used Current Year	(7,580,595)	(2,716,845)	(50,364,815)	(22,067,906)	(52,578,740)	(135,308,901)	(48,172,207)	(79,162,611)	(262,643,719)
Funds Carried Over to Next Year	$10,117,308	$14,431,369	$8,560,664	$45,030,631	$1,421,499	$1,421,499	$14,824,712	$8,620,624	$8,620,624
Rough Est DSC >>		13.59x	16.49x	3.07x	1.69x				

			Estimated Project Costs and Development Schedule								
		2012	Short Term								Total
		Base Year							Mid Term	Long Term	Escalated
	Capital Project Description	Costs	2012	2013	2014	2015	2016	Total	2017-2021	2022-2031	Costs
	OTHER CAPITAL PROJECTS										
	Short Term Projects (2012-2016)										
A.1	Airfield Pavement Maintenance	$780,114	$780,114	$0	$0	$0	$0	$780,114	$0	$0	$780,114
A.2	EA for Terminal Area Improvements	2,190,000	2,190,000		0	0	0	2,190,000	0	0	2,190,000
A.3	EA for West-Side Parallel Taxiway	575,000	575,000	0	0	0	0	575,000	0	0	575,000
OC1	Other Capital Projects	4,035,481	4,035,481	0	0	0	0	4,035,481	0	0	4,035,481
	Total Other Capital Projects 2012	$7,580,595	$7,580,595	$0	$0	$0	$0	$7,580,595	$0	$0	$7,580,595
A.4	Airfield Pavement Maintenance	$200,000	$0	$200,000	$0	$0	$0	$200,000	$0	$0	$200,000
OC2	Other Capital Projects	416,841	0	416,841	0	0	0	416,841	0	0	416,841
	Total Other Capital Projects 2013	$616,841	$0	$616,841	$0	$0	$0	$616,841	$0	$0	$616,841
A.5a	Airfield Pavement Maintenance	$200,000	$0	$0	$200,000	$0	$0	$200,000	$0	$0	$200,000
A.5b	Airfield Pavement Rehabilitation	398,132	0	0	418,287	0	0	418,287	0	0	418,287
A.6	Construct Buffer Between Existing Terminal & GA Apron	3,263,700	0	0	3,428,925	0	0	3,428,925	0	0	3,428,925
A.7	Construct West-Side GA Parallel Taxiway & Connectors	10,160,000	0	0	10,674,350	0	0	10,674,350	0	0	10,674,350
A.8	Construct West-Side GA Access Roadway & Parking	1,939,604	0	0	2,037,796	0	0	2,037,796	0	0	2,037,796
A.9	Construct West-Side GA Aircraft Parking Apron (280K sf)	9,411,535	0	0	9,887,994	0	0	9,887,994	0	0	9,887,994
A.10	Construct West-Side FBO Terminal (5,000 sf)	1,138,500	0	0	1,196,137	0	0	1,196,137	0	0	1,196,137
A.11	Construct West-Side FBO Shop Hangar (5,000 sf)	1,019,286	0	0	1,070,887	0	0	1,070,887	0	0	1,070,887
A.12	Construct West-Side FBO Storage Hangar (14,400 sf)	2,732,400	0	0	2,870,728	0	0	2,870,728	0	0	2,870,728
A.13	Construct West-Side GA Fuel Storage Area	2,511,472	0	0	2,638,615	0	0	2,638,615	0	0	2,638,615
A.14	Construct West-Side GA Aircraft Tie-Downs (30)	2,570,232	0	0	2,700,350	0	0	2,700,350	0	0	2,700,350
OC3	Other Capital Projects	2,144,299	0	0	2,144,299	0	0	2,144,299	0	0	2,144,299
	Total Other Capital Projects 2014	$37,489,160	$0	$0	$39,268,369	$0	$0	$39,268,369	$0	$0	$39,268,369
A.15	Airfield Pavement Maintenance	$150,000	$0	$0	$0	$150,000	$0	$150,000	$0	$0	$150,000
OC4	Other Capital Projects	1,745,307	0	0	0	1,745,307	0	1,745,307	0	0	1,745,307
	Total Other Capital Projects 2015	$1,895,307	$0	$0	$0	$1,895,307	$0	$1,895,307	$0	$0	$1,895,307
A.16	Construct AOC SRE Storage Improvements	$3,231,417	$0	$0	$0	$0	$3,566,880	$3,566,880	$0	$0	$3,566,880
A.17	Airfield Pavement Maintenance	0	0	0	0	0	0	0	0	0	0
OC5	Other Capital Projects	913,439	0	0	0	0	913,439	913,439	0	0	913,439
	Total Other Capital Projects 2016	$4,144,856	$0	$0	$0	$0	$4,480,319	$4,480,319	$0	$0	$4,480,319
	Total Short Term Projects (2012-2016)	$51,726,759	$7,580,595	$616,841	$39,268,369	$1,895,307	$4,480,319	$53,841,430	$0	$0	$53,841,430
	Mid Term Projects (2017-2021)										
B.1	Airfield Pavement Rehabilitation	$669,467	$0	$0	$0	$0	$0	$0	$757,440	$0	$757,440
B.2	Construct Aircraft Parking Apron	108,113	0	0	0	0	0	0	126,935	0	126,935
B.3	Construct New GSE Storage Building	880,440	0	0	0	0	0	0	1,033,725	0	1,033,725
B.4	Install R/W 15 Touchdown Zone Lighting	1,360,255	0	0	0	0	0	0	1,597,076	0	1,597,076
B.5	Movement Area Incursion Improvements/Fuel Storage Area Relocation	2,225,168	0	0	0	0	0	0	2,612,570	0	2,612,570
B.6	Construct GA Roadway & Parking Support East-Side Area	534,748	0	0	0	0	0	0	627,848	0	627,848
B.7	Relocate Segmented Circle & Wind Sock	9,488	0	0	0	0	0	0	11,140	0	11,140
B.8	Relocate Existing FBO Terminal Next to Pax Terminal	1,894,494	0	0	0	0	0	0	2,224,326	0	2,224,326
B.9	Construct GA Parking Apron Next to Pax Terminal	2,612,660	0	0	0	0	0	0	3,067,524	0	3,067,524
B.10a	Airfield Pavement Maintenance	1,250,000	0	0	0	0	0	0	1,250,000	0	1,250,000
B.10b	Airfield Pavement Rehabilitation	0	0	0	0	0	0	0	0	0	0
OC6a	Other Capital Projects-2017	584,476	0	0	0	0	0	0	584,476	0	584,476
OC6b	Other Capital Projects-2018	1,240,741	0	0	0	0	0	0	1,240,741	0	1,240,741
OC6c	Other Capital Projects	3,210,000	0	0	0	0	0	0	3,210,000	0	3,210,000
	Total Mid Term Projects (2017-2021)	$16,580,050	$0	$0	$0	$0	$0	$0	$18,343,801	$0	$18,343,801

ASPEN/PITKIN COUNTY AIRPORT
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Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Estimated Project Costs and Development Schedule

15-May-12

	Funding Schedule								
	Short Term						Mid Term	Long Term	Total
Capital Improvement Program	2012	2013	2014	2015	2016	Total	2017-2021	2022-2031	Funding
Funds Used for Capital Improvement Projects			total debt proceeds =	$50,000,000					
AIP Entitlement Grants	$2,214,477	$1,940,006	$1,975,917	$1,996,484	$2,017,405	$10,144,288	$10,411,648	$15,514,036	$36,069,971
AIP Discretionary Grants	1,080,263	890,737	15,293,410	0	0	17,264,410	24,670,335	0	41,934,744
CDOT Grants	1,400,000	1,500,000	1,500,000	1,500,000	2,000,000	7,900,000	1,699,895	917,446	10,517,342
Passenger Facility Charges (@$4.50)	1,115,110	888,374	903,652	919,193	935,001	4,761,330	4,916,832	13,791,531	23,469,693
PFC Eligible Debt Proceeds (25 yrs, 5.0%) Thru 2040	0		0	11,486,188	0	11,486,188	0	0	11,486,188
Less Principal Payments	0	0	0	(132,314)	(264,629)	(396,943)	(1,535,353)	(10,697,665)	(12,629,961)
Rental Car Customer Facility Charges	610,000	604,724	633,578	663,808	695,481	3,207,590	3,744,106	9,346,678	16,298,374
Private 3rd Party Financing (P3P)	0	0	22,402,507	249,542	1,647,741	24,299,790	3,423,592	18,305,364	46,028,747
Parking Facility Debt Proceeds (25 yrs, 5.0%) Thru 2040	0	0	0	38,513,812	0	38,513,812	0	0	38,513,812
Less Debt Service	0	0	0	(1,502,381)	(3,004,762)	(4,507,143)	(15,023,809)	(55,588,092)	(75,119,043)
SIB Loan Debt Service	(364,817)	(214,526)	(214,527)	(214,525)	0	(1,008,395)	0	0	(1,008,395)
Net Operating Cash Flow	622,992	1,421,591	1,999,573	5,058,067	4,943,371	14,045,595	29,268,175	81,369,224	124,682,993
Funds Available Current Year	6,678,025	7,030,906	44,494,110	58,537,873	8,969,608	125,710,522	61,575,421	72,958,523	260,244,465
Beginning Cash Balance/Funds Carried Over from Prior Year	11,019,878	10,117,308	14,431,369	8,560,664	45,030,631	11,019,878	1,421,499	14,824,712	11,019,878
Funds Used Current Year	(7,580,595)	(2,716,845)	(50,364,815)	(22,067,906)	(52,578,740)	(135,308,901)	(48,172,207)	(79,162,611)	(262,643,719)
Funds Carried Over to Next Year	$10,117,308	$14,431,369	$8,560,664	$45,030,631	$1,421,499	$1,421,499	$14,824,712	$8,620,624	$8,620,624
	Rough Est DSC >>	13.59x	16.49x	3.07x	1.69x				

		2012	Estimated Project Costs and Development Schedule								
			Short Term								Total
		Base Year							Mid Term	Long Term	Escalated
Capital Project Description		Costs	2012	2013	2014	2015	2016	Total	2017-2021	2022-2031	Costs
Long Term Projects (2022-2031)											
C.1	Construct Conventional Hangar Near Exiting FBO Terminal	$3,795,000	$0	$0	$0	$0	$0	$0	$0	$5,362,236	$5,362,236
C.2	Relocate ASOS	79,063	0	0	0	0	0	0	0	111,714	111,714
C.3	Construct Aircraft Parking Apron North of Patio Hangars	1,225,856	0	0	0	0	0	0	0	1,732,102	1,732,102
C.4	Improve/Replace Existing Patio Hangars	7,077,188	0	0	0	0	0	0	0	9,999,881	9,999,881
C.5	Construct Small GA Hangars (10 Units)	2,083,016	0	0	0	0	0	0	0	2,943,247	2,943,247
C.6a	Taxiway Lighting System Rehab	350,000	0	0	0	0	0	0	0	494,541	494,541
C.6b	Runway Lighting System Rehab	350,000	0	0	0	0	0	0	0	494,541	494,541
C.7	EMS Aircraft Parking/Deice Pad	2,398,316	0	0	0	0	0	0	0	3,388,758	3,388,758
C.8a	Airfield Pavement Maintenance	2,403,869	0	0	0	0	0	0	0	3,396,604	3,396,604
C.8b	Airfield Pavement Rehabilitation	5,044,165	0	0	0	0	0	0	0	7,127,273	7,127,273
OC7	Other Capital Projects	5,000,000	0	0	0	0	0	0	0	5,000,000	5,000,000
	Total Long Term Projects (2022-2031)	$29,806,473	$0	$0	$0	$0	$0	$0	$0	$40,050,897	$40,050,897
Total Other Capital Projects		$98,113,282	$7,580,595	$616,841	$39,268,369	$1,895,307	$4,480,319	$53,841,430	$18,343,801	$40,050,897	$112,236,128
Total Terminal Area Plan and Other Capital Project Costs		$218,978,702	$7,580,595	$2,716,845	$50,364,815	$22,067,906	$52,578,740	$135,308,901	$48,172,207	$79,162,611	$262,643,719

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Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
PFC Eligible Debt

15-May-12

Debt Issue Structure

Issue Date:	01-Jan-15
Interest:	5.0%
Term:	25 Years
Project Funding Requirement:	$11,486,188
Debt Service Reserve Fund Requirement (MADS):	896,127
Capitalized Debt Issue Costs (2%):	247,646
Total Debt Requirement:	$12,629,961

Notes:

(1) Assumes no interest earnings on Construction Fund balance or Debt Service Reserve Fund deposit.

Debt Service Schedule

Payment Number	Year	Beginning Principal	Annual Debt Service	Interest Payment	Principal Payment	Ending Principal
1	2016	$12,629,961	$896,127	$631,498	$264,629	$12,365,332
2	2017	12,365,332	896,127	618,267	277,860	12,087,472
3	2018	12,087,472	896,127	604,374	291,753	11,795,719
4	2019	11,795,719	896,127	589,786	306,341	11,489,378
5	2020	11,489,378	896,127	574,469	321,658	11,167,720
6	2021	11,167,720	896,127	558,386	337,741	10,829,980
7	2022	10,829,980	896,127	541,499	354,628	10,475,352
8	2023	10,475,352	896,127	523,768	372,359	10,102,993
9	2024	10,102,993	896,127	505,150	390,977	9,712,015
10	2025	9,712,015	896,127	485,601	410,526	9,301,489
11	2026	9,301,489	896,127	465,074	431,052	8,870,437
12	2027	8,870,437	896,127	443,522	452,605	8,417,832
13	2028	8,417,832	896,127	420,892	475,235	7,942,597
14	2029	7,942,597	896,127	397,130	498,997	7,443,600
15	2030	7,443,600	896,127	372,180	523,947	6,919,653
16	2031	6,919,653	896,127	345,983	550,144	6,369,509
17	2032	6,369,509	896,127	318,475	577,651	5,791,858
18	2033	5,791,858	896,127	289,593	606,534	5,185,324
19	2034	5,185,324	896,127	259,266	636,861	4,548,464
20	2035	4,548,464	896,127	227,423	668,704	3,879,760
21	2036	3,879,760	896,127	193,988	702,139	3,177,621
22	2037	3,177,621	896,127	158,881	737,246	2,440,375
23	2038	2,440,375	896,127	122,019	774,108	1,666,267
24	2039	1,666,267	896,127	83,313	812,813	853,454
25	2040	853,454	896,127	42,673	853,454	0
	Totals		$22,403,169	$9,773,208	$12,629,961	

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Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Parking Facility Debt

15-May-12

Debt Issue Structure

Issue Date:	01-Jan-15
Interest:	5.0%
Term:	25 Years
Project Funding Requirement:	$38,513,812
Debt Service Reserve Fund Requirement (MADS):	3,004,762
Capitalized Debt Issue Costs (2%):	830,371
Total Debt Requirement:	$42,348,945

Notes:
(1) Assumes no interest earnings on Construction Fund balance or Debt Service Reserve Fund deposit.

Debt Service Schedule

Payment Number	Year	Beginning Principal	Annual Debt Service	Interest Payment	Principal Payment	Ending Principal
1	2016	$42,348,945	$3,004,762	$2,117,447	$887,314	$41,461,631
2	2017	41,461,631	3,004,762	2,073,082	931,680	40,529,951
3	2018	40,529,951	3,004,762	2,026,498	978,264	39,551,686
4	2019	39,551,686	3,004,762	1,977,584	1,027,177	38,524,509
5	2020	38,524,509	3,004,762	1,926,225	1,078,536	37,445,973
6	2021	37,445,973	3,004,762	1,872,299	1,132,463	36,313,510
7	2022	36,313,510	3,004,762	1,815,675	1,189,086	35,124,423
8	2023	35,124,423	3,004,762	1,756,221	1,248,541	33,875,883
9	2024	33,875,883	3,004,762	1,693,794	1,310,968	32,564,915
10	2025	32,564,915	3,004,762	1,628,246	1,376,516	31,188,399
11	2026	31,188,399	3,004,762	1,559,420	1,445,342	29,743,057
12	2027	29,743,057	3,004,762	1,487,153	1,517,609	28,225,449
13	2028	28,225,449	3,004,762	1,411,272	1,593,489	26,631,959
14	2029	26,631,959	3,004,762	1,331,598	1,673,164	24,958,796
15	2030	24,958,796	3,004,762	1,247,940	1,756,822	23,201,974
16	2031	23,201,974	3,004,762	1,160,099	1,844,663	21,357,311
17	2032	21,357,311	3,004,762	1,067,866	1,936,896	19,420,414
18	2033	19,420,414	3,004,762	971,021	2,033,741	17,386,673
19	2034	17,386,673	3,004,762	869,334	2,135,428	15,251,245
20	2035	15,251,245	3,004,762	762,562	2,242,199	13,009,046
21	2036	13,009,046	3,004,762	650,452	2,354,309	10,654,736
22	2037	10,654,736	3,004,762	532,737	2,472,025	8,182,711
23	2038	8,182,711	3,004,762	409,136	2,595,626	5,587,085
24	2039	5,587,085	3,004,762	279,354	2,725,407	2,861,678
25	2040	2,861,678	3,004,762	143,084	2,861,678	0
	Totals		$75,119,043	$32,770,098	$42,348,945	

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Table 10-4

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Projected Capital Funding Sources

15-May-12

Capital Improvement Projects	Total Escalated Costs	AIP Entitlement Funding	AIP Discretionary Funding	Total AIP Funding	CDOT Grants	Passenger Facility Charges (Debt)	Passenger Facility Charges (PAYG)	Private 3rd Party Financing (P3P)	Cash Reserves/ Net Revenues	Total Funding
TERMINAL AREA PLAN PHASES										
Phase 1 - Existing Pax Apron Reconstruction										
T1.0 Existing Commercial Apron Reconstruction	$6,318,327	$0	$5,686,495	$5,686,495	$315,916	$315,916	$0	$0	$0	$6,318,327
Phase 2 - New Terminal Concourse										
T2.1 Airline Functions	$12,699,664	$4,867,409		$4,867,409	$3,034,983	$4,797,272			$0	$12,699,664
T2.2 Baggage Security Screening	614,085			0	30,704	583,381			0	614,085
T2.3 Concessions-Eligible	381,322			0	19,066	362,256			0	381,322
T2.4 Concessions-Ineligible	249,542			0				249,542	0	249,542
T2.5 Public Areas	6,593,242	3,056,231		3,056,231	1,727,656	1,809,356			0	6,593,242
T2.6 Non-Public Areas-Eligible	1,408,093			0	70,405	1,337,688			0	1,408,093
T2.7 Non-Public Areas-Ineligible	10,907			0					10,907	10,907
Total Phase 2 - New Terminal Concourse	$21,956,854	$7,923,640	$0	$7,923,640	$4,882,814	$8,889,952	$0	$249,542	$10,907	$21,956,854
Phase 3 - New Auto Roads & Parking										
Phase 3a - Short Term Development										
T3.1 Main Terminal Access & Loop Roads	$1,208,124	$1,087,311		$1,087,311	$60,406	$60,406			$0	$1,208,124
T3.2 Public Parking Access Roads	142,118			0					142,118	142,118
T3.3 RAC Parking Access Roads	264,957			0					264,957	264,957
T3.4 FBO Facility Access Roads	61,790			0					61,790	61,790
T3.5 Auto Parking Garage:										
T3.5a Public (480 spaces)	23,068,376			0					23,068,376	23,068,376
T3.5b Employee (0 spaces)	0			0					0	0
T3.5c RAC (270 spaces)	12,975,962			0					12,975,962	12,975,962
T3.5d FBO (0 spaces)	0			0				0	0	0
T3.6 Auto Parking Surface:										
T3.6a Employee (90 spaces)	1,853,709			0					1,853,709	1,853,709
T3.6b RAC (60 spaces)	1,235,806			0					1,235,806	1,235,806
T3.6c FBO (80 spaces)	1,647,741			0				1,647,741	0	1,647,741
T3.7 RAC Support Facilities	2,625,071			0					2,625,071	2,625,071
T3.8 Landscaping	1,235,806			0					1,235,806	1,235,806
T3.9 Site Demolition-Eligible	94,908	85,417		85,417	4,745	4,745			0	94,908
T3.10 Site Demolition-Ineligible	3,543,854			0					3,543,854	3,543,854
Phase 3b - Long Term Development Added Garage Spaces>PUB+69, EMP+88, RAC+243, FBO+150=+550 new + 750 Phase 3a = 1,300 Total at Completion	33,231,034			0					33,231,034	33,231,034
Total Phase 3 - New Auto Roads & Parking	$83,189,255	$1,172,728	$0	$1,172,728	$65,152	$65,152	$0	$1,647,741	$80,238,482	$83,189,255
Phase 4 - New Commercial Apron										
T4.0 New Commercial Apron Construction	$5,259,805	$0	$4,733,824	$4,733,824	$262,990		$262,990		$0	$5,259,805
-	0	0	0	0	0	0	0	0	0	0
Total Phase 4 - New Commercial Apron	$5,259,805	$0	$4,733,824	$4,733,824	$262,990	$0	$262,990	$0	$0	$5,259,805
Phase 5 - New Terminal Completion										
T5.1 Airline Functions-Eligible	$7,593,400	$0	$6,834,060	$6,834,060		$759,340			$0	$7,593,400
T5.2 Airline Functions-Ineligible	165,542			0				165,542	0	165,542
T5.3 Passenger & Baggage Security Screening-Eligible	1,858,290		1,672,461	1,672,461		185,829			0	1,858,290
T5.4 Passenger & Baggage Security Screening-Ineligible	421,970			0					421,970	421,970
T5.5 Concessions-Eligible	943,337		849,003	849,003		94,334			0	943,337
T5.6 Concessions-Ineligible	47,390			0					47,390	47,390
T5.7 Public Areas	6,387,685		5,748,916	5,748,916		638,768			0	6,387,685
T5.8 Non-Public Areas-Eligible	5,368,967		4,832,070	4,832,070		536,897			0	5,368,967
T5.9 Non-Public Areas-Ineligible	1,123,561			0					1,123,561	1,123,561
Total Phase 5 - New Terminal Completion	$23,910,142	$0	$19,936,510	$19,936,510	$0	$2,215,168	$0	$165,542	$1,592,922	$23,910,142
Total Terminal Area Plan Costs Before Financing	$140,634,383	$9,096,368	$30,356,829	$39,453,197	$5,526,872	$11,486,188	$262,990	$2,062,825	$81,842,310	$140,634,383
Financing Costs for Debt Serviced with PFCs	9,773,208					9,773,208				9,773,208
Total Terminal Area Plan Costs	$150,407,591	$9,096,368	$30,356,829	$39,453,197	$5,526,872	$21,259,396	$262,990	$2,062,825	$81,842,310	$150,407,591

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Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Projected Capital Funding Sources

15-May-12

	Capital Improvement Projects	Total Escalated Costs	AIP Entitlement Funding	AIP Discretionary Funding	Total AIP Funding	CDOT Grants	Passenger Facility Charges (Debt)	Passenger Facility Charges (PAYG)	Private 3rd Party Financing (P3P)	Cash Reserves/ Net Revenues	Total Funding
OTHER CAPITAL PROJECTS											
Short Term Projects (2012-2016)											
A.1	Airfield Pavement Maintenance	$780,114			$0					$780,114	$780,114
A.2	EA for Terminal Area Improvements	2,190,000	0	1,971,000	1,971,000	109,500		109,500		0	2,190,000
A.3	EA for West-Side Parallel Taxiway	575,000	517,500		517,500	28,750		28,750		0	575,000
OC1	Other Capital Projects	4,035,481	0	0	0	1,261,750	0	0	0	2,773,731	4,035,481
	Total Other Capital Projects 2012	$7,580,595	$517,500	$1,971,000	$2,488,500	$1,400,000	$0	$138,250	$0	$3,553,845	$7,580,595
A.4	Airfield Pavement Maintenance	$200,000			$0					$200,000	$200,000
OC2	Other Capital Projects	416,841	0	0	0	0	0	0	0	416,841	416,841
	Total Other Capital Projects 2013	$616,841	$0	$0	$0	$0	$0	$0	$0	$616,841	$616,841
A.5a	Airfield Pavement Maintenance	$200,000			$0					$200,000	$200,000
A.5b	Airfield Pavement Rehabilitation	418,287	376,459		376,459	20,914		20,914		0	418,287
A.6	Construct Buffer Between Existing Terminal & GA Apron	3,428,925			0					3,428,925	3,428,925
A.7	Construct West-Side GA Parallel Taxiway & Connectors	10,674,350		9,606,915	9,606,915	533,718		533,718		0	10,674,350
A.8	Construct West-Side GA Access Roadway & Parking	2,037,796			0				2,037,796	0	2,037,796
A.9	Construct West-Side GA Aircraft Parking Apron (280K sf)	9,887,994			0				9,887,994	0	9,887,994
A.10	Construct West-Side FBO Terminal (5,000 sf)	1,196,137			0				1,196,137	0	1,196,137
A.11	Construct West-Side FBO Shop Hangar (5,000 sf)	1,070,887			0				1,070,887	0	1,070,887
A.12	Construct West-Side FBO Storage Hangar (14,400 sf)	2,870,728			0				2,870,728	0	2,870,728
A.13	Construct West-Side GA Fuel Storage Area	2,638,615			0				2,638,615	0	2,638,615
A.14	Construct West-Side GA Aircraft Tie-Downs (30)	2,700,350			0				2,700,350	0	2,700,350
OC3	Other Capital Projects	2,144,299	0	0	0	107,215	0	0	0	2,037,084	2,144,299
	Total Other Capital Projects 2014	$39,268,369	$376,459	$9,606,915	$9,983,374	$661,847	$0	$554,632	$22,402,507	$5,666,009	$39,268,369
A.15	Airfield Pavement Maintenance	$150,000			$0					$150,000	$150,000
OC4	Other Capital Projects	1,745,307	0	0	0	87,265	0	0	0	1,658,042	1,745,307
	Total Other Capital Projects 2015	$1,895,307	$0	$0	$0	$87,265	$0	$0	$0	$1,808,042	$1,895,307
A.16	Construct AOC SRE Storage Improvements	$3,566,880	$3,210,192		$3,210,192	$178,344		$178,344		$0	$3,566,880
A.17	Airfield Pavement Maintenance	0			0					0	0
OC5	Other Capital Projects	913,439	0	0	0	45,672	0	0	0	867,767	913,439
	Total Other Capital Projects 2016	$4,480,319	$3,210,192	$0	$3,210,192	$224,016	$0	$178,344	$0	$867,767	$4,480,319
	Total Short Term Projects (2012-2016)	$53,841,430	$4,104,150	$11,577,915	$15,682,065	$2,373,128	$0	$871,226	$22,402,507	$12,512,504	$53,841,430
Mid Term Projects (2017-2021)											
B.1	Airfield Pavement Rehabilitation	$757,440	$681,696		$681,696	$37,872		$37,872		$0	$757,440
B.2	Construct Aircraft Parking Apron	126,935	114,242		114,242	6,347		6,347		0	126,935
B.3	Construct New GSE Storage Building	1,033,725			0				1,033,725	0	1,033,725
B.4	Install R/W 15 Touchdown Zone Lighting	1,597,076	1,437,368		1,437,368	79,854		79,854		0	1,597,076
B.5	Movement Area Incursion Improvements/Fuel Storage Area Relocation	2,612,570	2,351,313	0	2,351,313	130,628		130,628		0	2,612,570
B.6	Construct GA Roadway & Parking Support East-Side Area	627,848			0					627,848	627,848
B.7	Relocate Segmented Circle & Wind Sock	11,140	10,026		10,026	557		557		0	11,140
B.8	Relocate Existing FBO Terminal Next to Pax Terminal	2,224,326			0				2,224,326	0	2,224,326
B.9	Construct GA Parking Apron Next to Pax Terminal	3,067,524	2,760,772		2,760,772	153,376		153,376		0	3,067,524
B.10a	Airfield Pavement Maintenance	1,250,000			0					1,250,000	1,250,000
B.10b	Airfield Pavement Rehabilitation	0	0		0	0		0		0	0
OC6a	Other Capital Projects-2017	584,476	0	0	0	29,224	0	0	0	555,252	584,476
OC6b	Other Capital Projects-2018	1,240,741	0	0	0	62,037	0	0	0	1,178,704	1,240,741
OC6c	Other Capital Projects	3,210,000	0	0	0	1,200,000	0	0	0	2,010,000	3,210,000
	Total Mid Term Projects (2017-2021)	$18,343,801	$7,355,417	$0	$7,355,417	$1,699,895	$0	$408,634	$3,258,050	$5,621,804	$18,343,801

ASPEN/PITKIN COUNTY AIRPORT
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Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Projected Capital Funding Sources

15-May-12

	Capital Improvement Projects	Total Escalated Costs	AIP Entitlement Funding	AIP Discretionary Funding	Total AIP Funding	CDOT Grants	Passenger Facility Charges (Debt)	Passenger Facility Charges (PAYG)	Private 3rd Party Financing (P3P)	Cash Reserves/ Net Revenues	Total Funding
Long Term Projects (2022-2031)											
C.1	Construct Conventional Hangar Near Exiting FBO Terminal	$5,362,236			$0				$5,362,236	$0	$5,362,236
C.2	Relocate ASOS	111,714	100,543		100,543	5,586		5,586		0	111,714
C.3	Construct Aircraft Parking Apron North of Patio Hangars	1,732,102	1,558,892		1,558,892	86,605		86,605		0	1,732,102
C.4	Improve/Replace Existing Patio Hangars	9,999,881			0				9,999,881	0	9,999,881
C.5	Construct Small GA Hangars (10 Units)	2,943,247			0				2,943,247	0	2,943,247
C.6a	Taxiway Lighting System Rehab	494,541	445,087		445,087	24,727		24,727		0	494,541
C.6b	Runway Lighting System Rehab	494,541	445,087		445,087	24,727		24,727		0	494,541
C.7	EMS Aircraft Parking/Deice Pad	3,388,758	3,049,882		3,049,882	169,438		169,438		0	3,388,758
C.8a	Airfield Pavement Maintenance	3,396,604			0					3,396,604	3,396,604
C.8b	Airfield Pavement Rehabilitation	7,127,273	6,414,546		6,414,546	356,364		356,364		0	7,127,273
OC7	Other Capital Projects	5,000,000	3,500,000	0	3,500,000	250,000	0	0	0	1,250,000	5,000,000
	Total Long Term Projects (2022-2031)	$40,050,897	$15,514,036	$0	$15,514,036	$917,446	$0	$667,446	$18,305,364	$4,646,604	$40,050,897
Total Other Capital Projects		$112,236,128	$26,973,604	$11,577,915	$38,551,519	$4,990,470	$0	$1,947,307	$43,965,922	$22,780,911	$112,236,128
Total Terminal and Other Capital Project Costs		$262,643,719	$36,069,971	$41,934,744	$78,004,716	$10,517,342	$21,259,396	$2,210,297	$46,028,747	$104,623,222	$262,643,719

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

ASE_MP-TAP_FAB.123

Table 10-5

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Actual, Estimated, Budgeted and Projected Operations & Maintenance Expenses and Minor Capital Outlays

15-May-12

Operations & Maintenance Expenses and Minor Capital Outlays	Actual 2009	Actual 2010	Estimated 2011	Short Term: Budgeted 2012	Short Term: Projected 2013	Short Term: Projected 2014	Short Term: Projected 2015	Short Term: Projected 2016	Short Term: Total	Mid Term Projected 2017-2021	Long Term Projected 2022-2031
Terminal	$1,459,477	$1,662,236	$1,609,399	$1,948,212	$1,910,487	$1,749,060	$1,793,336	$2,103,928	$9,505,022	$11,307,302	$28,189,405
Annual Growth Rate	-	13.9%	-3.2%	21.1%	-1.9%	-8.4%	2.5%	17.3%	1.9%	2.6%	3.0%
ARFF	369,955	366,105	415,687	482,250	454,734	424,672	431,873	444,829	2,238,358	2,432,509	6,089,034
Annual Growth Rate	-	-1.0%	13.5%	16.0%	-5.7%	-6.6%	1.7%	3.0%	-2.0%	3.0%	3.0%
Roadway	418,988	373,604	435,936	508,914	484,129	455,064	467,012	481,022	2,396,140	2,630,425	6,584,454
Annual Growth Rate	-	-10.8%	16.7%	16.7%	-4.9%	-6.0%	2.6%	3.0%	-1.4%	3.0%	3.0%
AOA	952,867	959,582	1,074,982	1,274,793	1,126,036	1,136,518	1,114,168	1,147,593	5,799,109	6,275,509	15,708,793
Annual Growth Rate	-	0.7%	12.0%	18.6%	-11.7%	0.9%	-2.0%	3.0%	-2.6%	3.0%	3.0%
AOC Building	358,603	309,057	358,948	479,865	376,712	365,112	418,669	431,229	2,071,586	2,358,136	5,902,863
Annual Growth Rate	-	-13.8%	16.1%	33.7%	-21.5%	-3.1%	14.7%	3.0%	-2.6%	3.0%	3.0%
Parking	73,405	65,050	59,251	70,287	67,934	65,184	68,278	70,326	342,009	1,114,580	2,790,006
Annual Growth Rate	-	-11.4%	-8.9%	18.6%	-3.3%	-4.0%	4.7%	3.0%	0.0%	27.4%	3.0%
Security	174,534	171,316	188,259	216,887	209,625	200,163	208,647	214,906	1,050,228	1,175,194	2,941,734
Annual Growth Rate	-	-1.8%	9.9%	15.2%	-3.3%	-4.5%	4.2%	3.0%	-0.2%	3.0%	3.0%
Administration	295,233	296,206	313,548	371,947	359,492	343,268	357,816	368,550	1,801,072	2,015,383	5,044,887
Annual Growth Rate	-	0.3%	5.9%	18.6%	-3.3%	-4.5%	4.2%	3.0%	-0.2%	3.0%	3.0%
Projects	246,832	307,985	352,030	607,245	518,637	488,876	501,088	516,120	2,631,965	2,822,357	7,064,897
Annual Growth Rate	-	24.8%	14.3%	72.5%	-14.6%	-5.7%	2.5%	3.0%	-4.0%	3.0%	3.0%
Cost Centers	1,146,798	1,111,351	1,159,495	1,375,451	1,329,395	1,269,397	1,323,195	1,362,891	6,660,329	7,452,846	18,655,894
Annual Growth Rate	-	-3.1%	4.3%	18.6%	-3.3%	-4.5%	4.2%	3.0%	-0.2%	3.0%	3.0%
Total Operations & Maintenance Expenses and Minor Capital Outlays	$5,496,692	$5,622,492	$5,967,536	$7,335,852	$6,837,179	$6,497,314	$6,684,080	$7,141,394	$34,495,819	$39,584,240	$98,971,967
Annual Growth Rate	-	2.3%	6.1%	22.9%	-6.8%	-5.0%	2.9%	6.8%	-0.7%	3.3%	3.0%
Operating Expenses Per Enplaned Passenger											
Aspen/Pitkin County Airport	$25.02	$24.68	$26.75	$31.90	$29.23	$27.30	$27.61	$29.00	$28.98	$30.57	$33.73
Non-Hub Industry Average	$26.54	$27.33	$28.15	$29.00	$29.87	$30.76	$31.68	$32.64	$30.79	$35.69	$44.67

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

ASE_MP-TAP_FAB.123 Table 10-6

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Actual, Estimated, Budgeted and Projected Operating Revenues

15-May-12

Operating Revenues	Actual 2009	Actual 2010	Estimated 2011	Short Term: Budgeted 2012	Short Term: Projected 2013	Short Term: Projected 2014	Short Term: Projected 2015	Short Term: Projected 2016	Short Term: Total	Mid Term Projected 2017-2021	Long Term Projected 2022-2031
										ENP+INF	
										LDW+INF	
										INF	
										FIXED	
Airline Revenues											
Landing Fees	$1,301,824	$1,372,937	$1,225,373	$1,718,664	$1,826,881	$1,881,687	$1,938,138	$1,996,282	$9,361,653	$11,201,185	$29,894,323
Terminal Rent	1,243,786	1,311,728	1,158,157	1,405,320	1,493,807	1,538,621	1,584,780	1,632,323	7,654,851	8,926,213	22,344,011
Total Airline Revenues	$2,545,610	$2,684,665	$2,383,530	$3,123,984	$3,320,688	$3,420,309	$3,522,918	$3,628,605	$17,016,504	$20,127,397	$52,238,334
Annual Growth Rate	-	5.5%	-11.2%	31.1%	6.3%	3.0%	3.0%	3.0%	8.8%	3.5%	3.5%
Airline Cost Per Enplaned Passenger:											
Aspen/Pitkin County Airport	$11.59	$11.79	$10.68	$13.58	$14.19	$14.37	$14.55	$14.74	$14.30	$15.55	$17.80
Resort Airport Average	$14.40	$14.83	$15.27	$15.73	$16.21	$16.69	$17.19	$17.71	$16.71	$19.37	$24.24
Non-Airline Revenues											
GA Landing Fees	$982,113	$1,035,761	$1,011,419	$1,247,263	$1,325,798	$1,365,572	$1,406,539	$1,448,735	$6,793,907	$8,128,886	$21,694,806
Fuel Flowage Fees	285,556	301,155	395,620	400,000	425,186	437,942	451,080	464,613	2,178,821	2,606,952	6,957,572
FBO Rent	151,517	159,794	210,969	167,412	177,953	183,292	3,188,791	3,284,454	7,001,902	17,960,742	44,959,159
Patio Shelters Maintenance Fees	118,976	125,475	86,089	89,218	94,836	97,681	100,611	103,630	485,975	566,689	1,418,530
Rental Car Concession Fees	1,357,342	1,431,487	1,432,897	948,606	1,008,336	1,038,586	1,069,743	1,101,836	5,167,106	6,343,163	18,047,441
Rental Car Space Rent	281,574	296,955	297,248	352,800	375,014	386,265	397,853	409,788	1,921,720	2,240,890	5,609,375
Bar and Restaurant Concession Fees	39,163	41,302	38,523	39,924	42,438	43,711	45,022	46,373	217,468	266,965	759,563
Bar and Restaurant Space Rent	9,652	10,180	9,495	9,600	10,204	10,511	10,826	11,151	52,292	60,977	152,636
Gift Shop Concession Fees	50,421	53,175	44,682	46,306	49,222	50,698	52,219	53,786	252,231	309,640	880,982
Gift Shop Space Rent	34,277	36,149	30,376	31,480	33,462	34,466	35,500	36,565	171,473	199,952	500,519
Ground Transportation Fees	43,393	45,763	53,730	55,683	59,189	60,965	62,794	64,678	303,308	372,343	1,059,382
Public Parking Fees	492,461	519,362	543,977	525,000	558,057	574,799	592,043	609,804	2,859,702	5,171,201	14,712,999
Advertising Concession Fees	299,925	316,309	299,187	302,500	321,547	321,547	321,547	321,547	1,588,689	1,758,352	4,401,489
Other Concession Rentals	24,300	25,627	24,213	25,112	26,694	27,495	28,319	29,169	136,789	159,508	399,278
Other Revenues	60,777	64,097	82,493	85,558	90,945	93,673	96,483	99,378	466,036	543,438	1,360,329
Total Non-Airline Revenues	$4,231,447	$4,462,592	$4,560,918	$4,326,462	$4,598,881	$4,727,201	$7,859,371	$8,085,505	$29,597,420	$46,689,697	$122,914,061
Annual Growth Rate	-	5.5%	2.2%	-5.1%	6.3%	2.8%	66.3%	2.9%	12.1%	4.4%	3.7%
Total Operating Revenues	$6,777,057	$7,147,257	$6,944,448	$7,450,446	$7,919,569	$8,147,510	$11,382,289	$11,714,111	$46,613,924	$66,817,094	$175,152,394
Annual Growth Rate	-	5.5%	-2.8%	7.3%	6.3%	2.9%	39.7%	2.9%	11.0%	4.1%	3.6%
Other Non-Operating Revenues											
Investment Income	$188,074	$186,073	$102,697	$84,680	$56,498	$58,193	$59,939	$61,737	$321,047	$308,685	$617,371
State Fuel Excise Tax	96,209	95,185	99,426	117,098	78,127	80,471	82,885	85,372	443,954	479,023	1,278,443
State Fuel Sales Tax Rebate	270,557	267,678	247,563	291,564	194,530	200,366	206,377	212,569	1,105,407	1,192,727	3,183,214
Proceeds from F/A Disposition	10,000	9,894	182,766	15,056	10,045	10,347	10,657	10,977	57,082	54,884	109,768
Total Non-Operating Revenues	$564,840	$558,830	$632,453	$508,398	$339,201	$349,377	$359,859	$370,654	$1,927,489	$2,035,320	$5,188,796
Annual Growth Rate	-	-1.1%	13.2%	-19.6%	-33.3%	3.0%	3.0%	3.0%	-10.1%	3.2%	3.3%
Total Revenues	$7,341,897	$7,706,087	$7,576,901	$7,958,844	$8,258,770	$8,496,887	$11,742,147	$12,084,765	$48,541,413	$68,852,414	$180,341,191
Annual Growth Rate	-	5.0%	-1.7%	5.0%	3.8%	2.9%	38.2%	2.9%	9.8%	4.1%	3.6%
Total Revenues Per Enplaned Passenger											
Aspen/Pitkin County Airport	$30.85	$31.38	$31.13	$32.40	$33.85	$34.24	$47.02	$47.58	$39.17	$51.61	$59.69
Non-Hub Industry Average	$30.18	$31.09	$32.02	$32.98	$33.97	$34.99	$36.04	$37.12	$35.02	$40.59	$50.81

ASPEN/PITKIN COUNTY AIRPORT
Aspen, Colorado

ASE_MP-TAP_FAB.123 Table 10-7

Master Plan Update/Terminal Area Plan - Concept C1 - Financial Analysis
Scenario 3: Phase 3a-Short Term Reduced Parking Opt 02; Phase 3b-Parking Long Term; Short Term W/S FBO Dev
Financial Plan Summary
Budgeted and Projected Net Revenues, Capital Funding and Capital Expenditures

15-May-12

Operating/Capital Cash Flow	Short Term						Mid Term	Long Term
	Budgeted	Projected					Projected	Projected
	2012	2013	2014	2015	2016	Total	2017-2021	2022-2031
Operating Cash Flow								
Revenues:								
Airline Revenues	$3,123,984	$3,320,688	$3,420,309	$3,522,918	$3,628,605	$17,016,504	$20,127,397	$52,238,334
Non-Airline Revenues	4,326,462	4,598,881	4,727,201	7,859,371	8,085,505	29,597,420	46,689,697	122,914,061
Non-Operating Revenues	508,398	339,201	349,377	359,859	370,654	1,927,489	2,035,320	5,188,796
Total Revenues	$7,958,844	$8,258,770	$8,496,887	$11,742,147	$12,084,765	$48,541,413	$68,852,414	$180,341,191
Operations & Maintenance Expenses	$7,335,852	$6,837,179	$6,497,314	$6,684,080	$7,141,394	$34,495,819	$39,584,240	$98,971,967
Operating Net Cash Flow	$622,992	$1,421,591	$1,999,573	$5,058,067	$4,943,371	$14,045,595	$29,268,175	$81,369,224
Capital Cash Flow								
Beginning Cash Balance	$11,019,878	$10,117,308	$14,431,369	$8,560,664	$45,030,631	$11,019,878	$1,421,499	$14,824,712
Other Capital Funding Sources:								
AIP Entitlement Grants	$2,214,477	$1,940,006	$1,975,917	$1,996,484	$2,017,405	$10,144,288	$10,411,648	$15,514,036
AIP Discretionary Grants	1,080,263	890,737	15,293,410	0	0	17,264,410	24,670,335	0
CDOT Grants	1,400,000	1,500,000	1,500,000	1,500,000	2,000,000	7,900,000	1,699,895	917,446
Passenger Facility Charges (@$4.50)	1,115,110	888,374	903,652	919,193	935,001	4,761,330	4,916,832	13,791,531
PFC Eligible Debt Proceeds (25 yrs, 5.0%) Thru 2040	0	0	0	11,486,188	0	11,486,188	0	0
Less Principal Payments	0	0	0	(132,314)	(264,629)	(396,943)	(1,535,353)	(10,697,665)
Rental Car Customer Facility Charges	610,000	604,724	633,578	663,808	695,481	3,207,590	3,744,106	9,346,678
Private 3rd Party Financing (P3P)	0	0	22,402,507	249,542	1,647,741	24,299,790	3,423,592	18,305,364
Parking Facility Debt Proceeds (25 yrs, 5.0%) Thru 2040	0	0	0	38,513,812	0	38,513,812	0	0
Less Debt Service	0	0	0	(1,502,381)	(3,004,762)	(4,507,143)	(15,023,809)	(55,588,092)
SIB Loan Debt Service	(364,817)	(214,526)	(214,527)	(214,525)	0	(1,008,395)	0	0
Total Other Capital Funding Sources	$6,055,033	$5,609,315	$42,494,537	$53,479,806	$4,026,237	$111,664,927	$32,307,246	($8,410,701)
Total Funds Available for Capital Expenditures	$17,697,903	$17,148,214	$58,925,479	$67,098,537	$54,000,238	$136,730,400	$62,996,920	$87,783,235
Capital Improvement Program Expenditures	7,580,595	2,716,845	50,364,815	22,067,906	52,578,740	135,308,901	48,172,207	79,162,611
Ending Cash Balance	$10,117,308	$14,431,369	$8,560,664	$45,030,631	$1,421,499	$1,421,499	$14,824,712	$8,620,624

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Chapter 11

Airport Plans

MASTERPLAN UPDATE

11.1 Introduction

The plan for the future development of Aspen/Pitkin County Airport has evolved from an analysis of many considerations. Among these are: aviation demand forecasts and facility requirements; aircraft operational characteristics; construction phasing; environmental considerations; and, as characterized in the previously noted statement of goals, the general direction of airport development prescribed by Pitkin County management and staff. Forecasts are utilized as a basis for planning; however, facilities are only to be constructed to meet actual demand. Previous chapters have established and quantified the future development needs of the Airport. In this chapter, the various elements of the plan are categorically reviewed and detailed in summary and graphic format. A brief written description of the individual elements, represented in the set of Airport Plans for Aspen/Pitkin County Airport, is accompanied by a graphic description presented in the form of the *Airport Layout Plan*, the *Airport Airspace Drawings*, the *Inner Portion of the Approach Surface Drawings*, the *Departure Surface Drawings*, the *Terminal Area Plans*, *the Land Use Drawing*, and the *Airport Property Map*.

11.2 Airport Layout Plan

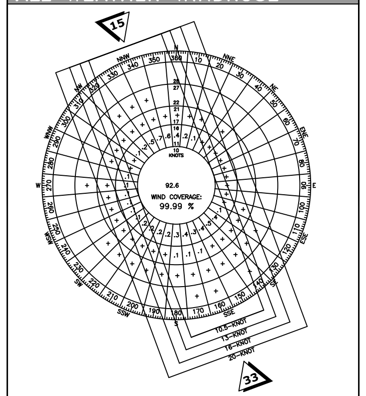
The Airport Layout Plan (ALP) is a graphic depiction of existing and ultimate airport facilities that will be required to enable the Airport to properly accommodate the forecast future demand. In addition, the ALP also provides detailed information on both airport and runway design criteria, which is necessary to define relationships with applicable standards. The following illustration (**Figure 11-1**) and the following paragraphs describe the major components of the future Airport Development Plan.

11.2.1 Runway System

The Airport's single runway configuration will be retained throughout the 20-year planning period. The straight-in instrument approach capabilities at the Airport will continue to be associated with Runway 15 (accommodating approaches from the north). Improvements are programmed for the Runway 15 straight-in approach, which will likely lower its approach visibility minimums. The physical layout of the Airport is programmed to accommodate instrument approach capabilities with a visibility minimum as low as one mile (the current public-use approach visibility minimum is three miles).

Runway Lighting and Landing Aids. The Medium Intensity Runway Lights (MIRLs) serving Runway 15/33 should be maintained. The Precision Approach Path Indicator (PAPI) lights and the Medium Intensity Approach Lighting System with Sequenced Flashers (MALSF) serving the Runway 15 end should be maintained. Consideration should be given to runway touchdown zone lighting and runway centerline lighting in the future. Finally, the Runway End Identifier Lights (REILs) serving Runway 33 should also be maintained.

ALL WEATHER WINDROSE

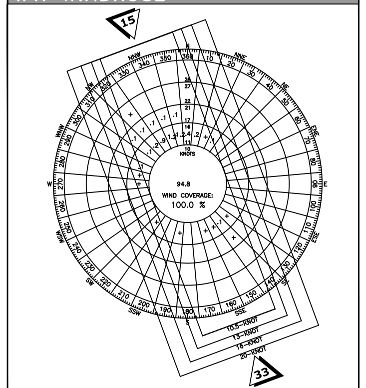


RUNWAY	10.5–KNOT	13–KNOT	16–KNOT	20–KNOT
15/33	98.95%	99.51%	99.92%	99.99%
15*	81.86%	82.34%	82.71%	82.76%
33*	78.62%	78.90%	79.17%	79.21%

NOTE: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 72467, Aspen, Colorado. Period of Record: 2000–2009.

* – Tail Wind Component of 5–Knots

IFR WINDROSE



RUNWAY	10.5–KNOT	13–KNOT	16–KNOT	20–KNOT
15/33	99.84%	99.96%	100.00%	100.00%
15*	72.14%	72.17%	72.18%	72.18%
33*	97.09%	97.20%	97.22%	97.22%

NOTE: National Oceanic and Atmospheric Administration, National Climatic Data Center, Station 72467, Aspen, Colorado. Period of Record: 2000–2009.

– Ceiling of less than 1,000 feet, but equal to or greater than 200 feet and/or visibility less than 3 miles, but equal to or greater than 1/2 mile.

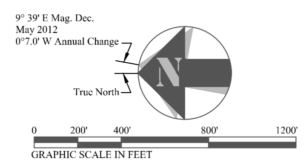
* – Tail Wind Component of 5–Knots

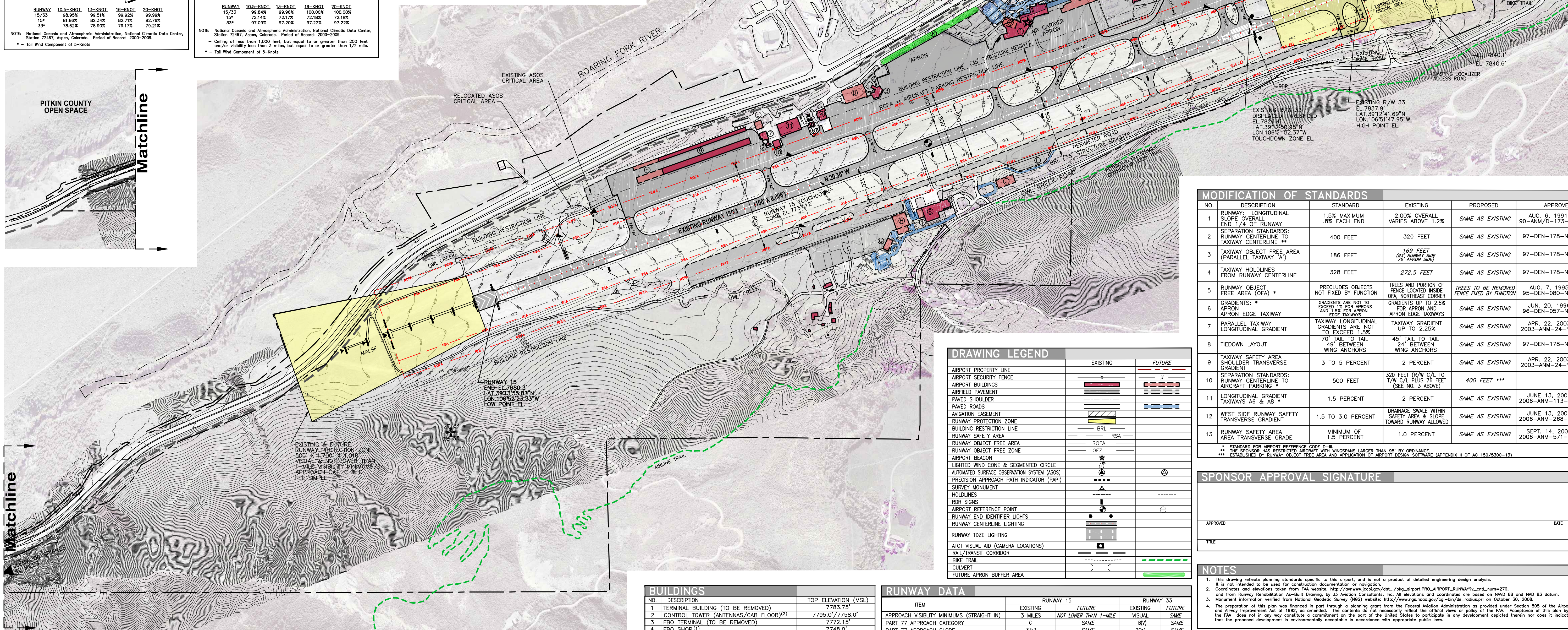
AIRPORT DATA

	EXISTING	FUTURE
AIRPORT ELEVATION (AMSL)	7837.9'	SAME
AIRPORT REFERENCE POINT (ARP)	LAT.39°13'18.76"N LON.106°52'05.65"W	LAT. SAME LON.SAME
AIRPORT REFERENCE CODE	D–III	SAME
NPIAS CATEGORY	PRIMARY COMM. SERVICE	SAME
MEAN MAX. TEMPERATURE (HOTTEST MONTH)°F	80.0	SAME
TAXIWAY LIGHTING	MITL	MITL,C/L
TAXIWAY MARKING	YES	SAME
AIRPORT & TERMINAL NAVAIDS	VOR, LDA, GPS	SAME

MONUMENT LOCATIONS

NUMBER	DESIGNATION	PID	LATITUDE	LONGITUDE
MONUMENT #1	ASE ARP 2	AB 7988	LAT.39°13'28.41"N	LON.106°52'08.77"W
MONUMENT #2	ASE D	AI 5942	LAT.39°13'45.58"N	LON.106°52'20.20"W
MONUMENT #3	ASE E	AI 5943	LAT.39°12'55.99"N	LON.106°51'58.47"W





MODIFICATION OF STANDARDS

NO.	DESCRIPTION	STANDARD	EXISTING	PROPOSED	APPROVED
1	RUNWAY: LONGITUDINAL SLOPE OVERALL END 1/4 OF RUNWAY	1.5% MAXIMUM .8% EACH END	2.00% OVERALL VARIES ABOVE 1.2%	SAME AS EXISTING	AUG. 6, 1991 90–ANM/D–173–NRA
2	SEPARATION STANDARDS: RUNWAY CENTERLINE TO TAXIWAY CENTERLINE **	400 FEET	320 FEET	SAME AS EXISTING	97–DEN–178–NRA
3	TAXIWAY OBJECT FREE AREA (PARALLEL TAXIWAY 'A')	186 FEET	169 FEET (93' RUNWAY SIDE 76' APRON SIDE)	SAME AS EXISTING	97–DEN–178–NRA
4	TAXIWAY HOLDLINES FROM RUNWAY CENTERLINE	328 FEET	272.5 FEET	SAME AS EXISTING	97–DEN–178–NRA
5	RUNWAY OBJECT FREE AREA (OFA) *	PRECLUDES OBJECTS NOT FIXED BY FUNCTION	TREES AND PORTION OF FENCE LOCATED INSIDE OFA, NORTHEAST CORNER	TREES TO BE REMOVED FENCE FIXED BY FUNCTION	AUG. 7, 1995 95–DEN–080–NRA
6	GRADIENTS: * APRON APRON EDGE TAXIWAY	GRADIENTS ARE NOT TO EXCEED 1% FOR APRONS AND 1.5% FOR APRON EDGE TAXIWAYS	GRADIENTS UP TO 2.5% FOR APRON AND APRON EDGE TAXIWAYS	SAME AS EXISTING	JUN. 20, 1996 96–DEN–057–NRA
7	PARALLEL TAXIWAY LONGITUDINAL GRADIENT	TAXIWAY LONGITUDINAL GRADIENTS ARE NOT TO EXCEED 1.5%	TAXIWAY GRADIENT UP TO 2.25%	SAME AS EXISTING	APR. 22, 2003 2003–ANM–24–NRA
8	TIEDOWN LAYOUT	70' TAIL TO TAIL 49' BETWEEN WING ANCHORS	45' TAIL TO TAIL 24' BETWEEN WING ANCHORS	SAME AS EXISTING	97–DEN–178–NRA
9	TAXIWAY SAFETY AREA SHOULDER TRANSVERSE GRADIENT	3 TO 5 PERCENT	2 PERCENT	SAME AS EXISTING	APR. 22, 2003 2003–ANM–24–NRA
10	SEPARATION STANDARDS: RUNWAY CENTERLINE TO AIRCRAFT PARKING *	500 FEET	320 FEET (R/W C/L TO T/W C/L PLUS 76 FEET (SEE NO. 3 ABOVE)	400 FEET ***	
11	LONGITUDINAL GRADIENT TAXIWAYS A6 & A8 *	1.5 PERCENT	2 PERCENT	SAME AS EXISTING	JUNE 13, 2006 2006–ANM–113–NRA
12	WEST SIDE RUNWAY SAFETY TRANSVERSE GRADIENT	1.5 TO 3.0 PERCENT	DRAINAGE SWALE WITHIN SAFETY AREA & SLOPE TOWARD RUNWAY ALLOWED	SAME AS EXISTING	JUNE 13, 2006 2006–ANM–268–NRA
13	RUNWAY SAFETY AREA AREA TRANSVERSE GRADE	MINIMUM OF 1.5 PERCENT	1.0 PERCENT	SAME AS EXISTING	SEPT. 14, 2006 2006–ANM–571–NRA

* STANDARD FOR AIRPORT REFERENCE CODE D–III.
** THE SPONSOR HAS RESTRICTED AIRCRAFT WITH WINGSPANS LARGER THAN 95' BY ORDINANCE.
*** ESTABLISHED BY RUNWAY OBJECT FREE AREA AND APPLICATION OF AIRPORT DESIGN SOFTWARE (APPENDIX II OF AC 150/5300–13)

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
PAVED SHOULDER		
PAVED ROADS		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	
RUNWAY SAFETY AREA	RSA	
RUNWAY OBJECT FREE AREA	ROFA	
RUNWAY OBJECT FREE ZONE	OFZ	
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
SURVEY MONUMENT		
HOLDLINES		
RDR SIGNS		
AIRPORT REFERENCE POINT		
RUNWAY END IDENTIFIER LIGHTS		
RUNWAY CENTERLINE LIGHTING		
RUNWAY TDZE LIGHTING		
ATCT VISUAL AID (CAMERA LOCATIONS)		
RAIL/TRANSIT CORRIDOR		
BIKE TRAIL		
CULVERT		
FUTURE APRON BUFFER AREA		

SPONSOR APPROVAL SIGNATURE

APPROVED DATE

TITLE

DECLARED DISTANCES

ITEM	RUNWAY 15 EXISTING	RUNWAY 33 EXISTING
TAKE–OFF RUN AVAILABLE (TORA)	7,006'	8,006'
TAKE–OFF DISTANCE AVAILABLE (TODA)	7,006'	8,006'
ACCELERATE–STOP DISTANCE AVAILABLE (ASDA)	7,006'	8,006'
LANDING DISTANCE AVAILABLE (LDA)	7,006'	7,006'

REVISIONS

	DATE

FAA APPROVAL

CONDITIONALLY APPROVED

Subject to letter dated: ____________________

FEDERAL AVIATION ADMINISTRATION
DENVER AIRPORTS DISTRICT OFFICE

Date: ____________________

CASE NO. ____________________

BUILDINGS

NO.	DESCRIPTION	TOP ELEVATION (MSL)
1	TERMINAL BUILDING (TO BE REMOVED)	7783.75'
2	CONTROL TOWER (ANTENNAS/CAB FLOOR)(2)	7795.0'/7758.0'
3	FBO TERMINAL (TO BE REMOVED)	7772.15'
4	FBO SHOP (1)	7748.0'
5	RENTAL CAR FACILITIES (1) (TO BE REMOVED)	7805.0'
6	FUEL FACILITY (EXPAND & RECONFIGURE)	7745.77'
7	RADAR CONTROL FACILITY	7760.75'
8	AIRPORT OPERATION CENTER	7791.70'
9	PATIO SHELTERS(1) (TO BE IMPROVED)	7734.0'
10	GROUND MAINT. EQUIP. BLDG. (TO BE REMOVED)	7746.61'
11	FBO HANGAR	7759.54'
A	FUTURE RENTAL CAR FACILITY	7825'(1)
B	FUTURE REPLACEMENT TERMINAL	7815'(1)
C	FUTURE GA/FBO TERMINAL	7790'(1)
D	FUTURE HANGAR	7770'(1)
E	FUTURE RELOCATED GROUND SERVICE EQUIP. BLDG.	7750'(1)
F	FUTURE SMALL GA HANGARS	7725'(1)
G	FUTURE GA/FBO TERMINAL	7765'(1)
H	FUTURE FBO HANGAR AND SHOP	7775'(1)
I	FUTURE AIRPORT OPERATIONS EXPANSION	7781'(1)
J	FUTURE FUEL STORAGE	7785'(1)
K	FUTURE APRON BUFFER AREA	
L	FUTURE EMERGENCY AIRCRAFT PARKING/DEICE PAD	

(1) – ESTIMATED TOP MSL (2) – EXISTING FROM OBSTRUCTION CHART TOP MSL

RUNWAY DATA

ITEM	RUNWAY 15 EXISTING	RUNWAY 15 FUTURE	RUNWAY 33 EXISTING	RUNWAY 33 FUTURE
APPROACH VISIBLITY MINIMUMS (STRAIGHT IN)	3 MILES	NOT LOWER THAN 1–MILE	VISUAL	SAME
PART 77 APPROACH CATEGORY	C	SAME	B(V)	SAME
PART 77 APPROACH SLOPE	34:1	SAME	20:1	SAME
RUNWAY WIDTH AND LENGTH	100' X 8,006'	SAME	100' X 8,006'	SAME
PAVEMENT TYPE	ASPHALT	SAME	ASPHALT	SAME
PAVEMENT STRENGTH (IN 1000 LBS.)	80sw/100dw	SAME	80sw/100dw	SAME
RUNWAY LIGHTING	MIRL	HIRL	MIRL	HIRL
RUNWAY MARKING	NPI	SAME	NPI	SAME
EFFECTIVE RUNWAY GRADIENT %	2%	1.97%	1.97%	1.97%
MAXIMUM GRADE WITHIN RUNWAY LENGTH	2.35%	SAME	2.35%	SAME
RUNWAY LINE–OF–SIGHT	CRITERIA MET	SAME	CRITERIA MET	SAME
VISUAL APPROACH AIDS	PAPI,MALSF	MALSF,TDZL,C/L LIGHTS	REILS	SAME
INSTRUMENT APPROACH AIDS	VOR/DME,GPS,LOC	SAME	VOR/DME,GPS	SAME
AIRPORT REFERENCE CODE	D–III	SAME	D–III	SAME
CRITICAL AIRCRAFT	G–IV/Q400	SAME	G–IV/Q400	SAME
RUNWAY SAFETY AREA WIDTH	500'	SAME	500'	SAME
RUNWAY SAFETY AREA BEYOND R/W END	1,000'	SAME	1,000'	SAME
RUNWAY OBJECT FREE AREA WIDTH 1	800'	SAME	800'	SAME
RUNWAY OBJECT FREE AREA BEYOND R/W END 1	1,000'	SAME	1,000'	SAME
OBSTACLE FREE ZONE	NO OBSTACLE FREE ZONE OBJECT PENETRATIONS			
THRESHOLD SITING CRITERIA	NO PENETRATIONS			

1 – SEE MODIFICATION OF STANDARDS DATA TABLE (THIS SHEET).

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As–Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Monument information verified from National Geodetic Survey (NGS) website: http://www.ngs.noaa.gov/cgi–bin/ds_radius.prl on October 30, 2008.
4. The preparation of this plan was financed in part through a planning grant from the Federal Aviation Administration as provided under Section 505 of the Airport and Airway Improvement Act of 1982, as amended. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this plan by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

Aspen-Pitkin County Airport/Sardy Field
ASPEN, COLORADO

Airport Layout Plan

PREPARED BY:

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE MAR 2013

SCALE 1" = 400'

SHEET NO. 1 of 9

Figure 11-1 **Airport Layout Plan**

11.2.2 Taxiway System

The Airport has recently completed the multi-phase project to fully relocate Taxiway A from its previous runway separation of 221.5 feet to a location that provides a runway/taxiway separation of 320 feet. As part of the recent runway extension project, a “tea cup” or bypass taxiway was also constructed on the west side of Runway 15/33. The centerline of this bypass taxiway is located at a 320-foot separation from the runway. The ALP illustrates a planned extension of this west side taxiway system to the north approximately 6,100 feet or to a point just short of Owl Creek. This west side taxiway is intended to serve potential aviation-related facilities on the west side of the Airport.

11.2.3 Landside Development

As discussed in the previous chapters, the ALP also allocates various areas for future landside facilities. Landside facilities include terminal facilities, aircraft parking aprons, hangars, aircraft maintenance facilities, automobile access and parking, support facilities, etc. Detailed illustrations of these landside improvement areas are provided in the *Terminal Area Plans* section of this chapter. As provided on the ALP, proposed landside improvements include:

Passenger Terminal Facilities. The location of the passenger terminal facilities at the Airport will remain on the east side of the Airport in relatively the same location as the existing. Conceptual layouts of future passenger terminal facilities were provided in a previous chapter (Chapter 5), entitled *TERMINAL AREA PLAN ALTERNATIVES.* The ALP illustrates the preferred alternative for the replacement of the terminal building, as well as the construction and re-alignment of the terminal loop roadway system, the location for a below grade parking structure, as well as the location of future rental car facilities.

East Side General Aviation Facilities. The following are the development recommendations for the east side general aviation area:

- **Relocate the existing GA/FBO terminal to the area near the existing commercial passenger terminal following replacement of the passenger terminal.**
- **Construct a large aircraft storage/maintenance hangar (200’ x 125’) near the existing GA/FBO terminal.**
- **Relocate airport refueling trucks loading area.**
- **Relocate ground service equipment building.**
- **Enclose/improve patio hangars.**
- **Construct future small GA aircraft storage hangars.**
- **Relocate Automated Surface Observation System (ASOS).**
- **Construct helicopter parking area.**

West Side General Aviation Facilities. The following are the development recommendations for the east side general aviation area:

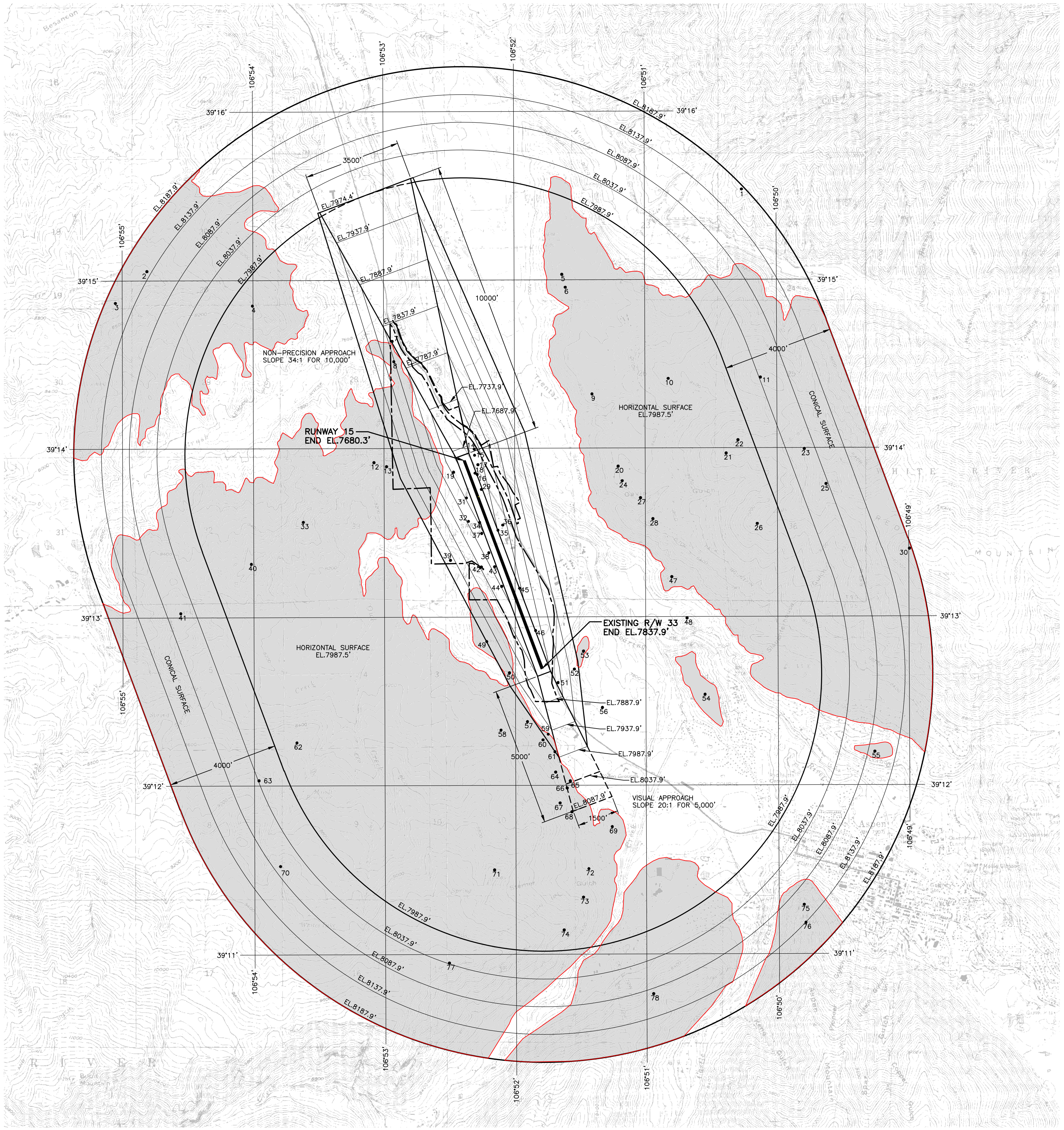
- **Construct west side parallel taxiway.**
- **Construct emergency medical services aircraft parking/deice pad.**
- **Construct fuel storage area.**
- **Improvements to Airport Operations Center (AOC).**
- **Construct FBO hangar and shop.**
- **Construct GA/FBO terminal.**
- **Construct aircraft parking apron in front of GA/FBO Terminal.**
- **Construct small aircraft tiedown area.**

Support Facilities. The only planned improvement to aviation support facilities included on the ALP is the planned west side fuel storage facility located off of Owl Creek Road just south of the Airport Operations Center.

11.3 Airspace Plan

The Airport Airspace Drawing is based upon Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. In order to protect the Airport's airspace and approaches from hazards that could affect the safe and efficient operation of aircraft, federal criteria contained in the FAR Part 77 document have been established to provide guidance in controlling the height of objects in the vicinity of airports. FAR Part 77 criteria specify a set of imaginary surfaces, which, when penetrated, identify an object as being an obstruction. Objects are identified using the Airport's published *Airport Obstruction Chart*.

The airspace drawings are included in the following illustrations (**Figures 11-2 and 11-3**) and provide plan and profile views depicting these criteria as they specifically relate to Aspen/Pitkin County Airport. The plan is based on the ultimate planned runway lengths, along with the ultimate planned approaches to each runway end.



OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
1	BUSH	8172	89	CONICAL SURFACE	TO REMAIN
2	BUSH	8856	710	CONICAL SURFACE	TO REMAIN
3	TREE	9096	101	CONICAL SURFACE	TO REMAIN
4	POLE	8492	504	HORIZONTAL SURFACE	TO REMAIN
5	VENT ON BLDG	8160	172	RUNWAY 33 APPROACH	TO REMAIN
6	TREE	8170	182	HORIZONTAL SURFACE	TO REMAIN
7	GROUND/BUSH	7825	5	HORIZONTAL SURFACE	TO REMAIN
8	GROUND/BUSH	7991	151	TRANSITIONAL SURFACE	TO REMAIN
9	TREE	8320	330	HORIZONTAL SURFACE	TO REMAIN
10	BUSH	8740	750	HORIZONTAL SURFACE	TO REMAIN
11	TREE	9286	1244	CONICAL SURFACE	TO REMAIN
12	BUSH	8511	525	HORIZONTAL SURFACE	TO REMAIN
13	ROD ON OL ASR	8534	548	HORIZONTAL SURFACE	TO REMAIN
14	TREE	7718	10	TRANSITIONAL SURFACE	TRIMMED
15	TREE	7722	13	TRANSITIONAL SURFACE	TRIMMED
16	WINDSOCK	7694	2.5	TRANSITIONAL SURFACE	TO REMAIN
17	TREE	7727	12	TRANSITIONAL SURFACE	TRIMMED
18	TREE	7712	18	PRIMARY SURFACE	TRIMMED
19	FENCE	7735	62	TRANSITIONAL SURFACE	TO BE RELOCATED
20	ANT ON BLDG	8411	423	HORIZONTAL SURFACE	TO REMAIN
21	TREE	9252	1264	HORIZONTAL SURFACE	TO REMAIN
22	TREE	9357	1335	HORIZONTAL SURFACE	TO REMAIN
23	TREE	9671	1839	CONICAL SURFACE	TO REMAIN
24	TREE	8450	462	HORIZONTAL SURFACE	TO REMAIN
25	TREE	9908	945	CONICAL SURFACE	TO REMAIN
26	ANTENNA	9383	1395	HORIZONTAL SURFACE	TO REMAIN
27	ANTENNA ON CHIMNEY	8478	490	HORIZONTAL SURFACE	TO REMAIN
28	CHIMNEY	8494	506	HORIZONTAL SURFACE	TO REMAIN
29	OL AMOM	7713	9	PRIMARY SURFACE	TO REMAIN
30	TREE	10364	2180	CONICAL SURFACE	TO REMAIN
31	TREE	7747	16	TRANSITIONAL SURFACE	TRIMMED
32	TREE	7789	12	TRANSITIONAL SURFACE	TRIMMED
33	BUSH	8681	697	HORIZONTAL SURFACE	TO REMAIN
34	BUSH	7736	NONE	TRANSITIONAL SURFACE	TRIMMED
35	WINDSOCK	7738	1.5	TRANSITIONAL SURFACE	TO REMAIN
36	ANTENNA ON OL ATCT	7795	26	TRANSITIONAL SURFACE	TO REMAIN
37	OL ON LIGHTED WINDSOCK	7753	5	TRANSITIONAL SURFACE	TO BE RELOCATED
38	GROUND	7760	NONE	TRANSITIONAL SURFACE	REMOVED
39	TREE	7953	NONE	TRANSITIONAL SURFACE	TO REMAIN
40	BUSH	8694	710	HORIZONTAL SURFACE	TO REMAIN
41	TREE	8731	672	CONICAL SURFACE	TO REMAIN
42	TREE	7846	16	TRANSITIONAL SURFACE	TO BE TRIMMED
43	GROUND	7769	NONE	TRANSITIONAL SURFACE	TO BE GRADED
44	BUSH	7783	NONE	TRANSITIONAL SURFACE	TO BE TRIMMED

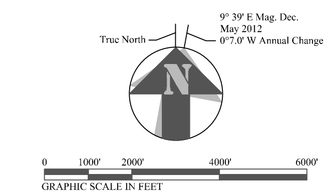
Notes: (N) – For public, non–interstate roadways, fifteen feet (15') is added to surface elevation to determine clearance, per FAR Part 77 Criteria.
Refer to the Inner Portion of the Approach Surface Drawing for close in objects.

OBSTRUCTIONS

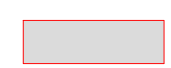
NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
45	WINDSOCK	7784	NONE	TRANSITIONAL SURFACE	TO REMAIN
46	WINDSOCK	7821	4.5	TRANSITIONAL SURFACE	TO REMAIN
47	TREE	8220	236	HORIZONTAL SURFACE	TO REMAIN
48	TREE	8002	18	HORIZONTAL SURFACE	TO REMAIN
49	BUSH	8189	204	TRANSITIONAL SURFACE	TO REMAIN
50	POLE	8062	105	TRANSITIONAL SURFACE	TO REMAIN
51	LIGHT	7869	NONE	TRANSITIONAL SURFACE	TO REMAIN
52	BUSH	7982	20	TRANSITIONAL SURFACE	TO REMAIN
53	TACAN	8033	49	HORIZONTAL SURFACE	TO REMAIN
54	BUSH	8287	303	HORIZONTAL SURFACE	TO REMAIN
55	CHIMNEY	8190	94	CONICAL SURFACE	TO REMAIN
56	ROD ON OL TOWER	8047	63	HORIZONTAL SURFACE	TO REMAIN
57	BUILDING	8093	9	HORIZONTAL SURFACE	TO REMAIN
58	ANT ON BLDG	8400	416	HORIZONTAL SURFACE	TO REMAIN
59	POLE	7978	13	TRANSITIONAL SURFACE	TO REMAIN
60	POLE	8071	87	HORIZONTAL SURFACE	TO REMAIN
61	TREE	8081	94	TRANSITIONAL SURFACE	TO REMAIN
62	TREE	8629	645	HORIZONTAL SURFACE	TO REMAIN
63	TREE	8942	909	CONICAL SURFACE	TO REMAIN
64	TREE	8204	220	HORIZONTAL SURFACE	TO REMAIN
65	TREE	8145	110	RUNWAY 33 APPROACH	TO REMAIN
66	TREE	8239	194	RUNWAY 33 APPROACH	TO REMAIN
67	TREE	8394	410	HORIZONTAL SURFACE	TO REMAIN
68	TREE	8256	272	HORIZONTAL SURFACE	TO REMAIN
69	POLE	8137	53	HORIZONTAL SURFACE	TO REMAIN
70	TREE	9266	1194	CONICAL SURFACE	TO REMAIN
71	TREE	9048	1064	HORIZONTAL SURFACE	TO REMAIN
72	TREE	8245	261	HORIZONTAL SURFACE	TO REMAIN
73	TREE	8424	442	HORIZONTAL SURFACE	TO REMAIN
74	TREE	8880	898	HORIZONTAL SURFACE	TO REMAIN
75	GROUND	8776	666	CONICAL SURFACE	TO REMAIN
76	TREE	8979	845	CONICAL SURFACE	TO REMAIN
77	ANTENNA ON BLDG	9736	1704	CONICAL SURFACE	TO REMAIN
78	TREE	8787	694	CONICAL SURFACE	TO REMAIN

Notes: (N) – For public, non–interstate roadways, fifteen feet (15') is added to surface elevation to determine clearance, per FAR Part 77 Criteria.
Refer to the Inner Portion of the Approach Surface Drawing for close in objects.

NOTE: LOCAL HEIGHT HAZARD ZONING - PITKIN COUNTY CODE 3-100.30B



Existing Airport Property


Terrain Penetrations

REVISIONS

	DATE

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As–Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Topographic background taken from USGS 7.5 Minute Survey Maps, "Aspen, CO, 1987", "Woody Creek, CO, 1987", "Highland Peak, CO, 1987", and "Ruedi Reservoir, CO, 1987".
4. Obstruction information obtained from Airport Obstruction Chart, Aspen–Pitkin County Airports/Sardy Field, Aspen, Colorado. (OC #5889)

Aspen-Pitkin County Airport/Sardy Field
ASPEN, COLORADO

Airport Airspace Drawing - Plan View

Barnard Dunkelberg & Company
a Mead & Hunt company

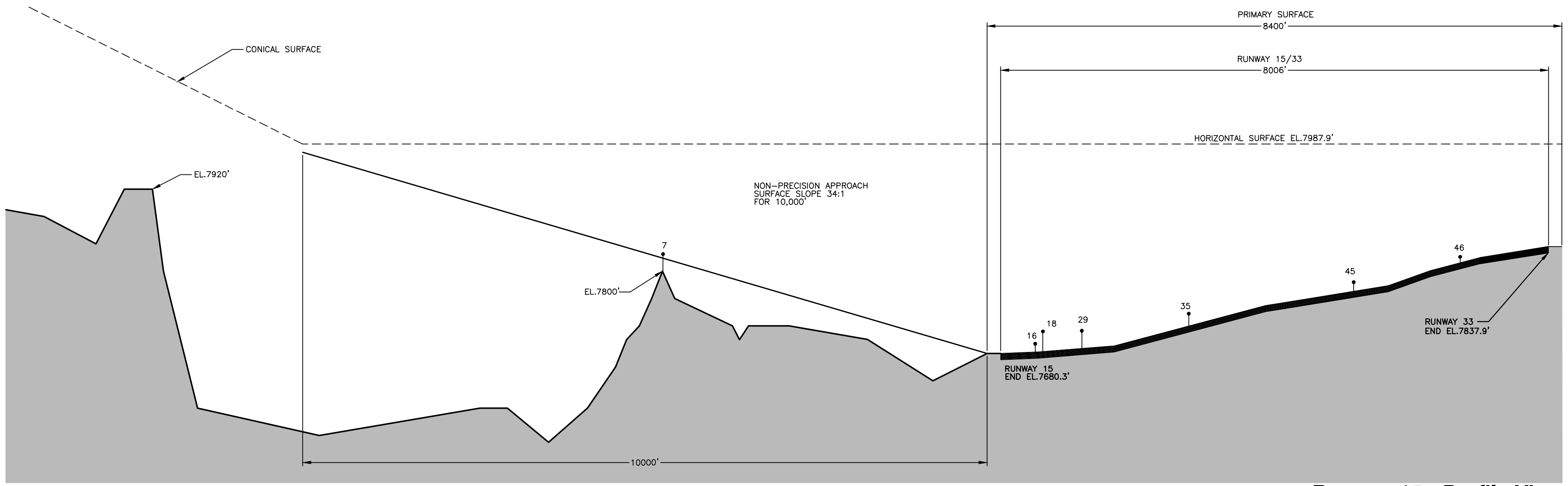
TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
MAR 2013

SCALE
1" = 2,000'

SHEET NO.
2 of 9

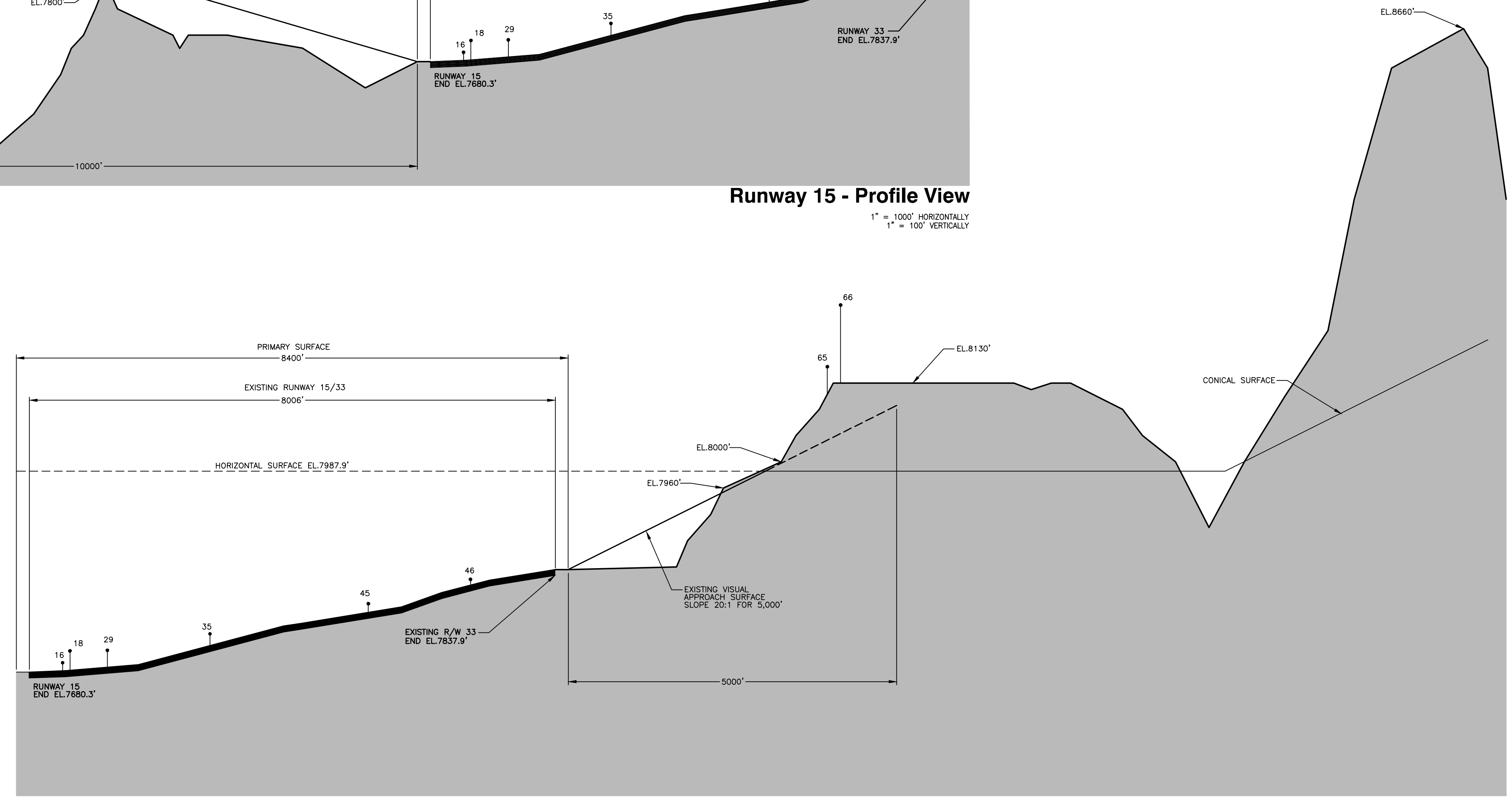


Runway 15 - Profile View

1" = 1000' HORIZONTALLY
1" = 100' VERTICALLY

OBSTRUCTIONS					
NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
7	GROUND/BUSH	7825	5	RUNWAY 15 APPROACH	TO REMAIN
16	WINDSOCK	7694	2.5	TRANSITIONAL SURFACE	TO REMAIN
18	TREE	7712	18	PRIMARY SURFACE	TRIMMED
29	OL AMOM	7713	9	PRIMARY SURFACE	TO REMAIN
35	WINDSOCK	7738	1.5	TRANSITIONAL SURFACE	TO REMAIN
45	WINDSOCK	7784	NONE	TRANSITIONAL SURFACE	TO REMAIN
46	WINDSOCK	7821	4.5	TRANSITIONAL SURFACE	TO REMAIN
65	TREE	8145	110	RUNWAY 33 APPROACH	TO REMAIN
66	TREE	8239	194	RUNWAY 33 APPROACH	TO REMAIN

Notes: (N) – For public, non-interstate roadways, fifteen feet (15') is added to surface elevation to determine clearance, per FAR Part 77 Criteria.
Refer to the Inner Portion of the Approach Surface Drawing for close in objects.



Existing and Future Runway 33 - Profile View

1" = 1000' HORIZONTALLY
1" = 100' VERTICALLY

REVISIONS	DATE

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As-Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Topographic background taken from USGS 7.5 Minute Survey Maps, "Aspen, CO, 1987", "Woody Creek, CO, 1987", "Highland Peak, CO, 1987", and "Ruedi Reservoir, CO, 1987".
4. Terrain profile represents the highest point along the length and across the width of the extended approach surface.
5. Obstruction information obtained from Airport Obstruction Chart, Aspen-Pitkin County Airports/Sardy Field, Aspen, Colorado. (OC #5889)

Aspen-Pitkin County Airport/Sardy Field
ASPEN, COLORADO

Airport Airspace Drawing - Profile View

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
MAR 2013

SCALE
as noted

SHEET NO.
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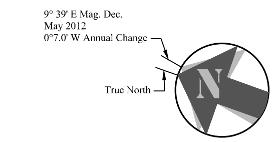
11.4 Inner Portion of the Approach Surface Drawings

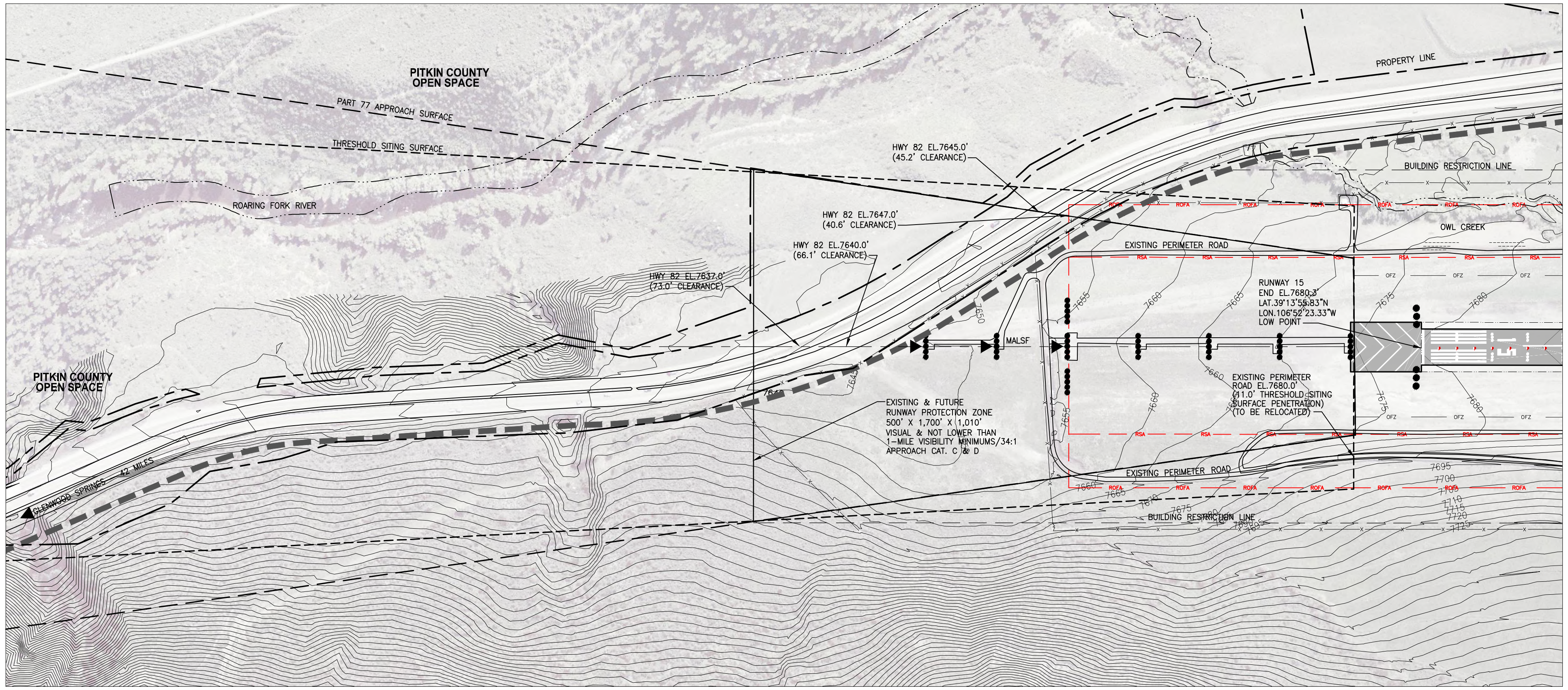
To provide a more detailed view of the inner portions of the Part 77 imaginary approach surfaces, the Threshold Siting Surfaces (TSS), and the Runway Protection Zone (RPZ) areas, the following drawings are provided. An RPZ is trapezoidal in shape, centered about the extended runway centerline, and typically begins 200 feet beyond the end of the runway. The RPZs are safety areas within which it is desirable to clear all objects (although some uses are normally acceptable). The size of the RPZ is a function of the design aircraft and the visibility minimums associated with the runway's instrument approach capabilities.

The following illustrations (**Figures 11-4 and 11-5**) provide large-scale drawings with both plan and profile delineations. They are intended to facilitate identification of the roadways, utility lines, railroads, structures, and other possible obstructions that may lie within the confines of the inner approach surface area associated with each runway end. As with the airspace plans, the inner portion of the approach surface drawings are based upon the ultimate planned runway length, along with the ultimate planned approaches to each runway.

Mitigation measures for identified obstructions to the Part 77 surfaces can range from obstruction lighting and marking to removal. When a penetration to a Threshold Siting Surface exists, one or more of the following actions are required:

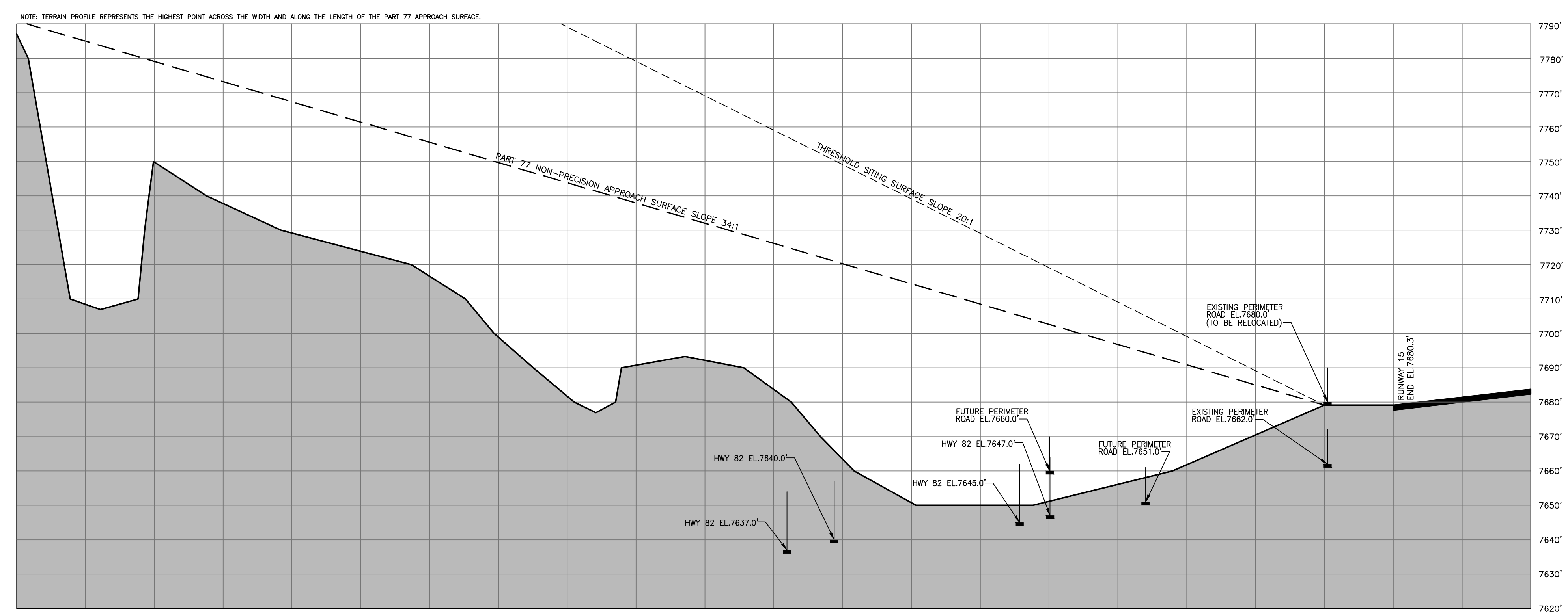
- **The object is removed or lowered to preclude penetration of applicable threshold siting surfaces.**
- **The threshold is displaced to preclude object penetration of applicable threshold siting surfaces, with a resulting shorter landing distance.**
- **The Glide Path Angle (GPA) and/or Threshold Crossing Height (TCH) is/are modified, or a combination of threshold displacement and GPA/TCH increase.**
- **Visibility minimums are raised.**
- **Night operations are prohibited unless the obstruction is lighted or an approved Visual Glide Slope Indicator (VGSI) is used.**





Runway 15 Plan View

1" = 200'



Runway 15 Profile View

1" = 200' HORIZONTALLY
1" = 20' VERTICALLY

OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION

THERE ARE NO KNOWN OBSTRUCTIONS IN THIS VIEW.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
PAVED SHOULDER		
PAVED ROADS		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	
RUNWAY SAFETY AREA	RSA	
RUNWAY OBJECT FREE AREA	ROFA	
RUNWAY OBJECT FREE ZONE	OFZ	
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
SURVEY MONUMENT		
HOLDLINES		
RDR SIGNS		
AIRPORT REFERENCE POINT		
RUNWAY END IDENTIFIER LIGHTS		
RUNWAY CENTERLINE LIGHTING		
RUNWAY TDZE LIGHTING		
ATCT VISUAL AID (CAMERA LOCATIONS)		
RAIL/TRANSIT CORRIDOR		
BIKE TRAIL		
CULVERT		
FUTURE APRON BUFFER AREA		

RUNWAY DATA

ITEM	RUNWAY 15		RUNWAY 33	
	EXISTING	*FUTURE*	EXISTING	*FUTURE*
APPROACH VISIBLITY MINIMUMS (STRAIGHT IN)	3 MILES	*NOT LOWER THAN 1-MILE*	VISUAL	*SAME*
PART 77 APPROACH CATEGORY	C	*SAME*	B(V)	*SAME*
PART 77 APPROACH SLOPE	34:1	*SAME*	20:1	*SAME*
RUNWAY WIDTH AND LENGTH	100' X 8,006'	*SAME*	100' X 8,006'	*SAME*
PAVEMENT TYPE	ASPHALT	*SAME*	ASPHALT	*SAME*
PAVEMENT STRENGTH (IN 1000 LBS.)	80sw/100dw	*SAME*	80sw/100dw	*SAME*
RUNWAY LIGHTING	MIRL	*HIRL*	MIRL	*HIRL*
RUNWAY MARKING	NPI	*SAME*	NPI	*SAME*
EFFECTIVE RUNWAY GRADIENT %	2%	*1.97%*	1.97%	*1.97%*
MAXIMUM GRADE WITHIN RUNWAY LENGTH	2.35%	*SAME*	2.35%	*SAME*
RUNWAY LINE-OF-SIGHT	CRITERIA MET	*SAME*	CRITERIA MET	*SAME*
VISUAL APPROACH AIDS	PAPI,MALSF	*MALSF,TDZL,C/L LIGHTS*	REILS	*SAME*
INSTRUMENT APPROACH AIDS	VOR/DME,GPS,LOC	*SAME*	VOR/DME,GPS	*SAME*
AIRPORT REFERENCE CODE	D-III	*SAME*	D-III	*SAME*
CRITICAL AIRCRAFT	G-IV/Q400	*SAME*	G-IV/Q400	*SAME*
RUNWAY SAFETY AREA WIDTH	500'	*SAME*	500'	*SAME*
RUNWAY SAFETY AREA BEYOND R/W END	1,000'	*SAME*	1,000'	*SAME*
RUNWAY OBJECT FREE AREA WIDTH [1]	800'	*SAME*	800'	*SAME*
RUNWAY OBJECT FREE AREA BEYOND R/W END [1]	1,000'	*SAME*	1,000'	*SAME*
OBSTACLE FREE ZONE	NO OBSTACLE FREE ZONE OBJECT PENETRATIONS			
THRESHOLD SITING CRITERIA	NO PENETRATIONS			

1 – SEE MODIFICATION OF STANDARDS DATA TABLE (THIS SHEET).

REVISIONS

	DATE

NOTES

1. This drawing reflects planning ~~standards~~ specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As-Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Ten feet (10') is added to private roads, fifteen feet (15') is added to public roads, and seventeen feet (17') is added to highways to determine clearance per FAR Part 77 Criteria.

Aspen-Pitkin County Airport/Sardy Field

ASPEN, COLORADO

Inner Portion of the Approach Surface Drawing - Runway 15 (Plan & Profile)

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
MAR 2013

SCALE
as noted

SHEET NO.
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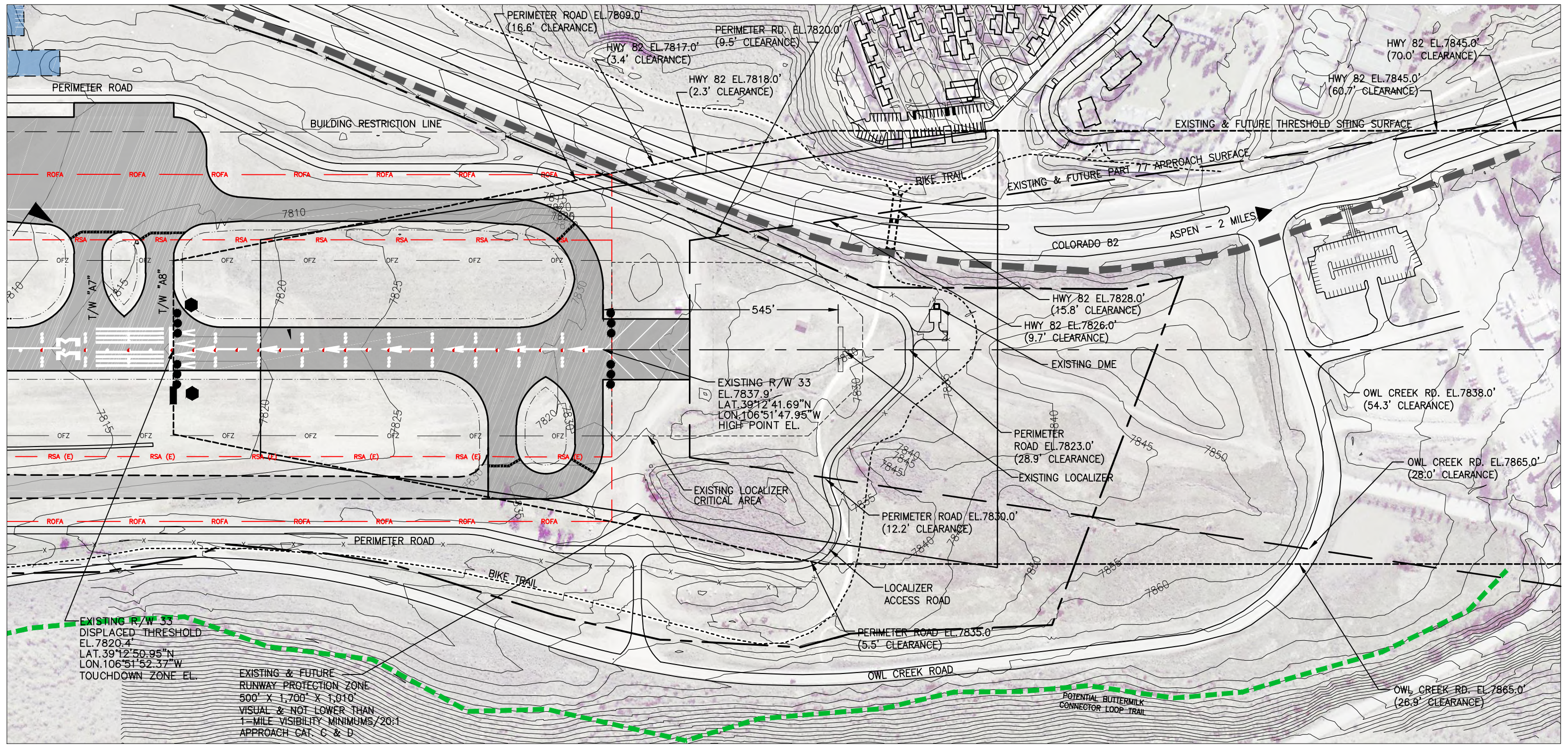
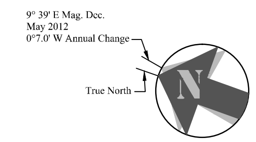
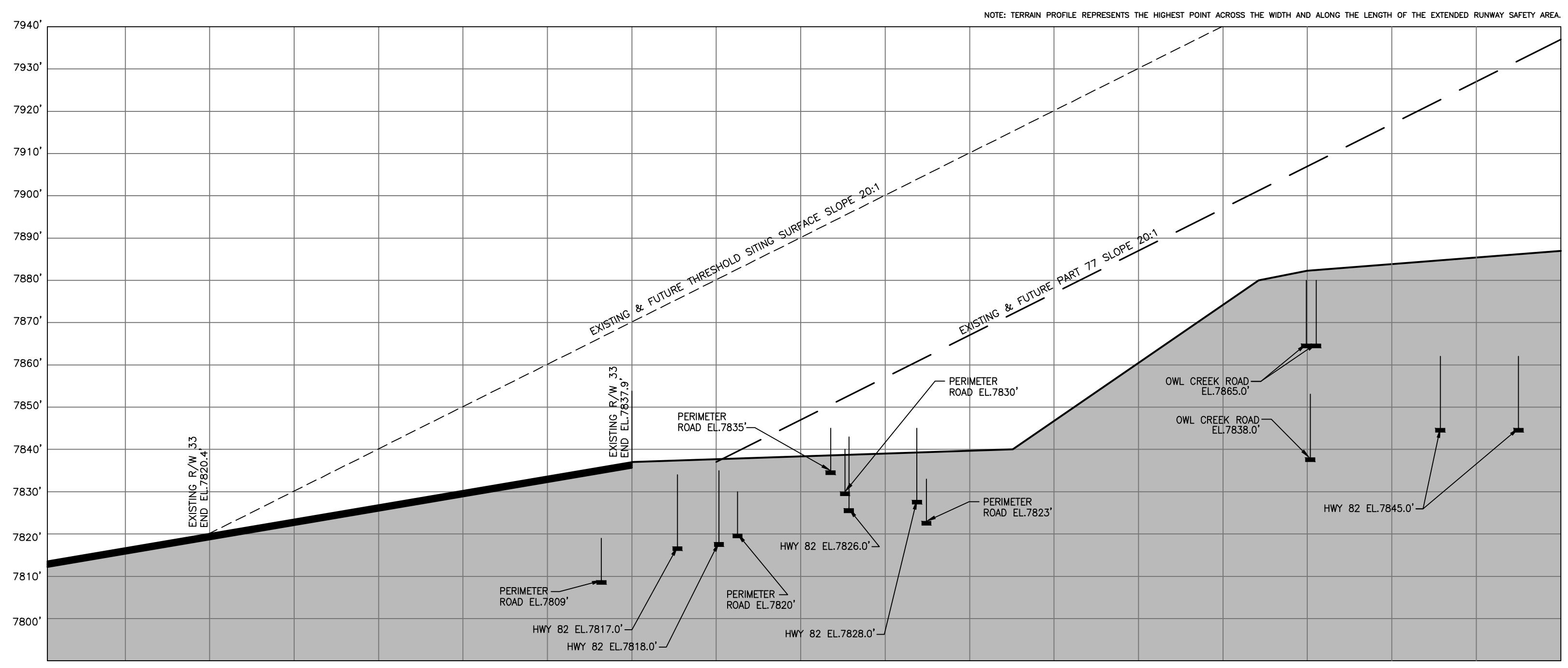
Figure 11-4 **Inner Portion of the Approach Surface Drawing - Runway 15**



Runway 33 - Plan View

1" = 200'





Runway 33 - Profile View

1" = 200' HORIZONTALLY
1" = 20' VERTICALLY

OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION

THERE ARE NO KNOWN OBSTRUCTIONS IN THIS VIEW.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
PAVED SHOULDER		
PAVED ROADS		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	
RUNWAY SAFETY AREA	RSA	
RUNWAY OBJECT FREE AREA	ROFA	
RUNWAY OBJECT FREE ZONE	OFZ	
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
SURVEY MONUMENT		
HOLDLINES		
RDR SIGNS		
AIRPORT REFERENCE POINT		
RUNWAY END IDENTIFIER LIGHTS		
RUNWAY CENTERLINE LIGHTING		
RUNWAY TDZE LIGHTING		
ATCT VISUAL AID (CAMERA LOCATIONS)		
RAIL/TRANSIT CORRIDOR		
BIKE TRAIL		
CULVERT		
FUTURE APRON BUFFER AREA		

RUNWAY DATA

ITEM	RUNWAY 15		RUNWAY 33	
	EXISTING	*FUTURE*	EXISTING	*FUTURE*
APPROACH VISIBLITY MINIMUMS (STRAIGHT IN)	3 MILES	*NOT LOWER THAN 1-MILE*	VISUAL	*SAME*
PART 77 APPROACH CATEGORY	C	*SAME*	B(V)	*SAME*
PART 77 APPROACH SLOPE	34:1	*SAME*	20:1	*SAME*
RUNWAY WIDTH AND LENGTH	100' X 8,006'	*SAME*	100' X 8,006'	*SAME*
PAVEMENT TYPE	ASPHALT	*SAME*	ASPHALT	*SAME*
PAVEMENT STRENGTH (IN 1000 LBS.)	80sw/100dw	*SAME*	80sw/100dw	*SAME*
RUNWAY LIGHTING	MIRL	*HIRL*	MIRL	*HIRL*
RUNWAY MARKING	NPI	*SAME*	NPI	*SAME*
EFFECTIVE RUNWAY GRADIENT %	2%	*1.97%*	1.97%	*1.97%*
MAXIMUM GRADE WITHIN RUNWAY LENGTH	2.35%	*SAME*	2.35%	*SAME*
RUNWAY LINE-OF-SIGHT	CRITERIA MET	*SAME*	CRITERIA MET	*SAME*
VISUAL APPROACH AIDS	PAPI,MALSF	*MALSF,TDZL,C/L LIGHTS*	REILS	*SAME*
INSTRUMENT APPROACH AIDS	VOR/DME,GPS,LOC	*SAME*	VOR/DME,GPS	*SAME*
AIRPORT REFERENCE CODE	D-III	*SAME*	D-III	*SAME*
CRITICAL AIRCRAFT	G-IV/Q400	*SAME*	G-IV/Q400	*SAME*
RUNWAY SAFETY AREA WIDTH	500'	*SAME*	500'	*SAME*
RUNWAY SAFETY AREA BEYOND R/W END	1,000'	*SAME*	1,000'	*SAME*
RUNWAY OBJECT FREE AREA WIDTH [1]	800'	*SAME*	800'	*SAME*
RUNWAY OBJECT FREE AREA BEYOND R/W END [1]	1,000'	*SAME*	1,000'	*SAME*
OBSTACLE FREE ZONE	NO OBSTACLE FREE ZONE OBJECT PENETRATIONS			
THRESHOLD SITING CRITERIA	NO PENETRATIONS			

1 – SEE MODIFICATION OF STANDARDS DATA TABLE (THIS SHEET).

REVISIONS

	DATE

NOTES

1. This drawing reflects planning ~~standards~~ specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As-Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Ten feet (10') is added to private roads, fifteen feet (15') is added to public roads, and seventeen feet (17') is added to highways to determine clearance per FAR Part 77 Criteria.

Aspen-Pitkin County Airport/Sardy Field

ASPEN, COLORADO

Inner Portion of the Approach Surface Drawing - Runway 33 (Plan & Profile)

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
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DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

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as noted

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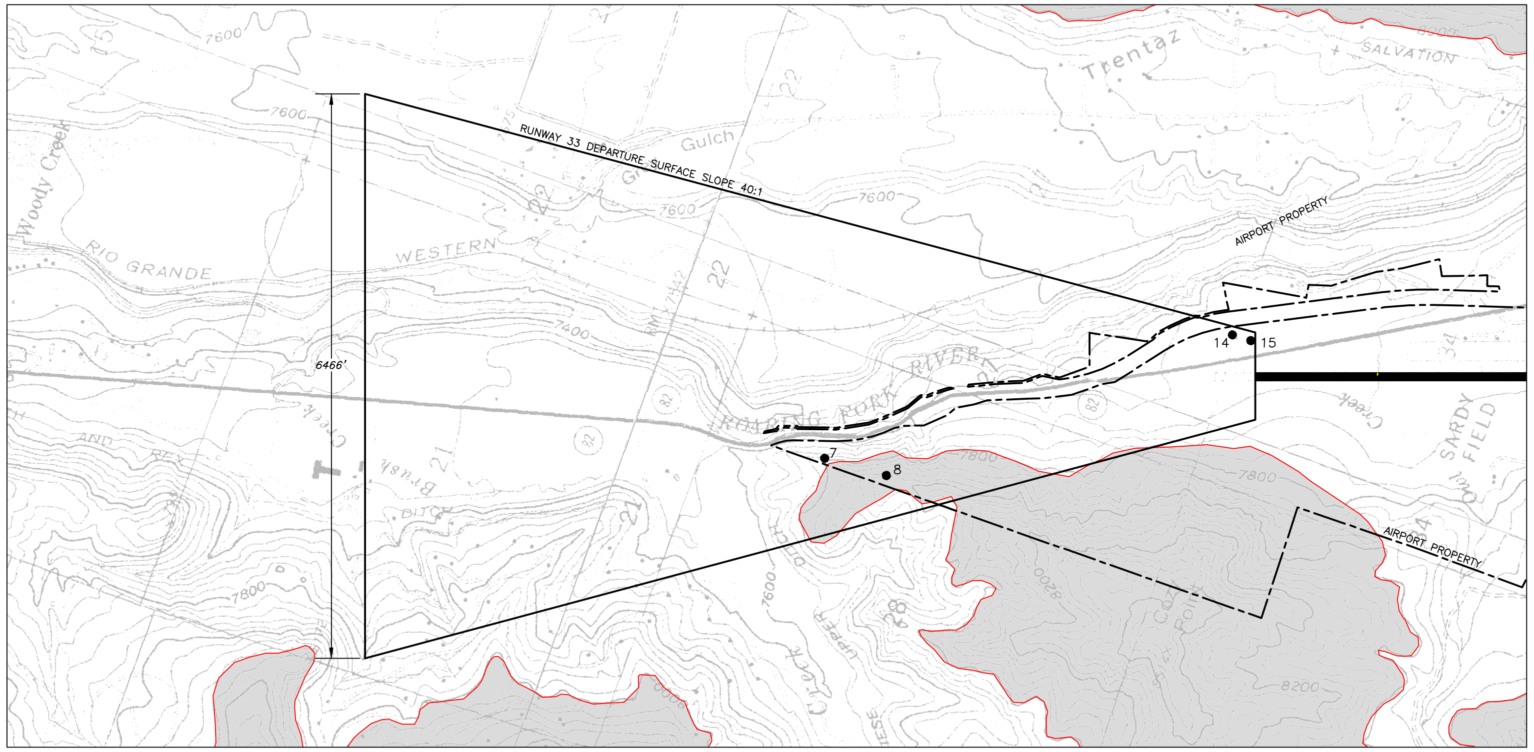
11.5 Departure Surface Drawing

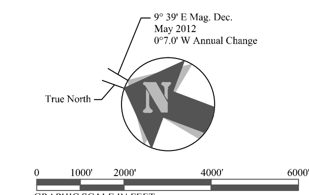
The following illustration (**Figure 11-6**) presents a detailed view of departure ends of the runway for aircraft departing to the south. The applicability of the departure surface is dependent on the designation of primary runway(s) for departure. Aspen/Pitkin County Airport has published departure procedures only for aircraft departing to the south from Runway 33.

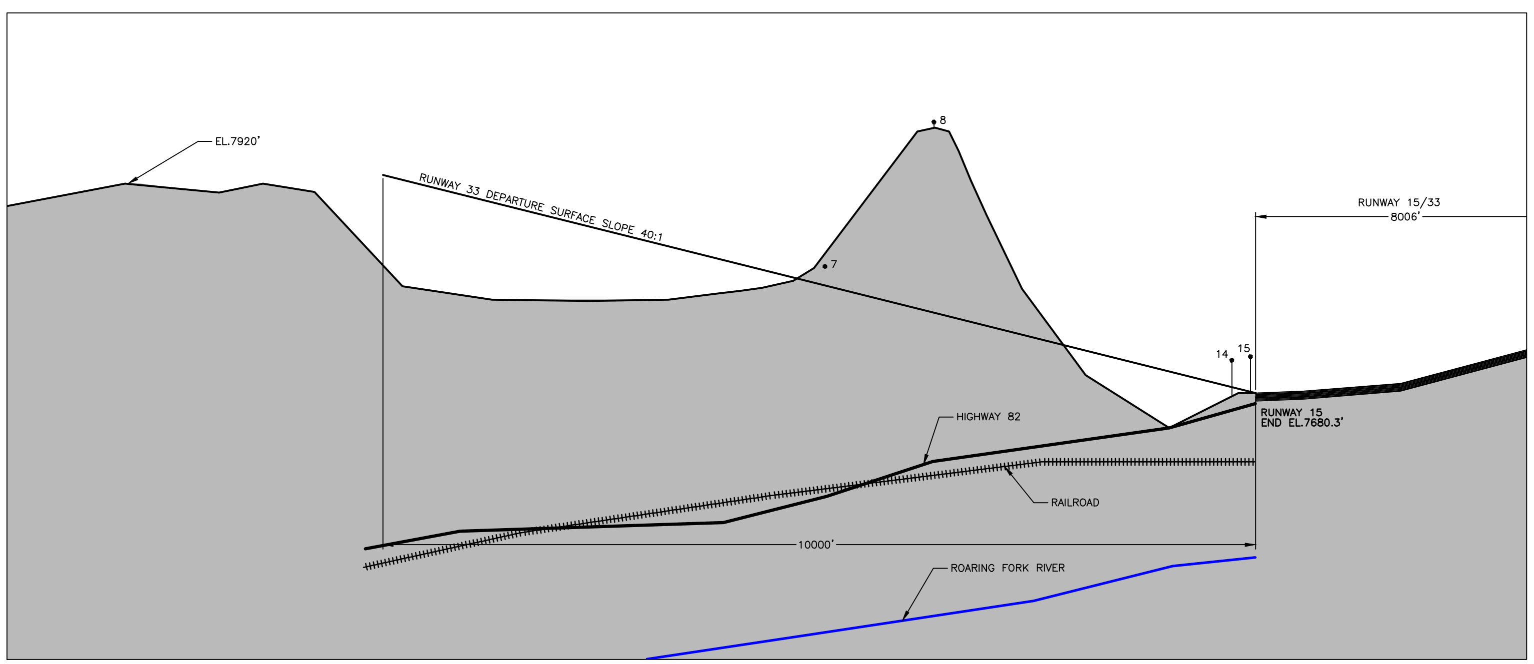
Also shown on the following illustrations is the one-engine inoperative (OEI) obstacle identification surface (OIS). According to FAA AC 150/5300-13, *Airport Design*, Change 18, this surface is currently provided for information only while a National OEI Policy is under development.



Runway 33 Departure Surface - Plan View

1" = 1000' HORIZONTALLY
1" = 100' VERTICALLY





Runway 33 Departure Surface - Profile View

1" = 1000' HORIZONTALLY
1" = 100' VERTICALLY

OBSTRUCTIONS

NO.	OBJECT DESCRIPTION	TOP ELEV.	PENETRATION	SURFACE PENETRATED	PROPOSED DISPOSITION
7	GROUND/BUSH	7825	5	HORIZONTAL SURFACE	TO REMAIN
8	GROUND/BUSH	7991	151	TRANSITIONAL SURFACE	TO REMAIN
14	TREE	7718	10	TRANSITIONAL SURFACE	TRIMMED
15	TREE	7722	13	TRANSITIONAL SURFACE	TRIMMED

Notes: Refer to the Inner Portion of the Approach Surface Drawing for close in objects.

REVISIONS

	DATE

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As-Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Topographic background taken from USGS 7.5 Minute Survey Maps, "Aspen, CO, 1987", "Woody Creek, CO, 1987", "Highland Peak, CO, 1987", and "Ruedi Reservoir, CO, 1987".
4. Obstruction information obtained from Airport Obstruction Chart, Aspen-Pitkin County Airports/Sardy Field, Aspen, Colorado. (OC #5889)

Aspen-Pitkin County Airport/Sardy Field
ASPEN, COLORADO

Departure Surface Drawing - Runway 33

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
MAR 2013

SCALE
1" = 400'

SHEET NO.
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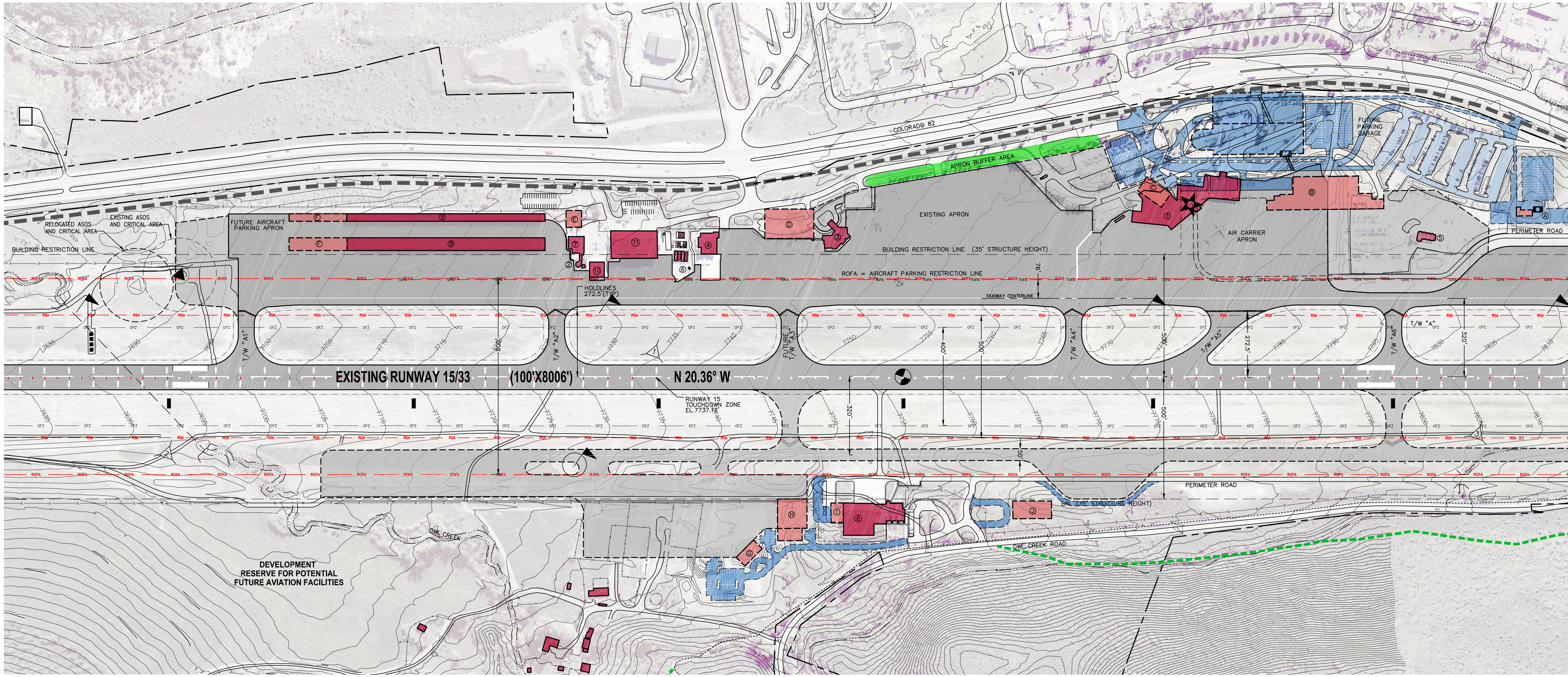
11.6 Terminal Area Plan

A more detailed view of both the east and west sides of the Airport is provided in the following illustration (**Figure 11-7**). A detailed layout of future terminal area facilities is presented, as well as a potential layout of future FBO facilities on the west side of the Airport.



NUMBER	DESIGNATION	PID	LATITUDE	LONGITUDE
MONUMENT #1	ASE ARP 2	AB 7988	LAT.39°13'28.41"N	LON.106°52'08.77"W
MONUMENT #2	ASE D	AI 5942	LAT.39°13'45.58"N	LON.106°52'20.20"W
MONUMENT #3	ASE E	AI 5943	LAT.39°12'55.99"N	LON.106°51'58.47"W

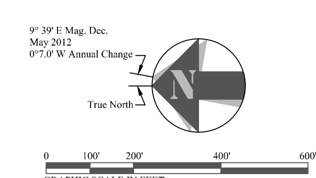
BUILDINGS

NO.	DESCRIPTION	TOP ELEVATION (MSL)
1	TERMINAL BUILDING (TO BE REMOVED)	7783.75'
2	CONTROL TOWER (ANTENNAS/CAB FLOOR)(2)	7795.0'/7758.0'
3	FBO TERMINAL (TO BE REMOVED)	7772.15'
4	FBO SHOP(1)	7748.0'
5	RENTAL CAR FACILITIES(1) (TO BE REMOVED)	7805.0'
6	FUEL FACILITY (EXPAND & RECONFIGURE)	7745.77'
7	RADAR CONTROL FACILITY	7760.75'
8	AIRPORT OPERATION CENTER	7791.70'
9	PATIO SHELTERS(1) (TO BE IMPROVED)	7734.0'
10	GROUND MAINT. EQUIP. BLDG. (TO BE REMOVED)	7746.61'
11	FBO HANGAR	7759.54'
A	*FUTURE RENTAL CAR FACILITY*	*7825'(1)*
B	*FUTURE REPLACEMENT TERMINAL*	*7815'(1)*
C	*FUTURE GA/FBO TERMINAL*	*7790'(1)*
D	*FUTURE HANGAR*	*7770'(1)*
E	*FUTURE RELOCATED GROUND SERVICE EQUIP. BLDG.*	*7750'(1)*
F	*FUTURE SMALL GA HANGARS*	*7725'(1)*
G	*FUTURE GA/FBO TERMINAL*	*7765'(1)*
H	*FUTURE FBO HANGAR AND SHOP*	*7775'(1)*
I	*FUTURE AIRPORT OPERATIONS EXPANSION*	*7781'(1)*
J	*FUTURE FUEL STORAGE*	*7785'(1)*
K	*FUTURE APRON BUFFER AREA*	
L	*FUTURE EMERGENCY AIRCRAFT PARKING/DEICE PAD*	

(1) – ESTIMATED TOP MSL (2) – EXISTING FROM OBSTRUCTION CHART TOP MSL

DRAWING LEGEND

	EXISTING	*FUTURE*
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE	X	X
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
PAVED SHOULDER		
PAVED ROADS		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	
RUNWAY SAFETY AREA	RSA	
RUNWAY OBJECT FREE AREA	ROFA	
RUNWAY OBJECT FREE ZONE	OFZ	
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
SURVEY MONUMENT		
HOLDLINES		
RDR SIGNS		
AIRPORT REFERENCE POINT		
RUNWAY END IDENTIFIER LIGHTS		
RUNWAY CENTERLINE LIGHTING		
RUNWAY TDZE LIGHTING		
ATCT VISUAL AID (CAMERA LOCATIONS)		
RAIL/TRANSIT CORRIDOR		
BIKE TRAIL		
CULVERT		
FUTURE APRON BUFFER AREA		



AIRPORT DATA

	EXISTING	*FUTURE*
AIRPORT ELEVATION (AMSL)	*7837.9'*	*SAME*
AIRPORT REFERENCE POINT (ARP)	*LAT.39°13'18.76"N LON.106°52'05.65"W*	*LAT. SAME LON.SAME*
AIRPORT REFERENCE CODE	D–III	*SAME*
NPIAS CATEGORY	PRIMARY COMM. SERVICE	*SAME*
MEAN MAX. TEMPERATURE (HOTTEST MONTH)°F	80.0	*SAME*
TAXIWAY LIGHTING	MITL	*MITL,C/L*
TAXIWAY MARKING	YES	*SAME*
AIRPORT & TERMINAL NAVAIDS	VOR, LDA, GPS	*SAME*

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As–Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Monument information verified from National Geodetic Survey (NGS) website: http://www.ngs.noaa.gov/cgi–bin/ds_radius.prl on October 30, 2008.

Aspen-Pitkin County Airport/Sardy Field

ASPEN, COLORADO

Terminal Area Plan

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
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DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE
MAR 2013

SCALE
1" = 200'

SHEET NO.
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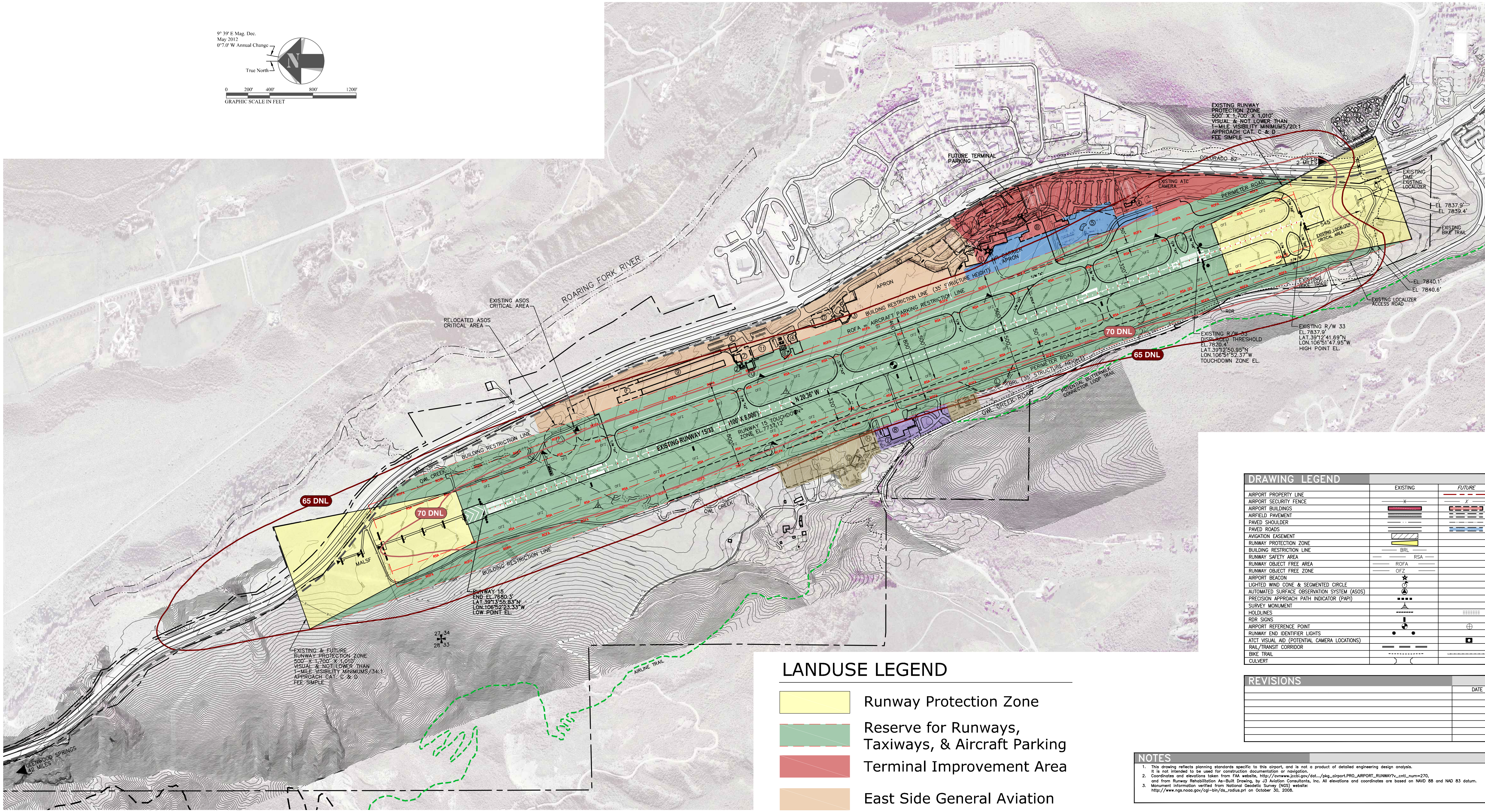
Figure 11-7 **Terminal Area Plan**

11.7 Airport Land Use Plan

The land use plan for Aspen/Pitkin County Airport, presented in the following illustration (**Figure 11-8**), depicts existing and recommended use of all land within the ultimate airport property line and in the vicinity of the Airport [including the area contained in the future 65 day/night average sound level (DNL) noise contour]. The purpose of the on-airport portions of the land use plan is to provide airport management with a guide for the potential leasing of revenue-producing areas on the Airport. It also provides guidance to local authorities for the establishment of appropriate land use zoning in the vicinity of the Airport.



LANDUSE LEGEND

- Runway Protection Zone
- Reserve for Runways, Taxiways, & Aircraft Parking
- Terminal Improvement Area
- East Side General Aviation
- West Side General Aviation
- Future 2022 DNL Noise Contours
- Air Carrier Aircraft Parking
- Airport Support Facilities

Note: There are no known public schools, parks or places of worship in the coverage area.

DRAWING LEGEND

	EXISTING	FUTURE
AIRPORT PROPERTY LINE		
AIRPORT SECURITY FENCE		
AIRPORT BUILDINGS		
AIRFIELD PAVEMENT		
PAVED SHOULDER		
PAVED ROADS		
AVIGATION EASEMENT		
RUNWAY PROTECTION ZONE		
BUILDING RESTRICTION LINE	BRL	
RUNWAY SAFETY AREA	RSA	
RUNWAY OBJECT FREE AREA	ROFA	
RUNWAY OBJECT FREE ZONE	OFZ	
AIRPORT BEACON		
LIGHTED WIND CONE & SEGMENTED CIRCLE		
AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS)		
PRECISION APPROACH PATH INDICATOR (PAPI)		
SURVEY MONUMENT		
HOLDLINES		
RDR SIGNS		
AIRPORT REFERENCE POINT		
RUNWAY END IDENTIFIER LIGHTS		
ATCT VISUAL AID (POTENTIAL CAMERA LOCATIONS)		
RAIL/TRANSIT CORRIDOR		
BIKE TRAIL		
CULVERT		

REVISIONS

	DATE

NOTES

1. This drawing reflects planning standards specific to this airport, and is not a product of detailed engineering design analysis. It is not intended to be used for construction documentation or navigation.
2. Coordinates and elevations taken from FAA website, http://avnwww.jccbi.gov/dat.../pkg_airport.PRO_AIRPORT_RUNWAY?v_cntl_num=270, and from Runway Rehabilitation As-Built Drawing, by J3 Aviation Consultants, Inc. All elevations and coordinates are based on NAVD 88 and NAD 83 datum.
3. Monument information verified from National Geodetic Survey (NGS) website: http://www.ngs.noaa.gov/cgi-bin/ds_radius.prl on October 30, 2008.

Aspen-Pitkin County Airport/Sardy Field
ASPEN, COLORADO

Airport Land Use Plan

Barnard Dunkelberg & Company
a Mead & Hunt company

TULSA
1616 East 15th Street
Tulsa, Oklahoma 74120
918.585.8844

DENVER
1743 Wazee Street, Suite 400
Denver, Colorado 80202
303.825.8844

DATE MAR 2013
SCALE 1" = 400'
SHEET NO. 8 of 9

Figure 11-8 **Airport Land Use Plan**

11.8 Airport Property Map/Exhibit A

The following illustration (**Figure 11-9**) indicates how various tracts of land within the airport boundaries were acquired (e.g., federal funds, surplus property, local funds, etc.). The purpose of the airport property map is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.

AIRPORT PARCEL DATA

PARCEL	ACREAGE + / -	INTEREST	COMMENTS	SOURCE OF FUNDS	ACQUISITION PURPOSE	DATE OF RECORDING	RECORDING INFO	GRANTOR
1	69.30	FEE SIMPLE		FAAP-01	AIRPORT DEVELOPMENT	08/29/1956	BK 174/PG 488	WALTER P. PAEPCKE & JOHN V. SPACHNER
2	5.00	FEE SIMPLE		FAAP-01	AIRPORT DEVELOPMENT	10/30/1961	BK 195/PG 517	ELIZABETH H. PAEPCKE, EXECUTIONER FOR ESTATE OF WALTER P. PAEPCKE
3 & 3a	6.48	FEE SIMPLE		FAAP-02	AIRPORT DEVELOPMENT	05/08/1963	BK 202/PG 270	ELIZABETH H. PAEPCKE, JOHN V. SPACHNER & PAUL NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST
6	31.27	FEE SIMPLE		ADAP-02	AIRPORT DEVELOPMENT	03/05/1969	BK 239/PG 636 BK 239/PG 639	ELIZABETH H. PAEPCKE, JOHN SPACHNER & STEPHEN MCK. DUBRUL JR. AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST (50% INTEREST) J.V. SPACHNER, OTHERWISE KNOWN AS JOHN V. SPACHNER (50% INTEREST)
A	17.31	FEE SIMPLE		ADAP-06	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	02/13/1979	BK 363/PG 345	GENERAL CONTRACTING CO, THOMAS S. REGES & JACK K. KORFF
B	4.72	FEE SIMPLE		ADAP-06	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	02/13/1979	BK 363/PG 341	D.H. HAMMAR
C	19.82	FEE SIMPLE		ADAP-07	AIRPORT DEVELOPMENT, TRANSITIONAL PROTECTION	11/09/1981	BK 417/PG 135	JOHN MCBRIDE
D-1	5.59	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	08/14/1975	BK 301/PG 744	ELIZABETH H. PAEPCKE, STEPHEN MCK. DUBRUL JR. & PETER NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST TO PETER VAN DOMELEN AS REP. ESTATE JOHN V. SPACHNER (GRANTEE)
D-2	0.65	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 355/PG 380	ELIZABETH H. PAEPCKE, STEPHEN MCK. DUBRUL JR. & PETER NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST
D-3	20.78	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 335/PG 383 BK 335/PG 363	ELIZABETH H. PAEPCKE, STEPHEN MCK. DUBRUL JR. & PETER NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST (50% INTEREST) PETER VAN DOMELAN AS THE LOCAL PERSONAL REPRESENTATIVE OF THE ESTATE OF JOHN V. SPACHNER(50% INTEREST)
D-4	51.46	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 335/PG 383 BK 335/PG 363	
D-5	22.36	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 335/PG 366 BK 335/PG 363	
E	1.54	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	01/10/1977	BK 322/PG 976	ROBERT M. BURLINGAME
H-1	5.80	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 335/PG 363	PETER VAN DOMELEN AS LOCAL REP. OF ESTATE JOHN V. SPACHNER
H-2	2.64	FEE SIMPLE		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/22/1977	BK 335/PG 369	ELIZABETH H. PAEPCKE, STEPHEN MCK. DUBRUL JR. & PETER NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST
I-1a	20.01	FEE SIMPLE		AIP-05	AIRPORT DEVELOPMENT	12/15/1988	BK 580/PG 983 BK 580/PG 989 BK 580/PG 994	ELIZABETH H. PAEPCKE, JOHN V. SPACHNER & PETER NITZE AS TRUSTEES FOR WALTER P. PAEPCKE LIFE INSURANCE TRUST (50% INTEREST), CAROLE S. SEELEN (35% INTEREST), AMERICAN NATIONAL BANK & TRUST COMPANY OF CHICAGO AND CAROLE S. SEELEN, AS TRUSTEES UNDER THE WILL OF JOHN V. SPACHNER DECEASED (15% INTEREST)
I-1b	278.09	FEE SIMPLE		AIP-05	AIRPORT DEVELOPMENT	12/15/1988		
I-2	19.81	FEE SIMPLE	FORMERLY I-4b & I-4c	AIP-11	AIRPORT DEVELOPMENT, APPROACH PROTECTION	06/10/1993	BK 714/PG 604	COURT ORDER: BOCC VS. THE WALTER PAEPCKE LIFE INSURANCE TRUST, THE JOHN SPACHNER FAMILY TRUST-WARREN, CAROLE SEELEN, THE ESTATE OF THOMAS SARDY & THOMAS CARL OKEN (PITCO TREASURER)
I-2a	21.81	FEE SIMPLE	FORMERLY I-2, I-3, & I-4a	AIP-08, AIP-09, AIP-11, SPONSOR	AIRPORT DEVELOPMENT, APPROACH PROTECTION	06/10/1993	BK 714/PG 604	
I-2b	10.91	FEE SIMPLE	FORMERLY K. SEE NOTES 1 AND 2.	AIP-11	AIRPORT DEVELOPMENT, APPROACH PROTECTION	04/30/2004	REC. 497018	
I-4d	1.18	FEE SIMPLE		AIP-11	AIRPORT DEVELOPMENT, APPROACH PROTECTION	06/10/1993	BK 714/PG 604	
J	0.55	FEE SIMPLE		AIP-03	APPROACH PROTECTION	07/03/1986	BK 514/PG 51	FLEET PROPERTIES CO.
M	0.5	FEE SIMPLE		SPONSOR	AIRPORT DEVELOPMENT, APPROACH PROTECTION	10/11/2001	REC. 459660	BOCC VS. OTTO STUDHALTER, PATRICIA K. STUDHALTER, THE BANK OF NEW YORK, TRUSTEE, WESTAR BANK & THOMAS CARL OKEN (PITCO TREASURER)
N	10.39	FEE SIMPLE		AIP-21	RUNWAY PROTECTION ZONE	03/12/2001	REC. 452307	BOCC VS. CITY OF ASPEN
N-1A	5.11	FEE SIMPLE		AIP-29	APPROACH PROTECTION	07/05/2005	REC. 512051	BOCC VS. CITY OF ASPEN, MAROON CREEK CLUB LLC
N-1B	8.05	FEE SIMPLE		AIP-29	APPROACH PROTECTION	07/05/2005	REC. 512051	
O	6.02	FUTURE FEE		- - -	- - -	09/06/2002	REC. 471970, (PARCEL 112-C)	DOT STATE OF COLORADO, BOCC VS. CRAIG STAPLETON, ROCKY MOUNTAIN NAT. GAS CO., BUTTERMILK MOUNTAIN SKIING CORP., ASPEN SKI COMPANY, THOMAS C. OKEN (PITCO TREASURER)
P	0.37	FEE SIMPLE	SEE NOTE 3	- - -	- - -	- - -	- - -	- - -

AIRPORT PARCEL DATA

PARCEL	ACREAGE + / -	INTEREST	COMMENTS	SOURCE OF FUNDS	ACQUISITION PURPOSE	DATE OF RECORDING	RECORDING INFO	GRANTOR
4	3.35	EASEMENT		FAAP-02	APPROACH PROTECTION	09/19/1958	BK 185/PG 182	WALTER P. PAEPCKE & JOHN V. SPACHNER
5	8.60	EASEMENT		FAAP-02	APPROACH PROTECTION	05/08/1963	BK 202/PG 272	ELIZABETH H. PAEPCKE, JOHN V. SPACHNER & PAUL NITZE AS TRUSTEES FOR WALTER PAEPCKE LIFE INSURANCE TRUST
F-1	0.28	EASEMENT		ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	07/26/1977	BK 332/PG 381	OTTO STUDHALTER & ELISABETH STUDHALTER
F-1	0.09	EASEMENT	SOUTH	ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	07/26/1977	BK 332/PG 381	OTTO STUDHALTER & ELISABETH STUDHALTER
F-2	0.02	EASEMENT	NORTH	ADAP-04	AIRPORT DEVELOPMENT, CLEAR ZONE, TRANSITIONAL PROTECTION	09/27/1977	BK 335/PG 591	SMITH & SONS INVESTMENT CO.
L	3.90	EASEMENT		SPONSOR	AVIGATION EASEMENT	01/31/2000	REC. 439985	CITY OF ASPEN & MUSIC ASSOCIATES OF ASPEN, INC.
C (CLAIM)	1.41	FEE SIMPLE	SEE NOTE 4	ADAP-07	AIRPORT DEVELOPMENT, TRANSITIONAL PROTECTION	11/09/1981	BK 417/PG 135	JOHN MCBRIDE
C (EXCPTN)	2.60	FEE SIMPLE	WITHIN CDOT 99 ROW - SEE NOTE 4	ADAP-07 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	10/16/2002	REC. 473357	PITKIN COUNTY
A (ROW)	0.72	FEE SIMPLE	WITHIN CDOT 99 ROW	ADAP-06 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471106	PITKIN COUNTY
B (ROW)	0.21	FEE SIMPLE	WITHIN CDOT 99 ROW	ADAP-06 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471106	PITKIN COUNTY
D-1 (ROW)	0.54	FEE SIMPLE	WITHIN CDOT 99 ROW	ADAP-04 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471106	PITKIN COUNTY
D-3 (ROW)	0.79	FEE SIMPLE	WITHIN CDOT 97 ROW - SEE NOTE 5	ADAP-04 (ORIGINAL)	- - -	- - -	- - -	- - -
E (ROW)	0.24	FEE SIMPLE	WITHIN CDOT 99 ROW	ADAP-04 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471106	PITKIN COUNTY
H-2 (ROW)	0.24	FEE SIMPLE	WITHIN CDOT 99 ROW	ADAP-04 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471108	PITKIN COUNTY
N (ROW)	0.64	FEE SIMPLE	WITHIN CDOT 99 ROW	AIP-21 (ORIGINAL) CDOT FOR EASEMENT	RELEASED FROM AERONAUTICAL USE	08/16/2002	REC. 471108	PITKIN COUNTY
P (ROW)	.05	FEE SIMPLE	SEE NOTE 6	- - -	- - -	- - -	- - -	- - -

EXHIBIT A NOTES

1. A PORTION OF PARCEL I-2a WAS DEDICATED TO THE COLORADO DEPARTMENT OF TRANSPORTATION - DIVISION OF HIGHWAYS FOR NON-AERONAUTICAL USE AS RIGHT-OF-WAY FOR STATE HIGHWAY 82 WHEN IT WAS RELOCATED IN 1996.

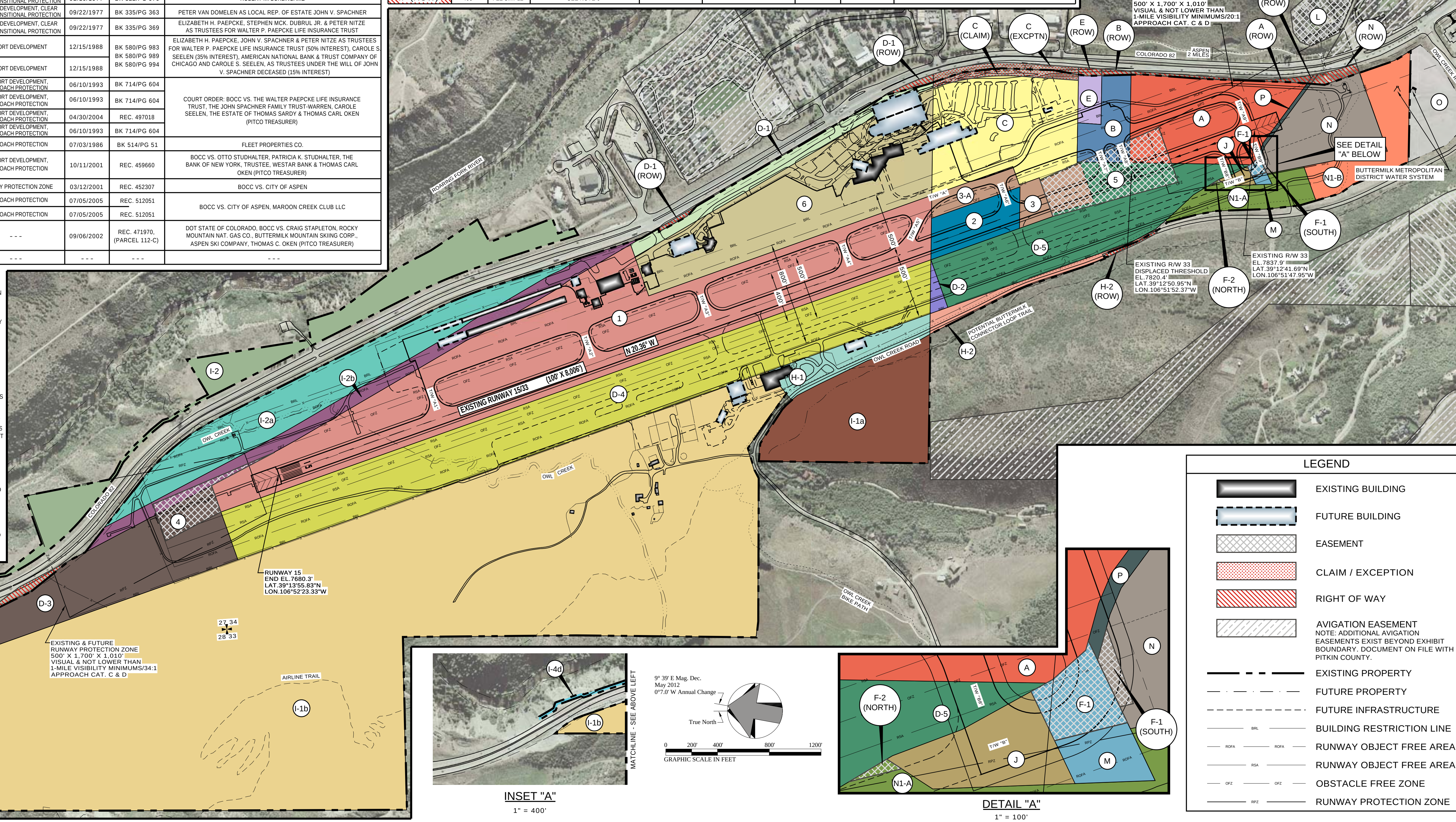
2. AS PART OF THE 1996 STATE HIGHWAY 82 RELOCATION, 10.91 ACRES OF PREVIOUS HIGHWAY 82 RIGHT-OF-WAY WAS CONVEYED FROM THE COLORADO DEPARTMENT OF TRANSPORTATION - DIVISION OF HIGHWAYS TO PITKIN COUNTY (ASPEN/PITKIN COUNTY AIRPORT) FOR AERONAUTICAL PURPOSES. THIS CONVEYANCE OCCURRED AND IS RECORDED AS SHOWN IN THE AIRPORT PARCEL DATA TABLE FOR PARCEL I-2b ON APRIL 30, 2004

3. OWL CREEK ROAD WAS RELOCATED IN 2000 ON THE SOUTH END OF THE AIRPORT. PARCEL P IS THE FORMER RIGHT-OF-WAY FOR THE PREVIOUS OWL CREEK ROAD ALIGNMENT. THE PUBLIC USE OF THIS FORMER RIGHT-OF-WAY WAS TO BE VACATED BY PITKIN COUNTY SO THE LAND COULD BE USED FOR AERONAUTICAL OR AIRPORT PURPOSES BY THE ASPEN/PITKIN COUNTY AIRPORT; HOWEVER, NO DOCUMENTATION OF THIS VACATION COULD BE FOUND. PITKIN COUNTY IS CURRENTLY IN THE PROCESS OF VACATING AND REPURPOSING THIS PARCEL.

4. PARCEL C AND IT'S PARENTING DEED (BOOK 417 PAGE 135 11/09/81 JOHN P. MCBRIDE > B.O.C.C) EXCLUDES A 100 FOOT STRIP WEST OF THE 1937 HIGHWAY 82 RIGHT-OF-WAY (EAST BOUNDARY OF DESCRIBED PARCEL C). THE 1999 STATE HIGHWAY 82 RIGHT-OF-WAY ACQUISITION (RECEPTION NO. 473537) SITUATED WITHIN THIS 100 FOOT STRIP WAS GRANTED BY THE CITY OF ASPEN AND PITKIN COUNTY JOINTLY TO THE COLORADO DEPARTMENT OF TRANSPORTATION (C.D.O.T.) AND IS IDENTIFIED AS PARCEL C (EXCEPTION) ON THE AIRPORT PARCEL DATA TABLE. AS A RESULT OF PITKIN COUNTY AND THE CITY OF ASPEN GRANTING C.D.O.T. THE STATE HIGHWAY 82 RIGHT-OF-WAY, IT APPEARS THAT THERE IS OWNERSHIP INTEREST BY PITKIN COUNTY AND THE CITY OF ASPEN WITHIN THE 100 FOOT EXCLUSION. THEREFORE, PARCEL C (CLAIM) LOCATED ON THE WEST SIDE OF THE STATE HIGHWAY 82 RIGHT-OF-WAY WITHIN THE 100 FOOT EXCLUSION IS BEING SHOWN AS AIRPORT PROPERTY; HOWEVER, THE OWNERSHIP DOCUMENTS FOR PARCEL C (CLAIM) COULD NOT BE FOUND. THE CURRENT PITKIN COUNTY ASSESSOR MAPPING ALSO SHOWS PARCEL C (CLAIM) AS BEING OWNED BY PITKIN COUNTY.

5. DURING THE RELOCATION OF STATE HIGHWAY 82 IN 1996, A PORTION OF PARCEL D-3 WAS TO BE CONVEYED TO THE COLORADO DEPARTMENT OF TRANSPORTATION (C.D.O.T.) FOR STATE HIGHWAY 82 RIGHT-OF-WAY; HOWEVER, NO SUCH DOCUMENTATION OF THIS CONVEYANCE COULD BE FOUND.

6. OWL CREEK ROAD WAS RELOCATED IN 2000 ON THE SOUTH END OF THE AIRPORT. PARCEL P (ROW) IS THE FORMER RIGHT-OF-WAY FOR THE PREVIOUS OWL CREEK ROAD ALIGNMENT THAT CURRENTLY LIES WITHIN THE RIGHT-OF-WAY FOR STATE HIGHWAY 82. THIS FORMER RIGHT-OF-WAY FOR OWL CREEK ROAD WAS TO BE VACATED AND CONVEYED TO THE COLORADO DEPARTMENT OF TRANSPORTATION FOR THE STATE HIGHWAY 82 RIGHT-OF-WAY, HOWEVER NO DOCUMENTATION OF THIS VACATION AND CONVEYANCE COULD BE FOUND. PITKIN COUNTY IS CURRENTLY IN THE PROCESS OF VACATING AND REPURPOSING THIS PARCEL.



JVIATION®

DES: P.A.F.
DRN: L.M.R.
CHK: P.A.F.
APP: J.D.I.

ISSUE RECORD

NO.	BY	DATE	DESCRIPTION

ASPEN-PITKIN COUNTY AIRPORT

ASPEN, COLORADO

ASPEN/PITKIN COUNTY AIRPORT
OWNED AND OPERATED BY PITKIN COUNTY

EXHIBIT A
PROPERTY MAP

DATE: JULY, 2013

SHEET NO.
1 of 1

ASE-LOC 11-EXBT-A.dwg Aug 05, 2013 - 2:16pm lrelatia

Final Report

Master Plan Update
Aspen/Pitkin County Airport

Appendix

MASTER PLAN UPDATE

Appendix

Appendix – Enplanement Forecast Background

Forecasting methodologies that were developed as a precursor to the selected methodology included:

- FAA's Terminal Area Forecast (TAF)
- Historical Trend Line
- Market Share (what percentage of national enplanements is expected to be captured at ASE)
- Socio-Economic Methodology – Population Variable
- Socio-Economic Methodology – Per Capita Income Variable
- Socio-Economic Methodology – Retail Sales Variable
- Socio-Economic Methodology – Available Pillows (rental property and lodging unit occupancy)

As originally published in 2008, these precursor methodologies are presented below.

Federal Aviation Administration Enplanement Forecast

The FAA monitors and projects activity levels for airports; this data is available in its TAF as shown in **Table 2-2**. The FAA predicts a slow, steady increase in passenger enplanements for the 20-year projection period: 189,022 in 2012; 196,214 in 2017; and, 210,598 in 2027; a CAGR of 0.16 percent.

Table 2-2. Enplanement Forecast – FAA Terminal Area Forecast (TAF)	
Year	**Enplanements**
Historical	
1995	200,685
1996	210,672
1997	224,815
1998	248,510
1999	213,903
2000	214,816
2001	187,622
2002	183,704
2003	195,782
2004	185,801
2005	194,353
2006	203,516
2007	183,632*
CAGR 1995-2006	*0.13%*
Projection	
2012	189,022
2017	196,214
2027	210,598**
CAGR 2006-2027	*0.16%*

Source:
Historical: Airport Management Records
Projected: FAA Terminal Area Forecast, June 2008
*Note: *Runway closed for 60 days for runway rehabilitation*
***Projected by Mead & Hunt, Inc. through linear extrapolation of FAA forecast figures through 2025.*

Forecasts that are developed for airport master plans and/or federal grants must be approved by the FAA. It is the FAA's policy, listed in AC 150/5070-6B, *Airport Master Plans*, that FAA approval of forecasts at non-hub airports with commercial service should be consistent with the TAF. Master plan forecasts for operations, based aircraft, and enplanements are considered to be consistent with the TAF if they meet the following criteria:

a) Forecasts differ by less than 10 percent in the five-year forecast and 15 percent in the 10-year or 20-year period; or
b) Forecasts do not affect the timing or scale of an airport project; or

c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3, *Field Formulation of the National Plan of Integrated Airport Systems.*

2.4.2 Historical Trend Line

The trend line projection presented in this section is based on one primary assumption; that future trends will continue to mimic those of the selected time period and that the factors that affect those trends will continue to influence demand levels in similar fashion. With the establishment of a linear trend line with historical data using the least squares methodology, this type of projection often serves as a baseline that represents static market conditions. The results of this type of projection in small markets are influenced by abrupt changes in available service or aircraft fleet.

In this case, historical data from 2002 to 2006 is used as the basis for trend line projections because of the decline in passenger enplanements that resulted from the terrorist attacks of September 11, 2001. There is a correlation coefficient of 0.75 between the year and passenger enplanements between 2002 and 2006.

Trend line projections of passenger enplanements are presented in **Table 2-3**. As shown, enplanements are projected to increase from 203,516 in 2006 to 280,480 in 2027, which results in a CAGR of 1.54 percent.

Table 2-3. Trend Line Projection	
Year	**Enplanements**
Historical	
1995	200,685
1996	210,672
1997	224,815
1998	248,510
1999	213,903
2000	214,816
2001	187,622
2002	183,704
2003	195,782
2004	185,801
2005	194,353
2006	203,516
2007	183,632*
CAGR 1995-2006	*0.13%*
Projection	
2012	223,187
2017	242,285
2027	280,480
CAGR 2006-2027	*1.54%*

Sources: Airport Management Records, Mead & Hunt, Inc.

* *Runway closed for 60 days for runway rehabilitation*

2.4.3 Market Share

The Airport's passenger enplanement market share has declined slightly during the presented time period (**see Table 2-4**). As shown, the Airport's market share has varied considerably, which reflects the changes in air service as well as the region's status as a tourism market. The 12-year high of 0.0421 percent occurred in 1998 and a low of 0.0284 percent in 2007, although as previously noted, the Airport was closed in 2007 for 60 days for runway rehabilitation.

This demand scenario assumes that a market share representing roughly the Historical average will continue into the future. There is a correlation coefficient of 0.58 between U.S. domestic enplanements and Aspen/Pitkin County enplanements from 2001 to 2006. Because there was a significant decrease in passenger enplanements in 2001, the market share methodology uses the six year market share average from 2001 to 2006 of 0.0307 percent as a benchmark for future levels of activity. Using the FAA's projections of U.S. domestic enplanements this market share results in 242,446 passenger enplanements in 2012, 278,810 in 2017, and 361,873 in 2027, resulting in a CAGR of 2.78 percent.

Table 2-4. Market Share Projection			
Year	**US Domestic Enplanements**	**ASE Enplanements**	**Market Share**
Historical			
1995	531,100,000	200,685	0.0378%
1996	558,100,000	210,672	0.0377%
1997	577,800,000	224,815	0.0389%
1998	590,400,000	248,510	0.0421%
1999	610,900,000	213,903	0.0350%
2000	641,200,000	214,816	0.0335%
2001	625,800,000	187,622	0.0300%
2002	575,100,000	183,704	0.0319%
2003	587,800,000	195,782	0.0333%
2004	628,500,000	185,801	0.0296%
2005	669,400,000	194,353	0.0290%
2006	668,400,000	203,516	0.0304%
2007	689,400,000	183,632*	0.0266%
CAGR 1995-2006	*2.11%*	*0.13%*	
Projection			
2012	789,400,000.0	242,446	0.0307%
2017	907,800,000.0	278,810	0.0307%
2027	1,178,249,856.0	361,873	0.0307%
CAGR 2006-2027	*2.74%*	*2.78%*	

Source: FAA Terminal Area Forecast, June 2008, Airport Management Records

* *Runway closed for 60 days for runway rehabilitation*

2.4.4 Socio-economic Methodology – Population Variable

Although the Aspen/Pitkin County Airport receives a high proportion of visitors, socio-economic factors that occur locally can impact levels of passenger activity. This Airport Master Plan presents projections of population, retail sales, available pillows, and per capita income to forecast enplanements.

The natural surroundings and recreational opportunities in and around Aspen render the region a desirable place to live. In response, some local communities have passed initiatives that slow population and development in an attempt to preserve the character of the area. The population of Pitkin County increased only slightly between 1995 and 2007 (see **Table 2-5**). Projections of population were obtained by Woods & Poole, Inc. a firm that specializes in the development of local socio-economic projections.

Table 2-5. Socio-economic Projection – Population

Year	ASE Enplanements	Pitkin County Population	Per Capita Enplanements
Historical			
1995	200,685	14,603	13.74
1996	210,672	14,519	14.51
1997	224,815	14,920	15.07
1998	248,510	14,886	16.69
1999	213,903	15,081	14.18
2000	214,816	14,777	14.54
2001	187,622	14,842	12.64
2002	183,704	14,882	12.34
2003	195,782	14,866	13.17
2004	185,801	14,748	12.60
2005	194,353	14,822	13.11
2006	203,516	14,798	13.75
2007	183,632*	15,029	12.22
CAGR 1996-2007	*0.13%*	*0.12%*	
Projection			
2012	221,853	16,003	13.86
2017	235,816	17,011	13.86
2027	265,330	19,140	13.86
CAGR 2006-2027	*1.27%*	*1.23%*	

Sources: Airport Management Records, Woods and Poole Economics, Inc. Mead & Hunt, Inc.

* *Runway closed for 60 days for runway rehabilitation*

Again, when adjusted for the decrease in enplanements following 2000, between 1995 and 2006, the average number of annual enplanements per person in Pitkin County was 13.86. The socio-economic population methodology assumes this figure will remain constant in the future. When multiplied by the projected population of the county, it is projected that there will be 221,853 passenger enplanements in 2012, 235,816 in 2017, and 265,330 in 2027, which results in a CAGR of 1.27 percent. From 1995 to 2006, the correlation coefficient between population and enplanements is only 0.18, which suggests that population is not a strong indicator of passenger enplanements.

2.4.5 Socio-economic Methodology – Per Capita Income Variable

Local economic conditions can impact levels of passenger activity. It is assumed that one's propensity toward air travel can be partially linked with available income. Because there is such a high demand to live in the Aspen/Pitkin County area, home values and cost of living are significantly above those in other regions. Pitkin County has the highest per capita income in the State of Colorado, and according to the

US Census Bureau had the third highest per capita income in the United States in 2005. Not surprisingly, per capita income in Pitkin County has increased significantly during the study period from $46,680 in 1995 to $71,628 in 2007, a CAGR of 3.63 percent. Projections of per capita income for Pitkin County were obtained from Woods & Poole Economics, Inc.

Enplanements per $1 of per capita income have declined significantly during that same timeframe from 4.30 in 1995 to 2.88 in 2006 (see **Table 2-6**). The largest decline occurred between 1998 and 2001, a period that experienced a significant reduction in passenger enplanements and an increase in per capita income. Enplanements per $1 of per capita income leveled during the years that followed. Anticipated 2008 enplanements are expected to result in 3.17 enplanements per $1 of per capita income. This figure is multiplied by projected incomes and results in 245,293 passenger enplanements in 2012, 264,009 in 2017, and 304,045 in 2027, a CAGR of 1.93 percent. It should be noted that income figures are presented in 2004 dollars. These are “constant” dollars and are used to measure the “real” change in earnings and income when inflation is taken into account. From 1995 to 2008, the correlation coefficient between population and enplanements is only 0.23, which suggests that per capita income may not be a strong indicator of passenger enplanements.

Table 2-6. Socio-economic Projection – Per Capita Income			
Year	**ASE Enplanements**	**Pitkin County Per Capita Income (2004 $)**	**Enplanements per $1 Income**
Historical			
1995	200,685	$46,680	4.30
1996	210,672	$50,886	4.14
1997	224,815	$53,529	4.20
1998	248,510	$58,850	4.22
1999	213,903	$61,857	3.46
2000	214,816	$72,143	2.98
2001	187,622	$70,243	2.67
2002	183,704	$68,670	2.68
2003	195,782	$68,815	2.85
2004	185,801	$72,982	2.55
2005	194,353	$75,788	2.56
2006	203,516	$70,686	2.88
2007	183,632*	$71,628	2.56
2008**	230,600**	$72,758	3.17
CAGR 1995-2006	*0.13%*	*3.84%*	
Projection			
2012	245,293	$77,394	3.17
2017	264,009	$83,299	3.17
2027	304,045	$95,931	3.17
CAGR 2006-2027	*1.93%*	*1.46%*	

Sources: Airport Management Records, Woods and Poole Economics, Inc. Mead & Hunt, Inc.
** Runway closed for 60 days for runway rehabilitation*
***Anticipated*

2.4.6 Socio-Economic Methodology – Retail Sales Variable

Another measure of a local economy's strength is retail sales. Because Aspen/Pitkin County receives a significant amount of tourists, total retail sales can be indicative of not only the number of tourists that may visit, but their propensity to spend as well. The retail sales methodology compares annual enplanements at the Airport to annual retail sales in Pitkin County. Overall, retail sales (in 2004 dollars) have steadily increased every year between 1995 and 2007 (see **Table 2-7**). There is a correlation coefficient of 0.77 between retail sales and enplanements. Projections of retail sales were obtained from Woods & Poole Economics, Inc.

As employed in other methodologies, the 2001-2006 average of 415.2 enplanements per $1 million in retail sales is used to offset the decrease from previous levels. This figure is multiplied by projected retail sales and produces 231,365 enplanements in 2012, 259,810 in 2017, and 326,563 in 2027, resulting in a CAGR of 2.28 percent.

Table 2-7. Total Retail Sales Methodology

Year	ASE Enplanements	Pitkin County Retail Sales (Millions)	Enplanements per $1 million Retail Sales
Historical			
1995	200,685	$401.8	499.44
1996	210,672	$400.3	526.26
1997	224,815	$407.3	552.02
1998	248,510	$416.8	596.21
1999	213,903	$444.2	481.53
2000	214,816	$447.0	480.57
2001	187,622	$447.6	419.16
2002	183,704	$449.1	409.06
2003	195,782	$454.5	430.72
2004	185,801	$462.2	401.97
2005	194,353	$474.7	409.43
2006	203,516	$483.5	420.95
2007	183,632*	$495.3	370.75
CAGR 1995-2006	*0.13%*	*1.70%*	
Projection			
2012	231,365	$557.2	415.22
2017	259,810	$625.7	415.22
2027	326,563	$786.5	415.22
CAGR 2006-2027	*2.28%*	*2.34%*	

Sources: Airport Management Records, Woods and Poole Economics, Inc. Mead & Hunt, Inc.

* *Runway closed for 60 days for runway rehabilitation*

2.4.7 Socio-Economic Methodology – Available Pillows Variable

In order to further understand how Aspen/Pitkin County's status as a destination market influences passenger enplanements at the Airport, a socio-economic methodology was developed that examines rental property and lodging unit occupancy. This methodology uses the number of condominiums, lodges, and hotels available for rent, along with the historical occupancy rate of those facilities, to project future passenger demand.

In order to account for various size units for rent, the number of occupied pillows, rather than units or rooms, was used for this analysis. The number of available pillows for rent in Aspen and Snowmass was obtained from Stay Aspen Snowmass. Data on Snowmass units and pillows was only available after year 2001 so only data from 2002 to 2006 was used for this historical analysis. Reviewing this data indicates that the total number of available pillows in Aspen and Snowmass increased from 14,741 in 2002 to 15,080 in 2006, a compound annual growth rate of 0.57% (see **Table 2-8**). Growth in the number of units and pillows available is somewhat subdued due to a number of factors. Construction development within the established Urban Growth Boundary for the City of Aspen has been limited to two percent annually[1], which limits the number of units that can be constructed. Also, there are a number of properties that were once rented to visitors that have been converted into permanent or semi-permanent housing and are no longer available for rent which works to offset any increase due to new rental unit construction.

The number of pillows available for rent in the future was projected using the 0.57% annual growth rate in available pillows that was exhibited from 2002 to 2006. Currently occurring within Snowmass is the new Base Village development which will add 500 upscale residential units, and includes new condominiums, conference, arts and events facilities and new restaurants, bars, cafes, and retail. These additional 500 units within Base Village were also included within the number of future available pillows for rent, assuming that 50% of the new units will be available for rent with an average of four pillows per unit.

The Aspen Chamber Resort Association reports monthly occupancy rates. Historically, there have been significant seasonal fluctuations in these figures due to peak travel periods; therefore, the occupancy rates presented in this section are yearly averages. Only properties within the City of Aspen were included within this historical occupancy data; however, this analysis assumes that occupancy trends that occur in the City are similar to other communities within Pitkin County. Historical annual rates have remained fairly consistent throughout the study period. The average occupancy rate between 2002 and 2006 was 53.8 percent, which is held constant throughout the projection period.

The number of available pillows is multiplied by 365 to obtain the number of pillows available in a year, and then multiplied by the annual average occupancy rate to determine the number of occupied pillows. Comparison to annual enplanement data indicates that for the five year average from 2002-2006, there was 0.066 enplanements for each occupied pillow. There is a correlation coefficient of 0.74 between occupied pillows and enplanements from 2002 to 2006.

This ratio of enplanements per occupied pillows is applied to the projected number of pillows to be occupied in Aspen in 2012, 2017, and 2027. This projects 215,761 enplanements in 2012, 221,981 in 2017, and 234,964 in 2027, resulting in a CAGR of 0.69 percent.

[1] *2000 Aspen Area Community Plan*

Table 2-8. Available Pillows Methodology					
Year	**ASE Enplanements**	**Aspen/Snowmass Available Pillows**	**Average Occupancy**	**Pillows Occupied Per Year**	**Enplanements Per Occupied Pillow**
Historical					
2002	183,704	14,741	53%	2,851,646	0.064
2003	195,782	14,544	53%	2,813,537	0.070
2004	185,801	14,814	52%	2,811,697	0.066
2005	194,353	14,947**	55%	3,000,610	0.065
2006	203,516	15,080	56%	3,082,352	0.066
2007	183,632*	N/A			
CAGR 2002-2006	*2.59%*	*0.57%*		*-1.38%*	
Projection		***Average 2002-2006***	***53.8%***		***0.066***
2012	215,761	16,603	53.8%	1,562,126	0.066
2017	221,981	17,082	53.8%	1,724,713	0.066
2027	234,964	18,081	53.8%	2,102,415	0.066
CAGR 2006-2027	*0.69%*	*0.87%*		*1.70%*	

Sources: Airport Management Records, Aspen Chamber Resort Association, Stay Aspen Snowmass, Mead & Hunt, Inc.

** Runway closed for 60 days for runway rehabilitation*

*** Available pillows data for 2004-2005 was unavailable. This figure was determined by averaging the 2003-2004 and 2005-2006 seasons*

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